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Environmental Impact Assessment Report

Volume 3 – EIAR Appendix

Prepared by: AWN Consulting, May 2026

Prepared for: Kirkland Investments Limited

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APPENDIX 2.1

Relevant Planning History within the Vicinity of the Subject Site

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Table 1: Relevant Planning History within the Vicinity of the Subject Site

Application details	Description	Decision & Date
Developments within 1km		
LCCC Ref. 2628	construction of a timber-frame single storey dwelling with standing seam zinc roofing with PV panels.	Decision: Further Information
LCCC Ref. 2660275	a Large-Scale Residential Development (LRD) Application Development of 212 no. Residential Units and a Creche, for a period of seven years, at this site: Towlerton, Ballysimon Road, Limerick.	New Application Decision: Due 05/05/2026
ACP Ref. 323410	Proposed Limerick City Greenway (UL to NTP) Project, 4.25km length. Southern extent of proposal terminates at the confluence of the Groody and Shannon rivers, c. 1km from Parkway Valley site. EIAR and NIS submitted with application.	Decision: Due 20/02/2026
Applicant: Bloodmill Road Estates Limited Reference: 201235 Location: Bloodmill Road, Singland, Co. Limerick	alterations to previously approved Planning ref no. 18/434. The alterations consist of alteration to design of Creche to provide a reduced floor area, addition of 3 semi-detached houses together with associated site works. This has commenced.	Decision: Grant Permission (with Conditions) Date: 27/04/2021
Applicant: McCarthy & Woulfe Ltd. Reference: 21142 Location: Brook Place, Rhebogue, Limerick	Construction of a single storey house and ancillary site works	Decision: Grant Permission (with Conditions) Date: 02/06/2021
Applicant: Osprey Construction Limited Reference: 201074 Location: Brú na Gruadán,	a residential development comprising 63 no. residential units - 1no. 2 storey 4 bedroom detached house, 34no. duplex units in four 3 storey blocks with 2 bedroom apartments on the ground floor and 3 bedroom houses over, 10no. duplex in 1 no 3 storey block with 1 bedroom apartments on ground floor and 3 bedroom terrace houses in 1 no block - along with alterations to the existing car parking at the site entrance, addition of bike shelters, with the construction of all associated roads, pavements, car parking, street lighting, foul and surface water drainage and all ancillary site development works on lands. This has commenced.	Decision: Grant Permission (with Revised Conditions) Date: 06/05/2021

Castletroy, Co. Limerick		
Applicant: McCarthy & Woulfe Ltd. Reference: 20827 Location: Anglers Walk, Rhebogue, Limerick	construction of two no dwelling houses and ancillary site works on an existing serviced road	Decision: Grant Permission (with Conditions) Date: 23/07/2021
Applicant: McCarthy & Woulfe Ltd. Reference: 211395 Location: Rhebogue Road, Rhebogue, Limerick	construction of a residential development comprising 6 terrace units with site entrance, and all ancillary site development works. Ancillary site development works include a new connection to the public water main, foul and surface water drainage, access road, footpaths, vehicle parking, landscaping, boundary treatments and site development works above and below ground	Decision: Grant Permission (with Conditions) Date: 17/05/2022
Applicant: Better Value Unlimited Company Reference: 22814 Location: Rhebogue Meadows, Dublin Road , Limerick	the installation of solar photovoltaic panels and mounting system (c.2, 528 sqm) on Dunnes Stores roof, including all other associated site works/services	Decision: Grant Permission (with Conditions) Date: 18/09/2022
Applicant: Granville Rangers AFC Reference: 2223 Location: Granville Rangers AFC, Glenbrook,, Bloodmill Road,, Singland, Limerick.	the installation of an all-weather training pitch with a 3.0 metre high surrounding fence and floodlighting on masts with ancillary site works	Decision: Grant Permission (with Conditions) Date: 20/09/2022

Applicant: Kearock Investments Ltd. Reference: 221216 Location: Old Dublin Road, Rhebogue, Limerick City	Large-Scale Residential Development (LRD) on lands (0.53 Ha) at Old Dublin Road, Rhebogue, Limerick City. The proposed development comprises of the construction of a Purpose-Built Student Accommodation (PBSA) scheme consisting of 26 no. apartments with a total of 202 no. student bedspaces distributed across 3 No. multi storey blocks with a gross development area of 5,771 sq. m. 'Block C' located at the southern end of the site addressing the Old Dublin Road provides 7 No. Student apartments and 52 No. Bedspaces and is 4 storeys with the uppermost floor setback. 'Block C' steps down to 2 storeys to the rear providing ancillary space (342 sq. m.) inclusive of a communal lounge, meeting room, reception area and laundry. Two additional Blocks proposed are located to the rear, namely 'Block B', a 5-storey block with 10 No. apartments and 79 No. Bedspaces and 'Block A', a 4/5 storey block with 9 No. Apartments and 71 No. Bedspaces located at the northern end of the site. A total of 1,519 sq. m. of landscaped public open space is provided across the scheme. The site will be accessed via a 4.8m shared surface and dedicated footpath from the old Dublin Road. The proposed development also includes parking for 16 No. cars and 142 No. bicycles, boundary treatments, bin storage, public lighting, EV charging Bays, electrical infrastructure including 1 no. electrical supply sub-station, water supply and foul and surface water drainage infrastructure and all associated and ancillary site and development works.	Decision: Grant Permission (Conditional, Appeal) Date: 17/05/2023
Applicant: Kirkland Investments Limited Reference: 23102 Location: Towlerton, Ballysimon, Limerick	the construction of a new 5-storey (5,529sq.m. approx.) Medical Building with plant at roof level, accommodating Medical Diagnostics (including X-Ray Screening / Diagnostics and PET CT), Medical Consulting Rooms and Treatment Rooms, offices, service areas, circulation, storage, refuse management, ESB substation and switchroom.	Decision: Permission Date: 19/07/2023
Applicant: Aileen and John McCarthy Reference: 221208 Location: Rhebogue Meadows, Co. Limerick	the construction of a new detached dwelling house with connection to existing services and all ancillary site works	Decision: Permission (Conditional) Date: 21/08/2023
Applicant: Limerick City and County Council Reference: JP91.317686 Location: Ballysimon, Co. Limerick	Proposed development of the Bloodmill Road Extension Scheme	Decision: Grant Permission (with Conditions) Date: 22/02/2024

Applicant: Board of Management of St. Brigid's National School Reference: 2460575 Location: St. Brigid's National School, Singland,, Limerick City,, Limerick.	the construction of a new two-storey school building extension of 622.3m ² at the ground floor and 613.3m ² at the first floor, together with a single storey link connecting to the existing building of 47.5m ² , with a total new area of 1,283.1m ² ; removal of 3 No. pre-fabricated classroom units; external secure play area and sensory garden; 4 No. new surface parking bays, 1 No. EV charging bay and 1 No. Accessible parking bay, a new secure bicycle shelter, 2 No. hard standing ball courts, hard and soft landscaping together with all associated site works	Decision: Grant Permission (with Conditions) Date: 07/11/2024
Applicant: Cathal Glynn Reference: 2460178 Location: Groody Student Park, Castletroy, Co. Limerick	the construction of 6 No. student accommodation, duplex type units over three floors, connections to mains foul & surface water services and all associated site works. This has commenced.	Decision: Grant Permission (with Revised Conditions) Date: 02/04/2025
ACP Ref. 321645/LCCC Ref. 21580	A residential development comprising 55 no. residential units and all associated site works. The development will be accessed via Hillcroft Close, St. Patricks Road, Singland, Limerick. c. 800m from Parkway Valley site.	Decision: Grant Permission Date: 12/05/2025.
Applicant: Groody Developments Limited Reference: 2560113 Location: Groody Road, Newcastle, Castletroy, Limerick	a Large-Scale Residential Development (LRD) - development of a Purpose-Built Student Accommodation (PBSA) scheme on land fronting the Groody Road and Dublin Road, Castletroy, in the townland of Newcastle, Limerick for a period of seven years. The development consisting of 196 no. Bed Clusters, is distributed across 5 no. separate blocks, ranging in height from 5 - 8 storeys, with a total of 1,400 no. student bedspaces to be delivered in two phases of development including: (i) Block A comprising 8 storeys providing for (a) 28 no. bed clusters and 224 no. bedspaces; (b) Student library; (c) Student union; (d) Plant room; (e) Bin store; (f) Bicycle store; (ii) Block B comprising 7 storeys providing for (a) 52 no. bed clusters and 400 no. bedspaces; (b) Reception & Office; (c) Post room; (d) Laundry room; (e) Student canteen; (f) Maintenance store; (g) Plant room; (h) ESB sub station & switch room; (i) Bin Storage; (j) and Bicycle store; (iii) Block C comprising 6 storeys providing for (a) 51 no. bed clusters and 355 no. bedspaces; (b) Student Gym; (c) Maintenance store; (d) Plant room; (e) ESB sub station & switch room; (f) Bin Storage; (g) and Bicycle store; (iv) Block D comprising 6 storeys providing for (a) 32 no. bed clusters and 211 no. bedspaces; (b) Reception & Office; (c) Post room; (d) Laundry room; (e) Student canteen; (f) Student supply retail unit (60m ²); (g) Plant room; (h) Maintenance store; (i) Bin Storage; and (k) Bicycle Storage; (v) Block E comprising 5 storeys providing for (a) 33 no. bed clusters and 210 no. bedspaces; (b) Reception & Office; (c) Laundry room; (d) Maintenance store; (e) Bicycle store; and (f) Plant room; and (vi) ancillary site development works including car and bicycle parking provision; boundary treatments; roof plant; public lighting; water supply; foul and surface water drainage infrastructure; signage; and a temporary construction access to facilitate Phase 2. Vehicular access to the site will be from the Groody Road with pedestrian access to the Dublin Road. Extensive landscaping proposals, including (a) landscaped courtyards; (b) pedestrian and cycle connections from the Groody Road to the Groody Green Wedge; (c) natural landscaping and public	Decision: Grant Permission (With Conditions) Date: 25/09/2025

	walkways within the Groody Green Wedge; and (d) a Wetland area adjacent to the Groody River are also proposed. Planning permission is also sought for use of the accommodation, outside of student term time, for short-term letting purposes. The planning application is accompanied by a Natura Impact Statement.	
Applicant: Ann Hannan Reference: 2560151 Location: Sandybrook House, Bloodmill Road, Limerick	a residential development comprising 31no. residential units, (1no. detached house, 6no. semi-detached houses, 14no. terrace houses, 10no. duplex units in a 3 storey block), construction of all associated roads, site entrance, boundary treatments, footpaths, car parking, street lighting, demolition of an existing dwelling and sheds, and all ancillary site development works	Decision: Grant Permission (With Conditions) Date: 23/10/2025
Applicant: Silvergrove Developments Limited Reference: PL91.321345 Location: Rhebogue Road,, Drominbeg Road, Rhebogue,, Limerick City.	the provision of 25 No. apartments in a two and three-storey height block on a site of 0.243 hectare. The proposed development comprises 10 No. 1 bed apartments and 15 No. 2 bed apartments, suitable for older persons and / or persons with disabilities and includes an Entry Lobby from Rhebogue Road, communal room, ground level landscaped communal courtyard, second floor landscaped communal terrace, bin/recycling store, bike store, vehicular access from the adjacent 'Drominbeg Square' development to the north, boundary treatment and landscaping, connections to public services and all associated site development works.	Decision: Grant Permission (With Revised Conditions) Date: 31/10/2025
Notable Developments >1km from the Proposed Development Site		
Applicant: Bon Secours Health System CLG Reference: 211740 Location: Bloodmill Road & Groody Road, Towlerlton, Ballysimon, Limerick	development at this c.3.29ha site, located at Bloodmill Road and Groody Road. The site is bounded by Bloodmill Road to the south-west, the Garryglass Roundabout to the south, the newly constructed lin road(permitted under Limerick City & County Council Ref. 19/546) to the north-east and Groody Road to the south-east. The development will consist of a new c.19,405sqm hospital over 2 to 4 no. storeys, with plant(c.3,100sqm) at roof level and associated c.504sqm 2no. storey energy centre. The proposed development will provide a 79no. bed hospital, with both in-patient and out-patient facilities and treatment rooms. The principal access and egress to the site will be from Groody Road to the south-east. Service access is proposed from the newly constructed link road in the north-east corner of the site with associated service egress point to the south-west onto Bloodmill Road. Pedestrian and cyclist access is provided from Groody Road and from the new link road. The development will also include ancillary administration offices, laboratories, patient pharmacy, oratory, operating theatres, staff and patient facilities including a staff and patient restaurant, car park at surface level with motorbike and cycle parking spaces, EV charging facilities, payment kiosks and security barriers. The development will also include signage, including 3no. signage totems, internal wayfinding, c.13sqm security cabin, public lighting, plant and associated screening, including gas infrastructure tank and vacuum insulated evaporator compound, all piped infrastructure and ducting, 1no. ESB substation, 3no. attenuation tanks, rainwater harvesting tanks, SUDs including green roof provision, services provision, boundary treatments, waste marshalling compound storage area, hard and soft landscaping, changes in level, internal roads and paths including vehicle set down areas, and all associated site development works above and below ground	Decision: Grant Permission (with Conditions) Date: 14/06/2022

ACP Ref. 316168	Upgrade of the existing Castletroy Wastewater Treatment Plant. Commenced July 2025, expected to be completed 2028. C. 2km from Parkway Valley	Decision: Grant Permission Date: 12/10/2023
ACP Ref. 321993	Proposed development to construct a new distributor road linking the L1116 Golf Links Road from Schoolhouse Road junction with the L5173 Groody Road. Slightly over 1km from Parkway Valley site.	Decision: Approve with Conditions Date: 31/10/2025

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APPENDIX 5.1

NRA/TII Criteria for Rating the Magnitude and Significance of Soils and Geological Impacts at EIA Stage National Roads Authority

NRA/TII, 2009

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Table 1 Criteria for rating site Attributes – Estimation of Importance of Soil and Geology Attributes (NRA)

Importance	Criteria	Typical Examples
Very High	Attribute has a high quality, significance or value on a regional or national scale Degree or extent of soil contamination is significant on a national or regional scale Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale*	Geological feature rare on a regional or national scale (NHA) Large existing quarry or pit Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale. *	Contaminated soil on site with previous heavy industrial usage Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site) Well drained and/or high fertility soils Moderately sized existing quarry or pit Marginally economic extractable mineral resource
Medium	Attribute has a medium quality, significance or value on a local scale Degree or extent of soil contamination is moderate on a local scale Volume of peat and/or soft organic soil underlying route is moderate on a local scale*	Contaminated soil on site with previous light industrial usage Small recent landfill site for mixed wastes Moderately drained and/or moderate fertility soils Small existing quarry or pit Sub-economic extractable mineral resource
Low	Attribute has a low quality, significance or value on a local scale Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying route is small on a local scale*	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

* Relative to the total volume of inert soil disposed of and/or recovered

Source: Box 4.1: 'Guidelines on Procedures for Assessment and Treatment of Geology for National Road Schemes' by the National Roads Authority (NRA, 2009)

Table 2 Criteria for Rating Impact Significance at EIA Stage - Estimation Of Magnitude of Impact on Soil / Geology Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit reserves Irreversible loss of high proportion of local high fertility soils Removal of entirety of geological heritage feature Requirement to excavate / remediate entire waste site Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves Removal of part of geological heritage feature Irreversible loss of moderate proportion of local high fertility soils Requirement to excavate / remediate significant proportion of waste site Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves Removal of small part of geological heritage feature Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils Requirement to excavate / remediate small proportion of waste site Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

Source: Box 5.1: 'Guidelines on Procedures for Assessment and Treatment of Geology, for National Road Schemes' by the National Roads Authority (NRA, 2009)

Table 3 Rating of Significant Environmental Impacts at EIA Stage (NRA)

Importance of Attribute	Magnitude of Importance			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/moderate	Profound/Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

Source: Box 5.4: Guidelines on Procedures for Assessment and Treatment of Geology for National Road Schemes' by the National Roads Authority (NRA, 2009)

APPENDIX 5.2

Parkway Valley Phase 1, Dublin Road, Singland, Limerick – Site Investigation

Report no. OCB25-049

OCB Geotechnical, October 2025

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Parkway Valley Phase 1, Dublin Road, Singland, Limerick – Site Investigation

Primary Author: Mark Nyhan

Client: Kirkland Investments

Client's Representative: Punch Consulting Engineers

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Document Control Sheet

Report No.: OCB25-049
Project title: Parkway Valley Phase 1, Dublin Road, Singland, Limerick
Client: Kirkland Investments
Client's Representative: Punch Consulting Engineers

Revision	Status	Report prepared by:	Report reviewed by:	Report approved by:	Issue date
002	Draft Factual	Mark Nyhan	Glen Byrne	Michael O'Connell	14 th October 2025

The works were conducted in accordance with:

Engineers Ireland (Geotechnical Society of Ireland) (2016), Specification and Related Documents for Ground Investigation in Ireland, 2nd edition 2016.

IS EN 1997-2:2007: Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing.

British Standards Institute (2015) BS 5930:2015+A1:2020, Code of practice for ground investigations.

METHODS OF DESCRIBING SOILS AND ROCKS

Soil and rock descriptions are based on the guidance in Section 6 of BS 5930:2015+A1:2020, Code of Practice for Ground Investigations. However, the following terms are used in the description of fine-grained soils, where applicable:

- Soft to Firm: fine-grained soil with consistency description close to the boundary between soft and firm soil (Table 7 of BS5930).
- Firm to Stiff: fine-grained soil with consistency description close to the boundary between firm and stiff soil (Table 7 of BS5930).

Abbreviations used on exploratory hole logs	
U	Nominal 100mm diameter undisturbed open tube sample
P	Nominal 100mm diameter undisturbed piston sample
B	Bulk disturbed sample
D	Small disturbed sample
W	Water sample
ES / EW	Soil sample for environmental testing / Water sample for environmental testing
SPT	Standard penetration test using a split spoon sampler (small disturbed sample obtained)
SPT (C)	Standard penetration test using 60-degree solid cone
x,x/x,x,x,x,x	Blows per increment during the standard penetration test. The initial two values relate to the seating drive (150mm) and the remaining four to the 75mm increments of the test length. The length achieved is stated (mm) for any test increment less than 75mm
N=X	SPT blow count 'N' given by the summation of the blows 'X' required to drive the full test length (300mm)
N=X/Z	Incomplete standard penetration test where the full test length was not achieved. The blows 'X' represent the total blows for the given test length 'Z' (mm)
V VR	Shear vane test (borehole) Hand vane test (trial pit) Shear strength stated in kPa V: undisturbed vane shear strength VR: remoulded vane shear strength
dd/mm/yy: 1.0 dd/mm/yy: dry	Date & water level at the borehole depth at the end of shift and the start of the following shift
Abbreviations relating to rock core	
TCR (%)	Total Core Recovery: Ratio of rock/soil core recovered (both solid and non-intact) to the total length of core run.
SCR (%)	Solid Core Recovery: Ratio of solid core to the total length of core run. Solid core has a full diameter, uninterrupted by natural discontinuities, but not necessarily a full circumference and is measured along the core axis between natural fractures.
RQD (%)	Rock Quality Designation: Ratio of total length of solid core pieces greater than 100mm to the total length of core run.
FI	Fracture Index: Number of natural discontinuities per metre over an indicated length of core of similar intensity of fracturing.
NI	Non-Intact: Used where the rock material was recovered fragmented, for example as fine to coarse gravel size particles.
AZCL	Assessed zone of core loss: The estimated depth range where core was not recovered.
DIF	Drilling induced fracture: A fracture of non-geological origin brought about by the rock coring.

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Parkway Valley Phase 1, Dublin Road, Singland, Limerick

1 AUTHORITY

On the instructions of Punch Consulting Engineers, acting on the behalf of the Kirkland Investments, a ground investigation was undertaken at the above location to provide geotechnical and environmental information for input to the design and construction of a proposed housing development.

This report details the work carried out on site; it contains a description of the site and the works undertaken, exploratory hole logs and laboratory test results.

All information given in this report is based upon the ground conditions encountered during the site investigation works, and on the results of the laboratory and field tests performed. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata, contaminant concentrations, and water conditions between or below exploratory holes. It should be noted that groundwater levels usually vary due to seasonal and/or other effects and may at times differ to those measured during the investigation.

This report was prepared by OCB Geotechnical Ltd for the use of the Kirkland Investments and Punch Consulting Engineers in response to particular instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded.

2 SCOPE

The extent of the investigation, as instructed by Punch Consulting Engineers, included cable percussion and rotary drilled boreholes, standpipe installations, trial pits, plate load testing, laboratory testing and the preparation of an interpretative report on the findings.

3 DESCRIPTION OF SITE

The Parkway Valley property is located at the northeast portion of Singland (Saingeal) townland along the west side of the Reboge Meadows, approximately 2.6 kilometres east of Limerick City centre. Parkway Valley is an elongate property extending up to 440 metres south-southwest at an oblique angle from a west-east to southwest-northeast curved section of the Dublin Road (Regional Road R445). The Parkway Valley property is up to 250 metres wide in the northern half and narrows irregularly to 29 metres wide at the south-southwest end. Access to the Parkway Valley property is via an indented gateway on the east-southeast side of a roundabout junction at the west side of the site, which also provides access to the separate Parkway Retail Park located along the south side of the Dublin Road to the west of the northern portion of the Parkway Valley property.

For development purposes, the Parkway Valley property has been divided into two phases approximately along a line extending east-southeast from the site entrance: Phase 1 includes the southern approximate 260 metres length of the property and Phase 2 includes the northern approximate 180 metres length of the property. The site investigation was conducted in the Phase 1 area at the southern portion of the Parkway Valley property.

Ground surface at the eastern portion of Singland townland has an overall gentle slope to the east-northeast towards the Reboge Meadows (Currach na Réabóige) along the Groody River valley. The Groody River (An Ghrúda) flows in a meandering course in an overall north-northwest direction at distances between approximately 310 and 400 metres northeast of the Parkway Valley property towards the River Shannon, which flows to the west less than 750 metres north-northwest of the Parkway Valley property. A network of east-northeast to northeast flowing drainage channels historically extended from the eastern vicinity of the Parkway Valley property across the Reboge Meadows.

However, much of the original sloping ground at the Parkway Valley property has been cut out to create a more level area to the east of a reinforced concrete retaining wall which is up to 7 metres in height above the cut-out area. The concrete retaining wall, which is located approximately 20 to 70 metres east of the irregular indented west side of the Parkway Valley property, extends approximately 250 metres along a NNE-SSW orientation, with three short L-shaped turns, and has a stepped wing wall extending east-southeast at its southern end on the northside of an irregular sub-triangular shaped concrete structure that extends up to 42 metres to the south of the retaining wall at the higher elevation southern portion of the site. A separate retaining wall is located near the northern boundary of the Parkway Valley property along the Dublin Road (Phase 2 area).

A gravel-surfaced interior access road runs along the relatively narrow higher elevation area between the western property boundary and the main NNE-SSW orientated retaining wall. The interior access road curves steeply down to the northeast in a 15-metre wide gap between the two retaining walls towards the Phase 2 area near the north end of the Parkway Valley property and slopes more gradually down to the east and then northeast in a loop around the southeast side of the concrete structure near the southern end of the site from where it continues northeast and north through a lower elevation wooded/scrubland area to the east of the Parkway Valley property where a pair of overhead high voltage electric lines are located.

Ground surface elevations at the Parkway Valley property ranged between approximately 15.9m MSL and 15.25m MSL at the narrower higher elevation west side of the site and between approximately 8.9m MSL and 8.3m MSL at the main cut-out portion of the site. A proposed development was formerly partially constructed at the site during the 2000s and subsequently demolished. Concrete from the demolition was placed as a fill material at most of the cut-out portion of the site. Concrete was present at the surface at two areas at the northern portion of the site: a L-shaped area east of TP01 and a 0.7m wide J-shaped strip northwest of TP03 and TP04. Ground surface elevations at access roads near the overhead electric lines to the east of the site were approximately 8.1m MSL to 7.4m MSL.

Some partially underground concrete structures and manholes for underground services were located on the west and south sides of the retaining walls at the site. Some more mature trees are located around the

perimeter of the site and numerous small tree saplings and bushes were growing throughout the site at the time of the site investigation. Limestone bedrock outcrops locally along the steep slope at the south end of the site and at a lower elevation to the west of where the gravel-surfaced interior access road enters the southeast end of lower cut-out portion of the site.

A combination of timber hoarding and metal post and mesh fencing was located along the north, west and south sides of the Parkway Valley property and the site was open towards the wooded/scrubland area to the east.

The site is surrounded by an ESB substation, a mix of residential and commercial properties and a recreational area across Dublin Road to the north, by Parkway Retail Park to the west of the north end of the site, by Chesterfield and Carn na Ree residential housing estates to the southwest and south and by a wooded/scrubland area where a pair of overhead high voltage electric lines are located to the east.

The existing site is presented on the site and exploratory hole location plans in Appendix A.

4 PREVIOUS SITE INVESTIGATIONS

A site investigation was conducted by IGSL Limited, on behalf of Byrne Looby Partnership Consulting Engineers, in early 2006 at the Parkway Valley property and two additional smaller areas to the north-northeast across the Dublin Road (Regional Road R445). Thirteen (13) IGSL cable percussion boreholes (BH01 through BH07, BH09 through BH12 and BHE1) were located within the Parkway Valley Phase I area; however ground level elevations are not included on the borehole logs and the topography of the site at the time of the IGSL site investigation in 2006 is not known. Eight rotary drilled boreholes were also completed, but the site plan provided does not appear to show the locations of the rotary boreholes.

In addition, a site investigation was conducted by IGSL Limited in 1994 for N7 road improvements (existing Dublin Road / Regional Road R445) which included two boreholes (BH1 and BH2) along the road to the north and northeast of the Parkway Valley property.

Excerpts from the site investigation reports, that are available on the Geological Survey of Ireland database, are presented in Appendix B.

5 SITE OPERATIONS

Site operations, which were conducted between the 31st July and 30th September 2025, included:

- Two (2) Cable Percussion Boreholes
- Eight (8) Rotary Boreholes, including one offset borehole
- Two (2) Standpipe Installations

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- Thirteen (13) Trial Pits
- Nine (9) Plate Load Tests.

The exploratory holes were located as instructed by Punch Consulting Engineers as shown on the exploratory hole location plans in Appendix A.

5.1 Boreholes

Ten (10) boreholes were put down through either soils or soils and bedrock strata to their completion depths. Two (2) boreholes were put down by cable percussion boring methods using a Pilcon soil boring rig and eight (8) boreholes were put down by rotary drilling methods using a Beretta T44 drilling rig.

The borehole logs state the methodology and plant used for each location. A summary of the boreholes is presented in the following sub-sections.

5.1.1 Cable percussion boreholes

Two (2) boreholes (BH01 and BH02) were put down to completion in minimum 200mm diameter using a Pilcon cable percussion soil boring rig. The boreholes were terminated at 3.8m BGL and 6.3m BGL upon encountering refusal on obstructions such as boulders or possible weathered bedrock.

Inspection pits were dug using a Takeuchi TB290-2 excavator between ground level and 0.4m BGL at BH01 and between ground level and 1.0m BGL at BH02 to ensure boreholes were put down at locations clear of services and the surficial coarse granular Made Ground.

Disturbed (bulk bag and tub) samples were taken within the encountered strata. Standard penetration tests were carried out in accordance with EC7 at standard depth intervals using a solid cone (SPT-C). The penetrations are stated for those tests for which the full 150mm seating drive or 300mm test drive was not possible. The N-values provided on the borehole logs are uncorrected and no allowance has been made for energy ratio corrections.

Any water strikes encountered during boring were recorded along with any changes in their levels as the borehole proceeded.

Appendix C presents the borehole logs.

5.1.2 Rotary open hole boreholes

Four (4) boreholes (R005, R006, offset R006A and R009) were put down to refusal by rotary open hole drilling techniques using a Beretta T44 drilling rigs. Boreholes R005, R006 and R006A met refusal at shallow depths of 0.6m BGL, 1.4m BGL and 1.435m BGL, respectively, on possible steel rebar reinforced concrete. Water inflow occurred at 0.5m BGL within Made Ground in the three boreholes so the obstructions could not be seen. A 13-tonne excavator dug an inspection pit through Made Ground and broke through concrete using a rock breaker at borehole R009 location. The drilling rig was set up over the inspection pit; however, refusal was encountered at 1.5m BGL.

Appendix C presents the borehole logs.

5.1.3 Rotary drilled boreholes

Four (4) boreholes (RC02, RC03, RC04 and RC07) were put down to their completion by rotary drilling techniques only using a Beretta T44 drilling rig. Symmetrix-cased full hole rotary percussive drilling techniques were employed to advance the boreholes to bedrock, after which rotary coring was employed to recover core samples of the bedrock. SPTs were carried out at standard intervals throughout the overburden where feasible.

Rotary coring was carried out within bedrock strata using conventional coring methods with a metric T2-101 core barrel. The core was extracted in up to 1.5m lengths using the T2-101 core barrel, which produced core of nominal 84mm diameter, and was placed in double channel wooden core boxes.

Any water strikes encountered during boring were recorded along with any changes in their levels as the borehole proceeded.

The core was subsequently photographed and examined by a qualified and experienced Engineering Geologist, thus enabling the production of an engineering log in accordance with *BS 5930:2015 + A1: 2020, Code of practice for ground investigations*.

Appendix C presents the borehole logs, with core photographs presented in Appendix D.

5.2 Standpipe Installations

Groundwater monitoring standpipes were installed in rotary boreholes RC03 and RC07 in September 2025. Borehole RC03 standpipe has a screened interval from 0.8m to 6.5m BGL and borehole RC07 standpipe has a screened interval from 6.5m to 9.5m BGL.

Details of the installations, including the diameter of the pipe and depth range of the response zones, are provided in Appendix C on the borehole logs.

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5.3 Trial Pits

Thirteen (13) trial pits (TP01 through TP13) were excavated using a Takeuchi TB290-2 excavator, fitted with 600mm wide bucket, on 31st July and 1st August 2025.

Several of the trial pits met shallow refusal on buried concrete structures and one met refusal on multiple strands of rebar within crushed concrete fill material. Other trial pits had to be terminated because of rapid water inflow at shallow depth or collapsing side walls.

Disturbed (small tub and bulk bag) samples were taken at standard depth intervals and changes of strata in the native soils. Any water strikes encountered during excavation were recorded along with any changes in their levels as the excavation proceeded. The trial pits were backfilled with arisings and compacted using the excavator following completion.

Appendix E presents the trial pit logs with photographs of the pits and arisings provided in Appendix F.

5.4 Plate Load Tests

Plate bearing tests (PBT) were carried out at six (6) trial pit locations (TP02, TP03, TP04, TP06, TP07 and TP10) on 5th August and 22nd August 2025 as follows:

PBT #	TP #	Depth (m BGL)	Date
PBT.01	TP02	0.6m	05/08/25
PBT.02	TP03	0.6m	05/08/25
PBT.03	TP04	0.6m	05/08/25
PBT.04	TP06	0.6m	05/08/25
PBT.05	TP08	0.3m	22/08/25
PBT.06	TP04	0.0m	22/08/25
PBT.07	TP06	0.0m	22/08/25
PBT.08	TP10	0.0m	22/08/25
PBT.09	TP10	0.4m	22/08/25

The plate bearing tests were conducted as incremental loading tests in accordance with Clause 4.1 of BS1377-2: Part 9: 2022 (British Standards Institute, 2022). A 455mm diameter bearing plate was used with three to seven pressure loadings, followed by unloading.

Plate movements were measured using three dial gauges fitted to a remotely fixed tripod frame. Each loading increment was maintained until the plate movement had essentially stopped.

The test results provided in Appendix G include plots of settlement (mm) against applied pressure (kPa). The Modulus of Subgrade Reaction, k , is estimated by applying a “best fit” to the settlement-pressure plots, and is reported in MPa/m. The numerical value represents the pressure, in kPa, on the bearing plate that induces 1.25mm of settlement. An approximate calculated CBR value is also presented for each test location.

5.5 Surveying

A broad survey of the site using a handheld CAT scanner to identify any existing buried services or old foundations/obstructions to excavation was carried out before commencement of site investigation works.

The as-built positions of exploratory holes were surveyed following completion of site operations by a Site Engineer from OCB Geotechnical. Surveying was carried out using a Trimble R6 GPS system employing VRS and real time kinetic (RTK) techniques.

The plan coordinates (Irish National Grid) and ground elevation (mOD Malin) at each surveyed location are recorded on the individual exploratory hole logs.

6 LABORATORY WORK

Upon their receipt in the laboratory, all disturbed samples were carefully examined and accurately described and their descriptions incorporated into the borehole logs.

6.1 Geotechnical laboratory testing of soils

Laboratory testing of soils comprised:

- **soil classification:** moisture content and particle size distribution
- **soil chemistry:** pH

Laboratory testing of soils samples was carried out in accordance with I.S. EN 1997-2:2007: *Eurocode 7: Geotechnical design - Part 2 Ground investigation and testing* and British Standards Institute (2022) *BS 1377-2:2022, Methods of test for soils for civil engineering purposes. Parts 1 to 9*.

Geotechnical test results are presented in Appendix H.

6.2 Geotechnical laboratory testing of rock core

Laboratory testing of rock core samples comprised:

- point load index

Test	Test carried out in accordance with
Point Load Index	ISRM Suggested Methods (1985) Suggested method for determining point-load strength. Int. J. Rock Mech. Min. Sci. Geomech. Abstr. 22, pp. 53-60

Results of point load index testing are presented in Appendix I.

6.3 Environmental Laboratory Testing of Soils

Environmental testing, as specified by Punch Consulting Engineers, was conducted by Fitz Scientific on selected samples collected from Made Ground (TP03 1.0-1.5m, TP07 0.4-0.7m and TP10 0.7-1.2m). The samples were analysed for a Waste Acceptance Criteria (WAC) suite of parameters.

Results of environmental testing are presented in Appendix J.

7 GROUND CONDITIONS

7.1 General Geology of the Area

The site is located in a low-lying area with a flat to gently undulating ice-moulded topography along the west side of the Reboge Meadows/Groody River valley and approximately 750 metres south of the River Shannon, that is underlain by glacial sediments over volcanoclastic and limestone bedrock. The Geological Survey of Ireland (GSI) database indicates that native soils in this area consist Glacial Till derived from basic igneous rocks in the west and Glacial Till derived from limestones in the east. The Glacial Till is overlain by Glaciofluvial Deposits derived from limestones in the northwest and by Estuarine Alluvium along the more low-lying Reboge Meadows/Groody River valley to the east. The native soils are commonly covered by a variable thickness of Made Ground in the Limerick urban area.

The poorly sorted Glacial Till (diamict) was deposited under and at the margins of an ice body mainly during the last (c. 70,000 to 13,000 years ago) or second last (c. 198,000 to 132,000 years ago) of multiple glacial periods in the Pleistocene epoch (2.58 Ma to 11.7 Ka). The well sorted bedded Glaciofluvial Deposits were deposited by meltwaters during ice-sheet retreat prior to 11,700 years ago. Subglacial lineations in the Limerick City vicinity, such as streamlined bedrock and striae, indicate both NNW-SSE to northwest-southeast ice flow directions. The Estuarine Alluvium was deposited during the subsequent Holocene epoch.

The GSI bedrock geology database indicates that soils in the Limerick City area are mainly underlain by the Early Carboniferous / Mississippian (Viséan-age, c. 347-331 Ma) undifferentiated limestones with subordinate intercalated volcanoclastic rocks occurring in several areas, including an west-east trending area extending across much of Spital-Land, Singland, Reboge Meadows and Newcastle/Kilbane townlands.

