
Chapter 8: Soils & Geology

Chapter 8

Soils and Geology

8.1 Introduction

Trinity Wharf is a brownfield site, approximately 3.6 ha, located at the southern end of Wexford Town's quay-front. The site consists of reclaimed land that extends into Wexford Harbour and was gradually reclaimed with the northern part reclaimed around 1832 (initially as a dockyard area) and then extended south-eastwards through the late 1800s and early 1900s and was occupied by a number of industrial uses. Owing to the reclaimed nature of the site, the superficial soils are dominated by relatively deep layers of 'Made Ground'. Made ground has been defined as soil which has been altered in some way by human activity (imported and placed in-situ).

The characteristics of the proposed development that will impact soils and geology are described in the following paragraphs. The proposed development will involve raising the ground level using imported material. A new sea wall will also be constructed around the coastal boundaries of the site through sheet piles and the placement of rock armour along sections of the northern and southern edges. The structural design of the buildings will typically comprise a reinforced concrete superstructure. The foundation design is proposed to consist of driven steel or concrete piles extending to competent bedrock.

A 64 berth marina and associated breakwater units, pontoon walkways and finger berth is planned on the site's northern corner. The marina will be either piled or anchored. Pontoon berths and walkways will be restrained using tubular piles driven into the seabed or an alternative restraint system.

There will also be a 180m boardwalk structure at the northern corner of the site connecting Trinity Wharf with Paul Quay. The foundations for the boardwalk structure are proposed to be driven steel tubular sections which will be installed to immediately beneath the soffit level of the boardwalk deck where an integral connection will be made.

The chapter will assess the impact of these structures as part of the proposed development on the Trinity Wharf brownfield site. Full details of the project description and likely construction methodology is detailed in Chapter 4 'Description of Development'.

This chapter considers and assesses the likely significant impacts with regard to soils and geology associated with both the construction and operational phases of the proposed development. Measures to mitigate the assessed negative impacts of the development are proposed, and residual impacts are described. The chapter initially sets out the methodology used (Section 8.2), describes the existing soils and geology environment (Section 8.3), examines the predicted impacts of the proposed development (Section 8.4), proposes mitigation measures (Section 8.5), and identifies residual impacts (Section 8.6).

8.2 Methodology

This chapter has been prepared in accordance with the following guidelines:

- Institute of Geologists of Ireland (IGI) (2013) *Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements*;

- National Roads Authority (NRA 2008) *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*;
- Environmental Protection Agency (EPA 2017) *Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports*;
- Waste Management Act 1996 (as amended)

A desk study of the site of the proposed development was carried out in order to establish baseline conditions. The desk study involved collecting all relevant geological, hydrological, hydrogeological and meteorological data for the area. A suite of geological maps published by the Geological Survey of Ireland (GSI) were consulted as a part of the desk study. The maps included the bedrock, quaternary sediments, groundwater vulnerability and geological heritage sites, among other themes. Aerial and site-based photographs as well as historical maps and reports were also consulted as a part of the desk study. The desk study was followed by a walkover survey of the site of the proposed development by ROD Civil engineers in October 2018, with observations used in preparation of this chapter.

Previous Studies/ Reports

The following reports were consulted in the preparation of this chapter:

- Kavanagh Mansfield and Partners (2008): Report on a site investigation for a development at Trinity Wharf Wexford;
- RPS (2018): Trinity Wharf Marina Feasibility Study (project number IBE1115/D03)
- RSK (2018): Preliminary Asbestos Walkover Survey, Trinity Wharf, Wexford

Ground Investigations procured by Kavanagh Mansfield and Partners in 2008 consisted of 13 cable percussive boreholes in overburden and 9 rotary core boreholes in the bedrock. A suite of geotechnical laboratory tests for determination of the geotechnical soil parameters was carried out on the samples from the boreholes. The ground contamination testing was carried out on seven samples. The ground contamination testing was in accordance with “Murphy Suite” which determines the suitability of the soils for acceptance into licensed landfill facilities. The results of which are discussed in Section 8.3.

A Preliminary Asbestos Walkover Survey of the Trinity Wharf site was undertaken in October 2018. Sampling and testing of seven samples was undertaken and a map of general areas impacted with Asbestos Containing Materials (ACMs) was developed. The walkover survey and samples taken were confirmed by laboratory analysis as containing asbestos. The report recommended further work to be undertaken including the development of a remedial strategy and independent validation of the site prior to proceeding with the development. The Preliminary Asbestos Survey Walkover report is attached as Appendix 8.1 for reference.

8.3 Description of Receiving Environment

The proposed development is located on reclaimed land adjacent to the southern bank of the Wexford Harbour, south of the Wexford town centre. The site is flat, with generally low and sparse vegetation. The site is rectangular in shape, connected to the original bank at its southwestern side. The other three sides (north, east and south) that make the coastline are partially protected by historical concrete and masonry sea wall.

The sea bed depth at the location of the marina ranges from -2.5m OD (Ordnance Datum) to -7m OD while the depth at the location of the proposed boardwalk ranges from 0m OD to -2m OD. The site does not contain any Geological Heritage features or quarries.

Bedrock Geology

The GSI 1:100,000 bedrock map indicates that the site is underlain by the Shelmaliere Formation consisting of white and purple quartzites with slates. Cullenstown Formation (grey-green metagreywacke & slate) and Ballysteen Formation (limestones and shales) are also found in the vicinity.

The ground investigation carried out in 2008 indicate that the site is underlain by the moderately weak to strong, thin to medium bedded, slightly cherty limestone. The limestone was locally found to be interbedded with dark calcareous mudstone. This description matches well with the Ballysteen Formation features. Only one borehole (RC15) indicated the presence of interbedded sandstones and siltstones. Refer to borehole locations Plate 8.1 below.

The bedrock in the northern part of the site is typically observed at 10.2 – 11.5 m below ground level (bgl), overlain by the 0.5 -1m of weathered bedrock returned as angular clayey gravel. The bedrock at the southern end of the site was observed at approximately 5m bgl, overlain with 1m of weathered bedrock returned as angular clayey gravel. The central part of the site exhibits a very deep zone of highly weathered bedrock. For instance, borehole RC7 shows the weathered rock, recovered as gravel and cobbles, to extend from 11m bgl down to 22m bgl, with no competent bedrock encountered in this borehole.

Soils and Subsoils

The area is entirely covered by the made ground of very heterogenous composition. Clay, rubble, stone, ash, concrete and slag were all observed as constituents. The strength and density vary accordingly and the thickness of the made ground varies from 1.5m to 4.1m.

The made ground is underlain by alluvial soil typical of riverbanks. The alluvial soils are predominantly encountered as soft to firm sandy silts and loose silty sands. The thickness of the alluvial soil ranges from 1m to 5m. These soils have undergone a degree of consolidation under the made ground layer and building loading which is why no very soft material was encountered during the ground investigation in 2008.

Firm to stiff gravelly clay (widely known as glacial till or boulder clay) underlies the alluvial soils and overlies the weathered bedrock. The thickness of the gravelly clay ranges from 2m to over 8m in BH16. (Refer to Plate 8.1).



Plate 8.1 Borehole locations investigated by IGSL in 2008

Environmental Testing

A suite of Waste Acceptance Criteria (WAC) chemical tests were undertaken on seven samples as a part of the 2008 geotechnical investigation procured by Kavanagh Mansfield and Partners and undertaken by IGSL. The WAC testing followed the Murphy Suite Criteria to determine the suitability of the soils for acceptance into licensed landfill facilities. The location of the boreholes' locations investigated by IGSL are illustrated in Plate 8.1. The samples were taken using the 'Shell and Auger' technique of soft ground boring. All boring operations sampling and / or logging of soils and in-situ testing complies with the recommendations of the British Standard Code of Practice BS 5930 (1981), 'Site Investigation' and BS 1377:1990, 'Methods of test for soils for civil engineering purposes'.

Parameters forming part of the chemical testing included:

- Polychlorinated Biphenyls (PCBs)
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Mineral Oil
- BTEX & Petrol Range Organics (PRO)
- Total Organic Carbon (TOC)

Leachate analysis for metals and major anions and cations was also undertaken to assess potential for movement into groundwater.

The testing found elevated levels of Polycyclic Aromatic Hydrocarbons (PAHs) and sulphates in the made ground stratum in five out of seven samples. In general, low to moderate levels of contamination have been noted. A summary of the results are presented below:

- Dissolved Mercury, Benzene, Toluene, Ethylbenzene, Total Xylene, PCB's, Total Phenols, and Dissolved Cadmium were below the respective Limit of Detection (LOD) in all boreholes.
- Elevated levels of Mineral Oil were identified at boreholes 16 and 17 (south-eastern end of the site) – all other boreholes recorded values below the LOD of 1 mg/kg.
- Slightly elevated levels of Total Dissolved Solids (TDS) were identified at a depth of 2.5m below ground level at borehole 16, with all other samples categorised as Inert in terms of WAC (< 4000 mg/kg). The levels observed at borehole 16 categorise this material as Stable Non-reactive with respect to WAC guidance.
- Dissolved Antimony was either below the LOD or was within the inert criteria limits and were below 0.06 mg/kg with the exception of borehole 22. The levels observed at borehole 22 categorise this material as Stable Non-reactive with respect to WAC guidance.
- Dissolved Arsenic, Barium, Chromium, and Copper concentrations were found to be either below the LOD or within the inert criteria limits.
- Elevated levels of Total Organic Carbon (TOC) above the inert criteria were identified in five of the seven samples. Only boreholes 12 and 16 (in the deeper soil layers) fall below the Inert Landfill Threshold of 3%. For waste disposal purposes to landfill, the levels which were observed would classify the material as hazardous.
- Elevated levels of PAHs were identified in all samples analysed. Borehole 4 was found to have the highest concentrations of PAHs among the boreholes tested.

Further detail is available in the Kavanagh Mansfield and Partners Report from 2008 as appended to this EIAR as Appendix 8.2.

The Preliminary Asbestos Walkover Survey undertaken on 18th October 2018, identified fragments of asbestos cement and floor tiles and / or floor tile debris in numerous locations across the surface of the site. Seven samples were collected by RSK and asbestos was confirmed in five out of the seven samples. The preliminary findings indicate that Asbestos Containing Materials (ACMs) are broadly concentrated along the retaining wall in the northern portion of the site; along the edges of floor slabs; adjacent to and within many of the demolition stockpiles and in the gravel track along the eastern boundary. No suspect ACMs were identified within the grassed area or were visible on the surface of the stockpiles in the southern portion of the site. The Preliminary Walkover Asbestos Report is included as Appendix 8.1 of this EIAR.

The sea bed in the vicinity of the Trinity Wharf development, corresponding to the location of the boardwalk and the sea wall / revetments was sampled and tested as a part of the Trinity Wharf Marina Feasibility Study by RPS Group (November 2018). A comprehensive sampling programme was undertaken in July 2016 by Hydrographic Surveys Ltd to inform the feasibility study, whilst the sediment quality analysis was undertaken by the RPS Laboratory Services, see sampling locations in Plate 8.2 below.

The samples from the north west side of Trinity Wharf (A, B & C) were found to have values above the upper guidance threshold for OCPs and PAH levels that are substantially in excess of the lower guidance limit (there is no upper limit established at present). Station A, furthest from the Wharf, contained the least contaminated sediments on this side of the development area with stations B & C, closer to the Wharf, showing increasing levels of contaminants.

Station B had samples taken at both the surface (B1) and 1m below the surface (B2) and held the greatest amount of contaminants out of the three stations on this side of Trinity Wharf. The sample collected at depth tended to have higher levels of contaminants than the surface sample. Metals levels above the lower guidance levels were found for arsenic, copper, nickel, lead and zinc. PAH levels were also above the lower guidance level in both the surface and -1m samples, with the deeper sample recording total values approximately twice that of the surface sample. PCB, Organotin and TPH levels were satisfactory. OCP levels were all above the threshold effects level and the parameters for which limits have been set, Lindane and HCP were both above the upper guidance level.

Station C was a surface sample and contained elevations above the lower guidance level for arsenic, cadmium, nickel and zinc in the metals suite. Polycyclic Aromatic Hydrocarbon (PAH) and PolyChlorinated Biphenyl (PCB), Organotin (TBT and DBT) and total petroleum hydrocarbon (TPH) levels were acceptable. As with the other samples in the OCP suite, the results for Lindane and HCP were both above the upper guidance level for Station C, and the other parameters tested were above the Threshold Effects Level (TEL) published in the guidance.

Station D had samples taken at both the surface (D1) and 1m below the surface (D2). The samples were collected from the small accumulation of sediment immediately adjacent to the Wharf at the boundary with the navigation channel. In the metals suite, the two samples (surface and depth) recorded generally quite similar values, with the exception of copper, where the depth sample recorded a substantially higher value and both samples were above the upper guidance level. In keeping with many of the other surrounding stations, values for arsenic, nickel lead and zinc were also above the lower guidance level. PAH levels were acceptable; with the samples taken at depth recording levels almost three times lower than the surface sample. PCB levels were found to be above the lower guidance limit; however the deeper samples were four times higher than the surface sample. Organotin and TPH levels were satisfactory. OCP levels were also generally within acceptable thresholds.

Station E had samples taken at both the surface (E1) and 1m below the surface (E2). The sample collected at depth from station E was substantially more contaminated than the surface sample. In the metals suite, Station E was the only station which did not record elevated levels of arsenic or nickel. Sample E1 (surface) recorded only slight elevation of copper and all other metals levels were acceptable. Sample E2 (at depth) had slightly raised levels of cadmium and lead with all other metals at acceptable levels. In respect of PAH, the surface sample was well within the acceptable level however the sample collected at depth was over seven times higher and above the lower guidance limit. Similarly, the surface sample was totally clean of PCBs however the sample collected at depth recorded levels over 25 times higher and was again over the lower guidance level. Organotin and TPH levels were satisfactory. OCP levels were also generally within acceptable thresholds.

Generally speaking, the area returned results showing mild levels of contamination in the sediments although in a limited number of instances there were moderate levels of contamination present. Further information on the results of this sediment Analysis are found in Appendix 4.3

The exact disposal avenue for contaminated material excavated from the site will be determined in accordance with the actual level of contamination and Waste Acceptance Criteria following a comprehensive laboratory analysis of the material taking place prior to construction.



Plate 8.21: Location of sediment sampling stations at Trinity Wharf (Source: RPS Feasibility Study, 2018).

Groundwater and Hydrology

The groundwater was observed during the 2008 GI at approximately 1.5m – 2.0m below ground level, coinciding with the sea level.

Groundwater vulnerability is indicated as low on GSI's 1:100,000 map. However, the site-specific assessment was carried out, accounting for up to 4 m of predominantly high permeability made ground and further deeper layers of glaciofluvial gravels, up to 10m of moderate permeability soils such as sandy silts and up to 7m of low permeability cohesive glacial till over bedrock. Groundwater vulnerability ranges between moderate and high across the site depending on the exact thickness of the deposits present, according to the GSI Groundwater Vulnerability Classification Table 8.1 below.

Table 8.1 GSI Groundwater Vulnerability Classification Table

| Vulnerability Rating | Hydrogeological Conditions | | | | |
|----------------------|---|--|--|------------------------------|----------------|
| | Subsoil Permeability (Type) and Thickness | | | Unsaturated Zone | Karst Features |
| | High permeability (sand/ gravel) | Moderate permeability (e.g. sandy subsoil) | Low permeability (e.g. clayey subsoil, peat) | (Sand/ gravel aquifers only) | (<30m radius) |
| Extreme (E) | 0-3.0m | 0-3.0m | 0-3.0m | 0-3.0m | - |
| High (H) | >3.0m | 3.0-10.0m | 3.0-5.0m | >3.0m | N/A |
| Moderate (M) | N/A | >10.0m | 5.0-10.0m | N/A | N/A |
| Low (L) | N/A | N/A | >10.0m | N/A | N/A |

The main surface water body receptor in the study area is the Lower Slaney Estuary with made ground being the primary pathway for received precipitation.

8.4 Description of Potential Impacts

The made ground stratum exhibits low to moderate levels of contamination, primarily from PAHs and sulphates remaining from the historical industrial use of the site. In addition to that, the asbestos containing materials have been identified on the surface of the site. Mild to moderate levels of contamination with OCPs and PAHs were found in the samples from the sea bed undertaken as part of the Trinity Wharf Marina Feasibility Study by RPS Group (November 2018).

While the intention is for the construction works to be carried out with the least feasible disturbance of soils, some relatively minor amount of soil stripping or excavation can be expected. This primarily pertains to the construction of the foul sewage pumping station (located in the western corner of the site) and may be required for any deep service trenches or chambers identified during detailed design.

The pronounced heterogeneity of made ground and the relatively high compressibility of the alluvial soils can result in excess settlements stemming from structure loading. Any soil excavation has the potential to induce movement and settlement of surrounding ground during the construction phase.

All material excavated in the made ground stratum at the site shall be assumed to be contaminated. Appropriate testing of this material by a suitably qualified and licenced waste contractor shall take place for all aspects of ground contamination. Any contaminated material that is required to be excavated will be disposed of to a suitably licensed and permitted contractor to a licenced landfill site, which will be determined in accordance with the actual level of contamination and Waste Acceptance Criteria. Inert, non-hazardous and hazardous waste. Such contaminated material will be stored in separate bunds and will be disposed of to a suitable licensed facility. The mitigation measures for handling ACMs are presented in Section 4.4.5 in Chapter 4 of this EIAR.

8.5 Mitigation and Monitoring Measures

The mitigation measures for the impacts outlined in the section 8.4 above are outlined in this section.

Although the existing ground surface and all contaminated material is planned to be encapsulated in the thick imported granular material that will form the new surface, the removal of surface will be undertaken to ensure potential ACMs negative impacts to the environment is appropriately addressed prior to future development.

The following mitigation and control measures, in addition to the asbestos mitigation measures outlined in Section 4.4.4 in Chapter 4, will be adopted before the start of the construction works:

- Prior to the start of any construction works further asbestos surveys, intrusive asbestos surveys and site investigation and a Remediation Strategy will be developed prior to site clearance works and the subsequent construction of the site. The Asbestos Surveys and a Remediation Strategy will inform the site clearance strategy and removal of asbestos from the site. All site clearance works will be required to be undertaken by a suitably qualified, experienced and licensed asbestos contractor.
- All site clearance and excavation works will be required to follow the mitigation measures of this EIAR in this Chapter and those detailed in Chapter 4 as well as any future mitigation measures to be detailed in the Remediation Strategy (to be completed). For all site clearance works and excavation works suitably qualified,

experienced and licensed personnel will be required to undertake this specialist work in accordance with the 'measures for working with asbestos'. Any ACMs discovered in areas required for excavation, will be required to be disposed of by a licenced contractor to a licenced waste facility in accordance with waste management legislation, as appropriate.

- The 'Asbestos Survey and Remediation Strategy' will be undertaken prior to construction. All mitigation measures/ recommendations from these surveys and the remediation strategy will be required to be implemented as part of the proposed development.
- Remediation Verification Report will be produced to demonstrate that all mitigation measures proposed by the contractor to prevent the spread of asbestos or risk of fibre release and all associated remedial works implemented will be independently validated prior to proceeding with the redevelopment of the site.
- 'Measures for working with asbestos' as detailed in Chapter 4 shall be implemented by contractors as appropriate as part of the construction phase.
- The specialist contractor will ensure secure containment and transport of all contaminated materials to the appropriate licenced waste disposal facility.
- Contractors shall be required to submit and adhere to a Construction Method Statement indicating the extent of areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works. All associated hazardous waste residuals will also be stored within temporary bunded storage areas prior to removal by an appropriate EPA approved waste management contractor for off-site treatment/recycling/disposal. Any other building waste will be disposed of within on-site skips for removal by a licensed waste management contractor. The contractor will be required to submit a Construction and Demolition Waste Management Plan to the Council for approval which will address all types of materials to be disposed and the location of the licenced waste disposal facilities that will be used, as appropriate.
- Imported good-quality granular soils materials and rock armour revetment will be imported from local sources where possible. The nearest suitable licensed quarries are outlined in the Section 4.4.10 of the Chapter 4.
- To minimise any impact on the underlying subsurface strata from material spillages, all fuels, oils, solvents and paints used during construction these will be stored within specially constructed temporary bunded areas or within dedicated bunded containers. Spill kits and hydrocarbon adsorbent packs will be stored on the site compound and operators will be fully trained in the use of this equipment. Fuel for vehicles will be stored in a mobile double skinned tank.

In order limit the risk to human health and the surrounding aquatic environment by exposure to contaminated material through excavation, it is proposed to retain the majority of the made ground in place. The current ground level across the entire site will be raised for the proposed development (1.5m raise on average), using imported good quality granular material. It is also proposed that the uppermost 250mm of this material will comprise of compacted clay with a low permeability of $1 \times 10^{-7} \text{ ms}^{-1}$ (refer to Chapter 9 for details) to limit infiltration to percolating water. A minor volume of excavated material planned to be excavated pertaining to the foul sewage pump-out station and any deep service trenches or chambers will be identified during detailed design. Temporary works design and monitoring will ensure that there are no unacceptable ground movements and settlements of the adjacent ground. This material will be required to be tested for contaminants.

All buildings will rely on driven piles for foundations. This will minimise the need for the excavation and handling of the made ground layer and soft alluvial layers beneath it, as no in-situ ground needs to be displaced or handled during the execution of this type of piles. The alternative solution of bored piles was eliminated as it would produce contaminated soil arisings. Furthermore, transferring all loads on piles will avoid the settlements in the underlying strata (particularly in made ground and soft silts). The detailed design of driven piles will include a consideration of the allowable stresses in the bedrock so as to avoid fracturing the bedrock. The encapsulation of the contaminated ground will prevent contact between the contaminated ground and the environment and end-users in the operational phase.

It is noted that due to the stringent requirements for the rock used in the revetments, not all quarries are able to produce such stone. Quarries in strong metamorphic and volcanic rocks typically tend to produce suitable stone for revetment. Two quarries in Co. Wexford, in Ballykelly (37km) and Gorey (41km), quarry should contain suitable type of stone.

The steel driven piles were selected as the foundation option in order to avoid the handling of the contaminated pile arisings and reduce the environmental impacts related to the arisings disposal.

Sheet piles forming the sea wall on the site perimeter and the option of either bored piles or tubular steel piles and screw piles (helical anchors) for the foundation of the marina and boardwalk elements (to be decided during detailed design) are also selected as their installation requires no excavation or dredging. A sheet-piled wall will provide a new sea wall for the site, raising the site level to meet flood requirements and providing a barrier to contain contaminated material within the site.

The mildly contaminated made ground soil retained by sheet piled wall will be buried below the surface and the flow path for the potential contaminants will be largely severed by the sheet pile wall. The sheet pile wall will also provide for additional coastal protection and flood defence. The rock armour revetment and the armour underlayer will be placed directly on in-situ riverbed silt, in order to avoid the need for the handling and removal of contaminated silt.

8.6 Residual Impacts

There are no likely significant residual soil or geological impacts associated with the Trinity Wharf development.

8.7 Difficulties Encountered

No significant difficulties were experienced in the completing this assessment. While adequate information is available from previous investigations, additional and more detailed ground investigations will take place at the development site prior to detailed design stage in order to further classify ground conditions for design and also to quantify the disposal options for excavated material which may be contaminated. It is not considered that this affects this impact assessment due to the design, construction methodology and the mitigation measures provided in this EIAR.

8.8 References

Institute of Geologists of Ireland (IGI) (2013) *Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements*

National Roads Authority (NRA 2008) *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*

Environmental Protection Agency (EPA 2017) *Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports*

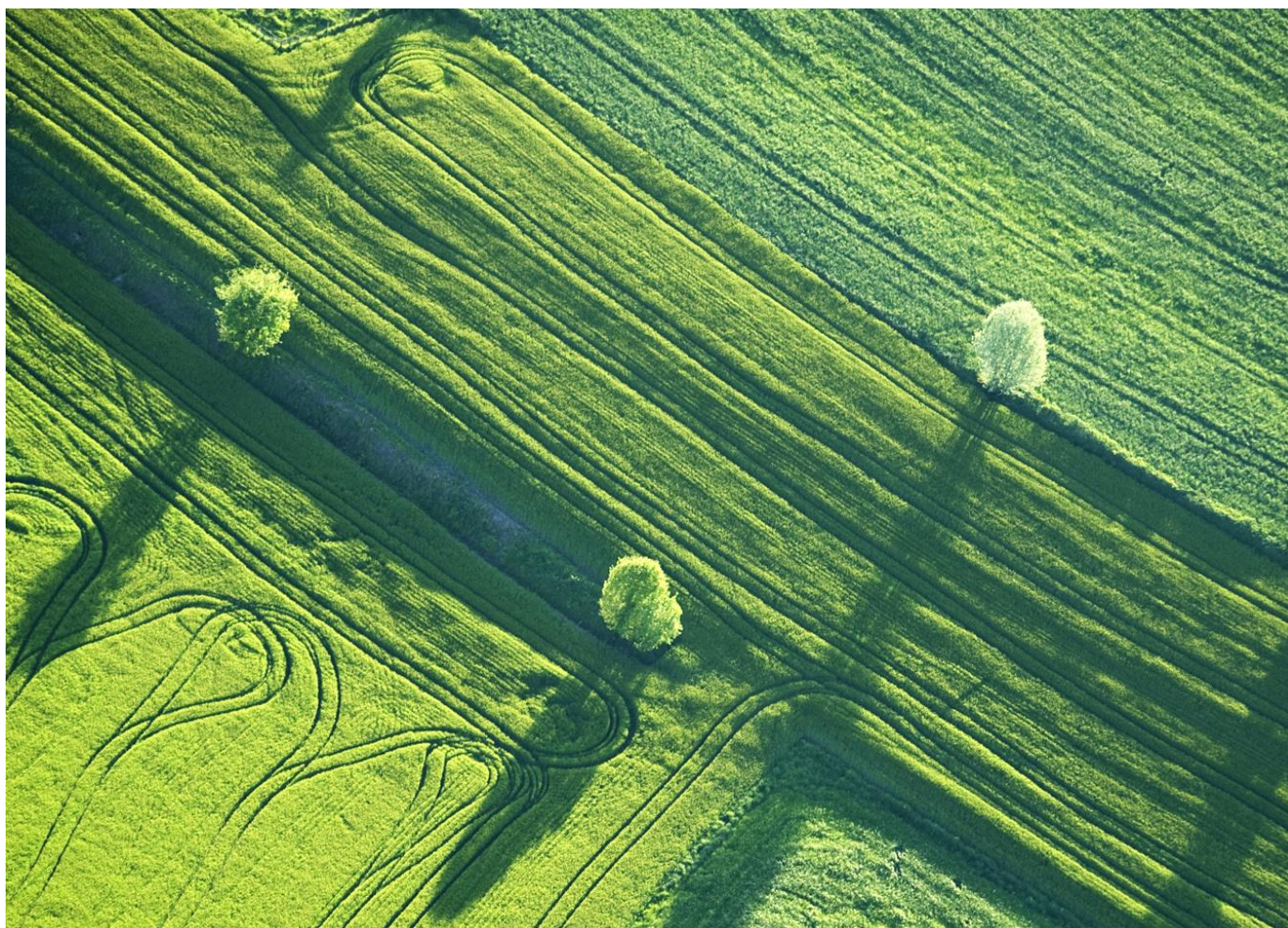
Government of Ireland. Waste Management Act 1996 (as amended)

Kavanagh Mansfield and Partners (2008): *Report on a site investigation for a development at Trinity Wharf Wexford*

RPS (2018): *Trinity Wharf Marina Feasibility Study (project number IBE1115/D03)*

RSK (2018): *Preliminary Asbestos Walkover Survey, Trinity Wharf, Wexford.*

Appendix 8.1 Preliminary Asbestos Walkover Survey



Wexford County Council

Preliminary Asbestos Walkover Survey

Trinity Wharf, Wexford

602393 (00)

OCTOBER 2018

RSK

RSK GENERAL NOTES

Project No.: 602393 (00)


Title: Preliminary Asbestos Walkover Survey – Trinity Wharf, Wexford

Client: Wexford County Council

Date: October 2018

Office: Dublin

Status: FINAL

| | | | |
|---------------|---|---------------------------|---|
| Author | <u>Bronagh O'Reilly</u> | Technical reviewer | <u>David O'Hagan</u> |
| Signature |  | Signature |  |
| Date: | 31 st October 2018 | Date: | 31 st October 2018 |

RSK Ireland (RSK) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and RSK. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by RSK for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK.

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1 INTRODUCTION

In October 2018, RSK Ireland Limited (RSK) was instructed by Wexford County Council to complete a preliminary walkover survey at the Trinity Wharf site, Wexford town. The survey was conducted on 19th October 2018. The aim of the assessment was to identify any potential Asbestos Containing Materials (ACMs) on the surface and near surface of the site following the discovery of suspected asbestos cement debris during a recent geotechnical investigation.

This report is subject to the RSK service constraints given in Appendix A and is not intended as a specification for any removal works. RSK can provide a detailed specification for works if required.

1.1 Site Location

The site is located on a c.10-acre parcel of reclaimed land adjacent to Wexford Harbour and is situated approximately 1.3km southeast of Wexford Town centre centred at Irish Grid reference T05541 21298. The site is located within an area of mixed commercial and residential land use. A site location plan is shown on Figure 1.

1.2 Site Description

The site is derelict and is located adjacent to Wexford Harbour. The former buildings were reported demolished between 2000 and 2005, with a number of stock piles containing construction and demolition waste remaining in various locations across the site and a number of the former floor slabs still in situ in the central portion of the site.

The site is bounded to the north, east and south by Wexford Harbour within an existing sea wall and the main Wexford to Rosslare railway line bounds the site to the south west.

The site lies at an elevation of approximately 5m above Ordnance Datum (mAOD) and is predominately flat. Access to the site can be gained via a gated entrance on Trinity Street to the north west of the site.

1.3 Scope of Work

The scope of the survey and layout of this report has been designed with consideration of the Health and Safety Executive guidance document 264 Asbestos: The Survey Guide and the CIRIA guidance document “Asbestos in soil and made ground: good practice site guide”.

The scope of works included:

- A preliminary walkover survey to identify any potential ACMs on the surface of the site;
- Limited representative sampling of any suspected ACMs on the surface of the site; and

- A factual and interpretative report with recommendations for further works (if required).

1.4 Proposed Development

It is our understanding that Wexford County Council plan to redevelop the 10-acre site to provide a high-quality business park which will include a mix of modern office space, hotel accommodation, multi-storey carparking, a landmark cultural and events multi-use building and 60 residential units. The proposed development will also include the provision of a 61-berth marina and a new boardwalk.

2 PRELIMINARY ASSESSMENT

2.1 Previous Asbestos Identification

From information provided by the councils appointed design consultants ROD, a fragment of cement suspected to contain asbestos was identified during the advancement of four trial pits in the northern portion of the site in October 2018. The TPs were undertaken as part of a geotechnical investigation by Priority Geotech. It is our understanding that all works were immediately stopped, and personnel and plant demobilised from site.

No laboratory results were provided to confirm the presence of asbestos in the cement fragment nor potential presence of asbestos in soils in any of the four TP locations completed.

No information has been provided with regards any asbestos surveys undertaken on the original buildings nor removal or disposal of asbestos during the subsequent demolition process.

2.2 Site History

A review of the historical maps of the site was undertaken to identify any potential sources of historic asbestos contamination. A review of the site history was undertaken by assessing the available historical maps on the Ordinance Survey of Ireland (OSI) map viewer <http://map.geohive.ie/mapviewer.html>.

The earliest available historical map of the area (1837-1842) shows the site to be undeveloped.

The development history of the site and surrounding area is detailed in Table 1 below. Map extracts are presented in Appendix B.

Table 1: Historical Map Review

| Year | Site Description | Surrounding Land Uses |
|-----------|---|--|
| 1837-1842 | The site is partly developed reclaimed land. Docks occupy the north west portion of the site and a railway runs through a yard on the south west portion. | A railway line bounds the south western portion of the site. Trinity Street is location parallel to the southern site boundary. A barracks is located south west of the site. The surrounding area to the north west is developed docks. Wexford town centre is located c.1.3km to the north west of the subject site. The surrounding area to the south appears to be residential dwellings along the main road infrastructure with associated gardens. |
| 1888-1913 | The site has been further developed and an iron works occupy a central portion of the site. The south western portion of the subject site remains undeveloped reclaimed land. | The railway line on the southern boundary of the site is named Fishguard & Rosslare Section on the map. There are no significant changes to the surrounding land use. |
| 1940s | The map shows the Clover Meats and Iron works. An Aerial view would indicate that the buildings | Further significant development in the surrounding area. |

| Year | Site Description | Surrounding Land Uses |
|-------------|--|---|
| | look like those typically constructed from AC cladding. | |
| 1995 | The map illustrates that the buildings were extended post iron works, for a car assembly plant. An Aerial view would confirm that the large building extending northeast to southwest would appear to be constructed of asbestos cement cladding. The remaining buildings appear to be corrugated metal. | The surrounding area is densely developed with mixed residential and commercial land use. |
| 2000 | No significant change onsite. | There are no significant changes to the surrounding land use. |
| 2005 | The existing buildings have been demolished and the footprint of the former buildings remains | There are no significant changes to the surrounding land use. |
| Present Day | The site is currently unoccupied. the former footprint of the buildings is still in situ. Stockpiles of construction and demolition waste in various locations across the site. | There are no significant changes to the surrounding land use. |

2.3 Site Walkover

A preliminary walkover of the site was undertaken by an RSK P402 Qualified asbestos surveyor on 19th October 2018. The findings are summarised below and supported by the site photographs presented in Appendix D. The purpose of the walkover was to establish if any ACMs were present to the surface of the site.

The site is currently derelict however easily accessible and used by nearby residents / dog walkers. There were a number of stock piles containing construction and demolition waste remaining in various locations across the site which is extensively overgrown prohibiting access and detailed inspection.

An area of grassland occupies the western portion of the site; hardstanding area and retaining wall to the northern portion of the site and a gravel path along the shoreline on the eastern boundary. The central portion of the site is predominately covered with concrete floor slabs noted to be in varying states of disrepair.

Evidence of ground disturbance was noted in four locations in the northern portion of the site, presumed to be from the recent geotechnical investigation.

The RSK asbestos consultant walked the site noting the main areas where obvious suspected ACMs were noted. Suspected ACMs predominately comprised asbestos cement debris and floor tiles. A small number of samples were taken of suspect ACMs, these were appropriately labelled and securely double-bagged whilst on site, prior to return to the UKAS accredited laboratory for analysis. Results are presented in Appendix C.

3 WALKOVER RESULTS

3.1 Asbestos Containing Materials

Seven samples representative of suspected ACMs were taken and five were confirmed by laboratory analysis as containing asbestos. Three of the positive samples were confirmed as asbestos cement (AC) and two were confirmed as asbestos floor tiles including bitumen adhesive. A photolog of the identified ACMs is provided in Appendix C.

The AC were identified in numerous locations across the surface of the site and would be consistent with corrugated profile sheeting and rainwater goods. The asbestos floor tiles were identified in large pieces or in small badly damaged fragments across the majority of the site including stockpiles.

No other obvious suspected ACMs were noted in the grassed area in the eastern portion of the site.

The following table summarises the findings of the bulk sample analysis including a classification of the material type.

Table 2: Asbestos Containing Materials – Bulk Samples

| Description | | Analysis Results | Classification | Observations |
|-------------|-------------------|---|-------------------------|---|
| S01 | Beige Floor Tile | Chrysotile detected in tile and bitumen | Thermoplastic & bitumen | Within C&D waste in NW portion of the site and across the site |
| S04 | AC Fragment | Chrysotile | Cement | AC sheeting adjacent to TP4. Similar debris noted adjacent all hard-standing areas and structures |
| S05 | AC Fragment | Chrysotile | Cement | Small fragments noted throughout gravel area on eastern boundary |
| S06 | Floor Tile Debris | Chrysotile detected in tile and bitumen | Thermoplastic & bitumen | Large area with floor tiles in situ, visible debris scattered throughout the area |

| Description | | Analysis Results | Classification | Observations |
|-------------|------------------|------------------|----------------|---|
| S07 | AC Debris (flat) | Chrysotile | Cement | Fragments noted on edge of floor slab along SW boundary |

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Asbestos Containing Materials

Fragments of AC and floor tiles and / or floor tile debris were identified in numerous locations across the surface of the site.

The preliminary findings would indicate that ACMs are broadly concentrated along the retaining wall in the northern portion of the site; along the edges of floor slabs; adjacent to and within many of the demolition stockpiles and in the gravel track along the eastern boundary.

The AC identified would be consistent with fragments and broken sections of corrugated profile sheeting and rainwater goods and likely originate from the large linear building illustrated in Map 5, which is strongly suspected to be constructed from AC cladding.

The asbestos floor tiles were identified in-situ in two main areas and distributed in large pieces or in small badly damaged fragments across much of the site.

No suspect ACMs were identified within the grassed area or to surface of the stockpiles in the southern portion of the site.

Given the presence of ACMs adjacent to and on the surface of several of the remaining stockpiles, it must be assumed that further ACMs are likely to be present within the stockpile material. The investigation of such was outside the scope of the walkover survey and visual assessment was hindered due to extensive overgrowth.

The presence of asbestos to the surface and potentially within the stockpiles of C&D waste across the site would pose a significant risk during the construction phase of the development and therefore further investigation to fully identify and quantify the extent of surface and subsurface asbestos contamination and subsequent remedial measures are required. Given the historical development of the site and widespread impact of asbestos across the surface, it is highly likely that sub surface material will also be impacted with asbestos contamination and will require further investigation.

4.2 Recommendations

Based on the findings of the preliminary walkover the following is recommended to quantify the potential risks and liabilities associated with asbestos contamination at the site:

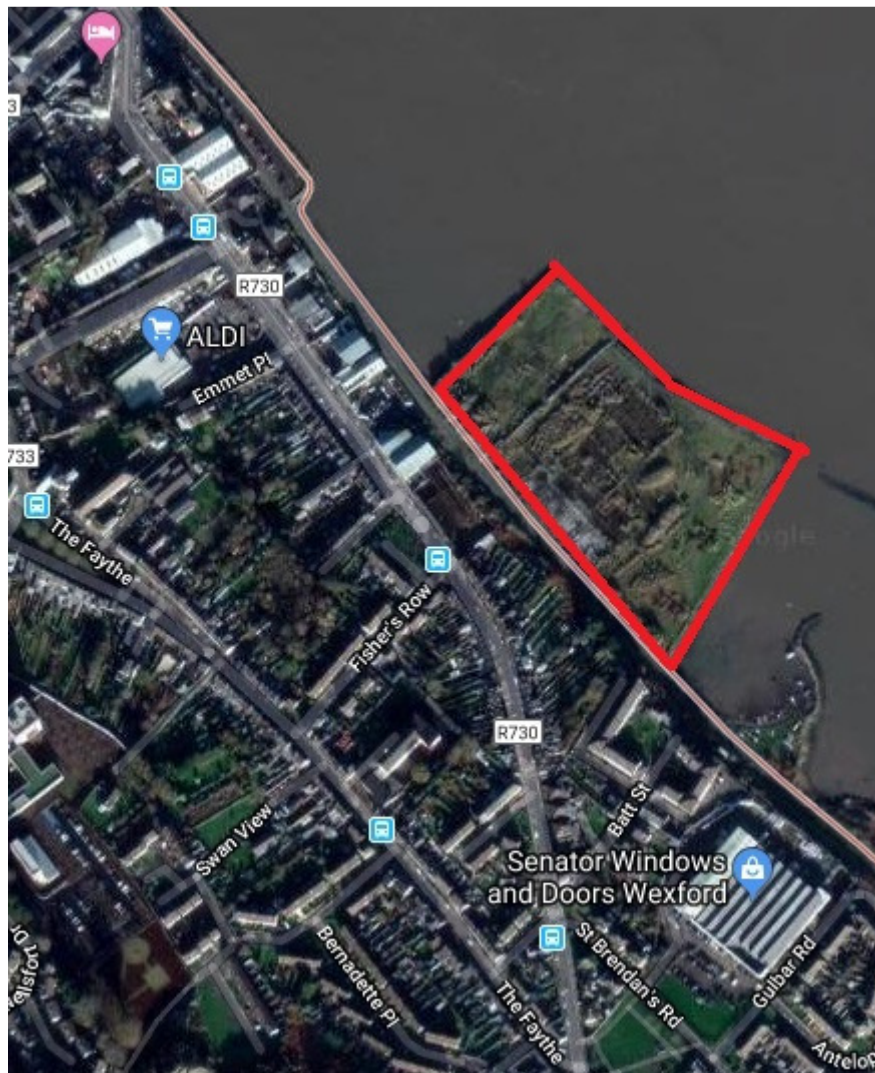
- Make safe or secure the site so that no further access is permitted to unauthorised personnel;
- Undertake a detailed asbestos survey of the surface of the site by a suitably qualified P402 asbestos surveyor(s) experienced in undertaking surveys on contaminated land sites. The aim of the survey should be to determine the full extent, type and location of all surface and near surface ACMs and should include representative sampling as appropriate.
- Undertake an intrusive investigation to identify any potential sub-surface asbestos contamination within the demolition material stockpiled in various locations across

the site. The investigation should only be undertaken and supervised by personnel suitably qualified to work with asbestos on sites of this nature (including all plant operatives and engineers) and should include representative sampling as appropriate.

- Undertake a targeted intrusive investigation comprising trail pits and / or slit trenches to determine the extent of any possible asbestos in the fill material and below floor slabs across the site. The SI should be scoped to cause the minimal amount of disturbance to any surface ACMs identified and all suitable control measures implemented to prevent exposure to asbestos throughout the works. The investigation should only be undertaken and supervised by personnel suitably qualified to work with asbestos on site of this nature and should include representative sampling for asbestos ID screening as appropriate.
- Develop a remedial strategy for the site upon completion of the investigations to outline works required to mitigate the risks associated with the asbestos contamination identified and to prevent the potential release of asbestos fibres during the proposed development works. It is advised that the contractor appointed to undertake the remedial programme is appropriately qualified and experienced to work with asbestos.
- Ensure all mitigation measures proposed by the contractor to prevent the spread of asbestos or risk of fibre release and all associated remedial works implemented are independently validated prior to proceeding with the redevelopment of the site.

It is also recommended that any further works to be completed as part of the geotechnical investigation are not permitted to proceed until remedial measures are instigated. This will ensure that the spread any potential exposure to the ACMs is minimised. All remedial works must be undertaken by a suitably qualified asbestos contractor and a method statement and evidence of competences provided in advance. Field staff should also ensure that they have received the appropriate accredited training for working with asbestos in soils prior to resuming the Geotech works and all entities involved in the works should hold appropriate PI insurance for working with asbestos.

FIGURES








| |
|--|
| Job Number: 602393 (00) |
| Job Title: Trinity Wharf, Wexford |
| Drawing Title: Figure 1 – Site Location Plan (Copyright googlemaps.co.uk) |
| Date: October 2018 |



SITE

Trinity Wharf
Wexford

LEGEND

-  Site boundary
-  Sample Location
-  Areas impacted by asbestos cement debris
-  Main areas impacted by asbestos floor tiles
-  Stockpiles of C&D rubble

TITLE

SAMPLE LOCATIONS AND
AREAS IMPACTED WITH ACMS



| | | |
|-------------|-------------|-------|
| Drawn by: | Date drawn: | Scale |
| BOR | Oct 2018 | NTS |
| Report No. | Page No. | |
| 602393 (00) | 01 of 01 | |

APPENDIX A

SERVICE CONSTRAINTS

RSK IRELAND LIMITED SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Ireland Limited (RSK) for Wexford County Council (the "client") in accordance with the terms of a contract between RSK and the "client", dated January 2018. The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.
2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date hereof, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.
8. The phase II or intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site.



APPENDIX B

HISTORICAL MAP REVIEW



| |
|---|
| Job Number: 602393 (00) |
| Job Title: Trinity Wharf, Wexford |
| Drawing Title: Map 1 – 1837-1842 (Copyright OSI) |
| Date: October 2018 |

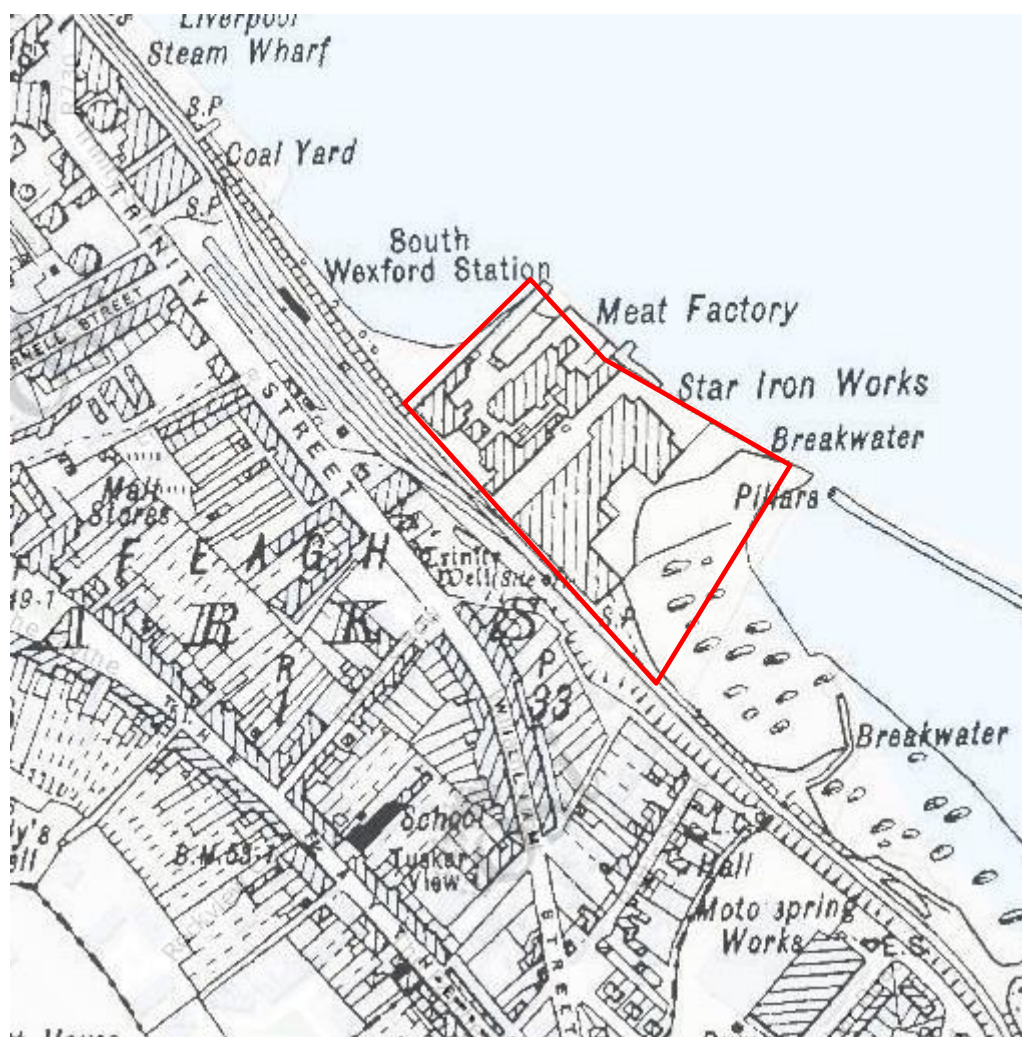


Job Number: 602393 (00)

Job Title: Trinity Wharf, Wexford

Drawing Title: Map 2 – 1888-1913 (Copyright OSI)

Date: October 2018



Job Number: 602393 (00)

Job Title: Trinity Wharf, Wexford

Drawing Title: Map 3 – Cassini c. 1940s (Copyright OSI)

Date: October 2018



| |
|--|
| Job Number: 602393 (00) |
| Job Title: Trinity Wharf, Wexford |
| Drawing Title: Map 4 – 1995 (Copyright OSI) |
| Date: October 2018 |

| |
|--|
| Job Number: 602393 (00) |
| Job Title: Trinity Wharf, Wexford |
| Drawing Title: Map 5 – 2000 (Copyright OSI) |
| Date: October 2018 |



Job Number: 602393 (00)

Job Title: Trinity Wharf, Wexford

Drawing Title: Map 6 – 2005 (Copyright OSI)

Date: October 2018



APPENDIX C

LABORATORY RESULTS



QUALITY CONSULTANTS (NI) LTD

Asbestos in Bulk Materials Analysis Report



Unit B9, Inspire Business Park, 16 Carrowreagh Road, Dundonald, BT16 1QT | T: 028 90484905 | M: 07974 264204 | E: iharper@qcni.co.uk

Bulk sample analysis & asbestos identification by stereo microscopy and polarised light microscopy with dispersion staining as described in the current HSG248, Appendix 2 and in-house method SOP 01. Quality Consultants (NI) Ltd accepts responsibility only for results obtained from samples received. No responsibility is accepted for the information provided by the client or any errors that may have arisen during their sampling (such as origin or homogeneity) or transportation procedures. Opinions, interpretations and comments regarding density, appearance, material type and classification (or other) expressed herein are outside the scope of our UKAS accreditation. **NADIS** = No asbestos detected in sample. All samples will be retained for a minimum of six months unless the client requests alternative arrangements.

