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Environmental Impact Assessment Report (EIAR) Volume 3 Appendices - Part 3 Chapter 11 and 12

In respect of

**A Proposed Large-scale Residential
Development at Ratoath, Co. Meath**

On behalf of

Beo Properties Ltd.

June 2025

1 Overview

1.1 Overview Appendices

Chapter 1 Introduction	N/A
Chapter 2 Background to the Scheme	N/A
Chapter 3 Planning Policy Context	N/A
Chapter 4 Alternatives	N/A
Chapter 5 Air Quality	N/A
Chapter 6 Climate Factors	N/A
Chapter 7 Noise & Vibration	N/A
Chapter 8 Biodiversity	8.1 Bat Survey 8.2 Non-volant Terrestrial Fauna Assessment
Chapter 9 Archaeology, Architectural & Cultural Heritage	9.1 Archaeological Impact Assessment (AIA) Report
Chapter 10 Landscape and Visual	10.1 Verified Views (Baseline and Photomontages)
Chapter 11 Land, Soils and Geology	11.1 Site investigation
Chapter 12 Water	12.1 Uisce Eireann EIAR Scoping Response Document
Chapter 13 Population & Human Health	N/A
Chapter 14 Material Assets: Traffic & Transport	N/A
Chapter 15 Material Assets Waste Management	N/A
Chapter 16 Material Assets Utilities	N/A
Chapter 17 Interactions	N/A
Chapter 18 Summary of Mitigation Measures	N/A

Appendix 11.1 - Site investigation

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**HOUSING DEVELOPMENT
RATHOAT COUNTY MEATH**

PIVOTAL CONSTRUCTION

**O'CONNOR SUTTON CRONIN
CONSULTING ENGINEERS**

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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.

Standards

The ground investigation works for this project have been carried out by IGSL in accordance with Eurocode 7 - Part 2: Ground Investigation & Testing (EN 1997-2:2007). This has been used together with complementary documents such as BS 5930 (1999), BS 1377 (Parts 1 to 9) and Engineers Ireland Specification & Related Documents for Ground Investigation in Ireland (2006). The following Irish (IS) and European Standards or Norms are referenced:

- IS EN 1997-2 Eurocode 7: 2007 – Geotechnical Design – Part 2: Ground Investigation & Testing
- IS EN ISO 22475-1:2006 Geotechnical Investigation and Sampling – Sampling Methods & Groundwater Measurements
- IS EN ISO 14688-1:2002 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 1: Identification and Description
- IS EN ISO 14688-2:2004 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 2: Classification Principles

Routine Sampling.

Undisturbed samples of soils, predominantly cohesive in nature are obtained unless otherwise stated by a 104mm diameter open-drive tube sampler or Piston 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 were conducted strictly in accordance with Section 4.6 of IS EN 1997-2:2007. The SPT equipment (hammer energy test) has been calibrated in accordance with EN ISO 22476-3:2005 to obtain the Energy Ratio (E_r) of each hammer. A calibration certificate is available upon request. The E_r is defined as the ratio of the actual energy E_{meas} (measured energy during calibration) delivered to the drive weight assembly into the drive rod below the anvil, to the theoretical energy (E_{theor}) as calculated from the drive weight assembly. The recorded number of blows (N) reported on the engineering logs are uncorrected. In sands, the energy losses due to rod length and the effect of the overburden pressure should be taken into account (see IS EN ISO 22476-3:2005).

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 conditions, tidal variations etc.

Engineering Logging

Soil and rock identification has been based on the examination of the samples recovered and conforms with IS EN ISO 14688-1:2002 and IS EN ISO 14689-1:2004.

Where peat has been encountered during site works, samples have been logged in accordance with the Von Post Classification (ref. Von Post, L. 1992. Sveriges Geologiska Undersöknings 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).

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.

Reporting

Recommendations made and opinions expressed in this 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 by IGSL Ltd for ground conditions between exploratory hole locations.

The engineering logs provide ground profiles and configuration of strata relevant to the investigation depths achieved and caution should be taken when extrapolating between exploratory points. No liability is accepted for ground conditions extraneous to the investigation points. Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction, mining works or karstification below or close to the site.

This report has been prepared for the project client and the information should not be used without prior written permission. Any recommendations developed in this report specifically relate to the proposed development. IGSL Ltd accepts no responsibility or liability for this document being used other than for the purposes for which it was intended.

**REPORT ON A SITE INVESTIGATION
FOR A PROPOSED HOUSING DEVELOPMENT
RATHOAT COUNTY MEATH
FOR
PIVOTAL CONSTRUCTION**

**O'CONNOR SUTTON CRONIN
CONSULTING ENGINEERS**

Report No. 22578

September 2020

I Introduction

A new residential development is proposed for a site located south of Rathoat in County Meath.

An investigation of sub soil conditions in the area of the new development has been carried out by IGSL for O'Connor Sutton Cronin, Consulting Engineers, on behalf of Pivotal Construction.

The scheduled site investigation included the following elements.

* Cable Percussion Boreholes	4 nr.
• Rotary Holes	1 nr.
• Trial Pits	6 nr.
• CBR by Plate Test	15 nr.
• Infiltration Test to BRE Digest 365	4 nr
• HD Dynamic Probes	2 nr.
• Geotechnical Laboratory Testing	
• Chemical Laboratory Testing	

Note:

Scheduled slit trenches at three locations were cancelled during the investigation period.

This report includes all factual data from completed field and laboratory operations and discusses these findings relative to the proposed new development.

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II Fieldwork

This development is to take place on a greenfield site located off the Fairyhouse Road just south of Rathoat Village in County Meath.

The exploratory locations are noted on the OCSC drawing enclosed in Appendix VIII. Locations were marked out by IGSL on site and were surveyed on completion to National Grid and Ordinance Levels were established.

The various elements of the investigation are detailed in the following paragraphs. All field works were supervised by an experienced geotechnical engineer who carefully recorded stratification, took photographs as necessary, recovered samples and prepared detailed records.

Close liaison was maintained throughout with the Consulting Engineer. All appropriate documentation was submitted and approved prior to site commencement. Each location was scanned electronically (CAT) to ensure that existing services were not damaged. A shallow trial pit was also opened by hand at borehole locations to confirm this.

All HSE safety regulations pertaining to COVID 19 were followed for this project.

Boreholes

The exploratory holes (BH01 to BH04) were bored with conventional 200mm cable-tool methods using a Dando Exploratory Rig.

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 reflect a high degree of consistency. Topsoil overlies a stratum of firm to stiff brown gravelly CLAY which continued to approximately 2.00 metres. Stiff to very stiff grey black gravelly CLAY is then encountered and boreholes continued to completion in this stratum at depths ranging from 4.60 to 8.10 metres. Cobbles and occasional boulders were noted randomly during the course of boring. Boreholes were terminated when further advancement was precluded by such boulder presence.

The sub-soils comprise GLACIAL TILL or BOULDER CLAY deposition, typically brown boulder clay overlying black boulder clay or lodgement till. The stratification is quite typical of the general area.

No ground water was encountered during the course of the borehole investigation. A standpipe was installed in BH01 to facilitate long-term ground water observation. Ground water level readings are included with the boring records.

Rotary Core Drilling

Rotary core drilling was scheduled at one location to advance borehole depth and establish rock horizon if practical. The hole was designated RB01.

A GEO 205 rig was used to drill a 100mm diameter hole to a depth of 16.50 metres.

A detailed drilling record is presented in Appendix II. The record confirms the presence of brown and black boulder clay extending to approximately 10.00 metres.

From 10.00 to 16.50 metres alternating layers of gravel and sand were noted with some adverse "blowing" noted in the fine sand layers.

It was not possible to recover core of the granular soils, sample identification was based on examination of fragmented drilling returns.

Standard Penetration Tests (SPT) were carried out at intervals during the course of rotary core drilling with results noted in the RH column of the detailed drilling log.

Trial Pits

Six Trial Pits were excavated using a JCB excavator under engineering supervision. Detailed trial pit logs with photographs are enclosed in Appendix III. Trial Pits are referenced TP01 to TP06. All locations have been surveyed to National Grid.

The records present a high degree of consistency, with surface topsoil initially noted. The topsoil is generally 200mm thick.

Below the topsoil a stratum of firm to stiff brown gravelly CLAY (Brown boulder clay) is encountered. This is consistent with the glacial till or boulder clay noted in the boreholes and continues to depths generally between 1.50 and 2.00 metres.

Very stiff to hard grey black lodgement till underlies the brown boulder clay and excavations were terminated in this stratum at depths between 1.90 and 3.00 metres. Difficulty in excavation in the black boulder clay was noted in each location.

Trial excavations were generally dry and stable throughout the investigation period.

A minor variation to the general pattern was noted in TP03 where the boulder clay becomes sandier and minor water seepage was noted at 2.20 metres.

Pits were backfilled with excavated material and compacted in layers. Disturbed areas were levelled and tidied on completion.

In Situ CBR by Plate Bearing Test

The CBR value of the soils at shallow depth was established at fifteen locations using Plate Bearing Test Apparatus. Tests were carried out at proposed roads or pavement areas. A steel plate is loaded and off-loaded incrementally over two stages and the deflection under load and recovery under off-load is measured by a system of dial gauges. The data is processed and load settlement graphs are prepared. An equivalent CBR value is calculated in accordance with NRA HD25-26/10. At each location testing was carried out at 0.50 metres BGL

Results are summarised in the following table and details are presented in Appendix IV with stratification noted on an appropriate Trial Pit record.

Test No.	CBR at Load Cycle (%)	CBR @ Re-Load (%)
PBT 01	5.8	6.7
PBT 02	15.2	46.3
PBT 03	7.2	27.9
PBT 04	11.0	13.4
PBT 05	11.8	32.5
PBT 06	12.8	36.3
PBT 07	5.0	36.3
PBT 08	4.9	10.2
PBT 09	4.9	9.8
PBT 10	3.4	5.2
PBT 11	3.2	6.1
PBT 12	3.0	4.4
PBT 13	3.6	5.8
PBT 14	5.4	6.9
PBT 15	21.5	45.1

Infiltration Tests

Infiltration testing was performed in accordance with BRE Digest 365 'Soakaway Design' at four locations. Details are presented in Appendix V. The Test Pits were opened to approximately 2.00 metres deep and detailed logs were prepared. The stratification comprised topsoil overlying stiff brown-grey gravelly CLAY.

To obtain a measure of the infiltration rate of the sub-soils, water is poured into the test pit, and records taken of the fall in water level against time. The test is normally carried out over two cycles following initial soakage. The infiltration rate is the volume of water dispersed per unit-exposed area per unit of time, and is generally expressed as metres/minute or metres/second. In these calculations the exposed area is the sum of the base area and the average internal area of the pit sides over the test duration.

No fall in water level was recorded in the first test cycle over the sixty-minute test period, confirming the impermeable nature of the boulder clay deposits.

An Infiltration Rate (f) of 0.00 metres/minute has been recorded at each location, confirming test failure

Heavy Duty Dynamic Probes

Heavy Duty Dynamic Probes were taken at two specified locations. Probing was in accordance with the heavy-duty probe specification of BS 1377: Part 9: 1990. In these tests, the soil resistance is measured in terms of the number of drop-hammer blows required to drive the test probe through each 100 mm increment of penetration. Probing is terminated when the blow count exceeds 25/100mm to avoid damage to the apparatus. Where loose material is present a single blow count may drive the apparatus in excess of 100mm. In this instance blow counts of zero may be recorded. Individual probe records are contained in Appendix VI and are summarised as follows.

Probe No.	SOFT ZONE N ₁₀₀ < 2	STIFF N ₁₀₀ > 6	REFUSAL
DP01	0.00 – 0.40	0.60	2.00
DP02	0.00 – 0.50	0.50	2.20

III. Testing

(a) In Situ Standard penetration Tests

Standard penetration tests were carried out at approximate 1.00 metre intervals in the geotechnical boreholes and corehole to measure relative in-situ soil strength. N values are noted in the right hand column of the individual records, representing the blow count required to drive the standard sampler 300mm into the soil, following initial seating blows. Where full test penetration was not achieved the blow count for a specific penetration is recorded, or refusal is indicated where appropriate. The results of the tests are summarised as follows:

STRATUM	N VALUE RANGE	AVERAGE	COMMENT
<i>Brown Gravelly CLAY</i>			
1.0 m BGL	14 to 19	17	Firm to Stiff
2.0 m BGL	22 to 28	25	Stiff
<i>Black Gravelly CLAY</i>			
3.0 m BGL	24 to 34	29	Stiff to Very Stiff
4.0 m BGL	31 to 38	35	Very Stiff
5.0 to 8.0 m BGL	33 to 50	40	Very Stiff to Hard
<i>Rotary Hole</i>			
8.0 to 16.00 metres	> 50	50	Hard

A number of limited penetration SPT tests were recorded on boulders or cobbles within the boulder clay stratum. These high results are not included in the above table or used in assessing average values.

All SPT tests in the rotary holes recorded refusal after limited penetration and are noted as $N > 50$.

(b) Laboratory Tests

A programme of laboratory testing was scheduled following completion of site operations. Geotechnical testing was carried out by IGSL in it's INAB-Accredited laboratory. Chemical testing was carried out in the UK by EUROFINS. The test programme included the following elements:

- Liquid and Plastic Limits / Moisture Content IGSL
- PSD Grading by wet sieve and hydrometer. IGSL
- Sulphate / Chloride / pH EUROFINS

All laboratory data is presented in Appendix VII and individual tests are briefly discussed as follows.

Liquid and Plastic Limits

Soil samples from the site had Atterberg Limits determined in accordance with BS1377. The results reflect a high degree of uniformity in the gravelly clay stratum. The soils fall consistently into the CL category of the standard Casagrande classification, reflecting sensitive uniformly low plasticity clay-matrix material.

The Natural Moisture Content ranges from 9 to 17%.

PSD Grading

The particle size distribution curves for three samples were determined by wet sieve and hydrometer analysis. The resulting graphs are uniformly and typically straight-line in nature, with smooth particle size distribution from the fine clay to coarse gravel fraction.

Both Atterberg Limits and PSD Grading results are typical of the local glacial till deposition.

Chemical

Two samples have been analysed to determine sulphate, chloride and pH values. Sulphate concentrations (SO₄ 2:1 extract) of < 0.010 g/l were established with pH values of 8.0 and 7.5. Water Soluble Chloride contents of < 0.010 g/l were also confirmed.

A sulphate design class of DS-1 (ACEC Classification for Concrete) is indicated for sulphate concentrations lower than 0.5 g/l. No special precautions are therefore deemed necessary for protection of below ground concrete.

IV. Discussion:

The new housing development is to be located on the site as shown on the attached plan. The area is greenfield, in former agricultural use.

A detailed investigation has been carried out under the direction of O'Connor Sutton Cronin. Consulting Engineers. The factual data from field and laboratory is presented in Sections 1 to III of this report.

SUMMARY STRATIFICATION

A high degree of consistency has been confirmed in the borehole and trial pit locations.

Superficial topsoil is present to an average depth of 0.20 metres.

Below the topsoil, GLACIAL TILL or BOULDER CLAY is encountered. This stratum is initially firm to stiff brown sandy gravelly CLAY, extending to about 2.00 metres and overlying stiff to very stiff black gravelly CLAY.

The black boulder clay continues to an approximate depth of 10.00 metres. Rotary drilling has confirmed more granular soils (SAND and GRAVEL) from 10.00 to the final investigation depth of 16.50 metres. Bedrock has not been identified.

No ground water was noted during the course of the borehole investigation and only a minor seepage was noted in an isolated sandy zone in Trial Pit TP03.

A standpipe installed at BH01 recorded water level at 8.20 metres BGL On 24/06/2020. A reading taken three weeks later (14/07/2020) recorded ground water standing at 1.74 metres BGL.

ALLOWABLE BEARING PRESSURES

The strength of the soils has been established by In-Situ Standard Penetration Tests in the boreholes and rotary hole. Dynamic Probe resistance is used to assess allowable bearing. Visual assessment of the ground during trial pit operations by experienced IGSL personnel has also been considered in establishing allowable bearing pressures. Geotechnical testing confirms the glacial till characteristics and the high degree of uniformity in the sub soil. The characteristics of the boulder clay in the general area are well documented and the findings on this site are typical of the regional pattern.

Standard Penetration Tests in the boulder clay at respective depths of 1.00, 2.00 and 3.00 metres, with suggested allowable bearing pressures, are indicated as follows:

Depth	N Value Range	Average N Value	ABP (Kn/Sq m.)	
			Using Lowest N	Using Average N
1.00	14 – 19	17	150	175
2.00	22 – 28	25	200	275
3.00	24 to 34	29	250	300

RECOMMENDED FOUNDATIONS

For conventional two-storey construction an allowable bearing pressure of 150 KPa is generally appropriate.

We would recommend adopting this allowable bearing pressure for conventional reinforced strip or pad foundations placed nominally at a depth of 1.00 metre. Utilising the lower SPT range would permit this allowable bearing pressure.

Maximum settlement of the order of 10mm can be expected in the glacial soils under this load intensity. Differential movement will be negligible.

We strongly recommend visual inspection of foundation excavations by experienced personnel to ensure uniformity and suitability of the founding medium. Any soft or suspect material should be removed and where necessary replaced with low-grade concrete. The soils encountered will be sensitive to moisture content variation and excavations should be protected by blinding or foundation concrete placed rapidly following excavation.

Should higher loading intensities be envisaged or if basement structures are proposed, foundation depth can be increased to avail of higher SPT values and increased allowable bearing pressure.

Excavation / Ground Water

No difficulties are envisaged in excavation in the boulder clay deposits. The lower black lodgement till is quite hard with some boulder presence, however experienced local contractors will have extensive experience in dealing with this stratum. No significant ground-water ingress was recorded some minor water seepages may occur.

Some care should be taken in deep service excavation. Statutory safety regulations prohibit personnel entering unsupported excavations greater than 1.20 metres deep, irrespective of apparent stability.

A final standing water table approximately 1.70 metres BGL has been indicated by standpipe observation. This will not be relevant in short term foundation excavation, but can be used in assessing possible uplift if basement structures are proposed.

Proposed Roads / Paved Areas

CBR values have been established by Plate Bearing Tests. An average CBR of 4 to 5% can be adopted for design purposes using the results at initial load cycle. Visual inspection of excavated formation is again advised to ensure that all organic or unsuitable fill material is removed.

Infiltration

Very low infiltration rates have been established by BRE Digest 365 test. The values are typical of cohesive glacial till or boulder clay material. The results indicate that the soils are unsuitable for dispersion of storm or surface water in conventional soakaways.

Disposal of storm / surface water to a suitable local watercourse or the use of the local authority storm water system should be considered.

Foundation Concrete

Low sulphate and chloride levels and near neutral pH values confirm that normal foundation concrete will be free from aggressive chemical attack.

IGSL/JC
September 2020

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Appendix I Boring Records

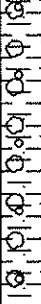
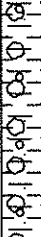
 GEOTECHNICAL BORING RECORD REPORT NUMBER 22578										
CONTRACT Ratoath, Co.Meath						BOREHOLE NO. BH01 SHEET Sheet 1 of 1				
CO-ORDINATES 702,256.00 E 750,600.00 N			RIG TYPE DANDO 2000 BOREHOLE DIAMETER (mm) 200 BOREHOLE DEPTH (m) 8.20			DATE COMMENCED 24/06/2020 DATE COMPLETED 24/06/2020				
CLIENT Pivotal Construction ENGINEER OCSC			SPT HAMMER REF. NO. ENERGY RATIO (%)			BORED BY W.BUTLER PROCESSED BY P.C.				
Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	TOPSOIL		90.65	0.20						
1	Firm to stiff brown/grey sandy SILT/CLAY with occasional gravel				AA135069	B	1.00		N = 19 (1, 3, 4, 5, 4, 6)	
2					AA135070	B	2.00		N = 22 (2, 3, 3, 3, 9, 7)	
3	Very stiff grey/ black sandy gravelly CLAY with occasional cobbles		88.35	2.50	AA135071	B	3.00		N = 34 (5, 4, 6, 6, 10, 12)	
4					AA135072	B	4.00		N = 33 (9, 7, 10, 9, 7, 7)	
5	Very stiff to hard black sandy gravelly CLAY with some cobbles				AA135073	B	5.00		N = 45 (8, 6, 9, 10, 12, 14)	
6					AA135074	B	6.00		N = 50/225 mm (9, 13, 22, 19, 9)	
7					AA135075	B	7.00		N = 50/150 mm (6, 15, 23, 27)	
8					AA135076	B	8.00		N = 50/75 mm (25, 50)	
8	End of Borehole at 8.20 m									
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
6.7	6.9	1							No water strike
7.4	7.6	0.5							
8	8.1	1.5							

INSTALLATION DETAILS					GROUNDWATER PROGRESS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
24-06-20	8.10	1.00	8.10	50mm SP					

REMARKS Covid 19 Safe Working Area erected . CAT scanned location and hand dug inspection pit carried out .	Sample Legend D - Small Disturbed (lub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) UT - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample
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IGSL BH LOG 22578.GPJ IGSL.GDT 14/7/20

 GEOTECHNICAL BORING RECORD										REPORT NUMBER 22578	
CONTRACT Ratoath, Co.Meath								BOREHOLE NO. BH02			
CO-ORDINATES 701,888.00 E 750,443.00 N GROUND LEVEL (m AOD) 91.98				RIG TYPE DANDO 2000 BOREHOLE DIAMETER (mm) 200 BOREHOLE DEPTH (m) 6.90		SHEET Sheet 1 of 1		DATE COMMENCED 23/06/2020 DATE COMPLETED 23/06/2020			
CLIENT Pivotal Construction ENGINEER OCSC				SPT HAMMER REF. NO. ENERGY RATIO (%)		BORED BY W.BUTLER PROCESSED BY F.C.					
Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details	
					Ref. Number	Sample Type	Depth (m)	Recovery			
0	TOPSOIL		91.73	0.25							
1	Firm light brown/grey sandy SILT/CLAY with occasional gravel				AA135063	B	1.00		N = 14 (2, 2, 3, 4, 3, 4)		
2	Stiff to very stiff grey and grey/black sandy gravelly CLAY with occasional cobbles		90.08	1.90	AA135064	B	2.00		N = 28 (2, 3, 7, 6, 7, 8)		
3					AA135065	B	3.00		N = 28 (5, 4, 4, 5, 9, 10)		
4					AA135066	B	4.00		N = 31 (20, 6, 7, 7, 8, 9)		
5	Very stiff to hard black very gravelly sandy CLAY with some cobbles		87.18	4.80	AA135067	B	5.00		N = 54 (7, 7, 10, 11, 14, 19)		
6					AA135068	B	6.00		N = 61 (9, 8, 12, 14, 16, 19)		
7	Obstruction End of Borehole at 6.90 m		85.08	6.90					N = 50/75 mm (8, 17, 50)		
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
6	6.2	1							No water strike
6.4	6.6	0.5							
6.7	6.9	1.5							

INSTALLATION DETAILS					GROUNDWATER PROGRESS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Covid 19 Safe Working Area erected . CAT scanned location and hand dug inspection pit carried out .	Sample Legend	
	D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub)	UT - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample

IGSL BH LOG 22578.GPJ IGSL.GDT 14/7/20

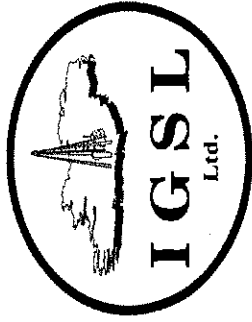
GEOTECHNICAL BORING RECORD										REPORT NUMBER 22578	
CONTRACT Ratoath, Co.Meath								BOREHOLE NO. BH03 SHEET Sheet 1 of 1			
CO-ORDINATES 701,691.00 E 750,277.00 N				RIG TYPE DANDO 2000 BOREHOLE DIAMETER (mm) 200 BOREHOLE DEPTH (m) 7.90				DATE COMMENCED 22/06/2020 DATE COMPLETED 22/06/2020			
GROUND LEVEL (m AOD) 93.65											
CLIENT Pivotal Construction ENGINEER OCSC				SPT HAMMER REF. NO. ENERGY RATIO (%)				BORED BY W.BUTLER PROCESSED BY P.C.			
Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details	
					Ref. Number	Sample Type	Depth (m)	Recovery			
0	TOPSOIL		93.45	0.20							
1	Firm light brown sandy SILT/CLAY with occasional cobbles		92.45	1.20	AA135055	B	1.00		N = 16 (2, 2, 5, 4, 3, 4)		
2	Firm grey sandy SILT/CLAY		91.65	2.00	AA135056	B	2.00		N = 27 (3, 3, 6, 9, 6, 6)		
3	Stiff grey and grey/black sandy gravelly silty CLAY with occasional cobbles				AA135057	B	3.00		N = 24 (3, 4, 4, 4, 9, 7)		
4	Very stiff to hard black sandy gravelly CLAY with some cobbles		89.85	3.80	AA135058	B	4.00		N = 35 (12, 6, 7, 9, 8, 11)		
5					AA135059	B	5.00		N = 33 (9, 7, 6, 8, 9, 10)		
6					AA135060	B	6.00		N = 64 (6, 10, 14, 21, 15, 14)		
7					AA135061	B	7.00		N = 50/150 mm (7, 15, 25, 25)		
8	Obstruction End of Borehole at 7.90 m		85.75	7.90	AA135062	B	7.90		N = 50/75 mm (25, 50)		
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	
6.3	6.5	0.75								No water strike	
7.7	7.9	2									
					GROUNDWATER PROGRESS						
INSTALLATION DETAILS					Date	Hole Depth	Casing Depth	Depth to Water	Comments		
Date	Tip Depth	RZ Top	RZ Base	Type							
REMARKS Covid 19 Safe Working Area erected . CAT scanned location and hand dug inspection pit carried out .					Sample Legend D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) UT - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample						

IGSL BH LOG 22578.GPJ IGSL GDT 14/7/20

 GEOTECHNICAL BORING RECORD										REPORT NUMBER 22578	
CONTRACT Ratoath , Co.Meath								BOREHOLE NO. BH04			
CO-ORDINATES 701,754.00 E 749,952.00 N				RIG TYPE DANDO 2000				SHEET Sheet 1 of 1			
GROUND LEVEL (m AOD) 92.58				BOREHOLE DIAMETER (mm) 200				DATE COMMENCED 25/06/2020			
				BOREHOLE DEPTH (m) 5.10				DATE COMPLETED 26/06/2020			
CLIENT Pivotal Construction				SPT HAMMER REF. NO.				BORED BY W.BUTLER			
ENGINEER OCSC				ENERGY RATIO (%)				PROCESSED BY E.C.			
Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details	
					Ref. Number	Sample Type	Depth (m)	Recovery			
0	TOPSOIL		92.43	0.15							
1	Firm light brown sandy SILT/CLAY with occasional gravel				AA135077	B	1.00		N = 15 (2, 2, 3, 2, 4, 6)		
2	Stiff grey and grey/black sandy gravelly SILT/CLAY		90.78	1.80	AA135078	B	2.00		N = 24 (4, 3, 5, 5, 6, 8)		
3	Very stiff to hard black very gravelly sandy CLAY with some cobbles		89.68	2.90	AA135079	B	3.00		N = 35 (3, 9, 10, 9, 6, 10)		
4					AA135080	B	4.00		N = 39 (6, 7, 8, 8, 12, 11)		
5	Obstruction		87.98	4.60							
5	End of Borehole at 5.10 m								N = 50/150 mm (6, 17, 23, 27)		
6											
7											
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		
4.1	4.3	0.75							No water strike		
4.4	4.5	0.5									
4.9	5.1	1.5									
INSTALLATION DETAILS					GROUNDWATER PROGRESS						
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments		
					26-06-20			4.00	Start of 2nd day		
REMARKS	Covid 19 Safe Working Area erected . CAT scanned location and hand dug inspection pit carried out .	Sample Legend D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub)	UT - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample								

IGSL BH LOG 22578 GPJ IGSL GDT 14/7/20

In Situ Groundwater Monitoring



Site Location | Ratoath, Co. Meath

Project No. 22578

Client: **Pivotal Construction**

Engineer OCSC

[illegible]

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Appendix II Rotary Core Logs



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

22578

CONTRACT Ratoath Development

DRILL HOLE NO RB01

SHEET Sheet 1 of 2

CO-ORDINATES

GROUND LEVEL (mOD)

RIG TYPE Geo205

FLUSH Air/Mist

DATE COMMENCED 27/07/2020

DATE COMPLETED 28/07/2020

CLIENT Pivotal Construction

INCLINATION (deg) -90

DRILLED BY IGSL

ENGINEER OCSC

CORE DIAMETER (mm) 78

LOGGED BY D. O'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R. %	S.C.R. %	R.Q.D. %	Fracture Spacing Log (mm)	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0					0 250 500			SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey/dark brown silty sandy gravelly CLAY				
1	1.50	0	0	0								
2		0	0	0				SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey/black sandy gravelly CLAY with occasional cobbles	2.20			
3	3.00											
4		0	0	0								
5	4.50											
6		0	0	0								
7	6.00											
8		0	0	0				SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey/brown sandy gravelly CLAY	7.20			N = 88 (3, 5, 12, 17, 28, 31)
9	7.50											
		0	0	0								N = 150 (5, 14, 23, 38, 40, 49)
	9.00											
		0	0	0								

REMARKS

Hole cased 0.00-16.50m. Erect Covid-19 Safe Zone - 1hr

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
6.50		N/S			Slow
10.20		N/S			Slow

GROUNDWATER DETAILS

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

22578

CONTRACT Ratoath Development

DRILL HOLE NO RB01

SHEET Sheet 2 of 2

CO-ORDINATES

GROUND LEVEL (mOD)

RIG TYPE Geo205

FLUSH Air/Mist

DATE COMMENCED 27/07/2020

DATE COMPLETED 28/07/2020

CLIENT Pivotal Construction

INCLINATION (deg) -90

DRILLED BY IGSL

ENGINEER OCSC

CORE DIAMETER (mm) 78

LOGGED BY D.D'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm)	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10	10.50				0 250 500			SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey/brown sandy GRAVEL	10.20			N = 96 (3, 7, 14, 20, 27, 35)
11		0	0	0				SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey/brown/black clayey gravelly SAND Driller notes blowing sand	11.10			
12	12.00							SYMMETRIX DRILLING: No recovery, observed by driller as returns of grey/black sandy cobbly GRAVEL	12.20			N = 115/174 mm (8, 19, 24, 41, 50)
13		0	0	0								N = 91/90 mm (5, 20, 41, 50)
14	13.50											
15		0	0	0								N = 50/10 mm (38, 50)
16	15.00											
17		0	0	0								N = 50/15 mm (45, 50)
18	16.50							End of Borehole at 16.50 m	16.50			
19												

REMARKS

Hole cased 0.00-16.50m. Erect Covid-19 Safe Zone - 1 hr

WATER STRIKE DETAILS

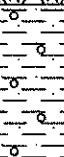
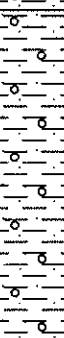
Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
6.50 10.20		N/S N/S			Slow Slow

GROUNDWATER DETAILS

INSTALLATION DETAILS					Date	Hole Depth	Casing Depth	Depth to Water	Comments
Date	Tip Depth	RZ Top	RZ Base	Type	28-07-20	16.50	16.50	4.40	Water level recorded 5 mins after end of drilling.

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Appendix III Trial Pit Logs

		TRIAL PIT RECORD						REPORT NUMBER 22578		
CONTRACT Ratoath Development						TRIAL PIT NO. TP01				
LOGGED BY D.Nolan						SHEET Sheet 1 of 1				
CO-ORDINATES 701,801.00 E 750,623.88 N						DATE STARTED 26/06/2020				
GROUND LEVEL (m) 91.76						DATE COMPLETED 26/06/2020				
CLIENT Pivotal Construction						EXCAVATION METHOD JCB				
ENGINEER OCSC										
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Firm brown slightly moist mottled grey very slightly sandy gravelly CLAY with medium cobble content.		0.25	91.51		133205	B	0.50-0.60		
	Stiff brown moist sandy gravelly CLAY with medium cobble content and low boulder content. Boulders < 300mm.		0.75	91.01		133206	B	1.00-1.20		
1.0										
	Stiff dark grey/black moist slightly sandy gravelly CLAY with medium cobble content and low boulder content. Boulders < 420mm.		1.80	89.96		133207	B	1.90-2.10		
2.0										
	End of Trial Pit at 2.30m		2.30	89.46						
3.0										
Groundwater Conditions No seepage										
Stability Good										
General Remarks CAT [Cable Avoidance Tool] used to scan area prior to breaking ground. Pit very hard to dig @ 2.3m.										

IGSL TP LOG 22578 RATOATH.GPJ IGSL.GDT 3/7/20

		TRIAL PIT RECORD						REPORT NUMBER 22578		
CONTRACT Ratoath Development						TRIAL PIT NO. TP02		SHEET Sheet 1 of 1		
LOGGED BY D.Nolan		CO-ORDINATES 702,157.13 E 750,618.77 N				DATE STARTED 30/06/2020		DATE COMPLETED 30/06/2020		
CLIENT Pivotal Construction ENGINEER OCSC		GROUND LEVEL (m) 90.92				EXCAVATION METHOD JCB				
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Stiff grey/brown slightly moist slightly sandy very gravelly CLAY with low cobble content.		0.30	90.62		133218	B	0.50-0.60		
1.0						133219	B	0.90-1.00		
	Stiff brown mottled grey moist sandy gravelly CLAY with low cobble content.		1.40	89.52		133220	B	1.50-1.60		
2.0	Firm to stiff dark grey/black very moist sandy gravelly CLAY with low cobble content and low boulder content. Boulders < 250mm.		1.90	89.02		133221	B	2.00-2.10		
	End of Trial Pit at 2.30m		2.30	88.62						
3.0										
Groundwater Conditions No seepage										
Stability Good										
General Remarks CAT [Cable Avoidance Tool] used to scan area prior to breaking ground. Pit very hard to dig @ 2.3m.										

IGSL TP LOG 22578 RATOATH.GPJ IGSL GDT 3/7/20

		TRIAL PIT RECORD						REPORT NUMBER 22578		
CONTRACT Ratoath Development						TRIAL PIT NO. TP03		SHEET Sheet 1 of 1		
LOGGED BY JL		CO-ORDINATES 702,079.98 E 750,578.87 N		DATE STARTED 23/06/2020		DATE COMPLETED 23/06/2020				
CLIENT Pivotal Construction ENGINEER OCSC		GROUND LEVEL (m) 91.59		EXCAVATION METHOD 7T Tracked Excavator						
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL: Soft light brown sandy CLAY with rootlets									
	Firm and firm to stiff yellow brown mottled light grey slightly gravelly slightly sandy silty CLAY with a low cobble content. Sand is fine to medium. Gravel is angular to subangular fine to coarse of mudstone and limestone. Cobbles are angular of limestone.		0.15	91.44		AA132188	B	0.40-0.50		
	Firm to stiff grey brown and grey slightly sandy gravelly clayey SILT with a low cobble content. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse of limestone. Cobbles are subangular to subrounded of limestone.		0.55	91.04		AA132189	B	0.60-0.70	>130	
1.0						AA132190	B	1.50-1.60		
2.0	Firm grey slightly sandy gravelly CLAY with a medium cobble content. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse of limestone. Cobbles are subrounded of limestone. (Recovered Moist)		1.90	89.69	 (Seepage)	AA132191	B	2.00-2.20		
	Stiff dark grey very slightly sandy gravelly CLAY with a medium cobble content		2.40	89.19		AA132192	B	2.60-2.80	>130	
3.0	End of Trial Pit at 3.00m		3.00	88.59						
Groundwater Conditions Seepage at 2.20m										
Stability Good										
General Remarks CAT [Cable Avoidance Tool] used to scan area prior to breaking ground. Pit terminated at required depth.										

IGSL TP LOG 22578 RATOATH.GPJ IGSL.GDT 3/7/20

 TRIAL PIT RECORD REPORT NUMBER 22578										
CONTRACT Ratoath Development						TRIAL PIT NO. TP04				
LOGGED BY D.Nolan						SHEET Sheet 1 of 1				
CO-ORDINATES 701,691.00 E 750,464.00 N						DATE STARTED 25/06/2020 DATE COMPLETED 25/06/2020				
CLIENT Pivotal Construction ENGINEER OCSC						GROUND LEVEL (m) 91.83 EXCAVATION METHOD JCB				
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Firm grey/brown moist sandy gravelly CLAY.		0.25	91.58						
						133201	B	0.50-0.60		
						133202	B	0.80-1.00		
1.0	Firm brown moist slightly slightly sandy gravelly CLAY with medium cobble content and low boulder content. Boulders < 300mm.		0.90	90.93						
						133203	B	1.50-1.60		
	Firm to stiff dark grey moist slightly sandy gravelly CLAY with medium cobble content and medium boulder content. Boulders < 300mm.		1.60	90.23						
2.0						133204	B	2.00-2.10		
										
	End of Trial Pit at 2.60m		2.60	89.23						
3.0										
Groundwater Conditions No seepage										
Stability Good										
General Remarks CAT [Cable Avoidance Tool] used to scan area prior to breaking ground. Pit very hard to dig @ 2.6m.										

IGSL TP LOG 22578 RATOATH.GPJ IGSL GDT 3/7/20

 TRIAL PIT RECORD REPORT NUMBER 22578										
CONTRACT Ratoath Development						TRIAL PIT NO. TP05				
LOGGED BY D.Nolan						CO-ORDINATES 702,003.00 E 750,394.09 N				
CLIENT Pivotal Construction ENGINEER OCSC						GROUND LEVEL (m) 91.95				
						SHEET Sheet 1 of 1				
						DATE STARTED 29/06/2020 DATE COMPLETED 29/06/2020				
						EXCAVATION METHOD JCB				
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Firm to stiff brown slightly moist very slightly sandy gravelly CLAY.		0.25	91.70						
	Firm to stiff dark grey/black moist slightly silty sandy gravelly CLAY with medium cobble content.		0.60	91.35		133214	B	0.50-0.60		
1.0	Stiff to very stiff dark grey/black moist slightly sandy gravelly CLAY with high cobble content and medium boulder content. Boulders < 500mm.		1.10	90.85		133215	B	0.90-1.00		
						133216	B	1.50-1.60		
2.0	End of Trial Pit at 1.90m		1.90	90.05						
3.0										
Groundwater Conditions No seepage										
Stability Good										
General Remarks CAT [Cable Avoidance Tool] used to scan area prior to breaking ground. Pit very hard to dig @ 1.9m.										

IGSL TP LOG 22578 RATOATH.GPJ IGSL.GDT 3/7/20

 TRIAL PIT RECORD							REPORT NUMBER 22578			
CONTRACT Ratoath Development						TRIAL PIT NO. TP06		SHEET Sheet 1 of 1		
LOGGED BY D.Nolan			CO-ORDINATES 701,696.01 E 750,306.00 N			DATE STARTED 26/06/2020		DATE COMPLETED 26/06/2020		
CLIENT Pivotal Construction ENGINEER OCSC			GROUND LEVEL (m) 93.25			EXCAVATION METHOD JCB				
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Firm to stiff brown mottled grey slightly moist slightly sandy gravelly CLAY with medium cobble content and medium boulder content. Boulders < 310mm.		0.25	93.00		133208	B	0.50-0.60		
1.0						133209	B	1.00-1.10		
	Stiff to very stiff dark grey/black moist slightly silty slightly sandy gravelly CLAY with medium cobble content and medium boulder content. Boulders < 250mm.		1.70	91.55		133210	B	1.90-2.10		
2.0			2.40	90.85						
	End of Trial Pit at 2.40m									
3.0										
Groundwater Conditions No seepage										
Stability Good										
General Remarks CAT [Cable Avoidance Tool] used to scan area prior to breaking ground. Pit very hard to dig @ 2.4m.										

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TP01: 2.3m

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TP02: 2.3m

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TP03: 3m

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TP04: 2.6m



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TP05: 1.9m

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TP06: 2.4m

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SA02: 2m

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30/06/2025



SA03: 2.1m



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SA04: 2m

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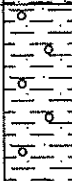


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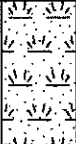
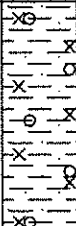
Appendix IV Plate Bearing Tests

		TRIAL PIT RECORD						REPORT NUMBER 22578		
CONTRACT Ratoath Development						TRIAL PIT NO. CBR01		SHEET Sheet 1 of 1		
LOGGED BY DN		CO-ORDINATES 701,862.93 E 750,338.04 N				DATE STARTED 29/06/2020		DATE COMPLETED 29/06/2020		
CLIENT Pivotal Construction ENGINEER OCSC		GROUND LEVEL (m) 92.68				EXCAVATION METHOD JCB				
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Firm to stiff brown mottled grey very slightly sandy gravelly CLAY.		0.25	92.43						
	End of Trial Pit at 0.50m		0.50	92.18						
1.0										
Groundwater Conditions Dry										
Stability Good										
General Remarks Plate bearing test carried out at 0.50m.										

IGSL TP LOG 22578 RATOATH CBR LOGS.GPJ IGSL.GDT 3/7/20

 TRIAL PIT RECORD							REPORT NUMBER			
CONTRACT Ratoath Development							TRIAL PIT NO. CBR02			
LOGGED BY DN			CO-ORDINATES 702,157.58 E 750,628.17 N		SHEET Sheet 1 of 1		DATE STARTED 30/06/2020			
CLIENT Pivotal Construction			GROUND LEVEL (m) 90.87		DATE COMPLETED 30/06/2020		EXCAVATION METHOD JCB			
ENGINEER OCSC										
0.0	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
	TOPSOIL.									
	Stiff brown mottled grey slightly moist very slightly sandy gravelly CLAY.		0.25	90.62						
	End of Trial Pit at 0.50m		0.50	90.37						
1.0										
Groundwater Conditions Dry										
Stability Good										
General Remarks Plate bearing test carried out at 0.50m.										

IGSL TP LOG 22578 RATOATH CBR LOGS.GPJ IGSL.GDT 3/7/20

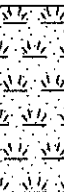
		TRIAL PIT RECORD						REPORT NUMBER 22578		
CONTRACT Ratoath Development						TRIAL PIT NO. CBR03 SHEET Sheet 1 of 1				
LOGGED BY JL			CO-ORDINATES 702,191.95 E 750,539.30 N			DATE STARTED 23/06/2020 DATE COMPLETED 23/06/2020				
CLIENT ENGINEER Pivotal Construction OCSC			GROUND LEVEL (m) 91.15			EXCAVATION METHOD 7T Tracked Excavator				
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL: Soft to firm light brown sandy silty CLAY with frequent rootlets									
	Firm occasionally firm to stiff yellow brown mottled grey slightly gravelly sandy silty CLAY. Sand is fine to medium. Gravel is angular to subangular fine to coarse of limestone and mudstone.		0.20	90.95						
	End of Trial Pit at 0.50m		0.50	90.65						
1.0										
Groundwater Conditions Dry										
Stability Good										
General Remarks Plate bearing test carried out at 0.50m. During test, landowner Peter Carey expressed surprise at seeing us in his field as he had not been notified of entry. In line with his instruction at the time, we vacated the field without carrying out the remaining works.										

IGSL TP LOG 22578 RATOATH CBR LOGS.GPJ | IGSL.GDT 3/7/20

 TRIAL PIT RECORD							REPORT NUMBER 22578			
CONTRACT Ratoath Development						TRIAL PIT NO. CBR04				
LOGGED BY DN						SHEET Sheet 1 of 1				
CO-ORDINATES 702,109.99 E 750,298.81 N						DATE STARTED 01/07/2020				
GROUND LEVEL (m) 91.70						DATE COMPLETED 01/07/2020				
CLIENT Pivotal Construction						EXCAVATION METHOD JCB				
ENGINEER OCSC										
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Stiff brown mottled grey moist gravelly CLAY.		0.25	91.45						
	End of Trial Pit at 0.50m		0.50	91.20						
1.0										
Groundwater Conditions Dry										
Stability Good										
General Remarks Plate bearing test carried out at 0.50m.										

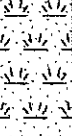
IGSL TP LOG 22578 RATOATH CBR LOGS.GPJ IGSL.GDT 3/7/20

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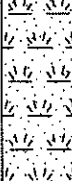
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CONTRACT Ratoath Development						TRIAL PIT NO. CBR05 SHEET Sheet 1 of 1				
LOGGED BY DN		CO-ORDINATES 702,103.85 E 750,189.91 N				DATE STARTED 01/07/2020 DATE COMPLETED 01/07/2020				
CLIENT Pivotal Construction ENGINEER OCSC		GROUND LEVEL (m) 91.77				EXCAVATION METHOD JCB				
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL									
	Stiff brown slightly moist very gravelly CLAY with medium cobble content.		0.25	91.52						
	End of Trial Pit at 0.50m		0.50	91.27						
1.0										
Groundwater Conditions Dry										
Stability Good										
General Remarks Plate bearing test carried out at 0.50m.										

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		TRIAL PIT RECORD						REPORT NUMBER 22578		
CONTRACT Ratoath Development						TRIAL PIT NO. CBR06		SHEET Sheet 1 of 1		
LOGGED BY DN		CO-ORDINATES 701,643.99 E 749,969.10 N				DATE STARTED 30/06/2020		DATE COMPLETED 30/06/2020		
CLIENT Pivotal Construction ENGINEER OCSC		GROUND LEVEL (m) 92.38				EXCAVATION METHOD JCB				
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Stiff brown mottled grey moist very slightly sandy gravelly CLAY.		0.20	92.18						
	End of Trial Pit at 0.50m		0.50	91.88						
1.0										
Groundwater Conditions Dry										
Stability Good										
General Remarks Plate bearing test carried out at 0.50m. Test moved out of ditch.										

IGSL TP LOG 22578 RATOATH CBR LOGS.GPJ IGSL.GDT 3/7/20

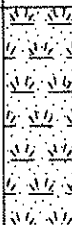
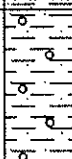
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CONTRACT Ratoath Development						TRIAL PIT NO. CBR07		SHEET Sheet 1 of 1		
LOGGED BY DN		CO-ORDINATES 701,806.51 E 749,935.72 N				DATE STARTED 30/06/2020		DATE COMPLETED 30/06/2020		
CLIENT Pivotal Construction ENGINEER OCSC		GROUND LEVEL (m) 92.50				EXCAVATION METHOD JCB				
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Stiff brown slightly mottled grey slightly moist very slightly sandy gravelly CLAY.		0.25	92.25						
	End of Trial Pit at 0.50m		0.50	92.00						
1.0										
Groundwater Conditions Dry										
Stability Good										
General Remarks Plate bearing test carried out at 0.50m. Test moved 10m out of ditch.										

IGSL TP LOG 22578 RATOATH CBR LOGS.GPJ IGSL.GDT 3/7/20

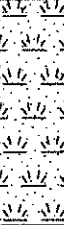
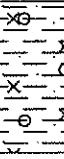
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CONTRACT Ratoath Development							TRIAL PIT NO. CBR08			
LOGGED BY DN							SHEET Sheet 1 of 1			
CO-ORDINATES 702,027.05 E 749,943.98 N							DATE STARTED 01/07/2020			
GROUND LEVEL (m) 92.42							DATE COMPLETED 01/07/2020			
CLIENT Pivotal Construction ENGINEER OCSC							EXCAVATION METHOD JCB			
Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Stiff brown slightly moist slightly sandy gravelly CLAY.		0.30	92.12						
	End of Trial Pit at 0.50m		0.50	91.92						
1.0										
Groundwater Conditions Dry										
Stability Good										
General Remarks Plate bearing test carried out at 0.50m.										