The limestones were deposited as carbonate sediments in a tropical sea on the northwest sloping shelf margin, often referred to as the Limerick Ramp, on the south side of the deeper Shannon Basin. The Viséan

limestone strata include a wide variety of carbonate sediments with differentiation of facies down along the Limerick Ramp (Sleeman and Pracht, 1999). These include oolitic grainstone limestones, which have been interpreted as deposited in turbulent shallow water as aprons on the flanks of volcanic cones, associated micritic limestones deposited in small mudmounds, dark grey to black thinly bedded bioturbated cherty argillaceous wackstone or packstone limestones deposited away from volcanic centres, younger graded packstone and grainstone limestones interbedded with carbonaceous shales, and then dark grey argillaceous wackstone and packstone limestones passing up into well-sorted fine-medium grained peloidal-skeletal grainstone limestones which in turn are overlain by oolitic and crinoidal grainstone limestones (Sleeman and Pracht, 1999). The tropical sea supported a diverse marine invertebrate biota that included corals, brachiopods, crinoids, gastropods and bryozoans.

Sleeman and Pracht (1999) report that two distinct subordinate extrusive igneous (volcanic) lithologies are intercalated with the Viséan limestone strata: (1) fragmented extrusive igneous rocks with various amounts of non-igneous components, referred to as “volcaniclastic rocks” and (2) un-fragmented or massive basic rocks usually of basaltic composition. The volcaniclastic rocks include blue, green, grey, red and purple coloured fine to coarse grained occasionally porphyritic or amygdaloidal, brecciated and/or conglomeratic extrusive igneous (volcanic) rocks. The ratio between non-volcanic and volcanic components varies widely. The massive extrusive igneous (volcanic) rocks are generally black porphyritic olivine basalts, weathered to various degrees, containing numerous amygdales filled with calcite (Sleeman and Pracht, 1999),

The bedrock strata were subjected to deformation (folding and faulting) during various tectonic events primarily a compressional/dextral shear (transpression) phase of deformation during the Variscan Orogeny (mountain building event) culminating in Late Carboniferous and Early Permian times (c. 318-297 Ma) but also North Atlantic extension and Alpine-Pyrenean compression during the subsequent Mesozoic and Cenozoic eras. The more intense Variscan deformation in South Munster gives way in the Limerick area to broad gentle open folding and reactivation of older Caledonian (c. 440-360 Ma) faults. The bedrock strata in the Limerick City area commonly dip at shallow angles of 15 degrees or less, mainly to the northwest and southeast, but locally at steeper angles. Folds and faults commonly trend west-southwest to east-northeast and the bedrock strata are locally offset by subordinate strike-slip faults with orientations ranging from NNW-SSE to NNE-SSW. In addition to displacement faults, the limestone and volcanic bedrock is also pervaded by a network of tectonic joints, brittle fractures across which there is no discernible displacement parallel to the fracture plane. The limestone bedrock strata were also subjected to deep weathering in sub-tropical environments during various intervals between mid-Jurassic and Palaeogene times (c. 175 to 23 Ma).

The Viséan limestones in the Limerick City area are classified as a locally important bedrock aquifer which is generally moderately productive while the subordinate extrusive igneous or volcanic bedrock areas are classified as a locally important bedrock aquifers which are moderately productive only in local zones. Groundwater vulnerability classification in the site vicinity varies from low in the east in the area underlain by Estuarine Alluvium, moderate across much of the site and high in the northwest and southwest. Karst features have been recorded locally within the Viséan limestones in north Co. Limerick. Karstification is caused by the action of slightly acidic rainwater percolating through fractures and chemically decomposing the rock over millions of years. Karstification can produce a complex network of open cavities in the

limestone bedrock that can extend up to several metres in width and penetrate downwards for several tens of metres.

7.2 Ground Types Encountered During Investigation of the Site

Variable ground conditions were encountered across the site from south-southwest to east-northeast. A northeast thickening and younging wedge of overburden soils overlies an irregularly sloping bedrock surface, which locally outcrops at the surface at the south end of the site and occurs as deep as 8.7m BGL (1.1m MSL) near the north end of the Phase 1 investigation area and at greater depths further northeast. The native soils are overlain by a cover of Made Ground including granular fill material and crushed demolition concrete in the cut-out area of the site and by older deeper cohesive Made Ground and reworked native soils in a smaller area at the northeast portion of the Phase I investigation area.

A summary of the ground types encountered in the exploratory holes is listed below from south-southwest to north-northeast and in approximate stratigraphic order.

South End of Site

Limestone bedrock outcrops locally along the steep slope at the south end of the site and at a lower elevation to the west of where the gravel-surfaced interior access road enters the southeast end of lower cut-out portion of the site (see photographs in Appendix K).

Trial pit TP12 was excavated at the northwest side of the sloping interior access road adjacent to the southeast side of the large concrete structure at the south end of the site. Ground surface sloped to the south and east. The trial pit encountered three layers of granular Made Ground over disturbed possible native soils:

- MADE GROUND: Grey slightly sandy slightly gravelly Cobbles and Small Boulders with occasional rootlets was encountered in thicknesses varying from 1.1m on the north side to 0.6m on the south side.
- MADE GROUND: Grey slightly silty very sandy Gravel with medium to high cobble content, occasional pockets of brown slightly sandy slightly gravelly silty clay, rare plastic and metal fragments and occasional rootlets was encountered from an average depth of 0.8m BGL to 1.1m BGL.
- MADE GROUND: Grey slightly silty very sandy Gravel with medium to high cobble content, intermixed with orange brown to brown slightly sandy slightly gravelly silty clay, occasional plastic fragments, two timber beams and a cloth fragment and occasional rootlets was encountered adjacent to the concrete structure to 2m BGL and to 1.4m BGL at the outer south side of the trial pit.
- Soft brown slightly sandy slightly gravelly silty CLAY with a little to some intermixed Made Ground as above (Possible Disturbed Native Soil) was encountered at the south side of the trial pit from 1.4m BGL to the penetrated depth of 2.0m BGL.
- Angular cobble to small boulder size fragments of dark grey fine-grained limestone at base of trial pit at 2.0m BGL may represent broken bedrock fragments.



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Concrete Structure at Southern Portion of the Site

Rotary drilled borehole RC07 and trial pit TP13 were located at the concrete structure at the southern portion of the site. TP13, which was excavated at a hole in the concrete structure, encountered:

- MADE GROUND: Brownish grey slightly silty very sandy Gravel, Cobbles and Boulders of angular concrete with occasional steel rebar, rare metal and timber fragments and occasional rootlets in the uppermost 1.1 metres.
- Brown slightly silty gravelly SAND with low to medium cobble and boulder content of angular to subangular dark grey limestone from 1.1m BGL to the penetrated depth of 2.25m BGL.
- The excavator met refusal on dark grey limestone (possible bedrock or a large boulder) at 2.25m BGL.

Beneath thin surficial concrete and subbase at borehole RC07, the driller recorded:

- Brown slightly clayey gravelly SAND with occasional small boulders to 1.0m BGL;
- Very dense brown slightly clayey very gravelly SAND with occasional cobbles and small boulders to 3.5m BGL;
- Possible limestone bedrock was recorded at 3.5m BGL (12.4m MSL) and cored from 4.1m to 9.5m BGL (see bedrock section below).

Soils at Lower Elevation Cut-Out Main Portion of the Site

- MADE GROUND consisted predominantly of two types of coarse granular materials:
 - o Crushed or Broken Concrete: Slightly silty sandy to very sandy Gravel and Cobble size with variable proportions of boulder size fragments of angular to subangular crushed concrete, locally with occasional to some gravel and cobbles of limestone and/or basalt, and with occasional to frequent steel rebar was encountered at the surface throughout most of the site. Thickness of the ranged from 0.2m to 1.35m
 - o Hardcore: Grey, locally slightly silty, very sandy Gravel and Cobbles or locally Gravel, Cobble and Small Boulders composed of dark grey limestone or locally basalt was encountered beneath the crushed concrete fill material at eight trial pits. It ranged in thickness from 0.1m to about 2.0m.
- CONCRETE is present at the surface at two areas at the northern portion of the site (an L-shaped area east of TP01 and a 0.7m wide J -shaped strip northwest of TP03 and TP04) and at a larger higher elevation irregular sub-triangular area near the southern end of the site. The concrete on the northwest side of TP03 was at least 1.5m thick. Subsurface concrete was encountered at 0.6m BGL at TP06 and 0.7m BGL at TP07.
- Refusal on a hard surface below the water table was encountered at 0.6m BGL in R005, 1.4m BGL in R006, 1.435m BGL in R006A, 1.5m BGL in R009, 1.2m BGL in TP09, and 1.35m BGL in TP11. The obstructions at some or all these locations may have been steel rebar reinforced concrete since the drill bit or excavator was unable to penetrate the material.

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- GRANULAR GLACIOFLUVIAL DEPOSITS consisting of an interbedded SAND and GRAVEL sequence were encountered throughout much of the site in exploratory holes that penetrated through the superficial Made Ground.. SAND was encountered at three trial pits that penetrated beneath the coarse granular fill materials as follows:
 - o Light orange becoming light brown slightly gravelly silty fine to medium SAND, with a little to some intermixed material from the overlying coarse granular fill material, was encountered from 1.0m BGL to the excavated depth of 2.25m BGL at TP02 at the northern portion of the site;
 - o Brown to locally greyish brown silty gravelly SAND, locally becoming silty SAND and GRAVEL, all with low cobble and small boulder content, was encountered from 1.2m BGL to the excavated depth of 2.7m BGL at TP08;
 - o Greyish brown to brown slightly silty slightly gravelly SAND was encountered below the water table from an estimated depth of 1.8m BGL to the excavated depth of 2.0m BGL at TP10; and, Brown becoming brownish grey slightly silty very sandy GRAVEL with medium to high cobble content was encountered from 2.0m BGL to the penetrated depth of 3.8m BGL at borehole BH01 near the middle of the site. This granular soil was slightly clayey in the upper portion. Borehole BH02 to the north encountered medium dense greyish brown slightly clayey silty very gravelly SAND with high cobble content from 4.0m to 5.0m BGL over brownish grey slightly silty sandy GRAVEL with medium to high cobble content from 5.0m to the penetrated depth of 6.3m BGL. Rotary open hole drilling encountered medium dense becoming dense slightly silty sandy GRAVEL from 1.0m to 4.0m BGL. During rotary open hole drilling, the driller described medium dense grey mottled brown clayey gravelly very silty SAND from 5.0m to 8.0m BGL over dense slightly sandy GRAVEL from 8.0m to 8.7m BGL above possible bedrock at RC02 and very dense grey sandy GRAVEL with occasional cobbles and small boulders from 5.2m to 6.5m BGL above bedrock in RC04,
- Subordinate Finer Grained Soils / Cohesive Soils were encountered at the middle to northwest portion of the site within the coarser grained granular Glaciofluvial Deposits, for example at BH02 in the north, as a thin layer in TP08 in the north and at RC04 and BH01 near the middle:
 - o Brown interlaminated to very thinly interbedded fine sandy SILT and very silty CLAY was encountered from 3.6m to 4.0m BGL at borehole BH02 in the north;
 - o Firm brown to brownish grey with a little yellowish-brown mottling slightly fine sandy clayey SILT with frequent blackened partially decayed vegetation fragments was encountered from 1.05m to 1.2m BGL at TP08;
 - o Very stiff greyish brown slightly gravelly sandy silty CLAY was recorded by the driller from 4.0m to 5.2m BG in borehole RC04;
 - o Firm brown slightly sandy slightly gravelly very silty CLAY with occasional cobbles (note: gravel and cobbles may in part derive from overlying Made Ground) was encountered from 0.4m to 1.2m BGL over a Glaciolacustrine Deposit composed of firm interlaminated slightly orangish brown silty CLAY and lighter brown to locally greyish brown SILT from 1.2m to approximately 1.5m BGL over brown slightly sandy to sandy gravelly silty CLAY with occasional to low cobble content from about 1.5m to 2.0m BGL at BH01 near the middle of the site.

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Northeast Portion of the Site

Different ground conditions were encountered located at the northeast portion of the Phase I investigation area. Beneath 0.8m of Made Ground similar to that at the remainder of the cut-out portion of the site, trial pit TP04 in the northeast encountered:

- Cohesive Soil / Possible Made Ground: Stiff orange brown fissured slightly gravelly silty CLAY with occasional blackened partially decayed rootlets was encountered at the west half on the south side of TP04 from 0.8m to 1.25m BGL, becoming thinner towards the north side.
- Greyish brown gravelly to very gravelly silty SAND with occasional rootlets encountered from 1.25m to 1.9m BGL at TP04 in the northeast site may represent an alluvial deposit.
- Partially Disturbed Estuarine Alluvium: Soft greyish brown slightly gravelly sandy clayey SILT with occasional cobbles and a boulder, occasional blackened partially decayed wood fragments and a trace of plastic and ceramic fragments was encountered from 1.9m BGL to the excavated depth of 3.2m BGL at TP04 in the northeast.

Bedrock at the Phase I Investigation Area

Possible bedrock outcrops or large boulders consisting of strong grey fine-grained LIMESTONE are present at ground surface at the lower elevation southeast portion of the site. In addition, as noted above, two trial pits excavated at the higher elevation area at the southern portion of the site may also have encountered potential bedrock.

- Angular cobble to small boulder size fragments of dark grey fine-grained limestone were observed at a depth of 2.0m BGL at the bottom of TP12, which was excavated on the southeast side of the concrete structure near the south end of the site and to the west of the possible bedrock outcrops.
- At TP13, excavated at a hole in the higher elevation concrete area at the southern portion of the site, the excavator met refusal on dark grey limestone (possible bedrock or a large boulder) at 2.25m BGL.

Rotary open hole drilling encountered bedrock or possible bedrock at depths of 8.7m BGL (minus 0.2m MSL) at borehole RC02 in the north, 4.0m BGL (4.8m MSL) and 6.5m BGL (2.4m MSL) at RC03 and RC04 in the middle and 3.5m BGL (12.4m MSL) at RC07 in the south. Rotary coring was conducted from 9.5m to 12.5m BGL at RC02, 4.0m to 7.0m BGL at RC03, 6.5m to 9.0m BGL at RC04 and 4.1m to 9.5m BGL at RC07.

Bedrock consisted mainly of strong to very strong (locally medium strong along incipient discontinuities) grey to dark grey fine grained micritic LIMESTONE with rare to frequent fossil shell debris and occasional, mostly very thin, calcite veins. A few laminae to thin beds of weak to medium strong lighter grey possible tuffaceous rock and coarser grained volcanoclastic rock occurred within the limestone at borehole RC07. Discontinuities are very closely to medium spaced, most commonly subhorizontal to shallow and steep to subvertical, planar to slightly undulating and with rough to locally dissolution-widened surfaces. The limestone is fresh to slightly weathered with lighter grey and occasional orange discolouration and evidence of dissolution on some discontinuity surfaces. No rock core was recovered from 7.48m to the penetrated depth of 9.0m BGL in RC04 and it was not clear whether there may have been a void at a portion of this interval or if the core fell back down the borehole.

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7.3 Groundwater

Water strikes, varying from trickling to rapid inflow, were encountered at shallow depths ranging from 0.35m to 1.1m BGL either within or at the base of coarse granular Made Ground at ten (10) trial pits (TP01 and TP03 through TP11) and six (6) boreholes (RC03, RC04, RO05, RO06, RO06A and RO09) in the lower elevation cut-out portion of the site. The coarser grain size of the Made Ground materials in comparison to the underlying finer grained native soils as well as the presence of underground concrete slabs within the Made Ground may be facilitating storage of perched water within the Made Ground.

Water or groundwater inflow was encountered at greater depths in two (2) trial pits and four (4) boreholes at the lower elevation cut-out portion of the site:

- In TP02, it was encountered at 2.15m BGL in silty fine SAND and rose to a level of 1.83m BGL over a 5-minute observation period;
- In TP08, it was encountered at 2.0m BGL in silty gravelly SAND with low cobble and boulder content and rose to a level of 2.0m BGL over a 20-minute observation period;
- In BH01, it was encountered at 1.8m BGL in slightly sandy to sandy gravelly silty CLAY with occasional to low cobble content and rose to a level of 1.4m BGL over a 20-minute observation period;
- In BH02, it was encountered at 3.0m BGL in slightly gravelly fine to medium SAND with low cobble content;
- In RC02, it was encountered at 8.2m BGL in a basal slightly sandy GRAVEL;
- In RC04, it was encountered at 5.8m BGL in sandy GRAVEL with occasional cobbles and small boulder and rose to a level of 0.65m BGL over a 20-minute observation period;

At the higher elevation southern end of the site, groundwater was not encountered at two trial pits (TP12 and TP13) but in borehole RC07, a water level of 7.2m BGL was measured on the morning of 29 September 2025 when the borehole was within limestone bedrock at a depth of 8.8m BGL.

It should be noted that groundwater conditions are subject to change seasonally and in response to local weather events.

8 DISCUSSION

8.1 Proposed Construction

It is proposed to construct a housing development at the Parkway Valley site in Limerick.

No further details were available to OCB Geotechnical at the time of preparing this report.

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8.2 Recommendations for construction

Based on site investigation work completed to date, it is likely that proposed structures would need to be founded on either medium dense to dense granular Glaciofluvial Deposits or limestone bedrock. Additional information will be provided following completion of the site investigation.

8.3 Re-use of Site Won Material

The results of this ground investigation and laboratory testing of the recovered soils were compared with Table 6/1 of Acceptable Earthworks Materials presented in Volume 1 of the Specification for Road Works – Series 600 – Earthworks.

Review of the data indicates that granular Made Ground at the site would be classified as General Granular Fill. This material would be suitable for general earthworks fill but would not be suitable for use as structural fill unless steel rebar, debris and boulders were removed.

Some of the native glaciofluvial granular soils at the site may have potential to be used as Class 6: Selected Granular Material but would first need to be analysed to determine if they have any argillaceous content. The subordinate Cohesive Soils and northeast Estuarine Alluvium at the site would likely be considered as Class 2C – General Cohesive Fill. This material would be suitable for general earthworks fill but would not be suitable for use as structural fill due to an excessive fines content.

8.4 Soil Waste Categorisation

Three environmental soil samples (TP03 1.0-1.5m BGL, TP07 0.7-1.2m BGL and TP10 0.4-0.7m BGL) were analysed for a Waste Acceptance Criteria (WAC) suite to assist in basic characterization of potential waste from the site.

The WAC results were compared to Landfill Waste Acceptance Criteria Limits for (1) Inert Waste Landfill, (2) Stable, Non-reactive Hazardous Waste in Non-hazardous Landfill and (3) Hazardous Waste Landfill. The WAC analytical results are below the Landfill Waste Acceptance Criteria Limits indicating that the materials that may be classified as inert/non-hazardous.

The results were also compared to EPA Waste Acceptance Criteria for Soil Recovery Facilities (EPA, 2020). The Parkway Valley property can be considered a non-greenfield site where the risk of contamination from chemical or solid materials is low. The site is located in Geochemical Domain 2: Carboniferous limestones and related rocks. The results for the three environmental samples are below the EPA Maximum Concentrations and/or Soil Trigger Levels in Soil and Stone for Soil Recovery Facilities.

9 REFERENCES

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BS EN 12457-2:2002 Characterisation of waste - Leaching - Compliance test for leaching of granular waste materials and sludges. One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 4 mm (without or with size reduction)

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Clayton C.R.I. 1995. The Standard Penetration Test (SPT): Methods and Use. CIRIA Report 143

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Environmental Protection Agency / An Ghníomhaireacht um Chaomhnú Comhshaoil, 2020, Guidance on waste acceptance criteria at authorised soil recovery facilities.

<https://www.epa.ie/publications/compliance--enforcement/waste/Guidance-on-Waste-Acceptance-Criteria-at-Authorised-Soil-Recovery-Facilities.pdf>

I.S. EN 1997-1: 2004. *Eurocode 7: Geotechnical design - Part 1 General Rules*.

I.S. EN 1997-2:2007: *Eurocode 7: Geotechnical design - Part 2 Ground investigation and testing*.

I.S. EN ISO 14688-1:2018: *Geotechnical investigation and testing — Identification and classification of soil — Part 1: Identification and description (ISO 14688-1:2017)*

I.S. EN ISO 14688-2:2018: *Geotechnical investigation and testing — Identification and classification of soil — Part 2: Principles for a classification (ISO 14688-2:2017)*

I.S. EN ISO 14689:2018: *Geotechnical investigation and testing - Identification, description and classification of rock (ISO 14689:2017)*

Sleeman, A. G. and Pracht, M. 1999. Geology of the Shannon Estuary: A geological description of the Shannon Estuary Region including parts of Clare, Limerick and Kerry, to accompany the bedrock geology 1:100,000 scale map series, Sheet 17, Shannon Estuary. Geological Survey of Ireland.

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Appendix A Site and Exploratory Hole Location Plans



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

Site Location Plan

CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	September 2025



Parkway Valley Phase 1, Dublin Road, Singland, Limerick

Site Location Plan

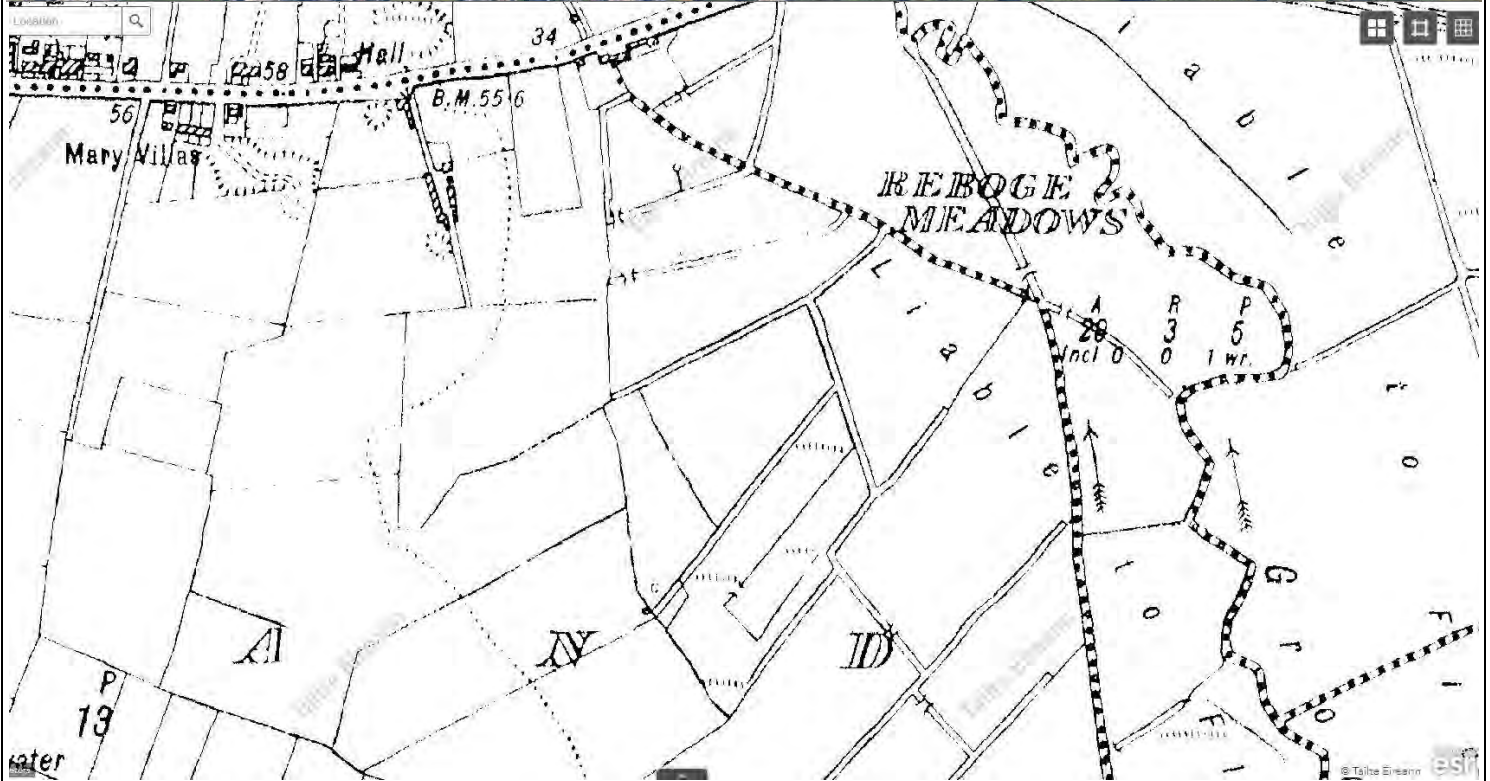
CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	September 2025



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

Site Location Plan

CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	September 2025



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

Historic Map

CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	September 2025



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

Site Location Plan

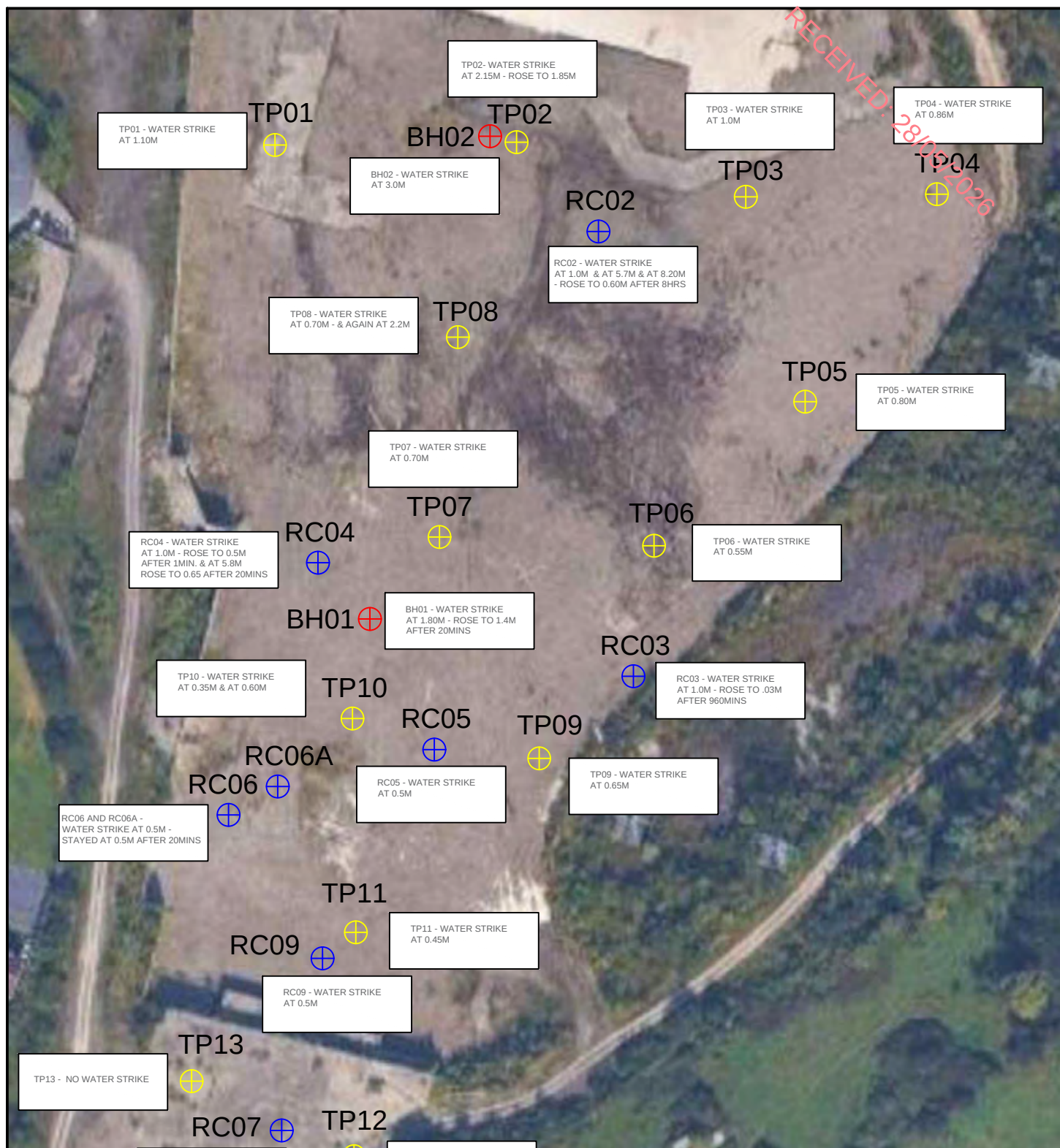
CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	September 2025



Parkway Valley Phase 1, Dublin Road, Singland, Limerick

Exploratory Hole Location Plan

CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	September 2025



**Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick**

**Exploratory Hole Locations
with Water Strike Data**

Client:

Kirkland Investments

Engineer:

Punch Consulting Engineers

Date:

September 2025

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Appendix B Previous Site Investigation Data

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ROYCETON PARKWAY
DEVELOPMENT
DUBLIN

Byrne Looby Partnership
Consulting Engineers

CONTENTS

I	INTRODUCTION
II	FIELDWORK
III	TESTING

APPENDICES

I	BOREHOLE RECORDS
II	CORE DRILLING RECORDS
III	LABORATORY TEST DATA
IV	SITE LOCATION PLAN / BOREHOLE LAYOUT

FOREWORD

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

General.

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

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

Boring Procedures.

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

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

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

Routine Sampling.

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

In-Situ Testing.

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

Groundwater.

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

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

Retention of Samples.

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

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**REPORT ON A SITE INVESTIGATION
FOR A DEVELOPMENT
AT PARKWAY LIMERICK
FOR
ROYCETON LIMITED
(BLP GEOTECHNICAL CONSULTANTS)**

Report No. 11654

MAY 2006

I Introduction

A major commercial development is being undertaken on a site at Dublin Road, Limerick near the Parkway Roundabout. The site developers, Royceton Limited, have ordered a comprehensive examination of sub-soil and bedrock conditions over the site area. This investigation was directed by BLP as Geotechnical Consultants and carried out by IGSL over a six week period on site between March and May 2006.

The programme of the investigation envisaged the construction of twenty-two cable percussion boreholes, to establish geotechnical criteria on which to base foundation design. Over two visits to site a total of twenty-three holes were bored, including re-bores at two locations and the omission of scheduled BH 08.

Rotary core drilling was carried out at a total of eight locations, to recover representative core of the bedrock. Three of these holes extended to depths of 25.00 metres.

All field-work was carried out in accordance with BS 5930, Code of Practice for Site Investigations (1999). Three standpipes were installed in the deep cored holes to permit on going ground water observation.

A programme of laboratory testing to confirm geotechnical soil parameters was prepared by BLP and laboratory testing was carried out at IGSL's Accredited laboratory immediately following site operations..

This report presents all factual data pertaining to the project

II Fieldwork

The site is located in Limerick, close to the Parkway Roundabout on the Dublin Road. A site location map and a detailed borehole layout is enclosed in Appendix IV to this report. All exploratory locations were determined by BLP on site and marked out by site personnel for IGSL.

a. Boreholes

The exploratory holes were bored with conventional 200mm cable-tool methods using a Dando Exploratory Rig.

Boreholes were designated BH 01 to BH 14 (scheduled BH 08 was not bored) and BH E1 to BH E8. Re-bores were carried out at BHs 14A and E5A when obstructions prevented advancement in the original locations.

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.

On completion of field works samples were returned at intervals to IGSL for laboratory analysis.

b. Coreholes

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

At RC 4, 5 and 6 core was recovered from approximately 5.00 metres to 25.00 metres and on completion standpipes were installed in each of these three locations.

Core was recovered and placed in timber boxes and returned to IGSL for detailed geotechnical logging. These records are contained in Appendix II to this report. All recovered core has been photographed, colour photographs have been issued digitally to BLP.

III Testing

(a) In-Situ :

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

Some limited penetration tests and refusals were recorded on cobbles or boulders in the overburden or on the limestone bedrock at the base of several boreholes

Standard penetration tests were also carried out on instruction during rotary drilling of overburden at RC 1.

(b) Laboratory :

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

Laboratory data is presented in Appendix III.

The geotechnical tests consisted of the following.

- a. Classification (Liquid and Plastic Limits)
- b. Grading Analysis (Wet sieve/ Hydrometer)
- c. Sulphate and pH determination
- d. Point Load Tests on Rock Core

IGSL Ltd/JC
SEPTEMBER 2005

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Appendix I – Cable Tool Borehole Records

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH01 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 10/04/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 11/04/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 3.60		BORED BY: J.Edwards			
N -		CASING DEPTH (m) 3.60					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	Brown slightly sandy gravelly CLAY with cobbles (Fill).									
0.50	Orange/brown sandy SILT/CLAY with occasional fine gravel.		V0605	B	0.50					
1.00			V0606	B	1.00	C	N=3			
1.70										
2.00	Stiff light brown very sandy slightly gravelly CLAY with cobbles.				V0607	B	2.00	C	N=35	
3.00					V0608	B	3.00	C	N=50/85mm	
3.60	Obstruction. End of Borehole at 3.60 m									
4										
5										
6										
7										
8										
9										
10										

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
2.30	2.40	0.50	.
2.80	2.90	0.75	.
3.50	3.60	2.00	

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
-	-	-	-	-	Borehole dry

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
11/04/2006	3.60	-	-	Borehole dry

Remarks: Removed equipment every evening.

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH02 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 11/04/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 11/04/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 3.70		BORED BY: J.Edwards			
N -		CASING DEPTH (m) 3.70					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	Brown slightly sandy gravelly CLAY with cobbles (Fill).			0.30	V0609	B	0.50	C	N=10	
-1	Firm orange/brown sandy (fine) slightly gravelly CLAY.				V0610	B	1.00			
-2	Stiff to very stiff orange/brown sandy slightly gravelly CLAY with cobbles.			1.90	V0611	B	2.00			
-3					V0612	B	3.00			
-4	Obstruction. End of Borehole at 3.70 m			3.70				C	N=R	
-5										
-6										
-7										
-8										
-9										
-10										

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
1.90	2.00	0.50	.
3.60	3.70	2.00	.

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
-	-	-	-	-	Borehole dry

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
11/04/2006	3.70	-	-	Borehole dry

Remarks:

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH03 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 10/04/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 10/04/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 3.30		BORED BY: J.Edwards			
N -		CASING DEPTH (m) 3.30					

DEPTH (M)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	Soft/firm orange/brown sandy SILT/CLAY with some gravel (possible fill).	[Pattern]		2.50	V0601	B	0.50	C	N=4	
1					V0602	B	1.00			
2					V0603	B	2.00			
3	Stiff brown sandy slightly gravely CLAY with cobbles.				V0604	B	3.00			
3.30	Obstruction. End of Borehole at 3.30 m									
4										
5										
6										
7										
8										
9										
10										

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
2.85	2.90	0.50	.
3.20	3.30	2.00	.

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
-	-	-	-	-	Borehole dry

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
10/04/2006	3.30	-	-	Borehole dry

Remarks: Rig was set up on steep slope.