Client and Site Details


| | |
|----------------|--|
| Client Details | RSK 48 Newforge Lane, Belfast, BT9 5NW |
| Site Details | Trinity Wharf |

Job Details

| | | | | |
|-----------------------|------------------------|---------------|---------------|----------------------|
| Samples Submitted By | No of samples received | Report No | Issue No | Client Order/Ref No. |
| RSK | 07 | BA9255 | 1.0 | 602393 |
| Date Samples Received | Date of Analysis | Analysed By | Authorised By | Date Authorised |
| 23.10.18 | 24.10.18 | Alan Mayes | Alan Mayes | 24.10.18 |

Sample Details and Analysis Results

| Client Sample No. | Laboratory Sample No. | Client Sample Details | Material Type | Asbestos Type(s) Identified |
|-------------------|-----------------------|-----------------------|---------------------------|--|
| 01 | BA9255/01 | Beige floor tile | Thermoplastic and bitumen | Chrysotile detected in tile and bitumen |
| 02 | BA9255/02 | Cement roof tile | Cement | NADIS |
| 03 | BA9255/03 | Grey floor tile | Thermoplastic | NADIS |
| 04 | BA9255/04 | AC fragment | Cement | Chrysotile |
| 05 | BA9255/05 | AC fragment | Cement | Chrysotile |
| 06 | BA9255/06 | Floor tile debris | Thermoplastic and bitumen | Chrysotile detected in tile and bitumen |
| 07 | BA9255/07 | AC debris (flat) | Cement | Chrysotile |

| Authorising Signature | Position | Date Issued |
|---|----------------|-------------|
|  | Senior Analyst | 24.10.18 |




APPENDIX D SITE PHOTOLOG



PHOTOGRAPHIC LOG

| | | | |
|---|--------------------------|--|--------------------------------------|
| Client Name: Wexford County Council | | Site Location: Trinity Wharf, Wexford | Preliminary Asbestos Walkover |
| Photo No. 1 | Date: 19/10/18 |  | |
| Direction Photo taken: N/A | | | |
| Description: S01. Fragments of floor tiles within rubble | | | |

| | | |
|---|--------------------------|--|
| Photo No. 2 | Date: 19/10/18 |  |
| Direction Photo taken: SW | | |
| Description: S04. AC debris adjacent TP-04 | | |





PHOTOGRAPHIC LOG

| | | | |
|--|--------------------------|---|--------------------------------------|
| Client Name: Wexford County Council | | Site Location: Trinity Wharf, Wexford | Preliminary Asbestos Walkover |
| Photo No. 3 | Date: 22/11/17 |  | |
| Direction Photo taken: South | | | |
| Description: S05 Small scattered fragments of AC to gravel path | | | |

| | | | |
|---|--------------------------|--|--|
| Photo No. 4 | Date: 19/10/18 |  | |
| Direction Photo taken: | | | |
| Description: S06 Floor tiles in situ and damaged fragments scattered throughout area. Area also significantly contaminated with AC | | | |




PHOTOGRAPHIC LOG

| | | | |
|---|--------------------------|--|--------------------------------------|
| Client Name: Wexford County Council | | Site Location: Trinity Wharf, Wexford | Preliminary Asbestos Walkover |
| Photo No. 5 | Date: 19/10/18 |  | |
| Direction Photo taken: South | | | |
| Description: S07 Sporadic fragments of AC (flat profile) to edge of floor slab along SW boundary | | | |
| Photo No. 6 | Date: 19/10/18 |  | |
| Direction Photo taken: N/A | | | |
| Description: Badly damaged asbestos floor tiles | | | |




PHOTOGRAPHIC LOG

| | | | |
|--|--------------------------|---|--------------------------------------|
| Client Name: Wexford County Council | | Site Location: Trinity Wharf, Wexford | Preliminary Asbestos Walkover |
| Photo No. 7 | Date: 19/10/18 |  | |
| Direction Photo taken: North | | | |
| Description: AC debris along edges of hardstanding / former floor slab | | | |

| | | | |
|---|--------------------------|--|--|
| Photo No. 8 | Date: 19/10/18 |  | |
| Direction Photo taken: West | | | |
| Description: AC debris along edge of hardstanding / adjacent large stockpile on rear side of wall | | | |



PHOTOGRAPHIC LOG

| | | | |
|---|--------------------------|---|--------------------------------------|
| Client Name: Wexford County Council | | Site Location: Trinity Wharf, Wexford | Preliminary Asbestos Walkover |
| Photo No. 9 | Date: 19/10/18 |  | |
| Direction Photo taken: East | | | |
| Description: AC debris to edge of large stockpile | | | |

| | | |
|--|--------------------------|--|
| Photo No. 10 | Date: 19/10/18 |  |
| Direction Photo taken: NE | | |
| Description: AC debris to stockpile in NW corner of the site | | |

Appendix 8.2 Kavanagh Mansfield and Partners Site Investigation

**WEXFORD HARBOUR
TRINITY WHARF
DEVELOPMENT**

**Kavanagh Mansfield & Ptns
Consulting Engineers**

CONTENTS

| | |
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| I | INTRODUCTION |
| II | FIELDWORK |
| III | TESTING |
| IV | DISCUSSION |

APPENDICES

| | |
|------------|--|
| I | BOREHOLE RECORDS |
| II | CORE DRILLING RECORDS |
| III | GEOTECHNICAL LABORATORY TEST DATA |
| IV | ENVIRONMENTAL LABORATORY DATA |
| IV | SITE LOCATION PLAN / SECTIONS |

FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

General.

Recommendations made, and opinions expressed in the report are based on the strata observed in the exploratory holes, together with the results of in-situ and laboratory tests. No responsibility can be held for conditions which have not been revealed by exploratory work, or which occur between exploratory hole locations. Whilst the report may suggest the likely configuration of strata, both between exploratory hole locations, or below the maximum depth of the investigation, this is only indicative, and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

Boring Procedures.

Unless otherwise stated, the 'Shell and Auger' technique of soft ground boring has been employed. All boring operations sampling and/or logging of soils and in-situ testing complies with the recommendations of the British Standard Code of Practice BS 5930 (1981), 'Site Investigation' and BS 1377:1990, 'Methods of test for soils for civil engineering purposes'.

Whilst the technique allows the maximum data to be obtained in soft ground, some disturbance and variation of soft and layered soils is unavoidable. Attention is drawn to this condition, whenever it is suspected. Where cobbles and boulders are recorded, no conclusion should be drawn concerning the size, presence, lithological nature, or numbers per unit volume of ground.

Where peat has been encountered during siteworks, samples have been logged in accordance with the Von Post Classification (ref. Von Post, L. 1992. Sveriges Gologiska Undersoknings torvinventering och nogra av dess hittills vunna resultat (SGU peat inventory and some preliminary results) Svenska-Mosskulturforeningens Tidskrift, Jonkoping, Swedden, 36, 1-37 & Hobbs N. B. Mire morphology and the properties of some British and foreign peats. QJEG, Vol. 19, 1986).

Routine Sampling.

Undisturbed samples of soils, predominantly cohesive in nature are obtained unless otherwise stated by a 104mm diameter open-drive tube sampler. In granular soils, and where undisturbed sampling is inappropriate, disturbed samples are collected. Smaller disturbed samples are also recovered at intervals to allow a visual examination of the full strata section.

In-Situ Testing.

Standard penetration tests, utilising either the standard split spoon sampler or solid cone and automatic trip-hammer are conducted unless otherwise where required by instruction. Subsequent to a seating drive of 150mm, a summation for the number of blows for 300mm penetration is recorded on the boring records together with the blow count for each 75mm penetration. In cases where incomplete penetration is obtained, the number of blows for the recorded value of penetration are noted. In coarse granular soils, a cone end is fitted to the sampler and a similar procedure adopted.

Groundwater.

The depth of entry of any influx of groundwater is recorded during the course of boring operations. However, the normal rate of boring does not usually permit the recording of an equilibrium level for any one water strike. Where possible drilling is suspended for a period of twenty minutes to monitor the subsequent rise in water level.

Groundwater conditions observed in the borings or pits are those appertaining to the period of investigation. It should be noted however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage condition, tidal variation or other causes.

Retention of Samples.

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded unless a period of retention of samples is agreed, it is our normal practice to discard all soil samples one month after submission of our final report.

REPORT ON A SITE INVESTIGATION FOR A DEVELOPMENT AT TRINITY WHARF WEXFORD

DEERLAND CONSTRUCTION LTD

**KAVANAGH MANSFIELD AND PARTNERS
CONSULTING ENGINEERS**

Report No. 13184

JANUARY 2008

1 Introduction

A major commercial development is being undertaken on a site at Trinity Wharf in Wexford. The site developers, Deerland Construction Limited, have ordered a comprehensive examination of sub-soil and bedrock conditions over the site area. This investigation was directed by Kavanagh Mansfield and Partners, Consulting Engineers, and carried out by IGSL in November/December 2007.

The proposed development includes reclamation of a large area of foreshore as well as the onshore development of the site formerly occupied by a motor assembly plant.

The programme of the investigation envisaged the construction of Cable Percussion Boreholes and Rotary Core Holes to establish geotechnical criteria on which to base foundation design. A number of scheduled exploratory locations were over tidal water and were to be constructed from a Jack Up drilling platform.

Delays have been experienced in obtaining foreshore licenses and the marine operations have been deferred. On land an area of the site was classified as "an area of natural habitat" and investigation here was also postponed pending receipt of permission from the appropriate authorities.

A programme of laboratory testing to establish geotechnical soil parameters was prepared by IGSL and laboratory testing was carried out at IGSL's Accredited laboratory immediately following site operations. A preliminary appraisal of environmental/contamination issues has also been carried out, with laboratory testing carried out by Alcontrol Geochem. Analysis was carried out to Murphy Suite requirements.

This report presents all factual data pertaining to the project and comments on the findings relative to construction of the land based segment of the development.

II Fieldwork

The site is located off Trinity Street in Wexford, comprising existing reclaimed land in Wexford harbour, formerly occupied by a major motor assembly operation. This reclaimed area is bounded on three sides by Wexford Harbour with an existing sea wall protecting the reclaimed lands. The main Wexford to Rosslare railway line forms part of the main land boundary. The site is reasonably level, ground level is taken as zero for the purposes of discussion in this report.

Demolition of the old industrial buildings has taken place, reinforced concrete ground floor slabs cover much of the site. Access to the site was secure and Deerland Construction Ltd. arranged for temporary access for drilling equipment, via a Railway Crossing, for the duration of the investigation.

A site location map and a detailed borehole and corehole layout is enclosed in Appendix V to this report. All exploratory locations were determined by Kavanagh Mansfield and Partners and marked out by site personnel for IGSL using the national grid co-ordinates provided. Access to some locations was not possible during this phase of works. Some additional boreholes were scheduled to provide in-fill data where it was indicated by the scheduled boreholes.

a. Boreholes

The exploratory holes were bored with conventional 200mm cable-tool methods using a Dando Exploratory Rig. A total of thirteen boreholes were constructed.

Detailed geotechnical records are contained in Appendix I to this report - the records give details of stratification, sampling, in-situ testing and groundwater. Note is also taken of any obstructions to normal boring requiring the use of the heavy chisel for advancement.

The boreholes typically encounter surface deposits of made ground overlying varying loose or soft strata of sand, clay or silt. Firm to stiff brown sandy clay or silt is then typically encountered, continuing to refusal on dense highly weathered rock (weathered to a dense coarse angular gravel consistency). Borehole refusal depths range from about 4.00 metres BGL at the south eastern end of the site (close to the railway line) to in excess of 17.00 metres in the centre of the site at BH 16.

Standpipes have been installed in three borehole locations to facilitate long term water observation. Ground water has been noted at about 2.00 metres in all locations. Tidal variation can be expected. Water strikes have also been observed in the lower dense gravel / weathered rock stratum.

Sections through the boreholes have been prepared and clearly identify the pattern of stratification across the site.

b. Coreholes

A Top-Drive rotary core drill was mobilised to drill and recover rock core at eight scheduled locations. An air mist flush was employed with standard triple tube technique. Open Hole Symmetrix Drilling was used in the overburden, with standard penetration tests carried out as instructed. Diamond core drilling was used in the bedrock, rock core was recovered at all locations.

Core was recovered and placed in timber boxes and returned to IGSL for detailed geotechnical logging. These records are contained in Appendix II to this report.

The bedrock is typically weak to moderately strong grey heavily weathered limestone / mudstone. The rock is typically thinly bedded with clay staining on many joints. In the weak weathered rock, standard penetration tests have been carried out to give an indication of in situ rock strength. The rock core findings can be summarised as follows:

| Location | Overburden | Weathered Rock | Solid Rock |
|----------|------------|----------------|---------------|
| RC 02 | 0 - 10.20 | 10.20 - 11.50 | 11.50 - 17.00 |
| RC 05 | 0 - 9.80 | 9.80 - 10.20 | 10.20 - 15.20 |
| RC 07 | 0 - 11.50 | 11.50 - 22.00 | |
| RC 09 | 0 - 10.90 | 10.90 - 11.50 | 11.50 - 16.50 |
| RC 10 | 0 - 9.20 | 9.20 - 17.00 | |
| RC 13 | 0 - 10.40 | 10.40 - 16.00 | |
| RC 15 | 0 - 5.00 | 5.00 - 7.00 | 7.00 - 12.60 |
| RC 17 | 0 - 15.40 | 15.40 - 16.00 | 16.00 - 21.00 |

Standpipes have been installed in RC 09, RC 13 and RC 15.

III Testing

(a) In-Situ :

Standard penetration tests were carried out at approximate 1.00 metre intervals in the geotechnical boreholes to measure relative in-situ soil strength. SPT tests have also been carried out in the rotary core holes. N values are noted in the right hand column of the records, representing the blow count required to drive the standard sampler 300mm into the soil, following initial seating blows.

Several limited penetration tests and refusals were recorded on cobbles or boulders in the overburden or on the weathered bedrock

The results of the tests are summarised as follows:

| STRATUM | N VALUE RANGE | COMMENT |
|--------------------|-----------------|---------------------------|
| Made Ground | 9 to 48 | Variable (Loose to Dense) |
| Alluvial Silt/Sand | 5 to 19 | Loose to medium Dense |
| Grey Brown Clay | 14 to 46 | Firm to Stiff |
| Gravel | 8 to 40 | Loose to Dense |
| Weathered Rock | + 50 to Refusal | Weak Rock |

Numerous limited penetration tests were recorded in the base stratum presumed to be the highly weathered thinly bedded limestone.

(b) Laboratory :

All geotechnical samples from the boreholes have been returned to the IGSL laboratory for initial visual inspection, a schedule of testing was prepared and tests as scheduled carried out.

Samples of the made ground were selected for detailed environmental analysis and sent to Alcontrol Ltd. Testing was in accordance with "Murphy Suite" which determines the suitability of the soils for acceptance into licensed landfill facilities.

Geotechnical laboratory data is presented in Appendix III and environmental results in Appendix IV.

Geotechnical Testing

The geotechnical tests have been carried out in accordance with BS1377 Part 2: 1990 and consisted of the following:

- Classification (Liquid and Plastic Limits)
- Grading Analysis (Wet sieve/ Hydrometer)
- Triaxial Compression
- Consolidation
- Sulphate and pH determination

Classification:

The liquid and plastic limits for samples of the cohesive soil from each borehole have determined. Results are tabulated and plotted on the standard Classification Chart. The tests in the main indicate that the gravelly clay stratum encountered in almost all locations if of low to intermediate (occasionally high) plasticity. In some instances plots below the "A" line suggest that the soil matrix be classified as silt.

Gradings:

The particle size distribution curves for the various strata have been established by wet sieve analysis for coarse material and by wet sieve and hydrometer for the finer material. Results are presented graphically. The gravelly clay stratum has typically evenly distributed straight line grading from the clay to the gravel fraction. The coarse base gravel/weathered rock is typically graded in the sand gravel fraction while the alluvial material underlying the fill typically grades as a fine slightly gravelly (shelly) sand.

Triaxial:

The cohesive strength and behavioural characteristics of undisturbed samples has been determined by consolidated un-drained triaxial compression test, with pore water pressure measurement.

Consolidation:

The consolidation characteristics of the four samples (above) have also been established by long term analysis under a pressure range from 12.5 to 200 kN/sq.m. The results indicate the anticipated rate and extent of settlement under load.

Sulphate and pH:

Chemical analysis has been carried out on several selected samples to establish soluble sulphate concentration and acidity in soil. While sulphate concentrations generally fell into Class I, high values were noted particularly in samples from BH 4 and BH 11.

Environmental Testing:

The results of Murphy Suite testing are contained in Appendix IV. This preliminary testing regime was carried out by Alcontrol Ltd. on seven samples selected at random from the made ground deposits.

These results reflect some elevated levels, particularly for PAHs and for Sulphates. In general low to moderate levels of contamination have been noted.

Additional sampling and analysis will be scheduled following detailed assessment of the current data.

IV: Discussion:

The proposed commercial/retail development at Wexford will involve construction over basement on the old motor assembly site located on reclaimed ground east of the main Dublin Rosslare Railway Line at Trinity Street, Wexford.

Reclamation of part of the foreshore of Wexford Harbour adjoining the above area is also proposed. Access to the development will be via a new bridge over the railway from Trinity Street.

A detailed investigation of ground conditions on the site has been carried out for Deerland Construction Ltd. This investigation was directed by Kavanagh Mansfield and Partners, Consulting Engineers for the project.

Conventional cable percussion methods were used to bore in overburden and rotary core drilling was carried out in the bedrock. Geotechnical and environmental laboratory analysis was also carried out to confirm design parameters.

The investigation has confirmed the following pattern of stratification:

MADE GROUND
ALLUVIUM
Gravelly CLAY
Dense GRAVEL
Weathered ROCK

The made ground varies in thickness from 1.50 to 4.00 metres and overlies loose organic sand or clay (alluvial deposits). The deepest area of alluvium is noted at BH 14 where it extends to almost 5.00 metres.

Firm to stiff gravelly clay (boulder clay) is then encountered. This stratum varies in thickness but extends to a maximum depth of about 17.00 metres at BH 16.

Dense gravel/weathered mudstone or limestone is finally encountered, the horizon of the weathered rock is relatively close to the surface at the southern end close to the railway at about 3.00 metres BGL deepening to in excess of 17 metres eastwards towards the estuary.

The rock quality across the site area is extremely variable. Triple tube rotary core drilling has been employed with good quality core of Limestone/Mudstone recovered in several boreholes. Highly weathered (residual) mudstone has however been encountered in a number of locations with very low solid recovery recorded. The particular locations showing deep weathering are RC 07, RC 10 and RC 13.

Several sections through the various boreholes have been provided, clearly indicating the variations in stratification and rock profile. Further variations are possible between the borehole positions.

The development is understood to incorporate basement construction over much of the footprint with an assumed formation 3.00 metres below existing ground level. Piling techniques are to be adopted to support structural and floor loads.

The basement excavation will be mainly in made ground deposits, with alluvium present over at least part of the site where fill is shallowest. Ground water ingress has been recorded at about 2.00 metres, however with tidal variation a design water level at or close to ground level should be adopted.

PILING

High column loads are envisaged for this development. The presence of weathered shaley limestone or mudstone underlying the site suggests that this would be the preferred medium for pile formation.

Rock at the southern corner of the site is at or about 4.00 to 5.00 metres and consideration could be given to direct excavation for column bases in this area, given that 3.00 metres may be excavated for the basement.

Over the remainder of the site rock head ranges from about 10.00 to 17.00 metres BGL. The quality of the rock varies as indicated on the detailed core logs and in some locations highly weathered mudstone extends to depths in excess of 17 metres.

We would suggest that where large diameter bored piles are used a penetration of 2.00 to 3.00 metres of sound rock should be achieved. In the highly weathered rock penetration of the order of 5.00 to 6.00 metres would be expected to ensure uniformity. A 900mm diameter bored pile could support about 300 tonnes.

Where pre-cast concrete piles are proposed, these should incorporate a rock shoe and be driven to refusal in the weathered rock material. Maximum pile loading for driven concrete piles will be about 150 tonnes.

Specialist piling contractors should be consulted to provide detailed design proposals based on the data contained in this report.

Basement Excavation and Ground Water

Basement construction to a depth of 3.00 metres or so is proposed for at least part of the site area. Ground water (tidally related) is anticipated. Consideration can be given to cofferdam construction (probably in segments) using the stiff gravelly clay as a seal for either traditional steel sheet piles or secant piles. This should effectively provide a sufficient seal against ground water to permit basement construction.

A final standing water level at or about ground level should be assumed (assuming flood or high spring tides) in design against uplift. Resistance to up-lift can be accommodated by the base slab and by utilising the bearing piles as anchors. The use of rock anchors may be also appropriate.

Disposal of Excavated Material

A preliminary assessment of environmental issues relating to the made ground and to earlier site usage has been carried out. Elevated levels of PAHs and Sulphates were noted and these may raise difficulties in disposal of excavated material to landfill.

The use of the excavated material in reclamation of part of the foreshore will be subject to Department of Marine regulations. These regulations are considerably more stringent than normal, testing to the Department's requirements involves samples being shipped to a specialist UK laboratory.

Specialist environmental experts should be consulted for advice on the issues outlined above.

Additional Works








Further borehole and corehole investigation is to be carried out in the special conservation area in the south-east of the site. During this site visit additional environmental sampling using trial pit excavation can be scheduled.

The low core recovery in some locations using traditional triple tube techniques has been noted. More sophisticated core drilling using GEOBORE "S" technology with MUD flush will ensure recovery of the weak bedrock and would be of use in assessing requirements for pile lengths.


Additional environmental laboratory analysis will be required to satisfy both landfill requirements and foreshore reclamation. Ground water sampling if required can be carried out from existing standpipes.


IGSL LTD/JC
JANUARY 2008


Appendix I – Cable Tool Borehole Records


|  GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
|--|---|---|-----------|--|---|--------------|--------------|---|-------------------|--------------------------------------|--|
| CONTRACT Trinity Wharf, Wexford | | | | | | | | BOREHOLE NO. BH3 SHEET Sheet 1 of 1 | | | |
| CO-ORDINATES(_) 109,000.00 E 112,500.00 N | | | | GROUND LEVEL (m) BOREHOLE DIAMETER (mm) 200 BOREHOLE DEPTH (m) 9.80 CASING DEPTH (m) 9.80 | | | | DATE STARTED 16/11/2007 DATE COMPLETED 17/11/2007 BORED BY T.McCarthy PROCESSED BY Taras | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | | | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | |
| | | | | | Ref. Number | Sample Type | Depth (m) | | | | |
| 0 | MADE GROUND (comprised of gravel, rubble, clay, ash) |  | | | 3737 | B | 0.50 | N = 15 (2, 3, 6, 4, 2, 3) | | | |
| 1 | | | | | 3738 | B | 1.50 | N = 9 (1, 2, 2, 3, 2, 2) | | | |
| 2 | Soft brown sandy CLAY/SILT |  | 2.20 | | 3739 | U | 2.50 | 12 blows | | | |
| 3 | Loose gray silty SAND |  | 3.00 | | 3740 | D | 3.05 | | | | |
| 4 | Stiff brown very gravelly CLAY (Possibly claybound gravel) |  | 3.30 | | 3741 | B | 3.50 | | | | |
| 5 | | | | | 3742 | B | 4.50 | N = 24 (2, 4, 4, 8, 5, 7) | | | |
| 6 | Medium dense to dense dark brown silty/clayey GRAVEL with cobbles (Possibly very gravelly clay) |  | 5.80 | | 3743 | B | 5.50 | N = 40 (3, 4, 11, 14, 9, 6) | | | |
| 7 | | | | | 3744 | B | 6.50 | N = 23 (2, 4, 4, 7, 7, 5) | | | |
| 8 | | | | | 3745 | B | 7.50 | N = 38 (3, 8, 10, 12, 9, 7) | | | |
| 9 | | | | | 3746 | B | 8.50 | N = 29 (4, 6, 7, 6, 7, 9) | | | |
| | Angular cobbles and boulders |  | 9.20 | | 3747 | B | 9.50 | N = 50/20 mm (17, 8, 50) | | | |
| End of Borehole at 9.80 m | | | | | | | | | | | |
| HARD STRATA BORING/CHISELLING | | | | | WATER STRIKE DETAILS | | | | | | |
| From (m) | To (m) | Time (h) | Comments | | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments | |
| 1 | 1.3 | 0.75 | | | 2.20 | 2.20 | | 1.90 | | Moderate | |
| 8.2 | 8.4 | 0.5 | | | 9.20 | 9.20 | | 3.60 | | Rapid | |
| 9.5 | 9.8 | 2 | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | 17-11-07 | 9.80 | 0.00 | 3.10 | End of boring | | |
| REMARKS | | | | | Sample Legend D - Small Disturbed (sub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | |


IGSL BH LOG 13184.GPJ IGSL GDT 30/1/08

| | | | | | | | | | | | | | | | | | | | | | |
|--|--|----------|-----------|--------------|--|-------------|--------------|----------------------------------|-------------------|--|--|--|--|--|--|--|--|--|--|------------------------|--|
|  | | | | | | | | | | GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | BOREHOLE NO. BH4 SHEET Sheet 1 of 1 | | | | | | | | | | | |
| CO-ORDINATES(_) 1,060.00 E 1,080.00 N | | | | | GROUND LEVEL (m) | | | | | DATE STARTED 14/11/2007 DATE COMPLETED 15/11/2007 | | | | | | | | | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | BOREHOLE DIAMETER (mm) 200 BOREHOLE DEPTH (m) 9.80 CASING DEPTH (m) 9.80 | | | | | BORED BY T.McCarthy PROCESSED BY Taras | | | | | | | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | | | | | | | | | | | |
| | | | | | Ref. Number | Sample Type | Depth (m) | | | | | | | | | | | | | | |
| 0 | MADE GROUND (comprised of concrete, rubble, clay, ash) | | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | 3717 | B | 1.00 | N = 11 (2, 3, 2, 3, 4, 2) | | | | | | | | | | | | | |
| 2 | Soft gray slightly sandy SILT (with some fill in the upper horizons) | | 1.40 | | 3718 | B | 2.00 | N = 9 (1, 2, 3, 2, 2, 2) | | | | | | | | | | | | | |
| 3 | | | | | 3719 | B | 3.00 | N = 8 (1, 1, 2, 1, 2, 3) | | | | | | | | | | | | | |
| 4 | Firm light brown sandy CLAY: with some gravel | | 3.20 | | 3720 | B | 4.00 | N = 16 (2, 3, 4, 3, 4, 5) | | | | | | | | | | | | | |
| 5 | | | | | 3721 | U | 5.00 | 45 blows | | | | | | | | | | | | | |
| 6 | Firm orangish brown CLAY: | | 4.60 | | 3722 | U | 5.50 | 40 blows | | | | | | | | | | | | | |
| 7 | | | | | 3723 | B | 6.50 | N = 34 (4, 5, 6, 9, 10, 9) | | | | | | | | | | | | | |
| 8 | Very stiff brown very gravelly CLAY with frequent cobbles | | 6.20 | | 3724 | B | 7.50 | N = 46 (3, 8, 10, 10, 12, 14) | | | | | | | | | | | | | |
| 9 | | | | | 3725 | B | 8.50 | N = 37 (4, 6, 9, 10, 11, 7) | | | | | | | | | | | | | |
| 9 | Angular cobbles and boulders | | 9.20 | | | | | | | | | | | | | | | | | | |
| | End of Borehole at 9.80 m | | 9.80 | | | | | | | | | | | | | | | | | | |
| HARD STRATA BORING/CHISELLING | | | | | WATER STRIKE DETAILS | | | | | | | | | | | | | | | | |
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments | | | | | | | | | | | | |
| 0.3 | 0.5 | 0.5 | | 2.40 | 2.40 | 4.80 | 2.00 | | Moderate | | | | | | | | | | | | |
| 3.8 | 3.9 | 0.25 | | 9.20 | 9.20 | | 3.30 | | Rapid | | | | | | | | | | | | |
| 7.9 | 8 | 0.25 | | | | | | | | | | | | | | | | | | | |
| 9.4 | 9.8 | 2 | | | | | | | | | | | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | 14-11-07 | 5.00 | 5.00 | Dry | End of day | | | | | | | | | | | | |
| | | | | | 15-11-07 | 9.60 | 0.00 | 2.80 | End of boring | | | | | | | | | | | | |
| REMARKS | | | | | Sample Legend D - Small Disturbed (rub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | | | | | | | | | | | |






| | | | | | | | | | | | | | | | | | | | | | |
|--|---|----------|-----------|--------------|--|-------------|--------------|--|-------------------|--|--|--|--|--|--|--|--|--|--|------------------------|--|
|  | | | | | | | | | | GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | BOREHOLE NO. BH6 SHEET Sheet 1 of 2 | | | | | | | | | | | |
| CO-ORDINATES(_) 1,150.00 E 1,100.00 N | | | | | GROUND LEVEL (m) | | | | | DATE STARTED 15/11/2007 DATE COMPLETED 16/11/2007 | | | | | | | | | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | BOREHOLE DIAMETER (mm) 200 BOREHOLE DEPTH (m) 9.90 CASING DEPTH (m) 9.90 | | | | | BORED BY T.McCarthy PROCESSED BY Taras | | | | | | | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | | | | | | | | | | | |
| | | | | | Ref. Number | Sample Type | Depth (m) | | | | | | | | | | | | | | |
| 0 | MADE GROUND (comprised of stone, gravel, rubble, clay) | | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | 3726 | B | 0.50 | N = 18 (2, 4, 4, 3, 6, 5) | | | | | | | | | | | | | |
| 2 | | | | | 3727 | B | 1.50 | N = 13 (2, 3, 3, 4, 3, 3) | | | | | | | | | | | | | |
| 3 | | | | | 3728 | B | 2.50 | N = 33 (1, 4, 9, 13, 7, 4) | | | | | | | | | | | | | |
| 4 | | | | | 3729 | B | 3.50 | N = 8 (2, 2, 3, 2, 1, 2) | | | | | | | | | | | | | |
| 5 | Soft grey/black SILT | | 4.10 | | 3730 | U | 4.50 | 20 blows | | | | | | | | | | | | | |
| 6 | | | | | 3731 | D | 5.05 | | | | | | | | | | | | | | |
| 7 | Stiff orangish brown CLAY/SILT | | 5.30 | | 3732 | B | 5.50 | N = 37 (4, 7, 8, 8, 10, 11) | | | | | | | | | | | | | |
| 8 | | | | | 3733 | B | 6.50 | N = 37 (3, 5, 6, 12, 9, 10) | | | | | | | | | | | | | |
| 9 | Very stiff light brown very gravelly CLAY with occasional cobbles | | 6.40 | | 3734 | B | 7.50 | N = 33 (4, 4, 6, 7, 8, 12) | | | | | | | | | | | | | |
| 9 | | | | | 3735 | B | 8.50 | N = 39 (3, 6, 8, 10, 10, 11) | | | | | | | | | | | | | |
| 9 | Angular cobbles and boulders | | 9.40 | | 3736 | B | 9.50 | N = 50/235 mm (5, 8, 6, 10, 19, 15) | | | | | | | | | | | | | |
| HARD STRATA BORING/CHISELLING | | | | | WATER STRIKE DETAILS | | | | | | | | | | | | | | | | |
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments | | | | | | | | | | | | |
| 2.1 | 2.3 | 0.5 | | 2.40 | 2.40 | | 2.00 | | Moderate | | | | | | | | | | | | |
| 7.9 | 8.1 | 0.5 | | 9.40 | 9.40 | | 3.90 | | Rapid | | | | | | | | | | | | |
| 9.1 | 9.2 | 0.25 | | | | | | | | | | | | | | | | | | | |
| 9.6 | 9.9 | 2 | | | | | | | | | | | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | 16-11-07 | 9.90 | 6.90 | 9.90 | 50mm SP | | | | | | | | | | | | |
| REMARKS | | | | | Sample Legend D - Small Disturbed (rub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | | | | | | | | | | | |

|  | | | | | | | | | | GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------|--------------|----------------|---|----------------------------|-------------|-----------|--|-------------------|----------------------------|--|--|--|---------------------------|--|-------------------------------|-------------|--------|-----------|------------------------|---------|--|--|--------------------|-------------------|-------------|-------------|-----------|------------|--------------|----------------|---|--------------|-----------|---------|--|----------|--|--|--|--|--|--|----------|------|------|------|---------|--|--|--|--|--|--|--|--|--|--|--|-----|-----|-----|--|----|--|--|--|--|--|--|--|--|--|--|--|-----|-----|------|--|----|--|--|--|--|--|--|--|--|--|--|--|-----|-----|---|--|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | BOREHOLE NO. BH6 | | | | SHEET Sheet 2 of 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CO-ORDINATES(_) 1,150.00 E 1,100.00 N | | | | | GROUND LEVEL (m) | | | | | DATE STARTED 15/11/2007 | | | | DATE COMPLETED 16/11/2007 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | BOREHOLE DIAMETER (mm) 200 | | | | | BORED BY T.McCarthy | | | | PROCESSED BY Taras | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | BOREHOLE DEPTH (m) 9.90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | CASING DEPTH (m) 9.90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><th rowspan="2">Depth (m)</th><th rowspan="2">Description</th><th rowspan="2">Legend</th><th rowspan="2">Elevation</th><th rowspan="2">Depth (m)</th><th colspan="3">Samples</th><th rowspan="2">Field Test Results</th><th rowspan="2">Standpipe Details</th></tr><tr><th>Ref. Number</th><th>Sample Type</th><th>Depth (m)</th></tr></table> | | | | | | | | | | | | | | | | Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | Ref. Number | Sample Type | Depth (m) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <table><tr><th colspan="4">HARD STRATA BORING/CHISELLING</th><th colspan="4">WATER STRIKE DETAILS</th><th colspan="4"></th></tr><tr><th>From (m)</th><th>To (m)</th><th>Time (h)</th><th>Comments</th><th>Water Strike</th><th>Casing Depth</th><th>Sealed At</th><th>Rise To</th><th>Time (min)</th><th>Comments</th><th></th><th></th><th></th><th></th><th></th><th></th></tr><tr><td>2.1</td><td>2.3</td><td>0.5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7.9</td><td>8.1</td><td>0.5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9.1</td><td>9.2</td><td>0.25</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9.6</td><td>9.9</td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | | | | | | | HARD STRATA BORING/CHISELLING | | | | WATER STRIKE DETAILS | | | | | | | | From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments | | | | | | | 2.1 | 2.3 | 0.5 | | | | | | | | | | | | | | 7.9 | 8.1 | 0.5 | | | | | | | | | | | | | | 9.1 | 9.2 | 0.25 | | | | | | | | | | | | | | 9.6 | 9.9 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HARD STRATA BORING/CHISELLING | | | | WATER STRIKE DETAILS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <table><tr><th colspan="4">GROUNDWATER DETAILS</th><th colspan="4"></th><th colspan="4"></th></tr><tr><th>Date</th><th>Hole Depth</th><th>Casing Depth</th><th>Depth to Water</th><th>Comments</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></tr><tr><td>16-11-07</td><td>9.90</td><td>6.90</td><td>9.90</td><td>50mm SP</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | | | | | | | GROUNDWATER DETAILS | | | | | | | | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | | | | | | | | | | 16-11-07 | 9.90 | 6.90 | 9.90 | 50mm SP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <table><tr><th colspan="4">INSTALLATION DETAILS</th><th colspan="4"></th><th colspan="4"></th></tr><tr><th>Date</th><th>Tip Depth</th><th>RZ Top</th><th>RZ Base</th><th>Type</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></tr><tr><td>16-11-07</td><td>9.90</td><td>6.90</td><td>9.90</td><td>50mm SP</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | | | | | | | INSTALLATION DETAILS | | | | | | | | | | | | Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | | | | | | | 16-11-07 | 9.90 | 6.90 | 9.90 | 50mm SP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16-11-07 | 9.90 | 6.90 | 9.90 | 50mm SP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><th colspan="4">REMARKS</th><th colspan="4">Sample Legend</th><th colspan="4"></th></tr><tr><td colspan="4"></td><td colspan="4">D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub)</td><td colspan="4">U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample</td></tr></table> | | | | | | | | | | | | | | | | REMARKS | | | | Sample Legend | | | | | | | | | | | | D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) | | | | U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REMARKS | | | | Sample Legend | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) | | | | U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |


|  | | | | | | | | | | GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--------------|----------------|---|----------------------------|-------------|-----------|--|-------------------|----------------------------|--|--|--|---------------------------|--|-------------------------------|---|--------|-----------|------------------------|---------|--|--|--------------------|-------------------|-------------|-------------|-----------|------------|--------------|----------------|---|--------------|-----------|---------|--|----------|--|--|--|--|--|--|----------|------|------|------|------------|---|--|------|------|----------|--|--|--|--|--|--|----------|------|------|------|---------|------|--|------|--|-------|--|--|--|--|--|--|-----|-----|------|--|---|--|--|--|--|--|--|--|--|--|--|--|-----|----|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|--|--|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---------------------------------|--|--|------|--|--|--|--|--|--|--|--|--|--|--|--|------------------------------|--|--|------|--|--|--|--|--|--|--|--|--|--|--|
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | BOREHOLE NO. BH8 | | | | SHEET Sheet 1 of 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CO-ORDINATES(_) 1,115.00 E 1,050.00 N | | | | | GROUND LEVEL (m) | | | | | DATE STARTED 17/11/2007 | | | | DATE COMPLETED 18/11/2007 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | BOREHOLE DIAMETER (mm) 200 | | | | | BORED BY T.McCarthy | | | | PROCESSED BY Taras | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | BOREHOLE DEPTH (m) 10.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | CASING DEPTH (m) 10.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><th rowspan="2">Depth (m)</th><th rowspan="2">Description</th><th rowspan="2">Legend</th><th rowspan="2">Elevation</th><th rowspan="2">Depth (m)</th><th colspan="3">Samples</th><th rowspan="2">Field Test Results</th><th rowspan="2">Standpipe Details</th></tr><tr><th>Ref. Number</th><th>Sample Type</th><th>Depth (m)</th></tr></table> | | | | | | | | | | | | | | | | Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | Ref. Number | Sample Type | Depth (m) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Ref. Number | Sample Type | Depth (m) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><td>0</td><td>MADE GROUND (comprised of re-inforced concrete, stone, gravel, ash, clay)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1</td><td>Soft brown sandy CLAY/SILT with occasional gravel</td><td></td><td></td><td>1.20</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td>Stiff to very stiff brown gravelly CLAY with occasional cobbles</td><td></td><td></td><td>3.00</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td>Dense angular grey silty GRAVEL</td><td></td><td></td><td>9.40</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td>Angular cobbles and boulders</td><td></td><td></td><td>9.80</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | | | | | | | 0 | MADE GROUND (comprised of re-inforced concrete, stone, gravel, ash, clay) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | Soft brown sandy CLAY/SILT with occasional gravel | | | 1.20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | Stiff to very stiff brown gravelly CLAY with occasional cobbles | | | 3.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Dense angular grey silty GRAVEL | | | 9.40 | | | | | | | | | | | | | Angular cobbles and boulders | | | 9.80 | | | | | | | | | | | |
| 0 | MADE GROUND (comprised of re-inforced concrete, stone, gravel, ash, clay) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1 | Soft brown sandy CLAY/SILT with occasional gravel | | | 1.20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | Dense angular grey silty GRAVEL | | | 9.40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Angular cobbles and boulders | | | 9.80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><th colspan="4">HARD STRATA BORING/CHISELLING</th><th colspan="4">WATER STRIKE DETAILS</th><th colspan="4"></th></tr><tr><th>From (m)</th><th>To (m)</th><th>Time (h)</th><th>Comments</th><th>Water Strike</th><th>Casing Depth</th><th>Sealed At</th><th>Rise To</th><th>Time (min)</th><th>Comments</th><th></th><th></th><th></th><th></th><th></th><th></th></tr><tr><td>0</td><td>0.2</td><td>1</td><td></td><td>2.20</td><td>2.20</td><td></td><td>1.80</td><td></td><td>Moderate</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>2.9</td><td>3</td><td>0.5</td><td></td><td>9.80</td><td>9.80</td><td></td><td>3.40</td><td></td><td>Rapid</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>8.2</td><td>8.3</td><td>1.25</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>9.8</td><td>10</td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | | | | | | | HARD STRATA BORING/CHISELLING | | | | WATER STRIKE DETAILS | | | | | | | | From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments | | | | | | | 0 | 0.2 | 1 | | 2.20 | 2.20 | | 1.80 | | Moderate | | | | | | | 2.9 | 3 | 0.5 | | 9.80 | 9.80 | | 3.40 | | Rapid | | | | | | | 8.2 | 8.3 | 1.25 | | | | | | | | | | | | | | 9.8 | 10 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17-11-07 | 3.00 | 3.00 | 1.80 | End of day | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18-11-07 | 4.00 | 1.00 | 4.00 | 50mm SP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><th colspan="4">INSTALLATION DETAILS</th><th colspan="4"></th><th colspan="4"></th></tr><tr><th>Date</th><th>Tip Depth</th><th>RZ Top</th><th>RZ Base</th><th>Type</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></tr><tr><td>18-11-07</td><td>4.00</td><td>1.00</td><td>4.00</td><td>50mm SP</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> | | | | | | | | | | | | | | | | INSTALLATION DETAILS | | | | | | | | | | | | Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | | | | | | | 18-11-07 | 4.00 | 1.00 | 4.00 | 50mm SP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18-11-07 | 4.00 | 1.00 | 4.00 | 50mm SP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><th colspan="4">REMARKS</th><th colspan="4">Sample Legend</th><th colspan="4"></th></tr><tr><td colspan="4"></td><td colspan="4">D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub)</td><td colspan="4">U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample</td></tr></table> | | | | | | | | | | | | | | | | REMARKS | | | | Sample Legend | | | | | | | | | | | | D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) | | | | U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REMARKS | | | | Sample Legend | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) | | | | U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |


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|  | | | | | | | | | | GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | BOREHOLE NO. BH8 SHEET Sheet 2 of 2 | | | | | | | | | | | |
| CO-ORDINATES(_) 1,115.00 E 1,050.00 N | | | | | GROUND LEVEL (m) BOREHOLE DIAMETER (mm) 200 | | | | | DATE STARTED 17/11/2007 DATE COMPLETED 18/11/2007 | | | | | | | | | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | BOREHOLE DEPTH (m) 10.00 CASING DEPTH (m) 10.00 | | | | | BORED BY T.McCarthy PROCESSED BY Taras | | | | | | | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | | | | | | | | | | | |
| | | | | | Ref. Number | Sample Type | Depth (m) | | | | | | | | | | | | | | |
| 10 | End of Borehole at 10.00 m | | | 10.00 | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | | |
| HARD STRATA BORING/CHISELLING | | | | | WATER STRIKE DETAILS | | | | | | | | | | | | | | | | |
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments | | | | | | | | | | | | |
| 0 | 0.2 | 1 | | | | | | | | | | | | | | | | | | | |
| 2.9 | 3 | 0.5 | | | | | | | | | | | | | | | | | | | |
| 8.2 | 8.3 | 1.25 | | | | | | | | | | | | | | | | | | | |
| 9.8 | 10 | 2 | | | | | | | | | | | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | | | | | | | | | | | | |
| 18-11-07 | 4.00 | 1.00 | 4.00 | 50mm SP | | | | | | | | | | | | | | | | | |
| REMARKS | | | | | Sample Legend | | | | | | | | | | | | | | | | |
| | | | | | D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) | | | | | U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | | | | | | |

IGSL BH LOG 13184 GPJ IGSL GDT 7/12/07

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|--|---|---|-----------|--------------|---|-------------|--------------|--------------------|-------------------|--|--|--|--|--|--|--|--|--|--|------------------------|--|
|  | | | | | | | | | | GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | BOREHOLE NO. BH9 SHEET Sheet 1 of 1 | | | | | | | | | | | |
| CO-ORDINATES(_) 1,160.00 E 1,050.00 N | | | | | GROUND LEVEL (m) BOREHOLE DIAMETER (mm) 200 | | | | | DATE STARTED 24/11/2007 DATE COMPLETED 29/11/2007 | | | | | | | | | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | BOREHOLE DEPTH (m) 10.10 CASING DEPTH (m) 10.10 | | | | | BORED BY T.McCarthy PROCESSED BY F.C | | | | | | | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | | | | | | | | | | | |
| | | | | | Ref. Number | Sample Type | Depth (m) | | | | | | | | | | | | | | |
| 0 | MADE GROUND (comprised of clay, rubble, stone, ash) |  | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | | |
| 2 | Firm grey brown sandy gravelly SILT |  | | 2.10 | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | |
| 4 | Firm to stiff brown sandy gravelly CLAY |  | | 4.00 | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
| 9 | Dense grey brown angular GRAVEL with cobbles and boulders |  | | 9.00 | | | | | | | | | | | | | | | | | |
| 10 | End of Borehole at 10.10 m | | | 10.10 | | | | | | | | | | | | | | | | | |
| HARD STRATA BORING/CHISELLING | | | | | WATER STRIKE DETAILS | | | | | | | | | | | | | | | | |
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments | | | | | | | | | | | | |
| 1 | 1.3 | 0.75 | | 2.00 | 2.00 | | 1.80 | | Slow | | | | | | | | | | | | |
| 6.9 | 7.1 | 0.5 | | 9.00 | 9.00 | | 3.70 | | Moderate | | | | | | | | | | | | |
| 8.2 | 8.4 | 0.5 | | | | | | | | | | | | | | | | | | | |
| 9.6 | 10.1 | 2 | | | | | | | | | | | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | | | | | | | | | | | | |
| 24-11-07 | 9.00 | 9.00 | 7.40 | End of Day | | | | | | | | | | | | | | | | | |
| REMARKS | | | | | Sample Legend | | | | | | | | | | | | | | | | |
| | | | | | D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) | | | | | U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | | | | | | |

IGSL BH LOG 13184 GPJ IGSL GDT 10/12/07

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|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|-----------|-----------|---------|----|------|----------------------------------|-------------------|--|--|
|  | | | | | | | | | | GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | | | | | | | | | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | BOREHOLE NO. BH11 | | | | | | | | | | SHEET Sheet 1 of 1 | | | | | | | | | |
| CO-ORDINATES() 1,030.00 E 0,990.00 N | | | | | | | | | | GROUND LEVEL (m) BOREHOLE DIAMETER (mm) 200 | | | | | | | | | | DATE STARTED 02/12/2007 DATE COMPLETED 02/12/2007 | | | | | | | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | | | | | | BOREHOLE DEPTH (m) 10.10 CASING DEPTH (m) 10.10 | | | | | | | | | | BORED BY T.McCarthy PROCESSED BY F.C | | | | | | | | | |
| Depth (m) | | | | | | | | | | Description | | | | | | | | | | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | |
| 0 | | | | | | | | | | MADE GROUND (comprised of tarmac over hardcore fill) | | | | | | | | | | | | | 7745 | B | 0.50 | N = 13 (3, 3, 4, 3, 4, 2) | | | |
| 1 | | | | | | | | | | Firm to stiff grey/brown CLAY with some boulders | | | | | | | | | | | 1.20 | | 7746 | B | 1.50 | N = 10 (1, 2, 2, 3, 2, 3) | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | | 7747 | B | 2.50 | N = 17 (2, 3, 3, 6, 4, 4) | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | 7748 | B | 3.00 | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | | 7749 | B | 3.50 | N = 18 (3, 4, 4, 5, 4, 5) | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | 7750 | B | 4.50 | N = 35 (2, 5, 9, 12, 8, 6) | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | 7751 | B | 5.50 | N = 35 (3, 4, 4, 10, 13, 8) | | | |
| 7 | | | | | | | | | | Medium dense brown clayey fine to coarse GRAVEL | | | | | | | | | | | 8.90 | | 7752 | NR | 6.00 | N = 28 (4, 7, 9, 6, 6, 7) | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | 7753 | B | 7.50 | N = 24 (3, 5, 6, 5, 7, 6) | | | |
| 9 | | | | | | | | | | Dense grey brown angular GRAVEL with cobbles and boulders | | | | | | | | | | | 8.10 | | 7754 | B | 8.50 | N = 32 (4, 5, 7, 7, 8, 10) | | | |
| 10 | | | | | | | | | | End of Borehole at 10.10 m | | | | | | | | | | | 10.10 | | | | | N = 50/115 mm (6, 10, 17, 33) | | | |
| HARD STRATA BORING/CHISELLING | | | | | | | | | | WATER STRIKE DETAILS | | | | | | | | | | | | | | | | | | | |
| From (m) To (m) Time (h) Comments | | | | | | | | | | Water Strike Casing Depth Sealed At Rise To Time (min) Comments | | | | | | | | | | | | | | | | | | | |
| 5.8 5.9 0.25 | | | | | | | | | | 6.90 6.90 | | | | | | | | | | 5.80 Moderate | | | | | | | | | |
| 7.2 7.4 0.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9.7 10.1 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | Date Hole Depth Casing Depth Depth to Water Comments | | | | | | | | | | | | | | | | | | | |
| Date Tip Depth RZ Top RZ Base Type | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REMARKS | | | | | | | | | | Sample Legend | | | | | | | | | | U - Undisturbed 100mm Diameter Sample D - Small Disturbed (tub) B - Bulk Disturbed LS - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|-----------|-----------|---------|---|-------|----------------------------------|-------------------|--|--|
|  | | | | | | | | | | GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | | | | | | | | | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | BOREHOLE NO. BH12 | | | | | | | | | | SHEET Sheet 1 of 2 | | | | | | | | | |
| CO-ORDINATES() 1,070.00 E 1,000.00 N | | | | | | | | | | GROUND LEVEL (m) BOREHOLE DIAMETER (mm) 200 | | | | | | | | | | DATE STARTED 29/11/2007 DATE COMPLETED 30/11/2007 | | | | | | | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | | | | | | BOREHOLE DEPTH (m) 13.90 CASING DEPTH (m) 13.90 | | | | | | | | | | BORED BY T.McCarthy PROCESSED BY F.C | | | | | | | | | |
| Depth (m) | | | | | | | | | | Description | | | | | | | | | | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | |
| 0 | | | | | | | | | | MADE GROUND (comprised of concrete, rubble, hardcore) | | | | | | | | | | | | | 7723 | B | 0.50 | N = 32 (3, 4, 8, 11, 7, 6) | | | |
| 1 | | | | | | | | | | | | | | | | | | | | | | | | | 1.50 | N = 50/115 mm (19, 6, 18, 32) | | | |
| 2 | | | | | | | | | | Soft grey slightly sandy SILT | | | | | | | | | | | 2.40 | | 7724 | B | 2.50 | N = 14 (2, 3, 3, 4, 3, 4) | | | |
| 3 | | | | | | | | | | Medium dense orange/brown silty SAND with some gravel | | | | | | | | | | | 2.90 | | 7725 | B | 3.50 | N = 14 (1, 3, 4, 4, 3, 3) | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | | 7726 | B | 4.50 | N = 11 (2, 2, 3, 2, 3, 3) | | | |
| 5 | | | | | | | | | | Firm to stiff orange/brown CLAY/SILT | | | | | | | | | | | 4.50 | | 7727 | B | 5.50 | N = 29 (3, 5, 6, 7, 7, 9) | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | 7728 | B | 6.50 | N = 37 (4, 7, 8, 8, 10, 11) | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | 7729 | B | 7.50 | N = 24 (3, 4, 6, 5, 6, 7) | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | NR | U | 8.00 | N = 27 (2, 4, 5, 7, 8, 7) | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | 7730 | B | 8.50 | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | 7731 | B | 9.50 | N = 36 (4, 6, 7, 9, 10, 10) | | | |
| | | | | | | | | | | | | | | | | | | | | | | | 7732 | B | 10.50 | N = 29 (2, 4, 6, 6, 8, 9) | | | |
| HARD STRATA BORING/CHISELLING | | | | | | | | | | WATER STRIKE DETAILS | | | | | | | | | | | | | | | | | | | |
| From (m) To (m) Time (h) Comments | | | | | | | | | | Water Strike Casing Depth Sealed At Rise To Time (min) Comments | | | | | | | | | | | | | | | | | | | |
| 1.3 2.1 2.5 | | | | | | | | | | 2.60 2.60 | | | | | | | | | | 2.20 Moderate | | | | | | | | | |
| 13.4 13.9 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | Date Hole Depth Casing Depth Depth to Water Comments | | | | | | | | | | | | | | | | | | | |
| Date Tip Depth RZ Top RZ Base Type | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REMARKS | | | | | | | | | | Sample Legend | | | | | | | | | | U - Undisturbed 100mm Diameter Sample D - Small Disturbed (tub) B - Bulk Disturbed LS - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) | | | | | | | | | |



GEOTECHNICAL BORING RECORD

REPORT NUMBER

13184

CONTRACT Trinity Wharf, Wexford

BOREHOLE NO. BH12
SHEET Sheet 2 of 2CO-ORDINATES(_) 1,070.00 E
1,000.00 NGROUND LEVEL (m)
BOREHOLE DIAMETER (mm) 200
BOREHOLE DEPTH (m) 13.90
CASING DEPTH (m) 13.90DATE STARTED 29/11/2007
DATE COMPLETED 30/11/2007
BORED BY T.McCarthy
PROCESSED BY F.CCLIENT Deerland Properties
ENGINEER Kavanagh Mansfield

| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details |
|-----------|---|--------|-----------|-----------|-------------|-------------|-----------|---------------------------------|-------------------|
| | | | | | Ref. Number | Sample Type | Depth (m) | | |
| 11 | Stiff black SILT/CLAY (continued) | | | | 7733 | B | 11.50 | N = 28 (3, 5, 5, 7, 8, 8) | |
| 12 | Stiff brown/white CLAY/SILT | | 11.80 | | 7734 | B | 12.50 | N = 23 (3, 4, 4, 6, 6, 7) | |
| 13 | Dense grey brown angular GRAVEL with cobbles and boulders | | 12.80 | | 7735 | B | 13.50 | N = 50/95 mm (8, 16, 32, 18) | |
| 14 | End of Borehole at 13.90 m | | 13.90 | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |

HARD STRATA BORING/CHISELLING

| From (m) | To (m) | Time (h) | Comments |
|----------|--------|----------|----------|
| 1.3 | 2.1 | 2.5 | |
| 13.4 | 13.9 | 2 | |

WATER STRIKE DETAILS

| Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments |
|--------------|--------------|-----------|---------|------------|----------|
| 13.10 | 13.10 | | 7.30 | | Rapid |

GROUNDWATER DETAILS

| Date | Hole Depth | Casing Depth | Depth to Water | Comments |
|------|------------|--------------|----------------|----------|
| | | | | |

INSTALLATION DETAILS

| Date | Tip Depth | RZ Top | RZ Base | Type |
|------|-----------|--------|---------|------|
| | | | | |

REMARKS

Sample Legend

D - Small Disturbed (rub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
U - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample

GEOTECHNICAL BORING RECORD

REPORT NUMBER

13184

CONTRACT Trinity Wharf, Wexford

BOREHOLE NO. BH14
SHEET Sheet 1 of 2CO-ORDINATES(_) 1,170.00 E
10,000.00 NGROUND LEVEL (m)
BOREHOLE DIAMETER (mm) 200
BOREHOLE DEPTH (m) 12.30
CASING DEPTH (m) 12.30DATE STARTED 18/11/2007
DATE COMPLETED 19/11/2007
BORED BY T.McCarthy
PROCESSED BY TarasCLIENT Deerland Properties
ENGINEER Kavanagh Mansfield

| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details |
|-----------|--|--------|-----------|-----------|-------------|-------------|-----------|------------------------------|-------------------|
| | | | | | Ref. Number | Sample Type | Depth (m) | | |
| 0 | MADE GROUND (comprised of re-inforced concrete, stone, rubble, clay) | | | | 3759 | B | 0.50 | N = 9 (1, 1, 2, 2, 2, 3) | |
| 1 | Loose grey silty SAND | | 1.40 | | 3760 | B | 1.50 | N = 13 (2, 2, 3, 3, 3, 4) | |
| 2 | Soft greyish black sandy SILT | | 2.60 | | 3761 | B | 2.50 | N = 12 (2, 3, 4, 3, 2, 3) | |
| 3 | | | | | 3762 | U | 3.00 | 18 blows | |
| 4 | | | | | 3763 | D | 3.55 | | |
| 5 | | | | | 3764 | B | 4.00 | N = 5 (1, 0, 1, 1, 2, 1) | |
| 6 | Loose grey sandy GRAVEL with fragments of shells | | 4.40 | | | | | | |
| 7 | Loose brown clayey sandy GRAVEL | | 4.80 | | 3765 | B | 5.00 | N = 8 (1, 2, 1, 2, 3, 2) | |
| 8 | | | | | 3766 | B | 6.00 | N = 11 (2, 2, 3, 3, 2, 3) | |
| 9 | Medium dense brown fine to medium sandy GRAVEL | | 6.10 | | 3767 | B | 7.00 | N = 15 (2, 3, 4, 3, 4, 4) | |
| 10 | | | | | 3768 | B | 8.00 | N = 18 (3, 3, 4, 4, 5, 6) | |
| 11 | Stiff brown gravelly CLAY with occasional cobbles | | 8.60 | | 3769 | B | 9.00 | N = 21 (2, 4, 5, 4, 5, 7) | |

HARD STRATA BORING/CHISELLING

| From (m) | To (m) | Time (h) | Comments |
|----------|--------|----------|----------|
| 0 | 0.2 | 1.25 | |
| 9.7 | 9.9 | 0.5 | |
| 10.5 | 10.6 | 0.5 | |
| 11.8 | 12.3 | 2 | |

WATER STRIKE DETAILS

| Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments |
|--------------|--------------|-----------|---------|------------|----------|
| 2.00 | 2.00 | | 1.80 | | Slow |




GROUNDWATER DETAILS

| Date | Hole Depth | Casing Depth | Depth to Water | Comments |
|----------|------------|--------------|----------------|--------------|
| 18-11-07 | 2.00 | 2.00 | 1.80 | End of day |
| 19-11-07 | 2.00 | 2.00 | 1.80 | Start of day |








REMARKS

Sample Legend


D - Small Disturbed (rub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
U - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample


| | | | | | | | | | |
|--|---|---|-----------|--|--------------|--|--------------------|------------------------------|----------|
|  | | GEOTECHNICAL BORING RECORD | | | | REPORT NUMBER 13184 | | | |
| CONTRACT Trinity Wharf, Wexford | | | | BOREHOLE NO. BH14 | | SHEET Sheet 2 of 2 | | | |
| CO-ORDINATES(_) 1,170.00 E 10,000.00 N | | GROUND LEVEL (m) | | BOREHOLE DIAMETER (mm) 200 | | DATE STARTED 18/11/2007 DATE COMPLETED 19/11/2007 | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | BOREHOLE DEPTH (m) 12.30 CASING DEPTH (m) 12.30 | | BORED BY T.McCarthy PROCESSED BY Taras | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | Field Test Results | Standpipe Details | |
| | | | | | Ref. Number | Sample Type | | | |
| | | | | | Depth (m) | | | | |
| | | | | | | | | | |
| 10 | Stiff brown gravelly CLAY with occasional cobbles (continued) |  | | | 3770 | B | 10.00 | N = 23 (3, 4, 4, 5, 5, 9) | |
| 11 | | | | | 3771 | B | 11.00 | N = 26 (4, 5, 6, 5, 7, 8) | |
| 12 | Angular cobbles and boulders |  | 11.60 | | 3772 | B | 12.00 | N = 50/20 mm (21, 4, 50) | |
| 13 | End of Borehole at 12.30 m | | 12.30 | | | | | | |
| HARD STRATA BORING/CHISELLING | | | | WATER STRIKE DETAILS | | | | | |
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments |
| 0 | 0.2 | 1.25 | | 11.60 | 11.60 | | 7.80 | | Moderate |
| 9.7 | 9.9 | 0.5 | | | | | | | |
| 10.5 | 10.6 | 0.5 | | | | | | | |
| 11.8 | 12.3 | 2 | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | |
| INSTALLATION DETAILS | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | |
| | | | | | | | | | |
| REMARKS | | | | Sample Legend D - Small Disturbed (rub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | |


IGSL BH LOG 13184.GPJ IGSL GDT 7/12/07

| | | | | | | | | | |
|--|---|---|-----------|--|--------------|--|--------------------|---|--------------|
|  | | GEOTECHNICAL BORING RECORD | | | | REPORT NUMBER 13184 | | | |
| CONTRACT Trinity Wharf, Wexford | | | | BOREHOLE NO. BH16 | | SHEET Sheet 1 of 2 | | | |
| CO-ORDINATES(_) 1,135.00 E 0,950.00 N | | GROUND LEVEL (m) | | BOREHOLE DIAMETER (mm) 200 | | DATE STARTED 20/11/2007 DATE COMPLETED 22/11/2007 | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | BOREHOLE DEPTH (m) 17.30 CASING DEPTH (m) 17.30 | | BORED BY T.McCarthy PROCESSED BY Taras | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | Field Test Results | Standpipe Details | |
| | | | | | Ref. Number | Sample Type | | | |
| | | | | | Depth (m) | | | | |
| | | | | | | | | | |
| 0 | MADE GROUND (comprised of oil, ash, slag, rubble) |  | | | 3777 | B | 0.50 | N = 16 (2, 3, 4, 3, 5, 4) | |
| 1 | | | | | 3778 | B | 1.50 | N = 24 (3, 6, 9, 7, 5, 3) | |
| 2 | Soft grey SILT |  | 2.40 | | 3779 | B | 2.50 | N = 5 (1, 0, 1, 1, 1, 2) 30 blows | |
| 3 | Loose grey silty SAND |  | 3.00 | | 3780 | U | 3.00 | | |
| 4 | Stiff to very stiff brown very gravelly CLAY |  | 3.50 | | 3781 | D | 3.55 | | |
| 5 | | | | | 3782 | B | 4.00 | N = 18 (2, 4, 4, 5, 4, 5) | |
| 6 | | | | | 3783 | B | 5.00 | N = 32 (3, 4, 5, 7, 11, 9) | |
| 7 | | | | | 3784 | B | 6.00 | N = 22 (2, 3, 4, 4, 8, 6) | |
| 8 | Stiff grey CLAY/SILT |  | 7.60 | | 3785 | B | 7.00 | N = 38 (3, 9, 10, 12, 9, 7) | |
| 9 | Stiff brown gravelly CLAY with occasional cobbles |  | 8.30 | | 3786 | B | 8.00 | N = 28 (4, 6, 7, 8, 6, 7) | |
| | | | | | 3787 | B | 9.00 | N = 27 (4, 5, 6, 6, 7, 8) | |
| HARD STRATA BORING/CHISELLING | | | | WATER STRIKE DETAILS | | | | | |
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments |
| 1.2 | 1.4 | 0.5 | | 2.40 | 2.40 | | 1.90 | | Moderate |
| 4.7 | 4.9 | 0.5 | | | | | | | |
| 5.3 | 5.4 | 0.25 | | | | | | | |
| 10.5 | 10.7 | 0.5 | | | | | | | |
| 16.9 | 17.3 | 2 | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | |
| INSTALLATION DETAILS | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | |
| 22-11-07 | 5.00 | 1.00 | 5.00 | 50mm SP | 20-11-07 | 3.00 | 3.00 | 1.70 | Start of day |
| 22-11-07 | 17.00 | 14.00 | 17.00 | 50mm SP | | | | | |
| REMARKS Seals from 5.50-14.00m | | | | Sample Legend D - Small Disturbed (rub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | |

IGSL BH LOG 13184.GPJ IGSL GDT 7/12/07

| | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|----------|-----------|--------------|---|-------------|--------------|-------------------------------|-------------------|--|--|--|--|--|--|--|--|--|--|------------------------|--|--|--|
|  | | | | | | | | | | GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | | | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | BOREHOLE NO. BH16 SHEET Sheet 2 of 2 | | | | | | | | | | | | | |
| CO-ORDINATES(_) 1,135.00 E 0,950.00 N | | | | | GROUND LEVEL (m) BOREHOLE DIAMETER (mm) 200 | | | | | DATE STARTED 20/11/2007 DATE COMPLETED 22/11/2007 | | | | | | | | | | | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | BOREHOLE DEPTH (m) 17.30 CASING DEPTH (m) 17.30 | | | | | BORED BY T.McCarthy PROCESSED BY Taras | | | | | | | | | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | | | | | | | | | | | | | |
| | | | | | Ref. Number | Sample Type | Depth (m) | | | | | | | | | | | | | | | | |
| 10 | Stiff brown gravelly CLAY with occasional cobbles (continued) | | | | 3788 | B | 10.00 | N = 35 (3, 6, 7, 9, 9, 10) | | | | | | | | | | | | | | | |
| 11 | | | | | 3789 | B | 11.00 | N = 24 (4, 4, 5, 6, 5, 8) | | | | | | | | | | | | | | | |
| 12 | | | | | 3790 | B | 12.00 | N = 25 (3, 4, 5, 5, 7, 8) | | | | | | | | | | | | | | | |
| 13 | | | | | 3791 | B | 13.00 | N = 33 (4, 6, 7, 7, 9, 10) | | | | | | | | | | | | | | | |
| 14 | | | | | 3792 | B | 14.00 | N = 29 (3, 4, 6, 6, 8, 9) | | | | | | | | | | | | | | | |
| 15 | | | | | 3793 | B | 15.00 | N = 24 (4, 5, 5, 6, 6, 7) | | | | | | | | | | | | | | | |
| 16 | | | | | 3794 | B | 16.00 | N = 22 (3, 4, 4, 5, 7, 6) | | | | | | | | | | | | | | | |
| 17 | Angular cobbles and boulders | | | 16.60 | 3795 | B | 17.00 | N = 75/40 mm (25, 50) | | | | | | | | | | | | | | | |
| 18 | End of Borehole at 17.30 m | | | 17.30 | | | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | | | | |
| HARD STRATA BORING/CHISELLING | | | | | WATER STRIKE DETAILS | | | | | | | | | | | | | | | | | | |
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments | | | | | | | | | | | | | | |
| 1.2 | 1.4 | 0.5 | | 16.60 | 16.60 | | 12.90 | | Moderate | | | | | | | | | | | | | | |
| 4.7 | 4.9 | 0.5 | | | | | | | | | | | | | | | | | | | | | |
| 5.3 | 5.4 | 0.25 | | | | | | | | | | | | | | | | | | | | | |
| 10.5 | 10.7 | 0.5 | | | | | | | | | | | | | | | | | | | | | |
| 16.9 | 17.3 | 2 | | | | | | | | | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | GROUNDWATER DETAILS | | | | | | | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | | | | | | | | | | | | |
| 22-11-07 | 5.00 | 1.00 | 5.00 | 50mm SP | | | | | | | | | | | | | | | | | | | |
| 22-11-07 | 17.00 | 14.00 | 17.00 | 50mm SP | | | | | | | | | | | | | | | | | | | |
| REMARKS Seals from 5.50-14.00m | | | | | Sample Legend | | | | | | | | | | | | | | | | | | |
| | | | | | D - Small Disturbed (Sub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) | | | | | U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|----------|-----------|--------------|---|-------------|--------------|-------------------------------------|-------------------|--|--|--|--|--|--|--|--|--|--|------------------------|--|--|--|
|  | | | | | | | | | | GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | | | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | BOREHOLE NO. BH17 SHEET Sheet 1 of 2 | | | | | | | | | | | | | |
| CO-ORDINATES(_) 1,180.00 E 0,950.00 N | | | | | GROUND LEVEL (m) BOREHOLE DIAMETER (mm) 200 | | | | | DATE STARTED 22/11/2007 DATE COMPLETED 23/11/2007 | | | | | | | | | | | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | BOREHOLE DEPTH (m) 12.50 CASING DEPTH (m) 12.50 | | | | | BORED BY T.McCarthy PROCESSED BY F.C | | | | | | | | | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | | | | | | | | | | | | | |
| | | | | | Ref. Number | Sample Type | Depth (m) | | | | | | | | | | | | | | | | |
| 0 | MADE GROUND (Comprised of iron slag) | | | | 7701 | B | 0.50 | N = 48 (3, 4, 4, 11, 14, 19) | | | | | | | | | | | | | | | |
| 1 | | | | | 7702 | B | 1.50 | N = 50/160 mm (9, 14, 18, 24, 8) | | | | | | | | | | | | | | | |
| 2 | | | | | 7703 | B | 2.50 | N = 12 (3, 5, 4, 3, 2, 3) | | | | | | | | | | | | | | | |
| 3 | Medium dense grey slightly silty SAND | | | 2.80 | 7704 | B | 3.50 | N = 18 (2, 3, 4, 3, 4, 5) | | | | | | | | | | | | | | | |
| 4 | Firm brown gravelly CLAY/Silt | | | 4.10 | 7705 | B | 4.50 | N = 15 (2, 3, 4, 4, 3, 4) | | | | | | | | | | | | | | | |
| 5 | | | | | 7706 | B | 5.50 | N = 14 (2, 2, 3, 3, 4, 4) | | | | | | | | | | | | | | | |
| 6 | Medium dense brown gravelly SAND | | | 5.80 | 7707 | B | 6.50 | N = 19 (3, 4, 4, 5, 4, 6) | | | | | | | | | | | | | | | |
| 7 | | | | | 7708 | B | 7.50 | N = 23 (2, 4, 4, 5, 7, 7) | | | | | | | | | | | | | | | |
| 8 | Stiff to very stiff brown gravelly CLAY with occasional cobbles | | | 7.60 | 7709 | B | 8.50 | N = 19 (3, 3, 4, 4, 5, 6) | | | | | | | | | | | | | | | |
| 9 | | | | | 7710 | B | 9.50 | N = 27 (2, 5, 4, 8, 9, 6) | | | | | | | | | | | | | | | |
| 10 | | | | | 7711 | B | 10.50 | N = 38 (3, 4, 6, 7, 11, 14) | | | | | | | | | | | | | | | |
| HARD STRATA BORING/CHISELLING | | | | | WATER STRIKE DETAILS | | | | | | | | | | | | | | | | | | |
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments | | | | | | | | | | | | | | |
| 0.8 | 1.7 | 2.25 | | 2.80 | 2.80 | | 2.30 | | Slow | | | | | | | | | | | | | | |
| 10.8 | 11 | 0.5 | | 5.80 | 5.80 | | 3.40 | | Moderate | | | | | | | | | | | | | | |
| 12.1 | 12.5 | 2 | | | | | | | | | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | GROUNDWATER DETAILS | | | | | | | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | | | | | | | | | | | | |
| 23-11-07 | | | | | | 4.00 | 4.00 | 2.40 | Start of Day | | | | | | | | | | | | | | |
| REMARKS | | | | | Sample Legend | | | | | | | | | | | | | | | | | | |
| | | | | | D - Small Disturbed (Sub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) | | | | | U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | | | | | | | | |



GEOTECHNICAL BORING RECORD

REPORT NUMBER
13184

CONTRACT
Trinity Wharf, Wexford

BOREHOLE NO.
BH17

CO-ORDINATES(_)
1,180.00 E
0,950.00 N

GROUND LEVEL (m)
BOREHOLE DIAMETER (mm) 200

CLIENT
ENGINEER
Deerland Properties
Kavanagh Mansfield

BOREHOLE DEPTH (m) 12.50
CASING DEPTH (m) 12.50

DATE STARTED
DATE COMPLETED
22/11/2007
23/11/2007

BORED BY
PROCESSED BY
T.McCarthy
F.C

Depth (m)
11
12
13
14
15
16
17
18
19
20
21



Description

Stiff to very stiff brown gravelly CLAY with occasional cobbles (continued)

Dense grey brown angular GRAVEL with cobbles and boulders

End of Borehole at 12.50 m

Legend



Elevation

11.80
12.50

Depth (m)

11.50

Ref. Number

7712

Sample Type

B

Depth (m)

11.50

Field Test Results

N = 31
(2, 4, 5, 8, 9, 9)

N = 50/75 mm
(25, 50)

Standpipe Details

HARD STRATA BORING/CHISELLING

WATER STRIKE DETAILS

From (m) To (m) Time (h) Comments

0.8 1.7 2.25

10.8 11 0.5

12.1 12.5 2

Date

Hole Depth

Casing Depth

Depth to Water


Comments

INSTALLATION DETAILS

REMARKS

Sample Legend

U - Undisturbed 100mm Diameter Sample
D - Small Disturbed (sub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)



GEOTECHNICAL BORING RECORD

REPORT NUMBER
13184

CONTRACT
Trinity Wharf, Wexford

BOREHOLE NO.
BH18

CO-ORDINATES(_)
1,180.00 E
0,950.00 N

GROUND LEVEL (m)
BOREHOLE DIAMETER (mm) 200

CLIENT
ENGINEER
Deerland Properties
Kavanagh Mansfield

BOREHOLE DEPTH (m) 4.50
CASING DEPTH (m) 4.50

DATE STARTED
DATE COMPLETED
20/11/2007
20/11/2007

BORED BY
PROCESSED BY
T.McCarthy
Taras

Depth (m)
0
1
2
3
4
5
6
7
8
9

Description

MADE GROUND (comprised of hardcore, clay, rubble)





Medium dense light brown silty sandy GRAVEL

Firm brownish reddish grey CLAY/SILT

Dense broken angular gravel,cobbles and boulders

End of Borehole at 4.50 m

Legend



Elevation

1.90
2.50
3.20
4.50

Depth (m)

0.50
1.50
2.50
3.50

Ref. Number

3773
3774
3775
3776

Sample Type

B
B
B
B

Depth (m)

0.50
1.50
2.50
3.50

Field Test Results

N = 19
(2, 3, 5, 4, 4, 6)

N = 13
(2, 4, 3, 3, 4, 3)

N = 21
(3, 4, 5, 5, 6, 5)

N = 33
(3, 4, 6, 7, 10, 10)

N = 75/20 mm
(25, 50)

Standpipe Details

HARD STRATA BORING/CHISELLING

WATER STRIKE DETAILS

From (m) To (m) Time (h) Comments

4.1 4.3 2

Date

Hole Depth

Casing Depth

Depth to Water

Comments

INSTALLATION DETAILS

REMARKS

Sample Legend

U - Undisturbed 100mm Diameter Sample
D - Small Disturbed (sub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)


| IGSL | | | | | | | | | | GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
|---|---|----------|-----------|--------------|--------------|-------------|--------------|-------------------------------|-------------------|--|--|--|--|--|--|--|--|--|--|---------------------------|--|
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | BOREHOLE NO. BH21 SHEET Sheet 1 of 1 | | | | | | | | | | | |
| CO-ORDINATES(_) | | | | | | | | | | GROUND LEVEL (m) | | | | | | | | | | DATE STARTED 01/12/2007 | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | | | | | | BOREHOLE DIAMETER (mm) 200 BOREHOLE DEPTH (m) 4.80 CASING DEPTH (m) 4.80 | | | | | | | | | | DATE COMPLETED 01/12/2007 | |
| | | | | | | | | | | BORED BY T.McCarthy PROCESSED BY F.C | | | | | | | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | | | | | | | | | | | |
| | | | | | Ref. Number | Sample Type | Depth (m) | | | | | | | | | | | | | | |
| 0 | MADE GROUND (comprised of clay, rubble, stone, ash) | | | | 7738 | B | 0.50 | N = 13 (3, 3, 4, 3, 4, 2) | | | | | | | | | | | | | |
| 1 | Firm brown sandy gravelly CLAY | | 0.95 | | 7737 | B | 1.50 | N = 14 (2, 2, 3, 3, 3, 5) | | | | | | | | | | | | | |
| 2 | | | | | 7738 | B | 2.50 | N = 15 (2, 3, 4, 3, 4, 4) | | | | | | | | | | | | | |
| 3 | Dense, grey, angular GRAVEL with many angular cobbles and boulders. | | 3.20 | | 7739 | B | 3.50 | N = 33 (3, 5, 7, 7, 9, 10) | | | | | | | | | | | | | |
| 4 | | | | | 7740 | B | 4.50 | N = 50/75 mm (25, 50) | | | | | | | | | | | | | |
| 5 | End of Borehole at 4.80 m | | 4.80 | | | | | | | | | | | | | | | | | | |
| HARD STRATA BORING/CHISELLING | | | | | | | | | | WATER STRIKE DETAILS | | | | | | | | | | | |
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments | | | | | | | | | | | | |
| 1.9 | 2.1 | 0.5 | | 2.30 | 2.30 | | 1.90 | | Slow | | | | | | | | | | | | |
| 4.2 | 4.8 | 2 | | | | | | | | | | | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | INSTALLATION DETAILS | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| REMARKS | | | | | | | | | | Sample Legend D - Small Disturbed (sub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | | | | | | |

IGSL BH LOG 13184.GPJ IGSL GDT 10/12/07

| IGSL | | | | | | | | | | GEOTECHNICAL BORING RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
|---|---|----------|-----------|--------------|--------------|-------------|--------------|------------------------------|-------------------|--|--|--|--|--|--|--|--|--|--|---------------------------|--|
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | BOREHOLE NO. BH22 SHEET Sheet 1 of 1 | | | | | | | | | | | |
| CO-ORDINATES(_) | | | | | | | | | | GROUND LEVEL (m) | | | | | | | | | | DATE STARTED 01/12/2007 | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | | | | | | BOREHOLE DIAMETER (mm) 200 BOREHOLE DEPTH (m) 3.90 CASING DEPTH (m) 3.90 | | | | | | | | | | DATE COMPLETED 01/12/2007 | |
| | | | | | | | | | | BORED BY T.McCarthy PROCESSED BY F.C | | | | | | | | | | | |
| Depth (m) | Description | Legend | Elevation | Depth (m) | Samples | | | Field Test Results | Standpipe Details | | | | | | | | | | | | |
| | | | | | Ref. Number | Sample Type | Depth (m) | | | | | | | | | | | | | | |
| 0 | MADE GROUND (comprised of hardcore, clay, rubble) | | | | 7741 | B | 0.50 | N = 20 (3, 5, 8, 6, 3, 3) | | | | | | | | | | | | | |
| 1 | | | | | 7742 | B | 1.50 | N = 12 (2, 3, 2, 3, 3, 4) | | | | | | | | | | | | | |
| 2 | Medium dense brown fine to coarse gravelly SAND | | 1.70 | | 7743 | B | 2.50 | N = 19 (3, 4, 5, 5, 4, 5) | | | | | | | | | | | | | |
| 3 | Dense grey brown angular GRAVEL with cobbles and boulders | | 2.80 | | 7744 | B | 3.50 | N = 50/70 mm (9, 16, 50) | | | | | | | | | | | | | |
| 4 | End of Borehole at 3.90 m | | 3.90 | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | |
| HARD STRATA BORING/CHISELLING | | | | | | | | | | WATER STRIKE DETAILS | | | | | | | | | | | |
| From (m) | To (m) | Time (h) | Comments | Water Strike | Casing Depth | Sealed At | Rise To | Time (min) | Comments | | | | | | | | | | | | |
| 3.4 | 3.9 | 2 | | 1.70 | 1.70 | | 1.50 | | Slow | | | | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | INSTALLATION DETAILS | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| REMARKS | | | | | | | | | | Sample Legend D - Small Disturbed (sub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample | | | | | | | | | | | |

IGSL BH LOG 13184.GPJ IGSL GDT 10/12/07

Appendix II – Rotary Coring Records

| | | | | | | | | | | | | | |
|---|---------------------------|-------------------------------------|------------------------------|----------------|---|-------------------------------|----------------------------------|--|-------------------|------------------------|-----------------------|--------------------------|----------------------|
|  | | GEOTECHNICAL CORE LOG RECORD | | | | REPORT NUMBER 13184 | | | | | | | |
| CONTRACT Trinity Wharf, Wexford | | | | | DRILLHOLE NO RC02 | | | | | | | | |
| | | | | | SHEET Sheet 1 of 2 | | | | | | | | |
| CO-ORDINATES(_) | | | GROUND LEVEL (m) | | DATE STARTED 30/11/2007 | | | | | | | | |
| | | | CORE DIAMETER (mm) 84 | | DATE COMPLETED 01/12/2007 | | | | | | | | |
| CLIENT Deerland Properties | | | INCLINATION -90 | | DRILLED BY Millennium | | | | | | | | |
| ENGINEER Kavanagh Mansfield | | | FLUSH Air/Mist | | LOGGED BY IGSL | | | | | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) 0 250 500 | Legend | Non-intact zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) |
| 0 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of concrete, gravel and cobbles. | 1.20 | | | | |
| 1 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of black silty sand. | | | | | |
| 2 | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown clay. | 5.70 | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown gravelly (fine) clay. | 8.70 | | | | |
| 10 | | | | | | | | | 10.00 | | | | |
| REMARKS 2 Core boxes. | | | | | | | | INSTALLATION REMARKS | | | | | |
| | | | | | | | | GROUNDWATER DETAILS | | | | | |
| | | | | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments | |
| | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | | | | |
| | | | | | | | | | | | | | |

IGSL RC NEW LOG 10M PER PG 13184RC.GPJ IGSL.GDT 17/12/07

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

13184

CONTRACT Trinity Wharf, Wexford

DRILLHOLE NO RC02
SHEET Sheet 2 of 2

CO-ORDINATES(_)

GROUND LEVEL (m)
CORE DIAMETER (mm) 84
INCLINATION -90
FLUSH Air/Mist

DATE STARTED 30/11/2007
DATE COMPLETED 01/12/2007
DRILLED BY Millennium
LOGGED BY IGSL

CLIENT Deerland Properties
ENGINEER Kavanagh Mansfield

| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) |
|--------------------|--------------------|---------|---------|---------|-----------------------|--------|---------------------------|---|-----------|---|-----------|-------------------|---------------|
| 10 | 10.00 | | | | 0 250 500 | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as angular clayey gravel size returns of highly weathered limestone (possible bedrock). Rotary drilling. No recovery. Observed by driller as very weathered rock. Moderately weak to locally moderately strong, thin to medium bedded, grey, fine grained, slightly cherty LIMESTONE. Moderately to highly weathered. | 10.20 | Discontinuities are rough and undulose. Apertures are open with slightly iron oxide stained and clay and fine gravel smeared surfaces. Irregular breaks throughout. | | | |
| 11 | 11.50 | | | | | | | | 11.50 | | | | |
| 12 | | 100 | 0 | 0 | | | | | | | | | |
| 13 | 13.00 | | | | | | | | | | | | |
| 14 | | 87 | 14 | 11 | | | | | | | | | |
| | 14.50 | | | | | | | | | | | | |
| | 14.80 | 100 | 0 | 0 | | | | | | | | | |
| 15 | | 50 | 0 | 0 | | | | | | | | | |
| 16 | 16.00 | | | | | | | | | | | | |
| | | 100 | 41 | 18 | | | | | | | | | |
| 17 | 17.00 | | | | | | | End of Corehole at 17 (m) | 17.00 | | | | |
| 18 | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | |

REMARKS

2 Core boxes.


INSTALLATION REMARKS


GROUNDWATER DETAILS

| Date | Hole Depth | Casing Depth | Depth to Water | Comments |
|------|------------|--------------|----------------|----------|
|------|------------|--------------|----------------|----------|


INSTALLATION DETAILS

| Date | Tip Depth | RZ Top | RZ Base | Type |
|------|-----------|--------|---------|------|
|------|-----------|--------|---------|------|

| | | | | | | | | | | | | | |
|---|--------------------|---------|---------|-----------------------|-----------------------|--------|---------------------------|--|------------|------------------------|----------------|-------------------|---------------|
| <div><div>GEOTECHNICAL CORE LOG RECORD</div></div> | | | | | | | | | | REPORT NUMBER 13184 | | | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | DRILLHOLE NO RC05 | | | | | |
| | | | | | | | | SHEET Sheet 1 of 2 | | | | | |
| CO-ORDINATES(_) | | | | GROUND LEVEL (m) | | | | DATE STARTED 26/11/2007 | | | | | |
| | | | | CORE DIAMETER (mm) 84 | | | | DATE COMPLETED 26/11/2007 | | | | | |
| CLIENT Deerland Properties | | | | INCLINATION -90 | | | | DRILLED BY Millennium | | | | | |
| ENGINEER Kavanagh Mansfield | | | | FLUSH Air/Mist | | | | LOGGED BY IGSL | | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) |
| 0 | | | | | 0 250 500 | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of concrete and silty gravel fill. | | | | | |
| 1 | | | | | | | | | | | | | |
| 2 | | | | | | | | | 2.70 | | | | |
| 3 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of grey silty sand. | | | | | |
| 4 | | | | | | | | | 4.20 | | | | |
| 5 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of silty clay. | | | | | |
| 6 | | | | | | | | | 5.70 | | | | |
| 7 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown gravelly clay | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | 9.80 | | | | |
| REMARKS | | | | | | | | INSTALLATION REMARKS | | | | | |
| 2 Core boxes. | | | | | | | | | | | | | |
| | | | | | | | | GROUNDWATER DETAILS | | | | | |
| | | | | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments | |
| INSTALLATION DETAILS | | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  | | | | | | | | | | GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | DRILLHOLE NO RC05 SHEET Sheet 2 of 2 | | | | | | | | | | | |
| CO-ORDINATES(_) | | | | | | | | | | GROUND LEVEL (m) | | | | | | | | | | DATE STARTED 26/11/2007 DATE COMPLETED 26/11/2007 | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | | | | | | CORE DIAMETER (mm) 84 INCLINATION -90 FLUSH Air/Mist | | | | | | | | | | DRILLED BY Millennium LOGGED BY IGSL | |
| Downhole Depth (m) Core Run Depth (m) T.C.R.% S.C.R.% R.Q.D.% Fracture Spacing (mm) Legend Non-intact zones (shaded) | | | | | | | | | | Strata description Depth (m) Discontinuities Elevation Standpipe Details SPT (N Value) | | | | | | | | | | | |
| 10.20 10.70 11.20 11.90 12.20 12.70 13.20 14.20 14.70 15.20 | | | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as angular clayey gravel size returns of variably weathered limestone (possible bedrock). (continued) Moderately strong to moderately weak, thinly bedded, grey to dark grey, fine grained, slightly cherty LIMESTONE. Moderately to highly weathered. | | | | | | | | | | Discontinuities are rough to locally smooth and undulose to irregular and locally planar. Apertures are open with clay smeared and slightly iron oxide stained surfaces. Dips are sub-10° with predominantly variable breaks throughout. | |
| End of Corehole at 15.2 (m) | | | | | | | | | | | | | | | | | | | | | |
| REMARKS 2 Core boxes. | | | | | | | | | | INSTALLATION REMARKS | | | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | | | | | | | | | | | | |
| Date Hole Depth Casing Depth Depth to Water Comments | | | | | | | | | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | | | | | | | | | | | | |
| Date Tip Depth RZ Top RZ Base Type | | | | | | | | | | | | | | | | | | | | | |

IGSL RC NEWLOG 10M PER PG 13184RC.GPJ IGSL.GDT 17/12/07

| | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|
|  | | | | | | | | | | GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | DRILLHOLE NO RC07 SHEET Sheet 1 of 3 | | | | | | | | | | | |
| CO-ORDINATES(_) | | | | | | | | | | GROUND LEVEL (m) | | | | | | | | | | DATE STARTED 27/11/2007 DATE COMPLETED 28/11/2007 | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | | | | | | CORE DIAMETER (mm) 84 INCLINATION -90 FLUSH Air/Mist | | | | | | | | | | DRILLED BY Millennium LOGGED BY IGSL | |
| Downhole Depth (m) Core Run Depth (m) T.C.R.% S.C.R.% R.Q.D.% Fracture Spacing (mm) Legend Non-intact zones (shaded) | | | | | | | | | | Strata description Depth (m) Discontinuities Elevation Standpipe Details SPT (N Value) | | | | | | | | | | | |
| 1.20 2.70 5.70 8.70 | | | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of concrete and cobbly gravelly fill. SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of sandy clay SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of black silty sand. SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown clay SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown gravelly clay | | | | | | | | | | | |
| REMARKS 1 Core box. | | | | | | | | | | INSTALLATION REMARKS | | | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | | | | | | | | | | | | |
| Date Hole Depth Casing Depth Depth to Water Comments | | | | | | | | | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | | | | | | | | | | | | |
| Date Tip Depth RZ Top RZ Base Type | | | | | | | | | | | | | | | | | | | | | |

IGSL RC NEWLOG 10M PER PG 13184RC.GPJ IGSL.GDT 17/12/07

| GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER 13184 | | | |
|---|--------------------|---------|---------|--------------------------|-----------------------|------------------------------|---------------------------|--|----------------|-------------------------------|-----------|-------------------|-------------------------------------|
| CONTRACT Trinity Wharf, Wexford | | | | | | DRILLHOLE NO RC07 | | SHEET Sheet 2 of 3 | | | | | |
| CO-ORDINATES(_) | | | | GROUND LEVEL (m) | | DATE STARTED 27/11/2007 | | DATE COMPLETED 28/11/2007 | | | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | CORE DIAMETER (mm) 84 | | DATE COMPLETED 28/11/2007 | | DRILLED BY Millennium | | | | | |
| | | | | INCLINATION -90 | | LOGGED BY IGSL | | | | | | | |
| FLUSH Air/Mist | | | | | | | | | | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-Intact zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) |
| 10 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown gravelly clay (continued) | | | | | |
| 11 | 11.50 | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as angular clayey gravel size returns of highly weathered limestone (possible bedrock). Brown grey clayey angular GRAVEL and COBBLES (possible highly weathered limestone bedrock) | 11.30 11.50 | | | | |
| 12 | | 7 | 0 | 0 | | | | | | | | | |
| 13 | 13.00 | | | | | | | | | | | | N = 50/105 mm (3, 5, 12, 12, 26) |
| 14 | | 7 | 0 | 0 | | | | | | | | | |
| 15 | 14.50 | | | | | | | | | | | | N = 50/95 mm (4, 4, 10, 15, 25) |
| 16 | | 10 | 0 | 0 | | | | | | | | | |
| 17 | 16.00 | | | | | | | | | | | | N = 50/80 mm (3, 6, 15, 25, 10) |
| 18 | | 7 | 0 | 0 | | | | | | | | | |
| 19 | 17.50 | | | | | | | | | | | | N = 50/85 mm (3, 4, 5, 20, 25) |
| 20 | | 20 | 0 | 0 | | | | | | | | | |
| 21 | 19.00 | | | | | | | | | | | | N = 50/75 mm (4, 4, 19, 31) |
| 22 | | 20 | 0 | 0 | | | | | | | | | |

REMARKS

1 Core box.

INSTALLATION REMARKS

GROUNDWATER DETAILS

| Date | Hole Depth | Casing Depth | Depth to Water | Comments |
|------|------------|--------------|----------------|----------|
| | | | | |
| | | | | |

INSTALLATION DETAILS

| Date | Tip Depth | RZ Top | RZ Base | Type |
|------|-----------|--------|---------|------|
| | | | | |
| | | | | |

| GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER 13184 | | | |
|---|--------------------|---------|---------|--------------------------|-----------------------|------------------------------|---------------------------|--|-----------|-------------------------------|-----------|-------------------|--------------------------------|
| CONTRACT Trinity Wharf, Wexford | | | | | | DRILLHOLE NO RC07 | | SHEET Sheet 3 of 3 | | | | | |
| CO-ORDINATES(_) | | | | GROUND LEVEL (m) | | DATE STARTED 27/11/2007 | | DATE COMPLETED 28/11/2007 | | | | | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | CORE DIAMETER (mm) 84 | | DATE COMPLETED 28/11/2007 | | DRILLED BY Millennium | | | | | |
| | | | | INCLINATION -90 | | LOGGED BY IGSL | | | | | | | |
| FLUSH Air/Mist | | | | | | | | | | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-Intact zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) |
| 20 | | | | | | | | Brown grey clayey angular GRAVEL and COBBLES (possible highly weathered limestone bedrock) (continued) | | | | | N = 50/75 mm (5, 7, 30, 20) |
| 20.50 | | 80 | 0 | 0 | | | | | | | | | |
| 21 | 21.00 | | | | | | | | | | | | |
| 21.50 | | 30 | 0 | 0 | | | | | | | | | |
| 22 | 22.00 | | | | | | | End of Corehole at 22 (m) | | | | | |
| 23 | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | | |
| 28 | | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | | |

REMARKS

1 Core box.

INSTALLATION REMARKS

GROUNDWATER DETAILS

| Date | Hole Depth | Casing Depth | Depth to Water | Comments |
|------|------------|--------------|----------------|----------|
| | | | | |
| | | | | |

INSTALLATION DETAILS


| Date | Tip Depth | RZ Top | RZ Base | Type |
|------|-----------|--------|---------|------|
| | | | | |
| | | | | |


| GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER <div style="border: 1px solid black; padding: 2px; display: inline-block;">13184</div> | | | |
|--|--------------------|---------|---------|------------------------------|-----------------------|----------------------------------|---------------------------|---|-----------|--|-----------|-------------------|---------------|
| CONTRACT Trinity Wharf, Wexford | | | | | | DRILLHOLE NO RC09 | | SHEET Sheet 1 of 2 | | | | | |
| CO-ORDINATES(_) | | | | GROUND LEVEL (m) | | DATE STARTED 26/11/2007 | | DATE COMPLETED 27/11/2007 | | | | | |
| | | | | CORE DIAMETER (mm) 84 | | DATE COMPLETED 27/11/2007 | | | | | | | |
| CLIENT Deerland Properties | | | | INCLINATION -90 | | DRILLED BY Millennium | | LOGGED BY IGSL | | | | | |
| ENGINEER Kavanagh Mansfield | | | | FLUSH Air/Mist | | | | | | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) |
| 0 | | | | | 0 250 500 | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of sandy gravel fill. | 1.20 | | | | |
| 1 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of grey silt. | | | | | |
| 2 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of silty sand. | 2.70 | | | | |
| 3 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown gravelly clay | 4.20 | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | |
| REMARKS | | | | | | INSTALLATION REMARKS | | | | | | | |
| 2 Core boxes. | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | | | | |
| 27-11-07 | 16.50 | 12.50 | 16.50 | 50mm SP | | | | | | | | | |


IGSL RC NEW LOG 10M PER PG 13184RC.GPJ IGSL.GDT 17/12/07


| GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER <div style="border: 1px solid black; padding: 2px; display: inline-block;">13184</div> | | | |
|--|--------------------|---------|---------|------------------------------|-----------------------|----------------------------------|---------------------------|---|-----------|---|-----------|-------------------|---------------|
| CONTRACT Trinity Wharf, Wexford | | | | | | DRILLHOLE NO RC09 | | SHEET Sheet 2 of 2 | | | | | |
| CO-ORDINATES(_) | | | | GROUND LEVEL (m) | | DATE STARTED 26/11/2007 | | DATE COMPLETED 27/11/2007 | | | | | |
| | | | | CORE DIAMETER (mm) 84 | | DATE COMPLETED 27/11/2007 | | | | | | | |
| CLIENT Deerland Properties | | | | INCLINATION -90 | | DRILLED BY Millennium | | LOGGED BY IGSL | | | | | |
| ENGINEER Kavanagh Mansfield | | | | FLUSH Air/Mist | | | | | | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) |
| 10 | | | | | 0 250 500 | | | | 10.90 | | | | |
| 11 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as angular clayey gravel size returns of variably weathered limestone (possible bedrock). Strong to very strong to moderately strong and locally moderately weak, thin to medium bedded, grey to dark grey, fine grained, cherty and fossiliferous LIMESTONE (locally interbedded with dark grey/blay calcareous mudstone. Frequent thick calcite veins). Slightly to moderately weathered. | 11.50 | Discontinuities are rough and undulose to locally irregular (stylolite). Apertures are open with frequent clay/fine gravel smeared surfaces. Dips are sub-20° with sub-vertical fractures and variable breaks throughout. | | | |
| 12 | | 100 | 53 | 53 | | | | | | | | | |
| 13 | | 100 | 89 | 89 | | | | | | | | | |
| 14 | | 100 | 0 | 0 | | | | | | | | | |
| 15 | | 100 | 62 | 62 | | | | | | | | | |
| 16 | | 83 | 30 | 17 | | | | | | | | | |
| 17 | | | | | | | | End of Corehole at 16.5 (m) | 16.50 | | | | |
| 18 | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | |
| REMARKS | | | | | | INSTALLATION REMARKS | | | | | | | |
| 2 Core boxes. | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | | | | |
| 27-11-07 | 16.50 | 12.50 | 16.50 | 50mm SP | | | | | | | | | |