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		TRIAL PIT RECORD						REPORT NUMBER 22578		
CONTRACT Ratoath Development						TRIAL PIT NO. CBR09		SHEET Sheet 1 of 1		
LOGGED BY DN		CO-ORDINATES 702,058.07 E 749,627.97 N				DATE STARTED 01/07/2020		DATE COMPLETED 01/07/2020		
CLIENT Pivotal Construction ENGINEER OCSC		GROUND LEVEL (m) 88.78				EXCAVATION METHOD JCB				
0.0	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
	TOPSOIL.									
	Firm to stiff grey/brown moist very slightly sandy gravelly CLAY.		0.30	88.48						
	End of Trial Pit at 0.50m		0.50	88.28						
1.0										
Groundwater Conditions Dry										
Stability Good										
General Remarks Plate bearing test carried out at 0.50m.										

IGSL TP LOG 22578 RATOATH CBR LOGS.GPJ IGSL.GDT 3/7/20

		TRIAL PIT RECORD						REPORT NUMBER 22578		
CONTRACT Ratoath Development						TRIAL PIT NO. CBR12		SHEET Sheet 1 of 1		
LOGGED BY DN		CO-ORDINATES 701,806.01 E 750,606.00 N				DATE STARTED 29/06/2020		DATE COMPLETED 29/06/2020		
CLIENT Pivotal Construction ENGINEER OCSC		GROUND LEVEL (m) 92.27				EXCAVATION METHOD JCB				
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Firm to stiff brown mottled grey moist slightly silty very slightly sandy gravelly CLAY		0.30	91.97						
	End of Trial Pit at 0.50m		0.50	91.77						
1.0										
Groundwater Conditions Dry										
Stability Good										
General Remarks Plate bearing test carried out at 0.50m.										

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TRIAL PIT RECORD

REPORT NUMBER

22578

CONTRACT Ratoath Development

TRIAL PIT NO. CBR13
SHEET Sheet 1 of 1

LOGGED BY DN

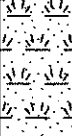
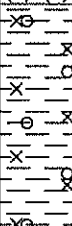
CO-ORDINATES 702,001.98 E
750,413.91 NDATE STARTED 29/06/2020
DATE COMPLETED 29/06/2020CLIENT Pivotal Construction
ENGINEER OCSC

GROUND LEVEL (m) 92.19

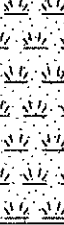
EXCAVATION METHOD JCB

	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Firm to stiff brown moist slightly sandy gravelly CLAY.		0.20	91.99						
	End of Trial Pit at 0.50m		0.50	91.69						
1.0										

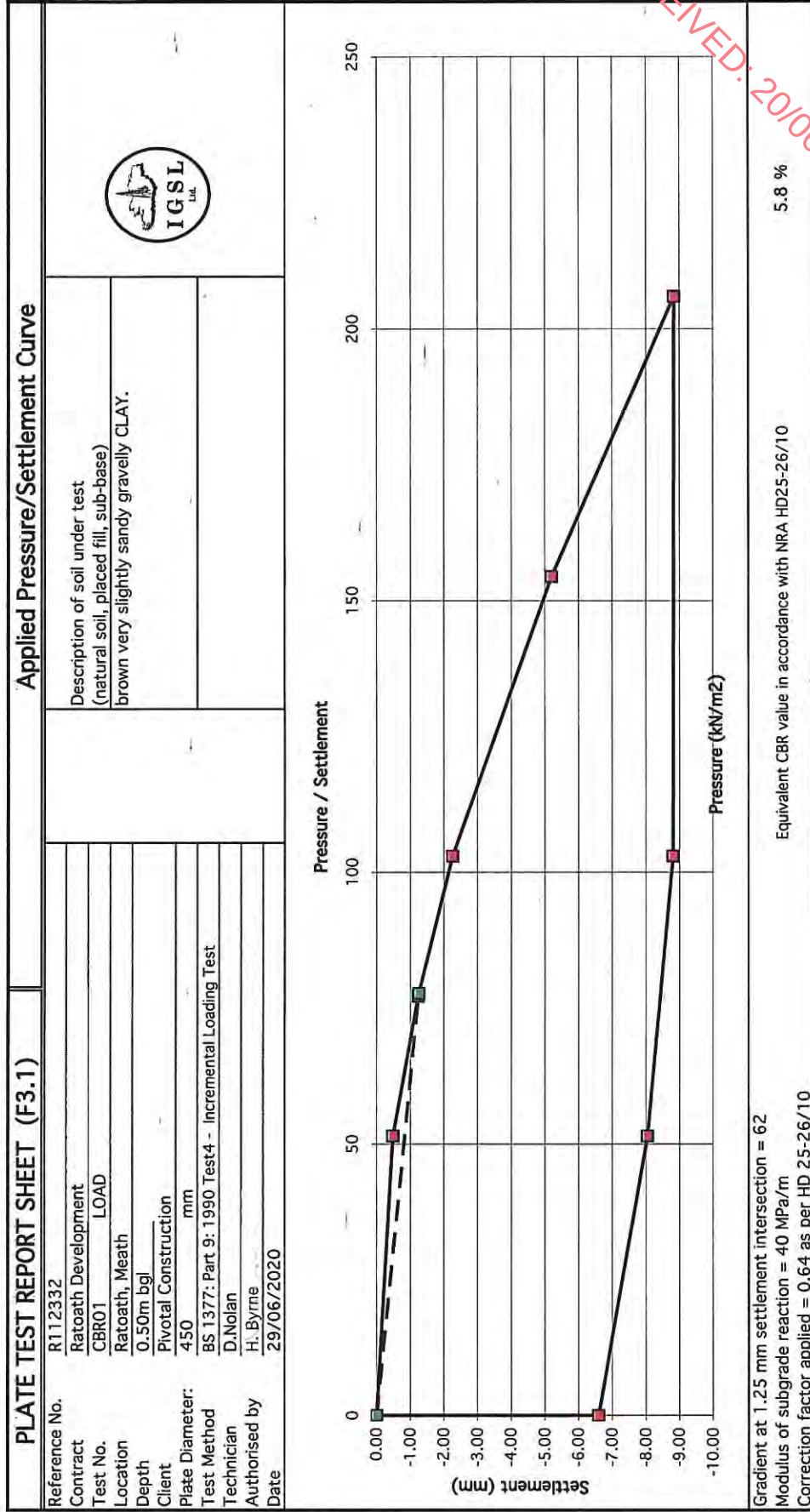
Groundwater Conditions
DryStability
GoodGeneral Remarks
Plate bearing test carried out at 0.50m.

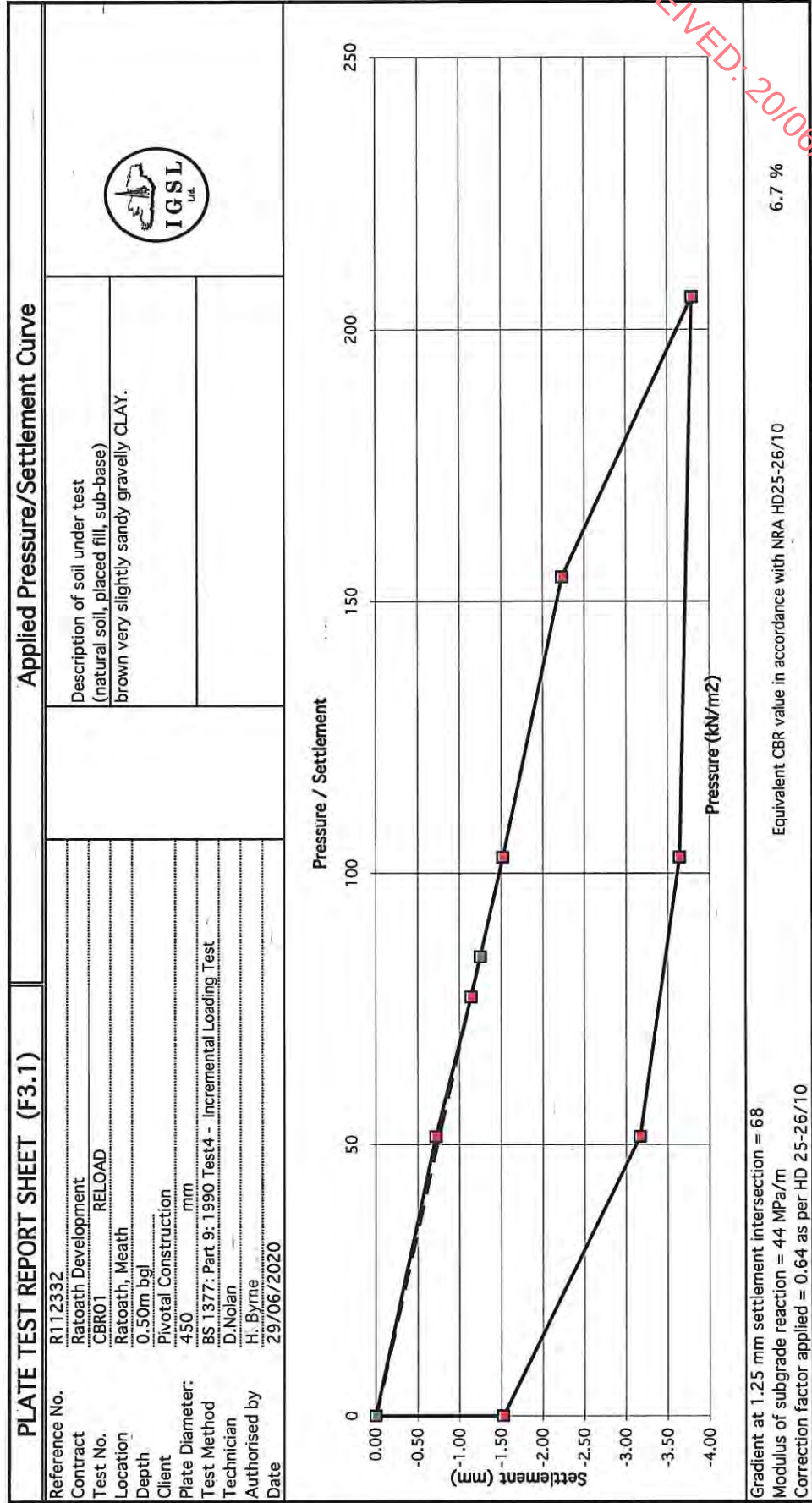
 TRIAL PIT RECORD REPORT NUMBER 22578										
CONTRACT Ratoath Development						TRIAL PIT NO. CBR14				
LOGGED BY DN						SHEET Sheet 1 of 1				
CO-ORDINATES 701,703.05 E 750,481.92 N						DATE STARTED 25/06/2020				
GROUND LEVEL (m) 91.83						DATE COMPLETED 25/06/2020				
CLIENT Pivotal Construction						EXCAVATION METHOD JCB				
ENGINEER OCSC										
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL.									
	Firm to stiff brown mottled grey moist slightly silty slightly gravelly CLAY.		0.20	91.63						
	End of Trial Pit at 0.50m		0.50	91.33						
1.0										
Groundwater Conditions Dry										
Stability Good										
General Remarks Plate bearing test carried out at 0.50m.										

IGSL TP LOG 22578 RATOATH CBR LOGS.GPJ IGSL.GDT 3/7/20

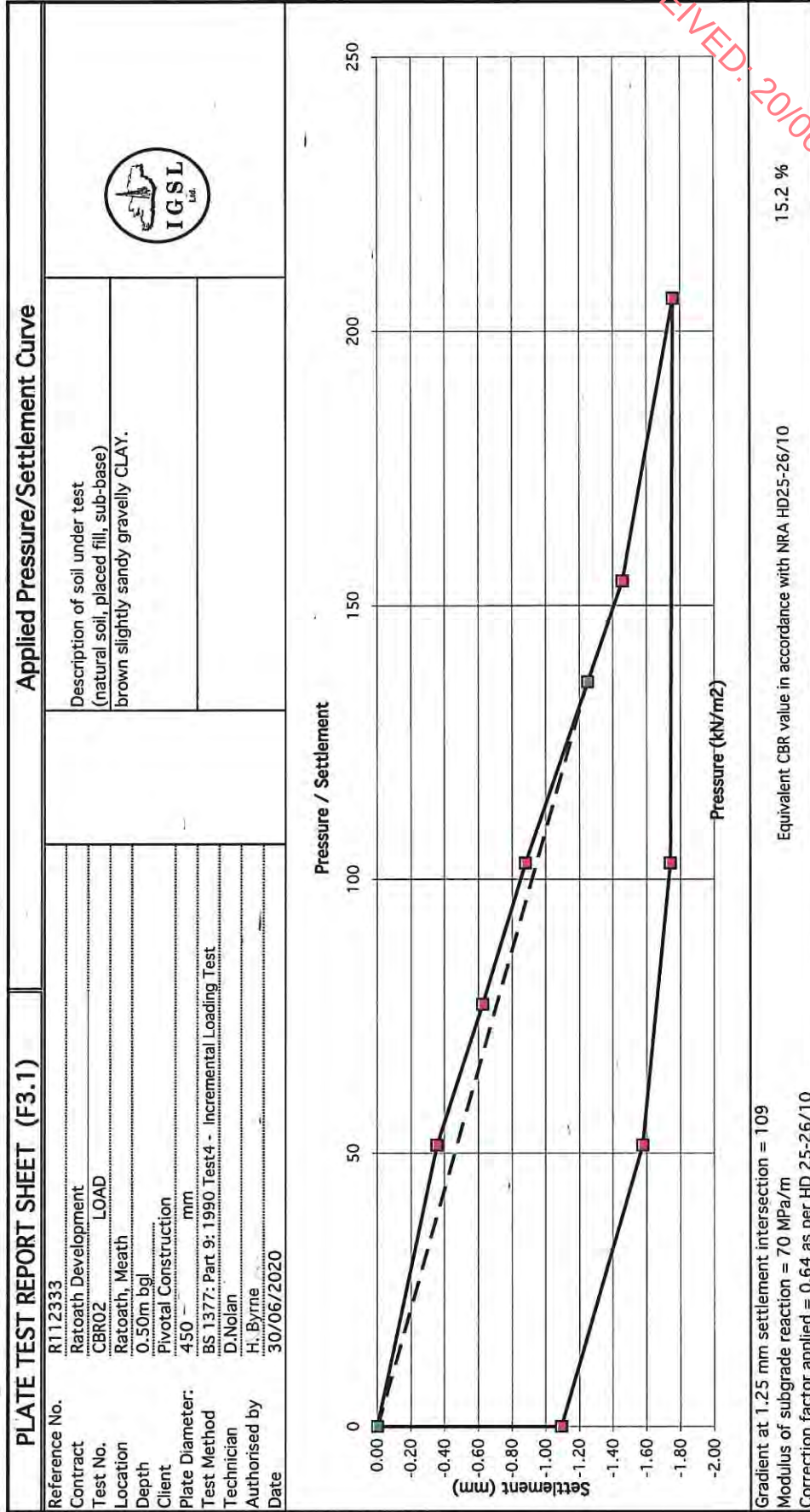
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CONTRACT Ratoath Development						TRIAL PIT NO. CBR15		SHEET Sheet 1 of 1		
LOGGED BY DN		CO-ORDINATES 701,618.23 E 750,322.71 N				DATE STARTED 30/06/2020		DATE COMPLETED 30/06/2020		
CLIENT Pivotal Construction ENGINEER OCSC		GROUND LEVEL (m) 93.55				EXCAVATION METHOD JCB				
	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	TOPSOIL									
	Stiff to very stiff brown mottled grey very slightly sandy gravelly CLAY		0.30	93.25		133217	CBR	0.30-0.50		
	End of Trial Pit at 0.50m		0.50	93.05						
1.0										
Groundwater Conditions Dry										
Stability Good										
General Remarks Plate bearing test carried out at 0.50m. Test moved 10m due to power line. Test tried twice, first time plate was under a stone and second time there was not much movement so a sample was taken for a lab CBR. (Sample number 133217).										