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH04 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 29/03/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 29/03/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 5.10		BORED BY: J.Edwards			
N -		CASING DEPTH (m) 5.10					

DEPTH (M)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	TOPSOIL									
0.50	Stiff light brown sandy CLAY/SILT with occasional gravel.				V3970	B	0.50			
1.00				V3971	B	1.00	C	N=26		
2.00				V3972	B	2.00	C	N=23		
2.80	Very stiff brown sandy gravelly CLAY with cobbles and occasional boulders.				V3972	W	2.70			
3.00				V3973	B	3.00	C	N=27		
4.00				V3974	B	4.00	C	N=50/50mm		
5.10	End of Borehole at 5.10 m				V3975	B	5.00	C	N=R	

Hard Strata Boring / Chiselling				Water Strike Details			
From (m)	To (m)	Hours	Comments	Water Strike	Casing Depth	Sealed At	Rise To
0.00	0.00	3.00	Moving in soft ground.	2.70	2.70	-	2.20
1.50	1.55	0.75	.				
2.90	3.00	0.50	.				
5.00	5.10	2.00	.				

Standpipe Installation Details				Groundwater Observations			
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth
					29/03/2006	5.10	-

Date	Tip Depth	RZ Top	RZ Base	Type

Date	Hole Depth	Casing Depth	Depth to Water	Comments
29/03/2006	5.10	-	-	Borehole dry

Remarks: 1 hour - winching rig onto position (BH04 from BH05). 1 hour - winching off position (unable to winch with equipment - unlead on BH position).

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH05 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 28/03/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 29/03/2006			
CO-ORDINATES : E - N -		BOREHOLE DEPTH (m) 6.70		BORED BY: J.Edwards			
CASING DEPTH (m) 6.70							

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	TOPSOIL									
0.30	Firm light brown sandy CLAY.				V3963	B	0.50			
1.30					V3964	B	1.00	C	N=12	
	Stiff to very stiff light brown sandy CLAY with cobbles.				V3965	B	2.00	C	N=24	
					V3965	W	2.50			
					V3966	B	3.00	C	N=33	
					V3967	B	4.00	C	N=35	
					V3968	B	5.00	C	N=44	
					V3969	B	6.00	C	N=50/ 160mm	
6.70	End of Borehole at 6.70 m							C	N=R	

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
1.55	1.60	0.50	.
3.10	3.20	1.00	.
4.40	4.50	0.75	.
5.30	5.40	0.50	.
6.60	6.70	2.00	.

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
2.50	2.50	-	2.10	20	Medium

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
29/03/2006	6.70	0.00	3.80	End of borehole

Remarks: Standing 16 hours on access (10 hrs 27.3. + 6 hrs 28.3.)

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH06 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 07/04/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 07/04/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 5.40		BORED BY: P.Tidswell			
N -		CASING DEPTH (m) 5.40					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	TOPSOIL			0.20	V2074	B	0.00			
	Soft light brown mottled grey sandy CLAY (Fill).			0.80				C	N=11	
	Soft brown/purple sandy CLAY/SILT.				V2075	B	1.00			
								C	N=7	
	Stiff brown sandy gravelly CLAY with occasional cobbles.			2.40	V2076	B	2.00			
								C	N=35	
	Dense grey fine to coarse sandy GRAVEL.			3.10	V2077	B	3.00			
								C	N=36	
					V2078	B	4.00			
								C	N=39/125mm	
	Obstruction caused by possible bedrock (black LIMESTONE).			5.20	V2079	B	5.00			
	End of Borehole at 5.40 m			5.40	V2080	B	5.40	C	N=R	

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
3.20	3.40	0.75	.
4.80	4.90	0.25	.
5.20	5.40	2.00	.

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
4.40	4.40	-	3.80	-	Medium

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
07/04/2006	5.40	5.40	3.60	End of day

Remarks: 1.5 hrs - extra over move to BH06 position + taking rig off site and putting safe compound due to vehicles being vandalized.

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH7 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 15/03/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 16/03/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 8.10		BORED BY: J.Edwards			
N -		CASING DEPTH (m) 8.10					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	MADE GROUND (consisting of gravel, brick and concrete slabs).				V3908	B	0.50			
-1					V3909	B	1.00	C	N=17	
-2					V3910	B	2.00	C	N=19	
-3	Loose brown fine to coarse slightly silty SAND with occasional fine gravel.			2.50	V3911	B	3.00	C	N=5	
-4					V3912	B	4.00	C	N=7	
-5					V3913	B	5.00	C	N=10	
-6	Dense brown fine to coarse sandy GRAVEL with cobbles.			5.60	V3913	W	5.40			
-7					V3914	B	6.00	C	N=50/85mm	
-8					V3915	B	7.00	C	N=50/235mm	
-9					V3916	B	8.00	C	N=50/85mm	
-10	End of Borehole at 8.10 m			8.10						

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
0.75	0.80	1.00	
5.90	6.00	1.25	
7.45	7.50	0.75	
8.00	8.10	2.00	

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
5.40	5.40	-	5.20	20	Slow

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
16/03/2006	8.10	0.00	5.20	End of borehole

Remarks: Water bowser hired for gravels.

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH09 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 08/04/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 08/04/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 5.80		BORED BY: P.Tidswell			
N -		CASING DEPTH (m) 5.80					

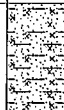
DEPTH (M)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	TOPSOIL			0.10	V2081	B	0.00			
	Soft brown sandy CLAY with cobbles.			0.40				C	N=13	
	Firm to stiff light brown mottled grey sandy slightly gravelly CLAY.				V2082	B	1.00			
								C	N=16	
					V2083	B	2.00			
								C	N=13	
	Loose purple/grey silty SAND (possible sandy silt).			2.70						
					V2084	B	3.00			
								C	N=15	
	Stiff grey sandy gravelly CLAY with occasional cobbles.			3.80						
					V2085	B	4.00			
								C	N=22	
					V2086	B	5.00			
								C	N=25/50mm	
	Obstruction.			5.70						
	End of Borehole at 5.80 m			5.80	V2087	B	5.80			

Hard Strata Boring / Chiselling				Water Strike Details			
From (m)	To (m)	Hours	Comments	Water Strike	Casing Depth	Sealed At	Rise To
3.80	3.90	0.75	.	5.30	5.30	-	1.20
4.20	4.40	0.75	.				
5.70	7.80	2.00					

Standpipe Installation Details					Groundwater Observations			
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water
					08/04/2006	5.80	5.80	1.20
								End of day

Remarks: 0.5 hr - extra over move to BH09 location.

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH10 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 16/03/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 20/03/2006			
CO-ORDINATES : E - N -		BOREHOLE DEPTH (m) 8.50		BORED BY: J.Edwards			
CASING DEPTH (m) 8.50							

DEPTH (M)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	Loose brown silty/clayey SAND (possible fill).			0.80	V3917	B	0.50	C	N=2	
-1	Loose light brown fine to coarse silty SAND (possible sandy SILT).				V3918	B	1.00			
-2					V3919	B	2.00			
-3	Loose orange/brown fine to coarse slightly silty SAND.			3.00	V3920	B	3.00	C	N=3	
-4					V3921	B	4.00	C	N=5	
-5					V3922	B	5.00	C	N=6	
-6					V3926	W	5.80	C	N=9	
-6					V3923	B	6.00			
-7				7.20	V3924	B	7.00	C	N=50/ 150mm	
-8	Dense brown gravelly SAND (possible sandy GRAVEL).				7.50					
-8	Hard brown sandy slightly gravelly CLAY.	V3925	B	8.00		C	N=50/ 85mm			
-9		9.50	V3926	B	9.00	C	N=50/ 10mm			
-10	End of Borehole at 8.50 m									

Hard Strata Boring / Chiselling				Water Strike Details			
From (m)	To (m)	Hours	Comments	Water Strike	Casing Depth	Sealed At	Rise To
7.35	7.40	0.75		5.80	5.80	-	5.10
7.70	7.80	0.75					
8.45	8.50	1.00					
9.40	9.50	2.00					
							Time
							20
							Comments
							Medium

Standpipe Installation Details					Groundwater Observations			
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water
20/03/2006	9.50	0.00	4.90	End of borehole				

Remarks: 2 hours - delay reaccess

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH11 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 22/03/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 23/03/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 5.80		BORED BY: J.Edwards			
N -		CASING DEPTH (m) 5.80					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
	MADE GROUND (consisting of clay, sand, cobbles, boulders and concrete).				V3942	B	0.50			
-1					V3943	B	1.00	C	N=12	
-2	Loose light brown fine to coarse silty SAND with occasional fine gravel (possible very sandy SILT).			2.10	V3944	B	2.00	C	N=8	
-3	(Blowing from 3.00 m.)				V3945	B	3.00	C	N=3	
-4					V3952	W	3.30			
-5					V3946	B	4.00	C	N=2	
-6				5.50	V3947	B	5.00	C	N=10	
-7				6.20	V3948	B	6.00	C	N=16	
-8	Dense grey/brown silty gravelly SAND (possible very sandy GRAVEL).			7.40	V3949	B	7.00	C	N=33	
-9					V3950	B	8.00	C	N=50/ 230mm	
-10					V3951	B	9.00	C	N=50/ 160mm	
	End of Borehole at 5.80 m			9.80				C	N=R	

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
0.55	0.60	1.00	.
5.75	5.80	0.75	.
8.15	8.20	0.50	.
9.70	9.80	2.00	.

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
3.30	3.30	-	2.80	20	Medium

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
23/03/2006	9.80	0.00	3.80	End of borehole

Remarks:

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH12 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 11/04/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 12/04/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 9.00		BORED BY: J.Edwards			
N -		CASING DEPTH (m) 9.00					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	MADE GROUND consisting of clay, stone, concrete slab fill.				V0613	B	0.50			
					V0614	B	1.00	C	N=26	
1	MADE GROUND consisting of grey/brown very sandy gravely clay fill with cobbles.			2.00	V0615	B	2.00	C	N=11	
2	Soft black PEAT.			2.30						
3	Soft grey sandy SILT.			3.40	V0616	B	3.00	C	N=7	
4	Medium dense grey silty slightly gravely SAND.			4.00	V0617	B	4.00	C	N=16	
5	Medium dense brown fine SAND with occasional fine gravel.			5.00	V0618	B	5.00	C	N=13	
6					V0619	B	6.00	C	N=16	
7					V0620	B	7.00	C	N=15	
8	Medium dense grey/brown very sandy fine to coarse GRAVEL with cobbles.			7.70	V0621	B	8.00	C	N=16	
9	Obstruction. End of Borehole at 9.00 m			9.00				C	N=R	
10										

Hard Strata Boring / Chiselling				Water Strike Details			
From (m)	To (m)	Hours	Comments	Water Strike	Casing Depth	Sealed At	Rise To
1.20	1.30	0.50	.	4.60	4.60	-	4.10
4.60	4.65	0.5	.				20
8.90	9.00	2.00	.				Medium

Standpipe Installation Details					Groundwater Observations			
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water
12/04/2006					12/04/2006	5.50	5.50	3.50
								Start of day

Remarks: 11/04/2006 - 0.5 hr extra over move (across site using track machine); in evening removed equipment on site. 12/04/2006 - set up rig in morning.

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH13 Sheet 1 of 2	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 20/03/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 22/03/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 14.40		BORED BY: J.Edwards			
N -		CASING DEPTH (m) 14.40					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	MADE GROUND (consisting of clay sand cobbles boulders and concrete).				V3927	B	0.50			
-1					V3928	B	1.00	C	N=28	
-2					V3929	B	2.00	C	N=14	
-3	Firm light brown sandy CLAY/SILT with occasional gravel and cobbles.			2.00	V3930	B	3.00	C	N=R	
-4					V3931	B	4.00	C	N=16	
-5					V3932	B	5.00	C	N=6	
-6	Loose grey/purple very silty fine to coarse SAND (possible sandy SILT).			4.40	V3937	W	5.40			
-7					V3933	B	6.00	C	N=3	
-8					V3934	B	7.00	C	N=5	
-9	Loose brown slightly gravelly SAND.			7.10						
-10	Loose light brown fine to coarse silty SAND with occasional fine gravel.			7.40	V3935	B	8.00	C	N=4	
-9					V3936	B	9.00	C	N=9	
-10					V3937	B	10.00	C	N=8	
Continued next sheet										

Hard Strata Boring / Chiselling				Water Strike Details			
From (m)	To (m)	Hours	Comments	Water Strike	Casing Depth	Sealed At	Rise To
0.85	0.90	1.00	.	5.40	5.40	-	5.10
1.95	2.00	0.75	.				20
3.10	3.15	1.00	.				Slow
4.10	4.20	0.75	.				
11.60	11.70	1.00	.				
13.40	13.50	0.75	.				
14.30	14.40	2.00	.				

Standpipe Installation Details					Groundwater Observations			
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water
22/03/2006	14.40						0.00	9.70
								End of borehole

Remarks:

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH13 Sheet 2 of 2	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -				DATE STARTED: 20/03/2006	
ENGINEER :		BOREHOLE DIAMETER (mm) 200				DATE COMPLETED: 22/03/2006	
CO-ORDINATES : E - N -		BOREHOLE DEPTH (m) 14.40				BORER BY: J.Edwards	
		CASING DEPTH (m) 14.40					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	Loose light brown fine to coarse silty SAND with occasional fine gravel.									
10.70	Stiff light brown sandy SILT/CLAY with some gravel.				V3939	B	11.00	C	N=22	
12.60					V3940	B	12.00	C	N=24	
12.60	Hard light brown sandy slightly gravelly CLAY with cobbles.				V3941	B	13.00	C	N=41	
14.40					V3942	B	14.00	C	N=50/ 85mm	
	End of Borehole at 14.40 m									

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
0.85	0.90	1.00	.
1.95	2.00	0.75	.
3.10	3.15	1.00	.
4.10	4.20	0.75	.
11.60	11.70	1.00	.
13.40	13.50	0.75	.
14.30	14.40	2.00	.

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
5.40	5.40	-	5.10	20	Slow

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
22/03/2006	14.40	0.00	9.70	End of borehole

Remarks:

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH14 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 24/03/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 24/03/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 3.50		BORED BY: J.Edwards			
N -		CASING DEPTH (m) 3.50					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
	MADE GROUND (consisting of clay, sand, cobbles and boulders).				V3962	B	0.50			
-1				V3963	B	1.00	C	N=23		
-2				V3964	B	2.00	C	N=50/ 90mm		
-3				V3965	B	3.00	C	N=50/ 160mm		
	End of Borehole at 3.50 m			3.50						
-4										
-5										
-6										
-7										
-8										
-9										
-10										

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
1.45	1.50	0.50	.
2.50	2.60	1.50	.
3.40	3.50	2.00	.

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
-	-	-	-	-	Borehole dry

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
24/03/2006	3.50	-	-	Borehole dry

Remarks: Borehole refused in madeground.

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH14A Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 24/03/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 24/03/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 2.70		BORED BY: J.Edwards			
N -		CASING DEPTH (m) 2.70					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	MADE GROUND (consisting of clay, sand, cobbles, boulders and concrete).	X								
1								C	N=R	
2								C	N=26	
2.70	End of Borehole at 2.70 m			2.70				C	N=R	
3										
4										
5										
6										
7										
8										
9										
10										

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
0.50	0.55	0.50	.
1.00	1.10	1.25	.
2.60	2.70	2.00	

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
-	-	-	-	-	Borehole dry

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
24/03/2006	2.70	-	-	Borehole dry

Remarks:

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.				
CONTRACT : Proposed Appartment Development, Limerick					BOREHOLE NO: BH E1 Sheet 1 of 1					
CLIENT : Royceton Limited		GROUND LEVEL (mOD)		-		DATE STARTED: 10/04/2006				
ENGINEER :		BOREHOLE DIAMETER (mm)		200		DATE COMPLETED: 10/04/2006				
CO-ORDINATES : E -		BOREHOLE DEPTH (m)		3.30		BORED BY: J.Edwards				
N -		CASING DEPTH (m)		3.30						
DEPTH (M)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	Brown sandy slightly gravelly CLAY with cobbles (possible fill).				V3997	B	0.50			
1	Soft to firm light brown/grey sandy CLAY/SILT.			0.70	V3998	B	1.00	C	N=10	
2					V3999	B	2.00	C	N=6	
3	Stiff brown/grey sandy gravelly CLAY with cobbles.			2.60						
					V4000	B	3.00	C	N=54/80mm	
	Obstruction. End of Borehole at 3.30 m			3.30						
4										
5										
6										
7										
8										
9										
10										

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
2.75	2.80	0.50	.
3.20	3.30	2.00	.

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
-	-	-	-	-	Borehole dry

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
10/04/2006	3.30	-	-	Borehole dry

Remarks: 1 hr - using track machine to pull rig onto BH position.

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BHE2 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -				DATE STARTED: 13/05/2006	
ENGINEER :		BOREHOLE DIAMETER (mm) 200				DATE COMPLETED: 13/05/2006	
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 7.90				BORED BY: P.Tidswell	
N -		CASING DEPTH (m) 7.90					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	MADE GROUND (Consisting of imported stone)				V2163	B	0.00			
0.40	Soft black PEAT.							C	N=9	
1.00	Firm purple grey slightly sandy SILT/CLAY				V2164	B	1.00			
1.80	Firm brown sandy laminated CLAY/SILT				V2165	B	2.00		N=15	
3.60	Firm brown laminated slightly sandy CLAY/SILT with some fine to medium gravel				V2166	B	3.00		N=14	
3.60					V2167	B	4.00		N=10	
5.00					V2168	B	5.00		N=7	
6.70					V2169	B	6.00		N=15	
7.00	Medium dense to dense grey/brown silty sandy GRAVEL with some cobble				V2170	B	7.00		N=42/150mm	
7.70	Obstruction.									
7.90	End of Borehole at 7.90 m				V2171	B	7.90			

Hard Strata Boring / Chiselling				Water Strike Details			
From (m)	To (m)	Hours	Comments	Water Strike	Casing Depth	Sealed At	Rise To
6.20	6.50	0.50		7.50	7.50	-	4.40
7.70	7.90	2.00					20

Standpipe Installation Details					Groundwater Observations			
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water
					13/05/2006	7.90	7.90	4.80
								End of borehole

Remarks: 1 HOUR - Extra over move removing rig from site to safe compound. Move and setup on BHE2

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BHE3 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 12/05/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 12/05/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 9.80		BORED BY: P.Tidswell			
N -		CASING DEPTH (m) 9.80					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0.00	MADE GROUND (Comprised of imported stone)				V2153	B	0.00			
0.40	Soft locally firm brown PEAT			0.40				C	N=10	
0.70	Soft grey laminated sandy SILT			0.70	V2154	B	1.00			
2.00				2.00	V2155	B	2.00		N=7	
2.40	Stiff purple sandy CLAY/SILT			2.40	V2156	B	3.00		N=22	
3.60				3.60	V2157	B	4.00		N=18	
5.70	Firm brown laminated sandy CLAY/SILT			5.70	V2158	B	5.00		N=19	
5.70				5.70	V2159	B	6.00		N=8	
7.50	Soft brown sandy CLAY/SILT			7.50	V2160	B	7.50		N=6	
8.20				8.20					N=7	
8.20	Medium dense to dense grey fine to coarse sandy GRAVEL with cobbles			8.20	V2161	B	9.00		N=28	
9.60	Obstruction.			9.60						
9.80	End of Borehole at 9.80 m			9.80	V2162	B	9.80		N=50/ 150mm	

Hard Strata Boring / Chiselling				Water Strike Details			
From (m)	To (m)	Hours	Comments	Water Strike	Casing Depth	Sealed At	Rise To
8.30	8.40	0.50		5.30	5.30	-	2.80
9.60	9.80	2.00		9.50	9.50	-	4.60

Standpipe Installation Details					Groundwater Observations				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

Remarks: 1 HOUR - Extra over move to BH3 and set up

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH E4 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD)		-		DATE STARTED: 13/04/2006	
ENGINEER :		BOREHOLE DIAMETER (mm)		200		DATE COMPLETED: 13/04/2006	
CO-ORDINATES : E -		BOREHOLE DEPTH (m)		6.50		BORED BY: J.Edwards	
N -		CASING DEPTH (m)		6.70			

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	MADE GROUND consisting of clay fill with bricks, cobbles and boulders.				V0626	B	0.50			
1					V0627	B	1.00	C	N=8	
2					V0628	B	2.00	C	N=7	
3					V0629	B	3.00	C	N=11	
4					V0630	B	4.00	C	N=11	
5					V0631	B	5.00	C	N=16	
6					V0632	B	6.00	C	N=50/ 80mm	
6.50	End of Borehole at 6.50 m									
7										
8										
9										
10										

Hard Strata Boring / Chiselling				Water Strike Details			
From (m)	To (m)	Hours	Comments	Water Strike	Casing Depth	Sealed At	Rise To
0.85	0.90	0.50	.	6.10	6.10	-	6.00
6.40	6.50	2.00	.				20
							Slow

Standpipe Installation Details					Groundwater Observations			
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water
					13/04/2006	6.50	6.50	6.10
								End of borehole

Remarks: 1 hr - winching rig on site with heavy rain, ground was slippery. Casing on severe angle due to massive boulder.

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH E5 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD)		-		DATE STARTED: 12/04/2006	
ENGINEER :		BOREHOLE DIAMETER (mm)		200		DATE COMPLETED: 12/04/2006	
CO-ORDINATES : E -		BOREHOLE DEPTH (m)		3.50		BORED BY: J.Edwards	
N -		CASING DEPTH (m)		3.50			

DEPTH (M)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	MADE GROUND consisting of stone fill (boulders in length up to 2 m) with some clay.				V0622	B	0.50	C	N=50/ 160mm	
-1					V0623	B	1.00			
-2					V0624	B	2.00			
-3					V0625	B	3.00			
-3.20	MADE GROUND consisting of dark grey sandy SILT with boulders and pockets of rubbish. Obstruction.			3.20						
-3.50										
-3.50	End of Borehole at 3.50 m									
-4										
-5										
-6										
-7										
-8										
-9										
-10										

Hard Strata Boring / Chiselling				Water Strike Details			
From (m)	To (m)	Hours	Comments	Water Strike	Casing Depth	Sealed At	Rise To
0.55	0.60	0.50	.	-	-	-	-
2.00	2.30	1.25	.				
3.40	3.50	2.00					

Standpipe Installation Details					Groundwater Observations			
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water
					12/04/2006	3.50	3.50	-

Comments				
Borehole dry				

Comments				
Borehole dry				

Remarks: Unable to progress (made ground- massive boulders (2 m in length) used to build up surface above bog).

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.				
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH E5A Sheet 1 of 1				
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 12/04/2006						
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 12/04/2006						
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 3.40		BORED BY: J.Edwards						
N -		CASING DEPTH (m) 0.00								
DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	MADE GROUND consisting of stone fill (boulders) with some clay.									
1								C	N=32	
2								C	N=R	
3								C	N=R	
3.40	Obstruction - boulders. End of Borehole at 3.40 m			3.40						
4										
5										
6										
7										
8										
9										
10										
From (m)	To (m)	Hours	Comments							
1.50	1.70	1.25	.							
2.10	2.15	0.50	.							
3.30	3.40	2.00								
Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments					
-	-	-	-	-	Borehole dry					
Date	Tip Depth	RZ Top	RZ Base	Type						
Date	Hole Depth	Casing Depth	Depth to Water	Comments						
12/04/2006	3.40	3.40	-	Borehole dry						

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BH E6 Sheet 1 of 1	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 23/03/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 24/03/2006			
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 6.00		BORED BY: J.Edwards			
N -		CASING DEPTH (m) 6.00					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	MADE GROUND (consisting of clay, sand, cobbles, boulders and concrete).				V3952	B	0.50			
1					V3953	B	1.00	C	N=50/75mm	
2	Medium dense light brown slightly clayey slightly gravelly SAND.			1.80	V3954	B	2.00	C	N=13	
3					V3955	B	3.00	C	N=15	
4	Dense dark grey silty slightly gravelly SAND.			3.50	V3956	B	4.00	C	N=56	
5					V3957	B	5.00	C	N=45	
6	End of Borehole at 6.00 m			6.00	V3958	B	5.90	C	N=R	
7										
8										
9										
10										

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
0.95	1.00	1.00	.
3.55	3.60	1.00	.
4.10	4.20	0.50	.
5.40	5.50	1.00	.
5.90	6.00	2.00	.

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
-	-	-	-	-	Borehole dry

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
24/03/2006	6.00	-	-	Borehole dry

Remarks:

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BHE7 Sheet 1 of 2	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -				DATE STARTED: 09/05/2006	
ENGINEER :		BOREHOLE DIAMETER (mm) 200				DATE COMPLETED: 10/05/2006	
CO-ORDINATES : E -		BOREHOLE DEPTH (m) 12.40				BORED BY: P.Tidswell	
N -		CASING DEPTH (m) 12.40					

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	MADE GROUND (Consisting of brown sandy CLAY with some limestone cobbles.)				V2125	B	0.00			
	Medium dense brown gravelly SAND			0.40				C	N=18	
-1					V2126	B	1.00			
								C	N=17	
-2					V2127	B	2.00			
								C	N=18	
-3	Firm brown very sandy laminated SILT			3.20	V2128	B	3.00			
								C	N=16	
-4	Medium dense brown fine to coarse slightly silty very sandy GRAVEL			4.20	V2129	B	4.00			
								C	N=24	
-5	Firm becoming stiff brown sandy and gravelly laminated CLAY/SILT			5.40	V2130	B	5.00			
								C	N=20	
-6					V2131	B	6.00			
								C	N=19	
-7					V2132	B	7.00			
								C	N=21	
-8	Medium dense grey brown fine to coarse sandy GRAVEL with cobble			8.40	V2133	B	8.00			
								C	N=29	
-9					V2134	B	9.00			
								C	N=30	
-10	Continued next sheet			9.80	V2135	B	10.00			

Hard Strata Boring / Chiselling				Water Strike Details			
From (m)	To (m)	Hours	Comments	Water Strike	Casing Depth	Sealed At	Rise To
4.30	4.40	0.50		6.20	6.20	-	-
9.10	9.40	0.75					
11.80	12.00	0.50					
12.20	12.40	2.00					

Standpipe Installation Details				Groundwater Observations			
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth

Date	Tip Depth	RZ Top	RZ Base	Type

Date	Hole Depth	Casing Depth	Depth to Water	Comments

Remarks: 1 HOUR - Extra over move from Rhebogue, Castleroy to Parkway, Castleroy Limerick

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.	
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BHE7 Sheet 2 of 2	
CLIENT : Royceton Limited		GROUND LEVEL (mOD) -		DATE STARTED: 09/05/2006			
ENGINEER :		BOREHOLE DIAMETER (mm) 200		DATE COMPLETED: 10/05/2006			
CO-ORDINATES : E - N -		BOREHOLE DEPTH (m) 12.40		BORED BY: P.Tidswell			
		CASING DEPTH (m) 12.40					

DEPTH (M)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
-10	Grey/brown sandy gravelly CLAY with some subrounded cobbles	[Pattern]		10.30						
-11	Very dense grey blue fine to coarse GRAVEL with some cobbles				V2136	B	11.00	C	N=25/ 75mm	
-12								C	N=70	
-12	Obstruction.	[Pattern]		12.20						
-12	End of Borehole at 12.40 m			12.40	V2137	B	12.40	C	N=R	
-13										
-14										
-15										
-16										
-17										
-18										
-19										
-20										

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
4.30	4.40	0.50	.
9.10	9.40	0.75	.
11.80	12.00	0.50	.
12.20	12.40	2.00	.

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
6.20	6.20	-	-	-	Medium

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments

Remarks: 1 HOUR - Extra over move from Rhebogue, Castleroy to Parkway, Castleroy Limerick

REPORT NO: 11654		GEOTECHNICAL BORING RECORD				IGSL Ltd.				
CONTRACT : Proposed Appartment Development, Limerick						BOREHOLE NO: BHE8 Sheet 1 of 2				
CLIENT : Royceton Limited		GROUND LEVEL (mOD)		-		DATE STARTED: 10/05/2006				
ENGINEER :		BOREHOLE DIAMETER (mm)		200		DATE COMPLETED: 11/05/2006				
CO-ORDINATES : E -		BOREHOLE DEPTH (m)		7.50		BORED BY: P.Tidswell				
N -		CASING DEPTH (m)		7.50						
DEPTH (M)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
0	MADE GROUND (Consisting of imported stone)				V2138	B	0.00			
	Medium dense brown gravelly SAND			0.30	V2139	B	1.00	C	N=16	
-1										
	Medium dense brown fine to coarse slightly silty SAND			1.30	V2140	B	2.00	C	N=16	
-2					V2141	B	3.00	C	N=20	
-3					V2142	B	4.00	C	N=22	
-4					V2143	B	5.00	C	N=17	
-5					V2144	B	6.00	C	N=21	
-6					V2145	B	7.00	C	N=25	
-7	Medium dense grey brown sandy fine to coarse GRAVEL with occasional small cobble			6.80	V2146	B	8.00	C	N=20	
-8					V2147	B	9.00	C	N=21	
-9					V2148	B	10.00	C	N=25	
-10	Continued next sheet									
Hard Strata Boring / Chiselling					Water Strike Details					
From (m)	To (m)	Hours	Comments							
7.20	7.40	0.75								
9.40	9.60	0.75								
12.20	12.30	0.75								
14.30	14.50	2.00								
					Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
					5.30	5.30	-	-	-	Medium
					Groundwater Observations					
Date	Hole Depth	Casing Depth	Depth to Water	Comments						
Standpipe Installation Details										
Date	Tip Depth	RZ Top	RZ Base	Type						
Remarks: 1 HOUR - Extra over move taking rig off site to safe compound										

REPORT NO: 11654

GEOTECHNICAL BORING RECORD

IGSL Ltd.

CONTRACT : Proposed Appartment Development, Limerick

BOREHOLE NO: BHE8
Sheet 2 of 2CLIENT : Royceton Limited
ENGINEER :

GROUND LEVEL (mOD) -

BOREHOLE DIAMETER (mm) 200

DATE STARTED: 10/05/2006

DATE COMPLETED: 11/05/2006

CO-ORDINATES : E -
N -

BOREHOLE DEPTH (m) 7.50

CASING DEPTH (m) 7.50

BORED BY: P.Tidswell

DEPTH (m)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			SPT TYPE	FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)			
10.0	Medium dense grey brown sandy fine to coarse GRAVEL with occasional small cobble							C	N=24	
11.0					V2149	B	11.00			
12.0	Dense brown fine to coarse slightly silty sandy GRAVEL with some cobble			11.60	V2150	B	12.00	C	N=29	
13.0					V2151	B	13.00	C	N=35	
14.0								C	N=37	
14.30	Obstruction.			14.30						
14.50	End of Borehole at 14.50 m			14.50	V2152	B	14.50	C	N=R	
15.0										
16.0										
17.0										
18.0										
19.0										
20.0										

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
7.20	7.40	0.75	.
9.40	9.60	0.75	.
12.20	12.30	0.75	.
14.30	14.50	2.00	.

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
5.30	5.30	-	-	-	Medium

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments

Remarks: 1 HOUR - Extra over move taking rig off site to safe compound

RECEIVED: 28/05/2026

Appendix II – Rotary Coring Records



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO
SHEET

RC1

Sheet 1 of 2

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

DATE STARTED

04/05/2006

DATE COMPLETED

04/05/2006

CLIENT
ENGINEER Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY

Millennium

LOGGED BY

IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
0					0 250 500									SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of cobbly gravelly clay fill.
1														
2														
3														
4													4.20	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly clay.
5													5.70	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of sandy clay.
6											N = 28 (3, 5, 5, 7, 7, 9)			SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of sandy clay.
7											N = 31 (4, 4, 6, 6, 8, 11)		7.20	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of clay.
8											N = 35 (3, 5, 7, 7, 9, 12)			
9														

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
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INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
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IGSL DH LOG 11654.GPJ IGSL_GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO
SHEETRC1
Sheet 2 of 2

CO-ORDINATES(_)

GROUND LEVEL (m)
CORE DIAMETER (mm)DATE STARTED 04/05/2006
DATE COMPLETED 04/05/2006CLIENT
ENGINEER Royceton Ltd.INCLINATION
FLUSH Air/MistDRILLED BY Millennium
LOGGED BY IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
10					0 250 500						N = 35 (2, 3, 6, 6, 10, 13)			SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of clay. (continued)
11											N = 42 (3, 6, 9, 9, 12, 12)			
12											N = 49 (4, 7, 11, 10, 13, 15)			
13											N = 38 (2, 5, 5, 9, 11, 13)		14.70	
14											N = 38 (3, 4, 7, 9, 9, 13)		16.20	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of sandy clay.
15													17.00	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of clay.
16														End of Corehole at 17 (m)
17														
18														
19														

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

INSTALLATION DETAILS

Date Tip Depth RZ Top RZ Base Type

Date Hole Depth Casing Depth Depth to Water Comments

IGSL DH LOG 11654.GPJ IGSL_GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO RC2

SHEET Sheet 1 of 2

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

78

DATE STARTED

10/05/2006

DATE COMPLETED

10/05/2006

CLIENT
ENGINEER

Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY
LOGGED BYMillennium
IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
0					0 250 500									SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of peaty clay topsoil.
1														
2													2.70	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of clay.
3													4.20	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of silty sand.
4													7.20	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of silty sandy gravel.
5													8.70	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of sandy gravel with occasional cobbles.
6													9.60	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as gravel size returns
7													10.00	
8														
9														

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
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INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
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IGSL.DH LOG 11654.GPJ IGSL.GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO
SHEET

RC2

Sheet 2 of 2

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

78

DATE STARTED

10/05/2006

DATE COMPLETED

10/05/2006

CLIENT
ENGINEER

Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY

Millennium

LOGGED BY

IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
10	10.00				0 250 500									
11		87	65	45										
12	11.50													
13		94	91	78										
14	13.10													
15		100	86	77										
16	14.70												14.70	
17														
18														
19														

of limestone (probable bedrock).
Strong, medium to locally thinly bedded, grey/dark grey/black, fine grained LIMESTONE (locally argillaceous, commonly cherty). Fresh to locally slightly weathered. Discontinuities are rough to smooth and undulose. Apertures are tight to locally open. Dips sub-horizontal and locally 90° (10.31m-10.6m).

End of Corehole at 14.7 (m)

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

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

INSTALLATION DETAILS

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

IGSL DH LOG 11654.GPJ IGSL.GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO
SHEET

RC3

Sheet 1 of 2

CO-ORDINATES()

GROUND LEVEL (m)

CORE DIAMETER (mm)

82

DATE STARTED

09/05/2006

DATE COMPLETED

09/05/2006

CLIENT

Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY

Millennium

LOGGED BY

IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
0					0 250 500									SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly clay.
1														
2														
3														
4														
4.20														
4.50														SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of sandy clay.
5.00	5.00													SYMMETRIX OPEN HOLE DRILLING: Observed by driller as gravel size returns of limestone (probable bedrock).
6		100	97	95										Strong to very strong, medium to thickly and locally thinly bedded, grey/dark grey, fine grained LIMESTONE (commonly cherty, slightly fossiliferous). Fresh to locally slightly weathered.
6.50														Discontinuities are rough and undulose. Apertures are tight to locally open. Dips horizontal and locally 90° (7.7m-8.35m, 9.2m-9.39m)
7		100	97	88										
8														
8.00		100	96	85										
9														
9.30														

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

INSTALLATION DETAILS

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

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

IGSL DH LOG 11654.GPJ IGSL.GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO

RC3

SHEET

Sheet 2 of 2

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

82

DATE STARTED

09/05/2006

DATE COMPLETED

09/05/2006

CLIENT

Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY

Millennium

LOGGED BY

IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
10		100	90	90										
10.80													10.80	End of Corehole at 10.8 (m)
11														
12														
13														
14														
15														
16														
17														
18														
19														

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

Date

Hole Depth

Casing Depth

Depth to Water

Comments

INSTALLATION DETAILS

Date

Tip Depth

RZ Top

RZ Base

Type

IGSL DH LOG 11654.GPJ IGSL GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO
SHEET

RC4

Sheet 1 of 3

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

82

DATE STARTED

07/05/2006

DATE COMPLETED

07/05/2006

CLIENT
ENGINEER

Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY

Millennium

LOGGED BY

IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
0					0 250 500									SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly clay.
1														
2														
3														
4														
5													5.20	
5.50													5.50	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as gravel size returns of limestone (probable bedrock).
6	87	77	62											Strong to very strong, medium to thickly and locally thinly bedded, grey/dark grey, fine grained LIMESTONE (commonly cherty, slightly fossiliferous). Fresh to locally slightly weathered.
7	7.00													Discontinuities are rough and undulose. Apertures are tight to locally open. Dips horizontal and locally 90° (13.1m-15.7m).
8	100	93	83											
8.50														
9	100	95	83											

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
07/05/2006	18.80	6.00	24.80	50mm SP

IGSL.DH LOG 11654.GPJ IGSL.GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO RC4

SHEET Sheet 2 of 3

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm) 82

DATE STARTED 07/05/2006

DATE COMPLETED 07/05/2006

CLIENT
ENGINEER Royceton Ltd.