IGSL RC NEW LOG 10M PER PG 13184RC.GPJ IGSL.GDT 17/12/07

| | | | | | | | | | | | | | | | | | | | | | |
|---|--------------------|---------|---------|---------|-----------------------|--------|---------------------------|--|-----------|--|------------|-------------------|----------------|----------|--|--|--|--|--|--|--|
|  | | | | | | | | | | GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | DRILLHOLE NO RC10 SHEET Sheet 1 of 2 | | | | | | | | | | | |
| CO-ORDINATES(_) | | | | | | | | | | GROUND LEVEL (m) CORE DIAMETER (mm) 84 INCLINATION -90 FLUSH Air/Mist | | | | | | | | | | DATE STARTED 01/12/2007 DATE COMPLETED 01/12/2007 | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | | | | | | DRILLED BY Millennium LOGGED BY IGSL | | | | | | | | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-Intact zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) | | | | | | | | |
| 0 | | | | | 0 250 500 | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of tar and fill. | 1.20 | | | | | | | | | | | | |
| 1 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of black sand. | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of black silty sand. | 5.70 | | | | | | | | | | | | |
| 7 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of sand grading into brown clay. | 7.20 | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown clay. | 8.70 | | | | | | | | | | | | |
| | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown clay. | 9.20 | | | | | | | | | | | | |
| | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown clay. | 10.00 | | | | | | | | | | | | |
| REMARKS 1 Core box. Rock falling in on core barrel. | | | | | | | | | | INSTALLATION REMARKS | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | GROUNDWATER DETAILS | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |


| | | | | | | | | | | | | | | | | | | | | | |
|---|--------------------|---------|---------|---------|-----------------------|--------|---------------------------|--|-----------|--|------------|-------------------|----------------|---------------------------------|--|--|--|--|--|--|--|
|  | | | | | | | | | | GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | DRILLHOLE NO RC10 SHEET Sheet 2 of 2 | | | | | | | | | | | |
| CO-ORDINATES(_) | | | | | | | | | | GROUND LEVEL (m) CORE DIAMETER (mm) 84 INCLINATION -90 FLUSH Air/Mist | | | | | | | | | | DATE STARTED 01/12/2007 DATE COMPLETED 01/12/2007 | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | | | | | | DRILLED BY Millennium LOGGED BY IGSL | | | | | | | | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-Intact zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) | | | | | | | | |
| 10 | 10.00 | 7 | 0 | 0 | 0 250 500 | | | Observed by driller as angular clayey gravel size returns of rock (possible bedrock). | | | | | | | | | | | | | |
| 11 | 11.50 | | | | | | | Angular red/white/brown mottled, slightly sandy coarse GRAVEL and COBBLES (predominantly sandstone) with local boulders, iron oxide stained, probable highly weathered rock. | | | | | | N = 40/85 mm (3, 4, 10, 15, 15) | | | | | | | |
| 12 | | 7 | 0 | 0 | | | | | | | | | | | | | | | | | |
| 13 | 13.00 | | | | | | | | | | | | | N = 50/75 mm (4, 10, 20, 30) | | | | | | | |
| 14 | 14.00 | | | | | | | | | | | | | | | | | | | | |
| 15 | 15.00 | | | | | | | | | | | | | | | | | | | | |
| 16 | 16.00 | | | | | | | | | | | | | | | | | | | | |
| 17 | 17.00 | | | | | | | End of Corehole at 17 (m) | 17.00 | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | | |
| REMARKS 1 Core box. Rock falling in on core barrel. | | | | | | | | | | INSTALLATION REMARKS | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | GROUNDWATER DETAILS | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | Date | Hole Depth | Casing Depth | Depth to Water | Comments | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

|  GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER 13184 | | | |
|---|--------------------|---------|---------|-----------------------|-----------------------|-------------------------|-----------------------------|--|-----------|-------------------------------|-----------|-------------------|---------------|
| CONTRACT Trinity Wharf, Wexford | | | | | | | DRILLHOLE NO RC13 | | | | | | |
| | | | | | | | SHEET Sheet 1 of 2 | | | | | | |
| CO-ORDINATES(_) | | | | GROUND LEVEL (m) | | DATE STARTED 25/11/2007 | | DATE COMPLETED 30/11/2007 | | | | | |
| | | | | CORE DIAMETER (mm) 84 | | | | | | | | | |
| CLIENT Deerland Properties | | | | INCLINATION -90 | | DRILLED BY Millennium | | LOGGED BY IGSL | | | | | |
| ENGINEER Kavanagh Mansfield | | | | FLUSH Air/Mist | | | | | | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) |
| 0 | | | | | 0 250 500 | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of concrete & gravel fill. | | | | | |
| 1 | | | | | | | | | | | | | |
| 2 | | | | | | | | | 2.70 | | | | |
| 3 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of grey sandy silt. | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | 5.70 | | | | |
| 6 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown sandy clay | | | | | |
| 7 | | | | | | | | | 7.20 | | | | |
| 8 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown gravelly clay | | | | | |
| 9 | | | | | | | | | | | | | |
| REMARKS 2 Core boxes. | | | | | | | | | | INSTALLATION REMARKS | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | | | | |
| 30-11-07 | 16.00 | 12.00 | 16.00 | 50mm SP | | | | | | | | | |

|  GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER 13184 | | | |
|---|--------------------|---------|---------|-----------------------|-----------------------|-------------------------|-----------------------------|--|-----------|-------------------------------|-----------|-------------------|---------------|
| CONTRACT Trinity Wharf, Wexford | | | | | | | DRILLHOLE NO RC13 | | | | | | |
| | | | | | | | SHEET Sheet 2 of 2 | | | | | | |
| CO-ORDINATES(_) | | | | GROUND LEVEL (m) | | DATE STARTED 25/11/2007 | | DATE COMPLETED 30/11/2007 | | | | | |
| | | | | CORE DIAMETER (mm) 84 | | | | | | | | | |
| CLIENT Deerland Properties | | | | INCLINATION -90 | | DRILLED BY Millennium | | LOGGED BY IGSL | | | | | |
| ENGINEER Kavanagh Mansfield | | | | FLUSH Air/Mist | | | | | | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-intact zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) |
| 10 | | | | | 0 250 500 | | | | 10.40 | | | | |
| 11 | 10.90 | 91 | 56 | 40 | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as angular clayey gravel size returns of highly weathered limestone (possible bedrock). | 10.90 | | | | |
| 12 | 12.00 | 93 | 21 | 21 | | | | Clayey sub-angular gravel and cobble size returns of limestone with occasional boulders (possible highly weathered rock) | | | | | |
| 13 | 13.40 | 64 | 0 | 0 | | | | | | | | | |
| 14 | 14.50 | 71 | 0 | 0 | | | | | | | | | |
| 15 | 15.20 | 62 | 0 | 0 | | | | | | | | | |
| 16 | 16.00 | | | | | | | End of Corehole at 16 (m) | 16.00 | | | | |
| 17 | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | |
| REMARKS 2 Core boxes. | | | | | | | | | | INSTALLATION REMARKS | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | | | | |
| Date | Tip Depth | RZ Top | RZ Base | Type | | | | | | | | | |
| 30-11-07 | 16.00 | 12.00 | 16.00 | 50mm SP | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|--------------------|---------|---------|---------|-----------------------|--------|---------------------------|---|-----------|---|-----------|---------------------------------|---------------|----------------|--|--|--|--|--|--|--|
|  | | | | | | | | | | GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | DRILLHOLE NO RC15 SHEET Sheet 1 of 2 | | | | | | | | | | | |
| CO-ORDINATES(_) | | | | | | | | | | GROUND LEVEL (m) CORE DIAMETER (mm) 84 | | | | | | | | | | DATE STARTED 30/11/2007 DATE COMPLETED 30/11/2007 | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | | | | | | INCLINATION -90 FLUSH Air/Mist | | | | | | | | | | DRILLED BY Millennium LOGGED BY IGSL | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-incluz zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) | | | | | | | | |
| 0 | | | | | 0 250 500 | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly fill. | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | 2.70 | | | | | | | | | | | | |
| 3 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of silty sandy gravel. | | | | | | | | | | | | | |
| 4 | | | | | | | | | 4.50 | | | | | | | | | | | | |
| 5 | 5.00 | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown sandy gravel (fine). Rotary drilling. No recovery. Observed by driller as very weathered rock. | 5.00 | | | | | | | | | | | | |
| 6 | | 0 | 0 | 0 | | | | | | | | | | | | | | | | | |
| 7 | 7.00 | 100 | 19 | 12 | | | | Moderately weak to moderately strong, thinly bedded, white slightly grey & purple (slightly green 11.6m-12.6m), fine grained SANDSTONE/SILTSTONE. Slightly to moderately weathered. | 7.00 | Discontinuities are rough and undulose and locally irregular. Apertures are open and incipient with iron oxide stained (pervasive 7.0m-9.8m) and commonly silt and fine gravel smeared surfaces. Dips are sub-20° with vertical fractures throughout. | | N = 50/80 mm (4, 7, 19, 21, 10) | | | | | | | | | |
| 8 | 8.00 | 100 | 0 | 0 | | | | | | | | | | | | | | | | | |
| 8.70 | | 100 | 28 | 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | |
| REMARKS 2 Core boxes. | | | | | | | | | | INSTALLATION REMARKS | | | | | | | | | | | |
| | | | | | | | | | | GROUNDWATER DETAILS | | | | | | | | | | | |
| | | | | | | | | | | Date | | | | Hole Depth | | | | | | | |
| | | | | | | | | | | Casing Depth | | | | Depth to Water | | | | | | | |
| | | | | | | | | | | Comments | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | | | | | | | | | | | | |
| Date | | | | | | | | | | Tip Depth | | | | RZ Top | | | | | | | |
| 30-11-07 | | | | | | | | | | 12.60 | | | | 8.60 | | | | | | | |
| | | | | | | | | | | RZ Base | | | | Type | | | | | | | |
| | | | | | | | | | | 50mm SP | | | | | | | | | | | |

IGSL RC NEW LOG 10M PER PG 13184RC.GPJ IGSL.GDT 17/12/07

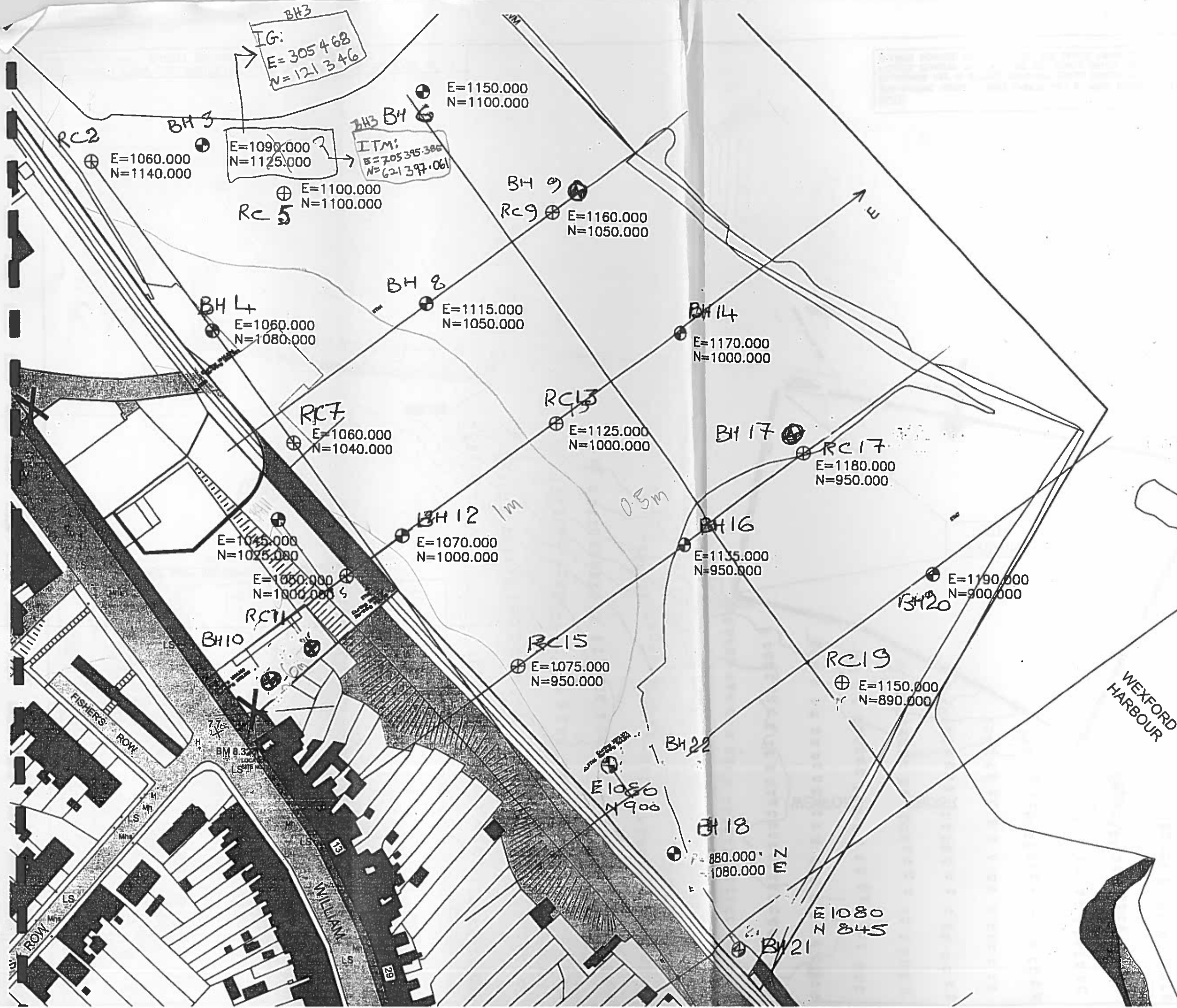
| | | | | | | | | | | | | | | | | | | | | | |
|---|--------------------|---------|---------|---------|-----------------------|--------|---------------------------|---|-----------|---|-----------|-------------------|---------------|----------------|--|--|--|--|--|--|--|
|  | | | | | | | | | | GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | DRILLHOLE NO RC15 SHEET Sheet 2 of 2 | | | | | | | | | | | |
| CO-ORDINATES(_) | | | | | | | | | | GROUND LEVEL (m) CORE DIAMETER (mm) 84 | | | | | | | | | | DATE STARTED 30/11/2007 DATE COMPLETED 30/11/2007 | |
| CLIENT Deerland Properties ENGINEER Kavanagh Mansfield | | | | | | | | | | INCLINATION -90 FLUSH Air/Mist | | | | | | | | | | DRILLED BY Millennium LOGGED BY IGSL | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-incluz zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) | | | | | | | | |
| 10 | 10.00 | | | | | | | Moderately weak to moderately strong, thinly bedded, white slightly grey & purple (slightly green 11.6m-12.6m), fine grained SANDSTONE/SILTSTONE. Slightly to moderately weathered. (continued) | | Discontinuities are rough and undulose and locally irregular. Apertures are open and incipient with iron oxide stained (pervasive 7.0m-9.8m) and commonly silt and fine gravel smeared surfaces. Dips are sub-20° with vertical fractures throughout. (continued) | | | | | | | | | | | |
| 11 | | 100 | 62 | 43 | | | | | | | | | | | | | | | | | |
| 11.60 | | | | | | | | | | | | | | | | | | | | | |
| 12 | | 100 | 59 | 43 | | | | | | | | | | | | | | | | | |
| 12.60 | | | | | | | | End of Corehole at 12.6 (m) | 12.60 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | | | | | |
| REMARKS 2 Core boxes. | | | | | | | | | | INSTALLATION REMARKS | | | | | | | | | | | |
| | | | | | | | | | | GROUNDWATER DETAILS | | | | | | | | | | | |
| | | | | | | | | | | Date | | | | Hole Depth | | | | | | | |
| | | | | | | | | | | Casing Depth | | | | Depth to Water | | | | | | | |
| | | | | | | | | | | Comments | | | | | | | | | | | |
| INSTALLATION DETAILS | | | | | | | | | | | | | | | | | | | | | |
| Date | | | | | | | | | | Tip Depth | | | | RZ Top | | | | | | | |
| 30-11-07 | | | | | | | | | | 12.60 | | | | 8.60 | | | | | | | |
| | | | | | | | | | | RZ Base | | | | Type | | | | | | | |
| | | | | | | | | | | 50mm SP | | | | | | | | | | | |

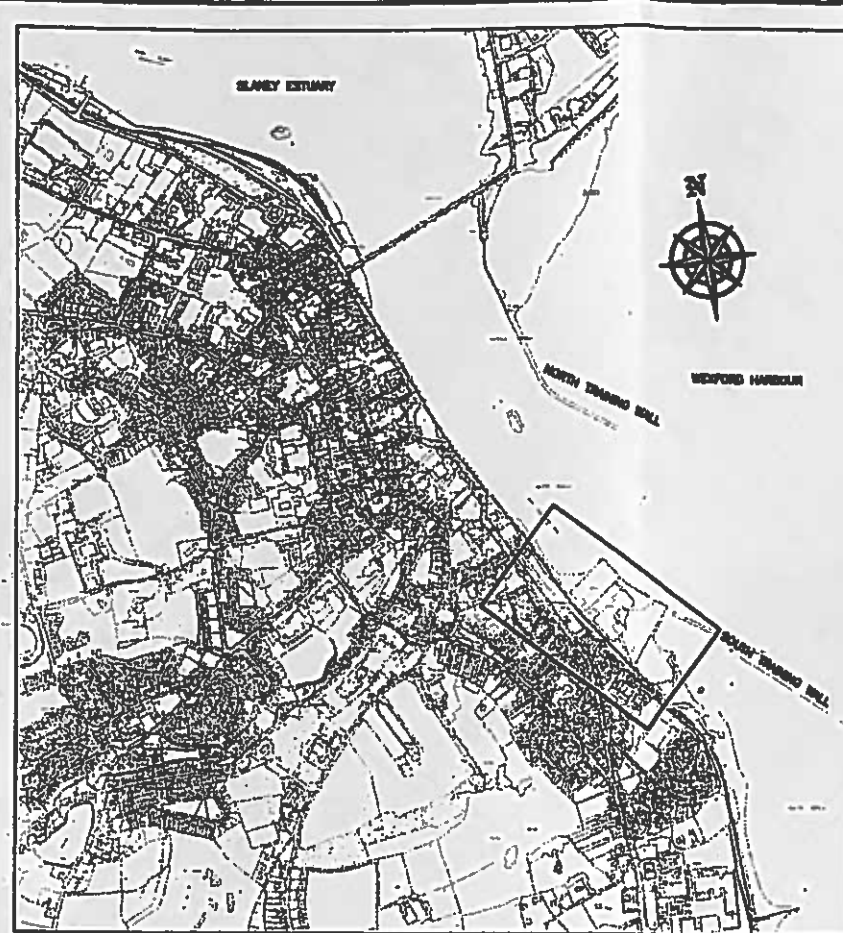
IGSL RC NEW LOG 10M PER PG 13184RC.GPJ IGSL.GDT 17/12/07

| IGSL | | | | | | | | | | GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
|--|--------------------|---------|---------|---------|-----------------------|--------|-----------------------------|--|-----------|------------------------------|-----------|--------------------------|---------------|----------------------------|--|------------------------------|--|--|--|------------------------|--|
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | DRILLHOLE NO RC17 | | SHEET Sheet 1 of 3 | | DATE STARTED 28/11/2007 | | DATE COMPLETED 29/11/2007 | | | | | |
| CO-ORDINATES(_) | | | | | | | | | | GROUND LEVEL (m) | | CORE DIAMETER (mm) 84 | | INCLINATION -90 | | FLUSH Air/Mist | | | | | |
| CLIENT ENGINEER Deerland Properties Kavanagh Mansfield | | | | | | | | | | DRILLED BY Millennium | | LOGGED BY IGSL | | | | | | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-inclined zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) | | | | | | | | |
| 0 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of cobbly gravelly fill. | 1.20 | | | | | | | | | | | | |
| 1 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of silty sandy clay | 2.70 | | | | | | | | | | | | |
| 2 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of silty clay | 4.20 | | | | | | | | | | | | |
| 3 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of black silty clay | 5.70 | | | | | | | | | | | | |
| 4 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown gravelly clay | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | |
| REMARKS 2 Core boxes. | | | | | | | | | | INSTALLATION REMARKS | | | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | | | | | | | | | | | | |
| Date | | | | | | | | | | Hole Depth | | | | Casing Depth | | | | | | | |
| Tip Depth | | | | | | | | | | RZ Top | | | | RZ Base | | | | | | | |
| Type | | | | | | | | | | | | | | | | | | | | | |

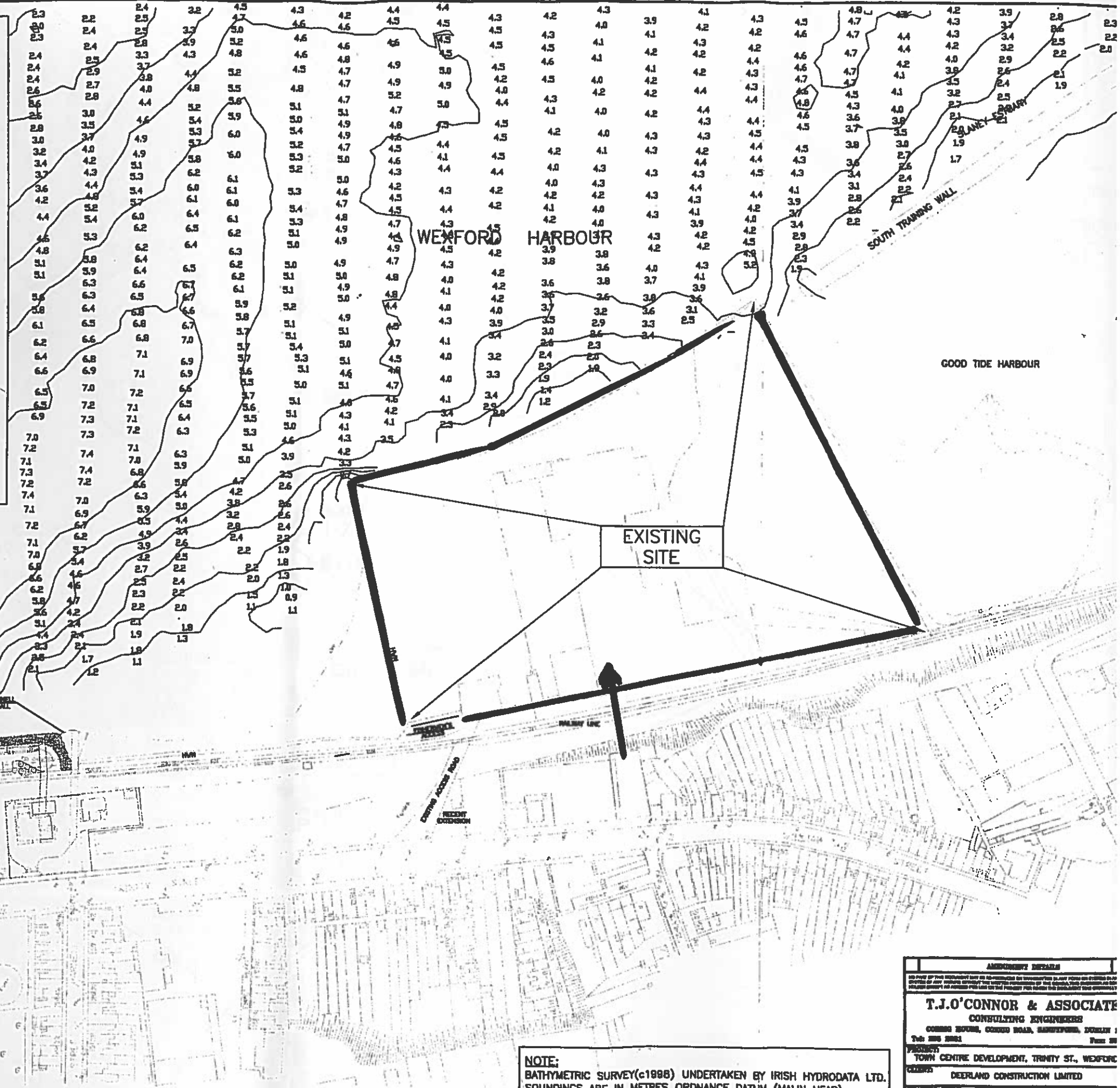
| IGSL | | | | | | | | | | GEOTECHNICAL CORE LOG RECORD | | | | | | | | | | REPORT NUMBER 13184 | |
|--|--------------------|---------|---------|---------|-----------------------|--------|-----------------------------|---|-----------|--|-----------|--------------------------|---------------|----------------------------|--|------------------------------|--|--|--|------------------------|--|
| CONTRACT Trinity Wharf, Wexford | | | | | | | | | | DRILLHOLE NO RC17 | | SHEET Sheet 2 of 3 | | DATE STARTED 28/11/2007 | | DATE COMPLETED 29/11/2007 | | | | | |
| CO-ORDINATES(_) | | | | | | | | | | GROUND LEVEL (m) | | CORE DIAMETER (mm) 84 | | INCLINATION -90 | | FLUSH Air/Mist | | | | | |
| CLIENT ENGINEER Deerland Properties Kavanagh Mansfield | | | | | | | | | | DRILLED BY Millennium | | LOGGED BY IGSL | | | | | | | | | |
| Downhole Depth (m) | Core Run Depth (m) | T.C.R.% | S.C.R.% | R.Q.D.% | Fracture Spacing (mm) | Legend | Non-inclined zones (shaded) | Strata description | Depth (m) | Discontinuities | Elevation | Standpipe Details | SPT (N Value) | | | | | | | | |
| 10 | | | | | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of brown gravelly clay (continued) | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | 15.40 | | | | | | | | | | | | |
| 16 | 16.00 | 100 | 25 | 19 | | | | SYMMETRIX OPEN HOLE DRILLING: Observed by driller as angular clayey gravel size returns of variably weathered limestone (possible bedrock). Moderately weak to moderately strong, grey/dark grey, medium grained LIMESTONE (heavily solution weathered - vuggy and leached). Moderately to highly weathered. | 16.00 | Discontinuities are rough and undulose to irregular. Apertures are open with sand and clay smeared/infilled surfaces. Dips are sub-10° with sub-vertical fractures throughout. | | | | | | | | | | | |
| 17 | 17.50 | | | | | | | | | | | | | | | | | | | | |
| 18 | | 93 | 0 | 0 | | | | | | | | | | | | | | | | | |
| 19 | 19.00 | 100 | 0 | 0 | | | | | | | | | | | | | | | | | |
| | 19.10 | 100 | 29 | 29 | | | | | | | | | | | | | | | | | |
| | 19.80 | | | | | | | | | | | | | | | | | | | | |
| REMARKS 2 Core boxes. | | | | | | | | | | INSTALLATION REMARKS | | | | | | | | | | | |
| GROUNDWATER DETAILS | | | | | | | | | | | | | | | | | | | | | |
| Date | | | | | | | | | | Hole Depth | | | | Casing Depth | | | | | | | |
| Tip Depth | | | | | | | | | | RZ Top | | | | RZ Base | | | | | | | |
| Type | | | | | | | | | | | | | | | | | | | | | |

GSL RC NEWLOG 10M PER PG 13184RCGPJ IGSLGDT 17/12/07





KEY MAP: WEXFORD TOWN PLAN (PART)
SCALE 1:20,000



NOTE:
BATHYMETRIC SURVEY(c1998) UNDERTAKEN BY IRISH HYDRODATA LTD.
SOUNDINGS ARE IN METRES ORDNANCE DATUM (MALIN HEAD)
FIGURES DENOTED THUS 4.8 ARE BED LEVELS BELOW DATUM
FIGURES DENOTED THUS -1.6 ARE BED LEVELS ABOVE DATUM

REPRODUCED FROM O.S. SHEETS WEXFORD 5451/22 & 23, 5512/02 & 03
UNDER ORDNANCE SURVEY IRELAND LICENCE No.: AR0008605

| | | |
|--|------------------|-------------|
| AMENDMENT DETAILS | | |
| NO PART OF THIS DOCUMENT MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT PERMISSION IN WRITING FROM THE CONSULTING ENGINEER. | | |
| T.J.O'CONNOR & ASSOCIATE | | |
| CONSULTING ENGINEERS | | |
| CORRIG BOHE, CORRIG ROAD, BALLYVAUGHAN, DUBLIN 1 | | |
| TEL: 01 836 1981 | FAX: 01 836 1981 | |
| PROJECT: TOWN CENTRE DEVELOPMENT, TRINITY ST., WEXFORD | | |
| CLIENT: DEERLAND CONSTRUCTION LIMITED | | |
| DRAWING TITLE: BATHYMETRIC SURVEY | | |
| SCALE: 1:2000 1:20,000 | JOB NO: | DRAWING NO: |
| DRAWN BY: J.T. | 2481 | SI-1 |

Appendix III – Geotechnical Laboratory Records

Summary of Classification Tests

BS1377:Part 2:1990, clauses 3.2, 4.3, 5.3 & 5.4

| BH/TP No. | Sample No. | Depth (m) | Sample Type | Moisture Content % | Liquid Limit % | Plastic Limit % | Plasticity Index | Plasticity <425µm % | Preparation | Description | Classification |
|-----------|------------|-----------|-------------|--------------------|----------------|-----------------|------------------|---------------------|-------------|--|----------------|
| BH 4 | 3718 | 2.00 | D | 28.7 | 49 | 32 | 17 | 50 | WS | Black slightly organic slightly sandy slightly gravelly SILT | MI |
| BH 4 | 3721 | 5.00 | U | | | | 0 | #DIV/0! | WS | Mottled orange brown sandy gravelly CLAY | |
| BH 4 | 3724 | 7.50 | D | 25 | 42 | 21 | 21 | 57 | WS | Brown slightly sandy gravelly CLAY | CI |
| BH 5 | 3739 | 2.5 | D | 21.1 | 22 | 14 | 8 | 82 | WS | Mottled orange grey brown slightly sandy slightly gravelly CLAY | CL |
| BH 5 | 3741 | 3.50 | D | 6.3 | 19 | NP | | 19 | WS | Orange brown silty very sandy GRAVEL with many cobbles | ML |
| BH 6 | 3732 | 5.50 | D | 22.6 | 47 | 23 | 24 | 81 | WS | Orange brown slightly sandy slightly gravelly CLAY | CI |
| BH 6 | 3733 | 6.50 | D | 16.7 | 49 | 24 | 25 | 59 | WS | Grey brown slightly sandy slightly gravelly CLAY with many cobbles | CI |
| BH 6 | 3735 | 8.50 | D | 22.4 | 43 | 22 | 21 | 54 | WS | Light brown slightly sandy slightly gravelly CLAY | CI |
| BH 8 | 3750 | 1.50 | D | 12.7 | 26 | 14 | 12 | 47 | WS | Brown slightly sandy gravelly CLAY | CL |
| BH 8 | 3752 | 3.5 | D | 10.6 | 28 | 14 | 14 | 59 | WS | Grey brown slightly sandy slightly gravelly CLAY | CL |
| BH 8 | 3756 | 7.5 | D | 14.8 | 48 | 24 | 24 | 66 | WS | Orange brown slightly sandy slightly gravelly CLAY | CI |
| BH 9 | 7716 | 3.00 | D | 19.9 | 27 | 15 | 12 | 77 | WS | Grey brown slightly organic sandy gravelly CLAY | CL |
| BH 9 | 7719 | 5.50 | D | 28.5 | 34 | 17 | 17 | 54 | WS | Grey brown slightly sandy slightly gravelly CLAY with some cobbles | CL |
| BH 11 | 7747 | 2.50 | D | 21.1 | 32 | 19 | 13 | 65 | WS | Grey brown slightly organic sandy gravelly CLAY | CL |
| BH 11 | 7751 | 5.50 | D | 15.4 | 40 | 19 | 21 | 48 | WS | Grey brown slightly sandy gravelly CLAY with some cobbles | CI |

Notes: NAT - tested as received WS - Wet sieved (425µm) NP - Non Plastic

Contract No. 13184

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TRINITY WHARF WEXFORD

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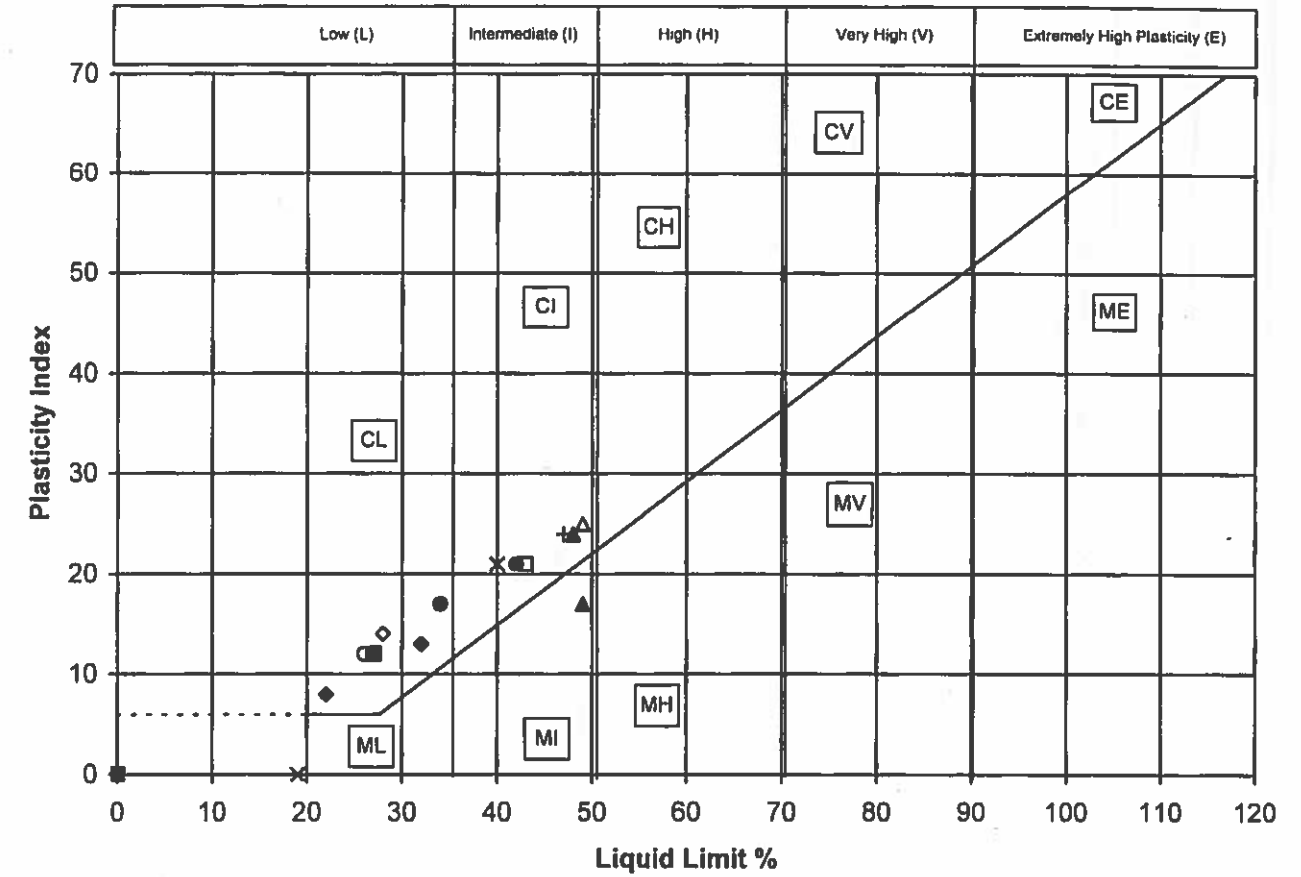
Plasticity Chart - Summary of Liquid & Plastic Limit Tests

BS1377:Part 2:1990, clauses 3.2, 4 & 5

Chart in accordance with BS5930:1999, fig.18

Contract No. 13184

Contract: TRINITY WHARF WEXFORD



| Code | BH/TP | Sample | Depth (m) | MC% | LL% | PL% | PI% | %<425µm | Description |
|------|-------|--------|-----------|------|-----|-----|-----|---------|--|
| ▲ | BH 4 | 3718 | 2.00 | 28.7 | 49 | 32 | 17 | 50 | Black slightly organic slightly sandy slightly gravelly SILT |
| ■ | BH 4 | 3721 | 5.00 | 0 | 0 | 0 | 0 | #DIV/0! | Mottled orange brown sandy gravelly CLAY |
| ● | BH 4 | 3724 | 7.50 | 25 | 42 | 21 | 21 | 57 | Brown slightly sandy gravelly CLAY |
| ◆ | BH 5 | 3739 | 2.50 | 21.1 | 22 | 14 | 8 | 82 | Mottled orange grey brown slightly sandy slightly gravelly CLAY |
| × | BH 5 | 3741 | 3.50 | 6.3 | 19 | NP | 0 | 19 | Orange brown silty very sandy GRAVEL with many cobbles |
| + | BH 6 | 3732 | 5.50 | 22.6 | 47 | 23 | 24 | 81 | Orange brown slightly sandy slightly gravelly CLAY |
| △ | BH 6 | 3733 | 6.50 | 16.7 | 49 | 24 | 25 | 59 | Grey brown slightly sandy slightly gravelly CLAY with many cobbles |
| □ | BH 6 | 3735 | 8.50 | 22.4 | 43 | 22 | 21 | 54 | Light brown slightly sandy slightly gravelly CLAY |
| ○ | BH 8 | 3750 | 1.50 | 12.7 | 26 | 14 | 12 | 47 | Brown slightly sandy gravelly CLAY |
| ◇ | BH 8 | 3752 | 3.50 | 10.6 | 28 | 14 | 14 | 59 | Grey brown slightly sandy slightly gravelly CLAY |
| ▲ | BH 8 | 3756 | 7.50 | 14.8 | 48 | 24 | 24 | 66 | Orange brown slightly sandy slightly gravelly CLAY |
| ■ | BH 9 | 7716 | 3.00 | 19.9 | 27 | 15 | 12 | 77 | Grey brown slightly organic sandy gravelly CLAY |
| ● | BH 9 | 7719 | 5.50 | 28.5 | 34 | 17 | 17 | 54 | Grey brown slightly sandy slightly gravelly CLAY with some cobbles |
| ◆ | BH 11 | 7747 | 2.50 | 21.1 | 32 | 19 | 13 | 65 | Grey brown slightly organic sandy gravelly CLAY |
| × | BH 11 | 7751 | 5.50 | 15.4 | 40 | 19 | 21 | 48 | Grey brown slightly sandy gravelly CLAY with some cobbles |
| + | | | | | | | | | |
| △ | | | | | | | | | |

NP denotes specimen is non-plastic.

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Summary of Classification Tests

BS1377:Part 2:1990, clauses 3.2, 4.3, 5.3 & 5.4

| BH/TP No. | Sample No. | Depth (m) | Sample Type | Moisture Content % | Liquid Limit % | Plastic Limit % | Plasticity Index | Plasticity <425µm % | Preparation | Description | Classification |
|-----------|------------|-----------|-------------|--------------------|----------------|-----------------|------------------|---------------------|-------------|--|----------------|
| BH 12 | 7727 | 5.50 | D | 18.9 | 46 | 24 | 22 | 98 | WS | Orange brown slightly sandy CLAY | CI |
| BH 12 | 7729 | 7.50 | D | 25.5 | 34 | 19 | 15 | 77 | WS | Black slightly sandy slightly gravelly CLAY | CL |
| BH 12 | 7732 | 10.50 | D | 27.3 | 37 | 21 | 16 | 96 | WS | Orange brown slightly sandy slightly gravelly CLAY | CI |
| BH 12 | 7734 | 12.50 | D | 18.4 | 38 | 20 | 18 | 50 | WS | Yellow very sandy gravelly CLAY | CI |
| BH 14 | 3762 | 3.00 | D | 30.6 | 31 | NP | | 81 | WS | Grey silty SAND with shell fragments | ML |
| BH 14 | 3770 | 10.00 | D | 19.9 | 45 | 25 | 20 | 30 | WS | Brown slightly sandy gravelly CLAY with broken rock | CI |
| BH 16 | 3780 | 3.00 | D | 24 | 27 | NP | | 76 | WS | Grey silty slightly organic SAND | ML |
| BH 16 | 3782 | 4.00 | D | 22 | 39 | 22 | 17 | 64 | WS | Orange brown slightly sandy slightly gravelly CLAY | CI |
| BH 16 | 3786 | 8.00 | D | 28.5 | 45 | 26 | 19 | 80 | WS | Mottled orange black brown sandy gravelly CLAY | CI |
| BH 16 | 3789 | 11.00 | D | 32 | 49 | 27 | 22 | 92 | WS | Orange brown slightly sandy slightly gravelly CLAY | CI |
| BH 16 | 3793 | 15.00 | D | 38.6 | 56 | 29 | 27 | 60 | WS | Dark brown slightly sandy slightly gravelly CLAY | CH |
| BH 17 | 7705 | 4.50 | D | 20.5 | 30 | 14 | 16 | 80 | WS | Grey brown slightly sandy slightly gravelly CLAY | CL |
| BH 17 | 7709 | 8.50 | D | 36.3 | 52 | 27 | 25 | 92 | WS | Brown slightly sandy slightly gravelly CLAY | CH |
| BH 18 | 3375 | 2.50 | D | 19.9 | 37 | 24 | 13 | 55 | WS | Orange yellow sandy gravelly CLAY (weathered rock) | CI |
| BH 21 | 7737 | 1.50 | D | 19.7 | 41 | NP | | 52 | WS | Yellow brown silty very sandy GRAVEL (poss weathered rock) | MI |
| BH 21 | 7738 | 2.50 | D | 21.2 | 48 | NP | | 30 | WS | Yellow brown silty very sandy GRAVEL (poss weathered rock) | MI |

Notes: NAT - tested as received WS - Wet sieved (425µm) NP - Non Plastic

Contract TRINITY WHARF WEXFORD

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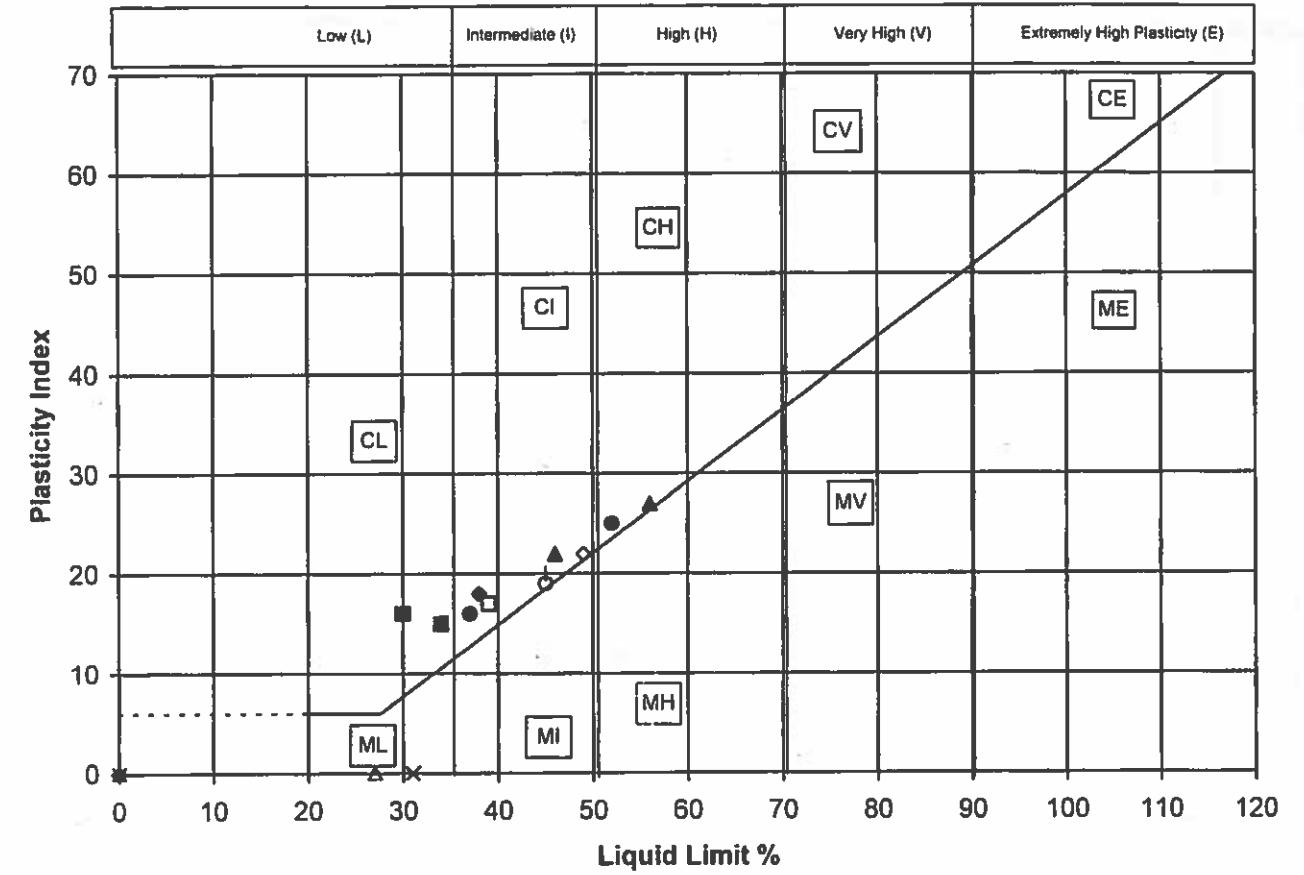
Plasticity Chart - Summary of Liquid & Plastic Limit Tests

BS1377:Part 2:1990, clauses 3.2, 4 & 5

Chart in accordance with BS5930:1999, fig.18

Contract No. 13184

Contract: TRINITY WHARF WEXFORD



| Code | BH/TP | Sample | Depth (m) | MC% | LL% | PL% | PI% | %<425µm | Description |
|------|-------|--------|-----------|------|-----|-----|-----|---------|---|
| ▲ | BH 12 | 7727 | 5.50 | 18.9 | 46 | 24 | 22 | 98 | Orange brown slightly sandy CLAY |
| ■ | BH 12 | 7729 | 7.50 | 25.5 | 34 | 19 | 15 | 77 | Black slightly sandy slightly gravelly CLAY |
| ● | BH 12 | 7732 | 10.50 | 27.3 | 37 | 21 | 16 | 96 | Orange brown slightly sandy slightly gravelly CLAY |
| ◆ | BH 12 | 7734 | 12.50 | 18.4 | 38 | 20 | 18 | 50 | Yellow very sandy gravelly CLAY |
| × | BH 14 | 3762 | 3.00 | 30.6 | 31 | NP | 0 | 81 | Grey silty SAND with shell fragments |
| + | BH 14 | 3770 | 10.00 | 19.9 | 45 | 25 | 20 | 30 | Brown slightly sandy gravelly CLAY with broken rock |
| △ | BH 16 | 3780 | 3.00 | 24 | 27 | NP | 0 | 76 | Grey silty slightly organic SAND |
| □ | BH 16 | 3782 | 4.00 | 22 | 39 | 22 | 17 | 64 | Orange brown slightly sandy slightly gravelly CLAY |
| ○ | BH 16 | 3786 | 8.00 | 28.5 | 45 | 26 | 19 | 80 | Mottled orange black brown sandy gravelly CLAY |
| ◇ | BH 16 | 3789 | 11.00 | 32 | 49 | 27 | 22 | 92 | Orange brown slightly sandy slightly gravelly CLAY |
| ▲ | BH 16 | 3793 | 15.00 | 38.6 | 56 | 29 | 27 | 60 | Dark brown slightly sandy slightly gravelly CLAY |
| ■ | BH 17 | 7705 | 4.50 | 20.5 | 30 | 14 | 16 | 80 | Grey brown slightly sandy slightly gravelly CLAY |
| ● | BH 17 | 7709 | 8.50 | 36.3 | 52 | 27 | 25 | 92 | Brown slightly sandy slightly gravelly CLAY |
| ◆ | | | | | | | | | |
| × | | | | | | | | | |
| + | | | | | | | | | |
| △ | | | | | | | | | |

NP denotes specimen is non-plastic.