IGSL TP LOG 22578 RATOATH CBR LOGS.GPJ IGSL GDT 3/7/20

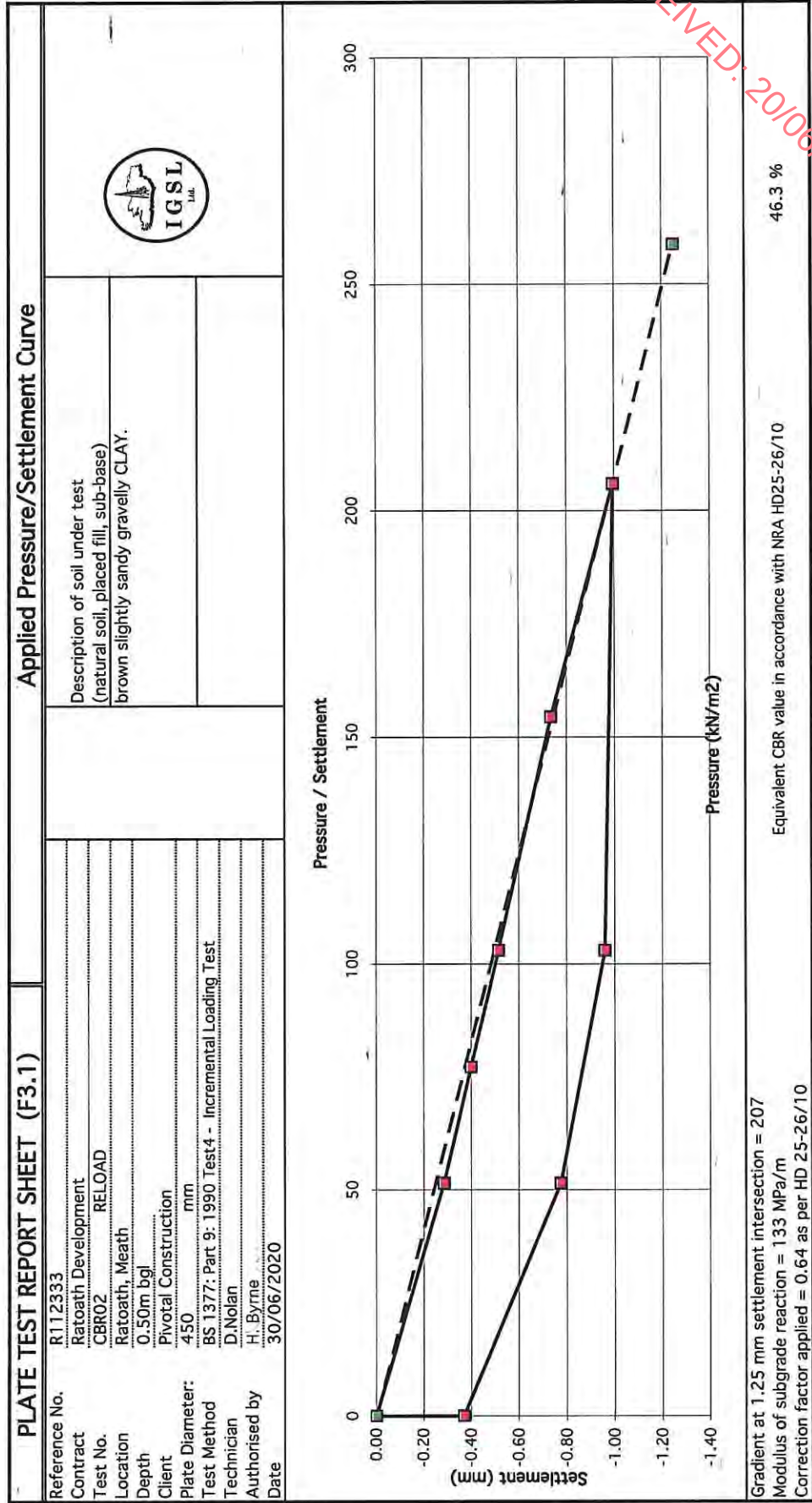


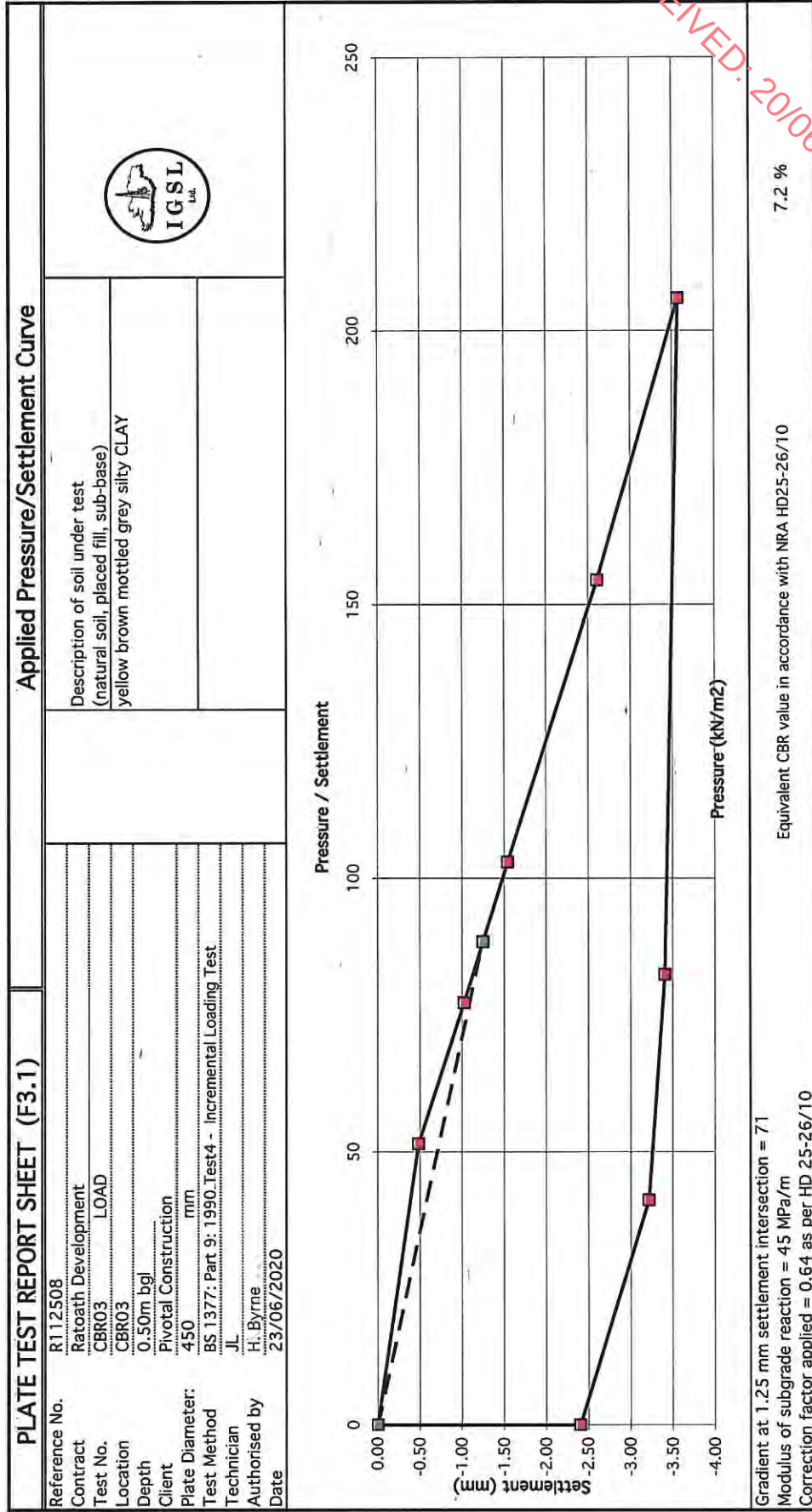


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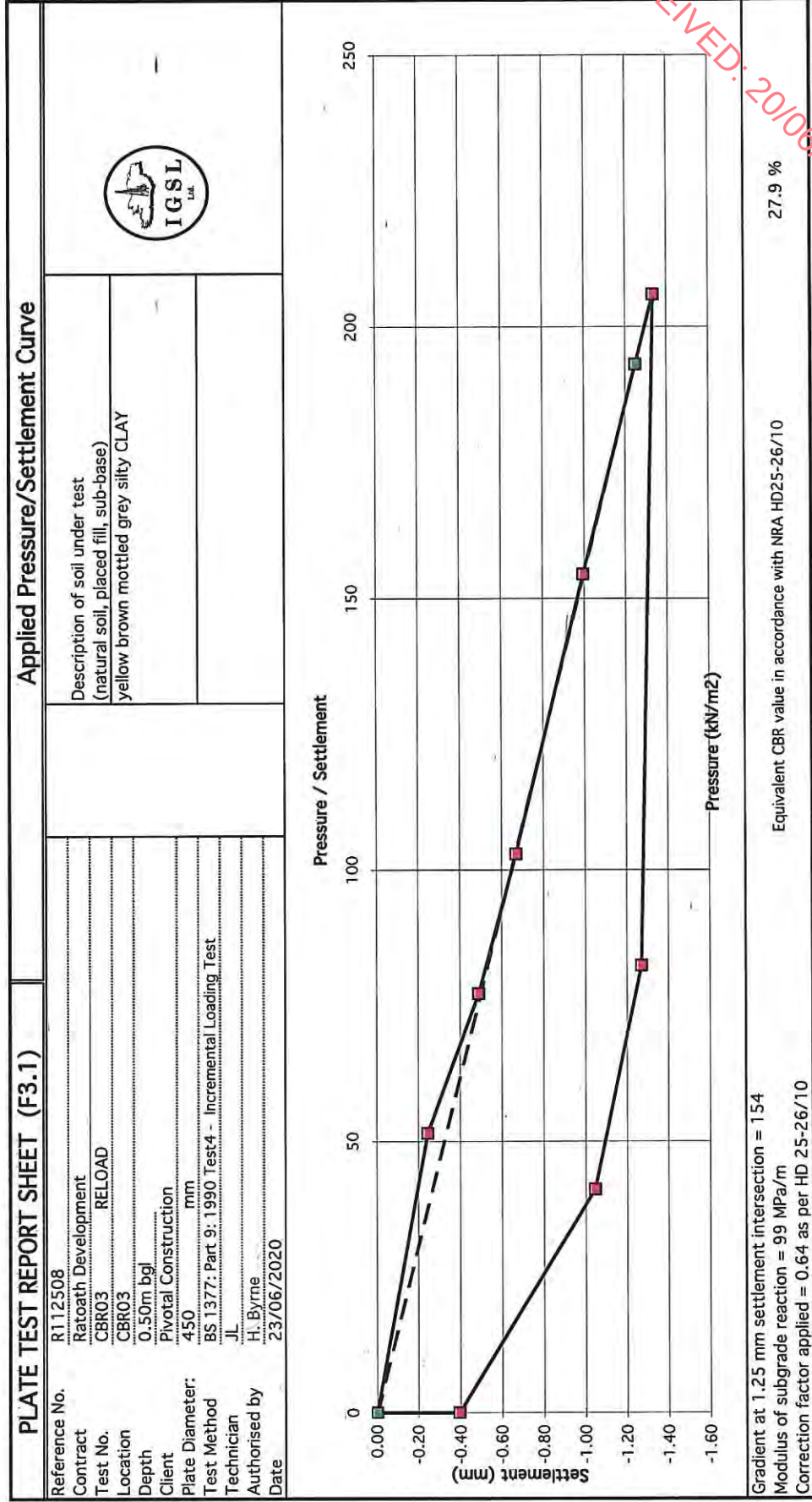


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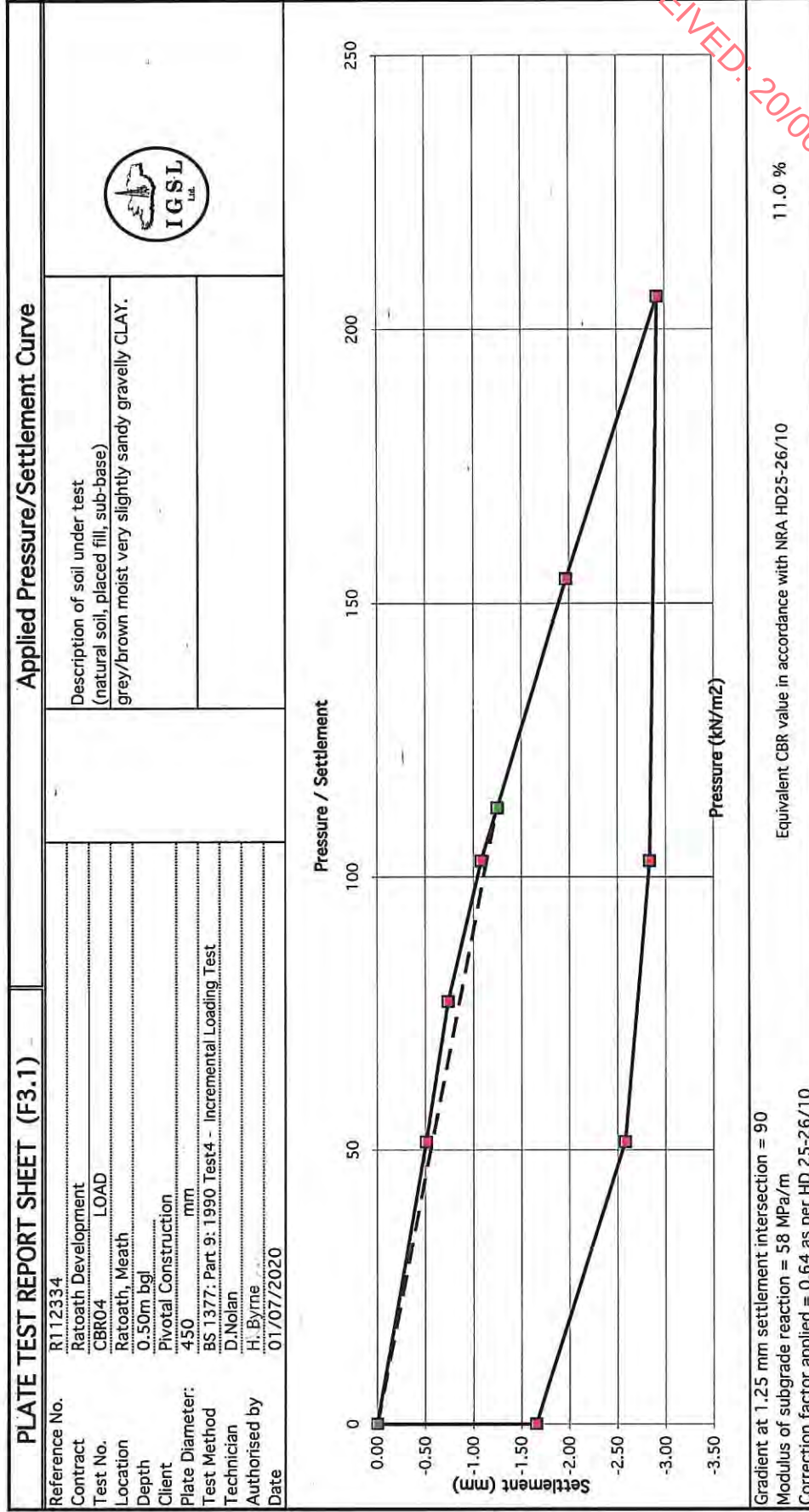




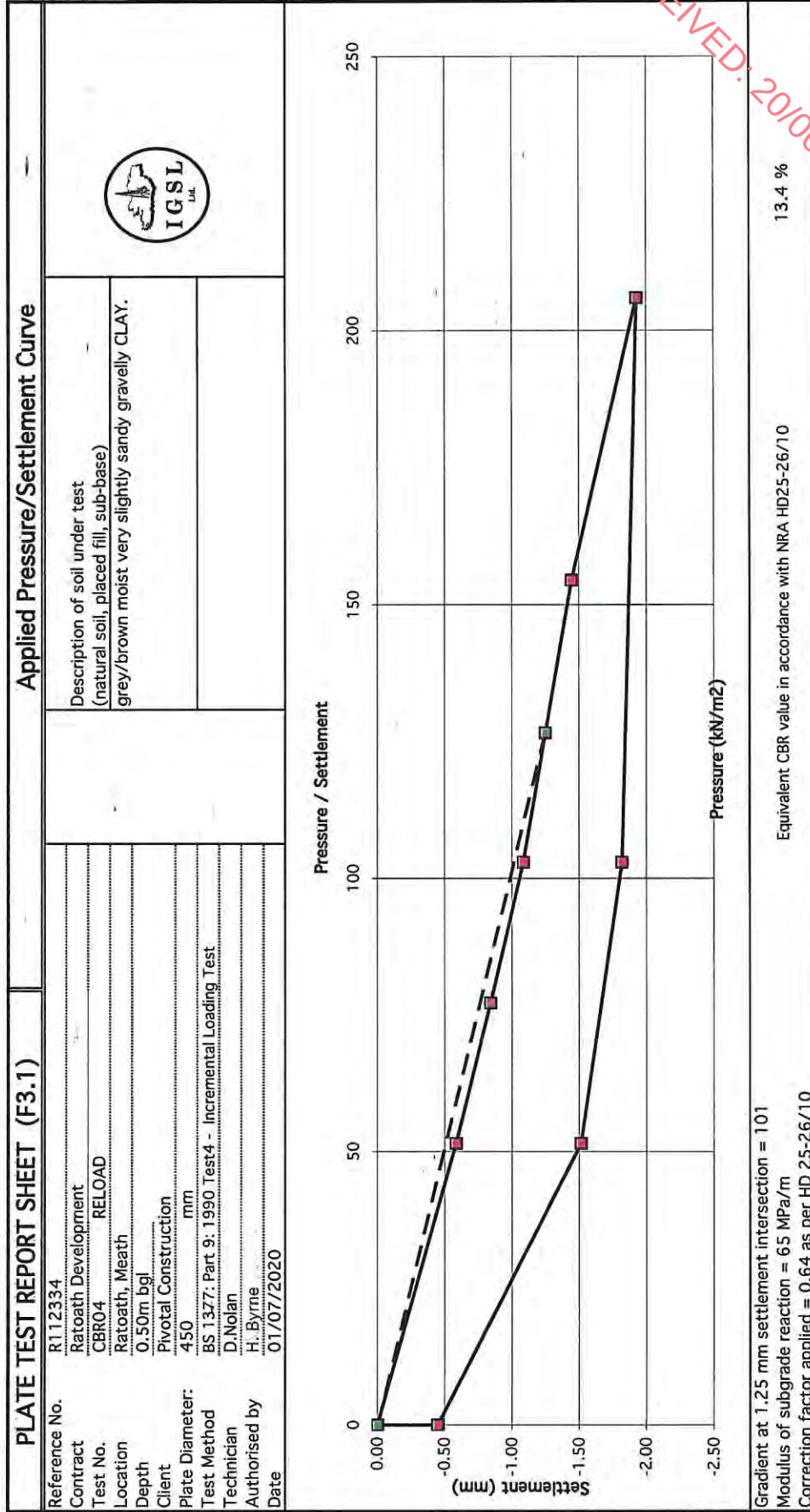
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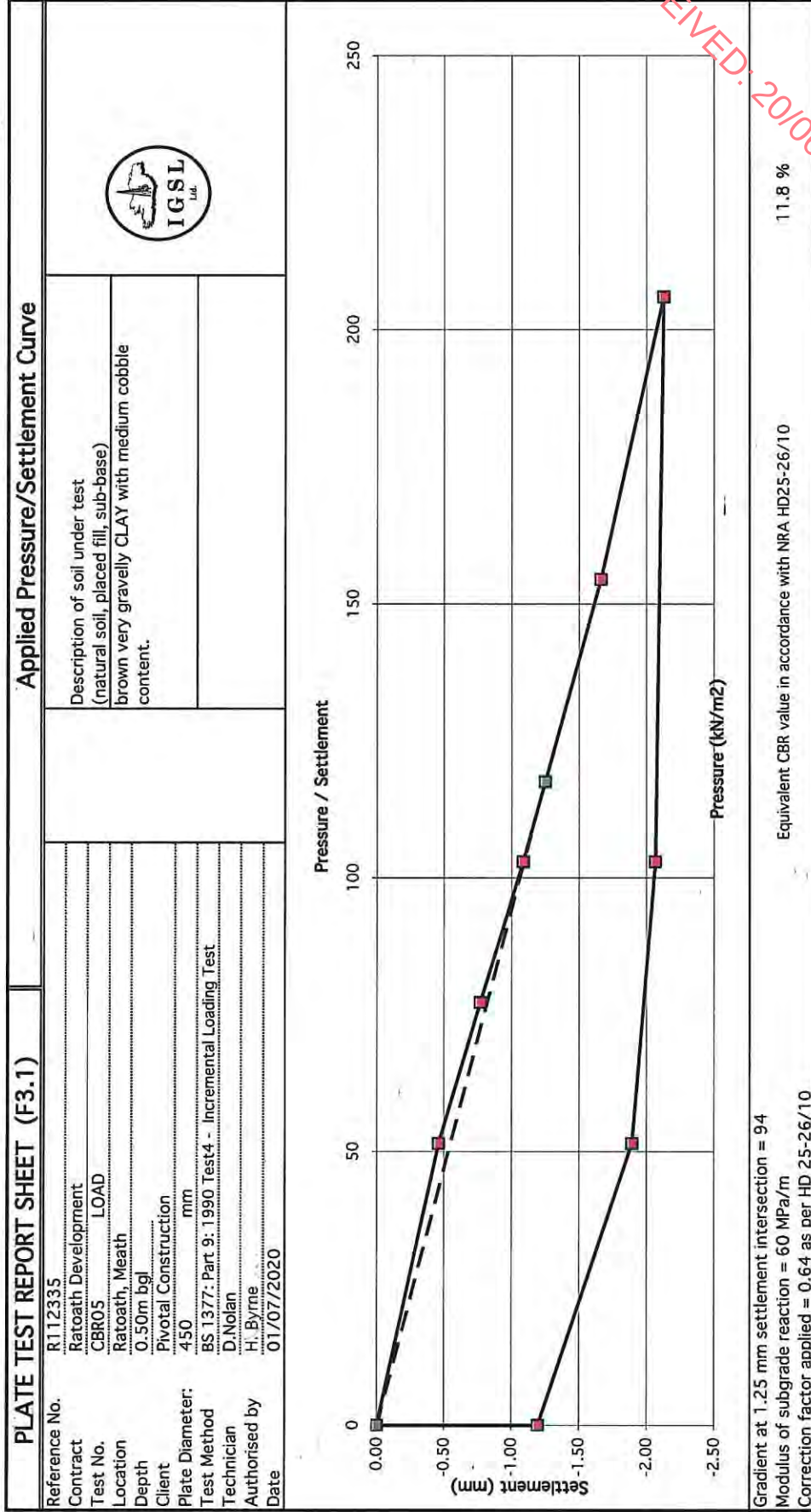
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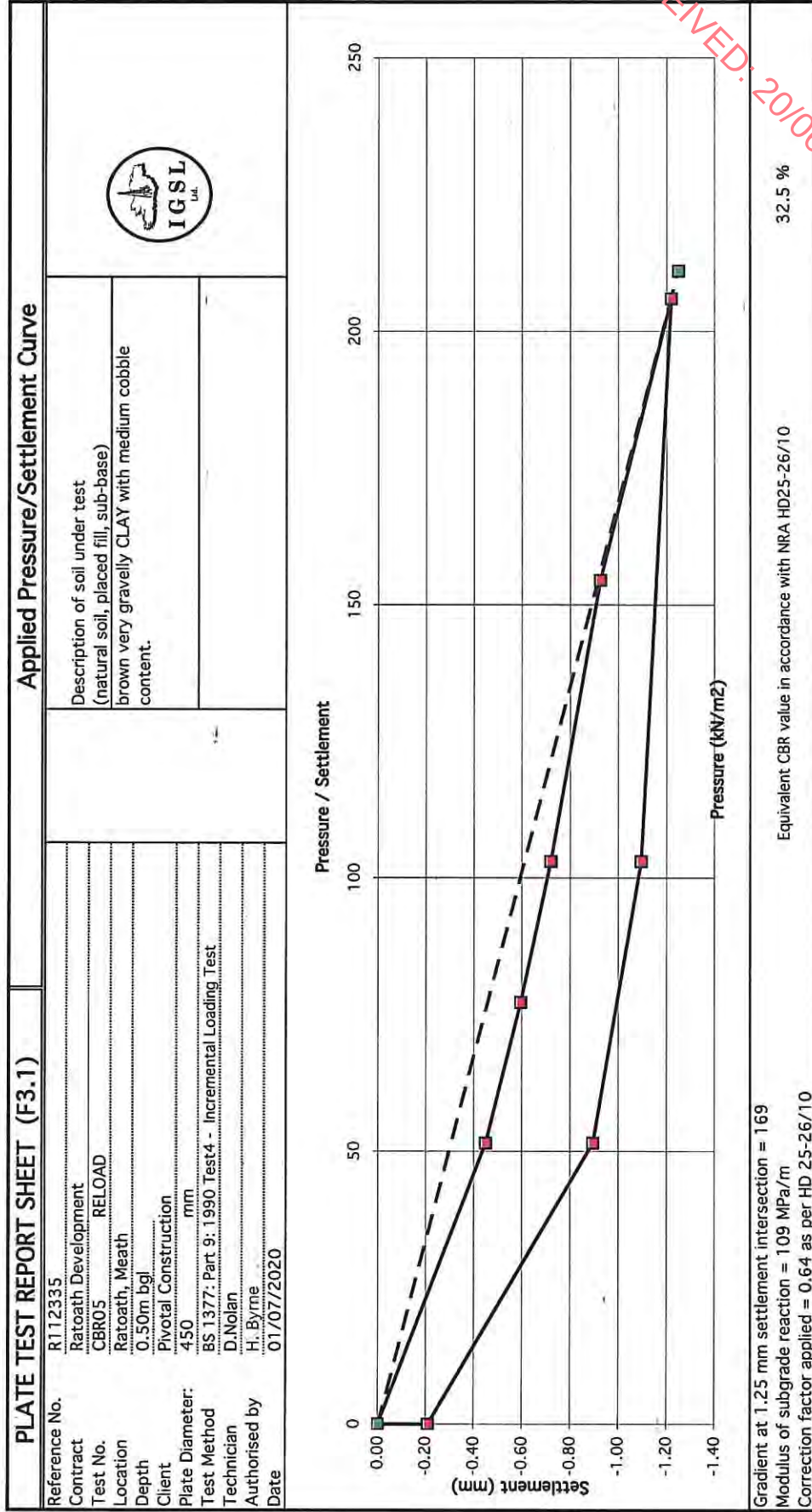


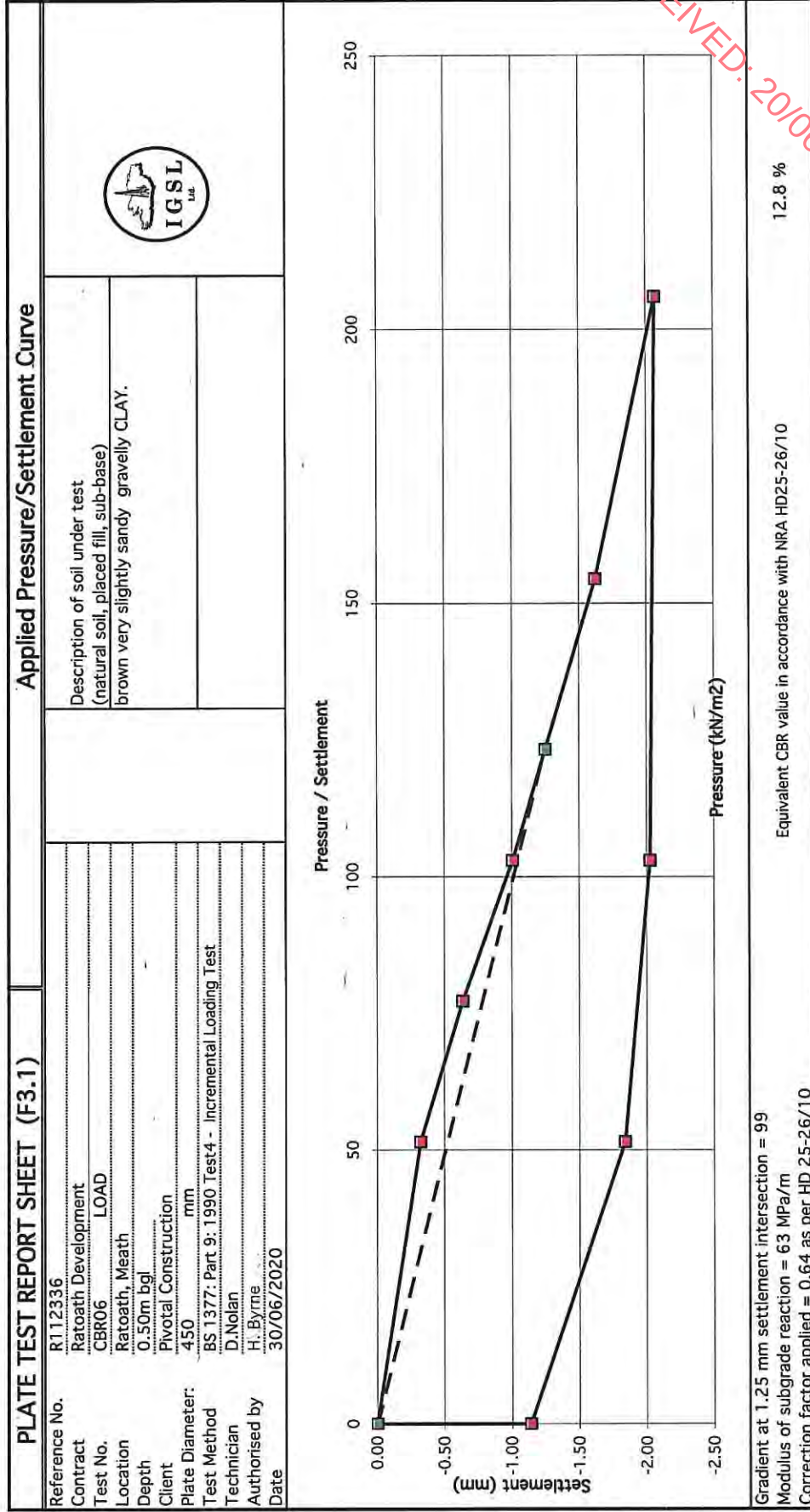
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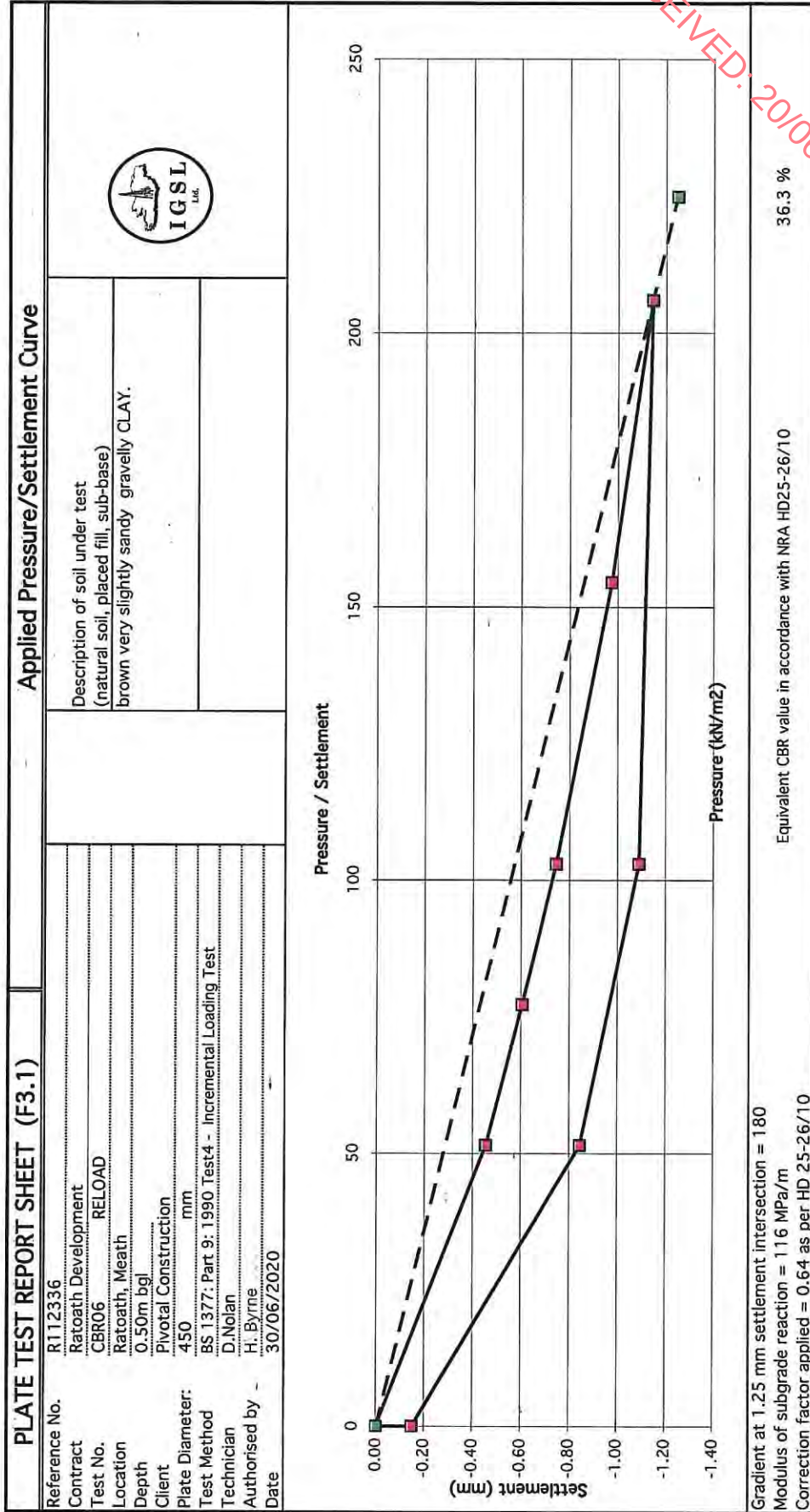