INCLINATION

FLUSH Air/Mist

DRILLED BY Millennium

LOGGED BY IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
10	10.00				0 250 500									Strong to very strong, medium to thickly and locally thinly bedded, grey/dark grey, fine grained LIMESTONE (commonly cherty, slightly fossiliferous). Fresh to locally slightly weathered. Discontinuities are rough and undulose. Apertures are tight to locally open. Dips horizontal and locally 90° (13.1m-15.7m). (continued)
11		100	97	97										
12	11.50													
13		100	93	91										
14	13.10													
15		100	90	43										
16	14.70													
17		100	95	74										
18	16.30													
19		100	70	51										
20	17.00													
21		100	96	86										
22	18.60													
23		100	100	100										

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
07/05/2006	18.80	6.00	24.80	50mm SP

IGSL DH LOG 11654.GPJ IGSL.GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO RC4

SHEET Sheet 3 of 3

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

82

DATE STARTED 07/05/2006

DATE COMPLETED 07/05/2006

CLIENT
ENGINEER Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY Millennium

LOGGED BY IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
20	20.20				0 250 500									Strong to very strong, medium to thickly and locally thinly bedded, grey/dark grey, fine grained LIMESTONE (commonly cherty, slightly fossiliferous). Fresh to locally slightly weathered. Discontinuities are rough and undulose. Apertures are tight to locally open. Dips horizontal and locally 90° (13.1m-15.7m). (continued)
21		100	94	84										
22	21.80													
23		100	100	100										
24	23.30													End of Corehole at 24.8 (m)
25		100	95	89										
26	24.80													
27														
28														
29														

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

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

INSTALLATION DETAILS

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

07/05/2006	18.80	6.00	24.80	50mm SP
------------	-------	------	-------	---------

IGSL DH LOG 11654.GPJ IGSL.GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO
SHEETRC5
Sheet 1 of 3

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

82

DATE STARTED

08/05/2006

DATE COMPLETED

08/05/2006

CLIENT
ENGINEER

Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY

Millennium

LOGGED BY

IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
0					0 250 500									
1														
2														
3														
4														
5	5.00												4.50	
5.50													5.00	
6	100	88	88											
	100	37	37											
6.60														
7	100	92	65											
8	8.10													
9	100	95	82											
9.70														

SYMMETRIX OPEN HOLE DRILLING:
Observed by driller as returns of gravelly clay.SYMMETRIX OPEN HOLE DRILLING:
Observed by driller as gravel size returns of limestone (probable bedrock).
Strong to very strong, medium to thickly and locally thinly bedded, grey/dark grey, fine grained LIMESTONE (commonly cherty, slightly fossiliferous, locally argillaceous). Fresh to locally slightly weathered. Discontinuities are rough and undulose. Apertures are tight to open with locally iron oxide surfaces and locally clay smeared (5.86m,5.9m,7.9m). Dips sub-horizontal and locally 90° (6.92m-7.32m, 9.54m-9.74m, 10.33m-11.3m,13.66m-14.01m, 17.43m-17.98m).

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
08/05/2006	20.20	5.00	25.20	50mm SP

IGSL DH LOG 11654.GPJ IGSL_GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO

RC5

SHEET

Sheet 2 of 3

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

82

DATE STARTED

08/05/2006

DATE COMPLETED

08/05/2006

CLIENT
ENGINEER

Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY
LOGGED BYMillennium
IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
10		100	94	43										Strong to very strong, medium to thickly and locally thinly bedded, grey/dark grey, fine grained LIMESTONE (commonly cherty, slightly fossiliferous, locally argillaceous). Fresh to locally slightly weathered. Discontinuities are rough and undulose. Apertures are tight to open with locally iron oxide surfaces and locally clay smeared (5.86m,5.9m,7.9m). Dips sub-horizontal and locally 90° (6.92m-7.32m, 9.54m-9.74m, 10.33m-11.3m,13.66m-14.01m, 17.43m-17.98m). (continued)
11	11.30													
12		100	88	50										
13	12.90													
14		100	89	33										
15	14.50													
16		100	92	84										
17	16.10													
18		100	94	68										
19	17.70													
20		100	68	19										
21	19.00													
22		100	74	47										

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
08/05/2006	20.20	5.00	25.20	50mm SP

IGSL DH LOG 11654.GPJ IGSL.GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO RC5

SHEET Sheet 3 of 3

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm) 82

DATE STARTED 08/05/2006

DATE COMPLETED 08/05/2006

CLIENT
ENGINEER Royceton Ltd.

INCLINATION

FLUSH Air/Mist

DRILLED BY Millennium

LOGGED BY IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
20					0 250 500									Strong to very strong, medium to thickly and locally thinly bedded, grey/dark grey, fine grained LIMESTONE (commonly cherty, slightly fossiliferous, locally argillaceous). Fresh to locally slightly weathered. Discontinuities are rough and undulose. Apertures are tight to open with locally iron oxide surfaces and locally clay smeared (5.86m,5.9m,7.9m). Dips sub-horizontal and locally 90° (6.92m-7.32m, 9.54m-9.74m, 10.33m-11.3m,13.66m-14.01m, 17.43m-17.98m). (continued)
20.60														
21		100	91	84										
22														
22.20														
23		100	100	100										End of Corehole at 25.2 (m)
23.70														
24		100	93	93										
25														
25.20														
26														
27														
28														
29														

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
08/05/2006	20.20	5.00	25.20	50mm SP

IGSL DH LOG 11654.GPJ IGSL_GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO
SHEET

RC6

Sheet 1 of 3

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

82

DATE STARTED

06/05/2006

DATE COMPLETED

06/05/2006

CLIENT
ENGINEER

Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY

Millennium

LOGGED BY

IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
0					0 250 500									
1														
2														
3													2.70	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly clay.
4														
5														
6														
7													7.20	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of sandy clay with occasional gravel.
8														
9														

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
06/05/2006	13.00	12.00	25.00	50mm SP

IGSL DH LOG 11654.GPJ IGSLGDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO
SHEET

RC6

Sheet 2 of 3

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

82

DATE STARTED

06/05/2006

DATE COMPLETED

06/05/2006

CLIENT
ENGINEER Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY

Millennium

LOGGED BY

IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
10					0 250 500									SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of clayey gravel with occasional cobbles. (continued)
11													11.20	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as gravel size returns of limestone (probable bedrock).
11.60													11.60	Observed by driller as gravel size returns of limestone (probable bedrock). Strong to very strong, medium to thickly and locally thinly bedded, grey/dark grey, fine grained LIMESTONE (commonly cherty, commonly fossiliferous). Fresh to locally slightly weathered. Discontinuities are rough and undulose. Apertures are tight to locally open. Dips horizontal and locally 90° (11.6m-14.5m, 20.73m-21.1m, 21.34m-21.61m).
12	100	35	0											
12.60														
13	100	72	39											
13.50														
14	100	22	53											
14.50														
15	100	100	97											
15.70														
16	100	96	83											
17														
17.20														
18	100	95	95											
18.70														
19	100	100	99											

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
06/05/2006	13.00	12.00	25.00	50mm SP

IGSL.DH LOG 11654.GPJ IGSL.GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO RC6

SHEET Sheet 3 of 3

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

82

DATE STARTED

06/05/2006

DATE COMPLETED

06/05/2006

CLIENT
ENGINEER Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY
LOGGED BYMillennium
IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
20	20.20				0 250 500									Strong to very strong, medium to thickly and locally thinly bedded, grey/dark grey, fine grained LIMESTONE (commonly cherty, commonly fossiliferous). Fresh to locally slightly weathered. Discontinuities are rough and undulose. Apertures are tight to locally open. Dips horizontal and locally 90° (11.6m-14.5m, 20.73m-21.1m, 21.34m-21.61m). (continued)
21		100	94	62										
22	21.80													
23		100	99	87										
24	23.30													
25	24.30	100	96	96										End of Corehole at 25 (m)
26	25.00	100	100	100										
27														
28														
29														

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

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

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
06/05/2006	13.00	12.00	25.00	50mm SP

IGSL DH LOG 11654.GPJ IGSL.GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO
SHEET

RC7

Sheet 1 of 2

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

82

DATE STARTED

09/05/2006

DATE COMPLETED

09/05/2006

CLIENT
ENGINEER

Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY
LOGGED BY

Millennium

IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
0					0 250 500									SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly clay.
1														
2													2.70	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of silty clay.
3													4.20	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of silty sand.
4													5.70	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of silty sandy gravel with occasional cobbles.
5													6.70	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as gravel size returns of limestone (probable bedrock).
6													7.20	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as gravel size returns of limestone (probable bedrock). Strong, medium to locally thinly bedded, grey/dark grey/black, fine grained LIMESTONE (locally argillaceous, commonly cherty). Fresh to locally slightly weathered. Discontinuities are rough to smooth and undulose. Apertures are tight to locally open. Dips sub-horizontal.
7	7.20													
8		100	65	65										
9	8.70													
		100	81	76										

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
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INSTALLATION DETAILS

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

IGSL.DH.LOG 11654.GPJ IGSL.GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO RC7

SHEET Sheet 2 of 2

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm) 82

DATE STARTED 09/05/2006

DATE COMPLETED 09/05/2006

CLIENT
ENGINEER Royceton Ltd.

INCLINATION

FLUSH Air/Mist

DRILLED BY Millennium

LOGGED BY IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
10	10.10													Strong, medium to locally thinly bedded, grey/dark grey/black, fine grained LIMESTONE (locally argillaceous, commonly cherty). Fresh to locally slightly weathered. Discontinuities are rough to smooth and undulose. Apertures are tight to locally open. Dips sub-horizontal. (continued)
		100	81	81										
11	11.30													
12		100	100	100										
	12.50												12.50	End of Corehole at 12.5 (m)
13														
14														
15														
16														
17														
18														
19														

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL DH LOG 11654.GPJ IGSL-GDT 16/5/06



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO
SHEET

RC8

Sheet 1 of 2

CO-ORDINATES (_)

GROUND LEVEL (m)

CORE DIAMETER (mm)

82

DATE STARTED

05/05/2006

DATE COMPLETED

05/05/2006

CLIENT
ENGINEER

Royceton Ltd.

INCLINATION

FLUSH

Air/Mist

DRILLED BY
LOGGED BYMillennium
IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
0					0 250 500									SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of peaty topsoil.
1														
2														
3													2.70	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as returns of gravelly clay.
4														
5														
6														
7	7.10	100	100	100									7.10	SYMMETRIX OPEN HOLE DRILLING: Observed by driller as gravel size returns of limestone (probable bedrock). Strong, medium to locally thinly bedded, grey/dark dark grey/black, fine grained LIMESTONE (locally argillaceous and cherty and commonly fossiliferous). Fresh to locally slightly weathered. Discontinuities are rough to smooth and undulose. Apertures are tight to locally open. Dips sub-horizontal.
8	7.60													
		100	80	72										
9	8.80													
		100	100	90										

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

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

INSTALLATION DETAILS

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



GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER

11654

CONTRACT Proposed Apartment Development, Limerick

DRILLHOLE NO RC8

SHEET Sheet 2 of 2

CO-ORDINATES(_)

GROUND LEVEL (m)

CORE DIAMETER (mm) 82

DATE STARTED 05/05/2006

DATE COMPLETED 05/05/2006

CLIENT
ENGINEER Royceton Ltd.

INCLINATION

FLUSH Air/Mist

DRILLED BY Millennium

LOGGED BY IGSL

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	Point Load Is(50) (MPa)	Legend	Elevation	Water	SPT (N Value)	Standpipe Details	Depth (m)	Description
10					0 250 500									
10.40														
11	100	92	92											Strong, medium to locally thinly bedded, grey/dark dark grey/black, fine grained LIMESTONE (locally argillaceous and cherty and commonly fossiliferous). Fresh to locally slightly weathered. Discontinuities are rough to smooth and undulose. Apertures are tight to locally open. Dips sub-horizontal. (continued)
11.90	100	43	20											
12.90	100	100	100											
14														
14.40	100	100	98											
15	15.00												15.00	End of Corehole at 15 (m)
16														
17														
18														
19														

REMARKS

INSTALLATION REMARKS

GROUNDWATER DETAILS

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

INSTALLATION DETAILS

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

IGSL DH LOG 11654.GPJ IGSL GDT 16/5/06

RECEIVED: 28/05/2026

Appendix III – Laboratory Test Records

Summary of Classification Tests

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

[illegible]

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

Contract

LIMERICK DEVELOPMENT

Contract No.

11654

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of

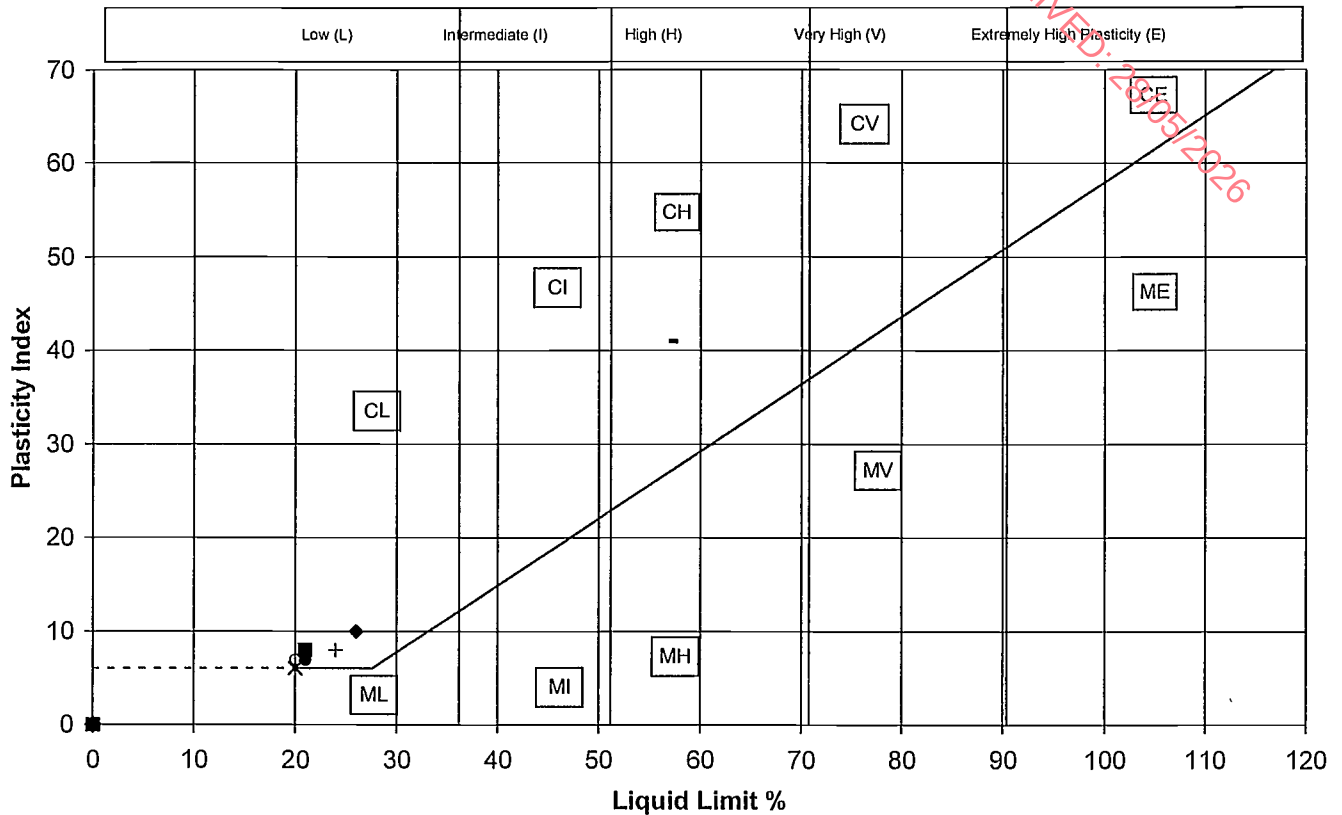
Plasticity Chart - Summary of Liquid & Plastic Limit Tests

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

Chart in accordance with BS5930:1999, fig.18

Contract No. 11654

Contract: LIMERICK DEVELOPMENT



Code	BH/TP	Sample	Depth (m)	MC%	LL%	PL%	PI%	%<425µm	Description
-	BH 1	606	1.00	26.4	57	16	41	89.0	Reddish brown slightly sandy CLAY with occasional gravel
■	BH 1	608	3.00	5.8	21	13	8	26.0	Light brown clayey sandy GRAVEL with many cobbles
●	BH 2	611	2.00	13.1	21	14	7	66.9	Reddish brown slightly sandy slightly gravelly CLAY
◆	BH 6	2075	1.00	19.7	26	16	10	89.4	Reddish brown slightly sandy CLAY with occasional gravel
X	BH 9	2083	2.00	12.6	20	14	6	69.5	Light brown slightly sandy slightly gravelly CLAY
+	BH E1	3999	2.00	19.6	24	16	8	88.0	Reddish brown slightly sandy CLAY
O	BH E1	4000	3.00	8.3	20	13	7	41.0	Brown slightly sandy gravelly CLAY with some cobbles
□									
-									
■									
●									
◆									
X									
+									
O									
□									

NP denotes specimen is non-plastic.

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Plasticity Chart - Summary of Liquid & Plastic Limit Tests

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

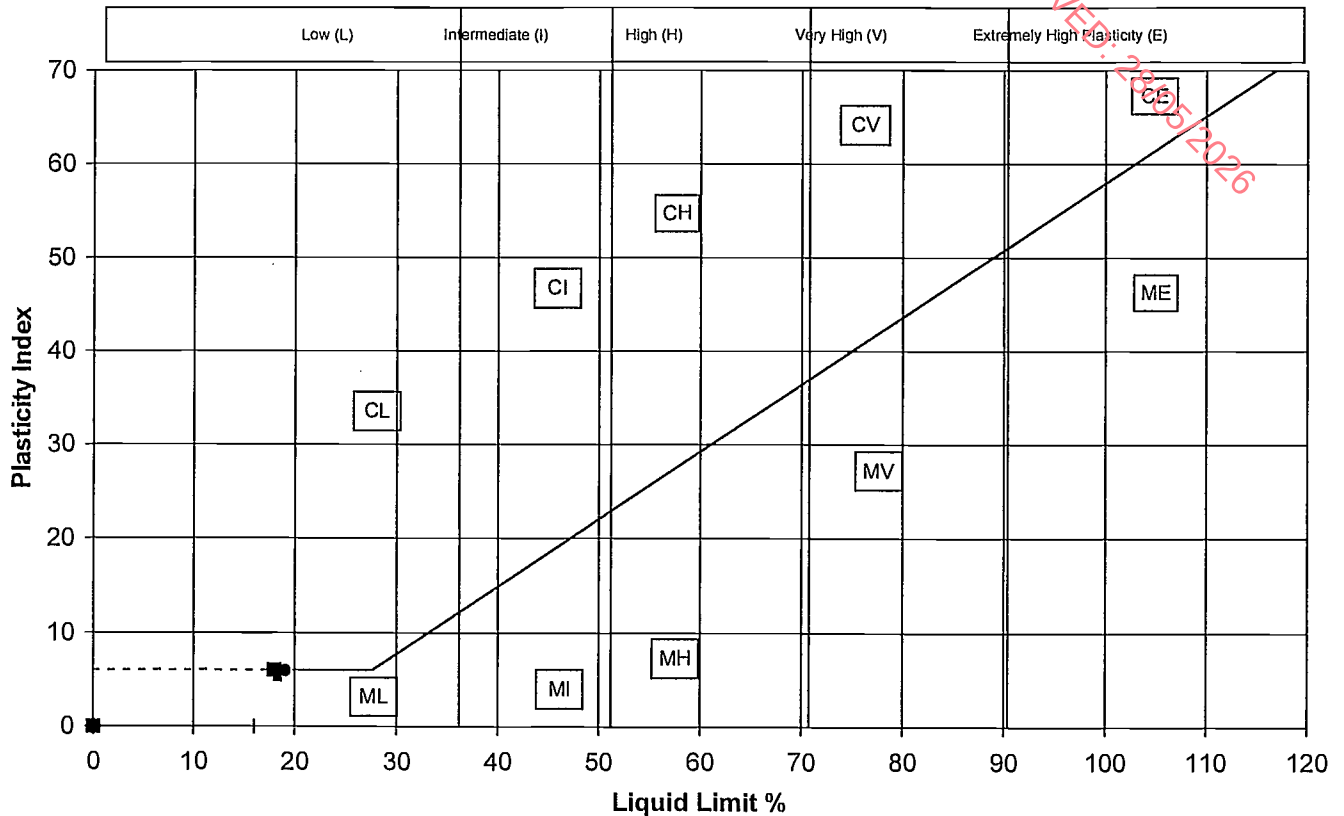
Chart in accordance with BS5930:1999, fig.18

Contract No.

11654

Contract:

LIMERICK DEVELOPMENT



Code	BH/TP	Sample	Depth (m)	MC%	LL%	PL%	PI%	%<425µm	Description
-	BH 4	3972	2.00	9.4	18	13	5	52.4	Brown slightly sandy slightly gravelly SILT
■	BH 4	3974	4.00	8.1	18	12	6	35.0	Light brown slightly sandy gravelly CLAY with many cobbles
●	BH 5	3966	3.00	7.4	19	13	6	43.3	Brown slightly sandy gravelly CLAY
◆	BH 10	3919	2.00	17.2		NP		40.0	Orange brown slightly silty gravelly SAND
X	BH 10	3925	8.00	5.2		NP		14.0	Brown slightly silty very sandy GRAVEL
+	BH 13	3940	12.00	9.12	16	NP		57.6	Brown slightly sandy slightly gravelly SILT
○									
□									
-									
■									
●									
◆									
X									
+									
○									
□									

NP denotes specimen is non-plastic.

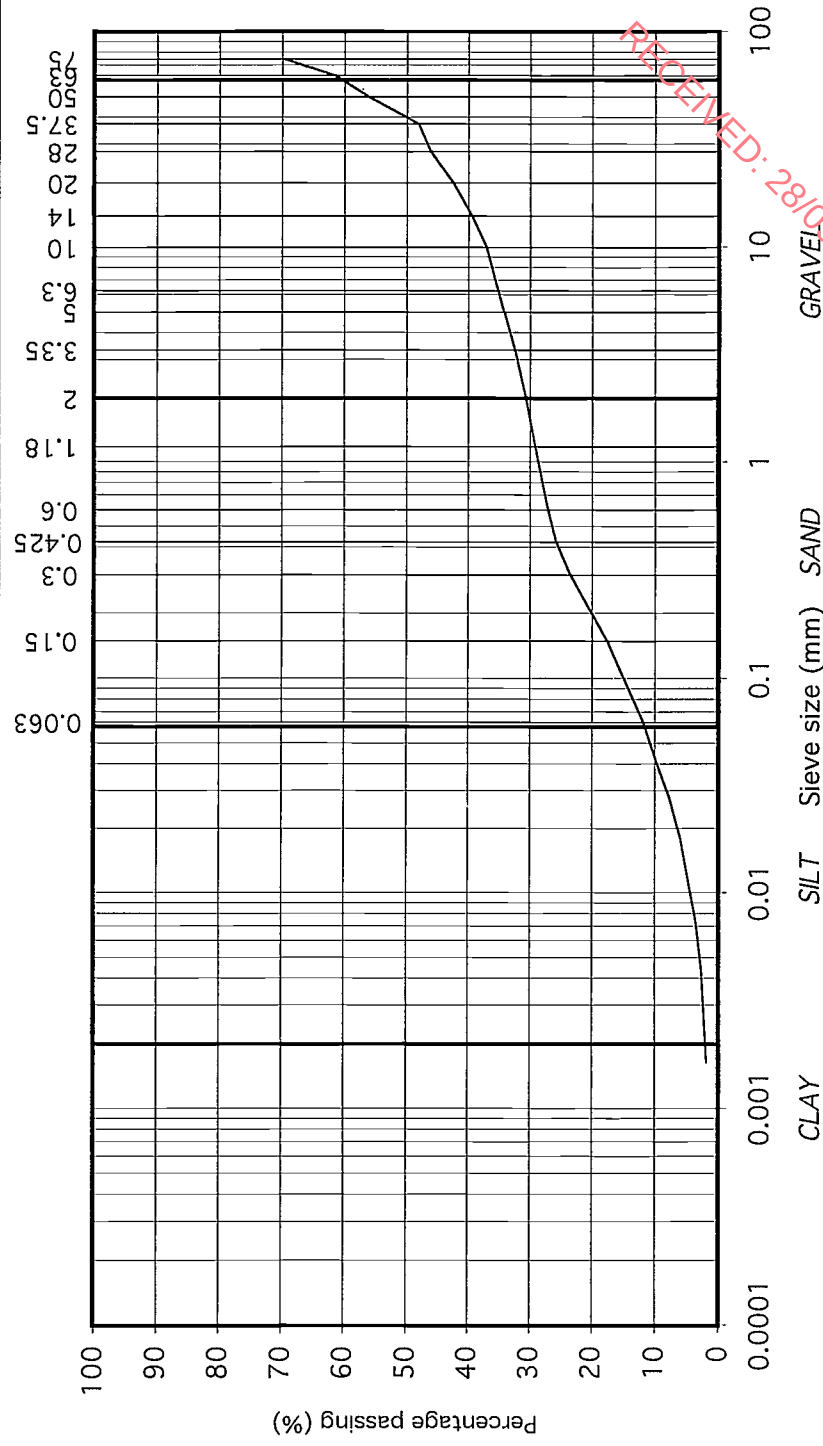
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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No: 11654
 Contract: LIMERICK DEVELOPMENT
 BH/TP No: BH 1
 SAMPLE No.: 608
 DEPTH (m): 3.00
 TEST METHOD: Wet sieve and hydrometer
 DESCRIPTION: Light brown clayey, sandy, GRAVEL with many cobbles

particle size	% passing	
75	70	COBBLES
63	61	GRAVEL
50	56	
37.5	48	
28	46	
20	42	SAND
14	39	
10	37	
6.3	35	
5	34	SILT/CLAY
3.35	32	
2	31	
1.18	29	
0.6	27	
0.425	26	
0.3	23	
0.15	18	
0.063	12	
0.039	9	
0.028	8	
0.018	6	
0.011	4	
0.008	4	
0.004	3	
0.002	2	



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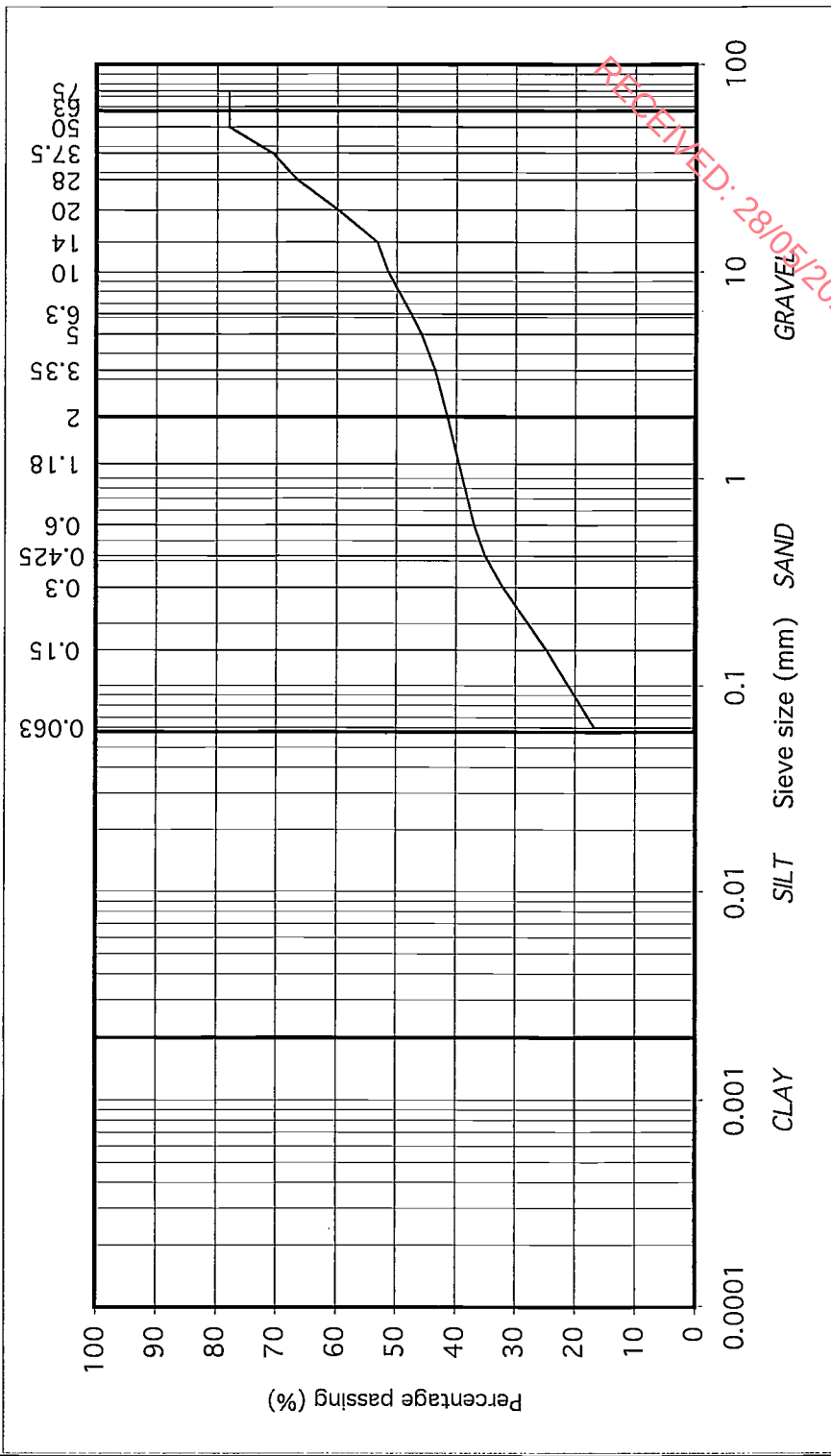
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PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No:	11654
Contract:	LIMERICK DEVELOPMENTS
BH/TP No:	BH 4
SAMPLE No.:	3974
DEPTH (m):	4.00
TEST METHOD:	Wet sieve
DESCRIPTION:	Light brown slightly sandy, gravelly, CLAY with many cobbles

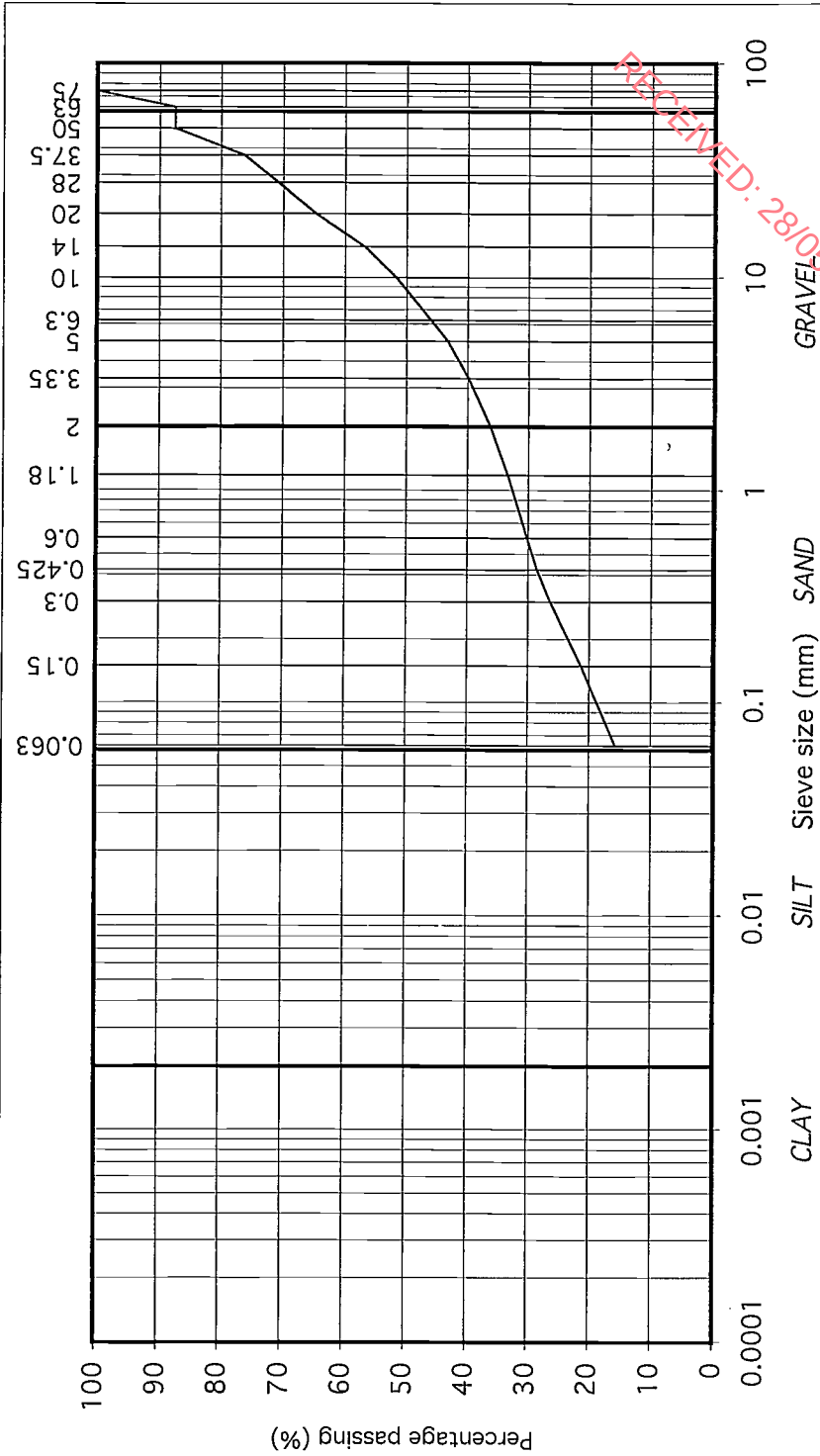


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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No: 11654
 Contract: LIMERICK DEVELOPMENT
 BH/TP No: BH 6
 SAMPLE No.: 2078
 DEPTH (m): 4.00
 TEST METHOD: Wet sieve
 DESCRIPTION: Brown grey slightly sandy, gravelly, SILT/CLAY with some cobbles