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Determination of Particle Size Distribution

BS1377:Part2:1990, clauses 9.2

Contract No: 13184

Contract: TRINITY WHARF WEXFORD

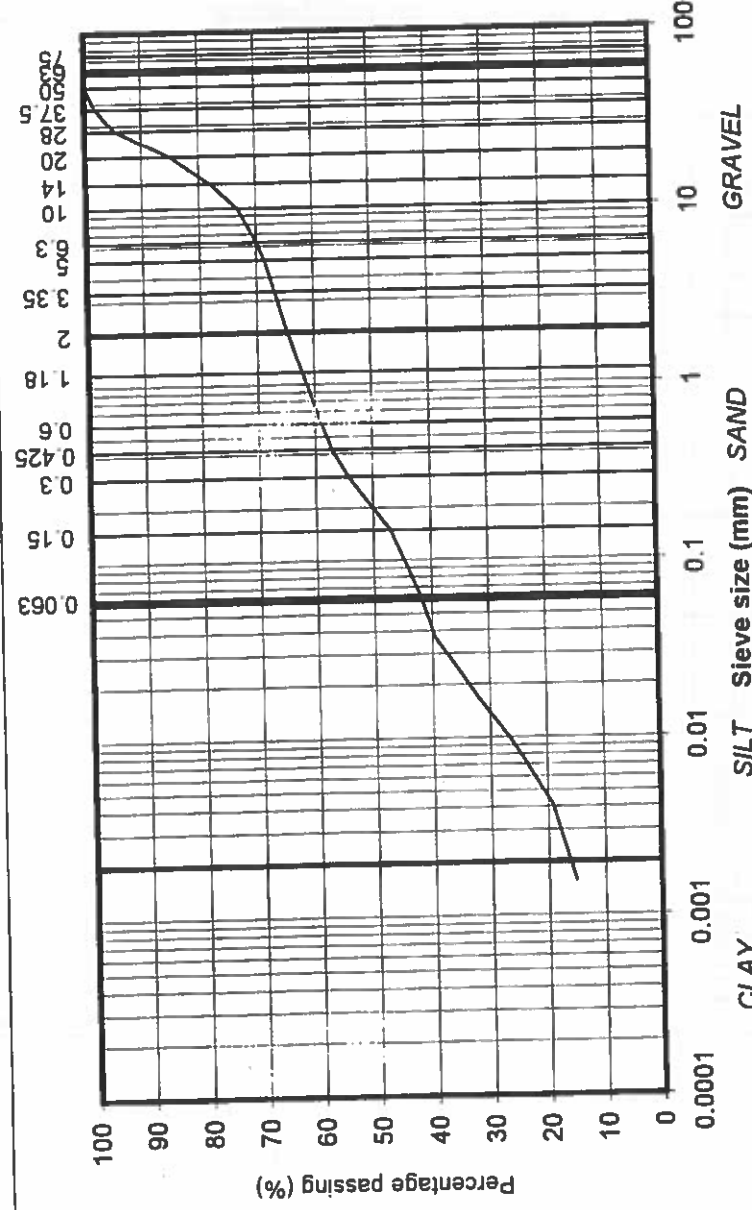
ВН/ТР No: BH 4

SAMPLE No.: 3724

DEPTH (m): 7.50

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Brown slightly sandy, gravelly, CLAY



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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No: 13184

Contract: TRINITY WHARF WEXFORD

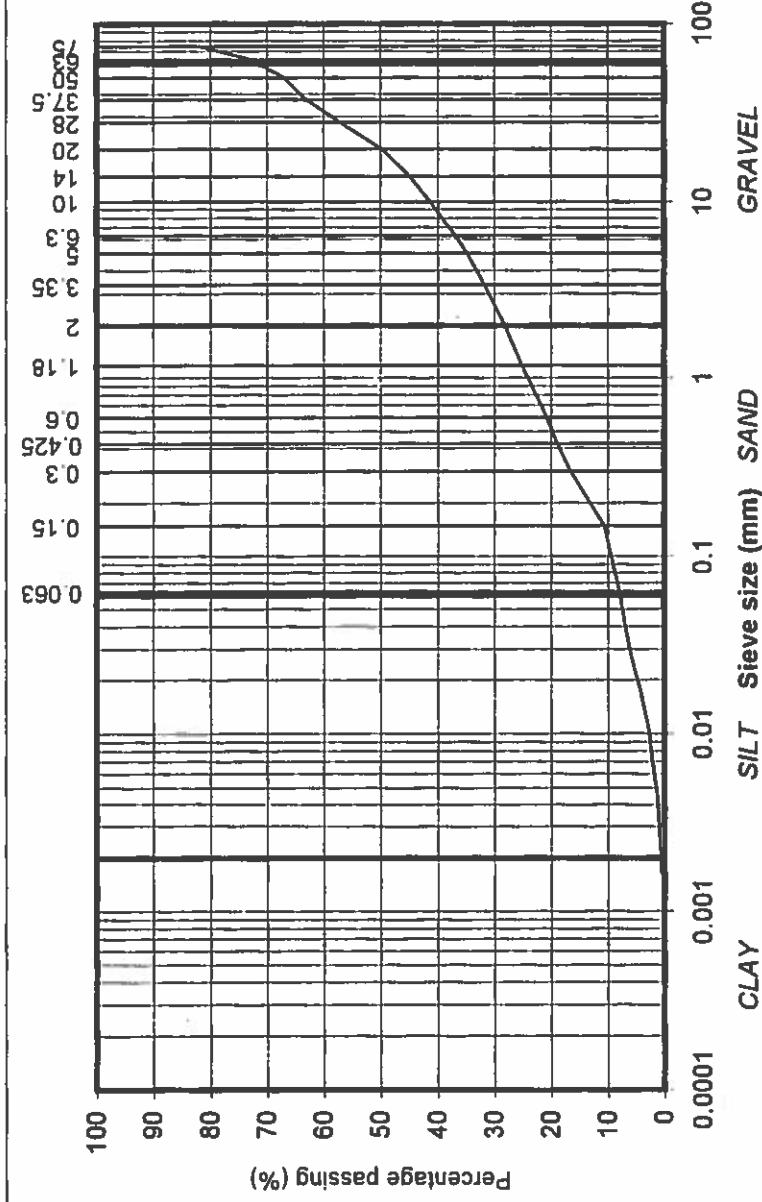
BH/TP No: BH 5

SAMPLE No.: 3741

DEPTH (m): 3.50

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Orange brown silty, very sandy, GRAVEL with many cobbles



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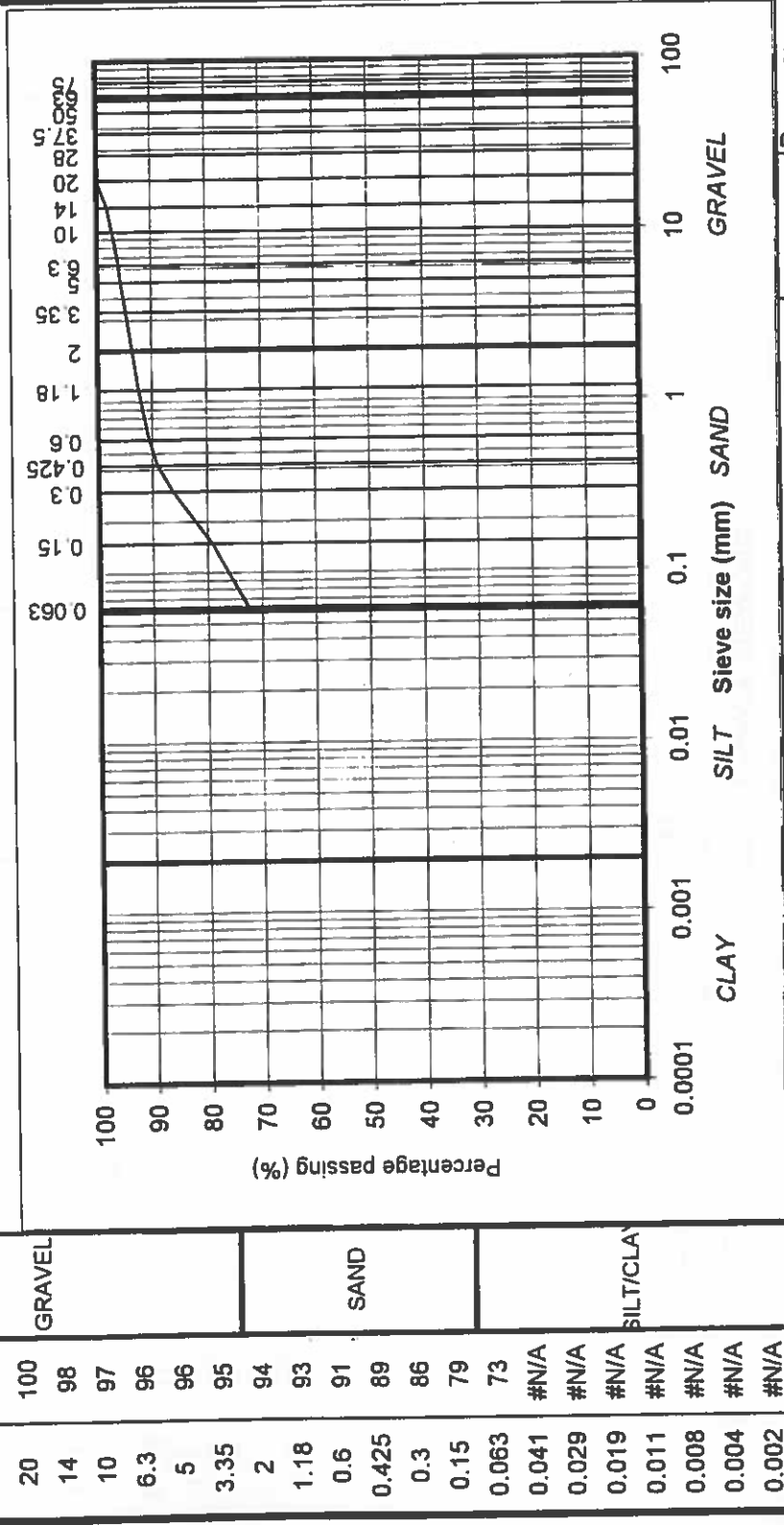
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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

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| Contract No: | 13184 |
| Contract: | TRINITY WHARF WEXFORD |
| BH/TP No: | BH 5 |
| SAMPLE No.: | 3744 |
| DEPTH (m): | 6.50 |
| TEST METHOD: | Wet sieve |
| DESCRIPTION: | Brown slightly sandy, slightly gravelly, SILT/CLAY |

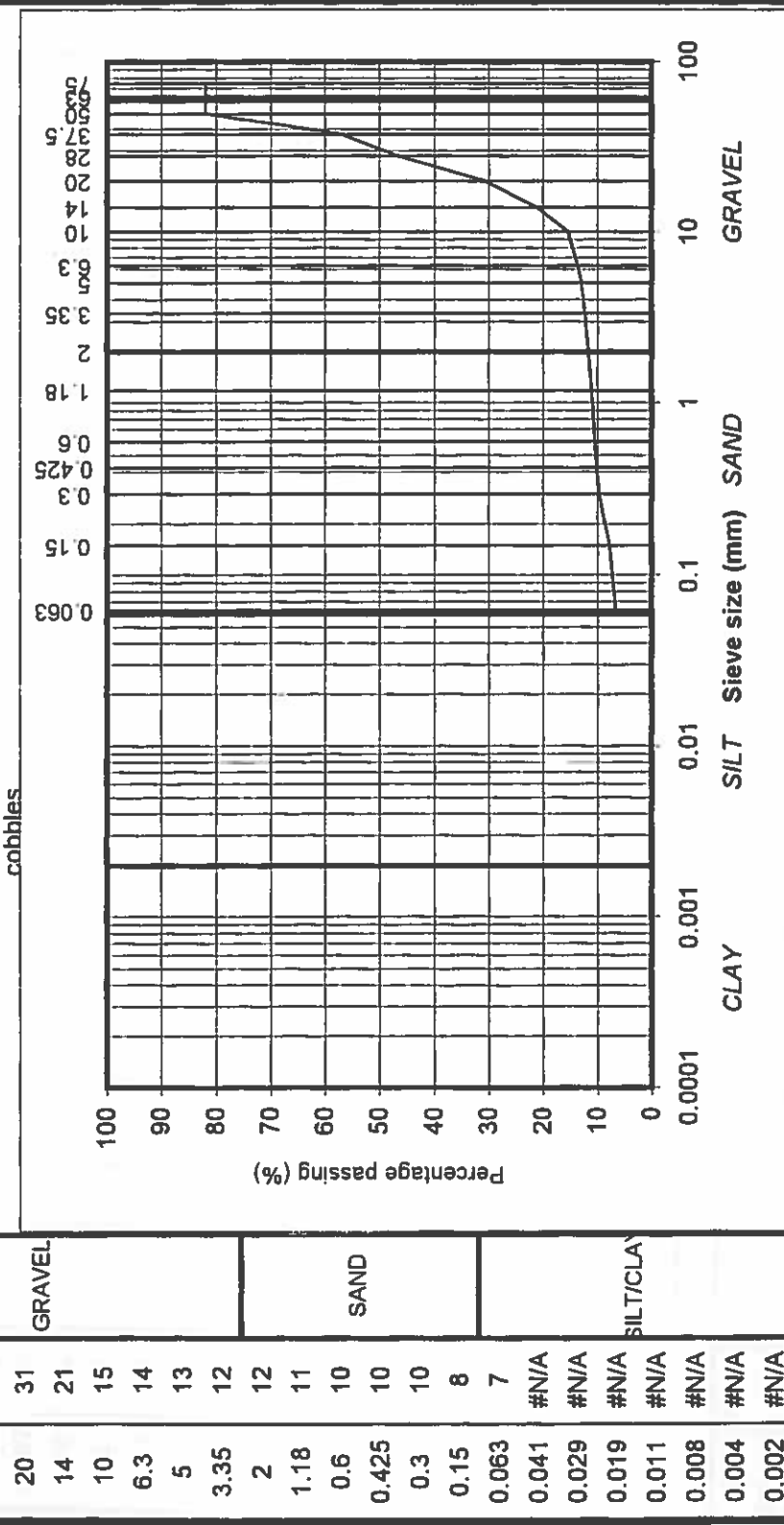


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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

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| Contract No: | 13184 |
| Contract: | TRINITY WHARF WEXFORD |
| BH/TP No: | BH 5 |
| SAMPLE No.: | 3746 |
| DEPTH (m): | 8.50 |
| TEST METHOD: | Wet sieve |
| DESCRIPTION: | Brown clayey/silty, slightly sandy, GRAVEL with some cobbles |



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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

| | |
|---------------|-----------|
| particle size | % passing |
| 75 | 77 |
| 63 | 77 |
| 50 | 77 |
| 37.5 | 77 |
| 28 | 76 |
| 20 | 75 |
| 14 | 72 |
| 10 | 71 |
| 6.3 | 69 |
| 5 | 68 |
| 3.35 | 67 |
| 2 | 64 |
| 1.18 | 63 |
| 0.6 | 60 |
| 0.425 | 59 |
| 0.3 | 58 |
| 0.15 | 53 |
| 0.063 | 50 |
| 0.037 | 48 |
| 0.026 | 45 |
| 0.017 | 40 |
| 0.010 | 33 |
| 0.007 | 29 |
| 0.004 | 23 |
| 0.002 | 16 |

COBBLES

GRAVEL

SAND

SILT/CLAY

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Grey brown slightly sandy, slightly gravelly, CLAY with many cobbles

Contract No: 13184

Contract: TRINITY WHARF WEXFORD

BH/TP No: BH 6

SAMPLE No.: 3733

DEPTH (m): 6.50

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Grey brown slightly sandy, slightly gravelly, CLAY with many cobbles

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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

| | |
|---------------|-----------|
| particle size | % passing |
| 75 | 100 |
| 63 | 100 |
| 50 | 83 |
| 37.5 | 83 |
| 28 | 79 |
| 20 | 76 |
| 14 | 75 |
| 10 | 74 |
| 6.3 | 72 |
| 5 | 72 |
| 3.35 | 71 |
| 2 | 70 |
| 1.18 | 69 |
| 0.6 | 67 |
| 0.425 | 66 |
| 0.3 | 65 |
| 0.15 | 62 |
| 0.063 | 58 |
| 0.037 | 53 |
| 0.026 | 49 |
| 0.017 | 43 |
| 0.010 | 36 |
| 0.007 | 33 |
| 0.004 | 28 |
| 0.002 | 21 |

COBBLES

GRAVEL

SAND

SILT/CLAY

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Orange brown slightly sandy, slightly gravelly, CLAY

Contract No: 13184

Contract: TRINITY WHARF WEXFORD

BH/TP No: BH 8

SAMPLE No.: 3756

DEPTH (m): 7.50

TEST METHOD: Wet sieve and hydrometer

DESCRIPTION: Orange brown slightly sandy, slightly gravelly, CLAY

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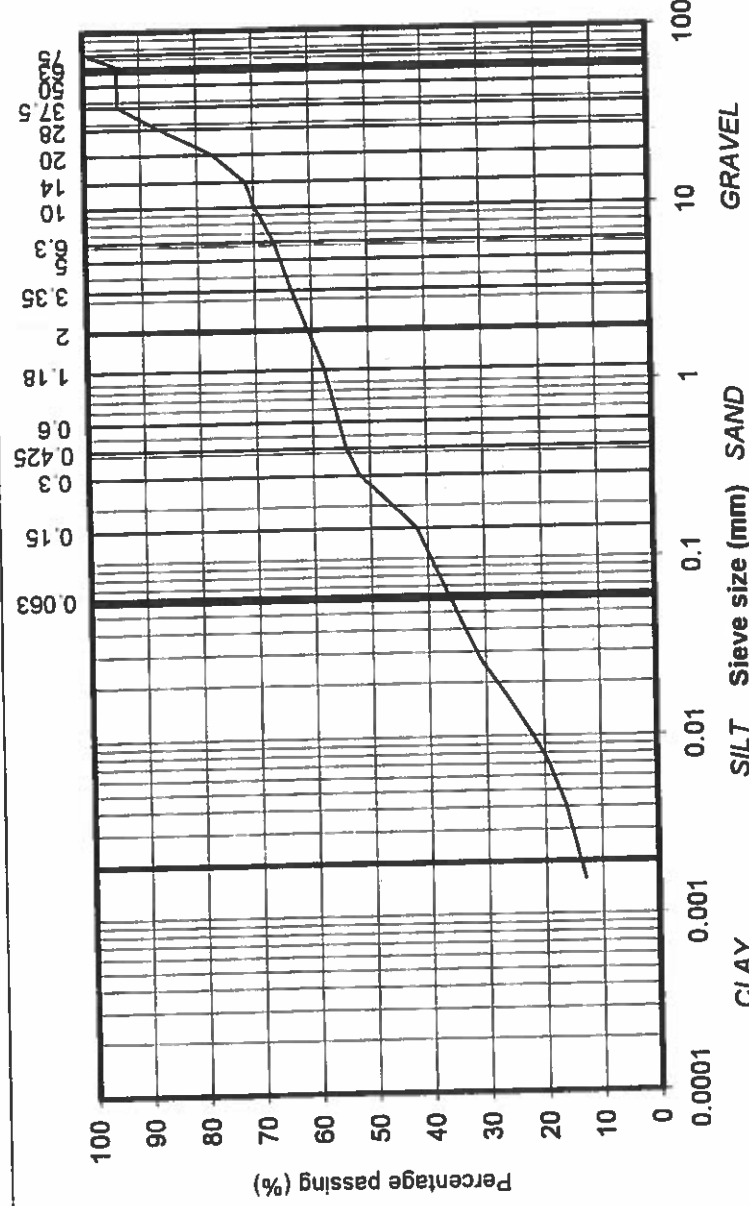
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Determination of Particle Size Distribution

BS1377:Part2:1990, clauses 9.2

| | | | |
|---------------|-----------|--------------|---|
| particle size | % passing | Contract No: | 13184 |
| 75 | 100 | Contract: | TRINITY WHARF WEXFORD |
| 63 | 94 | BH/TP No: | BH 9 |
| 50 | 94 | SAMPLE No.: | 7719 |
| 37.5 | 94 | DEPTH (m): | 5.50 |
| 28 | 87 | TEST METHOD: | Wet sieve and hydrometer |
| 20 | 77 | DESCRIPTION: | Grey brown slightly sandy, gravelly, CLAY with some cobbles |
| 14 | 72 | | |
| 10 | 70 | | |
| 6.3 | 67 | | |
| 5 | 65 | | |
| 3.35 | 63 | | |
| 2 | 61 | | |
| 1.18 | 58 | | |
| 0.6 | 55 | | |
| 0.425 | 54 | | |
| 0.3 | 52 | | |
| 0.15 | 42 | | |
| 0.063 | 37 | | |
| 0.037 | 33 | | |
| 0.027 | 31 | | |
| 0.017 | 27 | | |
| 0.010 | 22 | | |
| 0.007 | 19 | | |
| 0.004 | 16 | | |
| 0.002 | 13 | | |

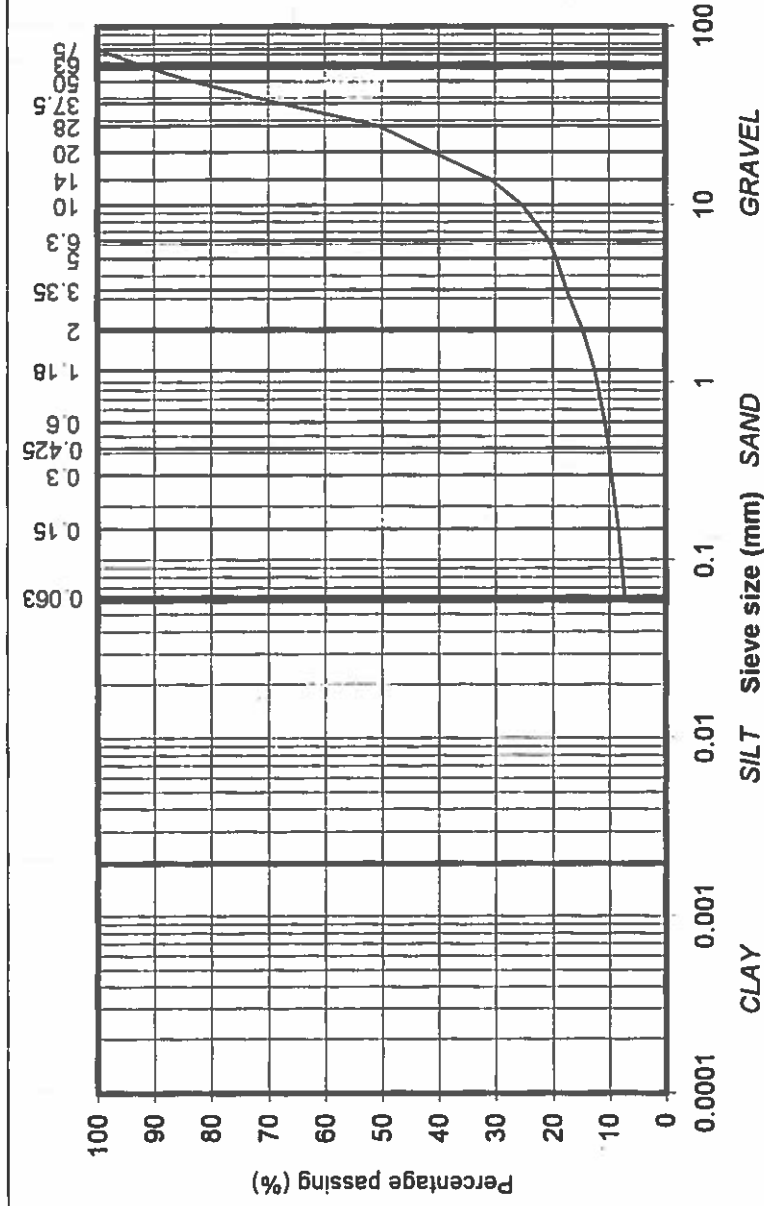


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Determination of Particle Size Distribution

BS1377:Part2:1990, clauses 9.2

| | | | |
|---------------|-----------|--------------|--|
| particle size | % passing | Contract No: | 13184 |
| 75 | 100 | Contract: | TRINITY WHARF WEXFORD |
| 63 | 93 | BH/TP No: | BH 9 |
| 50 | 84 | SAMPLE No.: | 7723 |
| 37.5 | 68 | DEPTH (m): | 9.50 |
| 28 | 51 | TEST METHOD: | Wet sieve |
| 20 | 41 | DESCRIPTION: | Grey brown clayey/silty, sandy, GRAVEL with some cobbles |
| 14 | 31 | | |
| 10 | 25 | | |
| 6.3 | 21 | | |
| 5 | 19 | | |
| 3.35 | 18 | | |
| 2 | 15 | | |
| 1.18 | 13 | | |
| 0.6 | 11 | | |
| 0.425 | 10 | | |
| 0.3 | 10 | | |
| 0.15 | 8 | | |
| 0.063 | 7 | | |
| 0.041 | #N/A | | |
| 0.029 | #N/A | | |
| 0.019 | #N/A | | |
| 0.011 | #N/A | | |
| 0.008 | #N/A | | |
| 0.004 | #N/A | | |
| 0.002 | #N/A | | |

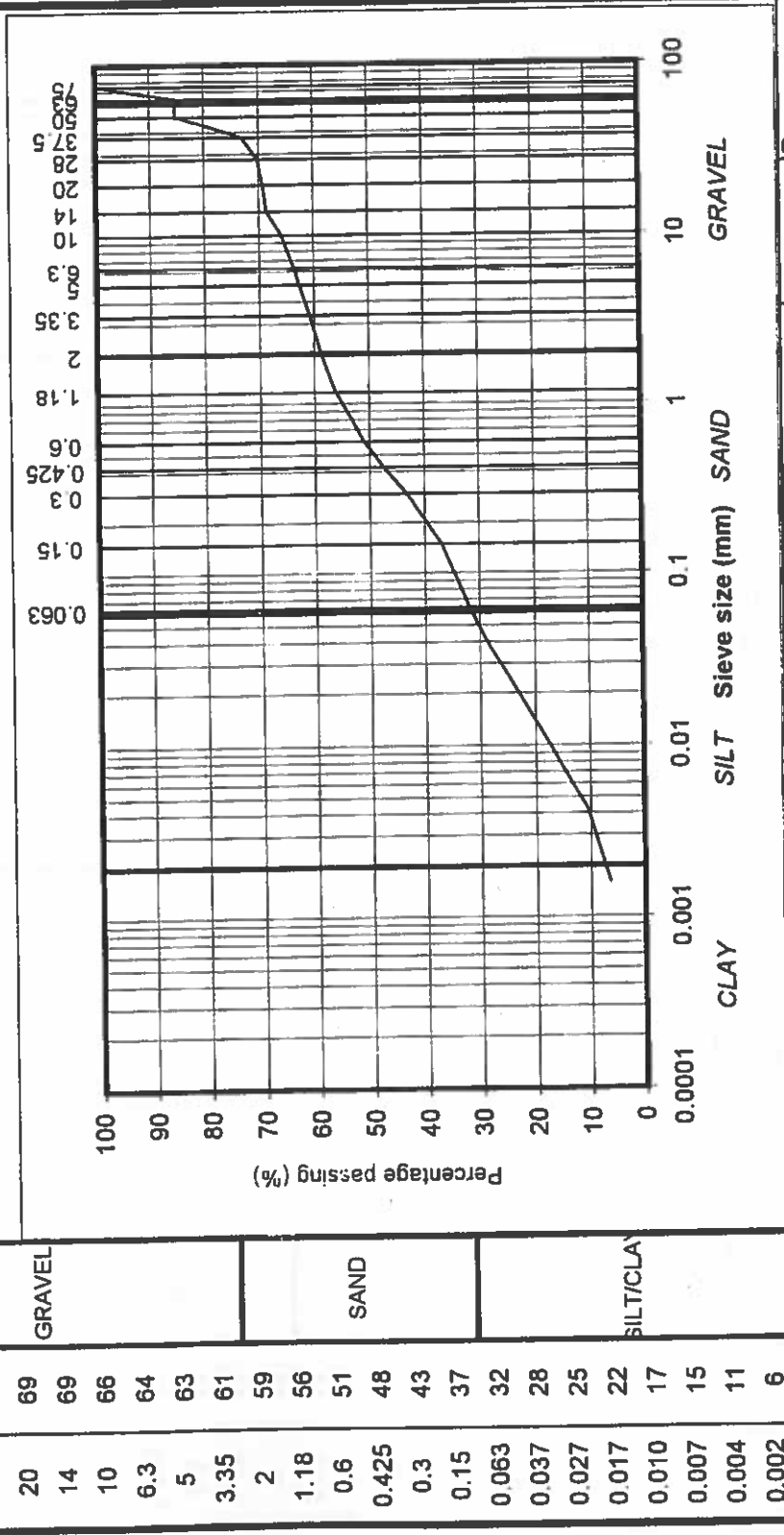


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Determination of Particle Size Distribution

BS1377:Part2:1990, clauses 9.2

| | |
|--------------|---|
| Contract No: | 13184 |
| Contract: | TRINITY WHARF WEXFORD |
| BH/TP No: | BH 11 |
| SAMPLE No.: | 7751 |
| DEPTH (m): | 5.50 |
| TEST METHOD: | Wet sieve and hydrometer |
| DESCRIPTION: | Grey brown slightly sandy, gravelly, CLAY with some cobbles |

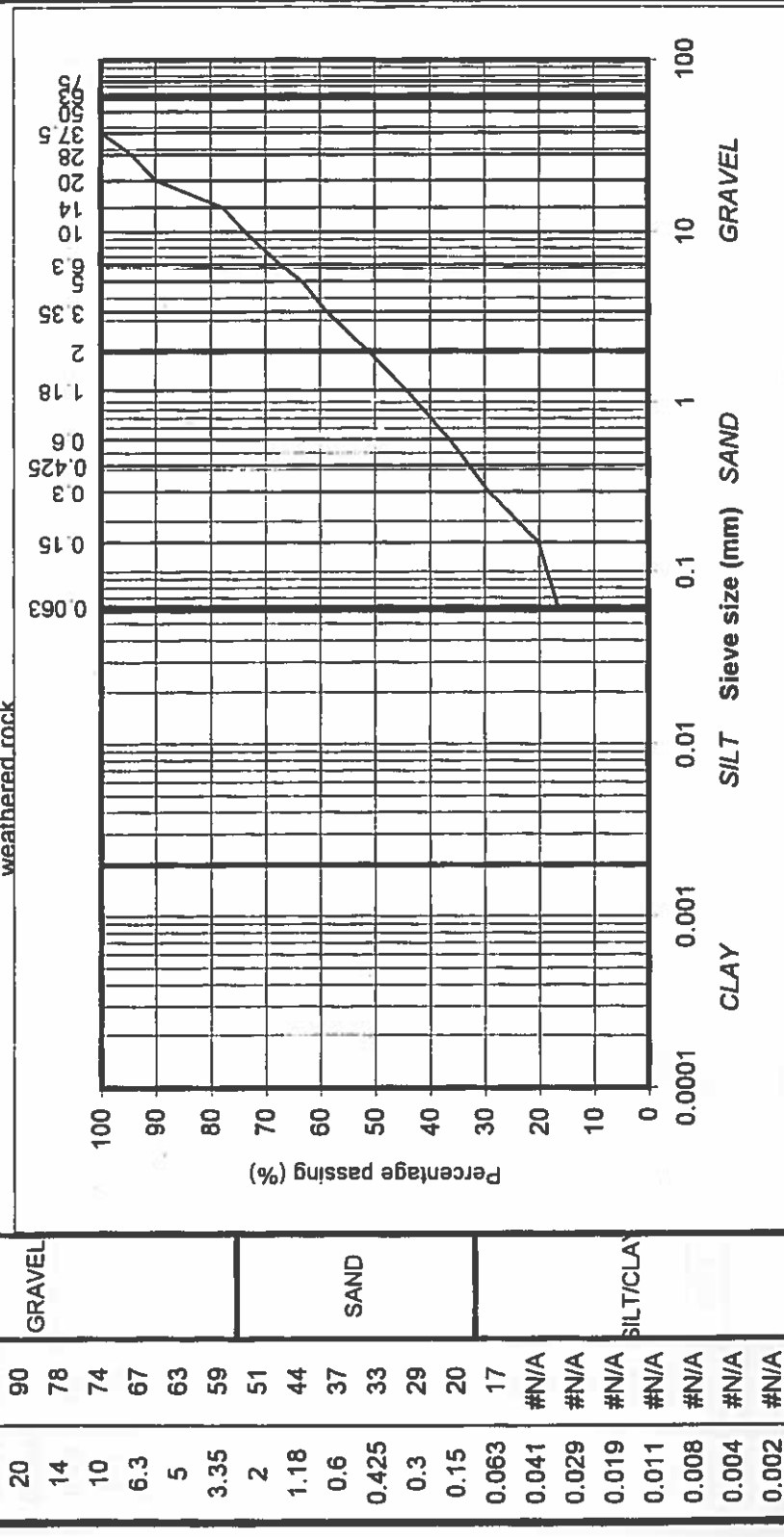


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Determination of Particle Size Distribution

BS1377:Part2:1990, clauses 9.2

| | |
|--------------|---|
| Contract No: | 13184 |
| Contract: | TRINITY WHARF WEXFORD |
| BH/TP No: | BH 11 |
| SAMPLE No.: | 7753 |
| DEPTH (m): | 7.50 |
| TEST METHOD: | Wet sieve |
| DESCRIPTION: | Yellow brown clayey/silty, very sandy, GRAVEL possible weathered rock |

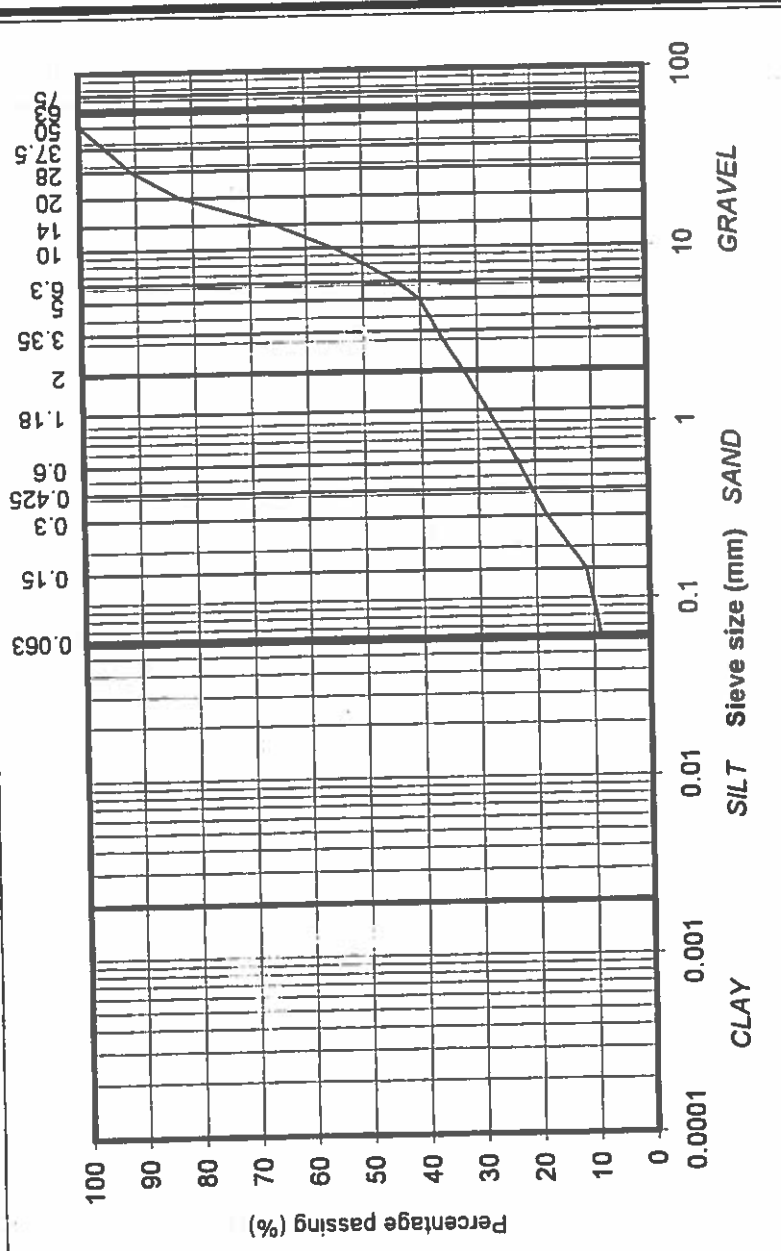


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Determination of Particle Size Distribution

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| | | | |
|---------------|-----------|--------------|---|
| particle size | % passing | Contract No: | 13184 |
| | | Contract: | TRINITY WHARF WEXFORD |
| | | BH/TP No: | BH 11 |
| | | SAMPLE No.: | 7754 |
| | | DEPTH (m): | 8.50 |
| | | TEST METHOD: | Wet sieve |
| | | DESCRIPTION: | Brown clayey/silty, very sandy, GRAVEL with broken rock/boulder |

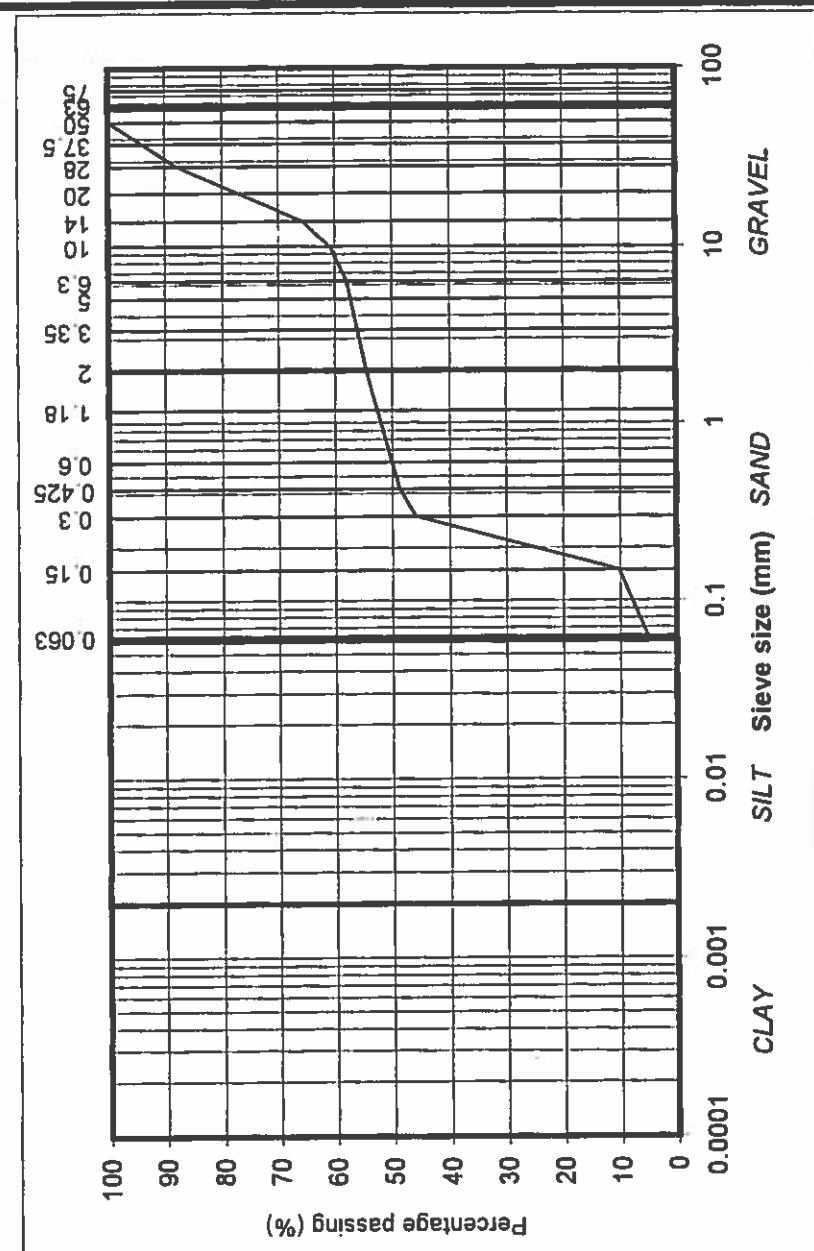


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Determination of Particle Size Distribution

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| | | | |
|---------------|-----------|--------------|--|
| particle size | % passing | Contract No: | 13184 |
| | | Contract: | TRINITY WHARF WEXFORD |
| | | BH/TP No: | BH 12 |
| | | SAMPLE No.: | 7725 |
| | | DEPTH (m): | 3.50 |
| | | TEST METHOD: | Wet sieve |
| | | DESCRIPTION: | Orange brown clayey, very gravelly, SAND |

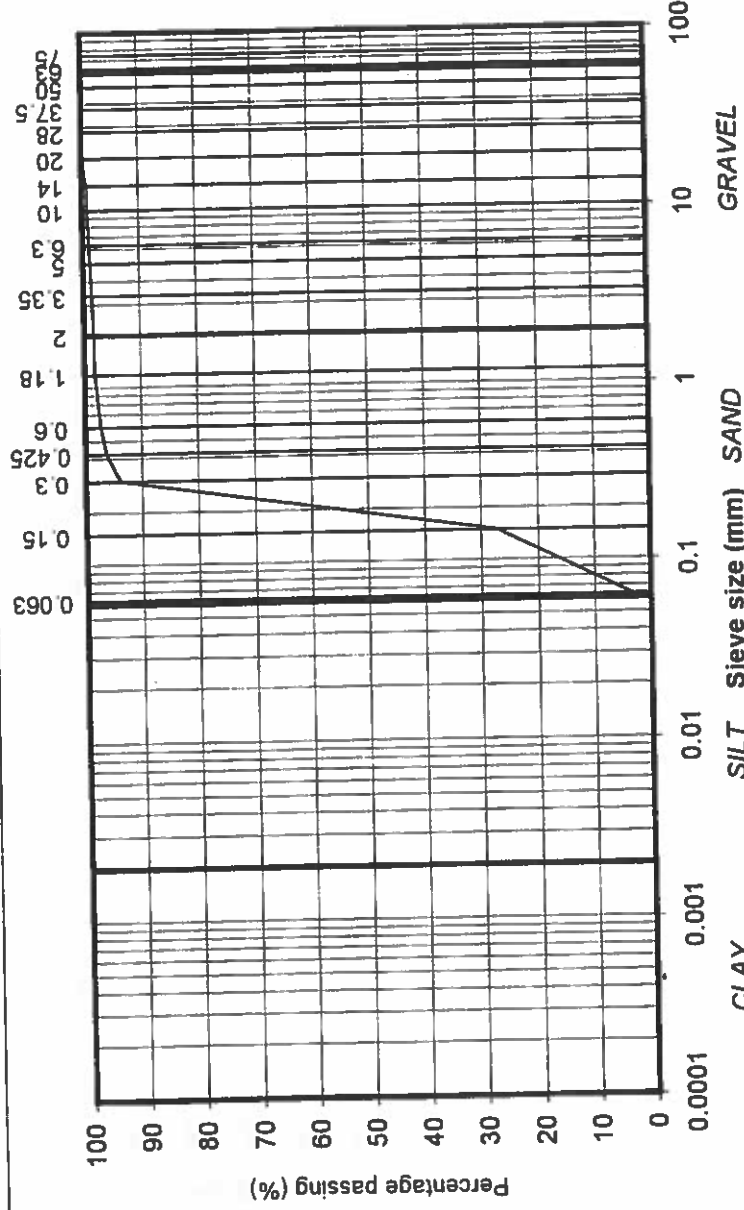


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Determination of Particle Size Distribution

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| | |
|--------------|---|
| Contract No: | 13184 |
| Contract: | TRINITY WHARF WEXFORD |
| BH/TP No: | BH 14 |
| SAMPLE No.: | 3760 |
| DEPTH (m): | 1.50 |
| TEST METHOD: | Wet sieve |
| DESCRIPTION: | Grey brown slightly clayey/silty, slightly gravelly, SAND |



| particle size | % passing | COBBLES | GRAVEL | SAND | SILT/CLAY |
|---------------|-----------|---------|--------|------|-----------|
| 75 | 100 | | | | |
| 63 | 100 | | | | |
| 50 | 100 | | | | |
| 37.5 | 100 | | | | |
| 28 | 100 | | | | |
| 20 | 100 | | | | |
| 14 | 99 | | | | |
| 10 | 99 | | | | |
| 6.3 | 99 | | | | |
| 5 | 99 | | | | |
| 3.35 | 99 | | | | |
| 2 | 98 | | | | |
| 1.18 | 98 | | | | |
| 0.6 | 97 | | | | |
| 0.425 | 96 | | | | |
| 0.3 | 94 | | | | |
| 0.15 | 27 | | | | |
| 0.063 | 4 | | | | |
| 0.041 | #N/A | | | | |
| 0.029 | #N/A | | | | |
| 0.019 | #N/A | | | | |
| 0.011 | #N/A | | | | |
| 0.008 | #N/A | | | | |
| 0.004 | #N/A | | | | |
| 0.002 | #N/A | | | | |

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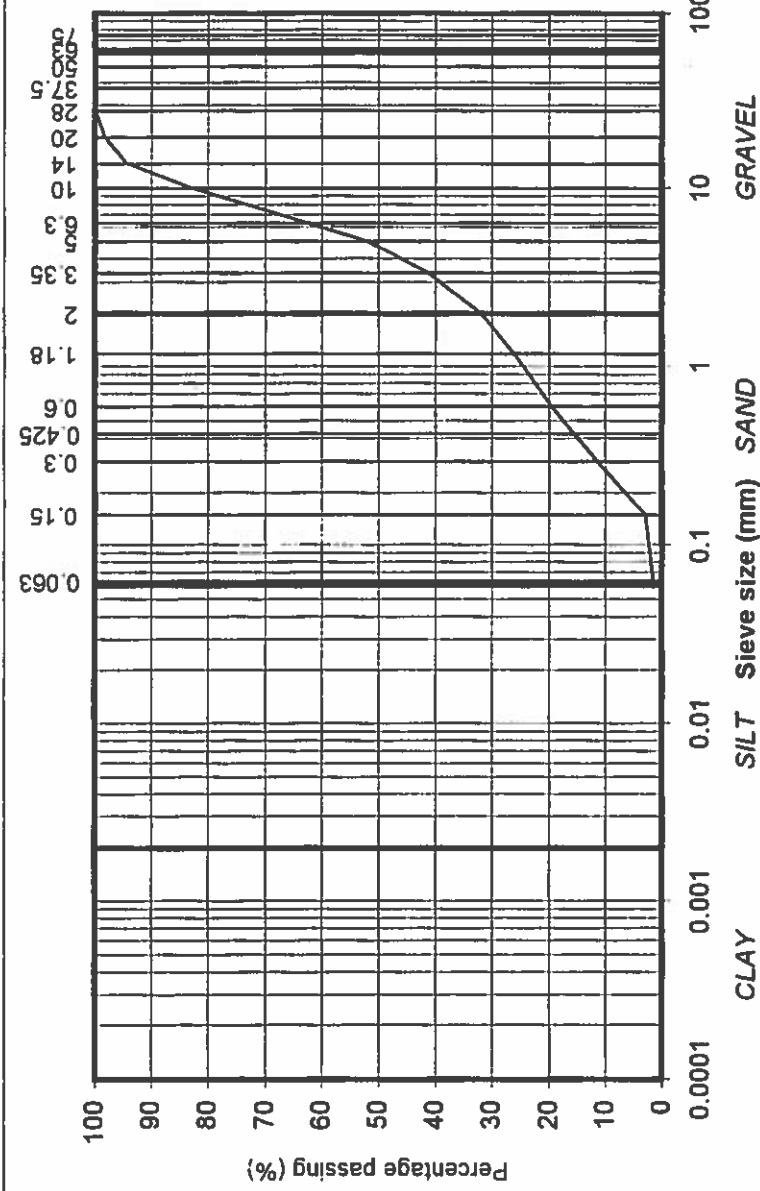
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Determination of Particle Size Distribution

BS1377:Part2:1990, clauses 9.2

| | |
|--------------|---|
| Contract No: | 13184 |
| Contract: | TRINITY WHARF WEXFORD |
| BH/TP No: | BH 14 |
| SAMPLE No.: | 3767 |
| DEPTH (m): | 7.00 |
| TEST METHOD: | Wet sieve |
| DESCRIPTION: | Brown slightly clayey/silty, very sandy, GRAVEL |



| particle size | % passing | COBBLES | GRAVEL | SAND | SILT/CLAY |
|---------------|-----------|---------|--------|------|-----------|
| 75 | 100 | | | | |
| 63 | 100 | | | | |
| 50 | 100 | | | | |
| 37.5 | 100 | | | | |
| 28 | 100 | | | | |
| 20 | 98 | | | | |
| 14 | 94 | | | | |
| 10 | 83 | | | | |
| 6.3 | 63 | | | | |
| 5 | 52 | | | | |
| 3.35 | 41 | | | | |
| 2 | 32 | | | | |
| 1.18 | 26 | | | | |
| 0.6 | 20 | | | | |
| 0.425 | 16 | | | | |
| 0.3 | 11 | | | | |
| 0.15 | 3 | | | | |
| 0.063 | 2 | | | | |
| 0.041 | #N/A | | | | |
| 0.029 | #N/A | | | | |
| 0.019 | #N/A | | | | |
| 0.011 | #N/A | | | | |
| 0.008 | #N/A | | | | |
| 0.004 | #N/A | | | | |
| 0.002 | #N/A | | | | |