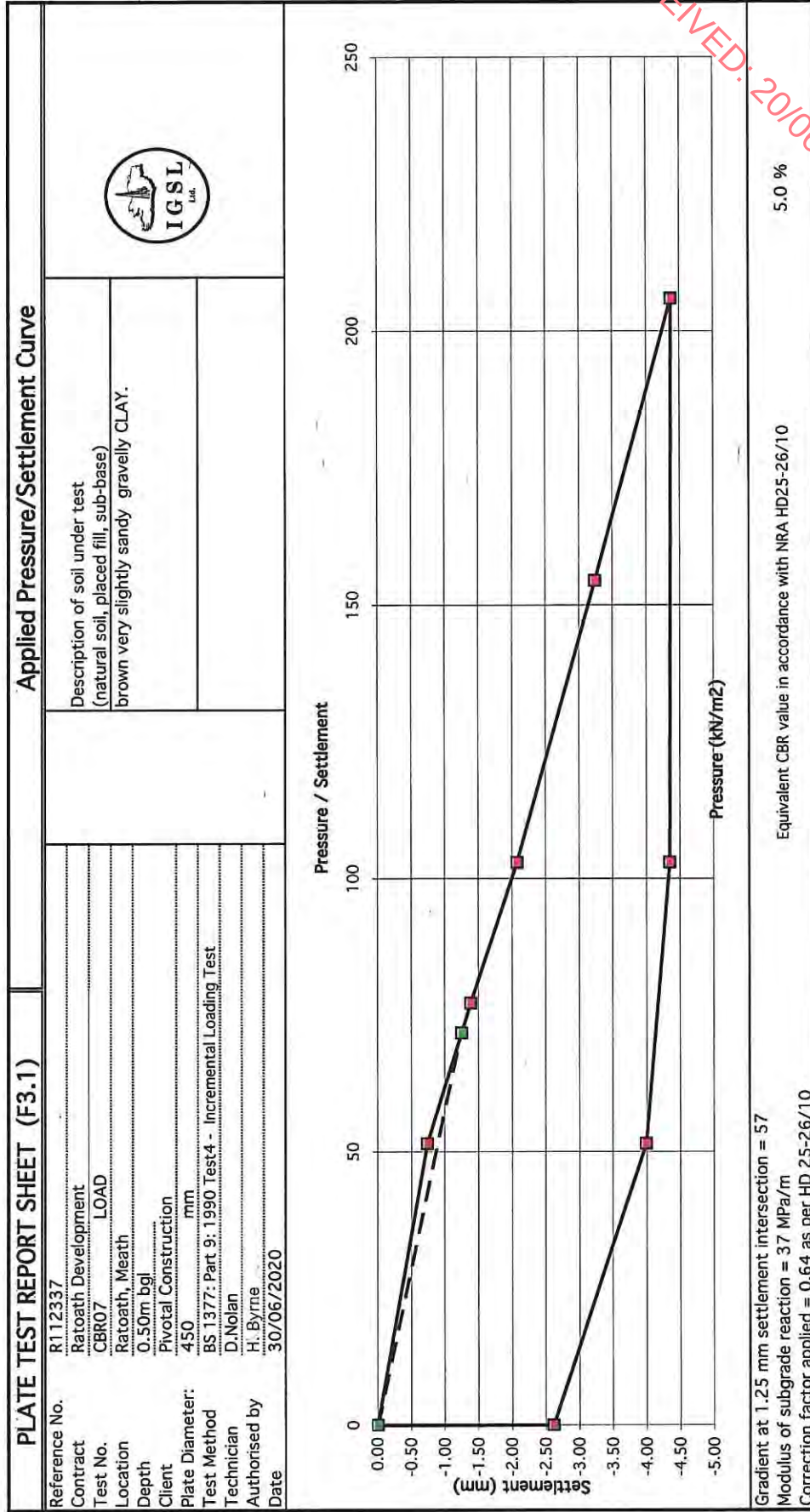
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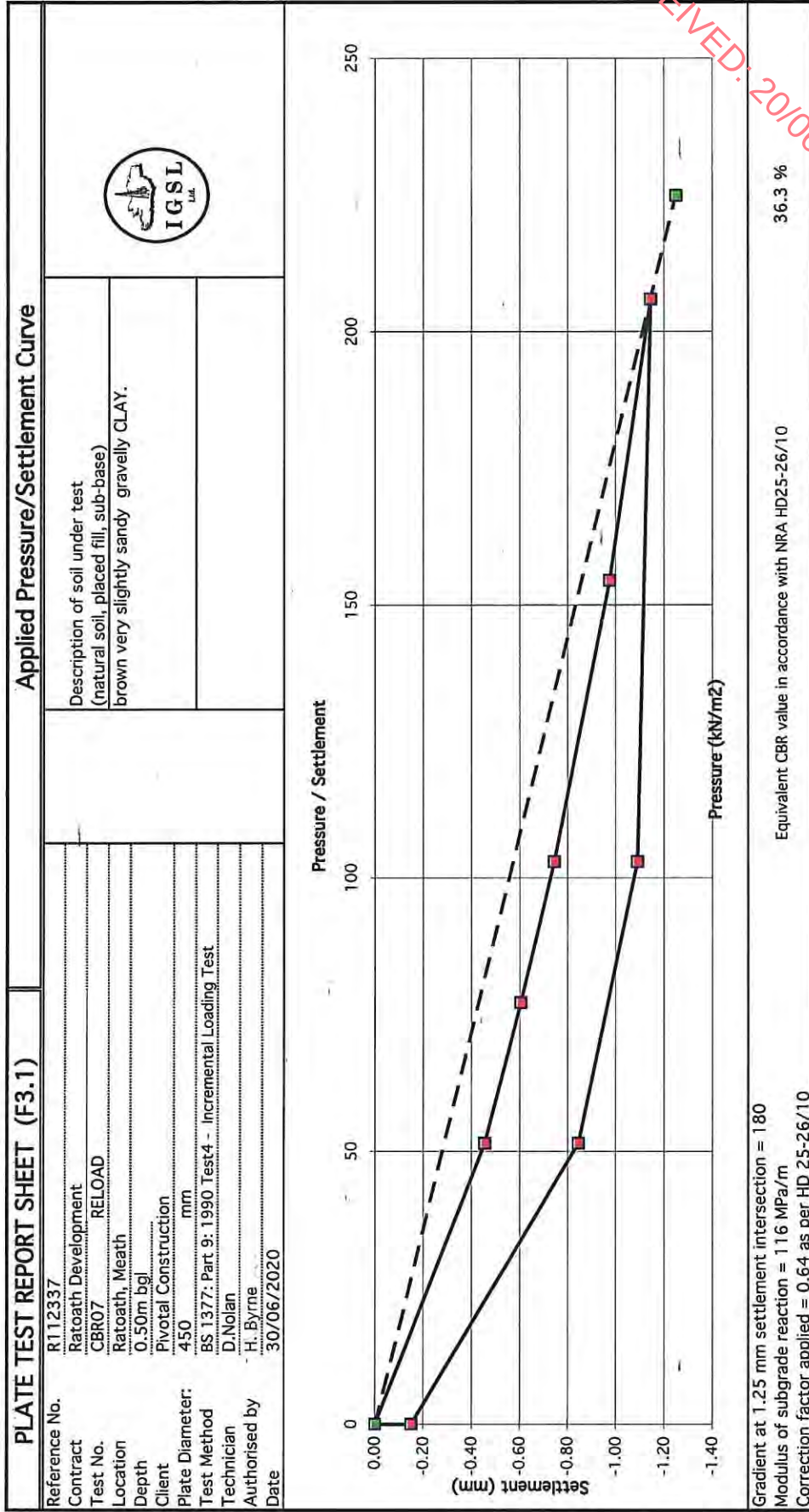


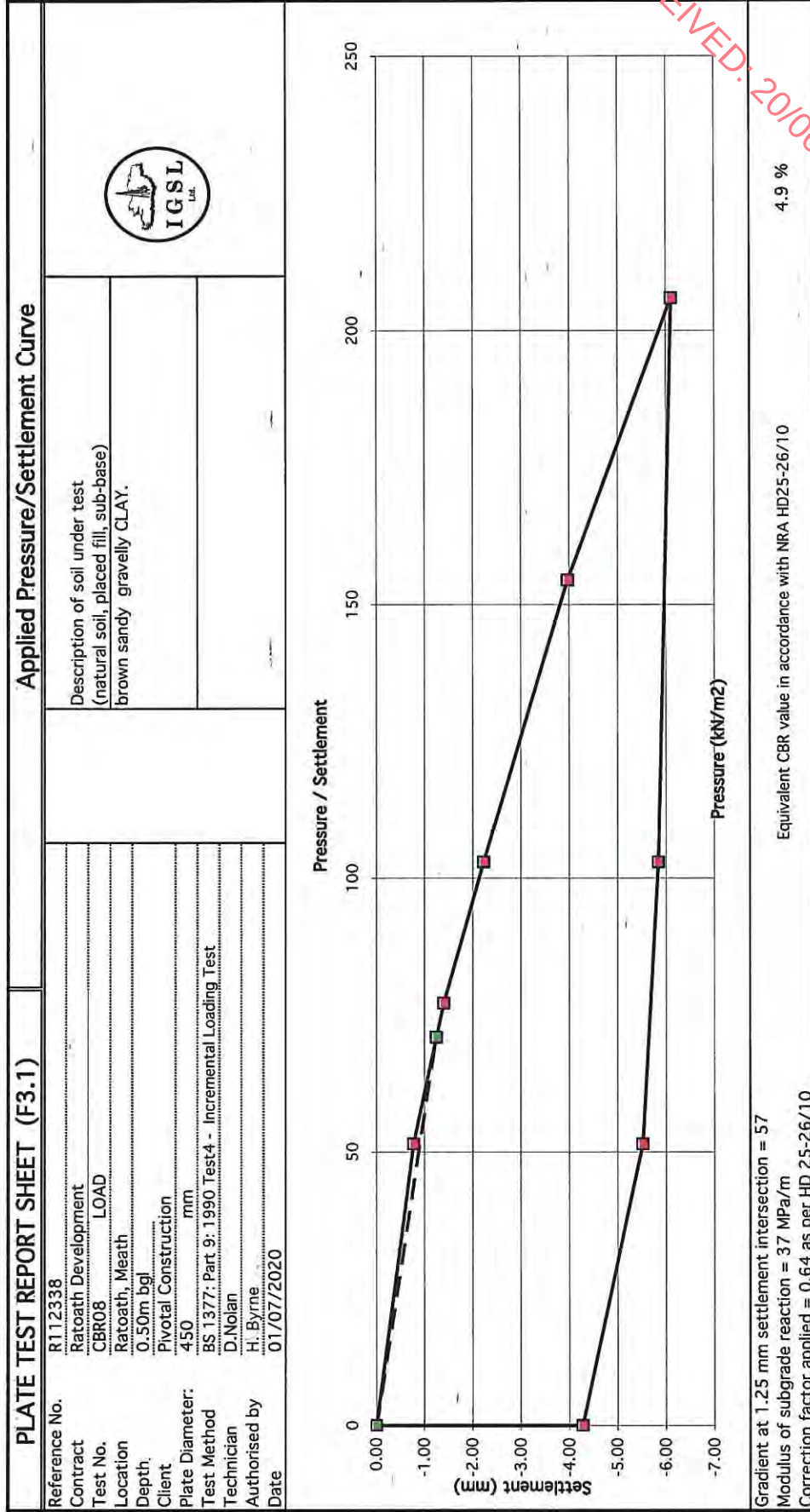


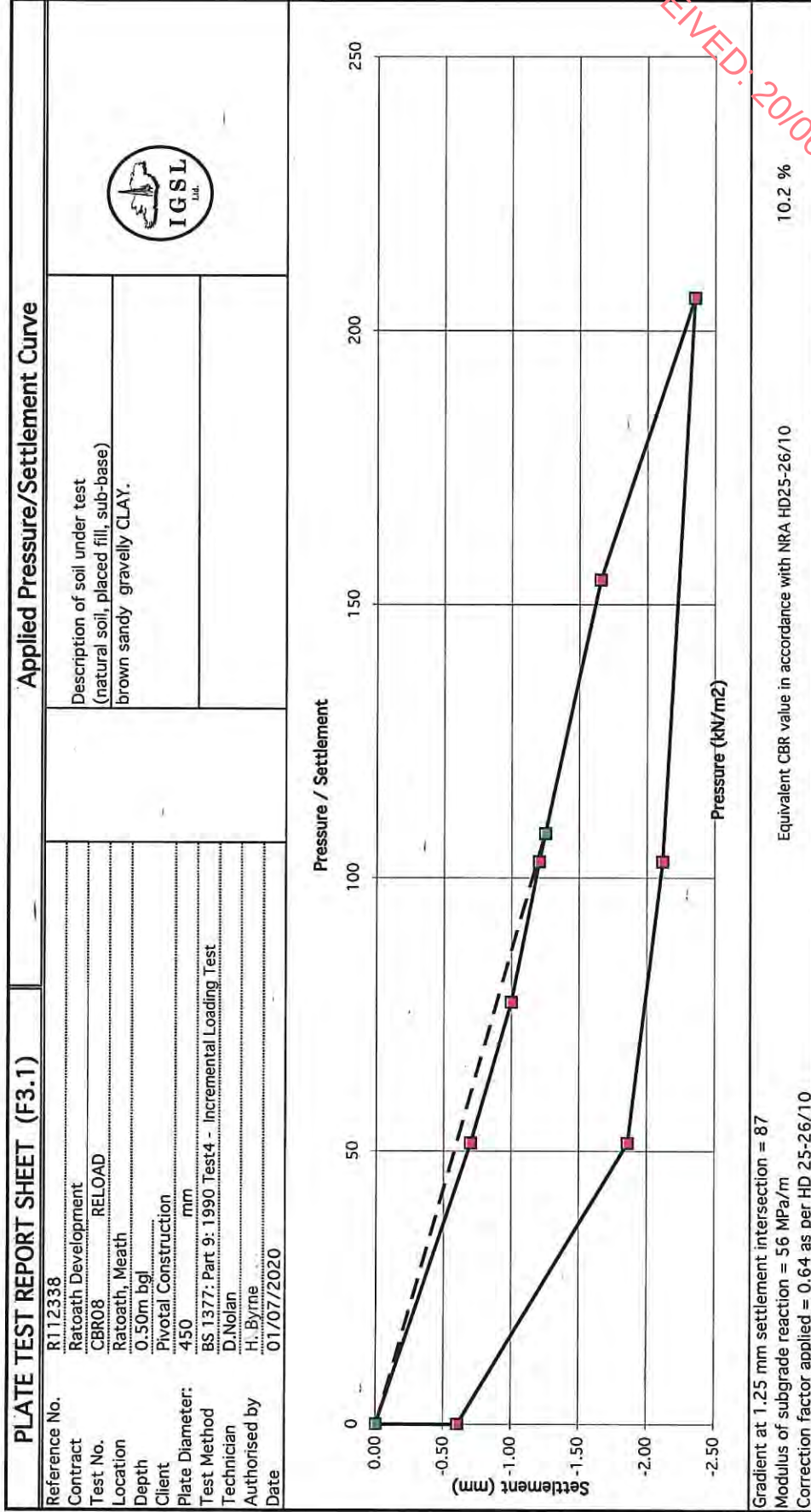


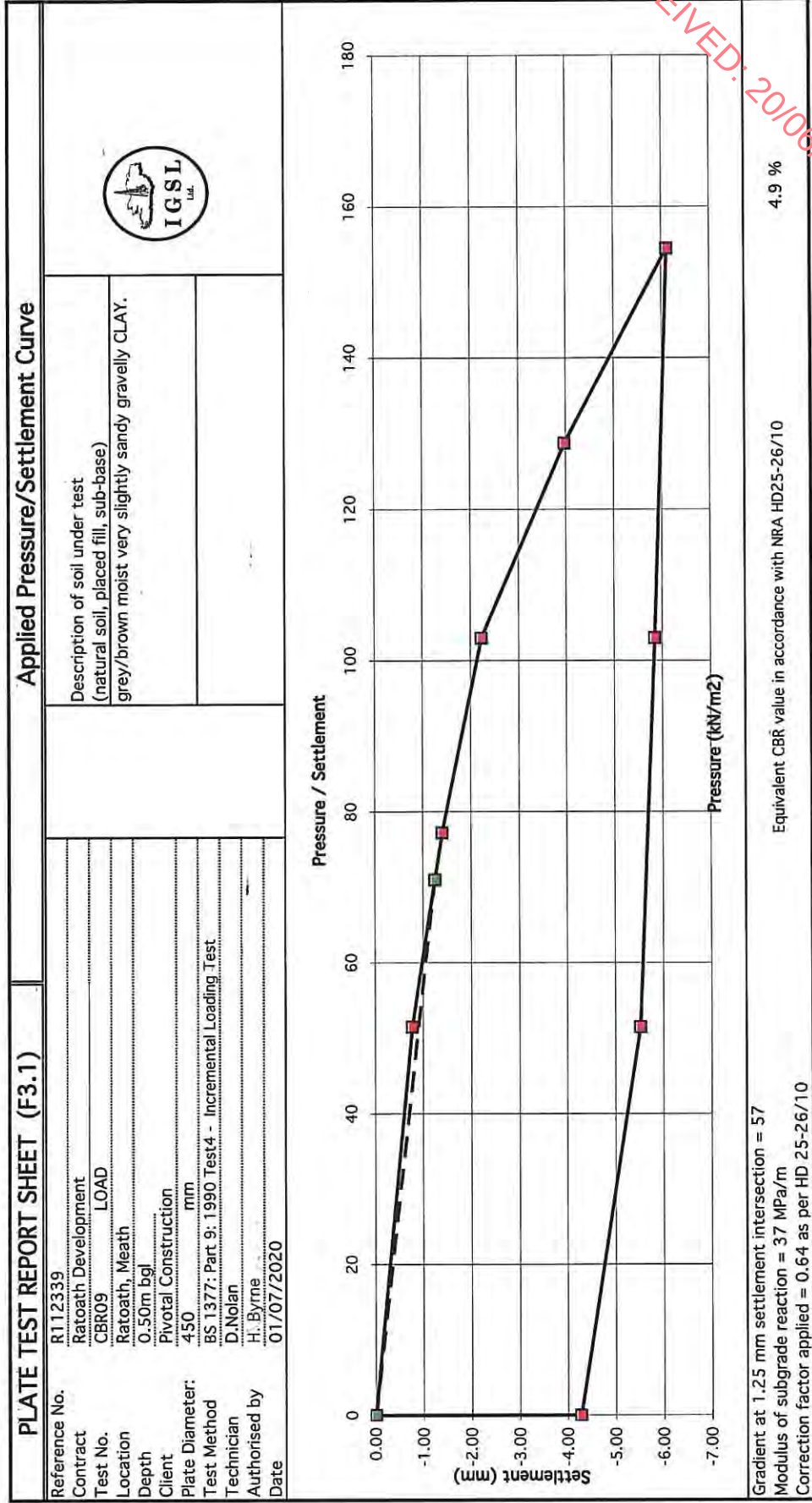


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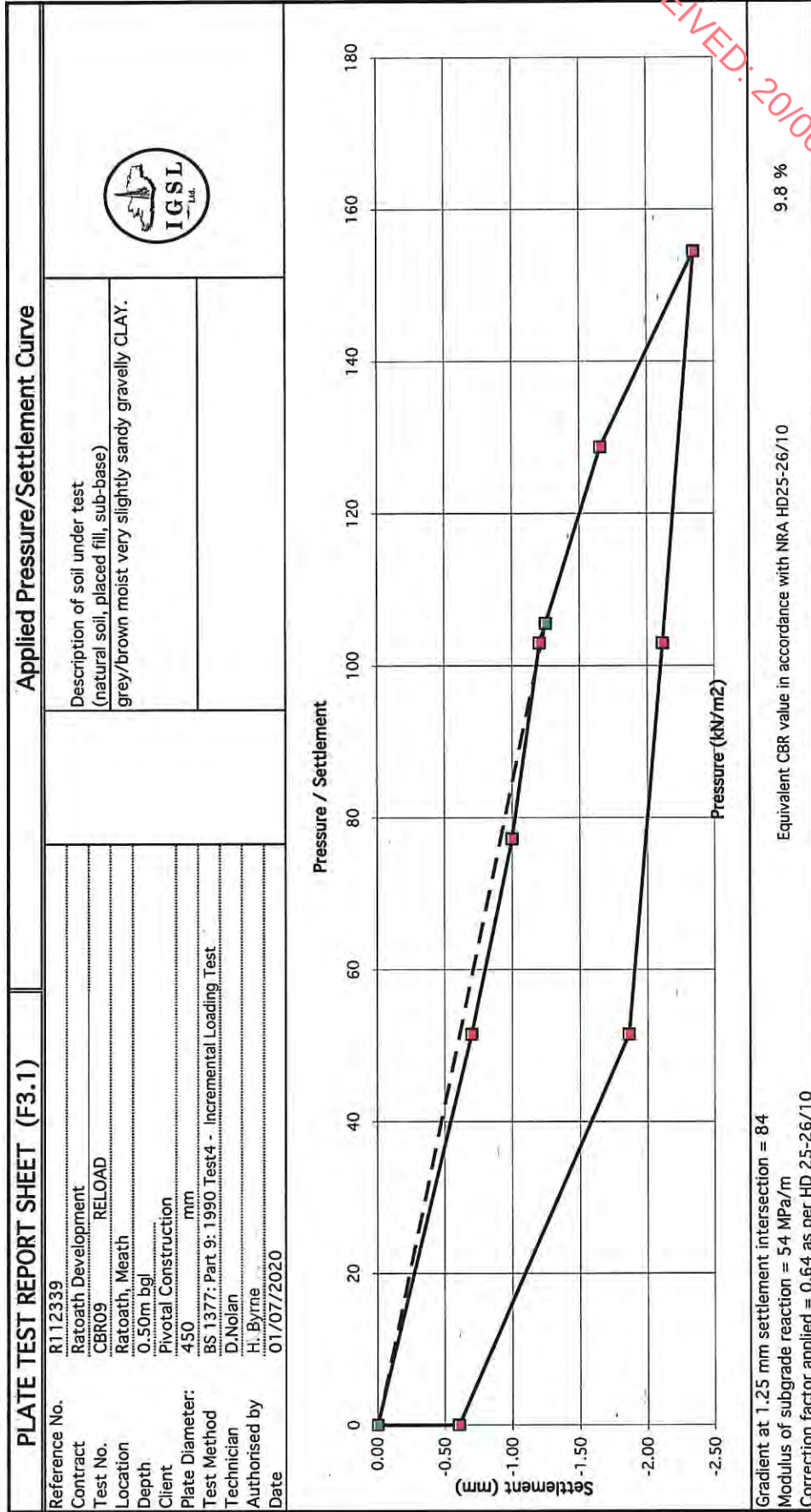