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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No:

11654

Contract:

LIMERICK DEVELOPMENTS

BH/TP No:

BH 7

SAMPLE No.:

3912

DEPTH (m):

4.00

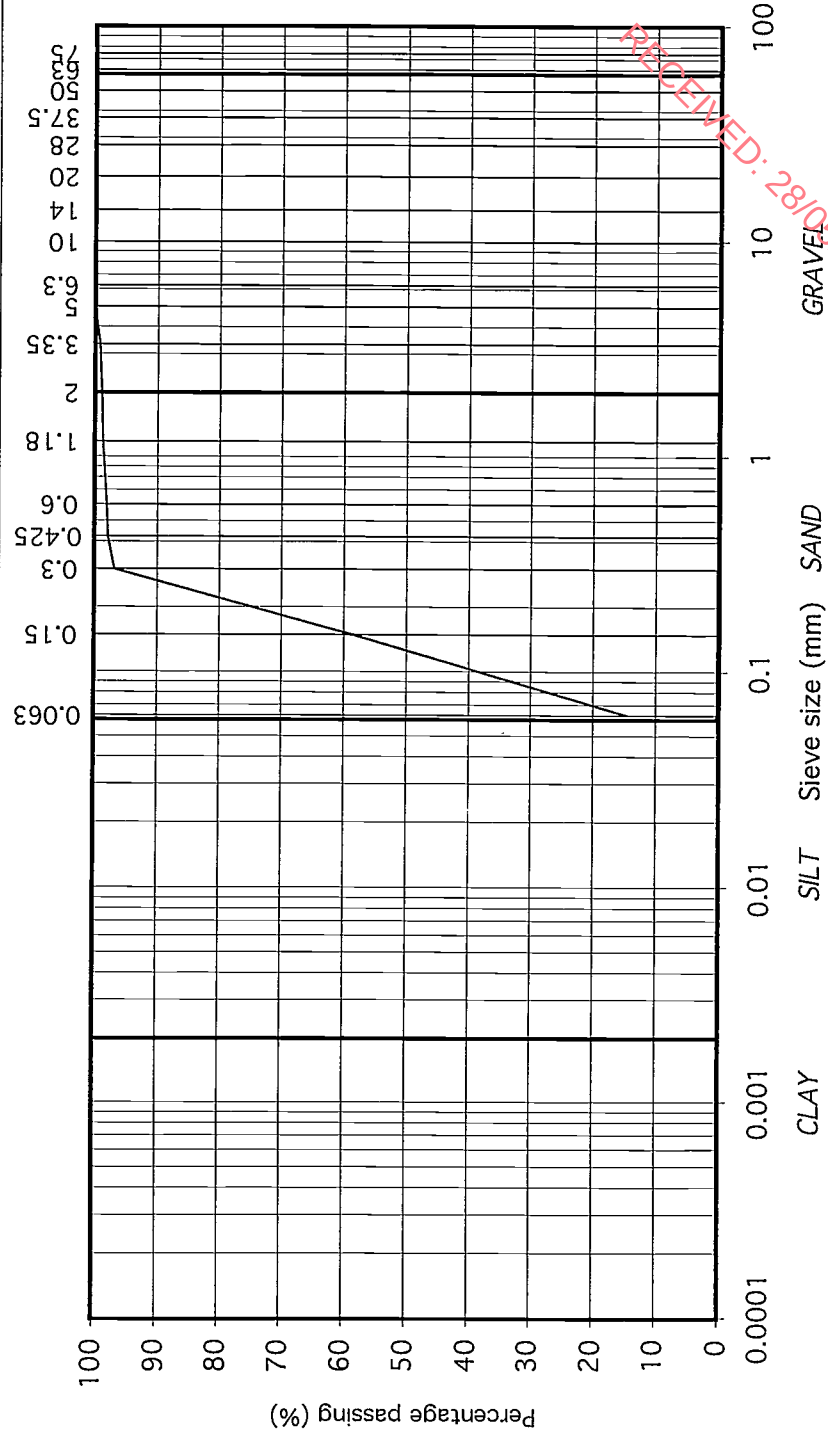
TEST METHOD:

Wet sieve

DESCRIPTION:

Orange brown clayey/silty, slightly gravelly, SAND

particle size	% passing	
75	100	COBBLES
63	100	GRAVEL
50	100	
37.5	100	
28	100	
20	100	GRAVEL
14	100	
10	100	
6.3	100	
5	100	GRAVEL
3.35	99	
2	99	
1.18	99	
0.6	98	SAND
0.425	98	
0.3	97	
0.15	59	
0.063	14	SILT/CLAY
0.041	#N/A	
0.029	#N/A	
0.018	#N/A	
0.011	#N/A	
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	



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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No:

11654

Contract:

LIMERICK DEVELOPMENTS

BH/TP No:

BH 7

SAMPLE No.:

3915

DEPTH (m):

7.00

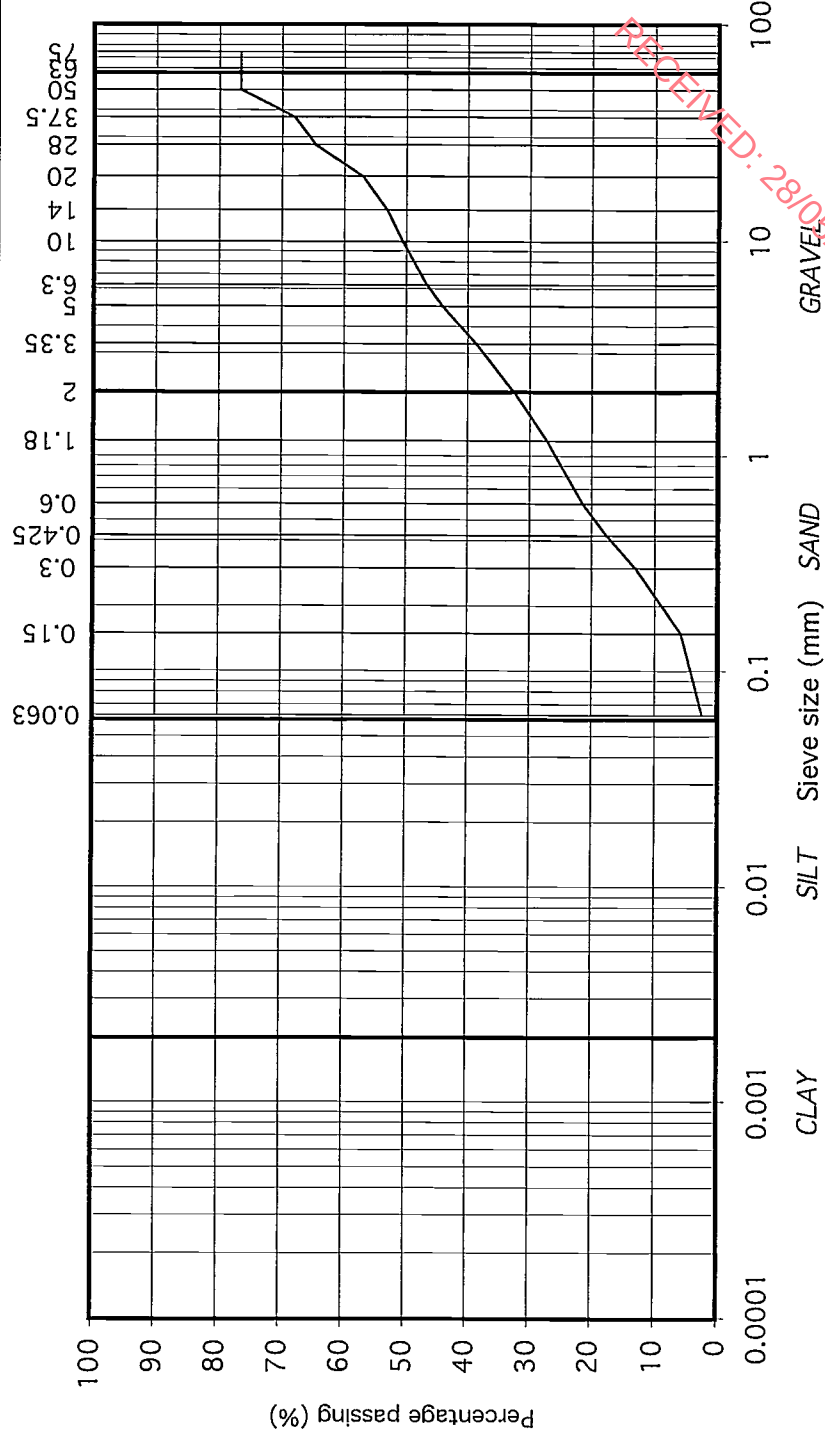
TEST METHOD:

Wet sieve

DESCRIPTION:

Brown slightly clayey/silty, very sandy, GRAVEL with many cobbles

particle size	% passing	
75	77	COBBLES
63	77	GRAVEL
50	77	
37.5	68	
28	65	
20	57	GRAVEL
14	53	
10	50	
6.3	47	
5	44	GRAVEL
3.35	39	
2	32	
1.18	27	
0.6	21	SAND
0.425	18	
0.3	13	
0.15	6	
0.063	2	SILT/CLAY
0.041	#N/A	
0.029	#N/A	
0.018	#N/A	
0.011	#N/A	
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	



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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No:

11654

Contract:

LIMERICK DEVELOPMENT

BH/TP No:

BH 9

SAMPLE No.:

2084

DEPTH (m):

3.00

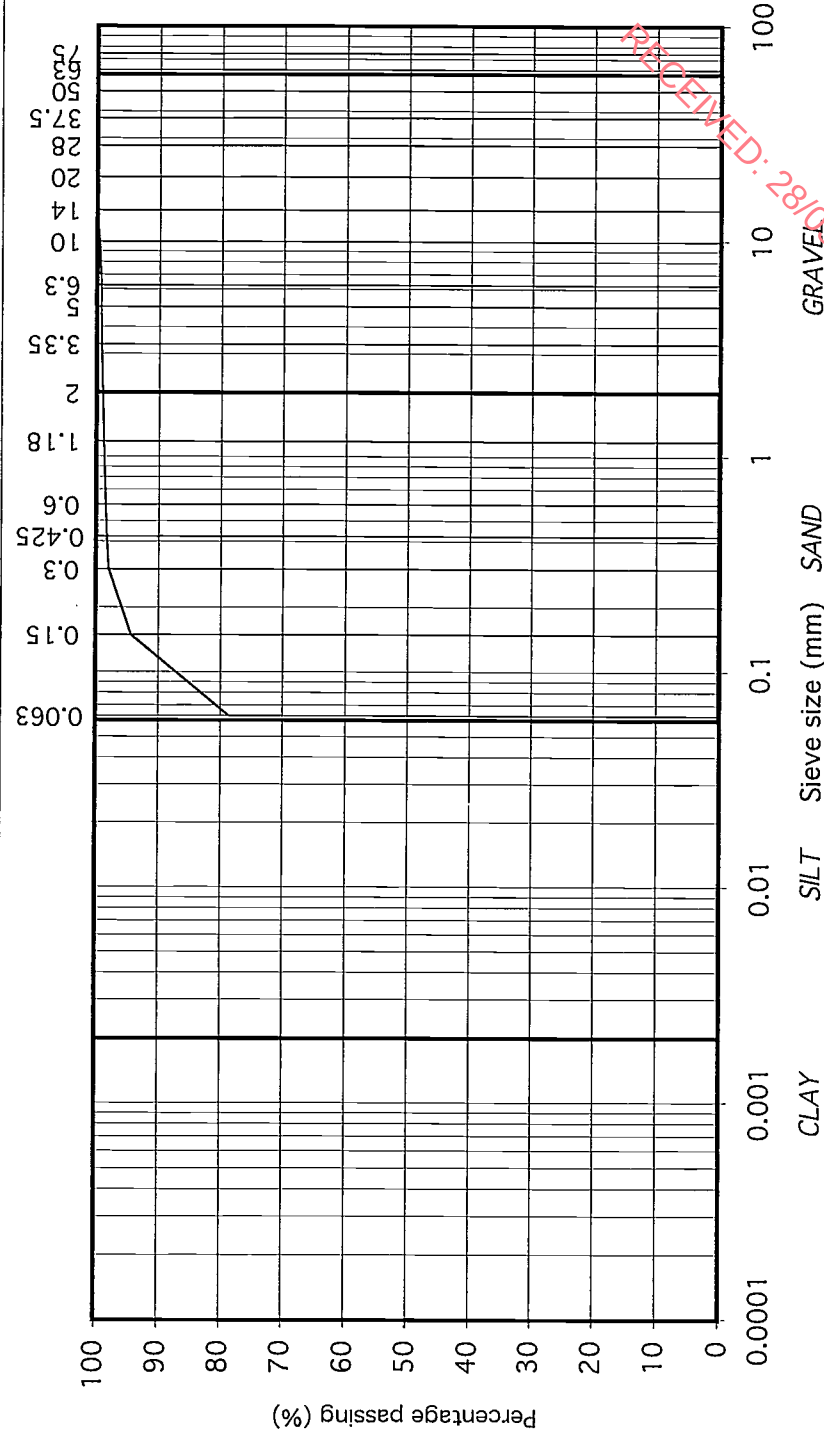
TEST METHOD:

Wet sieve

DESCRIPTION:

Purplish grey slightly sandy, slightly gravelly, SILT/CLAY

particle size	% passing	
75	100	COBBLES
63	100	GRAVEL
50	100	
37.5	100	
28	100	
20	100	SAND
14	100	
10	100	
6.3	99	
5	99	SILT/CLAY
3.35	99	
2	99	
1.18	99	
0.6	98	
0.425	98	
0.3	98	
0.15	94	
0.063	79	
0.041	#N/A	
0.029	#N/A	
0.018	#N/A	
0.011	#N/A	
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	



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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No: 11654

Contract: LIMERICK DEVELOPMENTS

BH/TP No: BH 10

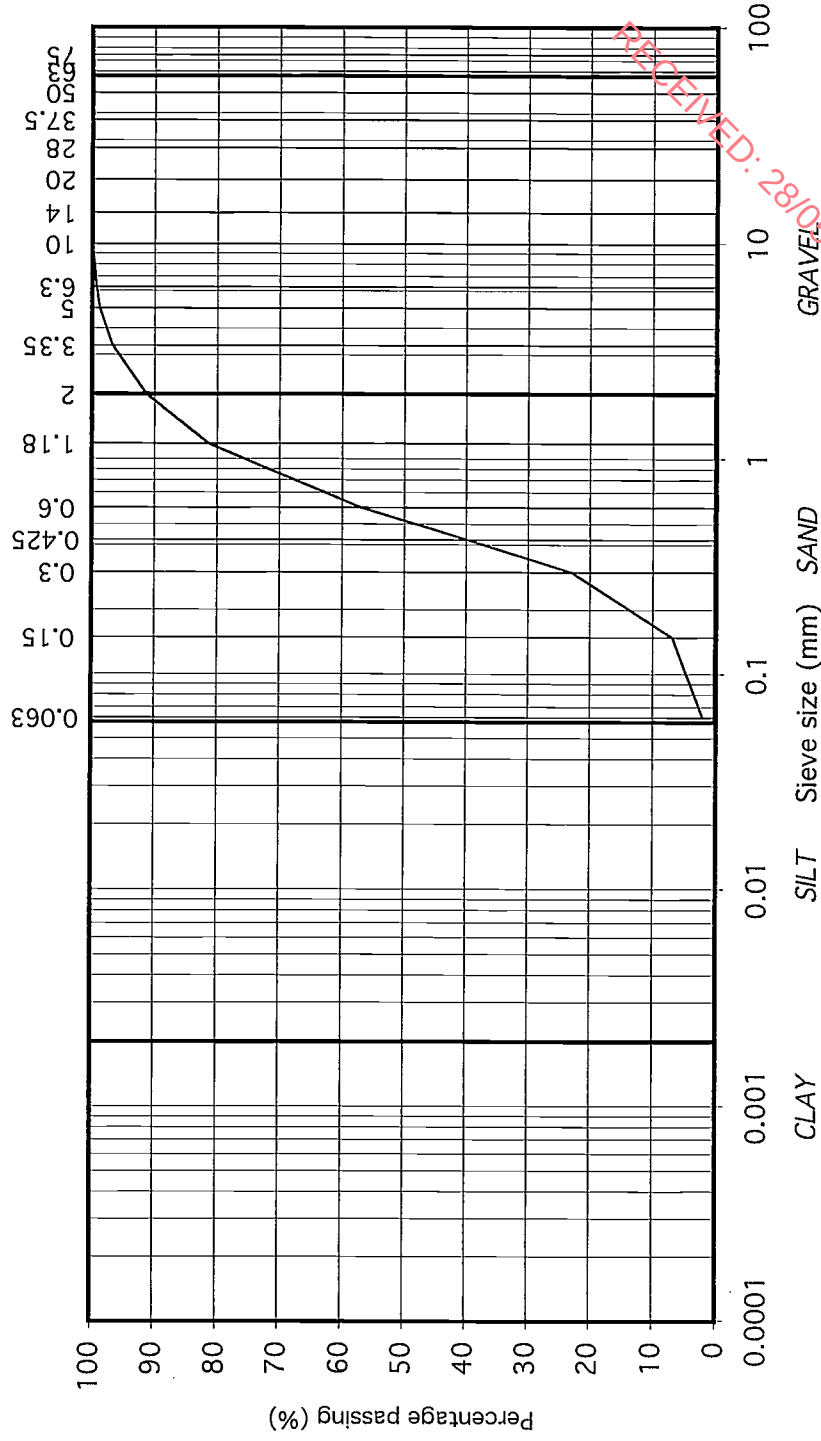
SAMPLE No.: 3919

DEPTH (m): 2.00

TEST METHOD: Wet sieve

DESCRIPTION: Orange brown slightly silty, gravelly, SAND

particle size	% passing	
75	100	COBBLES
63	100	GRAVEL
50	100	
37.5	100	
28	100	
20	100	GRAVEL
14	100	
10	100	
6.3	99	
5	99	SAND
3.35	97	
2	91	
1.18	81	
0.6	57	SILT/CLAY
0.425	40	
0.3	23	
0.15	7	
0.063	2	
0.041	#N/A	
0.029	#N/A	
0.018	#N/A	
0.011	#N/A	
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	



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PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No:

11654

Contract:

LIMERICK DEVELOPMENTS

BH/TP No:

BH 10

SAMPLE No.:

3925

DEPTH (m):

8.00

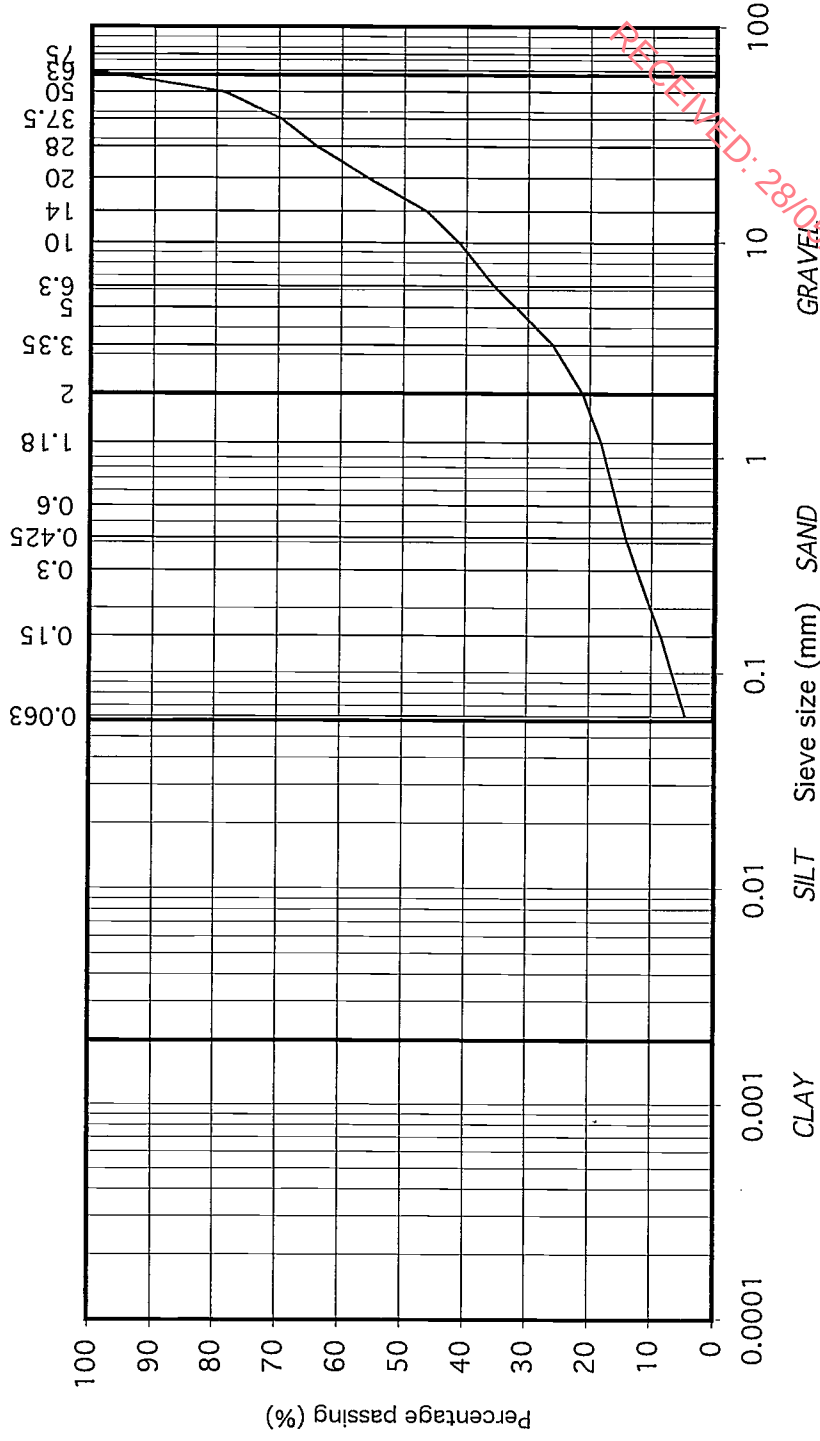
TEST METHOD:

Wet sieve

DESCRIPTION:

Brown slightly clayey, sandy, GRAVEL

particle size	% passing	
75	100	COBBLES
63	100	GRAVEL
50	79	
37.5	70	
28	64	
20	56	SAND
14	46	
10	41	
6.3	36	
5	32	SILT/CLAY
3.35	26	
2	21	
1.18	18	
0.6	15	
0.425	14	
0.3	12	
0.15	8	
0.063	5	
0.041	#N/A	
0.029	#N/A	
0.018	#N/A	
0.011	#N/A	
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	



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PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No: 11654

Contract: LIMERICK DEVELOPMENTS

BH/TP No: BH 11

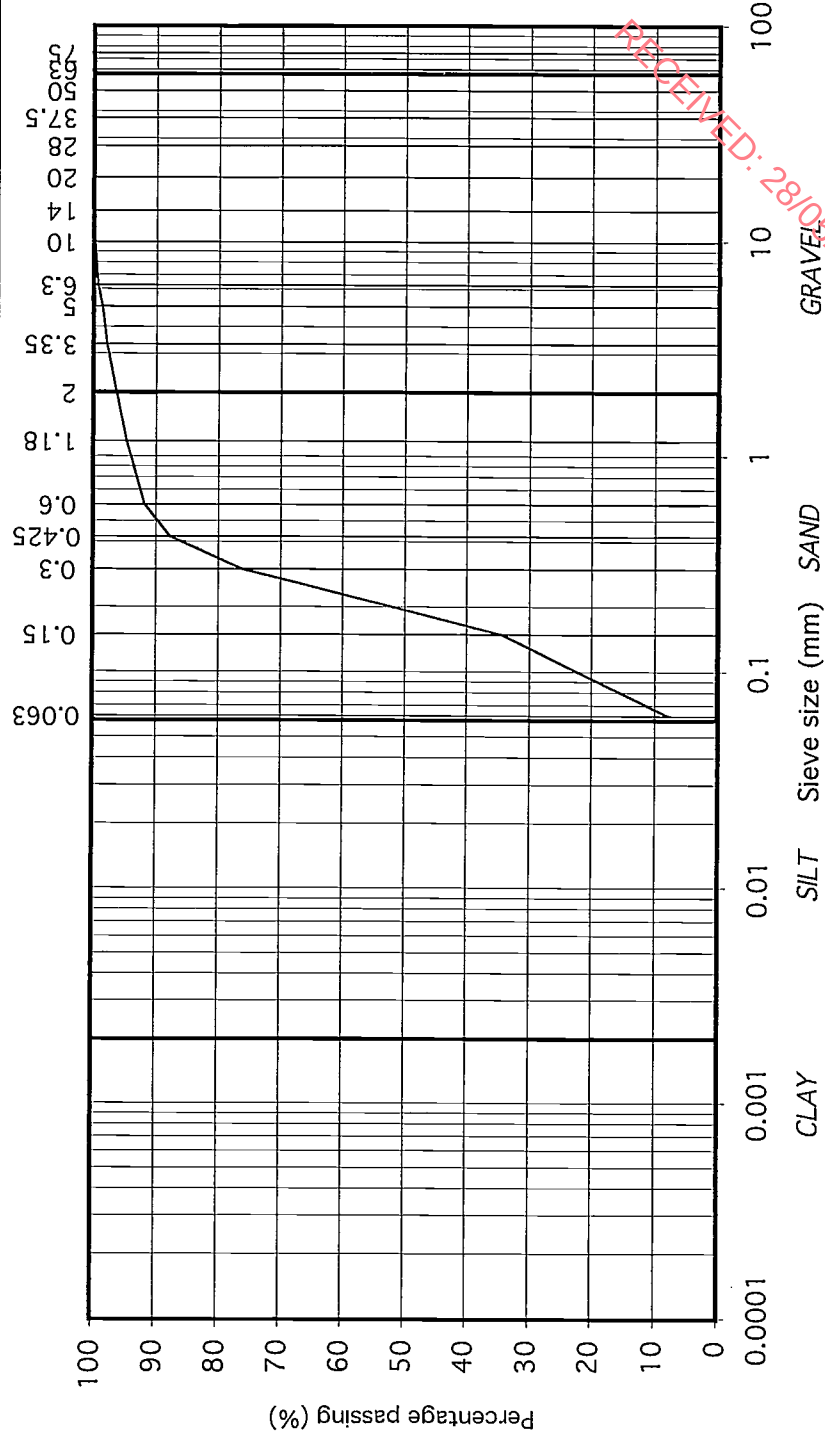
SAMPLE No.: 3946

DEPTH (m): 4.00

TEST METHOD: Wet sieve

DESCRIPTION: Orange brown clayey/silty, slightly gravelly, SAND

particle size	% passing	
75	100	COBBLES
63	100	GRAVEL
50	100	
37.5	100	
28	100	
20	100	GRAVEL
14	100	
10	100	
6.3	99	
5	99	SAND
3.35	98	
2	96	
1.18	95	
0.6	92	SILT/CLAY
0.425	88	
0.3	76	
0.15	34	
0.063	8	
0.041	#N/A	
0.029	#N/A	
0.018	#N/A	
0.011	#N/A	
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	



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20/4/06

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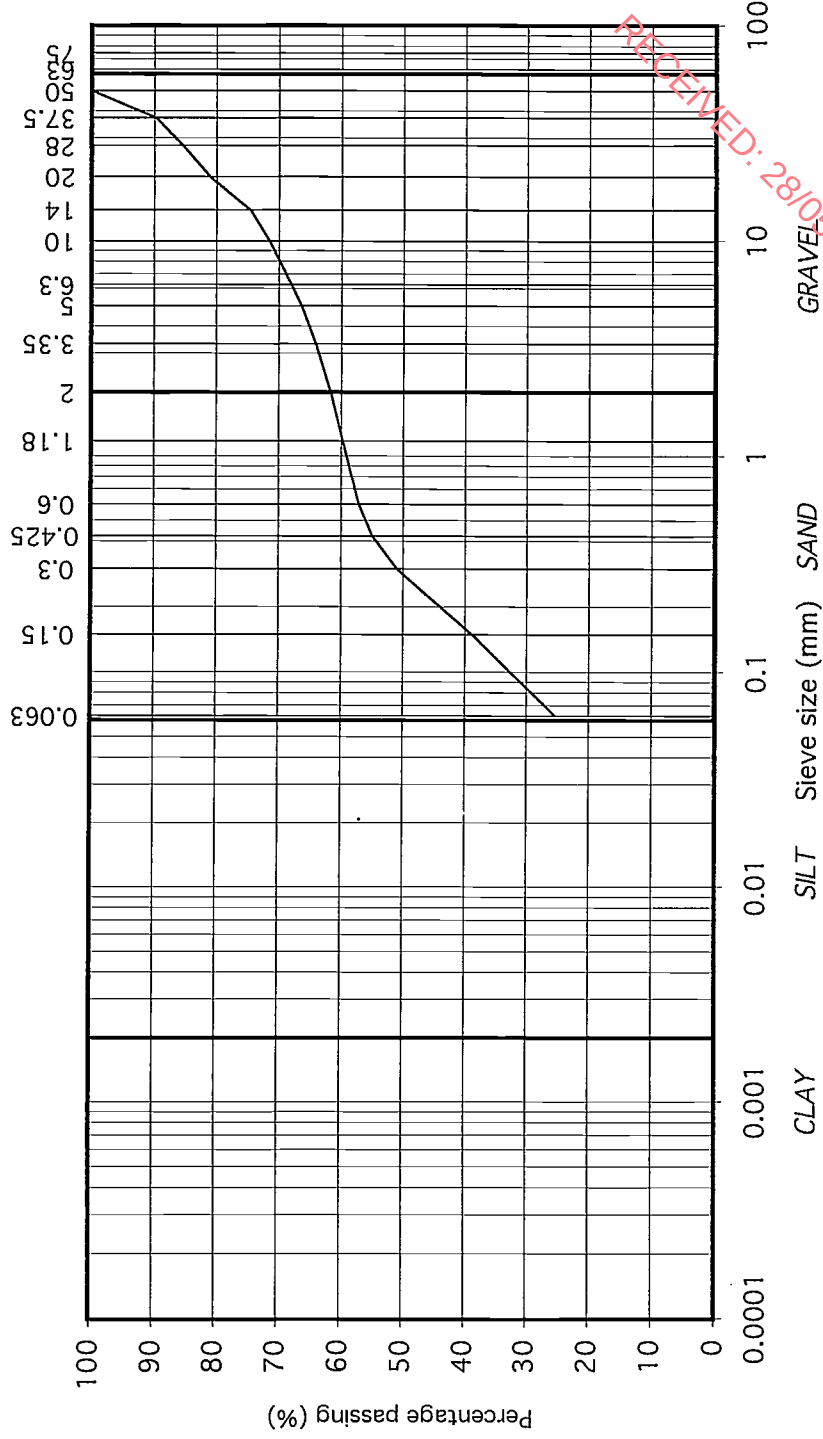
IGSL

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No: 11654
 Contract: LIMERICK DEVELOPMENTS
 BH/TP No: BH 11
 SAMPLE No.: 3950
 DEPTH (m): 8.00
 TEST METHOD: Wet sieve
 DESCRIPTION: Brown very clayey/silty, very sandy, GRAVEL

particle size	% passing	
75	100	COBBLES
63	100	GRAVEL
50	100	
37.5	90	
28	85	
20	81	SAND
14	75	
10	71	
6.3	68	
5	66	SILT/CLAY
3.35	64	
2	62	
1.18	60	
0.6	57	
0.425	55	
0.3	51	
0.15	39	
0.063	25	
0.041	#N/A	
0.029	#N/A	
0.018	#N/A	
0.011	#N/A	
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	



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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No:

11654

Contract: LIMERICK DEVELOPMENT

BH/TP No: BH 12

SAMPLE No.: 617

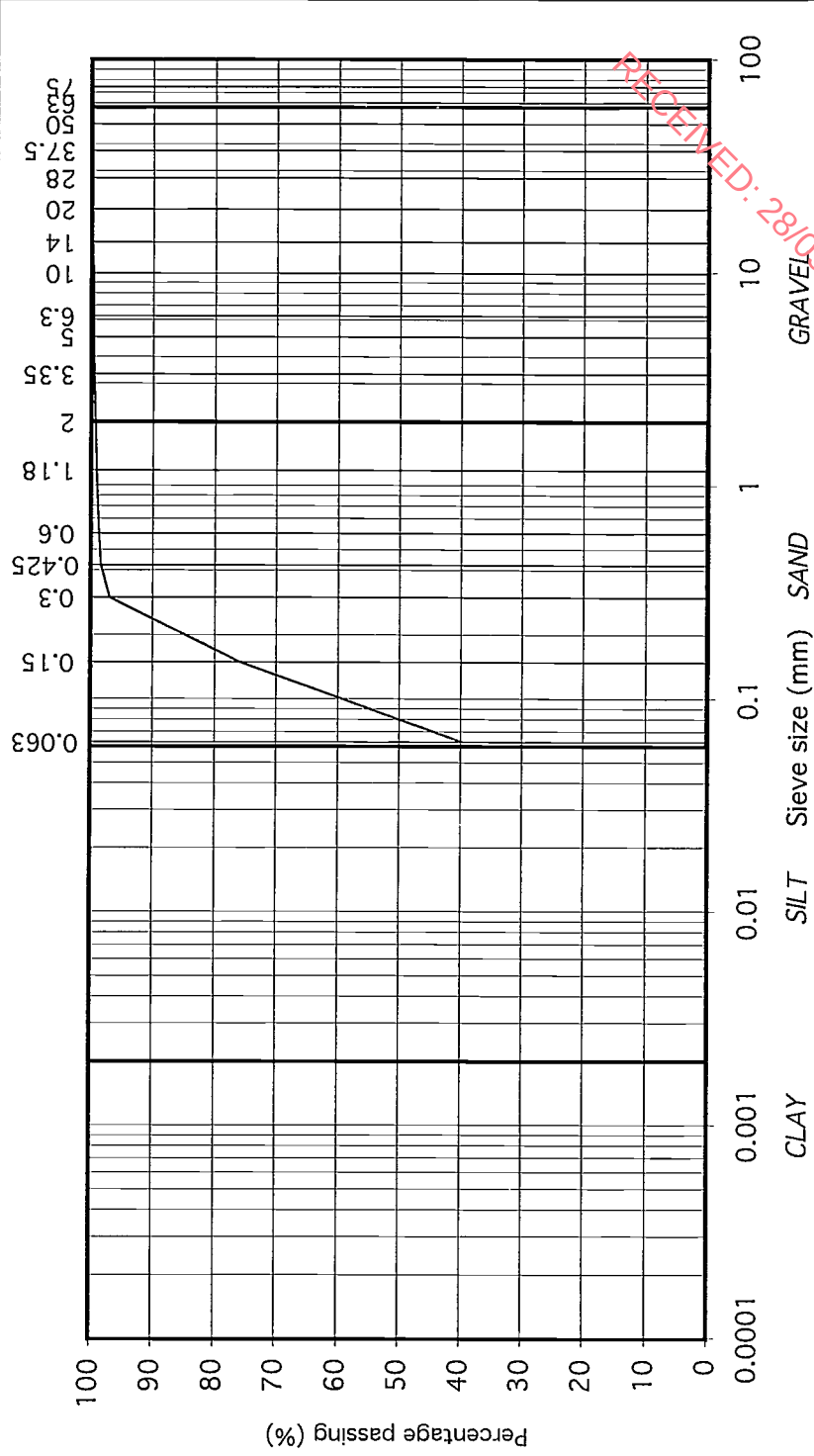
DEPTH (m): 4.00

TEST METHOD: Wet sieve

DESCRIPTION: Grey sandy, slightly gravelly, SILT/CLAY

particle size

75	100	COBBLES
63	100	GRAVEL
50	100	
37.5	100	
28	100	
20	100	GRAVEL
14	100	
10	100	
6.3	100	
5	100	GRAVEL
3.35	99	
2	99	
1.18	99	
0.6	99	SAND
0.425	98	
0.3	97	
0.15	76	
0.063	40	SILT/CLAY
0.041	#N/A	
0.029	#N/A	
0.018	#N/A	
0.011	#N/A	
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	