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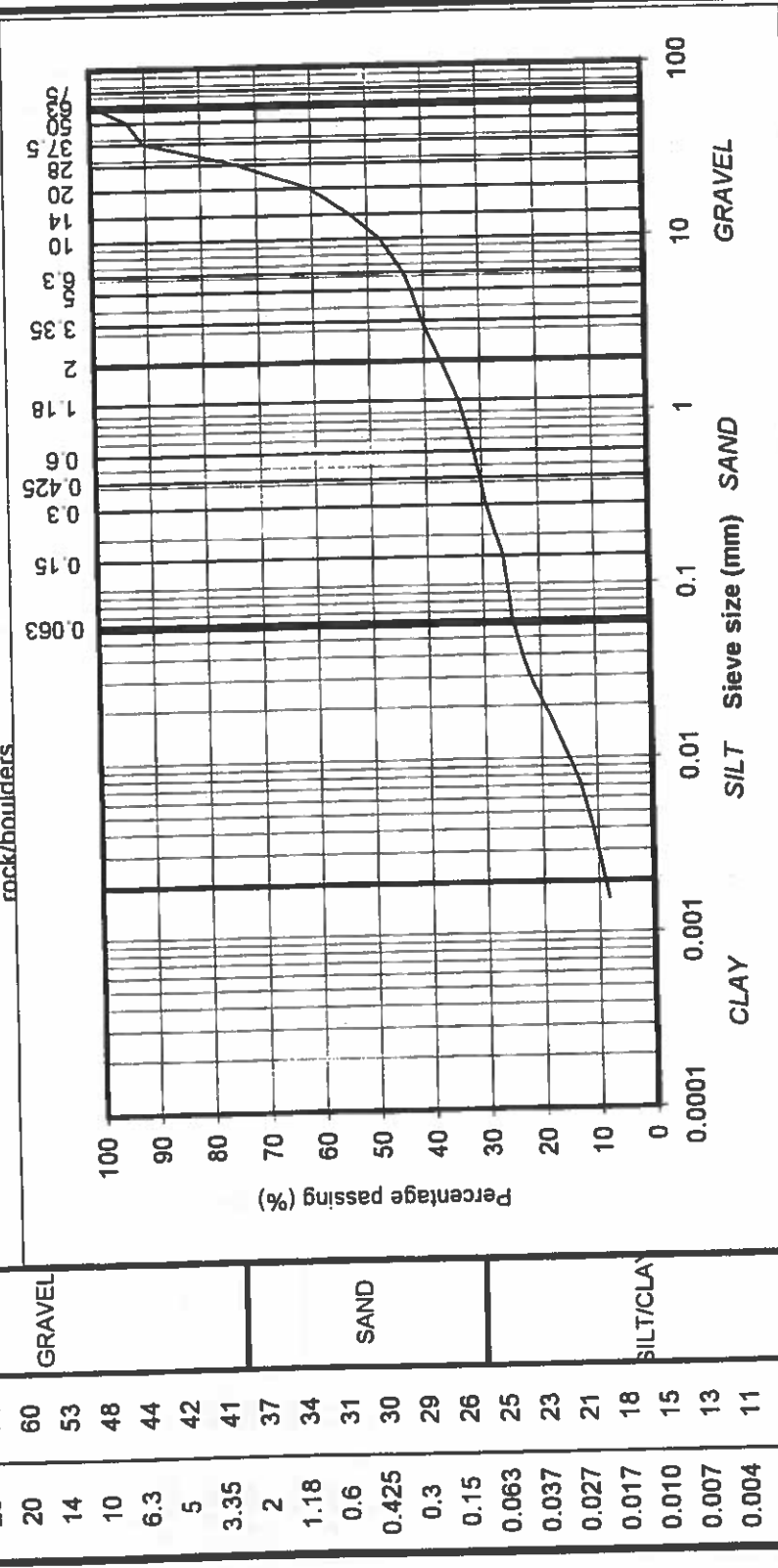
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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

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|--------------|--|
| Contract No: | 13184 |
| Contract: | TRINITY WHARF WEXFORD |
| BH/TP No: | BH 14 |
| SAMPLE No.: | 3770 |
| DEPTH (m): | 10.00 |
| TEST METHOD: | Wet sieve and hydrometer |
| DESCRIPTION: | Brown slightly sandy, gravelly, CLAY with broken rock/boulders |

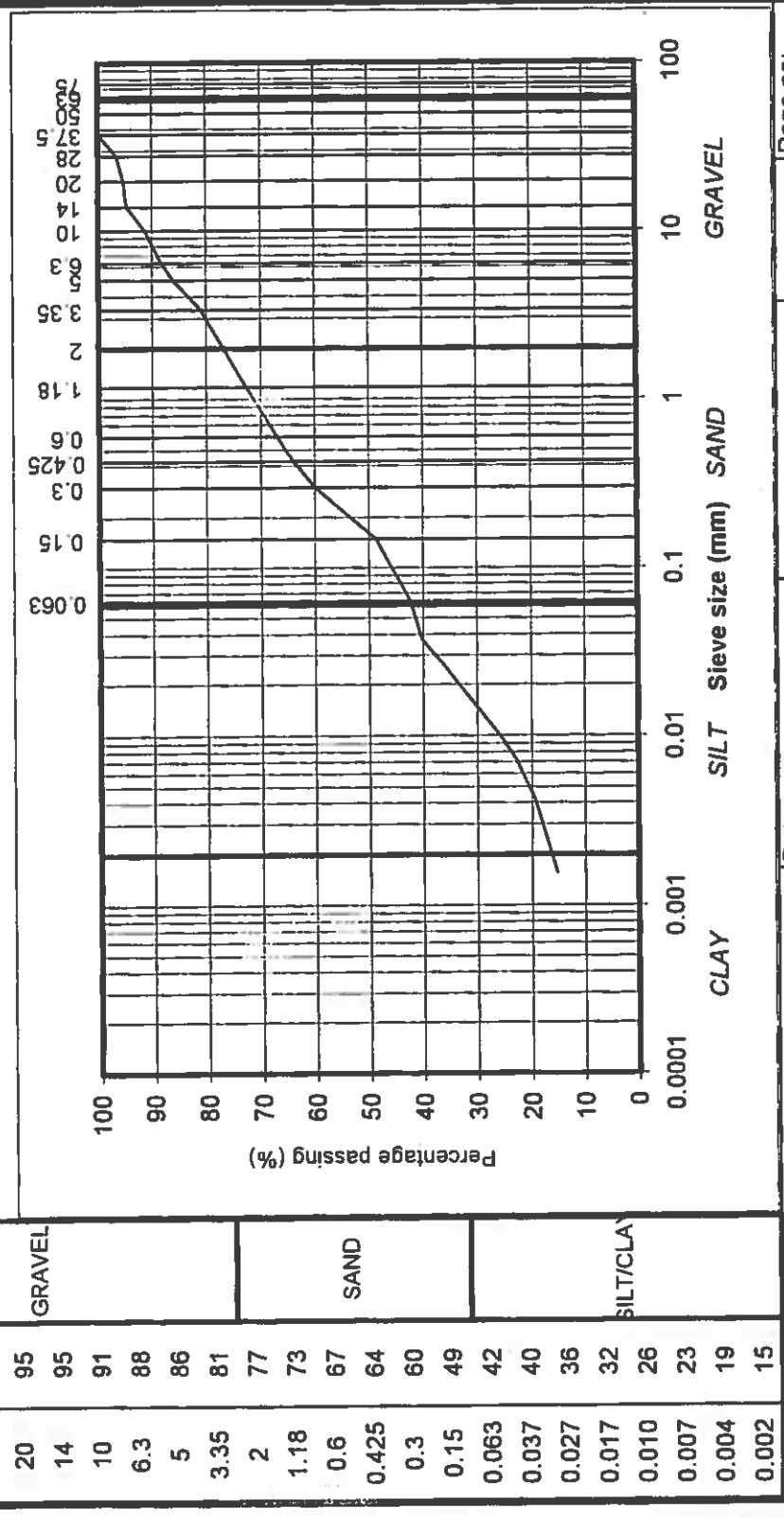


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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

| | |
|--------------|--|
| Contract No: | 13184 |
| Contract: | TRINITY WHARF WEXFORD |
| BH/TP No: | BH 16 |
| SAMPLE No.: | 3782 |
| DEPTH (m): | 4.00 |
| TEST METHOD: | Wet sieve and hydrometer |
| DESCRIPTION: | Orange brown slightly sandy, slightly gravelly, CLAY |



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Determination of Particle Size Distribution

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| | | | |
|---------------|-----------|--------------|--|
| particle size | % passing | Contract No: | 13184 |
| | | Contract: | TRINITY WHARF WEXFORD |
| 75 | 100 | BH/TP No: | BH 16 |
| 63 | 100 | SAMPLE No.: | 3789 |
| 50 | 100 | DEPTH (m): | 11.00 |
| 37.5 | 100 | TEST METHOD: | Wet sieve and hydrometer |
| 28 | 100 | DESCRIPTION: | Orange brown slightly sandy, slightly gravelly, CLAY |
| 20 | 100 | | |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 99 | | |
| 3.35 | 99 | | |
| 2 | 98 | | |
| 1.18 | 96 | | |
| 0.6 | 93 | | |
| 0.425 | 92 | | |
| 0.3 | 90 | | |
| 0.15 | 87 | | |
| 0.063 | 83 | | |
| 0.037 | 76 | | |
| 0.027 | 71 | | |
| 0.017 | 61 | | |
| 0.010 | 49 | | |
| 0.007 | 42 | | |
| 0.004 | 33 | | |
| 0.002 | 25 | | |

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Determination of Particle Size Distribution

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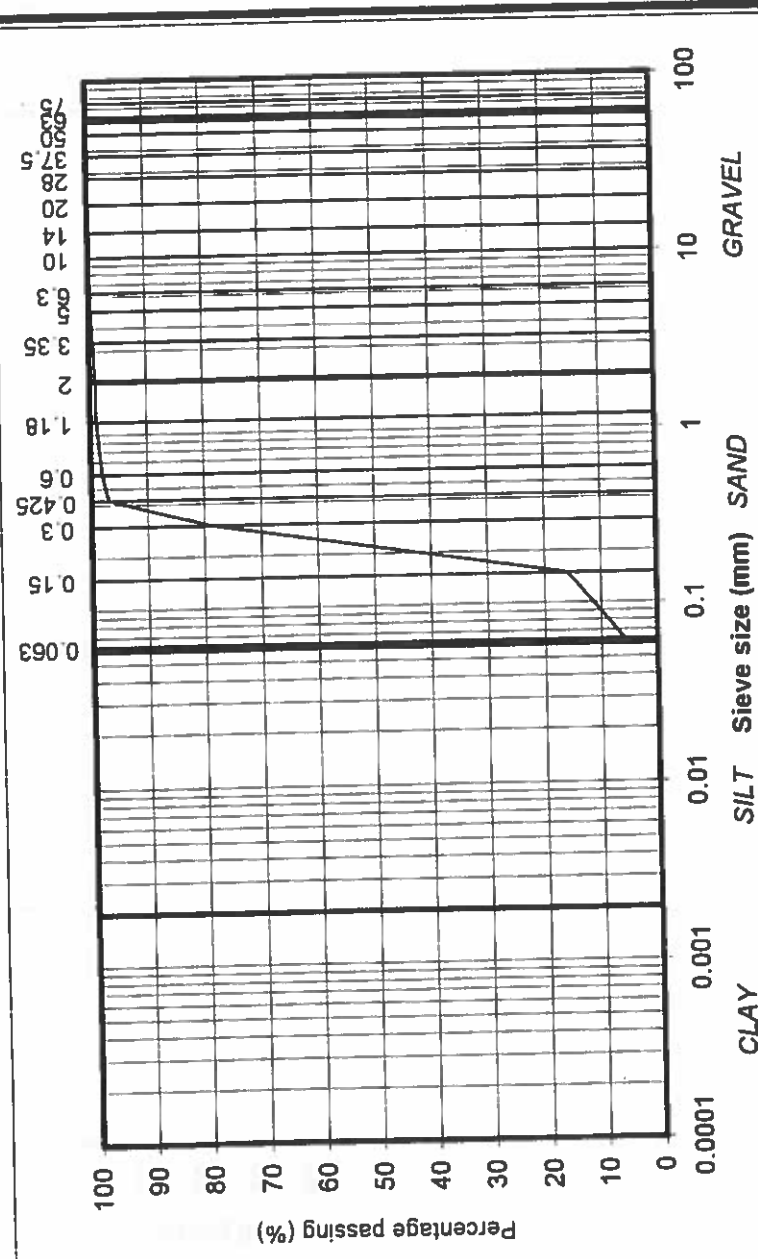
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|---------------|-----------|--------------|--|
| particle size | % passing | Contract No: | 13184 |
| | | Contract: | TRINITY WHARF WEXFORD |
| 75 | 100 | BH/TP No: | BH 16 |
| 63 | 100 | SAMPLE No.: | 3793 |
| 50 | 100 | DEPTH (m): | 15.00 |
| 37.5 | 100 | TEST METHOD: | Wet sieve and hydrometer |
| 28 | 96 | DESCRIPTION: | Dark brown slightly sandy, slightly gravelly, CLAY |
| 20 | 93 | | |
| 14 | 91 | | |
| 10 | 85 | | |
| 6.3 | 81 | | |
| 5 | 79 | | |
| 3.35 | 75 | | |
| 2 | 71 | | |
| 1.18 | 67 | | |
| 0.6 | 62 | | |
| 0.425 | 60 | | |
| 0.3 | 58 | | |
| 0.15 | 54 | | |
| 0.063 | 51 | | |
| 0.037 | 48 | | |
| 0.026 | 45 | | |
| 0.017 | 41 | | |
| 0.010 | 36 | | |
| 0.007 | 32 | | |
| 0.004 | 23 | | |
| 0.002 | 14 | | |

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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

| | | | |
|---------------|-----------|--------------|--|
| particle size | % passing | Contract No: | 13184 |
| 75 | 100 | Contract: | TRINITY WHARF WEXFORD |
| 63 | 100 | BH/TP No: | BH 17 |
| 50 | 100 | SAMPLE No.: | 7704 |
| 37.5 | 100 | DEPTH (m): | 3.50 |
| 28 | 100 | TEST METHOD: | Wet sieve |
| 20 | 100 | DESCRIPTION: | Grey brown clayey/silty, slightly gravelly, SAND |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 100 | | |
| 3.35 | 99 | | |
| 2 | 99 | | |
| 1.18 | 99 | | |
| 0.6 | 98 | | |
| 0.425 | 97 | | |
| 0.3 | 79 | | |
| 0.15 | 16 | | |
| 0.063 | 6 | | |
| 0.041 | #N/A | | |
| 0.029 | #N/A | | |
| 0.019 | #N/A | | |
| 0.011 | #N/A | | |
| 0.008 | #N/A | | |
| 0.004 | #N/A | | |
| 0.002 | #N/A | | |

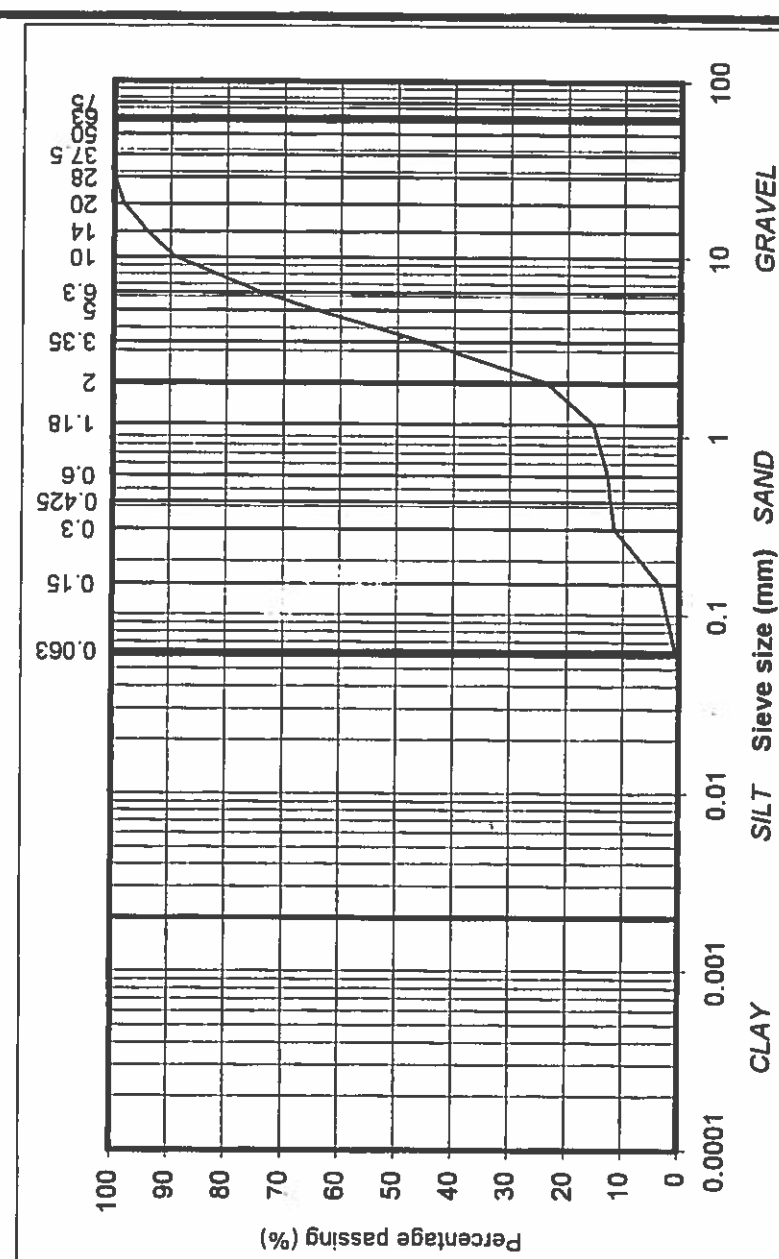


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Determination of Particle Size Distribution

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| | | | |
|---------------|-----------|--------------|---|
| particle size | % passing | Contract No: | 13184 |
| 75 | 100 | Contract: | TRINITY WHARF WEXFORD |
| 63 | 100 | BH/TP No: | BH 17 |
| 50 | 100 | SAMPLE No.: | 7707 |
| 37.5 | 100 | DEPTH (m): | 6.50 |
| 28 | 100 | TEST METHOD: | Wet sieve |
| 20 | 98 | DESCRIPTION: | Brown slightly clayey/silty, very sandy, GRAVEL |
| 14 | 94 | | |
| 10 | 89 | | |
| 6.3 | 74 | | |
| 5 | 64 | | |
| 3.35 | 46 | | |
| 2 | 24 | | |
| 1.18 | 15 | | |
| 0.6 | 13 | | |
| 0.425 | 12 | | |
| 0.3 | 12 | | |
| 0.15 | 4 | | |
| 0.063 | 1 | | |
| 0.041 | #N/A | | |
| 0.029 | #N/A | | |
| 0.019 | #N/A | | |
| 0.011 | #N/A | | |
| 0.008 | #N/A | | |
| 0.004 | #N/A | | |
| 0.002 | #N/A | | |

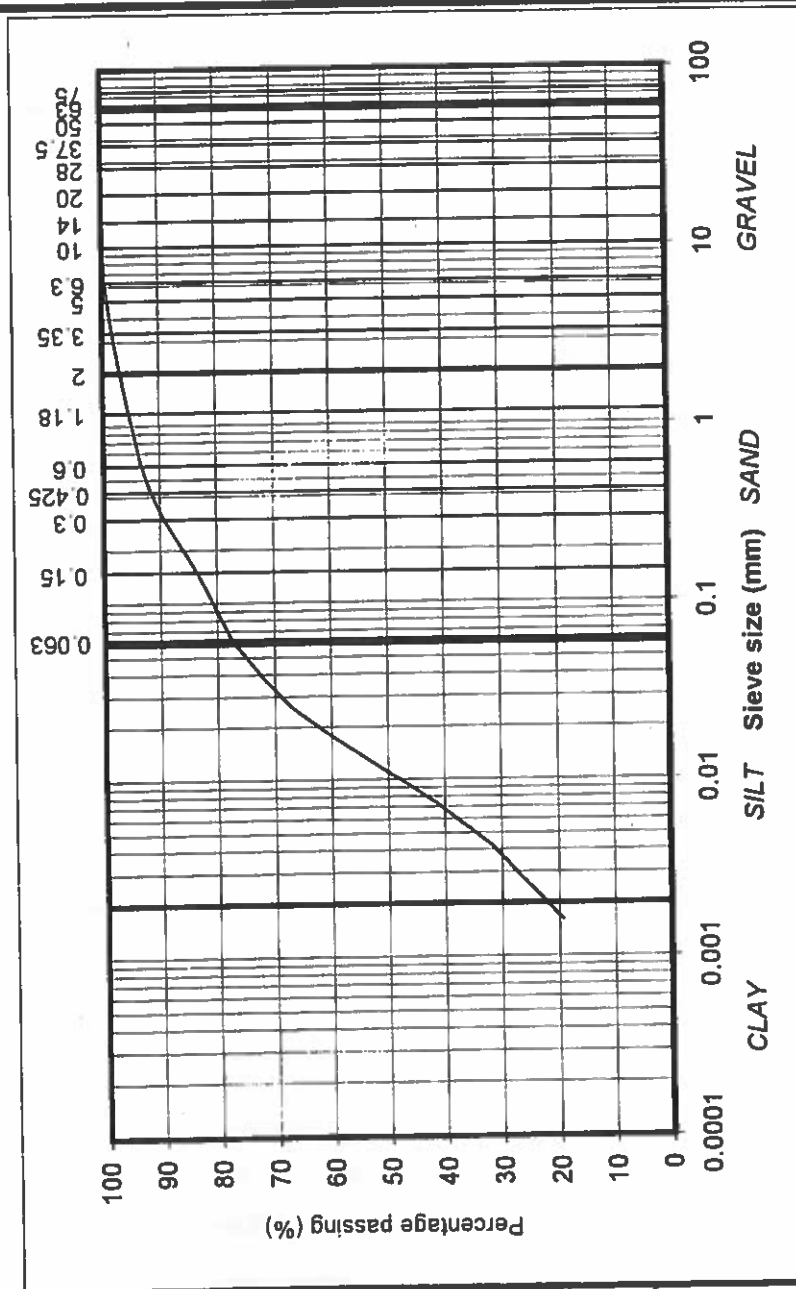


| | | | | | |
|---|-----------|-------|------------|----------|--|
| IGSL | Issued By | Date: | 30/01/2008 | Page no: | |
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| PSD V3.1 12.01 | | | | | |

Determination of Particle Size Distribution

BS1377:Part2:1990, clauses 9.2

| | | | |
|---------------|-----------|--------------|---|
| particle size | % passing | Contract No: | 13184 |
| 75 | 100 | Contract: | TRINITY WHARF WEXFORD |
| 63 | 100 | BH/TP No: | BH 17 |
| 50 | 100 | SAMPLE No.: | 7709 |
| 37.5 | 100 | DEPTH (m): | 8.50 |
| 28 | 100 | TEST METHOD: | Wet sieve and hydrometer |
| 20 | 100 | DESCRIPTION: | Brown slightly sandy, slightly gravelly, CLAY |
| 14 | 100 | | |
| 10 | 100 | | |
| 6.3 | 100 | | |
| 5 | 99 | | |
| 3.35 | 98 | | |
| 2 | 97 | | |
| 1.18 | 95 | | |
| 0.6 | 93 | | |
| 0.425 | 92 | | |
| 0.3 | 89 | | |
| 0.15 | 84 | | |
| 0.063 | 78 | | |
| 0.037 | 72 | | |
| 0.026 | 67 | | |
| 0.017 | 59 | | |
| 0.010 | 48 | | |
| 0.007 | 41 | | |
| 0.004 | 32 | | |
| 0.002 | 19 | | |

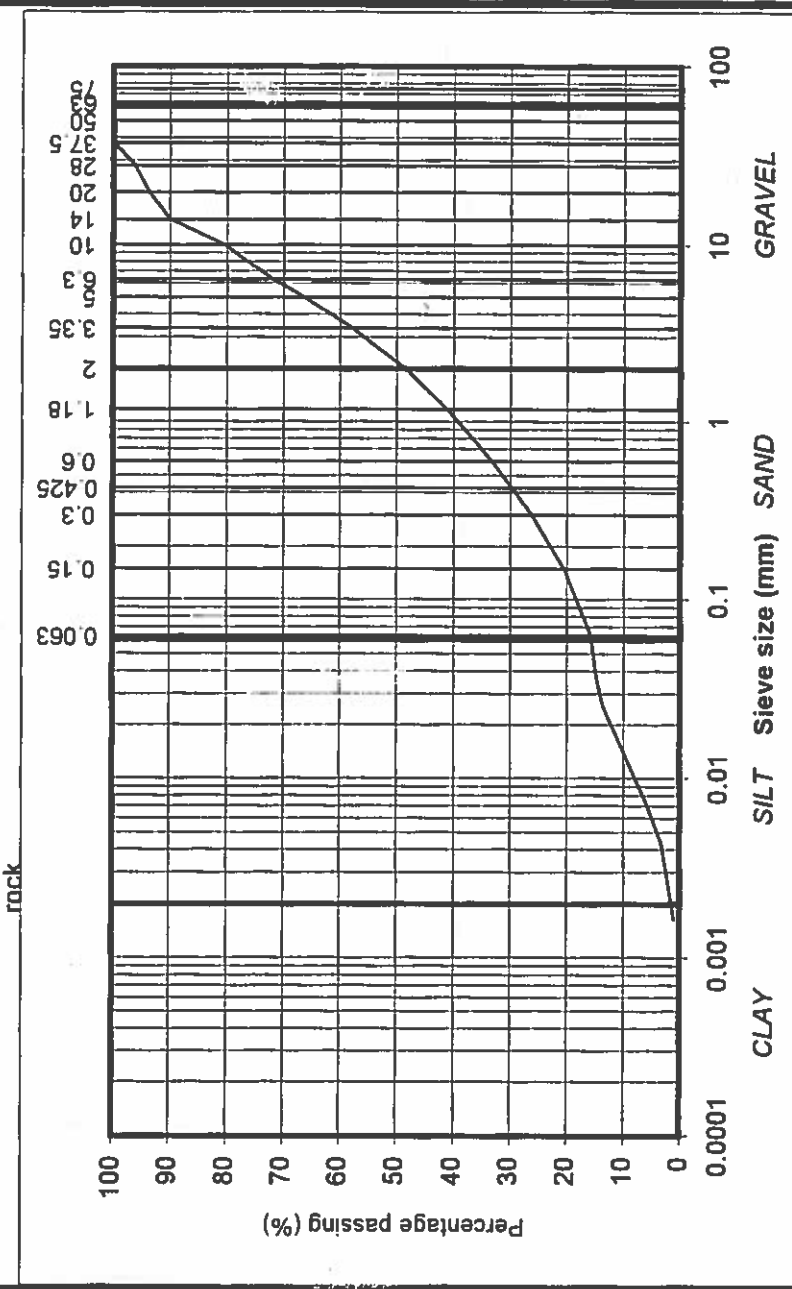


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|---|-----------|-------|------------|----------|--|
| IGSL | Issued By | Date: | 30/01/2008 | Page no: | |
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| PSD V3.1 12.01 | | | | | |

Determination of Particle Size Distribution

BS1377:Part2:1990, clauses 9.2

| | | | |
|---------------|-----------|--------------|--|
| particle size | % passing | Contract No: | 13184 |
| 75 | 100 | Contract: | TRINITY WHARF WEXFORD |
| 63 | 100 | BH/TP No: | BH 21 |
| 50 | 100 | SAMPLE No.: | 7738 |
| 37.5 | 100 | DEPTH (m): | 2.50 |
| 28 | 96 | TEST METHOD: | Wet sieve and hydrometer |
| 20 | 94 | DESCRIPTION: | Yellow brown silty, very sandy, GRAVEL possible weathered rock |
| 14 | 90 | | |
| 10 | 81 | | |
| 6.3 | 72 | | |
| 5 | 66 | | |
| 3.35 | 58 | | |
| 2 | 49 | | |
| 1.18 | 41 | | |
| 0.6 | 33 | | |
| 0.425 | 30 | | |
| 0.3 | 26 | | |
| 0.15 | 21 | | |
| 0.063 | 16 | | |
| 0.037 | 15 | | |
| 0.026 | 14 | | |
| 0.017 | 11 | | |
| 0.010 | 8 | | |
| 0.007 | 6 | | |
| 0.004 | 3 | | |
| 0.002 | 1 | | |



| | | | | | |
|---|-----------|-------|------------|----------|--|
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| PSD V3.1 12.01 | | | | | |

Determination of Particle Size Distribution

BS1377:Part2:1990, clauses 9.2

| | | | |
|--|--|---------------------------------|--|
| Contract No: 13184 | | Contract: TRINITY WHARF WEXFORD | |
| BH/TP No: BH 22 | | SAMPLE No.: 7743 | |
| DEPTH (m): 2.50 | | TEST METHOD: Wet sieve | |
| DESCRIPTION: Brown slightly sandy, gravelly, SILT/CLAY with broken rock/boulders | | | |

| particle size | % passing | COBBLES | GRAVEL | SAND | SILT/CLAY |
|---------------|-----------|---------|--------|------|-----------|
| 75 | 100 | | | | |
| 63 | 100 | | | | |
| 50 | 91 | | | | |
| 37.5 | 73 | | | | |
| 28 | 62 | | | | |
| 20 | 58 | | | | |
| 14 | 54 | | | | |
| 10 | 51 | | | | |
| 6.3 | 48 | | | | |
| 5 | 47 | | | | |
| 3.35 | 46 | | | | |
| 2 | 43 | | | | |
| 1.18 | 41 | | | | |
| 0.6 | 39 | | | | |
| 0.425 | 39 | | | | |
| 0.3 | 38 | | | | |
| 0.15 | 34 | | | | |
| 0.063 | 29 | | | | |
| 0.041 | #N/A | | | | |
| 0.029 | #N/A | | | | |
| 0.019 | #N/A | | | | |
| 0.011 | #N/A | | | | |
| 0.008 | #N/A | | | | |
| 0.004 | #N/A | | | | |
| 0.002 | #N/A | | | | |

| | | |
|-----------|------------------|----------|
| Issued By | Date: 30/01/2008 | Page no: |
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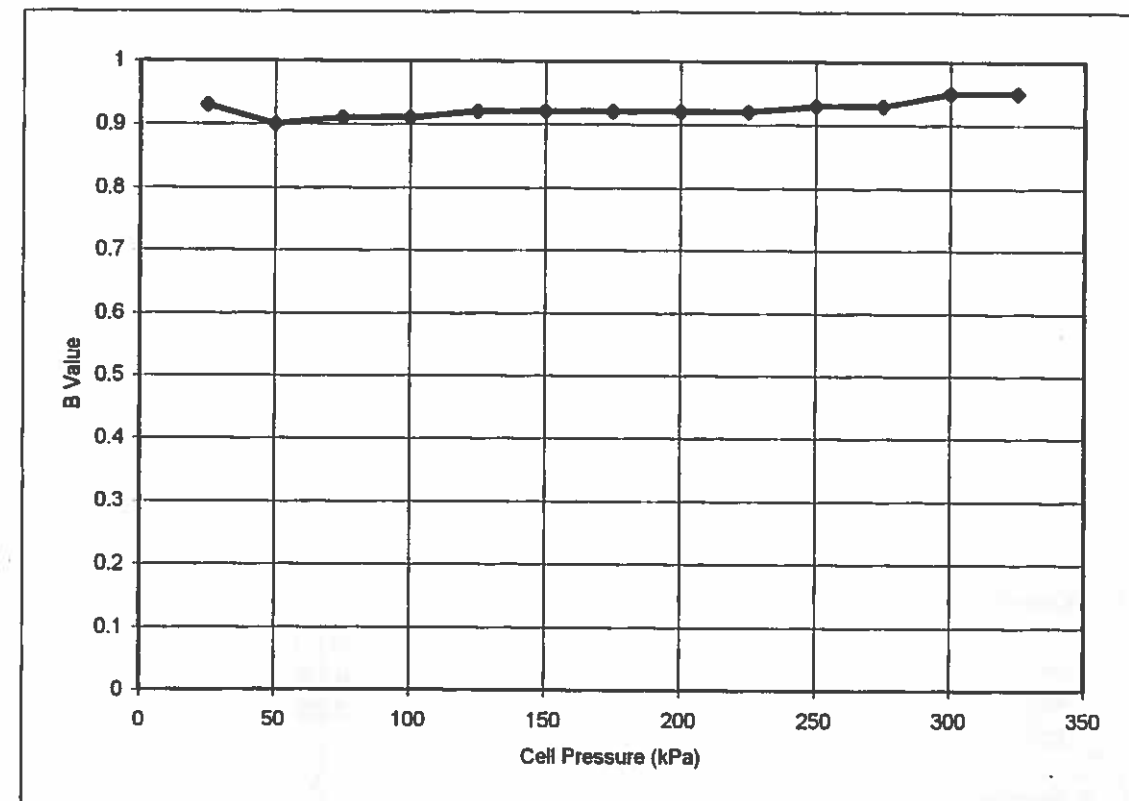
PSD V3.1 12.01



Consolidated undrained Triaxial Compression with pore pressure measurement

BS1377:Part 8:1990 and K H Head *Manual of Soil Laboratory Testing* vol 3

| | | | | | |
|--|--|---------------|-----------------------|------------------------|------|
| Contract No. | 13184 | Contract Name | Wexford | | |
| Location | BH3 | Sample No. | AE3740 | Depth (m) | 2.75 |
| | | | | Sample Type | U |
| Method of Preparation | Undisturbed | | Test Type Multi-stage | | |
| Description | Orangish brown sandy slightly gravelly CLAY with grey sandy clay at base | | | | |
| <i>Initial Dimensions and condition</i> | | | | | |
| Height (mm) | 200.5 | Diameter (mm) | 104.7 | Side drains fitted | No |
| | | Initial | Final | | |
| Moisture Content (%) | | 19 | 18 | | |
| Bulk Density (Mg/m ³) | | 2.02 | 2.03 | | |
| Dry Density (Mg/m ³) | | 1.70 | 1.73 | | |
| <i>Saturation Stage</i> | | | | | |
| Saturation by increments of Cell & Back Pressure | | | | | |
| Initial B Value | 0.93 | Final B Value | 0.95 | Increments of Pressure | 25 |



Number of days saturating 5



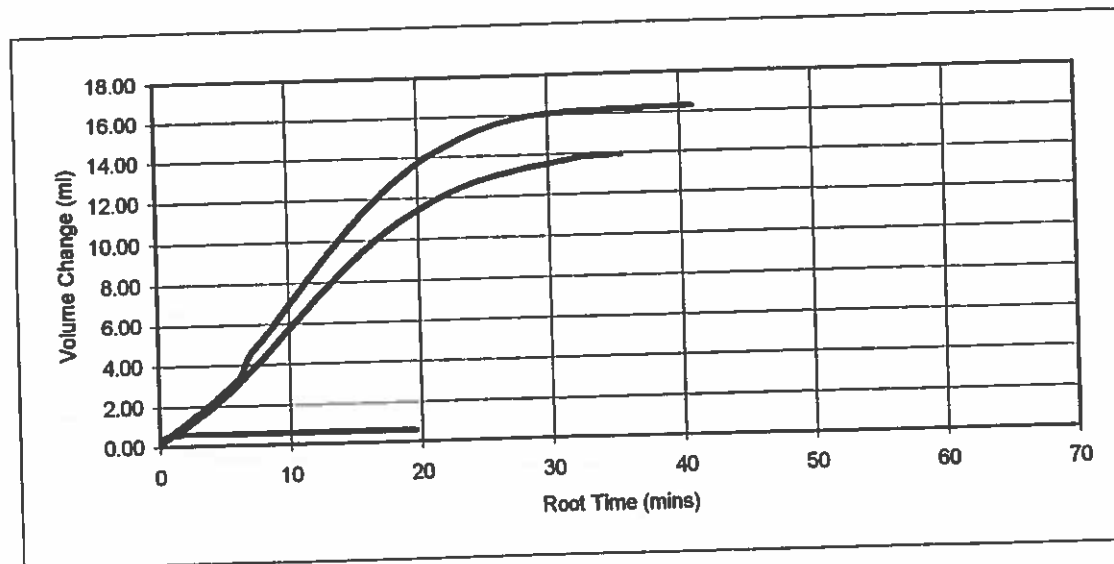
Consolidated undrained Triaxial Compression with pore pressure measurement

BS1377:Part 8:1990 and K H Head *Manual of Soil Laboratory Testing* vol 3

Contract No. 13184 Contract Name Wexford
Location BH3 Sample No. AE3740 Depth (m) 2.75 Sample Type U

Consolidation Stage

| Stage Number | 1 | 2 | 3 |
|-----------------------------|------|-------|-------|
| Cell Pressure (kPa) | 325 | 350 | 400 |
| Back Pressure (kPa) | 300 | 300 | 300 |
| Effective Pressure (kPa) | 25 | 50 | 100 |
| Final Pore Pressure (kPa) | 298 | 300 | 300 |
| Volume Change (ml) | 0.60 | 13.89 | 16.29 |
| % Pore Pressure Dissipation | 100 | 100 | 100 |



Number of days consolidating 4

Compression Stage

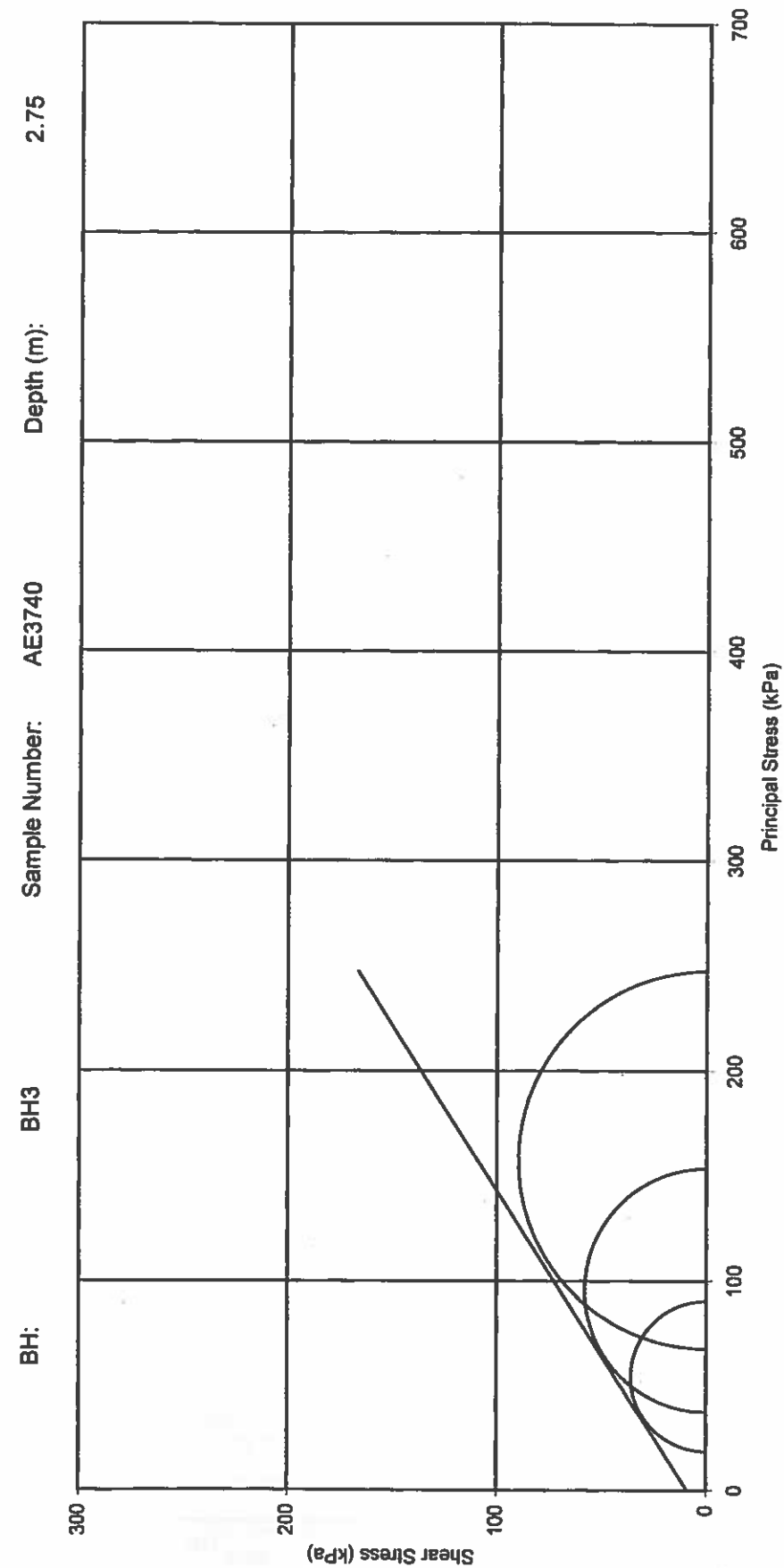
| Failure criteria | Maximum deviator stress | | |
|-----------------------------------|-------------------------|-------|--------|
| Stage | 1 | 2 | 3 |
| Effective Stress (kPa) | 25 | 50 | 100 |
| Rate of Strain (mm/min) | 0.07 | 0.01 | 0.0233 |
| Pore Pressure at start (kPa) | 299 | 300 | 300 |
| Axial strain at failure (%) | 5.3 | 9.6 | 16.5 |
| Deviator Stress at failure (kPa) | 71.9 | 115.9 | 179.3 |
| Pore Pressure at failure (kPa) | 306.49 | 312.3 | 330.97 |
| Major Principal stress at failure | 90.4 | 153.6 | 247.1 |
| Minor Principal stress at failure | 18.5 | 37.7 | 67.8 |
| Effective Principal Stress Ratio | 4.89 | 4.07 | 3.65 |

Number of days in compression 1 1 1

Total Number of days on test 12

CONSOLIDATED UNDRAINED TRIAXIAL TEST - MOHR CIRCLES

In accordance with BS1377:Part 8:1990 and K H Head *Manual of Soils Laboratory Testing* Vol 3



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C' = 9

$\phi = 32.5$

Contract No. 13184

Contract

Wexford

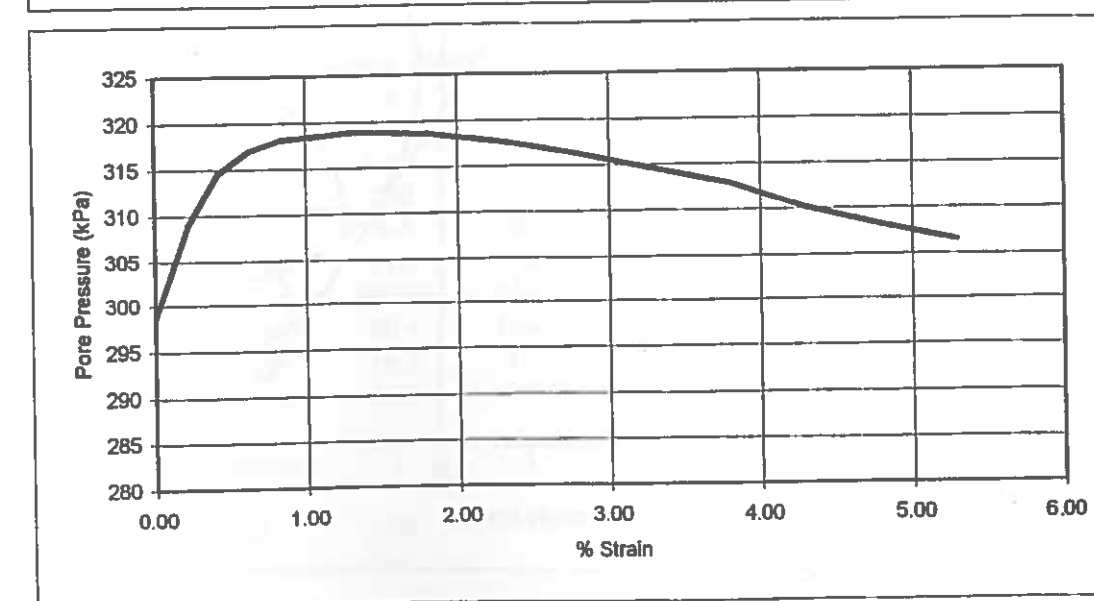
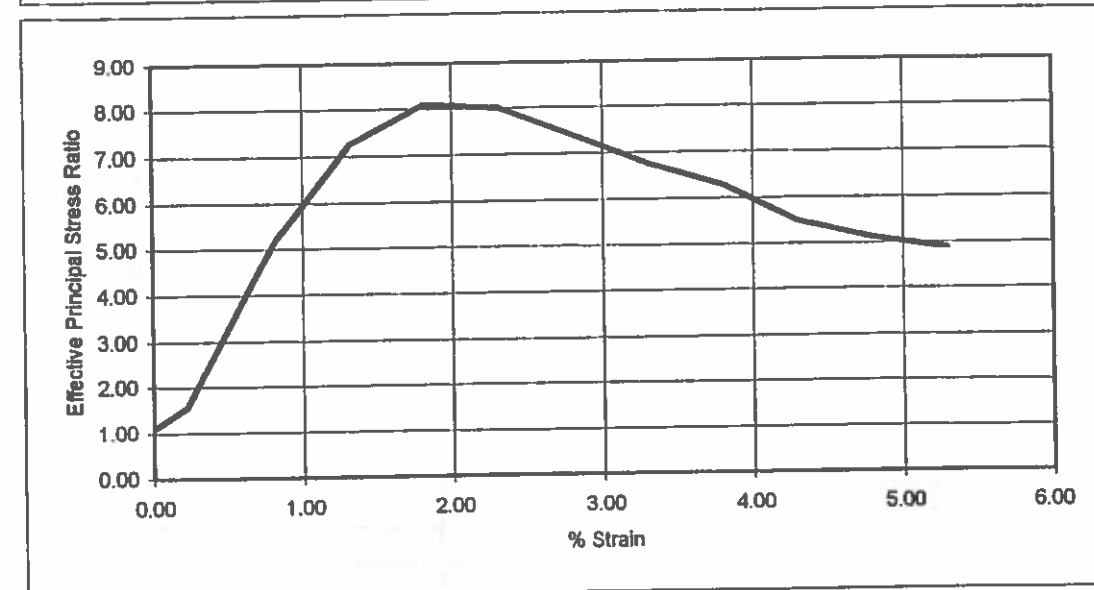
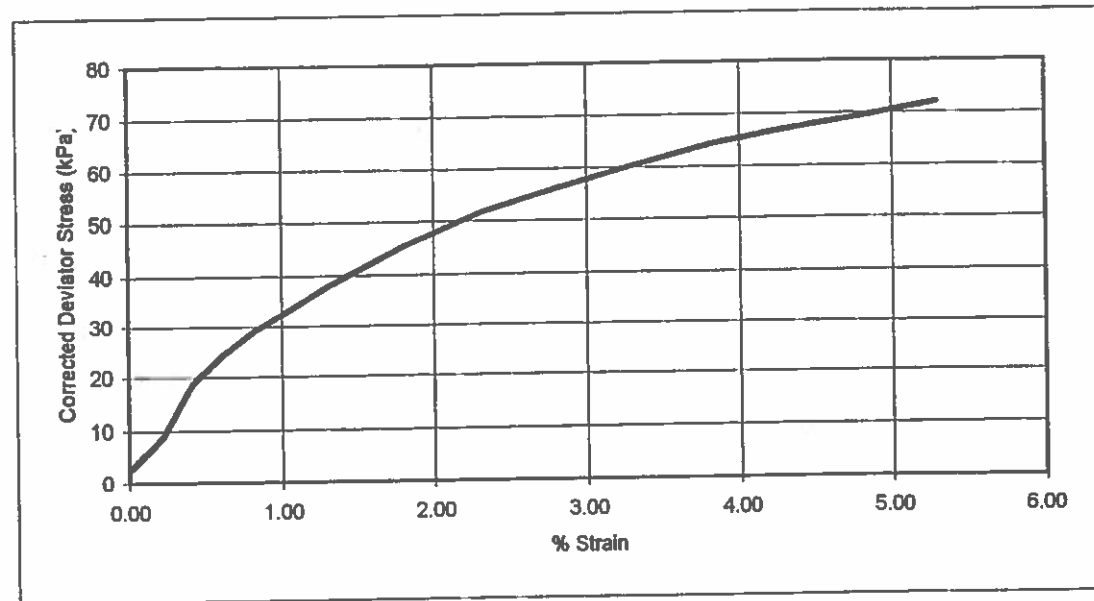
Figure