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PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R112340	Description of soil under test (natural soil, placed fill, sub-base)	IGSL Ltd.
Contract	Ratoath Development		
Test No.	CBR10	brown moist silty slightly gravelly CLAY.	
Location	LOAD		
Depth	Ratoath, Meath		
Client	0.50m bgl		
Plate Diameter:	Pivotal Construction		
Test Method	450 mm		
Technician	BS 1377: Part 9: 1990 Test 4 - Incremental Loading Test		
Authorised by	D. Nolan		
Date	H. Byrne		
	30/06/2020		

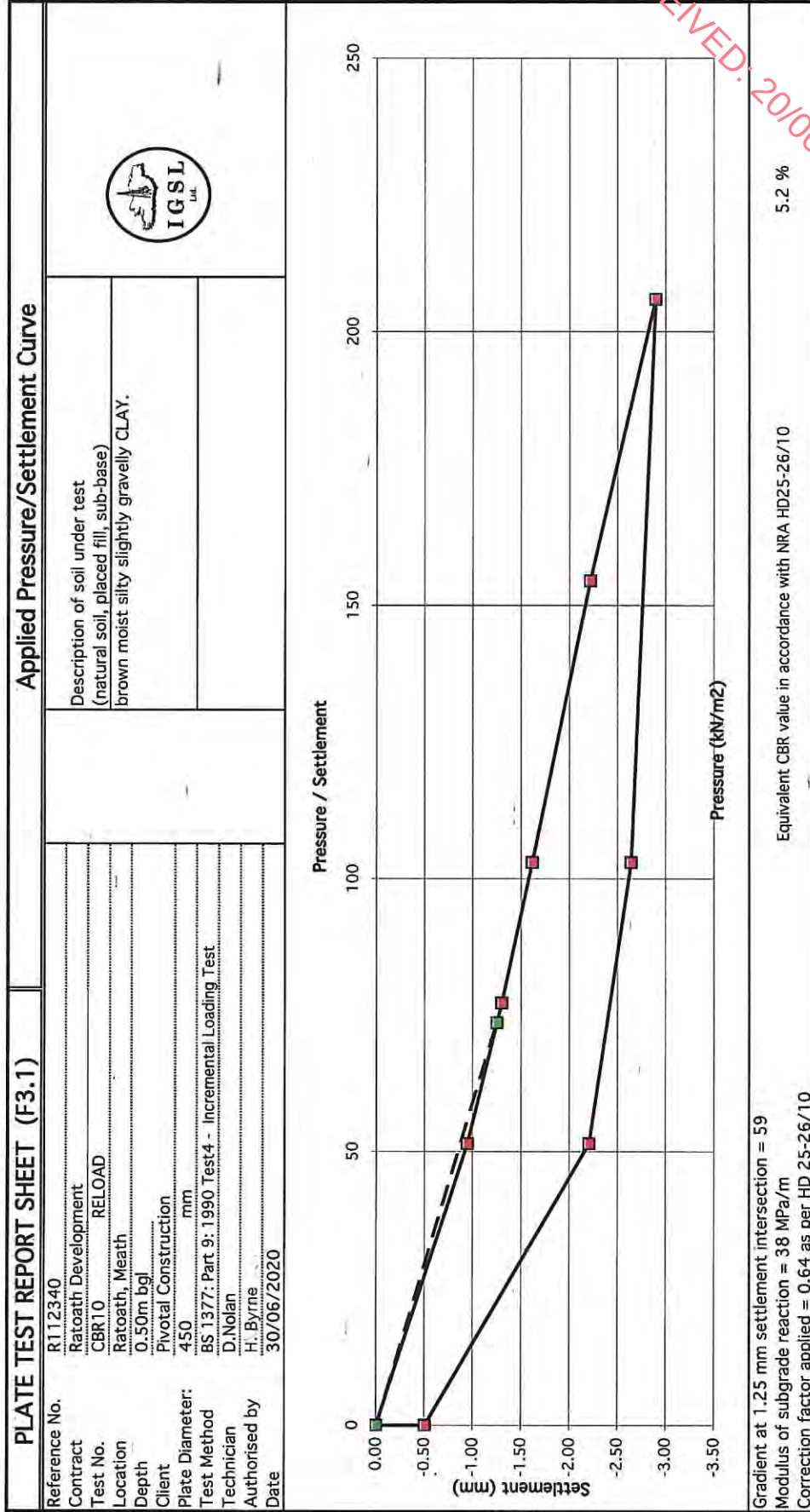
Pressure (kN/m²)	Settlement (mm)
0	0.00
50	-1.00
100	-2.00
150	-3.00
200	-4.00
250	-5.00

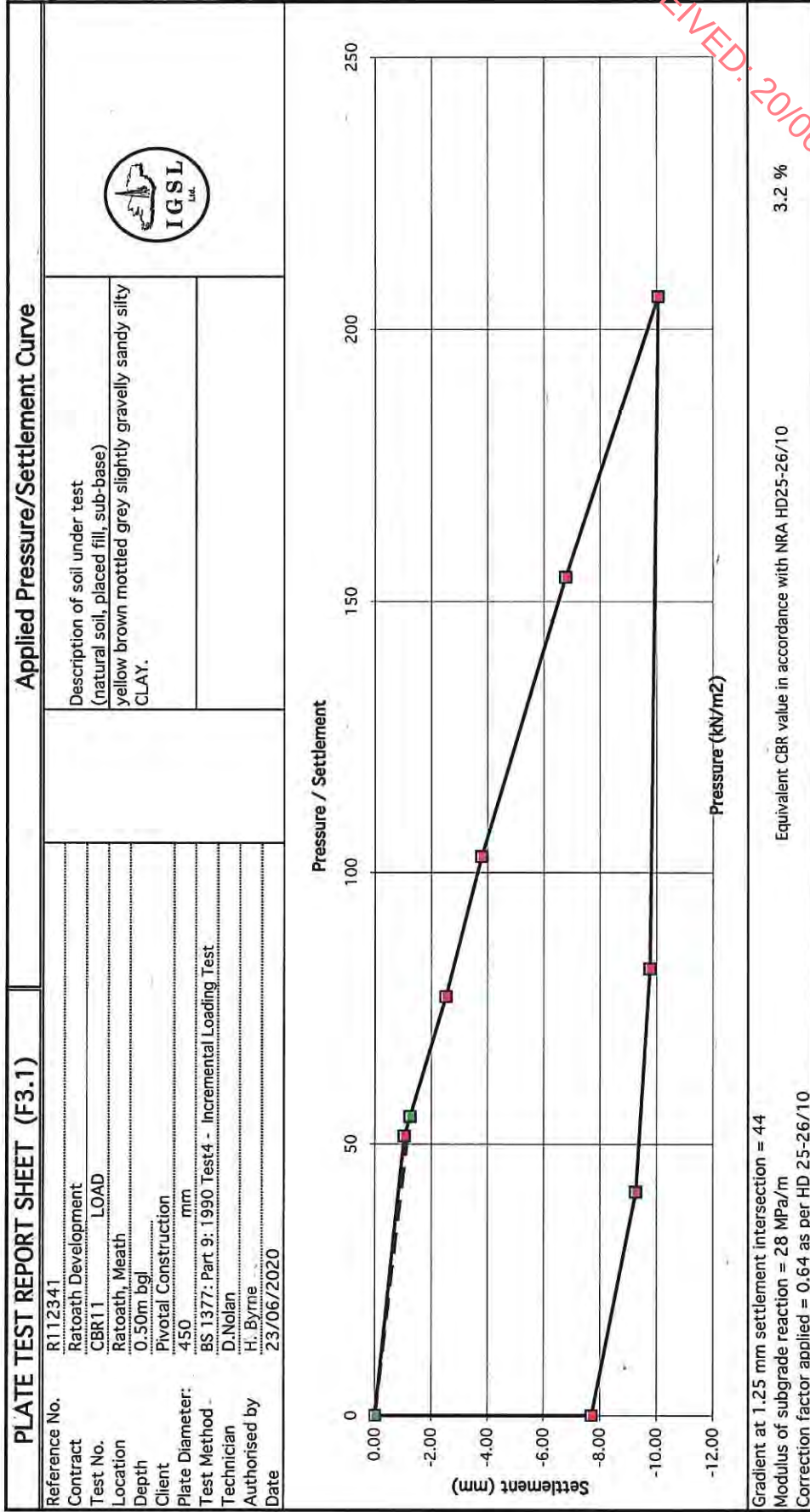
Pressure / Settlement

Pressure (kN/m²)

Gradient at 1.25 mm settlement intersection = 46 Modulus of subgrade reaction = 29 MPa/m Correction factor applied = 0.64 as per HD 25-26/10	Equivalent CBR value in accordance with NRA HD25-26/10 3.4 %
--	--

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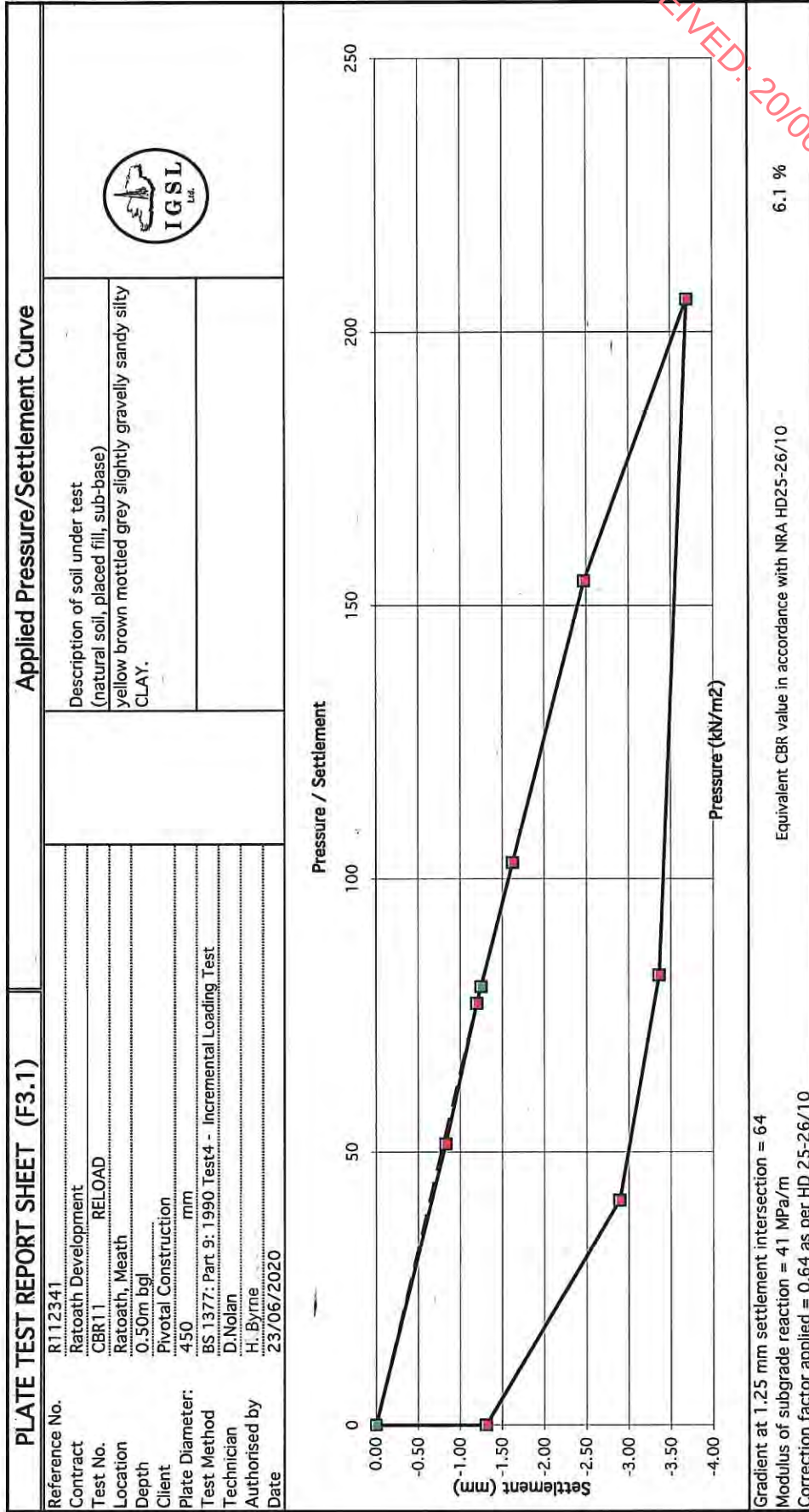


PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R112342	Description of soil under test (natural soil, placed fill, sub-base)	IGSL Ltd.
Contract	Ratoath Development		
Test No.	LOAD	brown very slightly sandy gravelly CLAY.	
Location	Ratoath, Meath		
Depth	0.5m (BGL)		
Client	Pivotal Construction		
Plate Diameter:	450 mm		
Test Method	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test		
Technician	D.Nolan		
Authorised by	H. Byrne		
Date	29/06/2020		

Pressure / Settlement

Pressure (kN/m²)	Settlement (mm)
0	0.00
25	-1.5
50	-2.5
75	-3.5
100	-4.5
150	-6.5
200	-9.5
225	-10.5

Pressure (kN/m²)

Gradient at 1.25 mm settlement intersection = 42	Equivalent CBR value in accordance with NRA HD25-26/10	3.0 %
Modulus of subgrade reaction = 27 MPa/m		
Correction factor applied = 0.64 as per HD 25-26/10		

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PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R112342	Description of soil under test (natural soil, placed fill, sub-base)	IGSL Ltd.
Contract	Ratoath Development		
Test No.	CBR12	brown very slightly sandy gravelly CLAY.	
Location	RELOAD		
Depth	Ratoath, Meath		
Client	0.5m (BGL)		
Plate Diameter:	Pivotal Construction		
Test Method	450 mm		
Technician	BS 1377: Part 9: 1990 Test 4 - Incremental Loading Test		
Authorised by	D. Nolan		
Date	H. Byrne		
	29/06/2020		

Pressure (kN/m²)	Settlement (mm)
0	0.00
50	-1.00
100	-1.50
150	-2.00
200	-3.50
250	-4.00

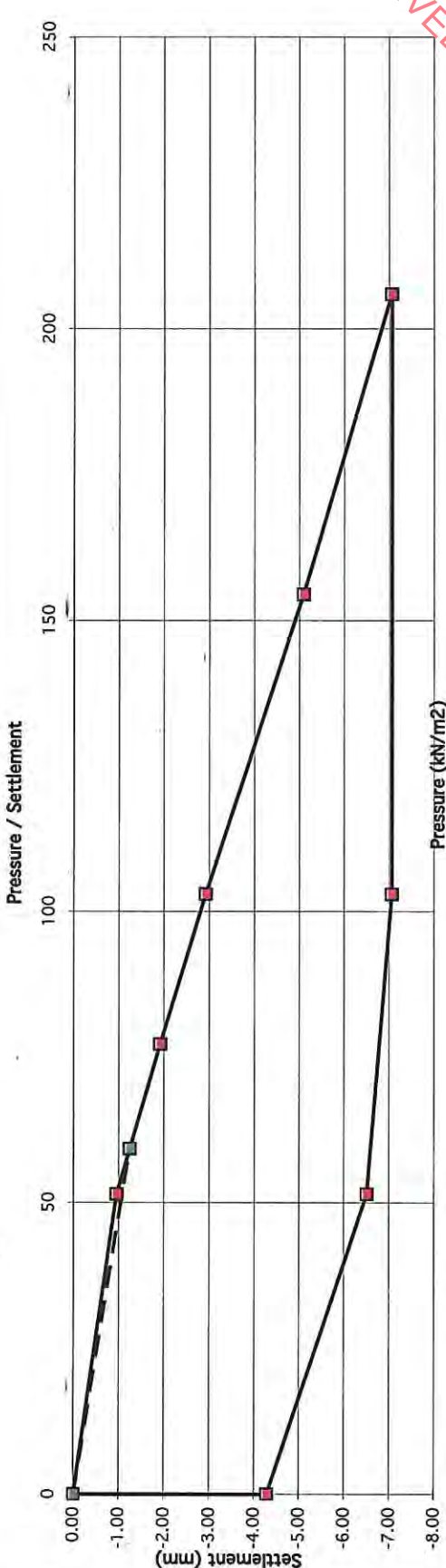
Pressure / Settlement

Pressure (kN/m²)

Gradient at 1.25 mm settlement intersection = 53 Modulus of subgrade reaction = 34 MPa/m Correction factor applied = 0.64 as per HD 25-26/10	Equivalent CBR value in accordance with NRA HD25-26/10 4.4 %
--	--

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PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R112343	Description of soil under test (natural soil, placed fill, sub-base)	
Contract	Ratoath Development		
Test No.	CBR13	brown very slightly sandy gravelly CLAY.	
Location	LOAD		
Depth	Ratoath, Meath		
Client	0.5m (BGL)		
Plate Diameter:	Pivotal Construction		
Test Method	450 mm		
Technician	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test		
Authorised by	D.Nolan		
Date	H. Byrne		
	29/06/2020		



Pressure (kN/m²)	Settlement (mm)
0	0.00
50	-1.00
100	-2.00
150	-3.00
200	-4.00
250	-7.00

Pressure / Settlement

Pressure (kN/m²)

Gradient at 1.25 mm settlement intersection = 47 Modulus of subgrade reaction = 30 MPa/m Correction factor applied = 0.64 as per HD 25-26/10	Equivalent CBR value in accordance with NRA HD25-26/10 3.6 %
--	--

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PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No.	R112343	Description of soil under test (natural soil, placed fill, sub-base)	IGSL Lab.
Contract	Ratoath Development		
Test No.	CBR13	brown very slightly sandy gravelly CLAY.	
Location	RELOAD		
Depth	Ratoath, Meath		
Client	0.5m (BGL)		
Plate Diameter:	Pivotal Construction		
Test Method	450 mm		
Technician	BS 1377: Part 9: 1990 Test4 - Incremental Loading Test		
Authorised by	D.Nolan		
Date	H. Byrne		
	29/06/2020		

Pressure / Settlement

Pressure (kN/m²)	Settlement (mm)
0	0.00
50	-0.80
100	-1.50
150	-2.20
200	-3.00
220	-3.50
200	-3.00
150	-2.20
100	-1.50
50	-0.80

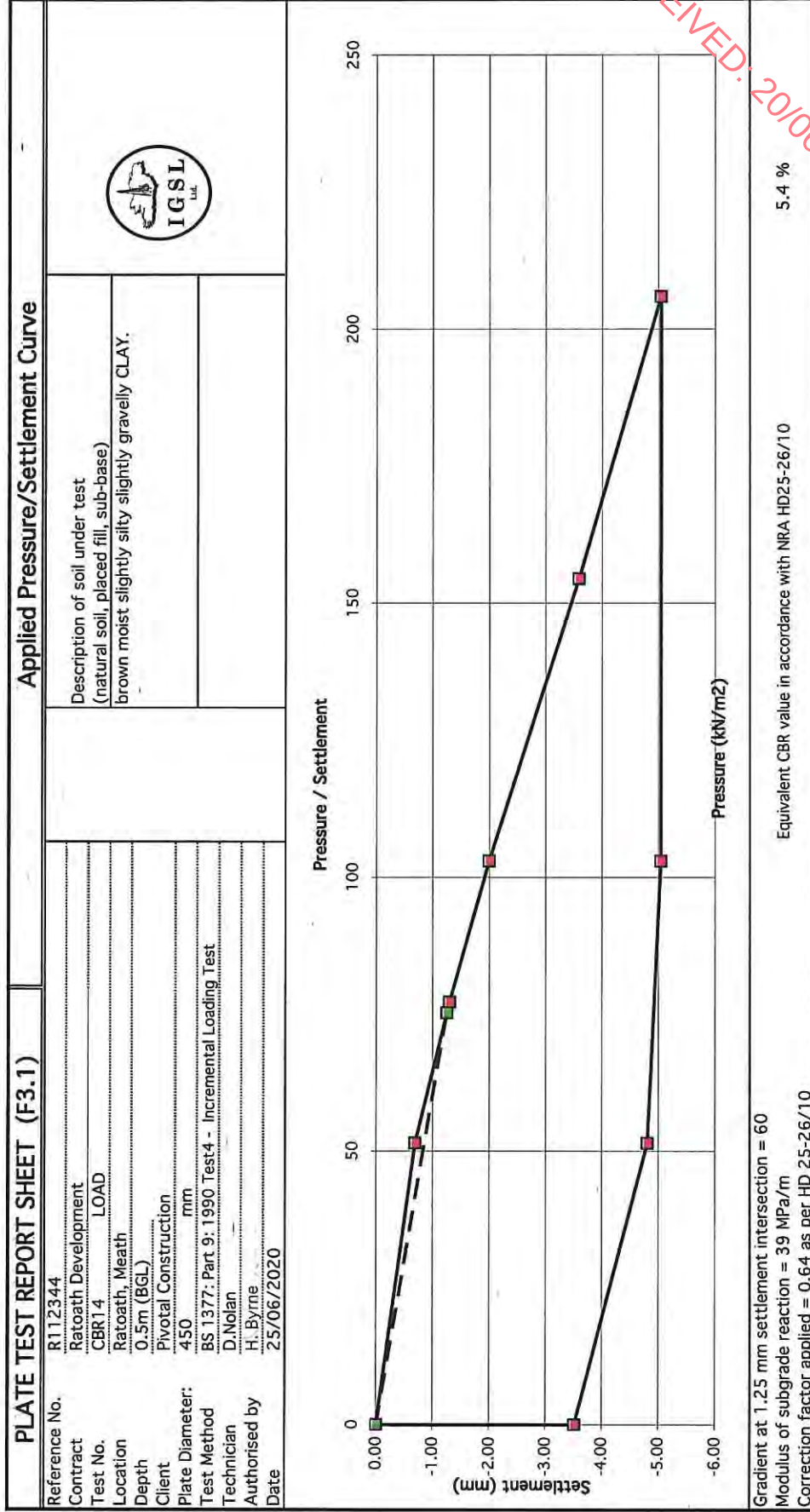
Pressure (kN/m²)

Gradient at 1.25 mm settlement intersection = 63
 Modulus of subgrade reaction = 40 MPa/m
 Correction factor applied = 0.64 as per HD 25-26/10