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PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No:

11654

Contract:

LIMERICK DEVELOPMENT

BH/TP No:

BH 12

SAMPLE No.:

619

DEPTH (m):

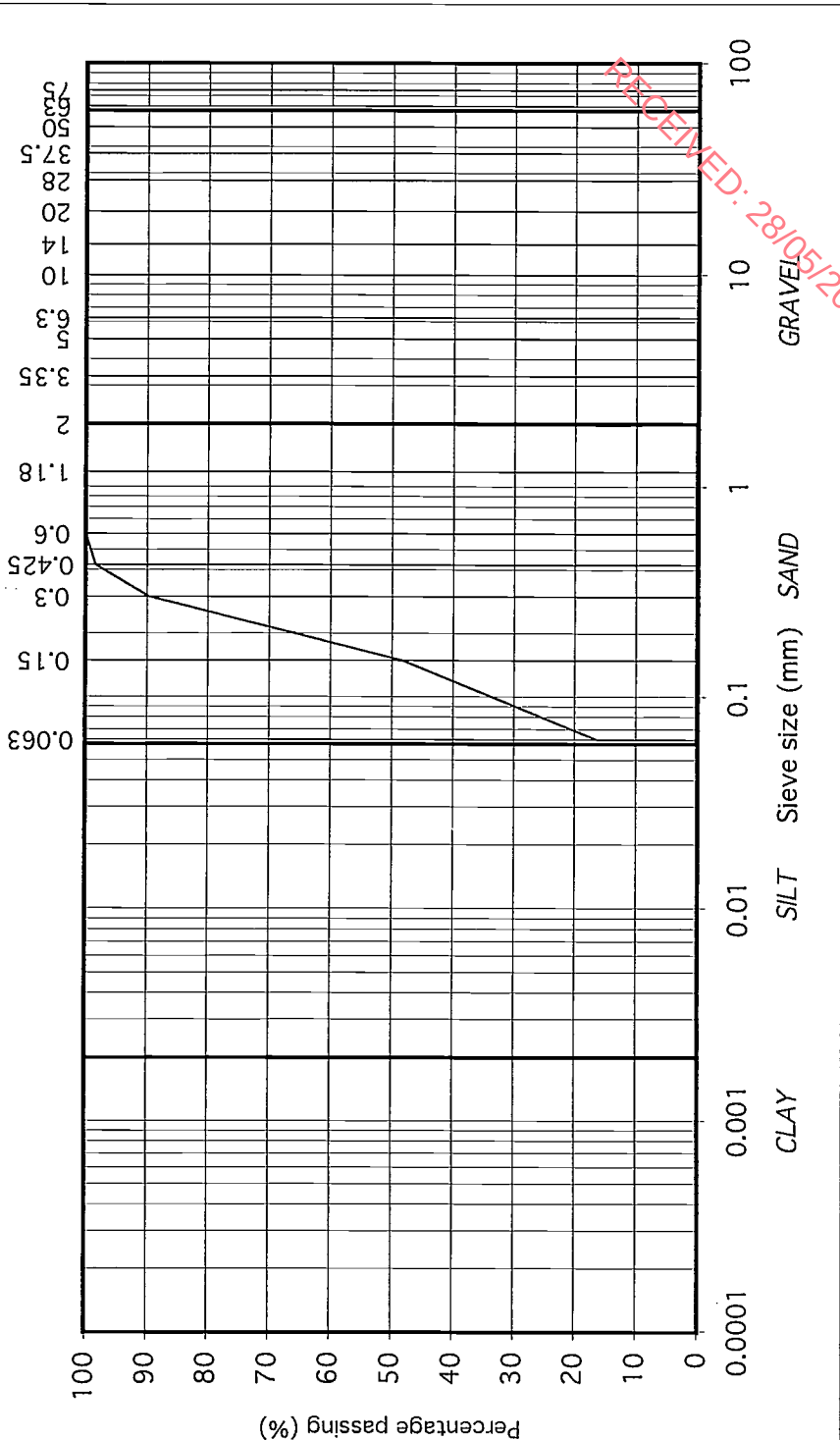
6.00

TEST METHOD:

Wet sieve

DESCRIPTION:

Grey brown very sandy, SILT/CLAY



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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No:

11654

Contract:

LIMERICK DEVELOPMENT

BH/TP No:

BH 12

SAMPLE No.:

621

DEPTH (m):

8.00

TEST METHOD:

Wet sieve

DESCRIPTION:

Brown sandy, slightly gravelly, SILT/CLAY

%

passing

COBBLES

75 100

63 100

50 87

37.5 87

28 87

20 83

14 83

10 83

6.3 83

5 83

3.35 83

2 83

1.18 83

0.6 82

0.425 80

0.3 73

0.15 43

0.063 19

0.041 #N/A

0.029 #N/A

0.018 #N/A

0.011 #N/A

0.008 #N/A

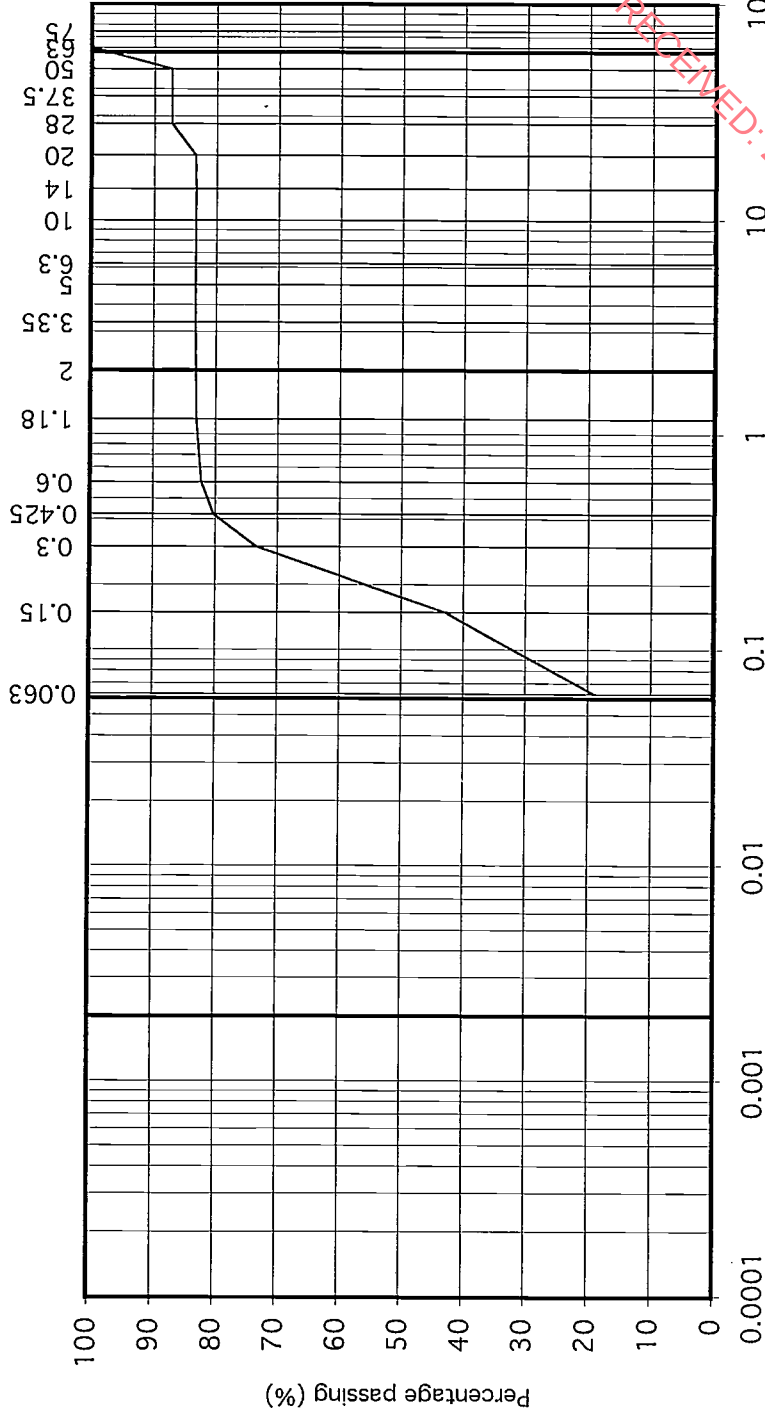
0.004 #N/A

0.002 #N/A

GRAVEL

SAND

SILT/CLAY



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PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No:

11654

Contract:

LIMERICK DEVELOPMENTS

BH/TP No:

BH 13

SAMPLE No.:

3936

DEPTH (m):

9.00

TEST METHOD:

Wet sieve

DESCRIPTION:

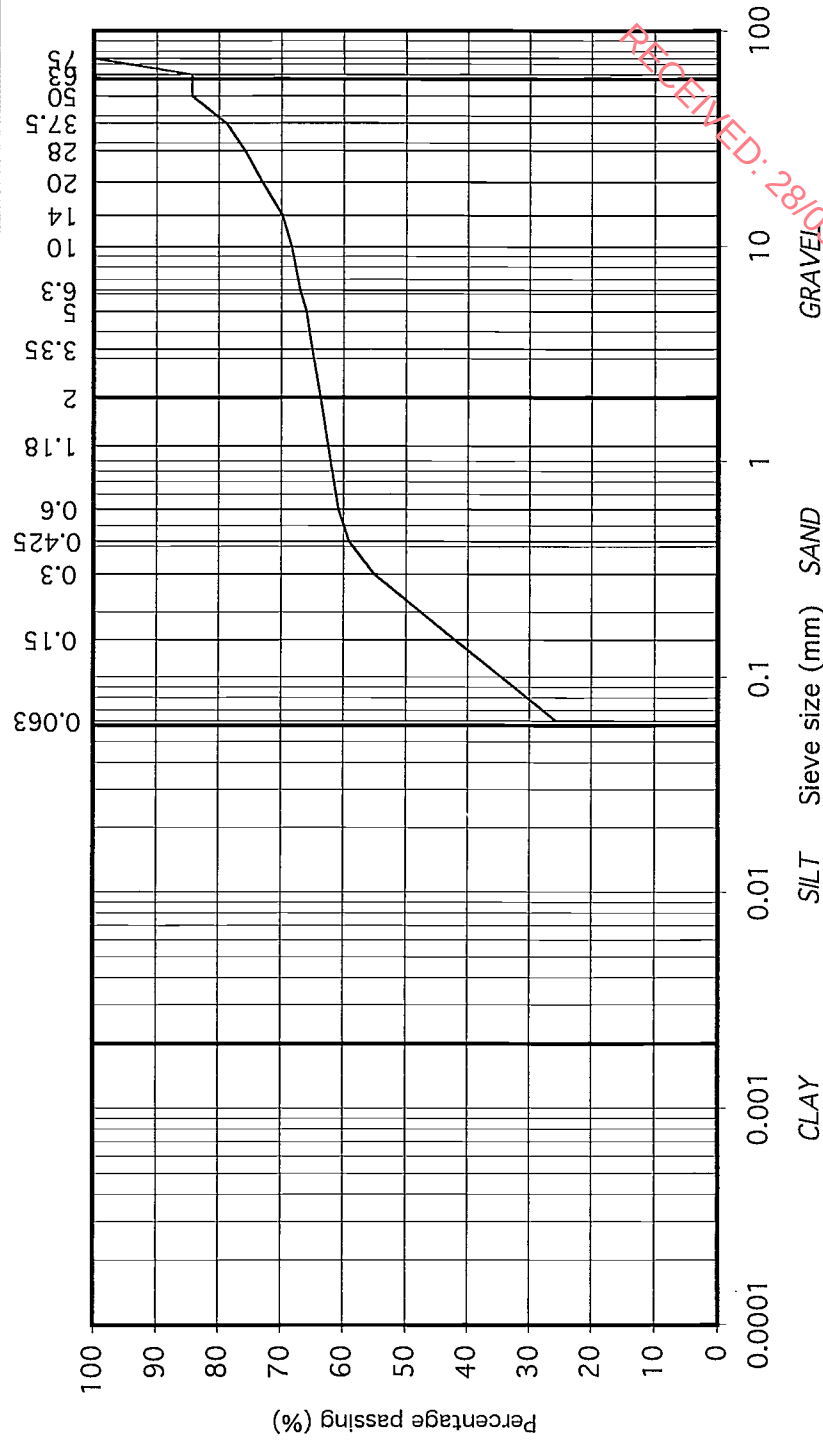
Brown very clayey/silty, very gravelly, SAND with some cobbles

particle size	% passing	
75	100	COBBLES
63	84	GRAVEL
50	84	
37.5	79	
28	76	
20	73	SAND
14	70	
10	68	
6.3	67	
5	66	SILT/CLAY
3.35	65	
2	64	
1.18	62	
0.6	61	
0.425	59	
0.3	55	
0.15	42	
0.063	26	
0.041	#N/A	
0.029	#N/A	
0.018	#N/A	
0.011	#N/A	
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	

GRAVEL

SAND

SILT/CLAY



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Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No:

11654

Contract:

LIMERICK DEVELOPMENT

BH/TP No:

BH E1

SAMPLE No.:

4000

DEPTH (m):

3.00

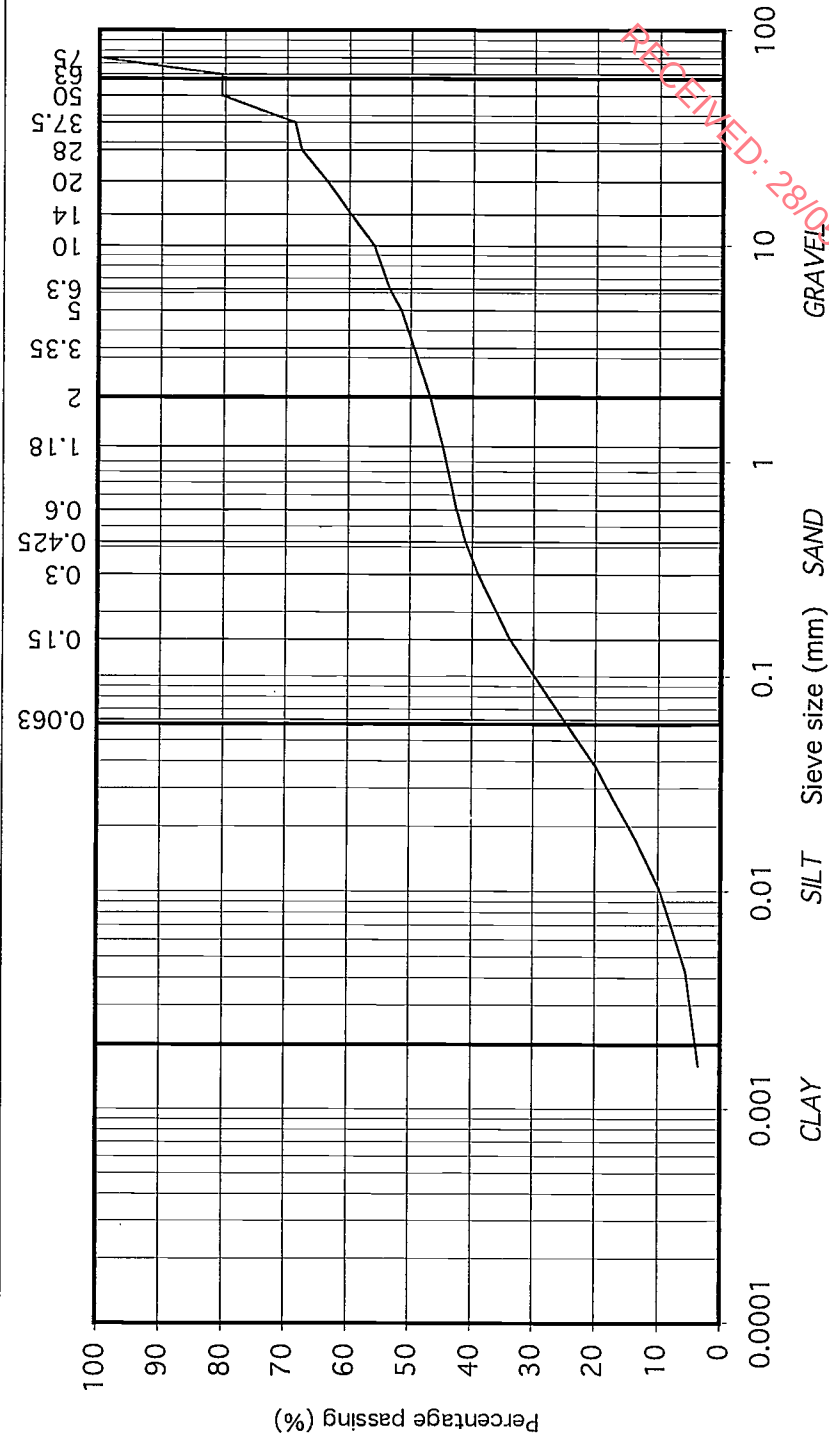
TEST METHOD:

Wet sieve and hydrometer

DESCRIPTION:

Brown slightly sandy, gravelly, CLAY with some cobbles

particle size	% passing	
75	100	COBBLES
63	80	GRAVEL
50	80	
37.5	69	
28	68	
20	63	SAND
14	60	
10	56	
6.3	53	
5	51	SILT/CLAY
3.35	49	
2	47	
1.18	45	
0.6	42	
0.425	41	
0.3	39	
0.15	34	
0.063	25	
0.038	20	
0.027	17	
0.017	13	
0.010	10	
0.007	8	
0.004	5	
0.002	3	



Compiled by:

Date:

Checked by:

Page no:

D CONNOLLY

16/5/06

IGSL

IGSL LIMITED, UNIT F, M7 BUSINESS PARK, NAAS, CO.KILDARE.

PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990, clauses 9.2

Contract No:

11654

Contract:

LIMERICK DEVELOPMENTS

BH/TP No:

BH E6

SAMPLE No.:

3956

DEPTH (m):

4.00

TEST METHOD:

Wet sieve

DESCRIPTION:

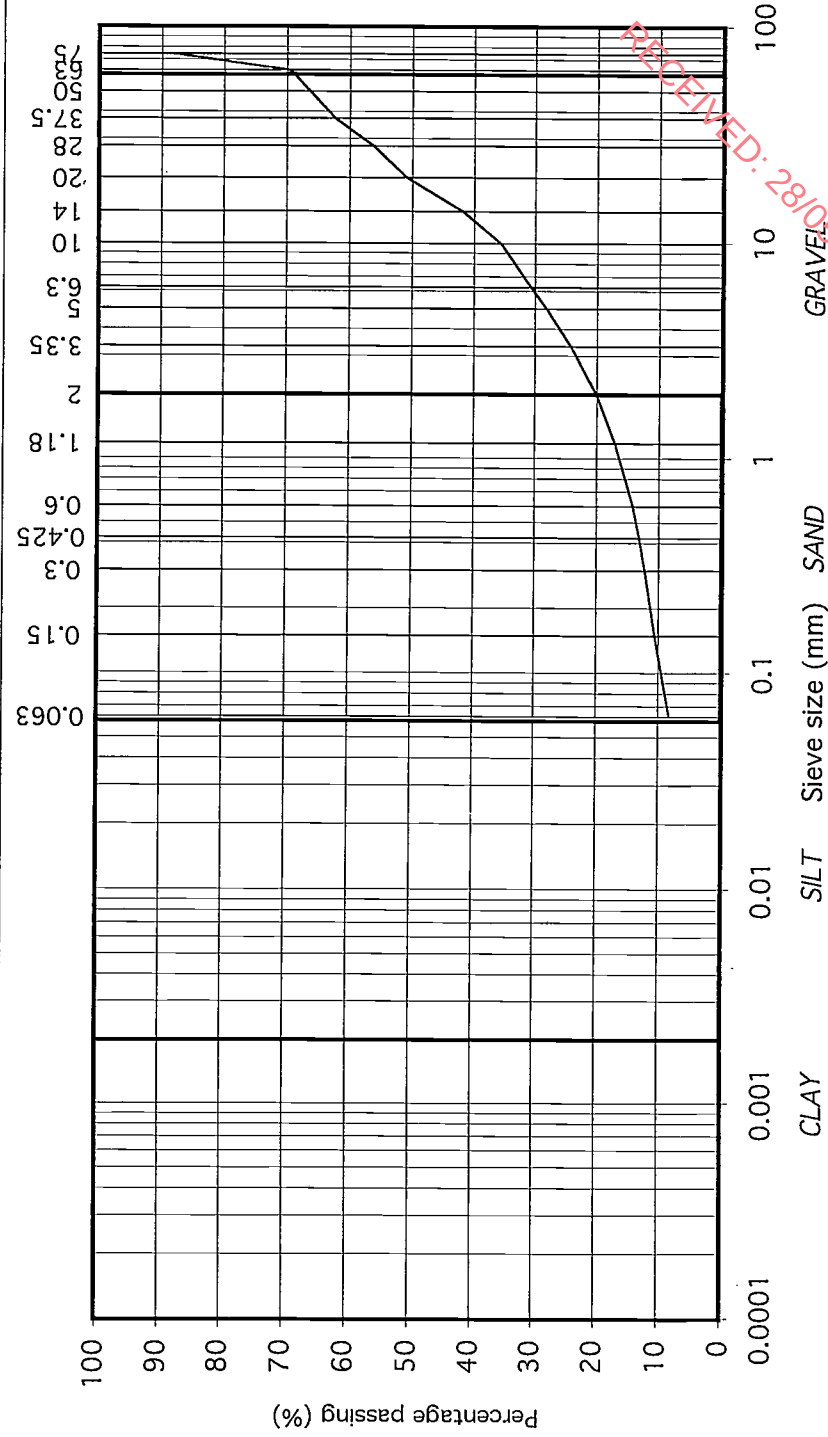
Grey clayey/silty, sandy, GRAVEL with many cobbles

particle size	% passing	
75	88	COBBLES
63	69	GRAVEL
50	66	
37.5	62	
28	56	
20	51	SAND
14	42	
10	36	
6.3	31	
5	28	SILT/CLAY
3.35	24	
2	20	
1.18	17	
0.6	14	
0.425	13	
0.3	12	
0.15	10	
0.063	8	
0.041	#N/A	
0.029	#N/A	
0.018	#N/A	
0.011	#N/A	
0.008	#N/A	
0.004	#N/A	
0.002	#N/A	

GRAVEL

SAND

SILT/CLAY



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Date:

20/4/06

Checked by:

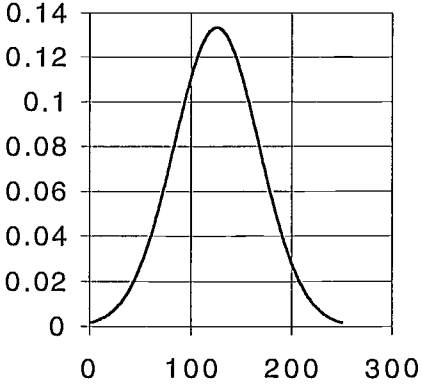
Date:

Page no:

IGSL

IGSL LIMITED, UNIT F, M7 BUSINESS PARK, NAAS, CO.KILDARE.

PSD V3.1 12.01

POINT LOAD DATA SHEET							IGSL
Contract: Parkway Limerick				Contract No. 11654			
DH No.	Depth m	D mm	P kN	F	Is MPa	Is(50) MPa	*UCS MPa
RC2	10.20	78	34.0	1.222	5.59	6.83	137
	12.50	78	35.0	1.222	5.75	7.03	141
RC3	5.40	82	40.0	1.249	5.95	7.43	149
	8.10	82	33.0	1.249	4.91	6.13	123
RC4	6.90	82	1.0	1.249	0.15	0.19	4
	8.60	82	42.0	1.249	6.25	7.80	156
RC5	74.00	82	38.0	1.249	5.65	7.06	141
	5.30	82	47.0	1.249	6.99	8.73	175
RC6	12.70	82	29.0	1.249	4.31	5.39	108
	14.60	82	26.0	1.249	3.87	4.83	97
RC7	7.80	82	45.0	1.249	6.69	8.36	167
	10.00	82	29.0	1.249	4.31	5.39	108
RC8	9.80	82	32.0	1.249	4.76	5.95	119
	7.30	82	38.0	1.249	5.65	7.06	141
Statistical Summary Data			Is(50)	UCS*	*UCS Normal Distribution Curve		
Number of Samples Tested			14	14	0.14		
Minimum			0.19	4	0.12		
Average			6.30	126	0.1		
Maximum			8.73	175	0.08		
Standard Dev.			2.09	42	0.06		
Upper 95% Confidence Limit			10.40	208.07	0.04		
Lower 95% Confidence Limit			2.19	43.86	0.02		
Comments:							
*UCS taken as k x Point Load Is(50):			k= 20				

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Appendix IV – Site Plan

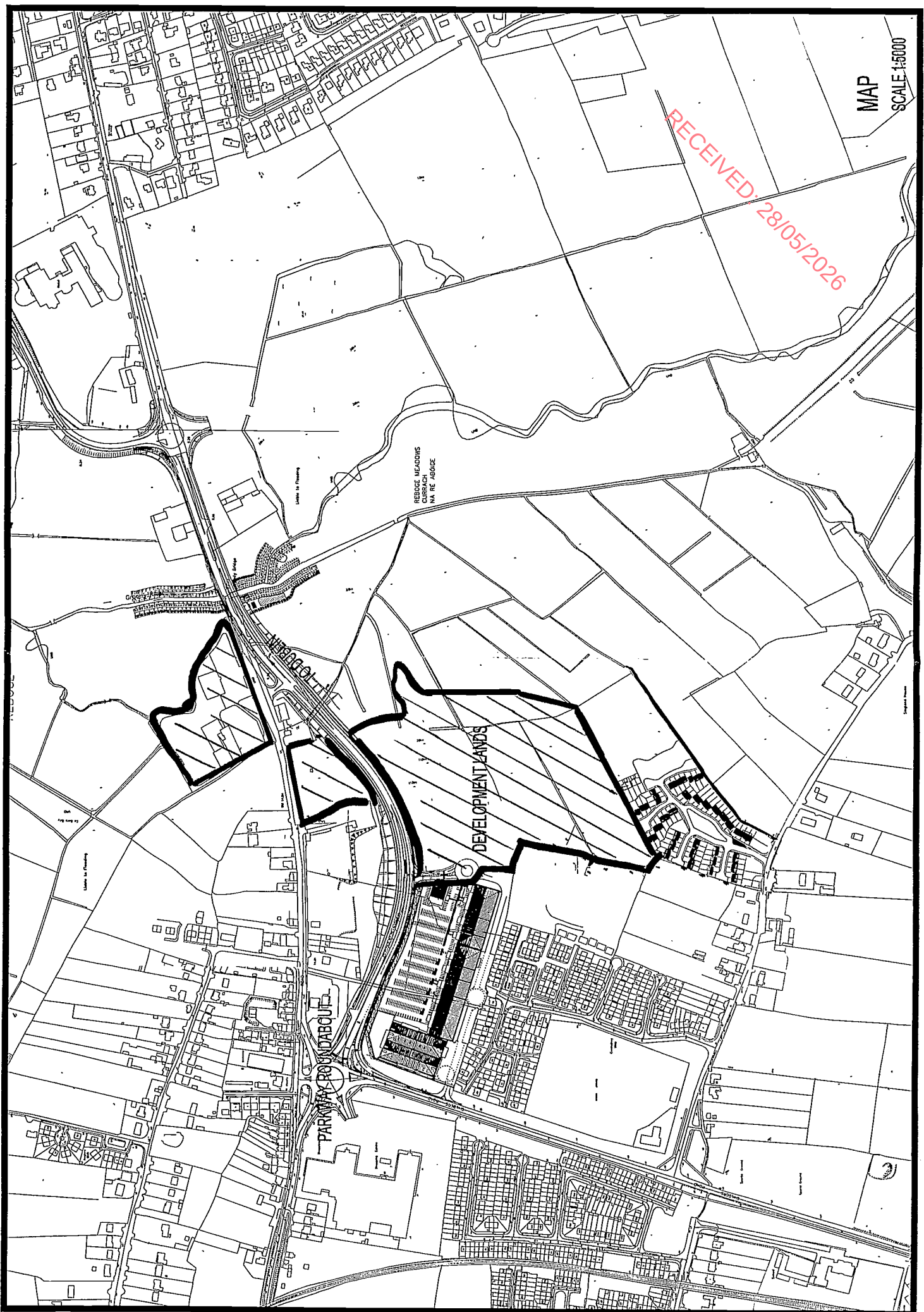
MAP
SCALE 1:5000

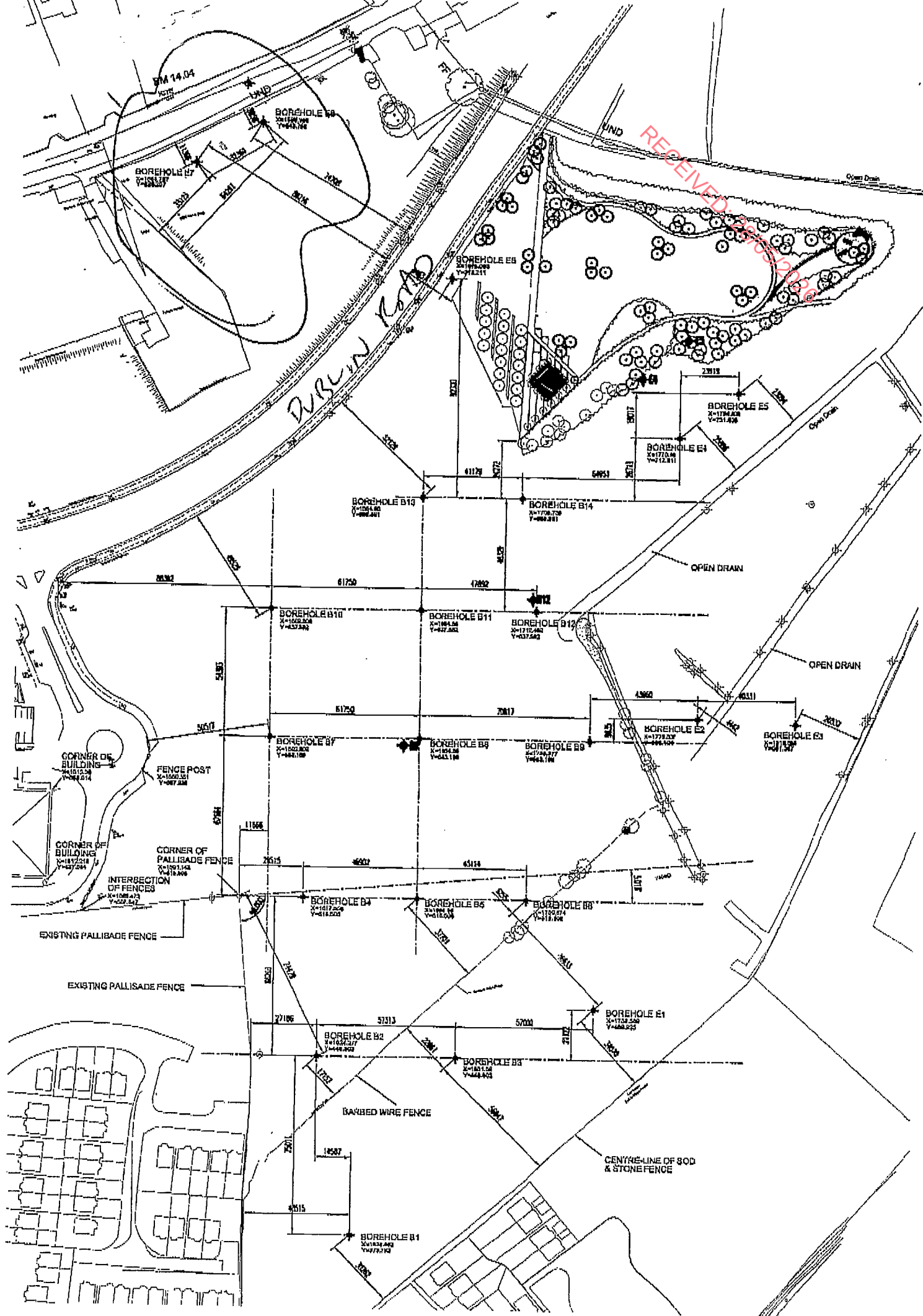
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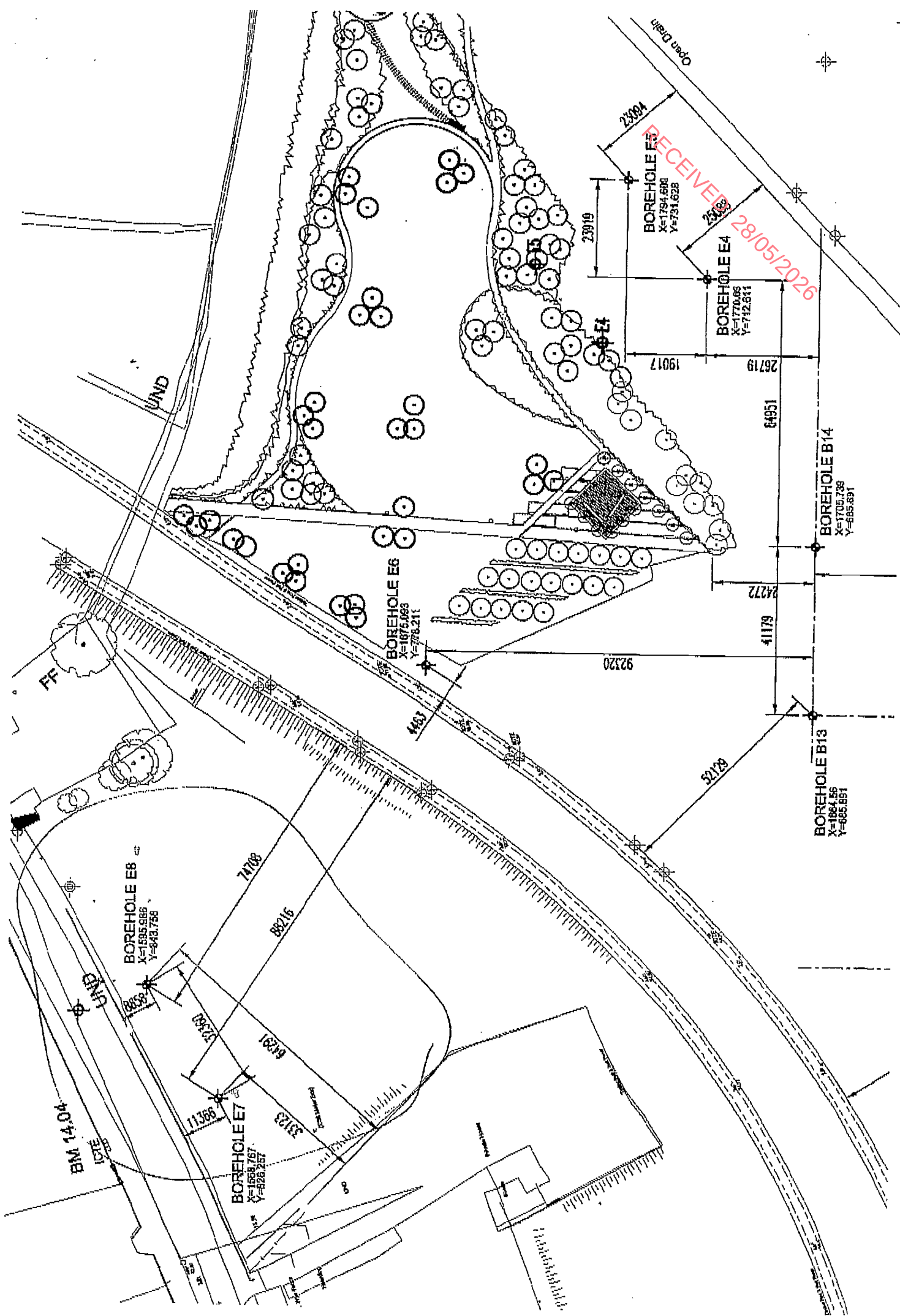
REDGE MEADOWS
CURRACH
NA RE ADGUE

DEVELOPMENT LANDS

PARKWAY ROUNDABOUT







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XX

X

XX

Report No. 2380

Box No. 155

Investigation ID 85774 - 85777

(4)

RECEIVED: 28/05/2026

**N 7 Road Improvements
Ground Investigation Report**

**August 1994
Limerick County Council
Road Design Office**

RECEIVED: 28/05/2026

SITE INVESTIGATION
FOR
N7 ROAD IMPROVEMENTS, Co. LIMERICK

AUGUST 1994

LIMERICK COUNTY COUNCIL

IRISH GEOTECHNICAL SERVICES LIMITED

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1. Introduction

2. Fieldwork and Ground Conditions

3. Discussion and Recommendations

4. Appendices

Appendix 1

Appendix II

- Cable Percussion Borehole Records

- Site Plan and cross sections

1. INTRODUCTION

A preliminary site investigation has been carried out for the N7 road improvements from the Parkway Roundabout to Plassey Park Junction, Co. Limerick. It is understood that the scheme will comprise approx. 1km of new four lane carriageway with a bridge over the Groody River. This brief report presents the cable percussion borehole records and an interpretation of the ground conditions in relation to the proposed development.