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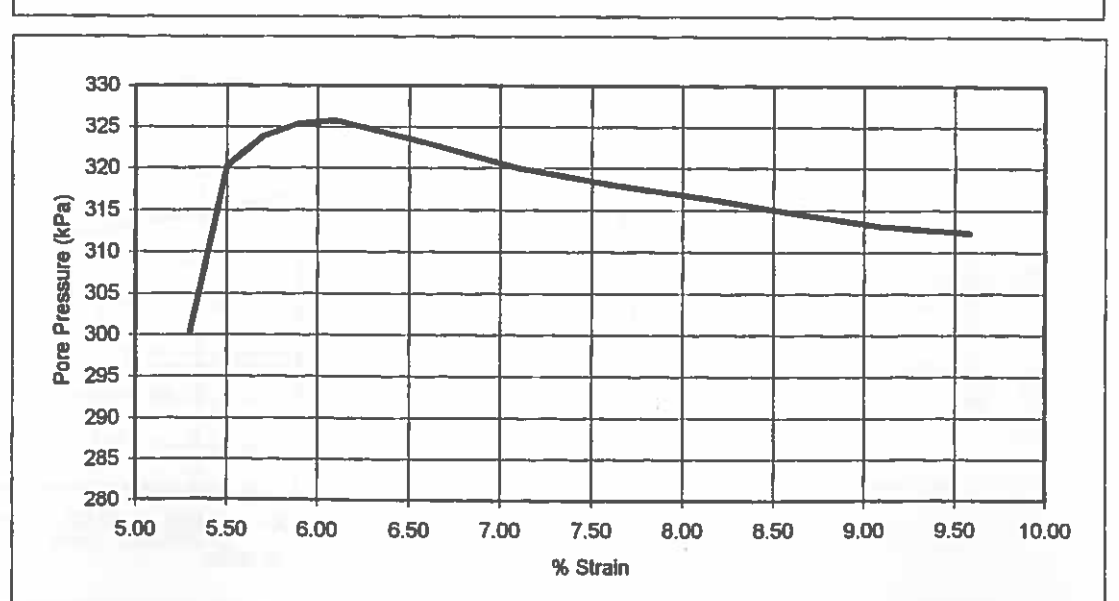
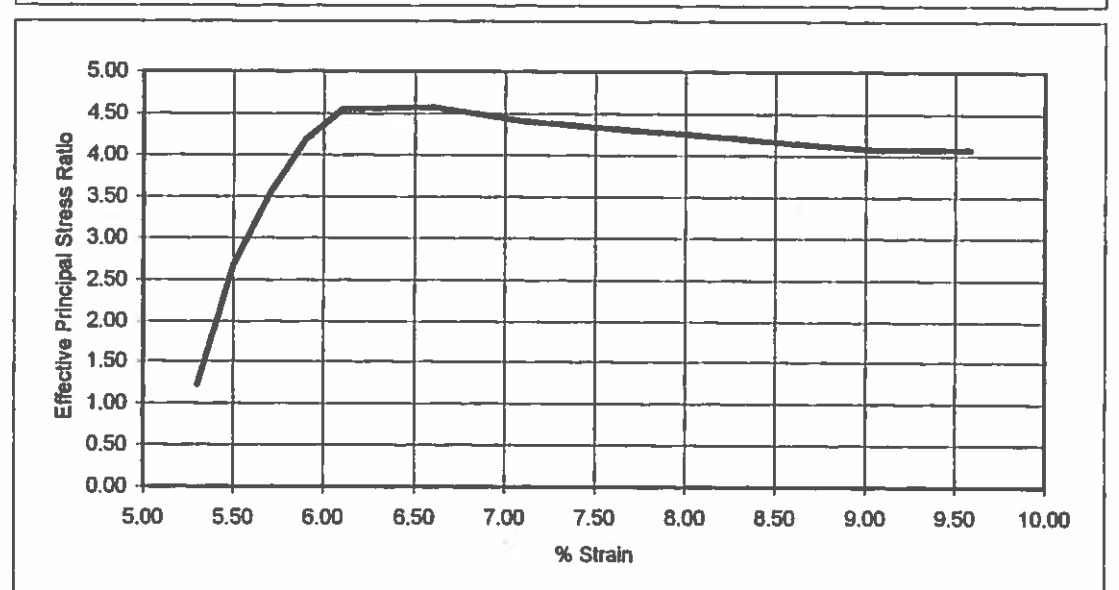
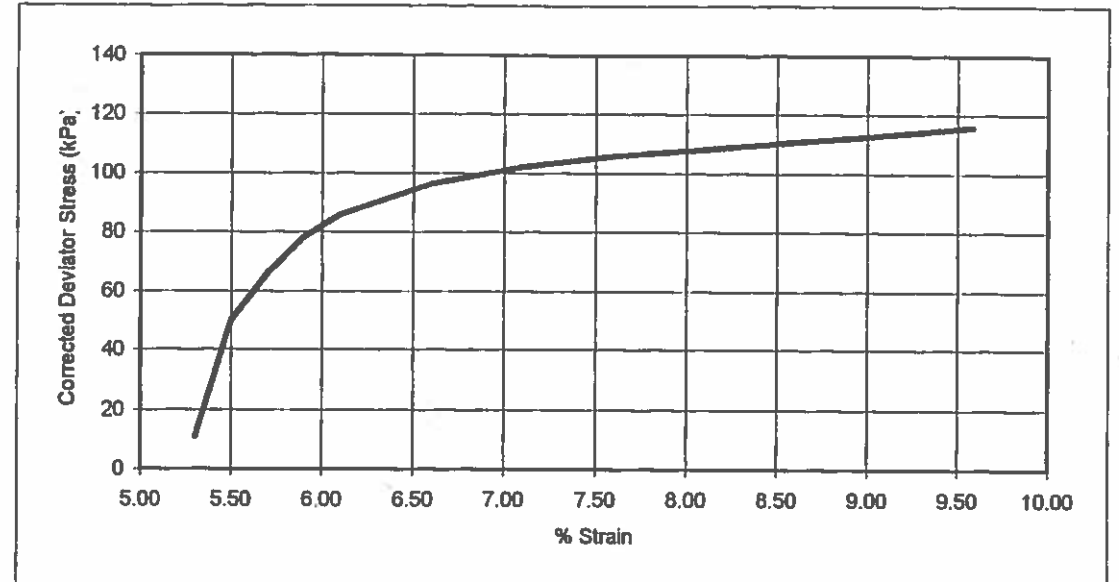
Consolidated Undrained Triaxial Compression with Pore Pressure Measurement

Contract No. 13184 Location BH3 Sample No. AE3740 Depth 2.75



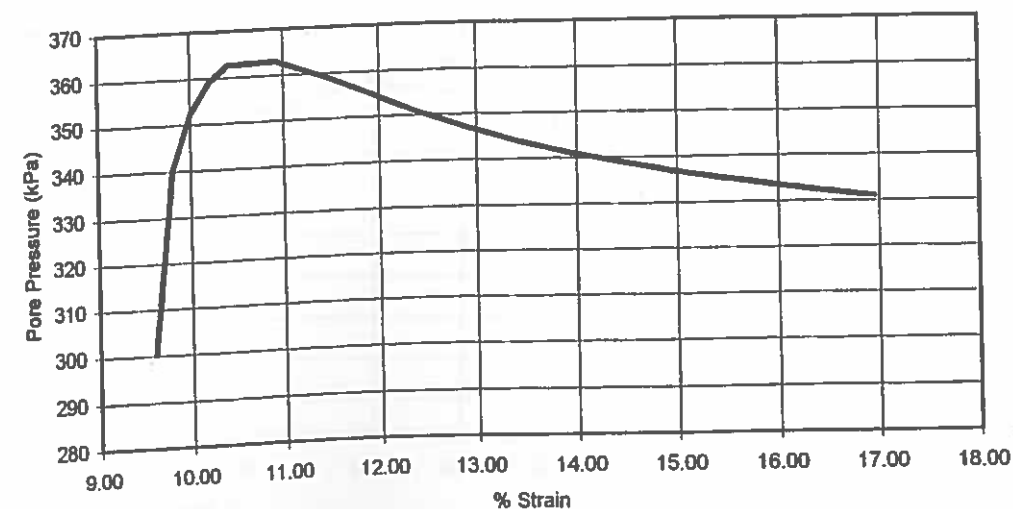
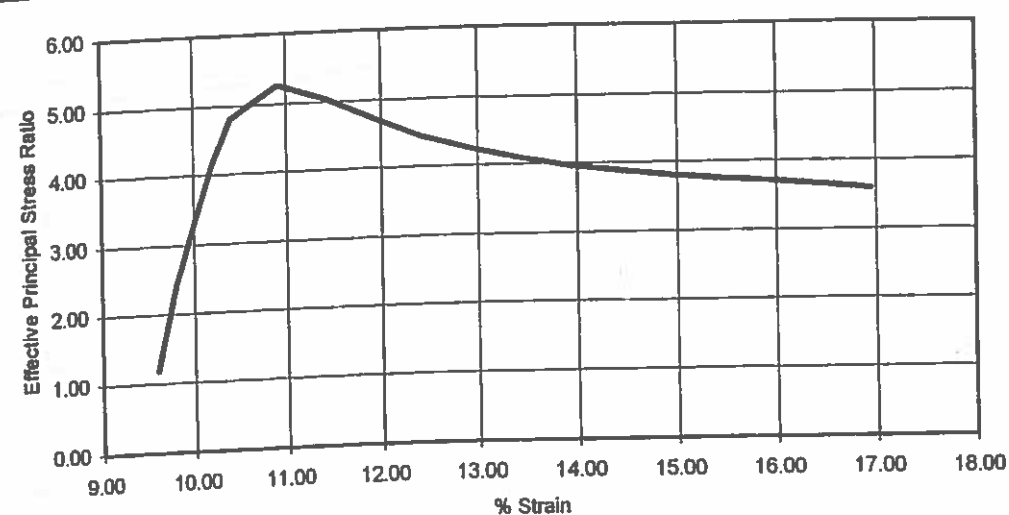
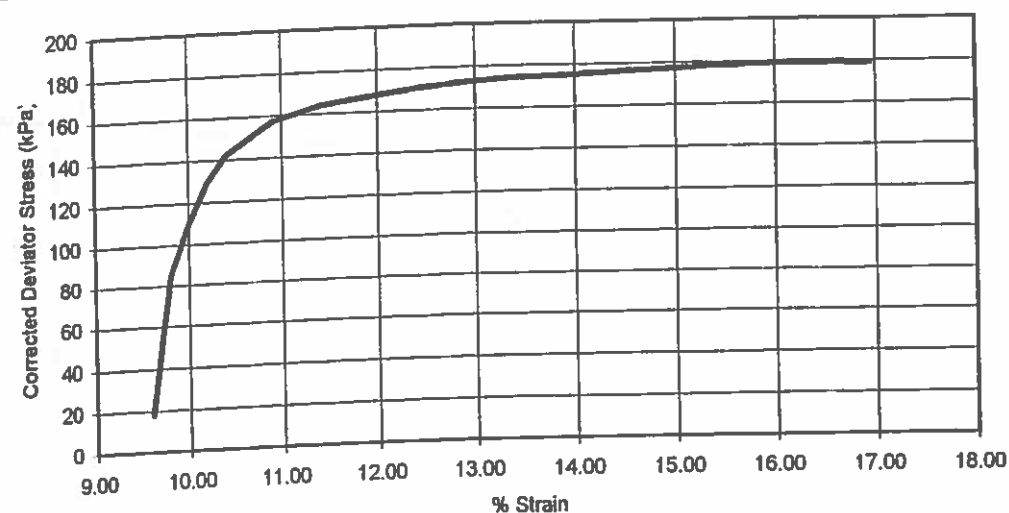
Consolidated Undrained Triaxial Compression with Pore Pressure Measurement

Contract No. 13184 Location BH3 Sample No. AE3740 Depth 2.75





Consolidated Undrained Triaxial Compression with Pore Pressure Measurement
Contract No. 13184 Location BH3 Sample No. AE3740 Depth 2.75



Stage 3



Consolidated undrained Triaxial Compression with pore pressure measurement
BS1377:Part 8:1990 and K H Head Manual of Soil Laboratory Testing vol 3

Contract No. 13184 Contract Name Wexford
Location BH14 Sample No. AE3762 Depth (m) 3.00 Sample Type U
Method of Preparation Undisturbed Test Type Multi-stage
Description Laminated: Greyish brown CLAY with shells and grey silty SAND with shells

Initial Dimensions and condition

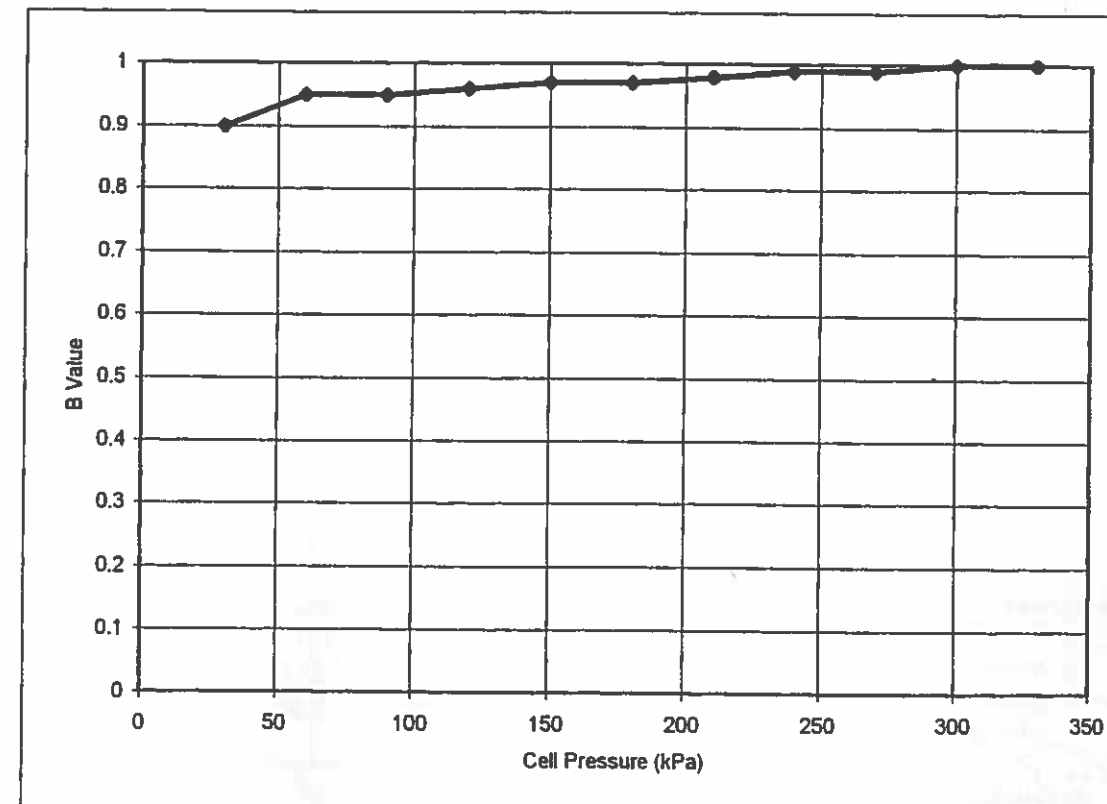
Height (mm) 200.5 Diameter (mm) 104.6 Side drains fitted No

| | Initial | Final |
|-----------------------------------|---------|-------|
| Moisture Content (%) | 54 | 43 |
| Bulk Density (Mg/m ³) | 1.58 | 1.65 |
| Dry Density (Mg/m ³) | 1.03 | 1.15 |

Saturation Stage

Saturation by increments of Cell & Back Pressure

Initial B Value 0.90 Final B Value 1.00 Increments of Pressure 30



Number of days saturating 2



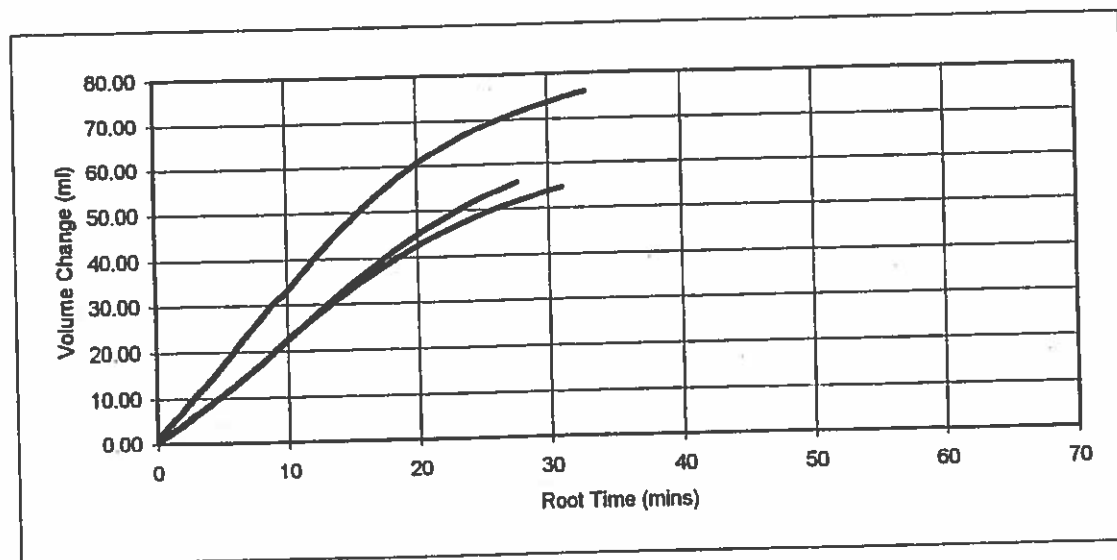
Consolidated undrained Triaxial Compression with pore pressure measurement

BS1377:Part 8:1990 and K H Head *Manual of Soil Laboratory Testing* vol 3

Contract No. **13184** Contract Name **Wexford**
Location **BH14** Sample No. **AE3762** Depth (m) **3.00** Sample Type **U**

Consolidation Stage

| Stage Number | 1 | 2 | 3 |
|-----------------------------|-------|-------|-------|
| Cell Pressure (kPa) | 330 | 360 | 420 |
| Back Pressure (kPa) | 300 | 300 | 300 |
| Effective Pressure (kPa) | 30 | 60 | 120 |
| Final Pore Pressure (kPa) | 300 | 299 | 301 |
| Volume Change (ml) | 76.05 | 54.65 | 55.94 |
| % Pore Pressure Dissipation | 100 | 100 | 99 |



Number of days consolidating **6**

Compression Stage

| Failure criteria | Maximum deviator stress | | |
|-----------------------------------|-------------------------|--------|--------|
| Stage | 1 | 2 | 3 |
| Effective Stress (kPa) | 30 | 60 | 120 |
| Rate of Strain (mm/min) | 0.03 | 0.0302 | 0.0256 |
| Pore Pressure at start (kPa) | 300 | 300 | 301 |
| Axial strain at failure (%) | 6 | 12.3 | 20 |
| Deviator Stress at failure (kPa) | 31 | 56.8 | 113.5 |
| Pore Pressure at failure (kPa) | 319.1 | 340.3 | 382.1 |
| Major Principal stress at failure | 41.9 | 76.5 | 151.4 |
| Minor Principal stress at failure | 10.9 | 19.7 | 37.9 |
| Effective Principal Stress Ratio | 3.84 | 3.89 | 3.99 |

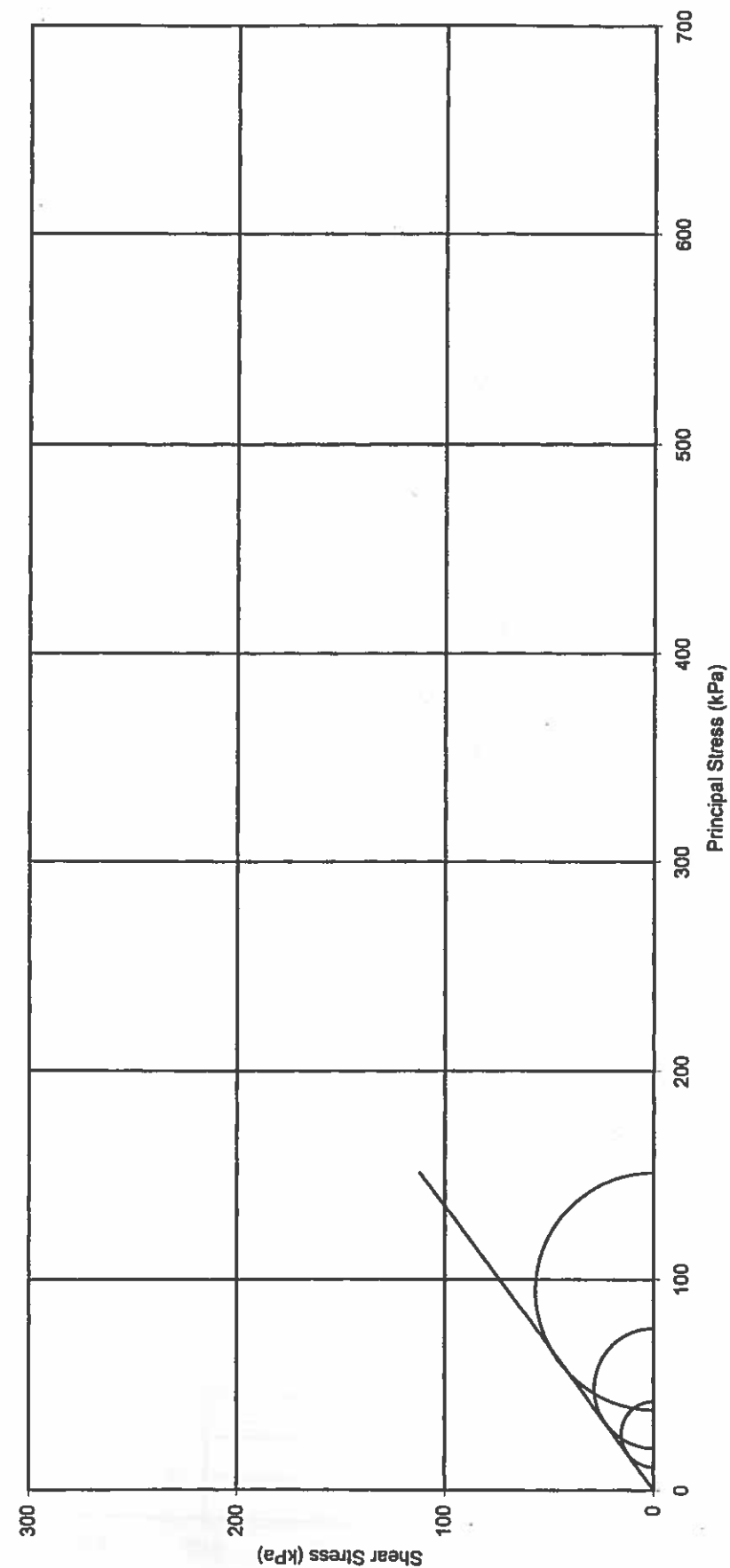
Number of days in compression **1** **1** **1**

Total Number of days on test **11**

CONSOLIDATED UNDRAINED TRIAXIAL TEST - MOHR CIRCLES

In accordance with BS1377:Part 8:1990 and K H Head *Manual of Soils Laboratory Testing* Vol 3

BH: **BH14** Sample Number: **AE3762** Depth (m): **3.00**



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Co. Kildare

Contract

$C' = 0$

$\phi' = 36.5$

Wexford

Figure

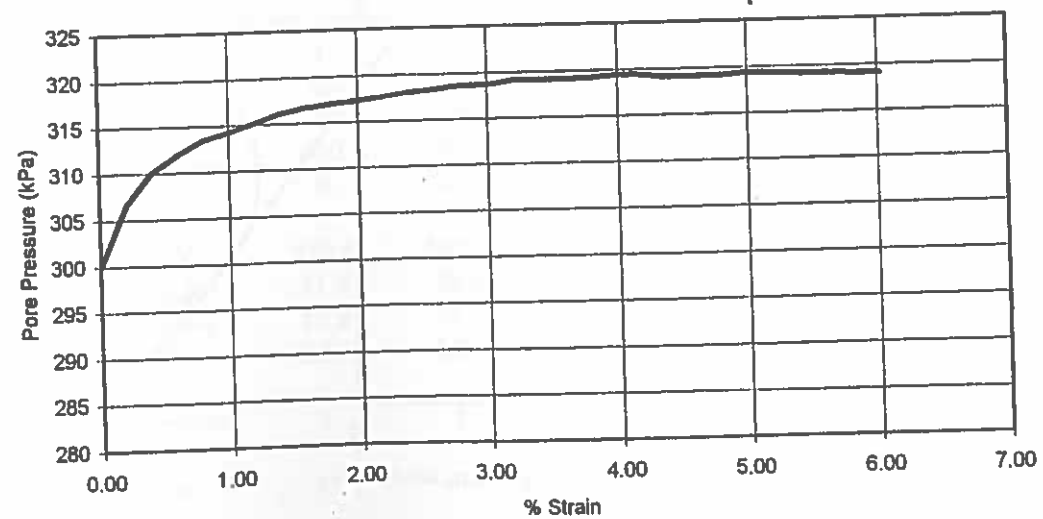
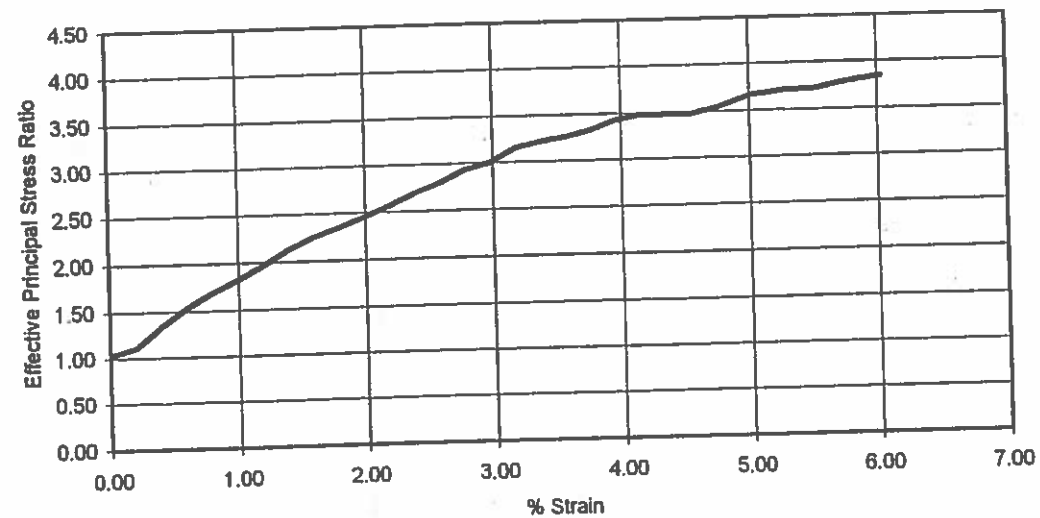
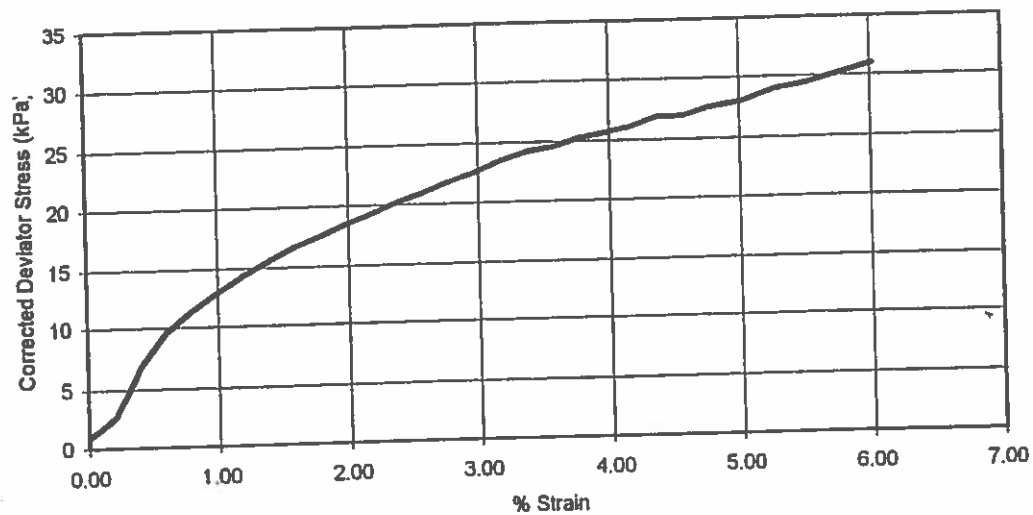
Page 3 of 6



Consolidated Undrained Triaxial Compression with Pore Pressure Measurement

Contract No. 13184 Location BH14 Sample No. AE3762 Depth 3.00

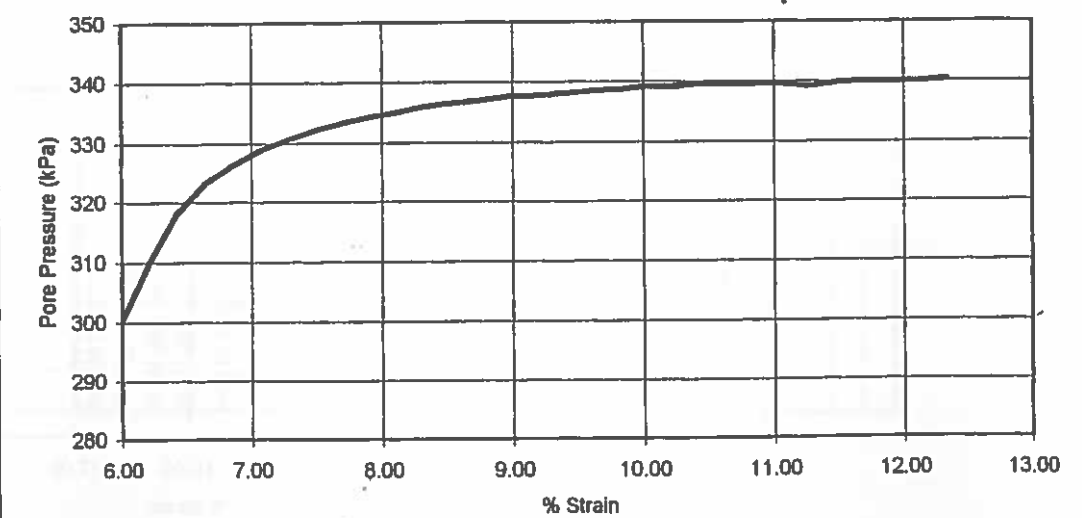
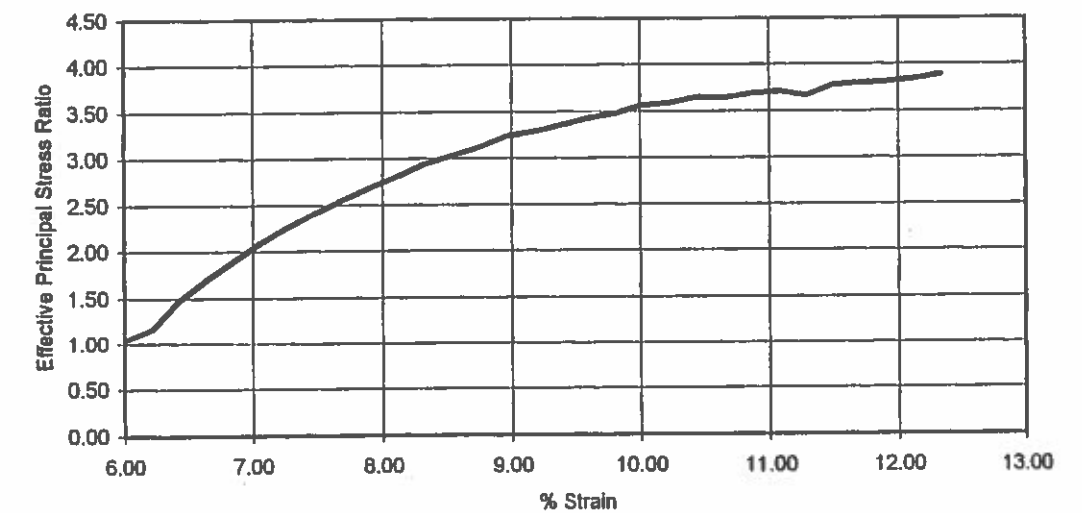
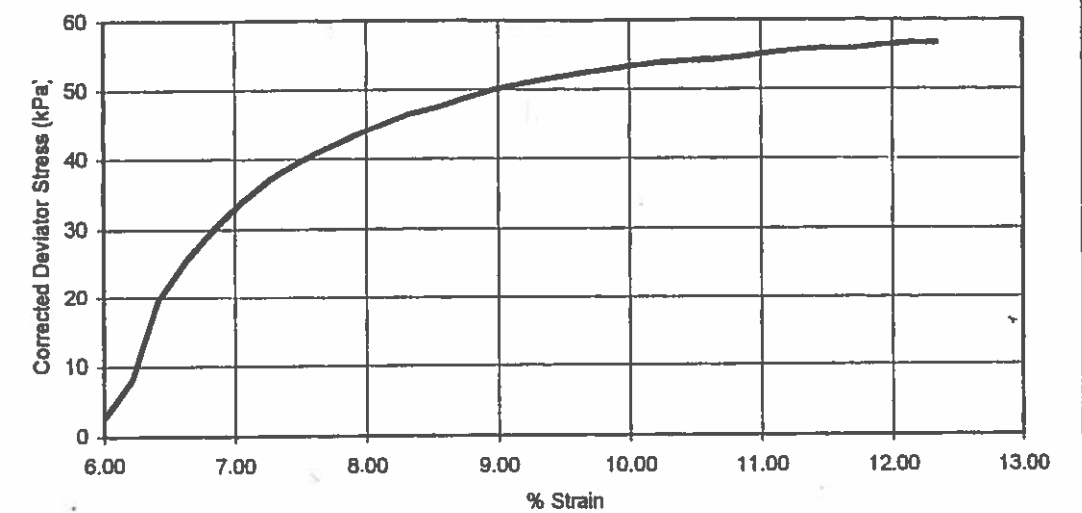
Stage 1



Consolidated Undrained Triaxial Compression with Pore Pressure Measurement

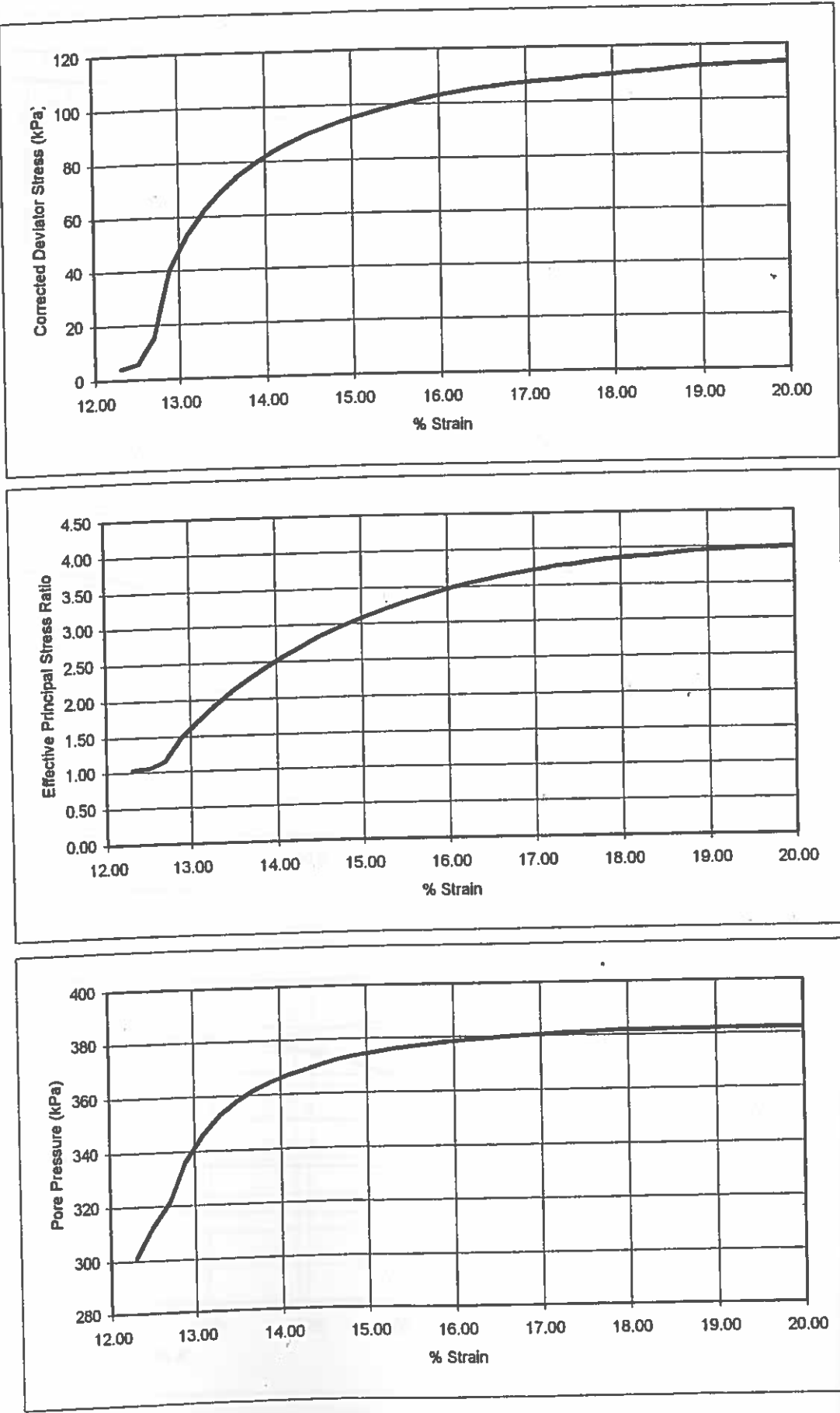
Contract No. 13184 Location BH14 Sample No. AE3762 Depth 3.00

Stage 2





Stage 3



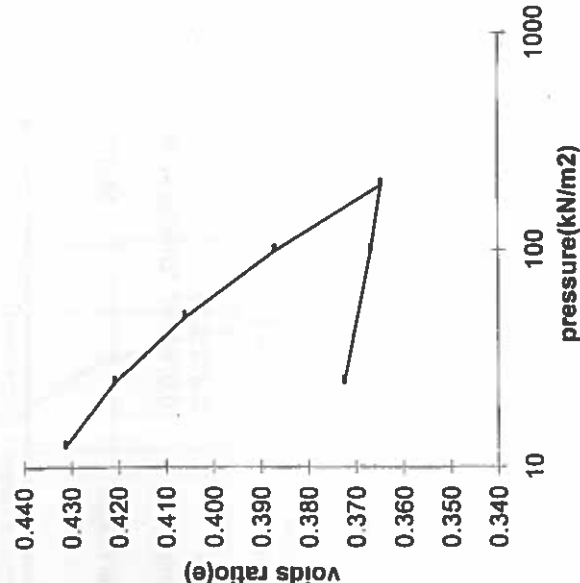
Consol bh5

CONSOLIDATION TEST CALCULATIONS IGSL

Initial height 19.05
Wt. soil+ring 287.2
final wet wt. 283
final dry wt 259.3
wt. of ring 90.7
w/c initial 16.5%
w/c final 14.1%
S.G. 2.65
e final 0.3725089
change in e 0.0761997 *change in Ht.
Final Height 18.012

Contract: TRINITY WHARF WEXFORD
Borehole No: 13184 BH3
Sample No: 3740
Depth: 2.50

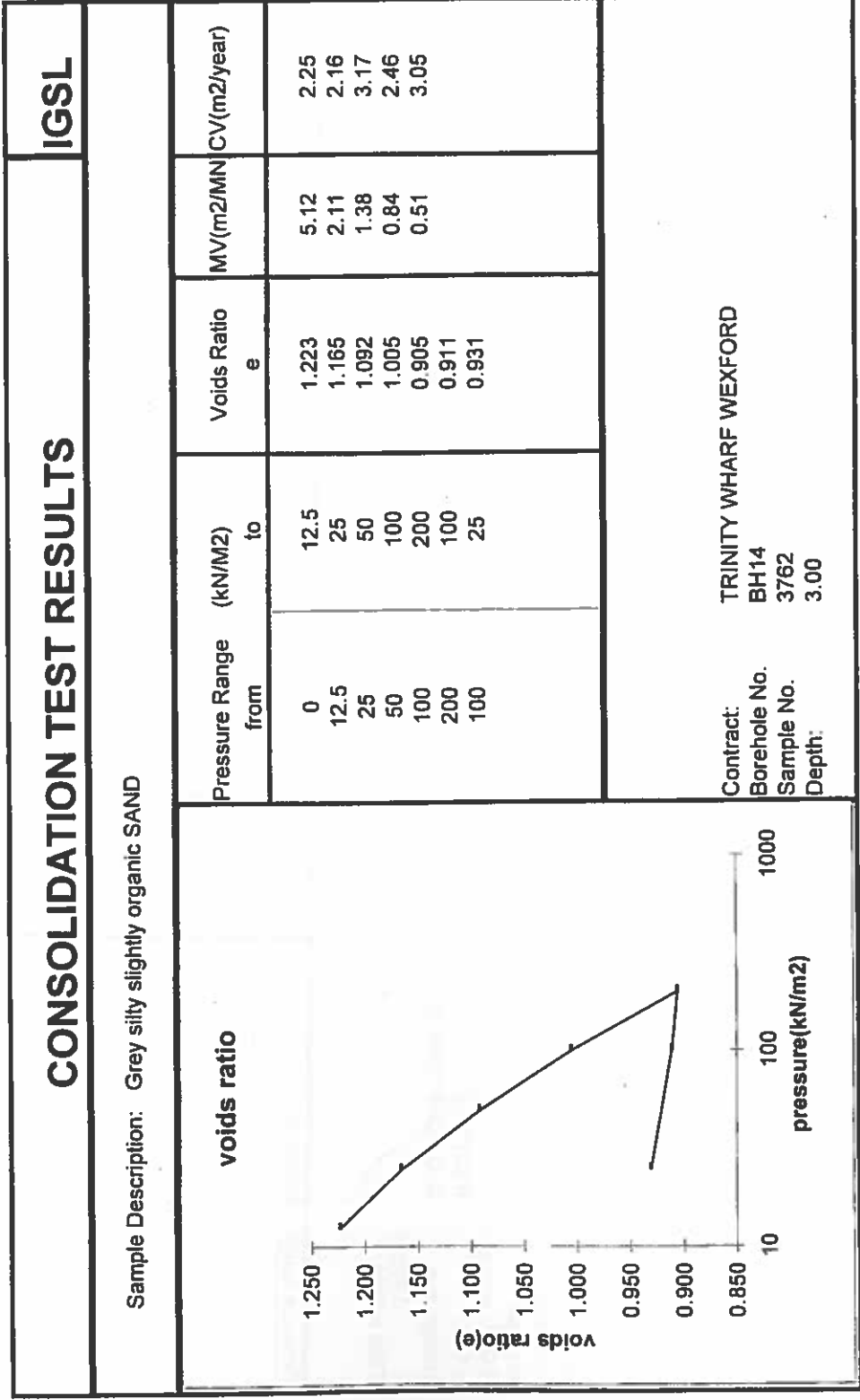
| Pressure range | Increment | change in Ht. | change in e | e at end of stage | average e | MV (m2MMN.) | HEIGHT H | AV. HEIGHT |
|----------------|-----------|---------------|-------------|-------------------|-----------|-------------|----------|------------|
| from | to | | | | | | | |
| 0 | 12.5 | 12.5 | 0.266 | 0.452 | | | 19.05 | |
| 12.5 | 25 | 12.5 | 0.136 | 0.431 | 0.441 | 1.125 | 18.784 | 18.917 |
| 25 | 50 | 25 | 0.196 | 0.421 | 0.426 | 0.581 | 18.648 | 18.716 |
| 50 | 100 | 50 | 0.248 | 0.406 | 0.414 | 0.423 | 18.452 | 18.55 |
| 100 | 200 | 100 | 0.294 | 0.387 | 0.397 | 0.271 | 18.204 | 18.328 |
| 200 | 100 | -100 | -0.028 | 0.365 | 0.376 | 0.163 | 17.91 | 18.057 |
| 100 | 25 | -75 | -0.074 | 0.367 | 0.366 | 0.016 | 17.938 | 17.924 |
| | | | | 0.373 | 0.370 | 0.055 | 18.012 | 17.975 |
| | | | | 0.373 | | | | |
| | | | | 0.373 | | | | |

| CONSOLIDATION TEST RESULTS | | | | | IGSL | |
|---|--|------------------------|------|------------------|-----------|-------------|
| Sample Description: Orange yellow brown slightly sandy slightly gravelly CLAY | | | | | | |
| <div>voids ratio</div>  | | Pressure Range (kN/M2) | | Voids Ratio e | MV(m2/MN) | CV(m2/year) |
| | | from | to | | | |
| | | 0 | 12.5 | 0.431 | 1.12 | 1.65 |
| | | 12.5 | 25 | 0.421 | 0.58 | 1.44 |
| | | 25 | 50 | 0.406 | 0.42 | 3.73 |
| | | 50 | 100 | 0.387 | 0.27 | 4.43 |
| | | 100 | 200 | 0.365 | 0.16 | 6.84 |
| | | 200 | 100 | 0.367 | | |
| | | 100 | 25 | 0.373 | | |
| Contract: TRINITY WHARF WEXFORD | | | | | | |
| Borehole No. BH3 | | | | | | |
| Sample No. 3740 | | | | | | |
| Depth: 2.50 | | | | | | |

| CONSOLIDATION TEST CALCULATIONS IGSL | | | | | | | | | |
|---|--------------------------|---------------|-------------|-------------------|-----------|-------------|----------|------------|--|
| <div>Contract: TRINITY WHARF WEXFORD</div> <div>13184</div> <div>Borehole No: BH4</div> <div>Sample No: 3721</div> <div>Depth: 5.00</div> | | | | | | | | | |
| initial height | 19.05 | | | | | | | | |
| Wt. soil+ring | 280.2 | | | | | | | | |
| final wet wt. | 276.3 | | | | | | | | |
| final dry wt | 247.5 | | | | | | | | |
| wt. of ring | 89.4 | | | | | | | | |
| w/c initial | 20.7% | | | | | | | | |
| w/c final | 18.2% | | | | | | | | |
| S.G. | 2.65 | | | | | | | | |
| e final | 0.4827324 | | | | | | | | |
| change in e | 0.0821094 *change in Ht. | | | | | | | | |
| Final Height | 18.058 | | | | | | | | |
| Pressure range | increment | change in Ht. | change in e | e at end of stage | average e | MV (m2/MN.) | HEIGHT H | AV. HEIGHT | |
| from | to | | | | | | | | |
| 0 | 12.5 | 12.5 | 0.018 | 0.564 | 0.555 | 0.912 | 19.05 | | |
| 12.5 | 25 | 12.5 | 0.012 | 0.546 | 0.541 | 0.605 | 18.834 | 18.942 | |
| 25 | 50 | 25 | 0.018 | 0.535 | 0.526 | 0.482 | 18.692 | 18.763 | |
| 50 | 100 | 50 | 0.024 | 0.516 | 0.504 | 0.325 | 18.468 | 18.58 | |
| 100 | 200 | 100 | 0.344 | 0.492 | 0.478 | 0.191 | 18.17 | 18.319 | |
| 200 | 100 | -100 | -0.056 | 0.464 | 0.466 | 0.031 | 17.826 | 17.998 | |
| 100 | 25 | -75 | -0.176 | 0.468 | 0.476 | 0.131 | 17.882 | 17.854 | |
| | | | | 0.483 | | | 18.058 | 17.97 | |
| | | | | 0.483 | | | | | |
| | | | | 0.483 | | | | | |
| | | | | 0.483 | | | | | |

| CONSOLIDATION TEST RESULTS | | | | | IGSL | |
|---|------|------------------------|-------|------------------|-----------------------|-------------|
| Sample Description: Mottled orange yellow brown slightly sandy slightly gravelly CLAY | | | | | | |
| <div>voids ratio</div> <div>voids ratio(e)</div> | | Pressure Range (kN/M2) | | Voids Ratio e | MV(m2/MN) | CV(m2/year) |
| | | from | to | | | |
| 0 | 12.5 | 12.5 | 0.546 | 0.91 | 0.40 | |
| 12.5 | 25 | 25 | 0.535 | 0.61 | 0.64 | |
| 25 | 50 | 50 | 0.516 | 0.48 | 1.53 | |
| 50 | 100 | 100 | 0.492 | 0.33 | 1.49 | |
| 100 | 200 | 200 | 0.464 | 0.19 | 2.94 | |
| 200 | 100 | 100 | 0.468 | | | |
| 100 | 25 | 25 | 0.483 | | | |
| | | | | | TRINITY WHARF WEXFORD | |
| Contract: | | | | | BH4 | |
| Borehole No. | | | | | 3721 | |
| Sample No. | | | | | 5.00 | |
| Depth: | | | | | | |

| CONSOLIDATION TEST CALCULATIONS IGSL | | | | | | | |
|---|--------------------------|---------------|-------------|-------------------|-----------|-------------|---------------------|
| <div>Contract: 13184 TRINITY WHARF WEXFORD</div> <div>Borehole No: BH14</div> <div>Sample No: 3762</div> <div>Depth: 3.00</div> | | | | | | | |
| initial height | 19.05 | | | | | | |
| Wt. soil+ring | 242.3 | | | | | | |
| final wet wt. | 227.3 | | | | | | |
| final dry wt | 191.5 | | | | | | |
| wt. of ring | 89.6 | | | | | | |
| w/c initial | 49.9% | | | | | | |
| w/c final | 35.1% | | | | | | |
| S.G. | 2.65 | | | | | | |
| e final | 0.9310108 | | | | | | |
| change in e | 0.1244368 *change in Ht. | | | | | | |
| Final Height | 15.518 | | | | | | |
| Pressure range | increment | change in Ht. | change in e | e at end of stage | average e | MV (m2/MN.) | HEIGHT H AV. HEIGHT |
| from to | | | | | | | |
| 0 12.5 | 12.5 | 1.182 | 0.147 | 1.371 | 1.297 | 5.123 | 19.05 |
| 12.5 25 | 12.5 | 0.466 | 0.058 | 1.223 | 1.194 | 2.114 | 17.868 |
| 25 50 | 25 | 0.592 | 0.074 | 1.165 | 1.129 | 1.384 | 17.402 |
| 50 100 | 50 | 0.694 | 0.086 | 1.092 | 1.049 | 0.843 | 16.81 |
| 100 200 | 100 | 0.804 | 0.100 | 1.005 | 0.955 | 0.512 | 16.116 |
| 200 100 | -100 | -0.046 | -0.006 | 0.905 | 0.908 | 0.030 | 15.312 |
| 100 25 | -75 | -0.16 | -0.020 | 0.911 | 0.921 | 0.138 | 15.358 |
| | | | | 0.931 | | | 15.518 |
| | | | | 0.931 | | | |
| | | | | 0.931 | | | |
| | | | | 0.931 | | | |



| CONSOLIDATION TEST RESULTS | | | | IGSL | | |
|---|------|------------------------|-------|-----------------------|-----------|-------------|
| Sample Description: Mottled orange yellow brown slightly sandy slightly gravelly CLAY | | | | | | |
| <div>voids ratio</div> <div>voids ratio(e)</div> | | Pressure Range (kN/M2) | | Voids Ratio e | MV(m2/MN) | CV(m2/year) |
| | | from | to | | | |
| 0 | 12.5 | 12.5 | 0.546 | 0.91 | 0.40 | |
| 12.5 | 25 | 25 | 0.535 | 0.61 | 0.64 | |
| 25 | 50 | 50 | 0.516 | 0.48 | 1.53 | |
| 50 | 100 | 100 | 0.492 | 0.33 | 1.49 | |
| 100 | 200 | 200 | 0.464 | 0.19 | 2.94 | |
| 200 | 100 | 100 | 0.468 | | | |
| 100 | 25 | 25 | 0.483 | | | |
| | | | | TRINITY WHARF WEXFORD | | |
| Contract: | | | | BH4 | | |
| Borehole No. | | | | 3721 | | |
| Sample No. | | | | 5.00 | | |
| Depth: | | | | | | |

| CONSOLIDATION TEST CALCULATIONS IGSL | | | | | | | |
|--|-----------|---------------|-------------|-------------------|-----------|-------------|---------------------|
| <div>initial height 19.05</div> <div>Wt. soil+ring 242.3</div> <div>final wet wt. 227.3</div> <div>final dry wt 191.5</div> <div>wt. of ring 89.6</div> <div>w/c initial 49.9%</div> <div>w/c final 35.1%</div> <div>S.G. 2.65</div> <div>e final 0.9310108</div> <div>change in e 0.1244368</div> <div>*change in Ht. 15.518</div> <div>Final Height 15.518</div> | | | | | | | |
| <div>Contract: 13184</div> <div>Borehole No: BH14</div> <div>Sample No: 3762</div> <div>Depth: 3.00</div> | | | | | | | |
| Pressure range | increment | change in Ht. | change in e | e at end of stage | average e | MV (m2/MN.) | HEIGHT H AV. HEIGHT |
| from to | | | | | | | |
| 0 12.5 | 12.5 | 1.182 | 0.147 | 1.371 | 1.297 | 5.123 | 19.05 |
| 12.5 25 | 12.5 | 0.466 | 0.058 | 1.223 | 1.194 | 2.114 | 17.868 |
| 25 50 | 25 | 0.592 | 0.074 | 1.165 | 1.129 | 1.384 | 17.402 |
| 50 100 | 50 | 0.694 | 0.086 | 1.092 | 1.049 | 0.843 | 16.81 |
| 100 200 | 100 | 0.804 | 0.100 | 1.005 | 0.955 | 0.512 | 16.116 |
| 200 100 | -100 | -0.046 | -0.006 | 0.905 | 0.908 | 0.030 | 15.312 |
| 100 25 | -75 | -0.16 | -0.020 | 0.911 | 0.921 | 0.138 | 15.358 |
| | | | | 0.931 | | | 15.518 |
| | | | | 0.931 | | | |
| | | | | 0.931 | | | |
| | | | | 0.931 | | | |