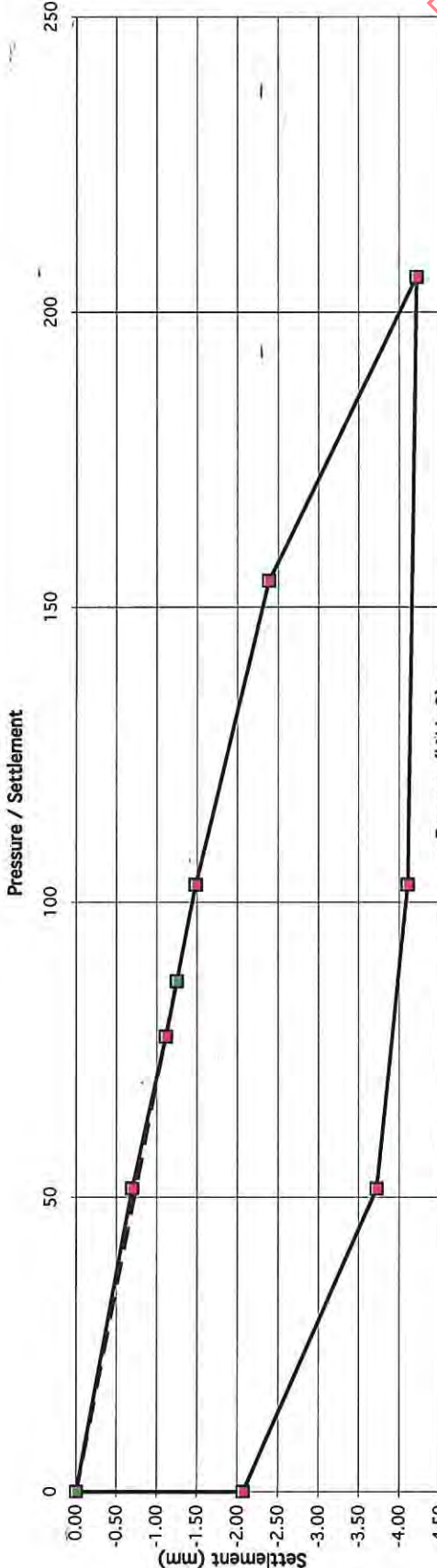
Equivalent CBR value in accordance with NRA HD25-26/10

5.8 %

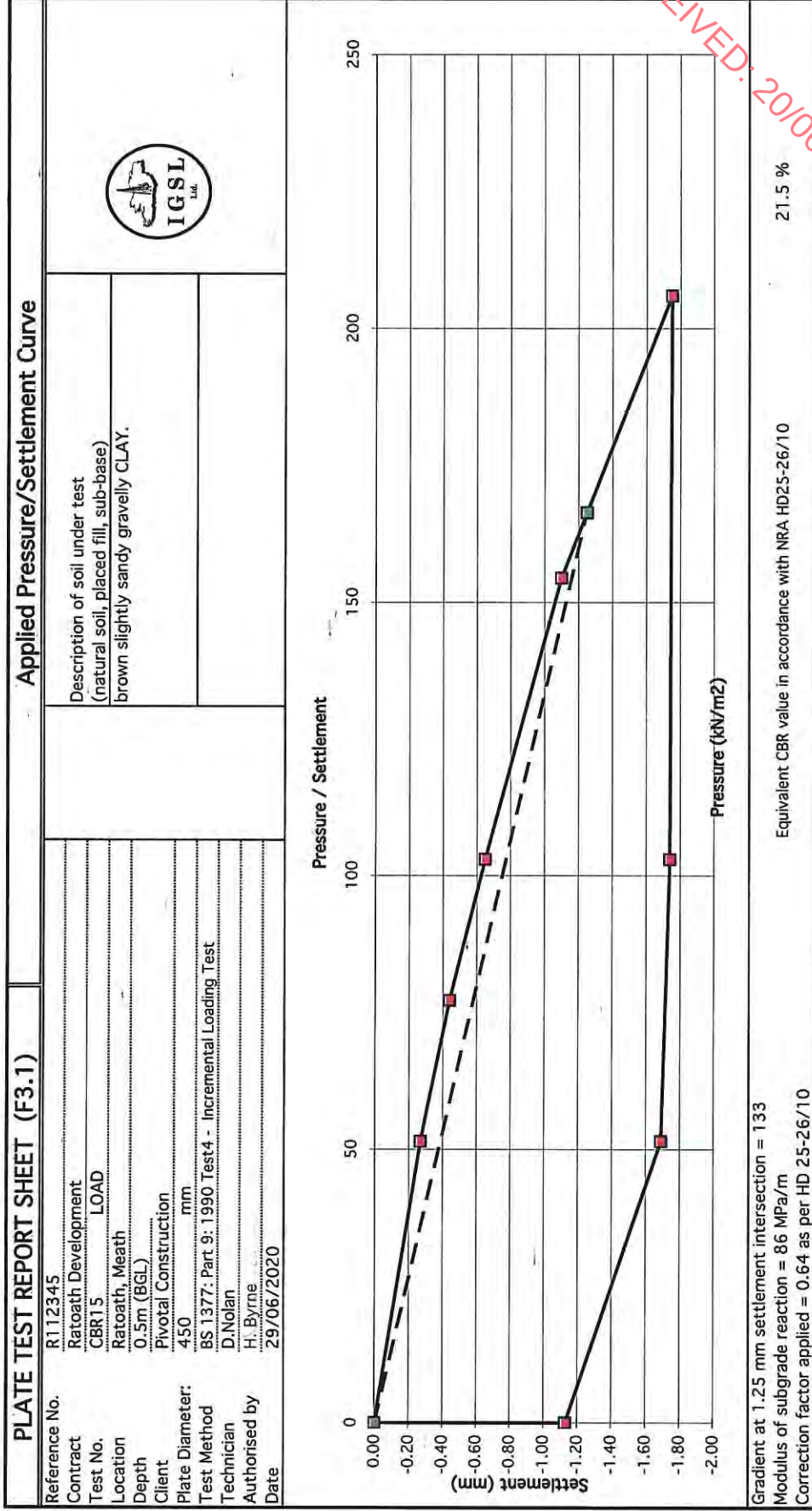
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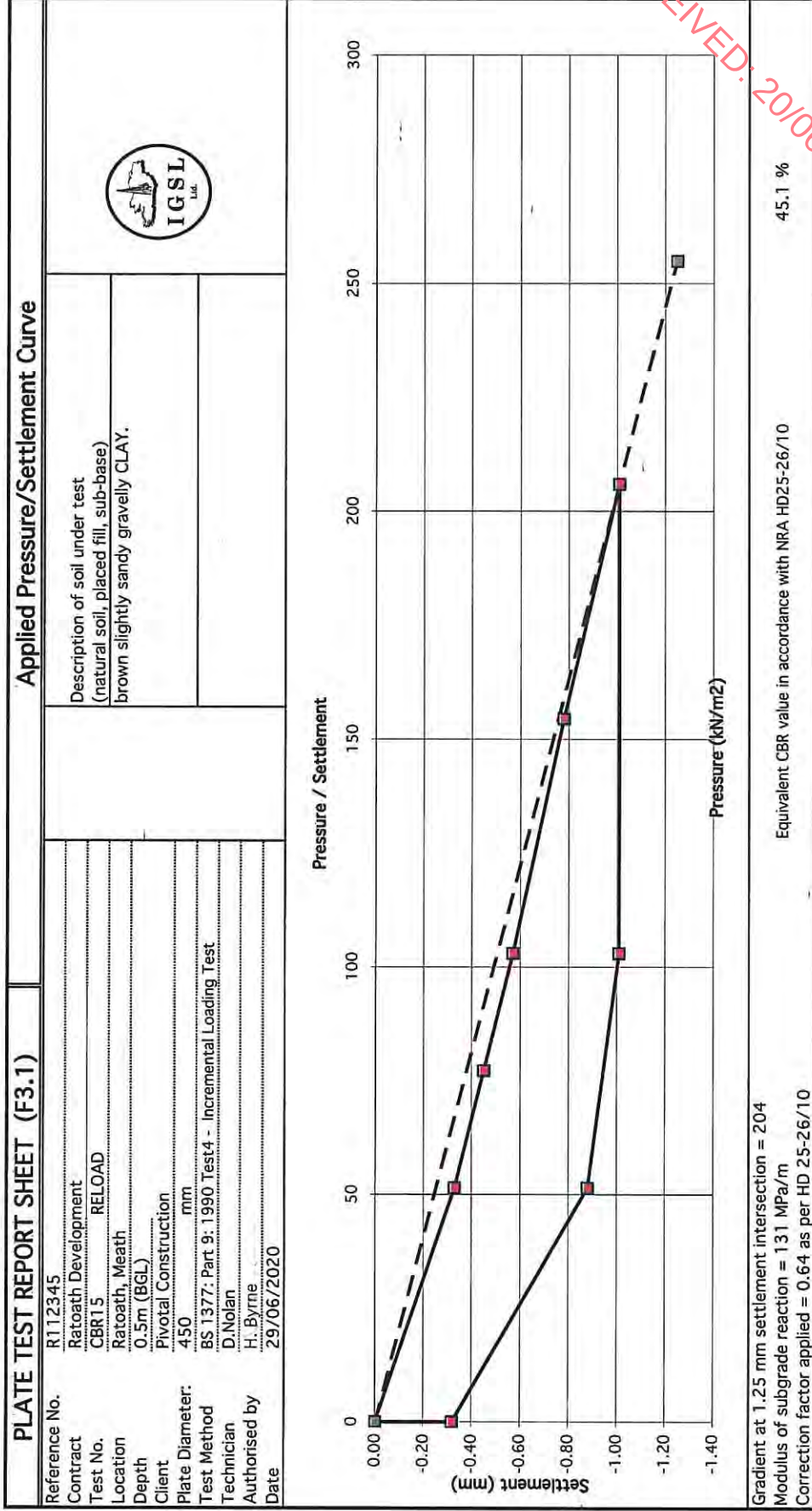
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PLATE TEST REPORT SHEET (F3.1)		Applied Pressure/Settlement Curve	
Reference No. Contract Test No. Location Depth Client Plate Diameter: Test Method Technician Authorised by Date	R112344 Ratoath Development CBR14 Ratoath, Meath 0.5m (BGL) Pivotal Construction 450 mm BS 1377: Part 9: 1990 Test4 - Incremental Loading Test D.Nolan H. Byrne 25/06/2020	Description of soil under test (natural soil, placed fill, sub-base) brown moist slightly silty gravelly CLAY.	
		Pressure / Settlement Pressure (kN/m ²)	
Gradient at 1.25 mm settlement intersection = 69 Modulus of subgrade reaction = 45 MPa/m Correction factor applied = 0.64 as per HD 25-26/10		Equivalent CBR value in accordance with NRA HD25-26/10 6.9 %	

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Appendix V BRE Digest 365 Tests

Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ratoath

Contract No.

22578

Test No. SA01

Client Pivotal Construction

Date: 27/06/2020

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL.	No ingress observed
0.30	1.00	Firm brown slightly silty slightly sandy gravelly CLAY with low cobble content	
1.00	1.80	Firm grey/brown slightly silty slightly sandy gravelly CLAY with medium cobble content and low boulder content. Boulders <	
1.80	1.95	Firm to stiff dark grey slightly sandy gravelly CLAY with medium cobble content and low boulder content. Boulders < 220mm.	

Field Data

Depth to Water (m)	Elapsed Time (min)
0.84	0.00
0.84	1.00
0.84	2.00
0.84	3.00
0.85	4.00
0.85	5.00
0.85	6.00
0.85	7.00
0.85	8.00
0.85	9.00
0.85	10.00
0.85	12.00
0.85	14.00
0.85	16.00
0.85	18.00
0.85	20.00
0.85	25.00
0.85	30.00
0.85	40.00
0.85	50.00
0.85	60.00

Field Test

Depth of Pit (D)	1.95	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.90	m

Initial depth to Water =	0.84	m
Final depth to water =	0.85	m
Elapsed time (mins)=	60.00	

Top of permeable soil		m
Base of permeable soil		m

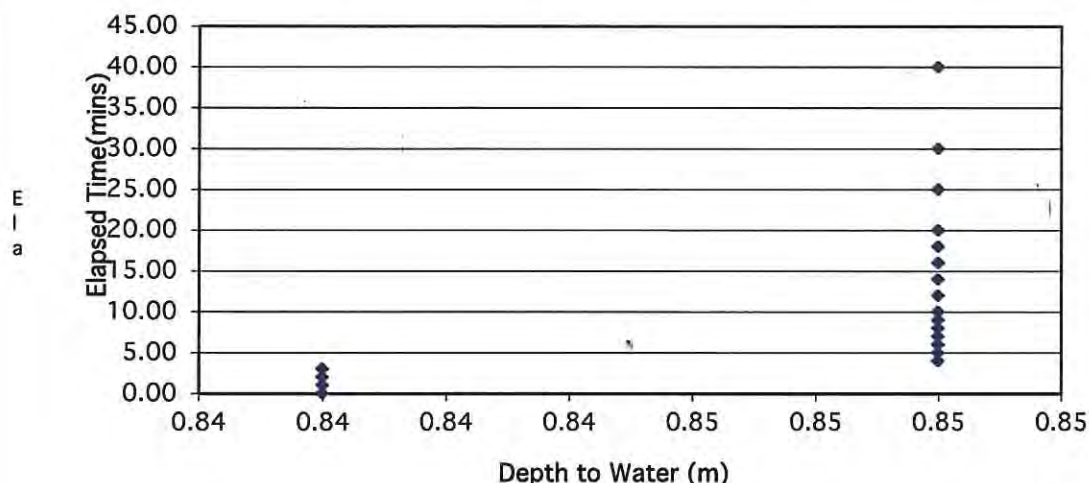
Base area=	0.76	m ²
*Av. side area of permeable stratum over test period	5.083	m ²
Total Exposed area =	5.843	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec

No fall in water level after 3 minutes - test failed

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ratoath

Contract No.

22578

Test No. SA02

Client Pivotal Construction

Date: 27/06/2020

Summary of ground conditions

from	to	Description	Ground water
0.00	0.20	TOPSOIL.	No ingress observed
0.20	0.90	Firm grey/brown slightly sandy gravelly CLAY with medium cobble content.	
0.90	2.00	Firm to stiff brown slightly sandy gravelly CLAY with medium cobble content and low boulder content. Boulders < 400mm.	

Field Data

Depth to Water (m)	Elapsed Time (min)
0.80	0.00
0.80	1.00
0.80	2.00
0.80	3.00
0.80	4.00
0.80	5.00
0.80	6.00
0.80	7.00
0.80	8.00
0.80	9.00
0.80	10.00
0.80	12.00
0.80	14.00
0.80	16.00
0.80	18.00
0.80	20.00
0.80	25.00
0.80	30.00
0.80	40.00
0.80	50.00
0.80	60.00

Field Test

Depth of Pit (D) 2.00 m
Width of Pit (B) 0.40 m
Length of Pit (L) 1.80 m

Initial depth to Water = 0.80 m
Final depth to water = 0.80 m
Elapsed time (mins)= 60.00

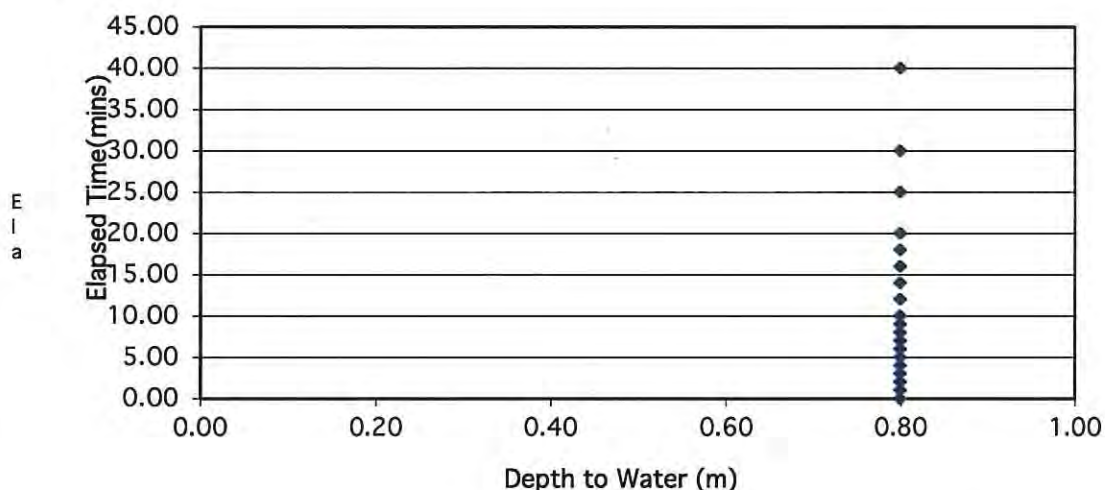
Top of permeable soil m
Base of permeable soil m

Base area= 0.72 m2
*Av. side area of permeable stratum over test period 5.28 m2
Total Exposed area = 6 m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ratoath

Contract No.

22578

Test No. SA03

Client Pivotal Construction

Date: 27/06/2020

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL.	No ingress observed
0.30	1.70	Firm to stiff brown mottled grey slightly sandy gravelly CLAY with medium cobble content and low boulder content. Boulders <	
1.70	2.10	Stiff dark grey/black slightly sandy gravelly CLAY with medium cobble content and low boulder content. Boulders < 330mm.	

Field Data

Depth to Water (m)	Elapsed Time (min)
0.87	0.00
0.87	1.00
0.87	2.00
0.87	3.00
0.87	4.00
0.87	5.00
0.87	6.00
0.87	7.00
0.87	8.00
0.87	9.00
0.87	10.00
0.87	12.00
0.87	14.00
0.87	16.00
0.87	18.00
0.87	20.00
0.88	25.00
0.88	30.00
0.88	40.00
0.88	50.00
0.88	60.00

Field Test

Depth of Pit (D)	2.10	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.80	m

Initial depth to Water =	0.87	m
Final depth to water =	0.88	m
Elapsed time (mins)=	60.00	

Top of permeable soil		m
Base of permeable soil		m

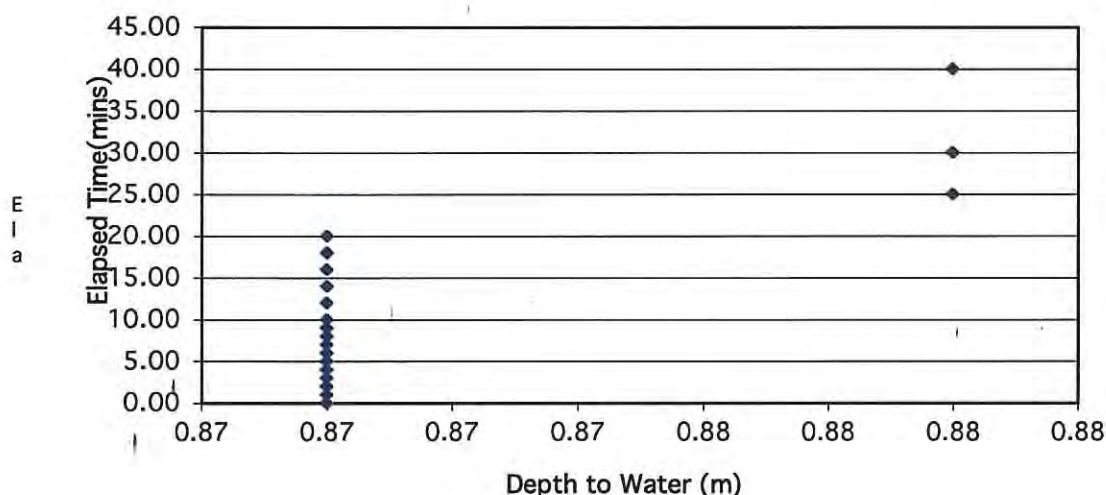
Base area=	0.72	m ²
*Av. side area of permeable stratum over test period	5.39	m ²
Total Exposed area =	6.11	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec

No fall in water level after 20 minutes - test failed

Depth of water vs Elapsed Time (mins)



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Ratoath

Contract No.

22578

Test No. SA04

Client Pivotal Construction

Date: 27/06/2020

Summary of ground conditions

from	to	Description	Ground water
0.00	0.25	TOPSOIL.	None observed
0.25	1.70	Firm to stiff brown mottled grey slightly sandy gravelly CLAY with medium cobble content.	
1.70	2.00	Firm to stiff dark grey/black very slightly sandy gravelly CLAY with medium cobble content.	