Laboratory testing has not been carried out on the bulk disturbed samples obtained from the boreholes. The soil samples have been logged in accordance with BS 5930, Code of Practice for Site Investigations.

2. FIELDWORK AND GROUND CONDITIONS

The fieldwork was undertaken during the period 30th May to 1st June 1994 and comprised four 200mm diameter cable percussion boreholes. Boreholes 1 and 2 were undertaken at the site of the proposed road, while Boreholes 3 and 4 were carried out at the site of the proposed bridge over the River Groody. The depth of the boreholes varied from 8.40m in Borehole 1 to a maximum of 16.30m in Borehole 4.

Bulk disturbed samples and Standard Penetration Tests (SPT's) were taken at each change of strata and at 1.50m intervals. The geotechnical descriptions of the sub-soils encountered, samples obtained and groundwater strikes are presented in Appendix I. No standpipes or standpipe piezometers were installed in the boreholes.

Boreholes 1 and 2 encountered a sequence of predominantly loose to medium dense silty gravelly sands with subordinate gravelly clays. The SPT N-Values show an increase in density with depth with N-Values of the order of 26 to 31 from approx. seven metres below existing ground level.

Borehole 1 advanced to 8.40m bgl with refusal in a dense gravel with fragments of fractured limestone recovered, this may represent the underlying bedrock. Borehole 2 encountered a considerable thickness of sandy silt, silty gravelly sand and sandy silts. The sub-soil conditions outlined above in Boreholes 1 and 2 appear to represent a normally consolidated estuarine or lacustrine deposit. Groundwater was encountered in Boreholes 1 and 2 at depths of between 2.00 and 6.90m bgl.

Boreholes 3 and 4 encountered a mixed sequence of silty sands, sandy gravels and some sandy silt. As outlined above, the SPT N-Values are again generally consistent, increasing with depth with values ranging from 6 to 58. In the case of Borehole 4, a horizon of very loose silty sand was identified from approx. 4.20 to 6.50m bgl. This stratum appears to represent a 'running sand' with extremely low SPT N-Values of 1 and 2 recorded.

3. DISCUSSION AND RECOMMENDATIONS

The cable percussion boreholes show that the overburden soils at the site comprise a variable sequence of very loose to medium dense silty sands and gravels with subordinate silts and clays. The cross section in Appendix II shows a proposed cut from Chainage 540 to 780 with a maximum depth of 4.50 metres from existing ground level to formation level. An embankment of approx. 2 metres is also proposed from Chainage 200 to 500. Subsequently there are a number of geotechnical factors to be considered for both design and construction of the embankment and cutting. These include permeability, strength and consolidation of the in-situ soils and an assessment of their suitability for re-use as engineering fill.

Given the composition of the soils encountered in Boreholes 1 and 2, it is expected that their in-situ permeability will be high with values typically of the order of 10^{-4} to 10^{-5} m/s. Thus, control of groundwater will be critical to both the stability of the cut, temporary works (trenches or cofferdams) and traffickability during construction. Dewatering by pumping may be required prior to and during the construction phase.

As outlined previously, groundwater was encountered along the road section at depths of between 6.90 and 2.00m bgl, however it should be noted that groundwater may be at a higher elevation during winter months. Taking an average SPT N-Value of 16 for the silty sands a ϕ (ϕ) value (internal angle of friction) of 28 to 30° is considered appropriate. In many instances the temporary works sideslopes of excavations in silty sands can stand at steep angles, approaching sub-vertical. However, temporary slope angles for the road cut should not exceed 1 on 1.5 (33.7°).

Long term (effective stress conditions) slope angles of 1 on 2.5 (21.8°) are considered reasonable, however stability calculations for both temporary and long-term conditions should be carried out before finalizing safe slope angles as these are guidelines only. It is important that sensible estimates are made of the average pore pressure ratio (r_u) and the consequences of construction relating to pore pressures, effective stresses and volume changes.

Borehole 2 which is located at the proposed cut area encountered loose sandy silts underlain by loose to medium dense slightly silty sands with groundwater encountered at 2.00 and 4.70m bgl. A two metre high embankment will impose

loads of the order of 35 to 40 kN/m². The rates and magnitudes of settlement in the loose to medium dense silty sands should be calculated using appropriate M_v and C_v values. If possible, undisturbed samples should be obtained for laboratory consolidation tests to ascertain the above parameters. Most of the resulting settlement will be immediate elastic with a small proportion of long-term residual settlement.

Given the depth and consistency of the overburden soils and subsequent structural loads, it is likely that piling will be required for the bridge abutments. Either driven pre-cast concrete or bored piles could be used given the ground conditions, it is recommended that pre-cast piles driven to a refusal set would be more advantageous as difficulties with groundwater are likely to be encountered. For temporary works such as deep manholes or drainage ducting, sheet piles are recommended for the support of sidewall excavations.

It is recommended that additional cable percussion boreholes are undertaken along the road section with in-situ permeability testing carried out. Trial pits (4 to 5m bgl) with soakaway tests would also provide additional information on the permeability and stability of the silty sands and gravels. Standpipes and standpipe piezometers should be installed in the cable percussion boreholes to monitor groundwater levels and pore pressures. The standpipes could also be used to monitor groundwater levels and pore pressures both during and after construction.

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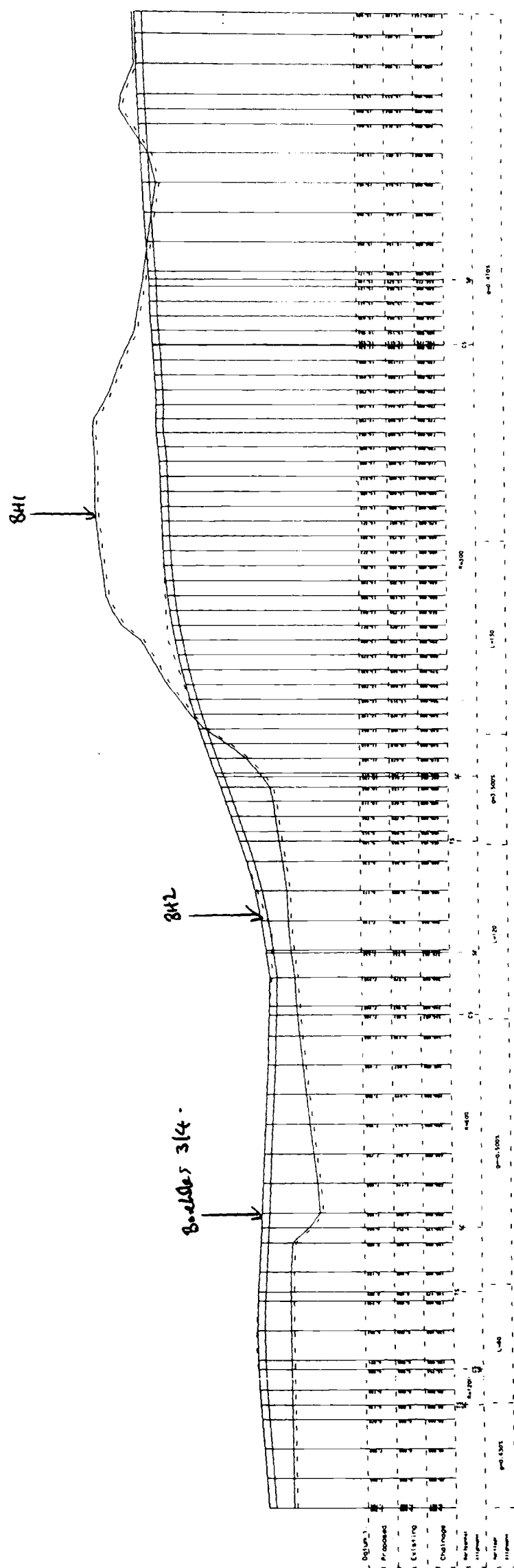
Appendix I

CABLE PERCUSSION BOREHOLE RECORDS

[illegible]

LEGEND
BH. BOREHOLE LOCATION





Vertical Alignment ch 3.000 to 1014.143
for the 12: Cway Centre Line

DO NOT SCALE

[illegible]

85774

REPORT NO. 2618		GEOTECHNICAL BORING RECORD				I.G.S.L.			
CONTRACT: PROPOSED ROAD AT GROODY					BOREHOLE NO.: 1				
					SHEET: 1 of 1				
CLIENT: LIMERICK CO.CO.		GROUND LEVEL (mOD)			DATE STARTED: 30.5.94				
		BOREHOLE DIAMETER (mm) 200			DATE COMPLETED: 31.05.94				
LOCATION: GROODY, LIMERICK		BOREHOLE DEPTH (m) 8.40			BORED BY: I.G.S.L.				
		CASING DEPTH (m) 8.40			LOGGED BY: I.G.S.L.				
DOWNHOLE DEPTH (m)	DESCRIPTION	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SAMPLES			FIELD TEST RESULTS	
					REFERENCE NUMBER	SAMPLE TYPE	DEPTH RECOVERED		
0	Brown sandy TOPSOIL			0.20					
-1	Firm brown silty sandy CLAY with occasional gravel.			1.30	2640	D	1.00		
-2	Fine to coarse brown silty SAND				2641	D	1.40		
							SPT	1.50 N12	
-3							SPT	3.00 N15	
-4	Firm to stiff brown sandy laminated SILT			3.40	2642	D	3.50		
-5					2643	D	SPT 4.70	4.50 N35	
-6							SPT	6.00 N30	
-7	Firm to stiff brown silty sandy gravelly CLAY			6.50	2644	D	6.50		
				6.80	2645	D	6.90		
	Grey brown fine to coarse sandy GRAVEL with cobbles and occasional boulder.						SPT	7.50 N31	
-8	Grey brown fine to coarse clayey GRAVEL with occ. cobble			7.90	2646	D	8.00		
	Grey fine to coarse GRAVEL with cobbles, boulders and pieces of possible broken ROCK			8.20	2647	D	8.30		
	End of borehole			8.40					
REMARKS.					Water level observations during boring				
CHISELLING 7.10-7.30 FOR 30 MIN 8.40 FOR 1.5 HRS					DATE	HOLE DEPTH	CASING DEPTH	DEPTH TO WATER	REMARKS
					30.50	6.90	6.90	6.90	STRIKE
						8.00	8.00	8.00	STRIKE
						8.40	8.30	7.80	END
FIELD TEST KEY: U-U100, Db-Disturbed Sample, S-SPT, W-Water Sample, R-Refusal.									

85777

REPORT NO. 268		GEOTECHNICAL BORING RECORD				I.G.S.L.		
CONTRACT: PROPOSED ROAD AT GROODY				BOREHOLE NO.: 4		SHEET: 1 of 2		
CLIENT: LIMERICK CO.CO.		GROUND LEVEL (MOD)		DATE STARTED: 1.06.94		DATE COMPLETED: 1.06.94		
LOCATION: GROODY, LIMERICK		BOREHOLE DIAMETER (mm) 200		BORED BY: I.G.S.L.		LOGGED BY: I.G.S.L.		
		BOREHOLE DEPTH (m) 16.30						
		CASING DEPTH (m) 16.30						
DOWNHOLE DEPTH (m)	DESCRIPTION	SYMBOLIC LOG	ELEVATION (MOD)	DEPTH (m)	REFERENCE NUMBER	SAMPLE TYPE	DEPTH RECOVERED	FIELD TEST RESULTS
0	Stiff grey silty gravelly clay FILL							
-1	Fine to coarse grey silty SAND			1.00	2658	D	1.00	
-2				2.30	2659	D	1.50	1.50 N6
-3	Firm grey brown sandy SILT with occasional gravel.				2660	D	2.50	
-4	Fine to coarse brown slightly silty SAND			3.80	2661	D	3.80	
-5	Very loose brown silty SAND. (possible 'running sand')			4.20				
-6					2662	D	5.00	
-7	Becoming loose to medium dense with depth.							
-8								
-9	(see sheet 2 of 2)							
REMARKS.				Water level observations during boring				
CHISELLING 7.10-7.30 FOR 30 MIN 8.40 FOR 1.5 HRS				DATE	HOLE DEPTH	CASING DEPTH	DEPTH TO WATER	REMARKS
				1.6	7.60	7.60	7.60	STRIKE
FIELD TEST KEY: U-U100, Db-Disturbed Sample, S-SPT, W-Water Sample, R-Refusal.								

85775

REPORT NO. 2618		GEOTECHNICAL BORING RECORD				I.G.S.L.			
CONTRACT: PROPOSED ROAD AT GROODY					BOREHOLE NO.: 2				
					SHEET: 1 of 2				
CLIENT: LIMERICK CO.CO.		GROUND LEVEL (MOD)			DATE STARTED: 31.5.94				
		BOREHOLE DIAMETER (mm) 200			DATE COMPLETED: 31.05.94				
LOCATION: GROODY, LIMERICK		BOREHOLE DEPTH (m) 15.40			BORED BY: I.G.S.L.				
		CASING DEPTH (m) 15.40			LOGGED BY: I.G.S.L.				
DOWNHOLE DEPTH (m)	DESCRIPTION	SYMBOLIC LOG	ELEVATION (MOD)	DEPTH (m)	SAMPLES			FIELD TEST RESULTS	
					REFERENCE NUMBER	SAMPLE TYPE	DEPTH RECOVERED		
0	Stiff grey silty clay FILL								
-1	Black sandy TOPSOIL with roots			0.90	2648	D	1.30		
				1.30	2649	D	1.30		
					2650	D	1.40		
	Firm grey brown sandy SILT				2651	D	1.50-2.00		
-2							SPT	2.00 N10	
-3					2652	D	3.00		
					2653	D	3.00-3.50		
-4							SPT	4.00 N11	
				4.40					
-5	Fine to coarse brown slightly silty SAND				2654	D	4.60		
					2655	D	5.00		
-6							SPT	5.50 N14	
-7							SPT	7.00 N14	
-8									
	Fine to coarse brown silty gravelly SAND			8.10	2656	D	8.20		
	(see sheet 2 of 2)								
9									
REMARKS: CHISELLING 7.10-7.30 FOR 30 MIN 8.40 FOR 1.5 HRS					Water level observations during boring				
					DATE	HOLE DEPTH	CASING DEPTH	DEPTH TO WATER	REMARKS
					31.5	2.00 4.70	2.00 4.70	2.00 4.70	STRIKE STRIKE
FIELD TEST KEY: U-U100, Db-Disturbed Sample, S-SPT, W-Water Sample, R-Refusal.									

REPORT NO. 2618		GEOTECHNICAL BORING RECORD				I.G.S.L.																	
CONTRACT: PROPOSED ROAD AT GROODY				BOREHOLE NO.: 2		SHEET: 2 of 2																	
CLIENT: LIMERICK CO.CO		GROUND LEVEL (m OD)		DATE STARTED: 31.5.94		DATE COMPLETED: 31.05.94																	
LOCATION: GROODY, LIMERICK		BOREHOLE DIAMETER (mm) 200		BORED BY: I.G.S.L.		LOGGED BY: I.G.S.L.																	
		BOREHOLE DEPTH (m) 15.40																					
		CASING DEPTH (m) 15.40																					
DOWNHOLE DEPTH (m)	DESCRIPTION	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SAMPLES			FIELD TEST RESULTS															
					REFERENCE NUMBER	SAMPLE TYPE	DEPTH RECOVERED																
9.50	(see previous sheet)							9.50 N18															
11.30	Grey brown silty gravelly SAND							11.30 N26															
12.30				12.30	1267	D	12.50																
15.00	Firm to stiff grey sandy SILT							15.00 N25 For 75mm then Ref.															
15.40	End of borehole			15.40																			
Remarks: CHISELLING AT 15.40 FOR 1.5Hrs <table border="1" style="float: right; margin-top: 10px;"> <thead> <tr> <th colspan="5">Water level observations during boring.</th> </tr> <tr> <th>Date</th> <th>Hole Depth</th> <th>Casing Depth</th> <th>Depth to Water</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>31.5</td> <td>15.40</td> <td>15.40</td> <td>6.40</td> <td>End</td> </tr> </tbody> </table>									Water level observations during boring.					Date	Hole Depth	Casing Depth	Depth to Water	Remarks	31.5	15.40	15.40	6.40	End
Water level observations during boring.																							
Date	Hole Depth	Casing Depth	Depth to Water	Remarks																			
31.5	15.40	15.40	6.40	End																			
FIELD TEST KEY: U-U100, Db-Disturbed Sample, S-SPT, W-Water Sample, R-Refusal.																							

85776

REPORT NO. 2618		GEOTECHNICAL BORING RECORD				I.G.S.L.		
CONTRACT: PROPOSED ROAD AT GROODY				BOREHOLE NO.: 3		SHEET: 1 of 2		
CLIENT: LIMERICK CO.CO.		GROUND LEVEL (mOD)		DATE STARTED: 2.06.94		DATE COMPLETED: 2.06.94		
LOCATION: GROODY, LIMERICK		BOREHOLE DIAMETER (mm) 200		BORED BY: I.G.S.L.		LOGGED BY: I.G.S.L.		
		BOREHOLE DEPTH (m) 9.50						
		CASING DEPTH (m) 9.50						
DOWNHOLE DEPTH (m)	DESCRIPTION	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	REFERENCE NUMBER	SAMPLE TYPE	DEPTH RECOVERED	FIELD TEST RESULTS
0	Brown peaty sandy TOPSOIL with some boulders							
-1	Fine to coarse grey silty SAND			1.20	2666	D	1.20 SPT	1.50 N8
-2				2.30	2667	D	1.50	
-3	Fine to coarse brown sandy GRAVEL with cobbles and boulders			2.30	2668	D	2.50	
-4				3.40			SPT	3.00 N11
-5	Fine to coarse brown slightly silty SAND				2669	D	3.50	
-6							SPT	5.00 N15
-7							SPT	6.50 N17
-8							SPT	8.00 N22
-9	(see sheet 2 of 2)				2670	D	8.50	
REMARKS.				Water level observations during boring				
CHISELLING 0.9-1.30 FOR 45 MIN				DATE	HOLE DEPTH	CASING DEPTH	DEPTH TO WATER	REMARKS
				2.6	2.00	2.00	2.00	STRIKE
FIELD TEST KEY: U-U100, Db-Disturbed Sample, S-SPT, W-Water Sample, R-Refusal.								

REPORT NO. 2618		GEOTECHNICAL BORING RECORD				I.G.S.L.			
CONTRACT: PROPOSED ROAD AT GROODY					BOREHOLE NO.: 3				
					SHEET: 2 of 2				
CLIENT: LIMERICK CO.CO		GROUND LEVEL (mOD)			DATE STARTED: 2.06.94				
		BOREHOLE DIAMETER (mm) 200			DATE COMPLETED: 2.06.94				
LOCATION: GROODY, LIMERICK		BOREHOLE DEPTH (m) 9.50			BORED BY: I.G.S.L.				
		CASING DEPTH (m) 9.50			LOGGED BY: I.G.S.L.				
DOWNHOLE DEPTH (m)	DESCRIPTION	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SAMPLES			FIELD TEST RESULTS	
					REFERENCE NUMBER	SAMPLE TYPE	DEPTH RECOVERED		
9	Fine to coarse brown silty SAND			9.50			SPT	9.50 N19	
-10	End of borehole								
-11									
-12									
-13									
-14									
-15									
-16									
-17									
-18									
Remarks: CHISELLING AT 9.50 FOR 1Hr					Water level observations during boring.				
					Date	Hole Depth	Casing Depth	Depth to Water	Remarks
					2.6	9.50	9.50	6.80	End
FIELD TEST KEY: U-U100, Db-Disturbed Sample, S-SPT, W-Water Sample, R-Refusal.									

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Appendix C

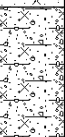
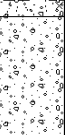
Borehole Logs

				Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Borehole No.: BH01	
				Coordinates: 560205.39 E 656755.01 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers		Sheet 1 of 1	
Method: Cable Percussion+Excavation				Ground Level: 8.92 mOD		Dates: 29/08/2025 – 01/09/2025		Scale: 1:52	
Plant: Pilcon+Takeuchi TB290-2								Driller: JB	
								Logger: MN	

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
0.40 - 1.20	B1					(0.40)		MADE GROUND: Brownish grey slightly silty very sandy Gravel and Cobbles with high small boulder content of angular to subangular crushed concrete with some dark grey limestone. Occasional steel rebar and occasional rootlets, moist.		0.5
0.40 - 1.20	D2				8.52	0.40		Firm brown slightly sandy slightly gravelly very silty CLAY with occasional cobbles, moist. Sand mostly fine to medium. Gravel fine to coarse. Gravel and cobbles angular to subangular dark grey limestone (possibly in part from overlying Made Ground)		1.0
1.20 - 2.00	B3				7.72	1.20		Firm interlaminated slightly orangish brown silty CLAY and lighter brown to locally greyish brown SILT, moist. (Glaciolacustrine Deposit)		1.5
1.20 - 2.00	D4				7.42	(0.30)		Soft brown slightly sandy to sandy gravelly silty CLAY with occasional to low cobble content, moist. Sand fine to coarse. Gravel fine to coarse, angular to subrounded dark grey limestone. Cobbles subangular dark grey limestone.		2.0
1.20 - 1.65	SPT (C) N=7			N=7 (2,3/2,1,2,2)		(0.50)		Loose brown slightly clayey slightly silty sandy GRAVEL with medium to high cobble content, wet. Sand fine to coarse. Gravel fine to coarse, angular to subangular light to dark grey to brownish grey limestone with occasional greyish green sandstone and white to orange quartz. Cobbles subangular dark grey limestone.		2.5
2.00 - 3.00	B5				6.92	2.00				3.0
2.00 - 3.00	D6					(1.00)				3.5
2.00 - 2.45	SPT (C) N=7		1.80	N=7 (3,2/1,2,1,3) 29-08-2025						4.0
3.00 - 3.80	B7				5.92	3.00				4.5
3.00 - 3.80	D8					(0.80)				5.0
3.00 - 3.45	SPT (C) N=74			N=74 (16,17/19,21,23,11)						5.5
					5.12	3.80		Driller unable to advance casing below 3.8m BGL. End of borehole at 3.800m		6.0
										6.5
										7.0
										7.5
										8.0
										8.5
										9.0
										9.5
										10.0

Remarks Slow boring from 3.0m to 3.8m BGL: 3 hours						Water Added		Water Strike - General			
						From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
								1.80		20	1.40
						Casing Details		Chiselling Details			
						To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)	
		3.80	200	3.80	3.80	01:00					

				Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Borehole No.: BH02	
				Coordinates: 560229.09 E		Client: Kirkland Investments		Sheet 1 of 1	
				656864.14 N		Client's Representative: Punch Consulting Engineers		Scale: 1:52	
Method: Excavation+Cable Percussion				Ground Level: 8.73 mOD		Dates: 02/09/2025 – 15/09/2025		Driller: JB	
Plant: Takeuchi TB290-2+Pilcon								Logger: MN	

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
1.20 - 2.00	B1					(1.00)		MADE GROUND: Light brownish grey very sandy Gravel and Cobble size fragments of angular to subangular crushed concrete with some to much limestone. Occasional rootlets.		
1.20 - 2.00	D2				7.72	1.00		Light brown fine to medium SAND, moist		
2.00 - 3.00	B3			N=17 (3,3/3,3,6,5)		(1.00)				
2.00 - 3.00	D4				6.72	2.00		Medium dense light brown slightly gravelly fine to medium SAND with low cobble content, moist. Sand mostly fine to medium. Gravel fine to coarse. Gravel and cobbles include angular to subangular grey to dark grey limestone and basalt and subangular to subrounded light red conglomeratic sandstone, brown to green sandstone and siltstone and white quartz.		
2.00 - 2.45	SPT (C) N=17					(1.60)				
3.00 - 3.45	SPT (C) N=22			N=22 (3,3/4,4,4,10)						
3.60 - 4.00	B5				5.12	3.60		Brown interlaminated to very thinly interbedded fine sandy SILT and very silty CLAY, wet.		
3.60 - 4.00	D6				4.72	4.00				
4.00 - 5.00	B7					(1.00)		Medium dense greyish brown slightly clayey silty very gravelly SAND with high cobble content, wet. Sample also contains some laminated greyish brown silty clay to sandy silty clay, possibly occurring as laminae to very thin beds or lenses. Sand fine to coarse. Gravel fine to coarse, mostly subangular dark grey limestone with a little yellow and green sandstone. Cobbles subangular dark grey limestone.		
4.00 - 5.00	D8			N=16 (4,3/3,4,3,6)						
4.00 - 4.45	SPT (C) N=16	4.00		02-09-2025	3.72	5.00				
5.00 - 6.00	B9					(1.30)		Brownish grey slightly silty sandy GRAVEL with medium to high cobble content, wet. Sand fine to coarse. Gravel fine to coarse, mostly subangular to occasionally subrounded, predominantly dark grey limestone with less red, green and yellow to yellowish brown sandstone. Cobbles subangular dark grey limestone.		
5.00 - 6.00	D10				2.42	6.30				
							<i>Driller unable to advance casing below 6.3m BGL.</i> End of borehole at 6.300m			

Remarks						Water Added		Water Strike - General							
						From (m) To (m)		Struck at (m)		Casing to (m)		Time (min)		Rose to (m)	
						0.60		3.00		3.00		0		0.00	
						Casing Details		Chiselling Details							
						To (m) Diam (mm)		From (m)		To (m)		Time (hh:mm)			
						6.30 200		6.30		6.30		01:00			

					Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick			Borehole No.: RC02	
					Coordinates: 560247.31 E 656848.70 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers			Sheet 1 of 2	
Method: Rotary Open Hole +Rotary Coring					Ground Level: 8.50 mOD		Dates: 10/09/2025 – 10/09/2025			Scale: 1:50	
Plant: Beretta T44										Driller: GOC	
										Logger: GOC +MN	

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
0.50 - 1.00					B1	8.00	0.50		Rotary Open Hole Drilling Driller described: MADE GROUND: Very sandy Gravel and Cobbles (Hardcore)		
1.00 - 2.00					B2	7.50	1.00		Rotary Open Hole Drilling Driller described: Possible Made Ground: greyish brown clayey silty very sandy Gravel with cobbles of dark grey limestone		
1.00 - 1.45					N=5 (1,1/1,1,1,2)	7.00	1.50		Rotary Open Hole Drilling Driller described: Soft to firm dark brown slightly sandy slightly gravelly silty CLAY with occasional rootlets		
2.00 - 3.00					B3	6.00	2.50		Rotary Open Hole Drilling Driller described: Soft brown silty CLAY with occasional gravel and occasional rootlets		
2.00 - 2.45					N=4 (1,0/1,0,2,1)	5.50	3.00		Rotary Open Hole Drilling Driller described: Soft greyish brown sandy silty CLAY with rare gravel, wet		
3.00 - 3.45					N=4 (0,0/0,0,2,2)	4.50	4.00		Rotary Open Hole Drilling Driller described: Firm grey mottled brown clayey very sandy SILT, wet		
3.50 - 4.00					B4	3.50	5.00		Rotary Open Hole Drilling Driller described: Grey mottled brown slightly gravelly clayey very sandy SILT, wet		
4.00 - 4.70					B5	3.00	6.00		Rotary Open Hole Drilling Driller described: Medium dense grey mottled brown clayey gravelly very silty SAND, moist becoming below 6.5m moist to wet		
4.00 - 4.45					N=8 (0,0/2,1,2,3)	2.50	7.00		Rotary Open Hole Drilling / Setting Casing Driller described: Possible Bedrock: Recovered as angular fragments of dark grey fine grained micritic Limestone		
4.70 - 5.00					B6	2.00	8.00		Rotary Open Hole Drilling Driller described: Dense slightly sandy GRAVEL including much grey to dark grey limestone and less red, green and yellowish brown sandstone		
5.00 - 5.45					N=28 (0,1/5,9,7,7)	1.50	9.50		Medium strong to very strong dark grey fine grained micritic LIMESTONE with rare fossil shell debris, including bivalves, occasionally more frequent in subhorizontal laminae to very thin beds. Occasional steep to subvertical		
6.00 - 6.50					B7	1.00	10.00				
6.50 - 6.95					N=27 (9,9/6,6,6,9)	0.50					
7.50 - 8.00					B8	0.00					
8.00 - 8.45					N=44 (15,8/9,10,11,14)	0.00					
8.50 - 9.00					B9	0.00					
9.50 - 9.51	99	87	61	13	50 (50 for 10mm/50 for 0mm)	-1.00	9.50				
10.00	TCR	SCR	RQD	FI							

Remarks										Water Added		Water Strike - General									
										From (m)		To (m)		Struck at (m)		Casing to (m)		Time (min)		Rose to (m)	
														8.20		8.20		0		0.00	
										Casing Details		Chiselling Details									
										To (m)		Diam (mm)		From (m)		To (m)		Time (hh:mm)			
										9.50		151									
										12.50		101									

					Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Borehole No.: RC03	
					Coordinates: 560258.81 E 656735.88 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers		Sheet 1 of 1 Scale: 1:50 Driller: GOC Logger: GOC +MN	
Method: Rotary Open Hole +Rotary Coring					Ground Level: 8.81 mOD		Dates: 17/09/2025 – 18/09/2025			
Plant: Beretta T44										

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
0.50 - 1.00					B1	8.51	(0.30) 0.30		Rotary Open Hole Drilling Driller described: MADE GROUND: Broken Concrete with grey sandy gravel		
1.00 - 1.45					N=24 (2,4/6,6,6,6)	7.81	(0.70) 1.00		Rotary Open Hole Drilling Driller described: Brownish grey slightly clayey slightly silty very sandy Gravel, moist		
1.50 - 2.00					B2		(1.00)		Rotary Open Hole Drilling Driller described: Medium dense brown and grey slightly silty very sandy GRAVEL, wet. Gravel fine to coarse, angular to subangular dark grey limestone.		
2.00 - 2.45					N=18 (1,3/3,5,4,6)	6.81	2.00		Rotary Open Hole Drilling Driller described: Medium dense greyish brown slightly silty sandy GRAVEL, wet. Gravel fine to coarse, angular to subangular dark grey limestone.		
2.50 - 3.00					B3		(1.00)		Rotary Open Hole Drilling Driller described: Medium dense greyish brown slightly silty sandy GRAVEL, wet. Gravel fine to coarse, angular to subangular dark grey limestone.		
3.00 - 3.45					N=34 (3,6/7,8,10,9)	5.81	3.00		Rotary Open Hole Drilling Driller described: Dense brown slightly silty sandy GRAVEL, wet. Gravel fine to coarse, angular to subangular dark grey limestone.		
3.50 - 4.00					B4		(1.00)		Rotary Open Hole Drilling Driller described: Dense brown slightly silty sandy GRAVEL, wet. Gravel fine to coarse, angular to subangular dark grey limestone.		
4.00 - 4.00					50 (50 for 0mm/50 for 0mm)	4.81	4.00		Strong to very strong dark grey fine grained micritic LIMESTONE with rare to occasional fossil shell debris, including bivalves, occasionally more frequent in subhorizontal laminae to very thin beds. Occasional steep to subvertical very thin calcite veins (<1mm thick). Rare wavy subhorizontal pressure solution stylolites (e.g. at 4.74m). Slightly weathered with lighter grey discolouration and possible dissolution on some discontinuity surfaces (e.g. subvertical slightly undulating discontinuity at c. 4.08m to 5.95m).		
5.20	92	77	77	3					Discontinuities medium spaced (590mm wide) becoming by 4.59m mostly closely to medium spaced (up to 230mm) and possibly locally very closely spaced at some joint intersections where rock core was recovered as non-intact angular coarse gravel to cobble size rock fragments:		
5.50	100	100	100	6			(3.00)		Discontinuities medium spaced (590mm wide) becoming by 4.59m mostly closely to medium spaced (up to 230mm) and possibly locally very closely spaced at some joint intersections where rock core was recovered as non-intact angular coarse gravel to cobble size rock fragments:		
6.00	100	36	36	NI					Discontinuities medium spaced (590mm wide) becoming by 4.59m mostly closely to medium spaced (up to 230mm) and possibly locally very closely spaced at some joint intersections where rock core was recovered as non-intact angular coarse gravel to cobble size rock fragments:		
6.50	100	80	74	8					Discontinuities medium spaced (590mm wide) becoming by 4.59m mostly closely to medium spaced (up to 230mm) and possibly locally very closely spaced at some joint intersections where rock core was recovered as non-intact angular coarse gravel to cobble size rock fragments:		
7.00	100	12	0	NI					Discontinuities medium spaced (590mm wide) becoming by 4.59m mostly closely to medium spaced (up to 230mm) and possibly locally very closely spaced at some joint intersections where rock core was recovered as non-intact angular coarse gravel to cobble size rock fragments:		
						1.81	7.00		End of borehole at 7.000m		

Remarks	Water Added		Water Strike - General			
	From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
			1.00	1.00	960	0.30
	Casing Details		Chiselling Details			
	To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)	
	4.00	151				
	7.00	101				

					Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick			Borehole No.: RC04	
					Coordinates: 560182.50 E 656766.06 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers			Sheet 1 of 1	
Method: Rotary Open Hole +Rotary Coring					Ground Level: 8.94 mOD		Dates: 12/09/2025 – 16/09/2025			Scale: 1:50	
Plant: Beretta T44										Driller: GOC Logger: GOC +MN	

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
0.50 - 1.00					B1	8.44	0.50		Rotary Open Hole Drilling Driller described: MADE GROUND: Concrete fragments, Hardcore and very sandy Gravel		
1.00 - 1.50					B2	7.94	1.00		Rotary Open Hole Drilling Driller described: Made Ground: Slightly silty sandy Gravel of dark grey limestone		
1.00 - 1.45					N=40 (9,18/13,16,6,5)	7.64	0.30		Rotary Open Hole Drilling Driller described: Dense slightly sandy GRAVEL		
1.50 - 2.00					B3	7.44	1.50		Rotary Open Hole Drilling Driller described: Dense light brown slightly gravelly silty SAND		
2.00 - 2.45					N=23 (2,2/3,3,3,14)	6.94	2.00		Rotary Open Hole Drilling Driller described: Light brown very silty fine SAND, wet		
2.50 - 3.00					B4		(1.40)		Rotary Open Hole Drilling Driller described: Medium dense light brown slightly gravelly to gravelly silty SAND		
3.00 - 3.42					N=61 (6,8/61 for 275mm)						
3.50 - 4.00					B5	5.54	3.40		Rotary Open Hole Drilling Driller described: Brown to grey slightly clayey silty sandy GRAVEL with occasional cobble to small boulder content, wet		
4.00 - 5.00					B6	4.94	4.00		Rotary Open Hole Drilling Driller described: Very stiff greyish brown slightly gravelly sandy silty CLAY		
4.00 - 4.45					N=37 (7,7/8,11,7,11)						
5.00 - 5.14					0 (48 for 135mm/0 for 0mm)	3.74	5.20		Rotary Open Hole Drilling Driller described: Very dense grey sandy GRAVEL with occasional cobbles and small boulders, wet		
5.50 - 6.00					B7		(1.30)				
6.50 - 6.80	96	60	60	NI	62 (6,17/62 for 150mm)	2.44	6.50		Strong to very strong dark grey fine grained micritic LIMESTONE mostly with occasional steep to subvertical very thin calcite veins (<1mm thick). Fresh to slightly weathered.		
6.95				6			(0.98)		Discontinuities closely to medium spaced: (1) Subhorizontal, planar, rough; (2) Steep to subvertical, planar to slightly undulating, rough. A trace of brown silty clay on some discontinuity surfaces.		
	50	39	39	NI		1.46	7.48		Rotary Coring: No Recovery from 7.48m to 9.0m		
8.00				NR			(1.52)		8.0m to 9.0m: Driller reported that flush water changed from muddy to light grey to dark grey / black.		
9.00						-0.06	9.00		End of borehole at 9.000m		

Remarks	Water Added		Water Strike - General			
	From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
			1.00	1.00	1	0.50
			5.80	5.80	20	0.65
	Casing Details		Chiselling Details			
	To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)	
	6.50	151				
	9.00	101				



Project No.:

25-049

Project Name:

Parkway Valley, Dublin Road, Singland, Limerick

Borehole No.:	
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R005

Coordinates:

560213.24 E

Client:

Kirkland Investments

Sheet 1 of 1

Method:

Rotary Open Hole

656715.67 N

656715.67 N

Client's Representative:

Punch Consulting Engineers

Scale: 1:50

Driller: GOC

Plant:

Beretta T44

Ground Level:

8.92 mOD

Dates:

19/09/2025 -

Logger: GOC

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
					8.32	(0.60) 0.60		Driller described: MADE GROUND: Angular cobble-size crushed concrete and grey sandy Gravel. <i>Driller recorded refusal on possible reinforced concrete at 0.6m BGL.</i> End of borehole at 0.600m		

Remarks

Water Added		Water Strike - General			
From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
		0.50		20	0.50

Casing Details		Chiselling Details		
To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)

				Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick				Borehole No.: RO06			
				Coordinates: 560173.17 E 656701.64 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers				Sheet 1 of 1			
Method: Rotary Open Hole				Ground Level: 9.03 mOD		Dates: 17/09/2025 -				Scale: 1:50			
Plant: Beretta T44										Driller: GOC			
										Logger: GOC			
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill			
0.50 - 1.00	B1					(1.00)		Rotary Open Hole Drilling Driller described: MADE GROUND: Broken Concrete and Steel Rebar with sandy gravelly silty clay below 0.5m			0.5		
1.00 - 1.35	SPT ()			44 (6,13/44 for 200mm)	8.02	1.00 (0.40)		Rotary Open Hole Drilling Driller described: MADE GROUND: Dense sandy Gravel			1.0		
					7.62	1.40		Driller recorded refusal on Possible Reinforced Concrete at 1.4m BGL End of borehole at 1.400m			1.5		
											2.0		
											2.5		
											3.0		
											3.5		
											4.0		
											4.5		
											5.0		
											5.5		
											6.0		
											6.5		
											7.0		
											7.5		
											8.0		
											8.5		
											9.0		
											9.5		
Remarks								Water Added		Water Strike - General			
								From (m) To (m)		Struck at (m) Casing to (m)		Time (min) Rose to (m)	
										0.50 0.50		20 0.50	
								Casing Details		Chiselling Details			
								To (m) Diam (mm)		From (m) To (m)		Time (hh:mm)	
								1.40 151					

				Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick				Borehole No.: RO06A	
				Coordinates: 560180.49 E 656707.22 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers				Sheet 1 of 1	
Method: Rotary Open Hole				Ground Level: 8.93 mOD		Dates: 17/09/2025 -				Scale: 1:50	
Plant: Beretta T44										Driller: GOC	
										Logger: GOC	

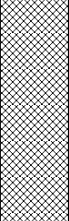
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
0.50 - 1.00	B1					(1.00)		Rotary Open Hole Drilling Driller described: MADE GROUND: Broken Reinforced Concrete with grey sandy gravel		
1.00 - 1.44	SPT (C)			N=35 (4,4/35 for 285mm)	7.92	1.00 (0.44)		Rotary Open Hole Drilling Driller described: MADE GROUND		
					7.49	1.44		Driller recorded refusal on Possible Reinforced Concrete at 1.435m BGL End of borehole at 1.435m		

Remarks						Water Added		Water Strike - General			
						From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
								0.50	0.50	20	0.50
						Casing Details		Chiselling Details			
						To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)	
						1.44	151				

				Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick				Borehole No.: RC07	
				Coordinates: 560187.75 E 656635.58 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers				Sheet 1 of 1	
Method: Rotary Open Hole +Rotary Coring				Ground Level: 15.89 mOD		Dates: 25/09/2025 – 29/09/2025				Scale: 1:50	
Plant: Beretta T44										Driller: GOC Logger: GOC +MN	

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
0.50 - 1.00					B1	15.79 15.73	(0.10) (0.08)	CONCRETE: 100mm thick MADE GROUND / SUBBASE: Grey sandy Gravel: 60mm thick Rotary Open Hole Drilling Driller described: Brown slightly clayey gravelly SAND with occasional small boulders			
1.00 - 1.12					50 (41 for 125mm/50 for 0mm)	14.89	1.00	Rotary Open Hole Drilling Driller described: Very dense brown slightly clayey very gravelly SAND with occasional cobbles and small boulders, moist			
1.50 - 2.00					B2						
2.00 - 3.00 2.00 - 2.36					B3 63 (4,10/63 for 210mm)		(2.50)				
3.00 - 3.50 3.00 - 3.06					B4 50 (50 for 60mm/50 for 0mm)						
4.10 - 4.10					50 (50 for 0mm/50 for 0mm)	12.39 11.79	3.50 (0.60) 4.10	Rotary Open Hole Drilling / Setting Casing Driller described: Possible Bedrock: Strong to very strong dark grey fine grained micritic LIMESTONE with rare to occasional fossil shell debris, including bivalves, occasionally more frequent in laminae to very thin beds. Rare steep to subvertical very thin calcite veins (<1mm thick). Slightly weathered with orange discolouration on discontinuity surfaces in the upper 0.5m. Discontinuities mostly closely to medium spaced (up to 480mm wide), locally very closely to closely spaced in medium strong intervals: (1) Subhorizontal to shallow, planar to slightly undulating, slightly rough to rough; (2) Steep to subvertical, planar to undulating, rough; A trace of brown silty clay on a few discontinuity surfaces. From 5.24m to 5.33m Medium strong to strong possibly tuffaceous rock with extremely closely spaced planar to undulating subhorizontal and subvertical incipient discontinuities. From 5.33m to 5.55m: Weak interlaminated to thinly interbedded grey fine to medium grained and light grey coarse grained possible volcaniclastic rock.			
5.60	100	95	63	5							
				16							
	98	93	93	2							
				20							
7.10							(5.40)				
	100	100	94	4					From 6.43m to 6.50m: Thin bed of weak light grey coarse grained possible volcaniclastic rock.		
									From 7.92m to 8.12m: Thin bed of medium strong grey very fine grained possibly tuffaceous rock.		
8.55					29-09-2025						
	100	100	100								
9.50						6.39	9.50		End of borehole at 9.500m		

Remarks	Water Added		Water Strike - General			
	From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
	Casing Details		Chiselling Details			
	To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)	
	4.10	151				
	9.50	101				

				Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick				Borehole No.: RO09		
				Coordinates: 560200.31 E 656682.84 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers				Sheet 1 of 1		
Method: Rotary Open Hole +Excavation				Ground Level: 8.96 mOD		Dates: 25/09/2025 -				Scale: 1:50		
Plant: Beretta T44+13 tonne										Driller: GOC		
										Logger: GOC		
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill		
					7.46	(1.50) 1.50		MADE GROUND: 13 tonne digger excavated through granular fill material down to Concrete and broke through the concrete using a rock breaker <i>Driller set up the rotary drilling rig over the inspection pit but met refusal on possible reinforced concrete at 1.5m BGL.</i> End of borehole at 1.500m			0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5	
Remarks							Water Added		Water Strike - General			
							From (m)	To (m)	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
									0.50		20	0.50
							Casing Details		Chiselling Details			
To (m)	Diam (mm)	From (m)	To (m)	Time (hh:mm)								

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Appendix D Rock Core Photographs



Parkway Valley,
Dublin Road,
Singland, Limerick

RC02, RC03 & RC04

CLIENT
Kirkland Investments

ENGINEER
Punch Consulting
Engineers

DATE
September 2025

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Parkway Valley,
Dublin Road,
Singland, Limerick

RC07

CLIENT
Kirkland Investments

ENGINEER
Punch Consulting
Engineers

DATE
September 2025

RECEIVED: 28/05/2026

Appendix D

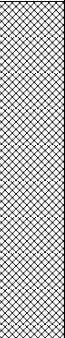
Trial Pit Logs

			Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Trial Pit No.: TP01	
			Co-ordinates: 560177.51 E 656862.06 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers		Sheet 1 of 1 Scale: 1:22 Driver: TMCN Logger: MN	
Method: Excavation			Ground Level: 8.58 mOD		Date: 31/07/2025			
Plant: Takeuchi TB290-2								

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
1.00 - 1.50	B1		8.07	(0.50)		MADE GROUND: Light brownish grey very sandy Gravel and Cobble size with low content of small boulder size fragments of angular to subangular crushed concrete. Occasional steel rebar. Occasional roots and rootlets.	
1.00 - 1.50	D2			0.50		MADE GROUND: Brownish grey slightly clayey slightly silty very sandy Gravel with high cobble content and occasional roots and rootlets, moist becoming by 1.1m wet. Sand fine to coarse. Gravel fine to coarse. Gravel and cobbles angular to subangular dark grey basalt and some limestone.	
			7.08	1.50		End of trial pit at 1.500m	

Remarks TP01 excavated on east side of 0.5m thick concrete roadway.		Water Strikes:		Stability: Sides collapsing below 1.1m Width: 1.00 Length: 2.10
		Struck at (m):	Remarks:	
		1.10		

			Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Trial Pit No.: TP02	
			Co-ordinates: 560232.11 E 656862.85 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers		Sheet 1 of 1 Scale: 1:22 Driver: TMCN Logger: MN	
Method: Excavation			Ground Level: 8.79 mOD		Date: 31/07/2025			
Plant: Takeuchi TB290-2								

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.50 - 1.00 0.50 - 1.00	B1 D2			(1.00)		MADE GROUND: Light brownish grey very sandy Gravel and Cobble size fragments of angular to subangular crushed concrete with some to much limestone. Occasional pockets of brown to orange brown slightly sandy slightly gravelly silty clay. Occasional rootlets.	
1.00 - 1.50 1.00 - 1.50	B3 D4		7.79	1.00		Light orange becoming light brown slightly gravelly silty fine to medium SAND, moist becoming by 2.15m wet. A little to some intermixed gravel from the overlying Made Ground in the upper portion.	
1.70 - 2.20 1.70 - 2.20	B5 D6			(1.25)			
			6.54	2.25		End of trial pit at 2.250m	

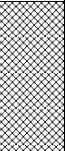
Remarks	Water Strikes:		Stability: Sides collapsing in sand
	Struck at (m):	Remarks:	
	2.15		Width: 0.80 Length: 2.10

			Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Trial Pit No.: TP03	
			Co-ordinates: 560284.02 E 656850.73 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers		Sheet 1 of 1 Scale: 1:22 Driver: TMCN Logger: MN	
Method: Excavation			Ground Level: 8.48 mOD		Date: 31/07/2025			
Plant: Takeuchi TB290-2								

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
1.00 - 1.50 1.00 - 1.50	B1 D2		8.28	(0.20)		MADE GROUND: Brownish grey slightly silty very sandy gravelly Cobbles composed of angular to subangular crushed concrete with some dark grey limestone. Occasional roots and rootlets.	
				0.20		MADE GROUND: Grey very sandy Gravel with high, becoming below 0.8m medium, cobble content and low small boulder content and occasional steel rebar. Gravel and cobbles composed of angular crushed concrete. From 0.4m to 0.8m in middle of south side and feathering to east and west: Lens of brown fine Sand with a little intermixed dark grey gravel from the surrounding Made Ground.	
				(1.40)			
			6.88	1.60		End of trial pit at 1.600m	

Remarks TP03 excavated on south side of 6.7m wide concrete strip (at least 1.5m thick).	Water Strikes:		Stability: Sides collapsing below 1.0m Width: 1.10 Length: 2.40
	Struck at (m):	Remarks:	
	1.00		

		Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Trial Pit No.: TP04	
		Co-ordinates: 560329.13 E 656852.70 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers		Sheet 1 of 1	
Method: Excavation		Ground Level: 8.53 mOD		Date: 31/07/2025		Scale: 1:22	
Plant: Takeuchi TB290-2						Driver: TMCN	
						Logger: MN	

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.80 - 1.20 0.80 - 1.20	B1 D2		8.08	0.45 (0.45)		MADE GROUND: Light brownish grey very sandy gravelly Cobbles to Small Boulder size fragments of angular to subangular crushed concrete with some to much limestone and occasional steel rebar. Occasional rootlets.	
			7.73	0.80 (0.35)		MADE GROUND: Brownish grey clayey silty sandy to very sandy Gravel and Cobbles, moist becoming wet at base. Gravel and Cobbles composed of angular dark grey limestone.	
			7.28	1.25 (0.45)		Woven geotextile fabric at 0.8m BGL. At west half on south side, becoming thinner on north side: Stiff orange brown slightly gravelly silty CLAY with occasional blackened partially decayed rootlets. Closely fissured with pale greenish grey colour on surfaces. (Possible Made Ground)	
1.30 - 1.80 1.30 - 1.80	B3 D4		6.63	1.90 (0.65)		Greyish brown gravelly to very gravelly silty SAND with occasional to locally frequent rootlets, moist. Sand fine to coarse. Gravel fine to coarse, subangular to subrounded including dark grey limestone. (Possible Disturbed Native Soil)	
2.50 - 3.00 2.50 - 3.00	B5 D6		5.33	3.20 (1.30)		Soft greyish brown slightly gravelly sandy clayey SILT with occasional cobbles and a boulder, occasional blackened partially decayed wood fragments and a trace of plastic and ceramic fragments. (Partially Disturbed Estuarine Alluvium)	
						End of trial pit at 3.200m	

Remarks	Water Strikes:		Stability: Spalling in Made Ground Width: 1.10 Length: 2.50
	Struck at (m):	Remarks:	
	0.86		

			Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Trial Pit No.: TP05	
			Co-ordinates: 560300.07 E 656805.78 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers		Sheet 1 of 1 Scale: 1:22 Driver: TMCN Logger: MN	
Method: Excavation			Ground Level: 8.75 mOD		Date: 31/07/2025			
Plant: Takeuchi TB290-2								

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.60 - 1.10 0.60 - 1.10	B1 D2		7.65	(1.10) 1.10		MADE GROUND: Greyish brown to light brownish grey slightly silty sandy gravelly Cobbles and Small Boulders of angular to subangular crushed concrete with a little basalt and limestone and a high content of steel rebar. Occasional roots and rootlets. Occasional plastic and timber fragments. Dry to moist becoming wet by 0.8m BGL. Excavator refusal on multiple strands of steel rebar. End of trial pit at 1.100m	

Remarks	Water Strikes:		Stability: Medium
	Struck at (m):	Remarks:	
	0.80		Width: 1.70 Length: 3.20



Project No.:

25-049

Project Name:

Parkway Valley, Dublin Road, Singland, Limerick

Trial Pit No.:

TP06

Co-ordinates:

560267.14 E

Client:	
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Kirkland Investments

Sheet 1 of 1

Method:

Excavation

656772.78 N

Client's Representative:

Punch Consulting Engineers

Scale: 1:22

Driver: TMcN

Plant:

Takeuchi TB290-2

Ground Level:

8.73 mOD

Date:

31/07/2025

Logger: MN

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.00 - 0.50 0.00 - 0.50	B1 D2			(0.50)		MADE GROUND: Light brownish grey slightly silty sandy gravelly Cobbles and Small Boulder size fragments of angular to subangular crushed concrete with a little limestone and occasional steel rebar, plastic and metal fragments, moist. Occasional rootlets.	
			8.23 8.13	0.50 (0.10) 0.60		MADE GROUND: Grey very sandy Gravel with medium to high cobble content, wet. Sand fine to coarse. Gravel fine to coarse. Gravel and cobbles angular including much dark grey limestone. <i>Excavator refusal on flat concrete surface at 0.6m BGL.</i> End of trial pit at 0.600m	0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0

Remarks

Water Strikes:

Struck at (m):

0.55

Remarks:

Stability:

Good

Width: 0.85

Length: 3.30

			Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Trial Pit No.: TP07	
			Co-ordinates: 560217.19 E 656773.82 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers		Sheet 1 of 1	
Method: Excavation			Ground Level: 8.91 mOD		Date: 31/07/2025		Scale: 1:22	
Plant: Takeuchi TB290-2							Driver: TMcN	
							Logger: MN	
Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	
0.40 - 0.70 0.40 - 0.70	B1 D2		8.51 8.21	(0.40)		MADE GROUND: Brownish grey slightly silty very sandy Gravel and Cobbles with high small boulder content of angular to subangular crushed concrete. Occasional steel rebar and occasional rootlets, moist.		0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0
				0.40		MADE GROUND: Grey slightly silty very sandy Gravel with medium cobble content, moist becoming wet at base. Sand fine to coarse. Gravel fine to coarse. Gravel and cobbles angular dark grey limestone and occasional concrete.		
				(0.30)				
						Excavator refusal on flat concrete surface at 0.7m BGL. End of trial pit at 0.700m		
Remarks						Water Strikes:		Stability:
						Struck at (m): 0.70		Good
						Remarks:		Width: 0.85 Length: 3.00

		Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Trial Pit No.: TP08	
		Co-ordinates: 560220.26 E		Client: Kirkland Investments		Sheet 1 of 1	
Method: Excavation		656817.98 N		Client's Representative: Punch Consulting Engineers		Scale: 1:22	
Plant: Takeuchi TB290-2		Ground Level: 8.72 mOD		Date: 01/08/2025		Driver: TMCN	
Logger: MN							

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.40 - 0.90	B1		8.52	(0.20)		MADE GROUND: Light brownish grey slightly clayey clayey slightly silty very sandy Gravel and Cobbles with low small boulder content of angular to subangular crushed concrete with a little limestone and basalt and occasional rootlets, dry to moist.	
0.40 - 0.90	D2			0.20		MADE GROUND: Light brown and grey clayey silty very sandy Gravel and Cobbles with high small boulder content, moist becoming by 0.7m -1.0m wet. Sand fine to coarse. Gravel fine to coarse. Gravel and cobbles angular dark grey limestone and occasional concrete fragments.	
				(0.85)			
1.20 - 1.70	B3		7.67	1.05		<u>Woven geotextile fabric at 1.0m to 1.05m BGL.</u>	
1.20 - 1.70	D4		7.52	(0.15)		Firm brown to brownish grey with a little yellowish brown mottling slightly fine sandy clayey SILT with frequent blackened partially decayed vegetation fragments including reeds, moist.	
				1.20		Brown to locally greyish brown silty gravelly SAND, locally becoming silty SAND and GRAVEL, all with low cobble and small boulder content, moist becoming by 2.2m wet. Sand mostly fine to medium. Gravel fine to coarse. Gravel, cobbles and small boulders mostly subangular to subrounded dark grey limestone and rare calcite.	
2.10 - 2.60	B5			(1.50)			
2.10 - 2.60	D6						
			6.02	2.70		<u>Sides collapsing below 1.5m BGL.</u>	
						End of trial pit at 2.700m	

Remarks	Water Strikes:		Stability: Sides collapsing below 1.5m
	Struck at (m):	Remarks:	
	0.70 2.20		
		Width:	1.00
		Length:	2.30

			Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Trial Pit No.: TP09	
			Co-ordinates: 560241.08 E 656723.74 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers		Sheet 1 of 1 Scale: 1:22 Driver: TMcN Logger: MN	
Method: Excavation			Ground Level: 8.84 mOD		Date: 01/08/2025			
Plant: Takeuchi TB290-2								

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.70 - 1.20 0.70 - 1.20	B1 D2		8.34	(0.50)	[Pattern]	MADE GROUND: Brownish grey slightly silty very sandy Gravel and Cobbles with high small boulder content, occasional steel rebar, timber and blue plastic fragments and occasional rootlets, moist. Sand mostly fine to medium. Gravel fine to coarse. Gravel, cobbles and boulders of angular to subangular crushed concrete with a little angular limestone and basalt.	
				0.50		MADE GROUND: Brownish grey slightly silty very sandy Gravel and Cobbles with high small boulder content, moist becoming wet. Sand fine to coarse. Gravel fine to coarse. Gravel, cobbles and small boulders angular dark grey limestone and occasional concrete.	
				(0.70)			
				1.20		Excavator refusal on hard surface at 1.2m BGL. End of trial pit at 1.200m	

Remarks	Water Strikes:		Stability: Good
	Struck at (m):	Remarks:	
	0.65		Width: 1.10 Length: 2.60



Project No.:

25-049

Project Name:

Parkway Valley, Dublin Road, Singland, Limerick

Trial Pit No.:

TP10

Co-ordinates:

560198.12 F

Client:

Kirkland Investments

Sheet 1 of 1

Method:

Excavation

656731.81 N

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Client's Representative:

Punch Consulting Engineers

Scale: 1:22

Driver: TMcN

Plant:

Takeuchi TB290-2

Ground Level:

8.86 mOD

Date:

01/08/2025

Logger: MN

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.70 - 1.20	B1		8.36	(0.50)		MADE GROUND: Light brownish grey to light greyish brown slightly silty very sandy Gravel and Cobbles with medium small boulder content, occasional steel rebar, rare timber and plastic fragments and occasional roots and rootlets, moist. Sand fine to coarse. Gravel fine to coarse. Gravel, cobbles and boulders of angular to subangular crushed concrete with a little angular limestone and basalt.	
0.70 - 1.20	D2			0.50		MADE GROUND: Grey slightly silty sandy to very sandy Gravel and Cobbles with low small boulder content, some pockets of orange brown slightly gravelly silty clay, occasional steel rebar and occasional rootlets, wet. Sand fine to coarse. Gravel fine to coarse. Gravel, cobbles and small boulders angular dark grey limestone and occasional concrete.	
				(1.30)			
1.80 - 2.00	B3		7.06	1.80		A few fragments of woven geotextile fabric were recovered from below water table: estimated to be possibly around 1.8m BGL.	
1.80 - 2.00	D4		6.86	(0.20)		Greyish brown to brown slightly silty slightly gravelly SAND, moist. Sand mostly medium grained. Gravel fine to coarse subangular to subrounded dark grey limestone and rare red sandstone.	
				2.00		End of trial pit at 2.000m	

Remarks

Water Strikes:

Struck at (m):

0.35

0.60

Remarks:

Stability:	
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Sides collapsing
below 0.6m

Width: 1.10

Length: 2.90

		Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Trial Pit No.: TP11	
		Co-ordinates: 560200.10 E 656682.78 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers		Sheet 1 of 1	
Method: Excavation		Ground Level: 8.94 mOD		Date: 01/08/2025		Scale: 1:22	
Plant: Takeuchi TB290-2						Driver: TMcN	
						Logger: MN	

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	
0.80 - 1.30 0.80 - 1.30	B1 D2			(1.35)		MADE GROUND: Brownish grey slightly silty very sandy Gravel and Cobbles with high small boulder content, occasional to frequent steel rebar, rare plastic fragments and occasional roots and rootlets, moist becoming by 0.45m wet. Sand fine to coarse. Gravel fine to coarse. Gravel, cobbles and boulders of angular to subangular crushed concrete with occasional angular limestone.		0.5
			7.59	1.35		Excavator refusal below the water table, on an obstruction at 1.35m BGL. End of trial pit at 1.350m		1.0
								1.5
								2.0
								2.5
								3.0
								3.5
								4.0

Remarks	Water Strikes:		Stability: Good
	Struck at (m):	Remarks:	
	0.45		Width: 1.10 Length: 2.70

		Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Trial Pit No.: TP12	
		Co-ordinates: 560201.05 E 656634.32 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers		Sheet 1 of 1	
Method: Excavation		Ground Level: 15.54 mOD		Date: 01/08/2025		Scale: 1:22 Driver: TMCN Logger: MN	
Plant: Takeuchi TB290-2							

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
1.10 - 1.40 1.10 - 1.40	B1 D2		14.74	0.80 (0.30)		MADE GROUND: Grey slightly sandy slightly gravelly Cobbles and Small Boulders with occasional rootlets, moist. Sand fine to coarse. Gravel fine to coarse. Gravel, cobbles and small boulders angular to subangular dark grey limestone. Ground surface slopes to south and east. Thickness of Made Ground varies from 1.1m on north side to 0.6m on south side.	0.5
			14.44	1.10 (0.30)		MADE GROUND: Grey slightly silty very sandy Gravel with medium to high cobble content, occasional pockets of brown slightly sandy slightly gravelly silty clay, rare plastic and metal fragments and occasional rootlets, moist. Sand fine to coarse. Gravel fine to coarse. Gravel and cobbles angular to subangular dark grey limestone.	1.0
1.50 - 2.00 1.50 - 2.00	B3 D4		14.14	1.40 (0.60)		MADE GROUND: Grey slightly silty very sandy Gravel with medium to high cobble content, intermixed with orange brown to brown slightly sandy slightly gravelly silty clay, occasional plastic fragments, two timber beams and a cloth fragment and occasional rootlets, moist. Sand fine to coarse. Gravel fine to coarse. Gravel and cobbles angular to subangular dark grey limestone.	1.5
			13.54	2.00		At south side of trial pit: Soft brown slightly sandy slightly gravelly silty CLAY with a little to some intermixed Made Ground as above. (Possible Disturbed Native Soil) MADE GROUND extends down to 2m BGL by concrete wall on north side of trial pit.	2.0
						Angular cobble to small boulder size fragments of dark grey fine grained limestone at base of trial pit at 2m BGL may be broken bedrock fragments. End of trial pit at 2.000m	2.5
							3.0
							3.5
							4.0

Remarks	Water Strikes:		Stability: Sides spalling
	Struck at (m):	Remarks:	
		None	Width: 1.10 Length: 2.50

		Project No.: 25-049		Project Name: Parkway Valley, Dublin Road, Singland, Limerick		Trial Pit No.: TP13	
		Co-ordinates: 560164.27 E 656649.95 N		Client: Kirkland Investments Client's Representative: Punch Consulting Engineers		Sheet 1 of 1	
Method: Excavation		Ground Level: 15.89 mOD		Date: 01/08/2025		Scale: 1:22	
Plant: Takeuchi TB290-2						Driver: TMCN	
						Logger: MN	

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.50 - 1.00 0.50 - 1.00	B1 D2			(1.10)		MADE GROUND: Brownish grey slightly silty very sandy Gravel, Cobbles and Boulders of angular concrete with occasional steel rebar, rare metal and timber fragments and occasional rootlets, dry to slightly moist. Sand fine to coarse. Gravel fine to coarse. Concrete slabs up to 950 x 700 x 100mm. One limestone boulder (400 x 360 x 300mm) at base.	0.5
			14.79	1.10		Brown slightly silty gravelly SAND with low to medium cobble and boulder content, moist. Sand mostly fine to medium. Gravel fine to coarse. Gravel, cobbles and boulders angular to subangular dark grey limestone.	1.0
1.70 - 2.20 1.70 - 2.20	B3 D4			(1.15)			1.5
			13.64	2.25		Excavator refusal on dark grey limestone (Possible Bedrock) at 2.25m BGL. End of trial pit at 2.250m	2.0
							2.5
							3.0
							3.5
							4.0

Remarks	Water Strikes:		Stability: Slight spalling
	Struck at (m):	Remarks:	
		None	Width: 1.60 Length: 2.70

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Appendix F

Trial Pit Photographs



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

TP01	
CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	August 2025



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

TP01

CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	August 2025



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

TP01

CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	August 2025

RECEIVED: 28/05/2026



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

TP01

CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	August 2025



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

TP01

CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	August 2025



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

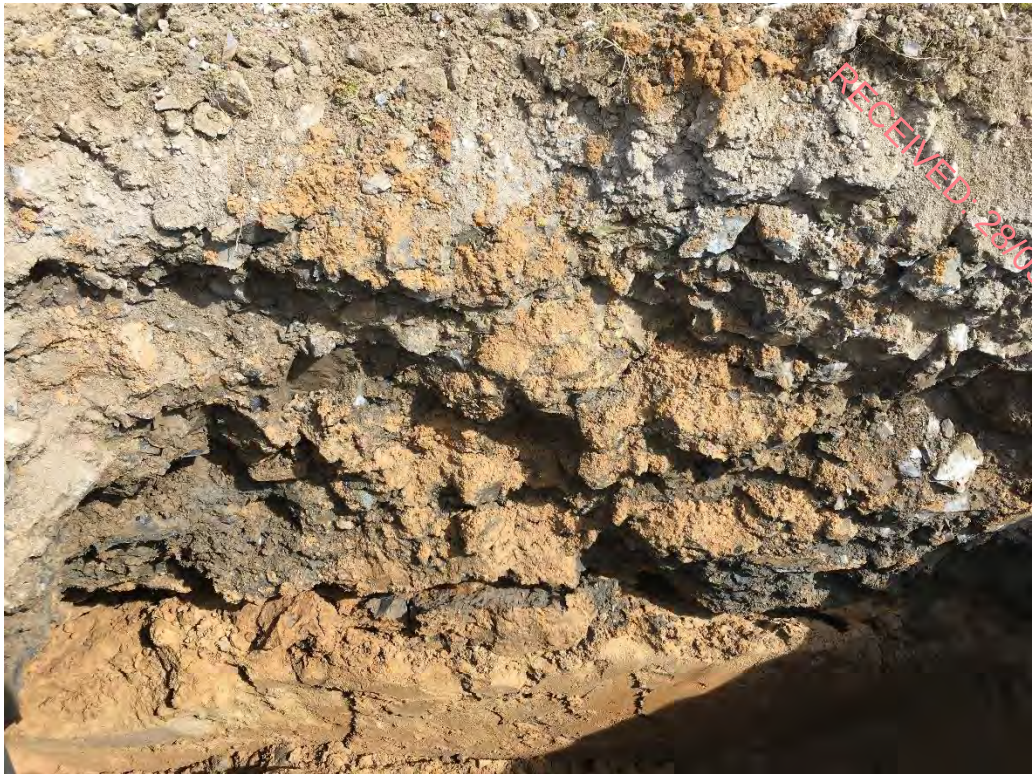
TP02

CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	August 2025



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

TP02	
CLIENT	Kirkland Investments
ENGINEER	Punch Consulting Engineers
DATE	August 2025



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

TP02

CLIENT Kirkland Investments	
ENGINEER Punch Consulting Engineers	
DATE	August 2025



Parkway Valley Phase 1,
Dublin Road, Singland,
Limerick

TP02

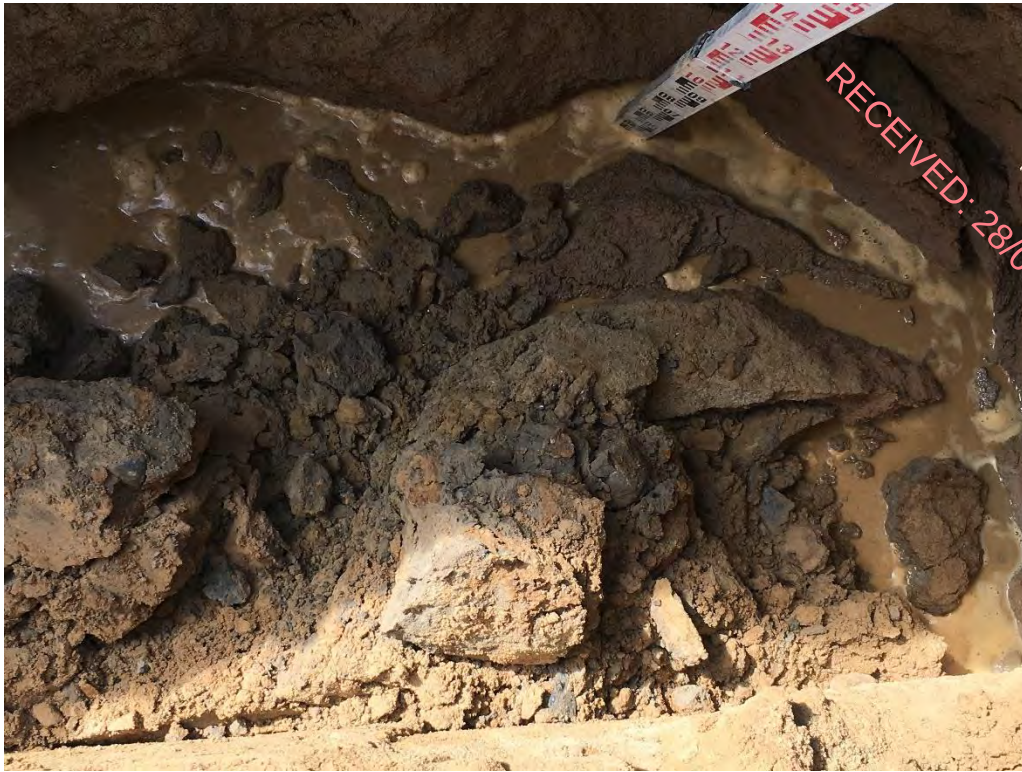
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