Consol bh5

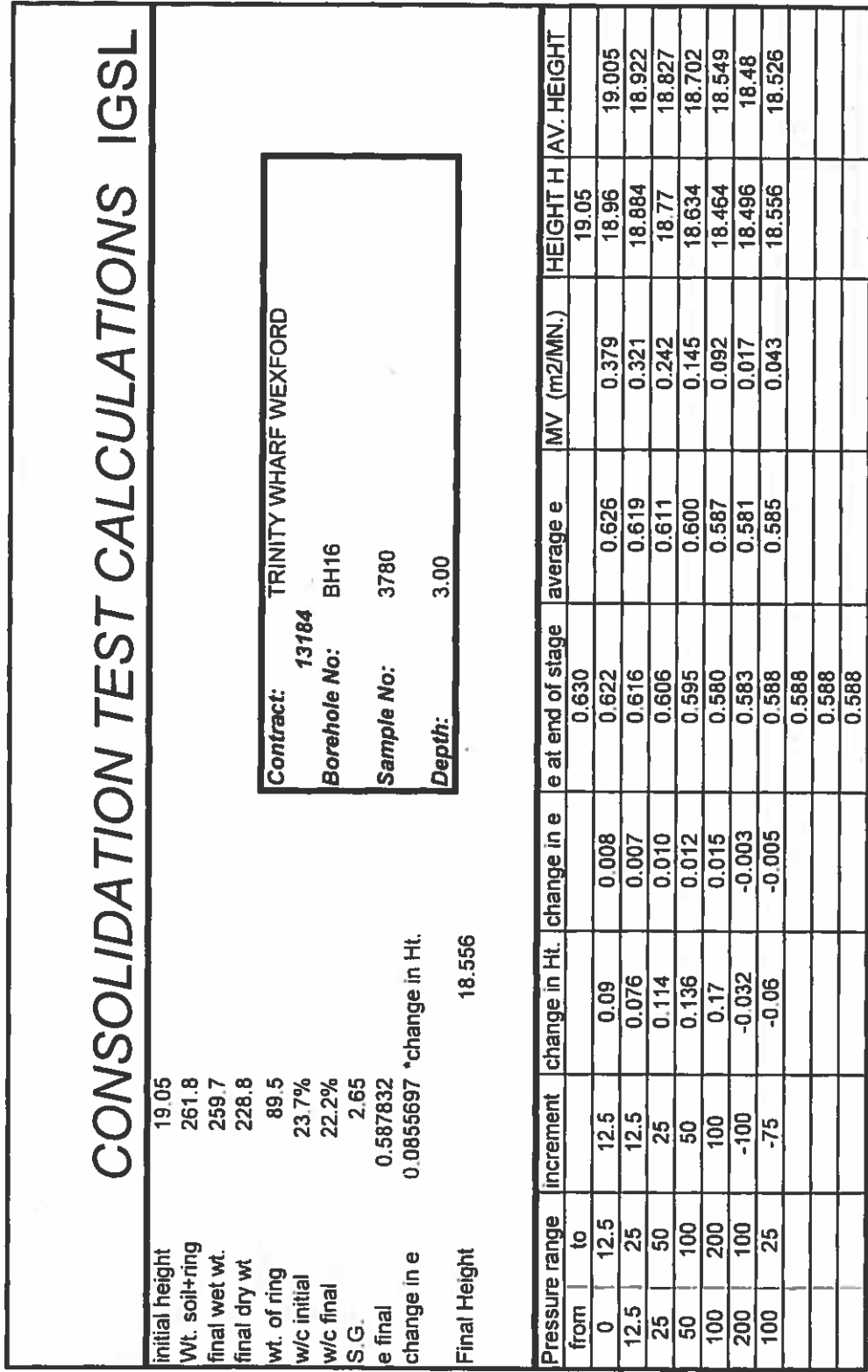
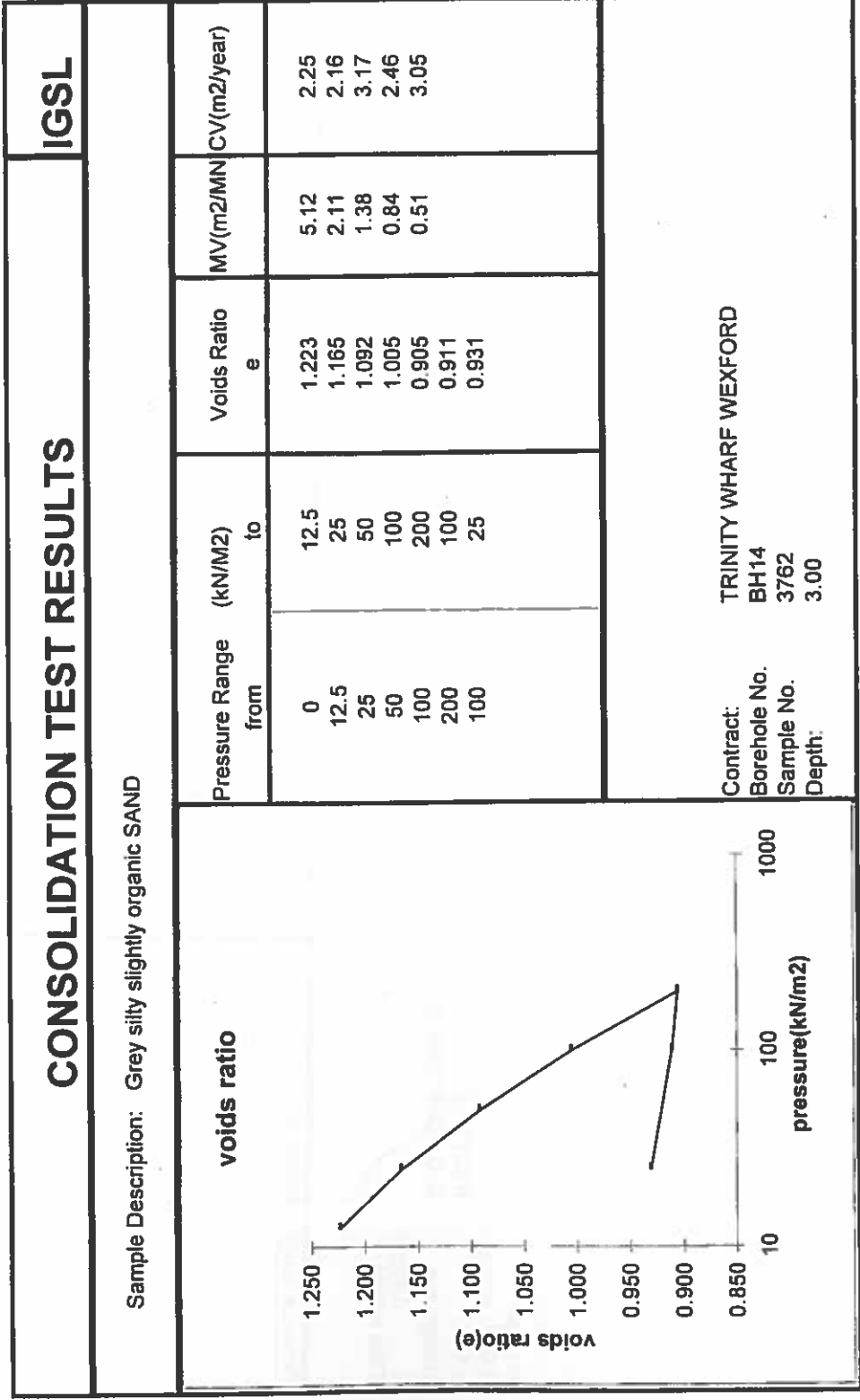
| CONSOLIDATION TEST RESULTS | | | | IGSL | | |
|---|--|------------------------|------|-------------|-----------|-------------|
| Sample Description: Orange yellow brown slightly sandy slightly gravelly CLAY | | | | | | |
| <div>voids ratio</div> <div>pressure(kN/m2)</div> | | Pressure Range (kN/M2) | | Voids Ratio | MV(m2/MN) | CV(m2/year) |
| | | from | to | e | | |
| | | 0 | 12.5 | 0.431 | 1.12 | 1.65 |
| | | 12.5 | 25 | 0.421 | 0.58 | 1.44 |
| | | 25 | 50 | 0.406 | 0.42 | 3.73 |
| | | 50 | 100 | 0.387 | 0.27 | 4.43 |
| | | 100 | 200 | 0.365 | 0.16 | 6.84 |
| | | 200 | 100 | 0.367 | | |
| | | 100 | 25 | 0.373 | | |
| Contract: TRINITY WHARF WEXFORD | | | | | | |
| Borehole No. BH3 | | | | | | |
| Sample No. 3740 | | | | | | |
| Depth: 2.50 | | | | | | |

Consol bh4

| CONSOLIDATION TEST CALCULATIONS IGSL | | | | | | | | | |
|---|--------------------------|---------------|-------------|-------------------|-----------|-------------|----------|------------|--|
| <div>Contract: TRINITY WHARF WEXFORD</div> <div>13184</div> <div>Borehole No: BH4</div> <div>Sample No: 3721</div> <div>Depth: 5.00</div> | | | | | | | | | |
| initial height | 19.05 | | | | | | | | |
| Wt. soil+ring | 280.2 | | | | | | | | |
| final wet wt. | 276.3 | | | | | | | | |
| final dry wt | 247.5 | | | | | | | | |
| wt. of ring | 89.4 | | | | | | | | |
| w/c initial | 20.7% | | | | | | | | |
| w/c final | 18.2% | | | | | | | | |
| S.G. | 2.65 | | | | | | | | |
| e final | 0.4827324 | | | | | | | | |
| change in e | 0.0821094 *change in Ht. | | | | | | | | |
| Final Height | 18.058 | | | | | | | | |
| Pressure range | increment | change in Ht. | change in e | e at end of stage | average e | MV (m2/MN.) | HEIGHT H | AV. HEIGHT | |
| from to | | | | | | | | | |
| 0 12.5 | 12.5 | 0.216 | 0.018 | 0.564 | | | 19.05 | | |
| 12.5 25 | 12.5 | 0.142 | 0.012 | 0.546 | 0.555 | 0.912 | 18.834 | 18.942 | |
| 25 50 | 25 | 0.224 | 0.018 | 0.535 | 0.541 | 0.605 | 18.692 | 18.763 | |
| 50 100 | 50 | 0.298 | 0.024 | 0.516 | 0.526 | 0.482 | 18.468 | 18.58 | |
| 100 200 | 100 | 0.344 | 0.028 | 0.492 | 0.504 | 0.325 | 18.17 | 18.319 | |
| 200 100 | -100 | -0.056 | -0.005 | 0.464 | 0.478 | 0.191 | 17.826 | 17.998 | |
| 100 25 | -75 | -0.176 | -0.014 | 0.468 | 0.466 | 0.031 | 17.882 | 17.854 | |
| | | | | 0.483 | 0.476 | 0.131 | 18.058 | 17.97 | |
| | | | | 0.483 | | | | | |
| | | | | 0.483 | | | | | |
| | | | | 0.483 | | | | | |

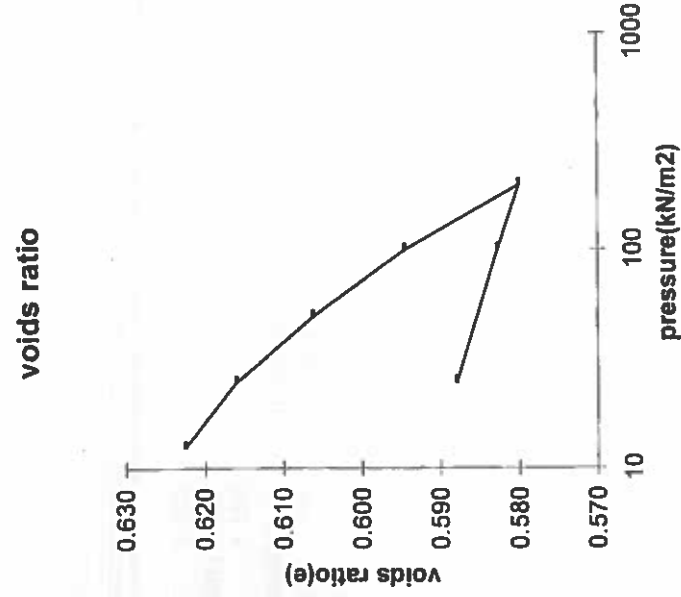
| CONSOLIDATION TEST RESULTS | | | | | IGSL | |
|---|------|------------------------|-------|------------------|-----------------------|-------------|
| Sample Description: Mottled orange yellow brown slightly sandy slightly gravelly CLAY | | | | | | |
| <div>voids ratio</div> <div>voids ratio(e)</div> | | Pressure Range (kN/M2) | | Voids Ratio e | MV(m2/MN) | CV(m2/year) |
| | | from | to | | | |
| 0 | 12.5 | 12.5 | 0.546 | 0.91 | 0.40 | |
| 12.5 | 25 | 25 | 0.535 | 0.61 | 0.64 | |
| 25 | 50 | 50 | 0.516 | 0.48 | 1.53 | |
| 50 | 100 | 100 | 0.492 | 0.33 | 1.49 | |
| 100 | 200 | 200 | 0.464 | 0.19 | 2.94 | |
| 200 | 100 | 100 | 0.468 | | | |
| 100 | 25 | 25 | 0.483 | | | |
| | | | | | TRINITY WHARF WEXFORD | |
| Contract: | | | | | BH4 | |
| Borehole No. | | | | | 3721 | |
| Sample No. | | | | | 5.00 | |
| Depth: | | | | | | |

| CONSOLIDATION TEST CALCULATIONS IGSL | | | | | | | | | |
|--|-----------|---------------|-------------|-------------------|-----------|-------------|----------|------------|--|
| <div>initial height 19.05</div> <div>Wt. soil+ring 242.3</div> <div>final wet wt. 227.3</div> <div>final dry wt 191.5</div> <div>wt. of ring 89.6</div> <div>w/c initial 49.9%</div> <div>w/c final 35.1%</div> <div>S.G. 2.65</div> <div>e final 0.9310108</div> <div>change in e 0.1244368</div> <div>*change in Ht. 15.518</div> <div>Final Height 15.518</div> | | | | | | | | | |
| <div>Contract: TRINITY WHARF WEXFORD</div> <div>Borehole No: BH14</div> <div>Sample No: 3762</div> <div>Depth: 3.00</div> | | | | | | | | | |
| Pressure range | increment | change in Ht. | change in e | e at end of stage | average e | MV (m2/MN.) | HEIGHT H | AV. HEIGHT | |
| from to | | | | | | | | | |
| 0 12.5 | 12.5 | 1.182 | 0.147 | 1.371 | 1.297 | 5.123 | 19.05 | 18.459 | |
| 12.5 25 | 12.5 | 0.466 | 0.058 | 1.223 | 1.194 | 2.114 | 17.868 | 17.635 | |
| 25 50 | 25 | 0.592 | 0.074 | 1.165 | 1.129 | 1.384 | 17.402 | 17.106 | |
| 50 100 | 50 | 0.694 | 0.086 | 1.092 | 1.049 | 0.843 | 16.81 | 16.463 | |
| 100 200 | 100 | 0.804 | 0.100 | 1.005 | 0.955 | 0.512 | 16.116 | 15.714 | |
| 200 100 | -100 | -0.046 | -0.006 | 0.905 | 0.908 | 0.030 | 15.312 | 15.335 | |
| 100 25 | -75 | -0.16 | -0.020 | 0.911 | 0.921 | 0.138 | 15.358 | 15.438 | |
| | | | | 0.931 | | | | | |
| | | | | 0.931 | | | | | |
| | | | | 0.931 | | | | | |
| | | | | 0.931 | | | | | |



CONSOLIDATION TEST RESULTS

Sample Description: Grey silty slightly organic SAND



| voids ratio | Pressure Range (kN/M ²) | | Voids Ratio e | MV(m ² /MN) | CV(m ² /year) |
|-------------|-------------------------------------|------|------------------|------------------------|--------------------------|
| | from | to | | | |
| | 0 | 12.5 | 0.622 | 0.38 | 12.37 |
| | 12.5 | 25 | 0.616 | 0.32 | 3.24 |
| | 25 | 50 | 0.606 | 0.24 | 5.02 |
| | 50 | 100 | 0.595 | 0.15 | 6.21 |
| | 100 | 200 | 0.580 | 0.09 | 7.89 |
| | 200 | 100 | 0.583 | | |
| | 100 | 25 | 0.588 | | |

The graph plots voids ratio (e) on the y-axis (ranging from 0.570 to 0.630) against pressure (kN/m²) on a logarithmic x-axis (ranging from 10 to 1000). A compression curve is shown with data points at approximately (12.5, 0.622), (25, 0.616), (50, 0.606), (100, 0.595), and (200, 0.580). A recompression path is also shown, starting at (200, 0.583) and ending at (25, 0.588).

TRINITY WHARF WEXFORD

Contract: BH16
Borehole No. 3780
Sample No.
Depth: 3.00

| SULPHATE ANALYSIS | | | | | | | | | | IGSL |
|---------------------------------|-----------|------------|-------------|-----------|---------------|------------------|--|-------------------|-------------------|-------------------|
| CONTRACT: TRINITY WHARF WEXFORD | | | | | | | | | | CONTRACT NO 13184 |
| BH/TP NO. | DEPTH (M) | SAMPLE NO. | SAMPLE TYPE | TEST CODE | % Passing 2mm | SULPHUR TRIOXIDE | | TOTAL SOIL so 3 % | TOTAL SOIL so 4 % | pH VALUE |
| | | | | | | WATER SO3 g/L | | | | |
| BH 4 | 2.00 | 3718 | D | S | 33 | | | 0.14 | 0.17 | 8.9 |
| BH 5 | 2.50 | 3739 | D | S | 67 | | | 0.02 | 0.02 | 8.1 |
| BH 8 | 3.50 | 3752 | D | S | 52 | | | 0.08 | 0.10 | 7.8 |
| BH 9 | 5.50 | 7719 | D | S | 45 | | | 0.07 | 0.08 | 8.4 |
| BH 11 | 2.50 | 7747 | D | S | 81 | | | 0.09 | 0.11 | 7.0 |
| BH 14 | 10.00 | 3770 | D | S | 40 | | | 0.01 | 0.01 | 8.9 |
| BH 16 | 11.00 | 3789 | D | S | 81 | | | 0.02 | 0.02 | 7.5 |
| BH 18 | 2.50 | 3375 | D | S | 64 | | | 0.01 | 0.01 | 7.6 |
| BH 21 | 1.50 | 7737 | D | S | 68 | | | 0.01 | 0.01 | 7.9 |

| TEST CODE | W = WATER | S = SOIL | A = AQUEOUS SOIL EXTRACT(2:1) |
|-----------|-----------|----------|-------------------------------|
|-----------|-----------|----------|-------------------------------|

Appendix IV – Environmental Test Records



ALcontrol Laboratories (Dublin)

18a Rosemount Business Park,
Ballycoolin,
Dublin 11
Ireland
Tel: +353 (0) 1 8829893
Fax: +353 (0) 1 8829895

CERTIFICATE OF ANALYSIS

Client: IGSL Ltd
Unit F
M7 Business Park
Naas
Co Kildare
Ireland

Attention: John Clancy

Date: 14 January, 2008

Our Reference: 07-B08783/01

Your Reference: TRINITY WHARF WEXFORD

Location:

A total of 7 samples was received for analysis on Thursday, 20 December 2007 and authorised on Monday, 14 January 2008. Accredited laboratory tests are defined in the log sheet, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation. We are pleased to enclose our final report, it was a pleasure to be of service to you, and we look forward to our continuing association.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Signed

Lorraine Mc Namara

Lorraine McNamara
Laboratory Technical Manager

Compiled By

Dylan Halpin

Dylan Halpin

Printed at 10:12 on 15/01/2008

ALcontrol Geochem Ireland is a trading division of ALcontrol UK Limited.

Registered Office: Templeborough House, Mill Close, Rotherham, S60 1BZ. Registered in England and Wales No. 4057291



APPENDIX

1. Results are expressed as mg/kg dry weight (dried at 30°C) on all soil analyses except for the following: NRA Leach tests, flash point, and ammoniacal N₂ by the BRE method, VOC, PRO, Cyanide, Acid Soluble Sulphide, SVOC, DRO, PAH, PCB, TPH CWG, TPH by IR, OFGs and SEM.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. A sub sample of all samples received will be retained free of charge for one month for soils and one month for waters (sample size permitting), but may then be discarded unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, an asbestos screen is done in-house on soils and if no fibres are found will be reported as NFD – no fibres detected. If fibres are detected, then identification and quantification is carried out by ALcontrol Technichem or Alcontrol Shutlers in the UK. If a sample is suspected of containing asbestos, then drying and crushing will be suspended on that sample until the asbestos results are known. If asbestos is present, then no analysis requiring dry sample are undertaken.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace is present in the volatile sample.
8. NDP – No Determination Possible due to insufficient/unsuitable sample.
9. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
10. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.

Last updated February 2005

ALcontrol Laboratories Ireland

Test Schedule Summary

Ref Number: 07-B08783/01

Client: IGSL Ltd

Date of Receipt: 20/12/2007

Sample Type: SOIL

Location:

Client Contact: John Clancy

Client Ref: TRINITY WHARF WEXFORD

TRACTED TO OTHER LABORATORY / ** SAMPLES ANALYSED AT THE CHESTER LABORATORY

| MODULE | METHOD | TEST NAME | TOTAL |
|--------|----------------|--|-------|
| | CEN 10:1 Leach | CEN 10:1 Leachate Test | 7 |
| | CV AA | Dissolved Mercury Low Level in CEN 10:1 Leachate | 7 |
| | ELTRA | Total Organic Carbon | 7 |
| | GC | PRO & BTEX | 7 |
| | GC FID/CALC | Mineral Oil by GC | 7 |
| | GCMS | Coronene | 7 |
| | GCMS | PAH EPA (16) | 7 |
| | GCMS | PAH Total (17) GCMS (Solid) | 7 |
| | GCMS | PAH Total (6) GCMS <1.6mg/kg (Solid) | 7 |
| | GCMS | PCB 7 Congeners | 7 |
| | GRAVIMETRIC | Natural Moisture Content | 7 |
| | GRAVIMETRIC | Total Dissolved Solids Gravimetric CEN 10:1 | 7 |
| | HPLC | Total Phenols by HPLC in CEN 10:1 Leachate | 7 |
| | ICP MS | Dissolved Antimony Low CEN 10:1 Leach | 7 |
| | ICP MS | Dissolved Arsenic Low CEN 10:1 Leach | 7 |
| | ICP MS | Dissolved Barium Low CEN 10:1 Leach | 7 |
| | ICP MS | Dissolved Cadmium Low CEN 10:1 Leach | 7 |
| | ICP MS | Dissolved Chromium Low CEN 10:1 Leach | 7 |
| | ICP MS | Dissolved Copper Low CEN 10:1 Leach | 7 |
| | ICP MS | Dissolved Lead Low CEN 10:1 Leach | 7 |
| | ICP MS | Dissolved Molybdenum Low CEN 10:1 Leach | 7 |
| | ICP MS | Dissolved Nickel Low CEN 10:1 Leach | 7 |
| | ICP MS | Dissolved Selenium Low CEN 10:1 Leach | 7 |
| | ICP MS | Dissolved Zinc Low CEN 10:1 Leach | 7 |
| | IR | Dissolved Organic Carbon in CEN 10:1 Leachate | 7 |
| | KONE | Chloride in CEN 10:1 Leachate | 7 |
| | KONE | Fluoride in CEN 10:1 Leachate | 7 |
| | KONE | Sulphate in CEN 10:1 Leachate | 7 |

☐ Interim ☒ Validate

ALcontrol Laboratories Ireland Table Of Results

01 / 5889

Ref Number: 07-B08783/01

Client: IGSL Ltd

Date of Receipt: 20/12/2007

(of first sample)

Sample Type: SOIL

Location:

Client Contact: John Clancy

Client Ref: TRINITY WHARF WEXFORD

[illegible]

Notes : METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL. NDP = NO DETERMINATION POSSIBLE.

Checked By: Dylan Halpin

Printed at 10:12 on 15/01/2008

* SUBCONTRACTED TO OTHER LABORATORY / ** SAMPLES ANALYSED AT THE CHESTER LABORATORY

Ref Number: 07-B08783/01

Sample Type: SOIL

Client: IGSL Ltd

Location:

Date of Receipt: 20/12/2007

Client Contact: John Clancy

(of first sample)

Client Ref: TRINITY WHARF WEXFORD

[illegible]

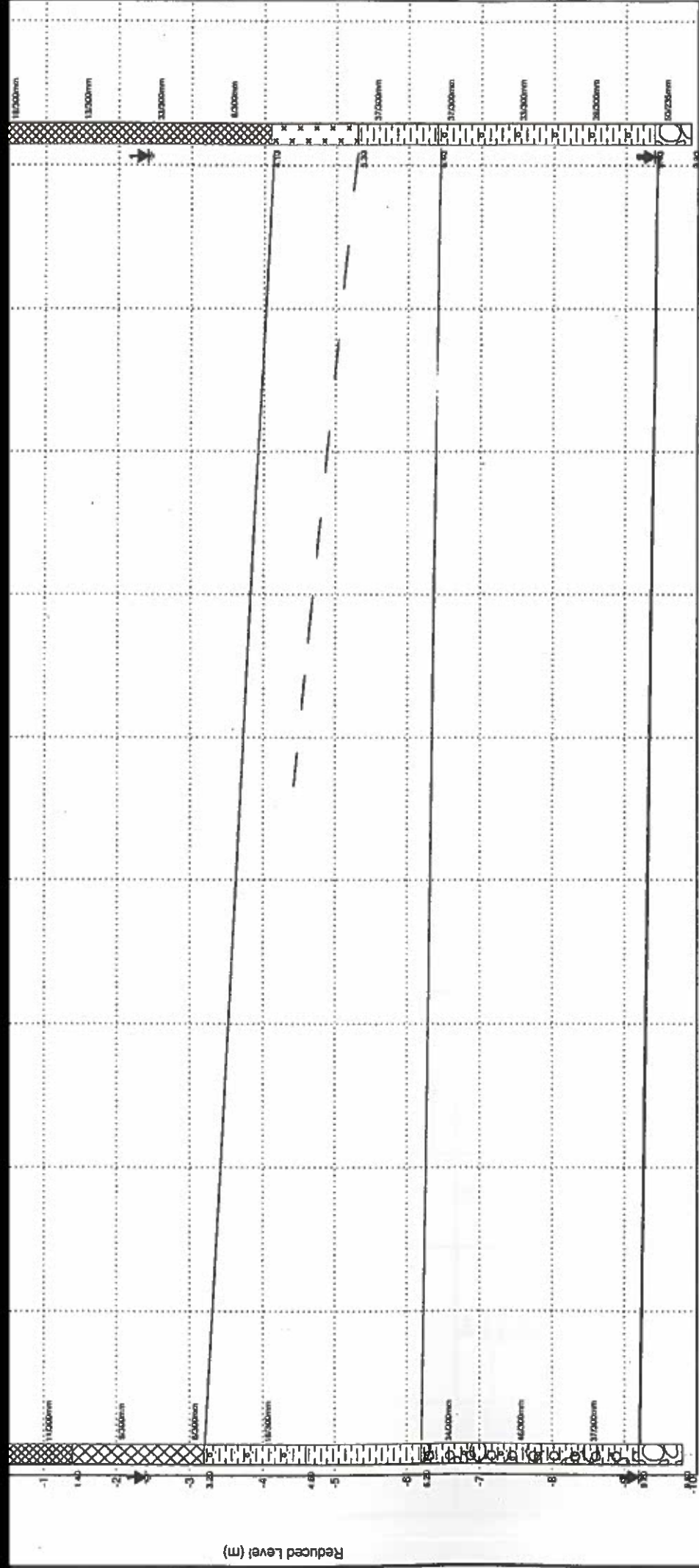
Notes : METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL. ND = NO DETERMINATION POSSIBLE

Checked By: Dylan Halpin

Printed at 10:12 on 15/01/2008

* SUBCONTRACTED TO OTHER LABORATORY / ** SAMPLES ANALYSED AT THE CHESTER LABORATORY

Appendix V Sections and Site Plans



NOT A CARBON COPY 13184 CP2 105L G07 201008



LITHOLOGY GRAPHICS

MADE GROUND BOULDERS

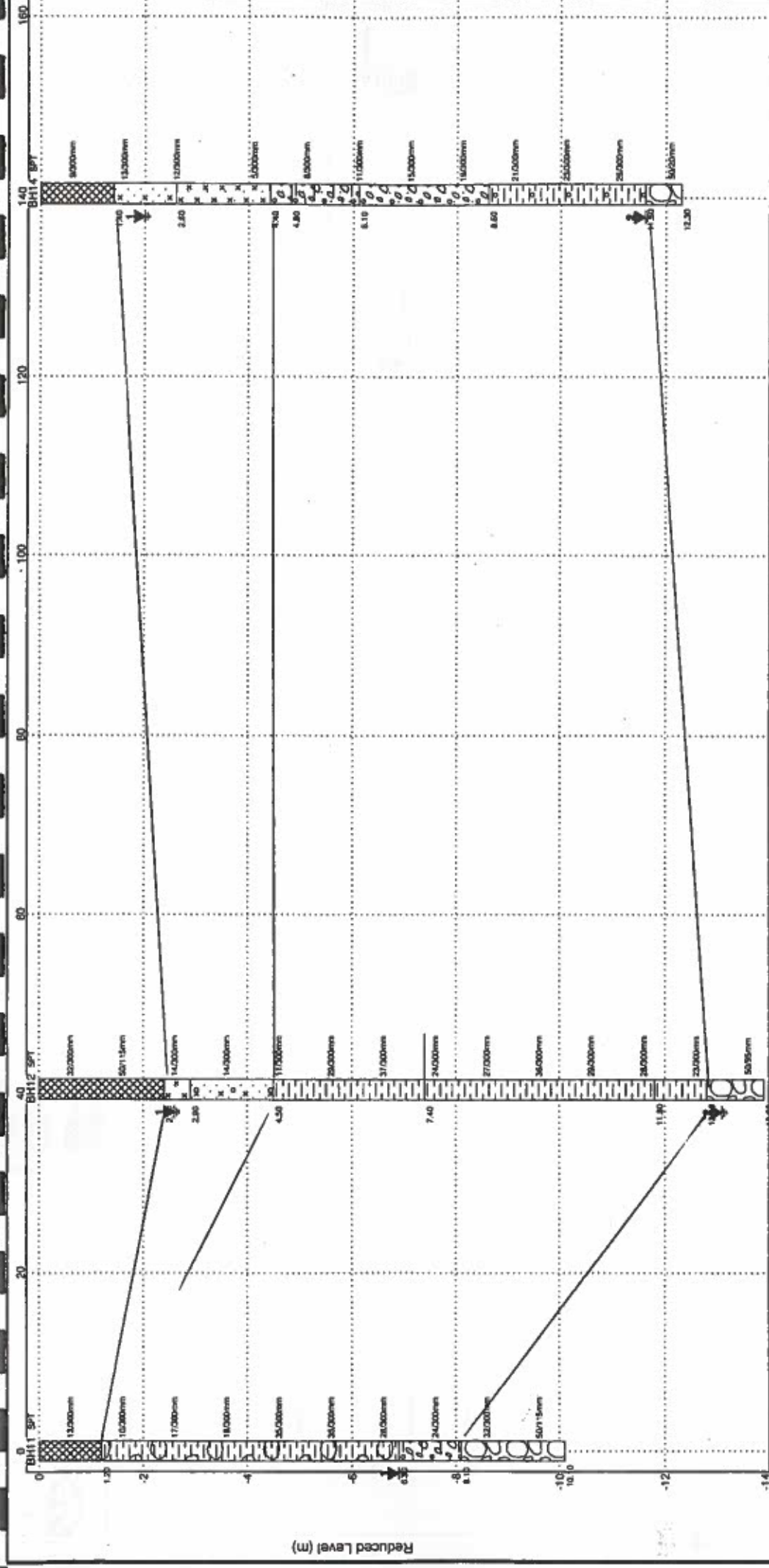
SANDY GRAVELLY CLAY GRAVELLY CLAY

SILTY SANDY GRAVELLY COBBLY BOULDERY CLAY

SUBSURFACE SECTION

Client: Deerland Properties
Project: Trinity Wharf, Wexford
Number: 13184

BH4



NOT A CARBON COPY 13184 CP2 105L G07 201008



LITHOLOGY GRAPHICS

MADE GROUND BOULDERS

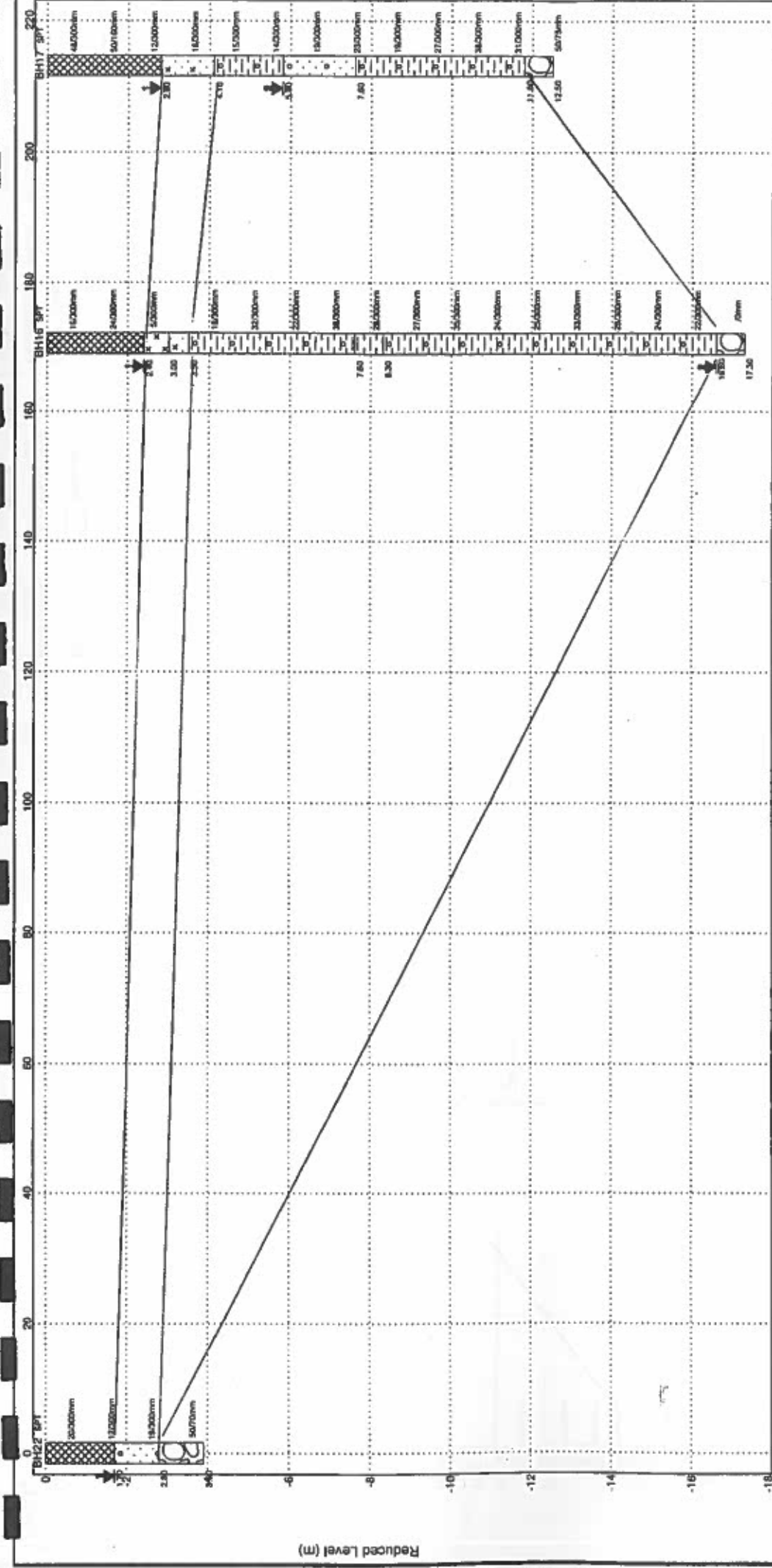
SANDY GRAVELLY CLAY GRAVELLY CLAY

SILTY SANDY GRAVELLY COBBLY BOULDERY CLAY

SUBSURFACE SECTION

Client: Deerland Properties
Project: Trinity Wharf, Wexford
Number: 13184

BH12

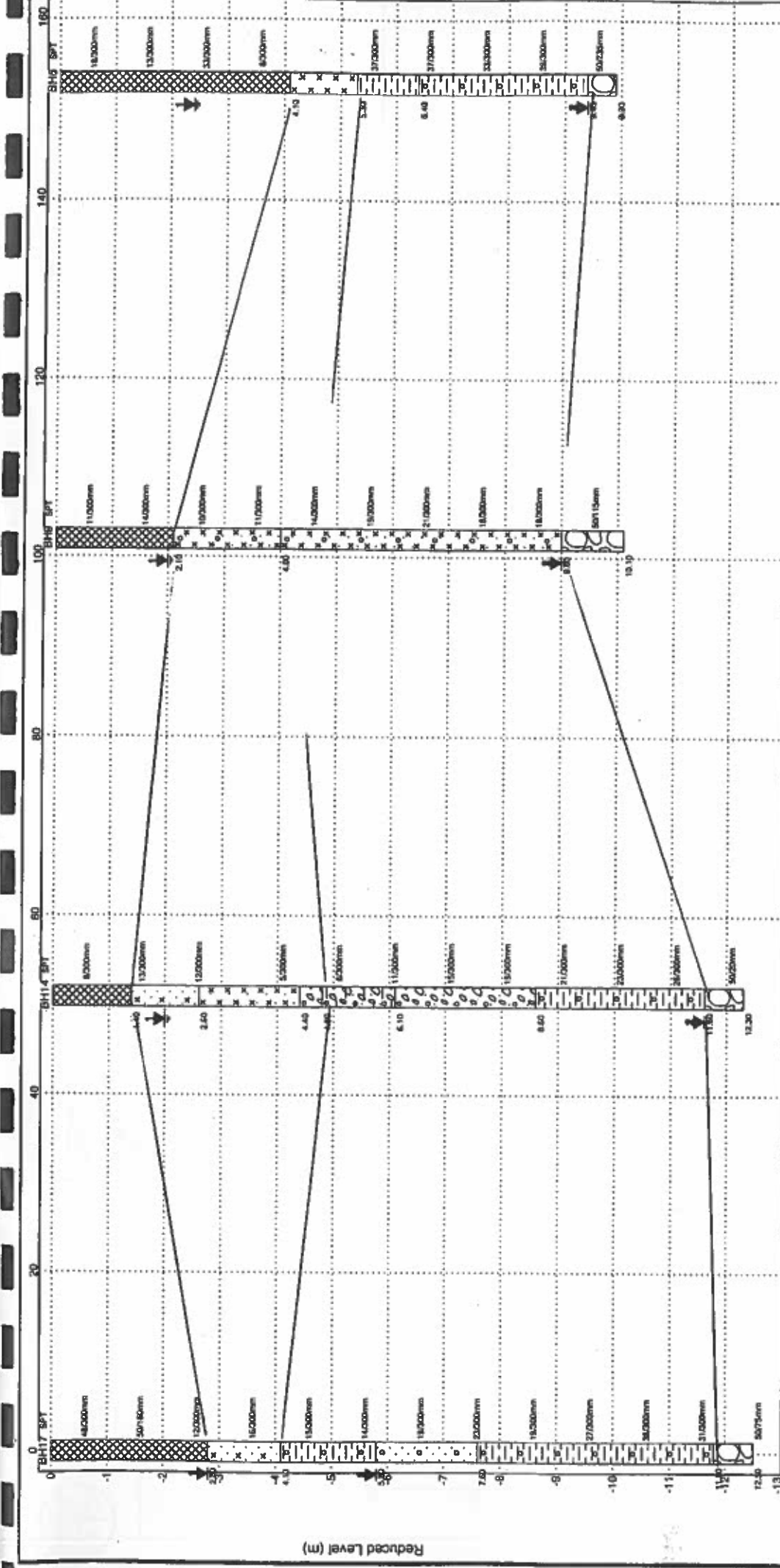


LITHOLOGY GRAPHICS

- MADE GROUND
- SILTY SAND
- GRAVELLY SAND
- SILTY CLAY
- GRAVELLY CLAY
- CLAY

SUBSURFACE SECTION

Client: Deerland Properties
Project: Trinity Wharf, Wexford
Number: 13184



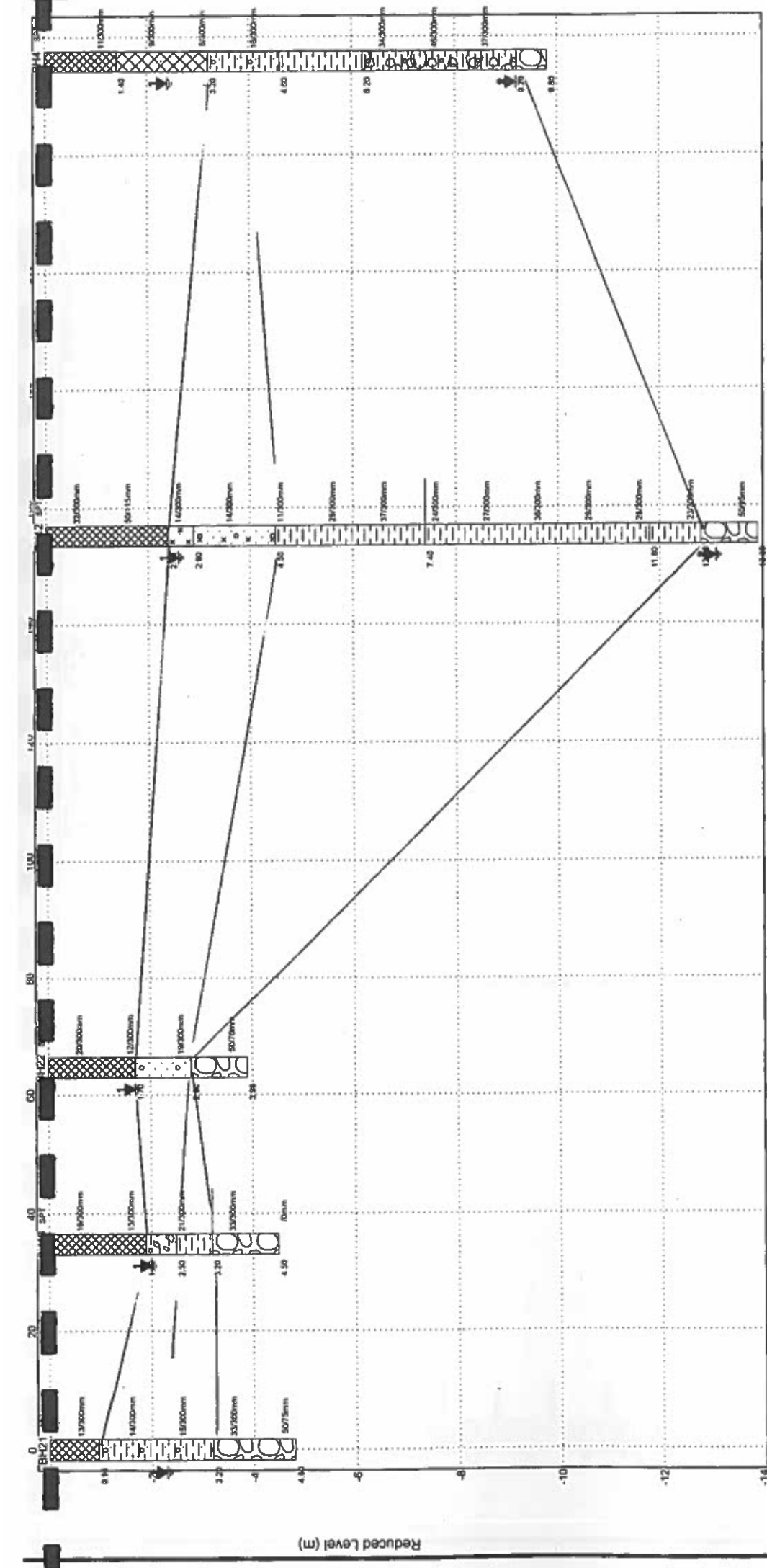
LITHOLOGY GRAPHICS

- MADE GROUND
- SILTY SAND
- GRAVELLY SAND
- SILTY CLAY
- GRAVELLY CLAY
- CLAY

SUBSURFACE SECTION

Client: Deerland Properties
Project: Trinity Wharf, Wexford
Number: 13184






LITHOLOGY GRAPHICS



SUBSURFACE SECTION

Client: Deerland Properties
Project: Trinity Wharf, Wexford
Number: 13184

LEGEND:

INDICATES E 

INDICATES F 