Field Data

Depth to Water (m)	Elapsed Time (min)
0.71	0.00
0.71	1.00
0.71	2.00
0.71	3.00
0.71	4.00
0.71	5.00
0.71	6.00
0.71	7.00
0.71	8.00
0.71	9.00
0.71	10.00
0.71	12.00
0.71	14.00
0.71	16.00
0.71	18.00
0.71	20.00
0.71	25.00
0.71	30.00
0.72	40.00
0.72	50.00
0.72	60.00

Field Test

Depth of Pit (D)	2.00	m
Width of Pit (B)	0.40	m
Length of Pit (L)	1.70	m

Initial depth to Water =	0.71	m
Final depth to water =	0.72	m
Elapsed time (mins)=	60.00	

Top of permeable soil		m
Base of permeable soil		m

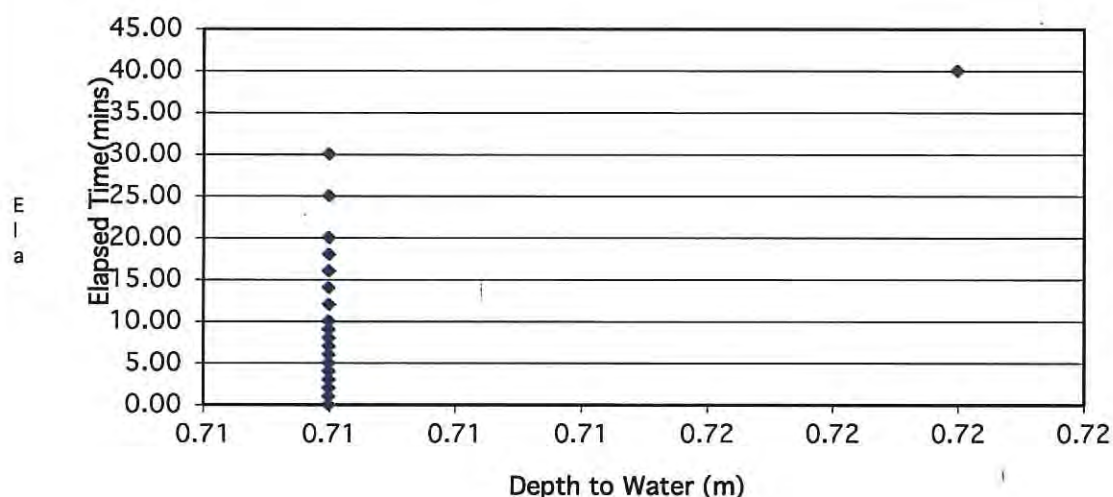
Base area=	0.68	m ²
*Av. side area of permeable stratum over test period	5.397	m ²
Total Exposed area =	6.077	m ²

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec

No fall in water during initial 50 minutes - test failed

Depth of water vs Elapsed Time (mins)



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Appendix VI Dynamic Cone Records



DYNAMIC PROBE RECORD

REPORT NUMBER

22578

CONTRACT Ratoath Development

PROBE NO. DP01

SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50

DATE DRILLED 25/06/2020

DATE LOGGED 25/06/2020

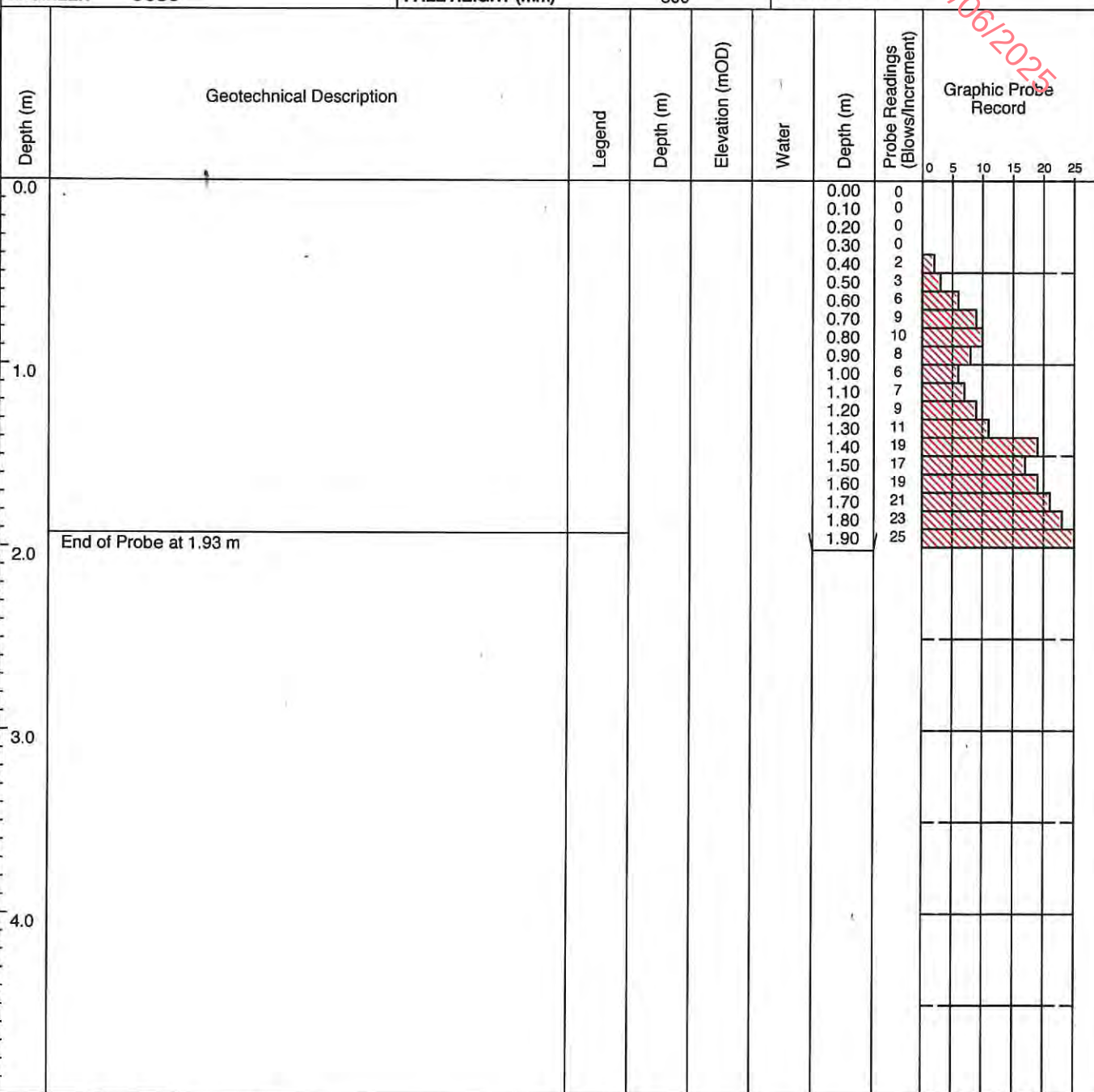
CLIENT Pivotal Construction

INCREMENT SIZE (mm) 100

ENGINEER OCSC

FALL HEIGHT (mm) 500

PROBE TYPE DPH



GROUNDWATER OBSERVATIONS

REMARKS

CAT [Cable Avoidance Tool] used to scan area prior to probe construction



DYNAMIC PROBE RECORD

REPORT NUMBER

22578

CONTRACT Ratoath Development

PROBE NO. DP02

SHEET Sheet 1 of 1

CO-ORDINATES

GROUND LEVEL (mOD)

HAMMER MASS (kg) 50

DATE DRILLED 25/06/2020

DATE LOGGED 25/06/2020

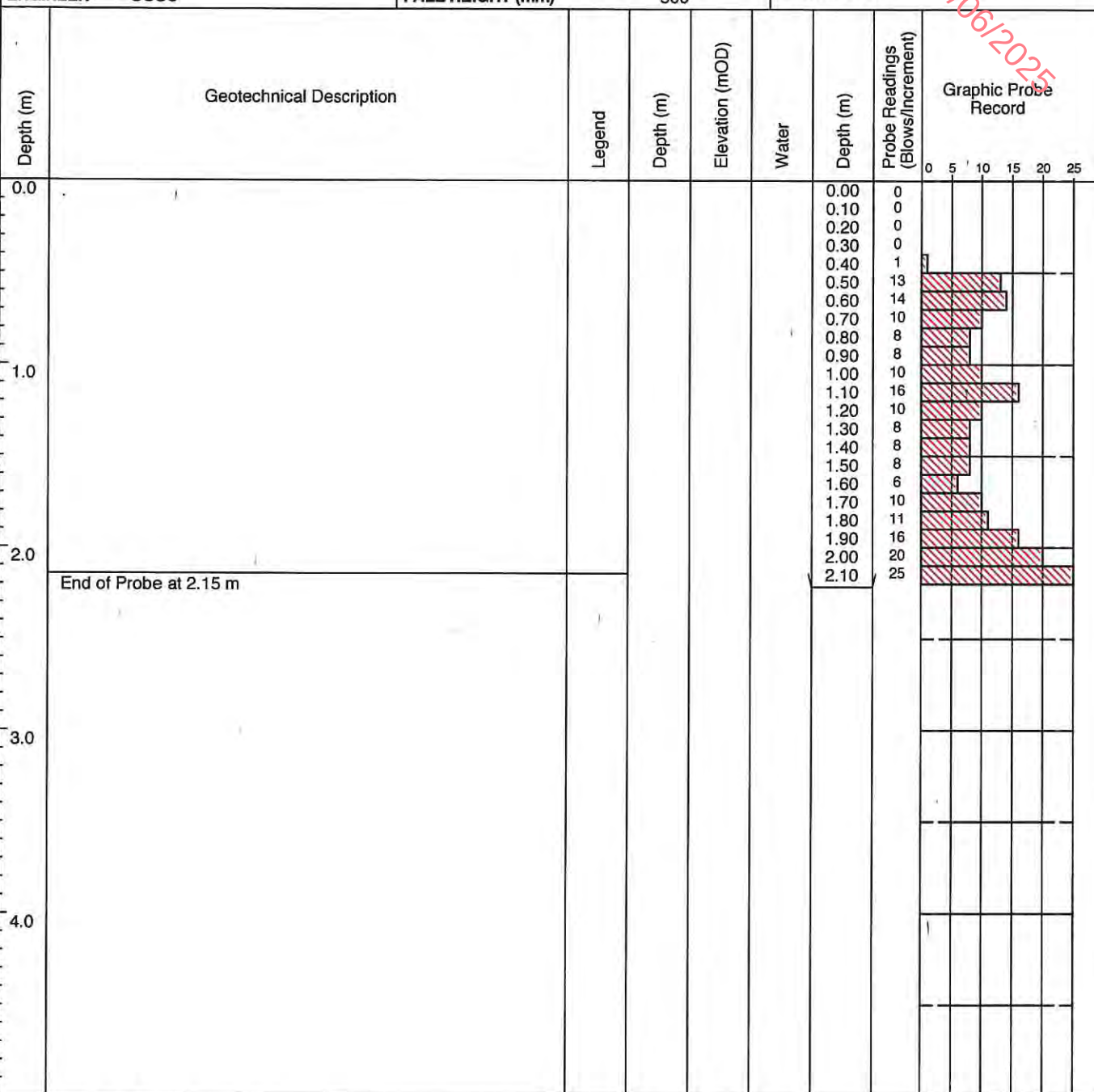
CLIENT Pivotal Construction

INCREMENT SIZE (mm) 100

ENGINEER OCSC

FALL HEIGHT (mm) 500

PROBE TYPE DPH



GROUNDWATER OBSERVATIONS

REMARKS

CAT [Cable Avoidance Tool] used to scan area prior to probe construction

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Appendix VII Laboratory Data

TEST REPORT

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5
(note: Sedimentation stage not accredited)



Contract No. 22578		Report No. R113296	
Contract: Ratoath, Co.Meath			
BH/TP: BH01			
Sample No. AA135075	Lab. Sample No. A20/2904		
Sample Type: B			
Depth (m) 7.00	Customer: OCSC Consulting Engineers, 9 Prussia St, Stoneybatter, Dublin		
Date Received 10/07/2020	Date Testing started 15/07/2020		
Description: Grey/brown slightly sandy, gravelly, CLAY with some cobbles			
Remarks			
Notes: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO 7892-4:2016. Results apply to sample as received. Sample size did not meet the requirement of BS1377			

particle size	% passing	CLAY	SILT	Sieve size (mm)	SAND	GRAVEL
75	100					
63	88					
50	88					
37.5	85					
28	79					
20	73					
14	67					
10	62					
6.3	55					
5	52					
3.35	48					
2	43					
1.18	39					
0.6	34					
0.425	33					
0.3	31					
0.15	27					
0.063	24					
0.037	22					
0.026	20					
0.017	18					
0.010	16	SAND				
0.007	15					
0.005	13					
0.001	10	COBBLES				

TEST REPORT

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5
(note: Sedimentation stage not accredited)



Contract No. 22578		Report No. R113297	
Contract: Ratoath, Co.Meath			
BH/TP: BH03			
Sample No. AA135060	Lab. Sample No. A20/2907		
Sample Type: B			
Depth (m) 6.00	Customer: OCSC Consulting Engineers, 9 Prussia St, Stoneybatter, Dublin		
Date Received 10/07/2020	Date Testing started 15/07/2020		
Description: Grey/brown slightly sandy, gravelly, CLAY with many cobbles			
Remarks			
Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-1:2016. Results apply to sample as received. Sample size did not meet the requirements of BS1377			

particle size	% passing	CLAY	SILT	Sieve size (mm)	SAND	GRAVEL
75	100					
63	65					
50	65					
37.5	65					
28	61					
20	57					
14	53					
10	50					
6.3	46					
5	44					
3.35	42					
2	39					
1.18	36					
0.6	33					
0.425	32					
0.3	31					
0.15	27					
0.063	24					
0.037	21					
0.027	20					
0.017	17					
0.010	14					
0.007	13					
0.005	12					
0.002	9					

TEST REPORT

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part 2:1990, clause 9.2 & 9.5
(note: Sedimentation stage not accredited)



Contract No. 22578		Report No. R113298	
Contract: Ratoath, Co.Meath			
BH/TP: BH04			
Sample No. AA135080	Lab. Sample No. A20/2909		
Sample Type: B			
Depth (m) 4.00	Customer: OCSC Consulting Engineers, 9 Prussia St, Stoneybatter, Dublin		
Date Received 10/07/2020	Date Testing started 15/07/2020		
Description: Grey/brown slightly sandy, slightly gravelly, SILT/CLAY			
Remarks			
Note: Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by BS1377:Part 2:2016. Results apply to particle as received.			

particle size	% passing	COBBLES	GRAVEL	SAND	SILT/CLAY
75	100				
63	100				
50	100				
37.5	100				
28	100				
20	96				
14	91				
10	89				
6.3	83				
5	80				
3.35	76				
2	70				
1.18	66				
0.6	60				
0.425	58				
0.3	55				
0.15	50				
0.063	45				
0.037	40				
0.027	36				
0.017	31				
0.010	27				
0.007	22				
0.005	19				
0.002	11				

Percentage passing (%)

Sieve size (mm)

CLAY SILT SAND GRAVEL

IGSL Ltd Materials Laboratory

Approved by: Date: 24/07/20

Page no: 1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)



Chemtest

Eurofins Chemtest Ltd

Depot Road

Newmarket

CB8 0AL

Tel: 01638 606070

Email: info@chemtest.com

Final Report

Report No.: 20-18135-1

Initial Date of Issue: 22-Jul-2020

Client: IGSL

Client Address: M7 Business Park
Naas
County Kildare
Ireland

Contact(s): Darren Keogh

Project: 22578 Rataoth Meath (OCSC)

Quotation No.: Q19-18246

Date Received: 15-Jul-2020

Order No.:

Date Instructed: 15-Jul-2020

No. of Samples: 2

Turnaround (Wkdays): 7

Results Due: 23-Jul-2020

Date Approved: 22-Jul-2020

Approved By:



Details: Glynn Harvey, Technical Manager

Results - Soil

Project: 22578 Rataoth Meath (OCSC)

Client: IGSL	Chemtest Job No.:					20-18135	20-18135
Quotation No.: Q19-18246	Chemtest Sample ID.:					1031960	1031961
Order No.:	Client Sample Ref.:					135069	135077
	Sample Location:					BH1	BH4
	Sample Type:					SOIL	SOIL
	Top Depth (m):					1.00	1.00
Determinand	Accred.	SOP	Units	LOD			
Moisture	N	2030	%	0.020	12		10
pH (2.5:1)	N	2010		4.0	[A] 8.2		[A] 8.4
Magnesium (Water Soluble)	N	2120	g/l	0.010	< 0.010		< 0.010
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	< 0.010		< 0.010
Total Sulphur	U	2175	%	0.010	[A] 0.019		[A] 0.029
Chloride (Water Soluble)	U	2220	g/l	0.010	[A] < 0.010		[A] < 0.010
Nitrate (Water Soluble)	N	2220	g/l	0.010	< 0.010		< 0.010
Ammonium (Water Soluble)	U	2120	g/l	0.01	< 0.01		< 0.01
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.017		[A] 0.031

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Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63, Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1031960	135069		BH1		A	Amber Glass 250ml
1031960	135069		BH1		A	Plastic Tub 500g
1031961	135077		BH4		A	Amber Glass 250ml
1031961	135077		BH4		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurement by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.

Report Information

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Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

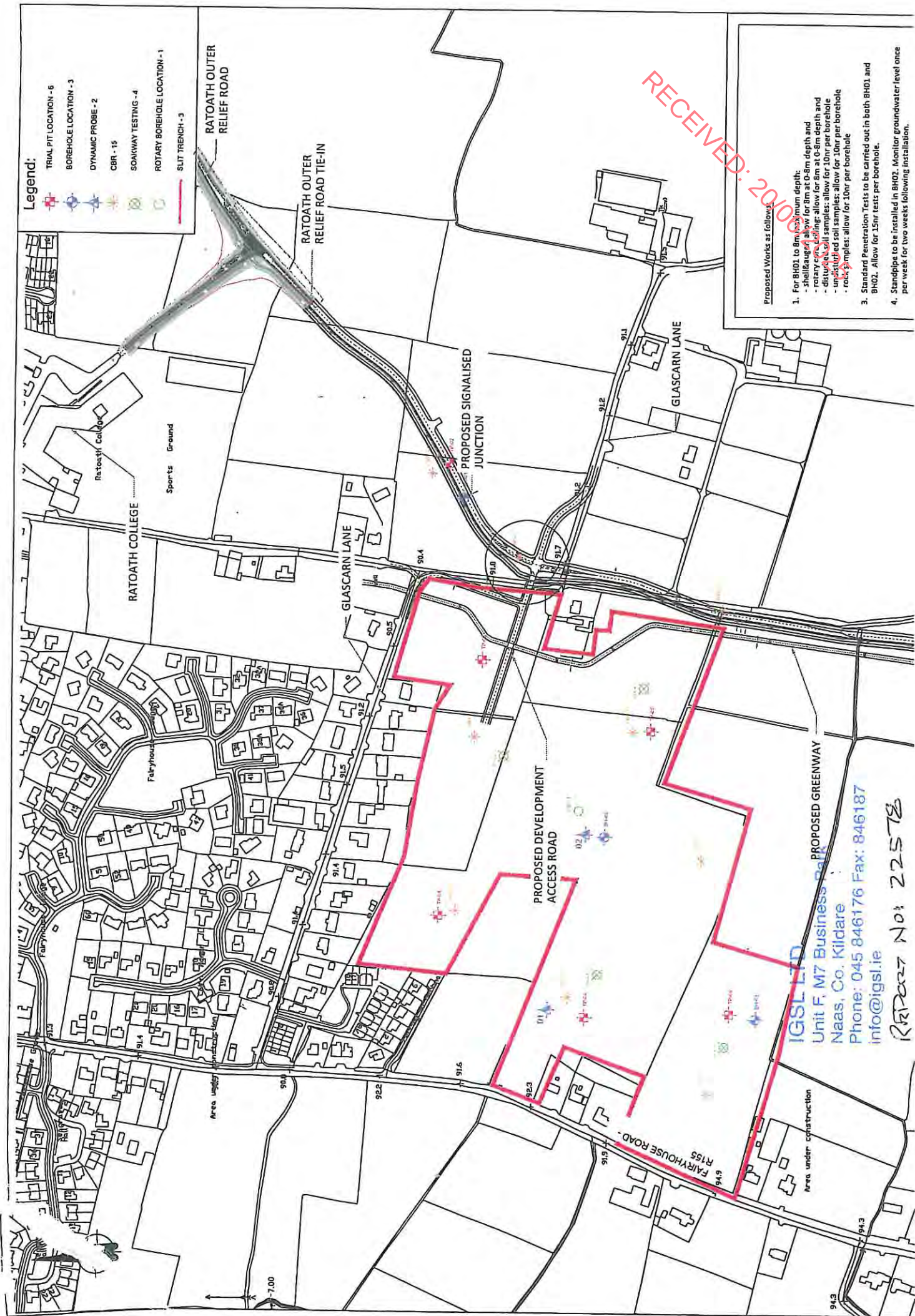
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

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Appendix VIII Site Plan



Legend:

- TRIAL PIT LOCATION - 6
- BOREHOLE LOCATION - 3
- DYNAMIC PROBE - 2
- CBR - 15
- SOAKWAY TESTING - 4
- ROTARY BOREHOLE LOCATION - 1
- SILT TRENCH - 3

Proposed Works as follows:

1. For BH01 to 8m maximum depth:
 - shellauger allow for 8m at 0.8m depth and
 - rotary core drilling allow for 8m at 0.8m depth and
 - disturbed soil samples: allow for 10nr per borehole
 - undisturbed soil samples: allow for 10nr per borehole
 - rock samples: allow for 10nr per borehole
3. Standard Penetration Tests to be carried out in both BH01 and BH02. Allow for 15nr tests per borehole.
4. Standpipe to be installed in BH02. Monitor groundwater level once per week for two weeks following installation.

IGSL LTD
 Unit F, M7 Business Park
 Naas, Co. Kildare
 Phone: 045 846176 Fax: 846187
 info@igsl.ie
 R12027 No: 22578

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Appendix 12.1 - Uisce Eireann EIAR Scoping Response Document

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Uisce Éireann Ref: PN25000019842

O'Connor, Sutton, Cronin & Associates Ltd
9 Prussia Street,
Dublin,
D07KT57

Attention: Mark Killian
Email: mark.killian@ocsc.ie

27th March, 2025

Re: EIAR Scoping Request – Proposed Large Scale Residential Development at Newtown, Ratoath, Co. Meath.

A Chara,

Uisce Éireann has received your Environmental Impact Assessment (EIA) scoping request relating to a proposed Large Scale Residential Development consisting of c.364 no. residential units in Newtown, Ratoath, Co. Meath.

It is Uisce Éireann's current policy to maintain safe and secure drinking water supplies and that no development that will impact Drinking Water Source. Uisce Éireann must be satisfied that the proposed development has no impact on drinking water quality and that water sources are adequately protected. It is a requirement of the Water Framework Directive that waters used for the abstraction of drinking water are protected so as to avoid deterioration in quality.

The following aspects of Water Services should also be considered in the scope of an EIA where relevant;

- a) Where the development proposal has the potential to impact an Uisce Éireann Drinking Water Source(s), the applicant shall provide details of measures to be taken to ensure that there will be no negative impact to Uisce Éireann's Drinking Water Source(s) during the construction and operational phases of the development. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified as part of the report.
- b) Where the development proposes the backfilling of materials, the applicant is required to include a waste sampling strategy to ensure the material is inert.
- c) Mitigations should be proposed for any potential negative impacts on any water source(s) which may be in proximity and included in the environmental management plan and incident response.

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Bosca OP 6000
Baile Átha Cliath 1
D01 WA07
Éire

Uisce Éireann
PO Box 6000
Dublin 1
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T: +353 1 89 25000
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www.water.ie

- d) Any and all potential impacts on the nearby public water supply water source(s) are assessed, including any impact on hydrogeology and any groundwater/surface water interactions.
- e) Impacts of the development on the capacity of water services (*i.e. do existing water services have the capacity to cater for the new development*). This is confirmed by Uisce Éireann in the form of a Confirmation of Feasibility (COF). If a development requires a connection to either a public water supply or sewage collection system, the developer is advised to submit a Pre-Connection Enquiry (PCE) enquiry to Uisce Éireann to determine the feasibility of connection to the Uisce Éireann network.
- f) The applicant shall identify any upgrading of water services infrastructure that would be required to accommodate the proposed development.
- g) In relation to a development that would discharge trade effluent – any upstream treatment or attenuation of discharges required prior to discharging to an Uisce Éireann collection network.
- h) In relation to the management of surface water; the potential impact of surface water discharges to combined sewer networks and potential measures to minimise and or / stop surface waters from combined sewers.
- i) Any physical impact on Uisce Éireann assets – reservoir, drinking water source, treatment works, pipes, pumping stations, discharges outfalls etc. including any relocation of assets.
- j) When considering a development proposal, the applicant is advised to determine the location of public water services assets, possible connection points from the applicant's site / lands to the public network and any drinking water abstraction catchments to ensure these are included and fully assessed in any pre-planning proposals. Details, where known, can be obtained by emailing an Ordnance Survey map identifying the proposed location of the applicant's intended development to datarequests@water.ie
- k) Other indicators or methodologies for identifying infrastructure located within the applicant's lands are the presence of registered wayleave agreements, visible manholes, vent stacks, valve chambers, marker posts etc. within the proposed site.
- l) Any potential impacts on the assimilative capacity of receiving waters in relation to Uisce Éireann discharge outfalls including changes in dispersion / circulation characterises. Hydrological / hydrogeological pathways between the applicant's site and receiving waters should be identified within the report.
- m) Any potential impact on the contributing catchment of water sources either in terms of water abstraction for the development (*and resultant potential impact on the capacity of the source*) or the potential of the development to influence /

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present a risk to the quality of the water abstracted by Uisce Éireann for public supply should be identified within the report.

- n) Where a development proposes to connect to an Uisce Éireann network and that network either abstracts water from or discharges wastewater to a "protected"/sensitive area, consideration as to whether the integrity of the site / conservation objectives of the site would be compromised should be identified within the report.
- o) Uisce Éireann does not permit building over of its assets. As an applicant you are required to;
- survey the site to determine the exact location of the assets. Any trial investigations should be carried out with the agreement and in the presence of Uisce Éireann.
 - Provide evidence of separation distances between the existing Uisce Éireann assets and proposed structures, other services, trees, etc. have to be in accordance with the Irish Water Codes of Practice and Standard Details.
- p) Where a diversion of Public Infrastructure may be required subject to layout proposal of the development and separation distances, the applicant is required to submit a Diversions Enquiry to diversions@water.ie
- q) Mitigation measures in relation to any of the above ensuring a zero risk to any Uisce Éireann drinking water sources (Surface and Ground water).

This is not an exhaustive list.

Please note;

- Where connection(s) to the public network is required as part of the development proposal, applicants are advised to complete the Pre-Connection Enquiry process and have received a Confirmation of Feasibility letter from Uisce Éireann ahead of any planning application.
- Uisce Éireann will not accept new surface water discharges to combined sewer networks.

Queries relating to the terms and observations above should be directed to planning@water.ie

Signed on behalf of Dermot Phelan
Connections and Developer Services