ardmore point

Phase 1 Desk Study Report
Taylor's Lane
Rathfarnham
Dublin

Client: MCCL

July 2021
Issue 2

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Phase 1 Desk Study
Taylor's Lane
Rathfarnham, Dublin

July 2021

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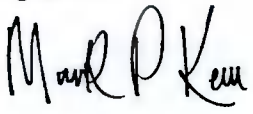
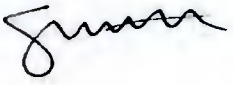
			Signature 	Signature 

Contents

Content of Tables

Appendices

1.0 Introduction

Ardmore Point Ltd was commissioned by MCCL, in December 2020, to complete a Phase 1 Desk Study for a site known as Taylor's Lane road, in Rathfarnham, Dublin, for a proposed new build Nursing Home Development.

This desk study has been prepared in accordance with British Standards BS5930:2015 and BS10175:2011+A2:2017 and all normative references, including Land Contamination Risk Management guidance, *Model Procedures for the Management of Land Contamination,* and local authorities as good practice in Scotland.

The desk study presents and discusses the available data obtained for the site and surrounding area's environmental, geological, and historical profile, which have been obtained from the available information Ardmore Point Ltd obtained. This desk study report identifies the potential environmental issues at the site and develops an initial conceptual site model (CSM) for geological environmental considerations.

A Phase 1 Desk Study Report is considered required prior to the development of the site to support the building warrant application. The Report is therefore designed to address the likely requirements for the building warrant to discharge any requirements for possible contamination risk.

This report has been prepared for MCCL and their appointed professional advisors and may not be relied upon by a third party for any purpose without the written consent of this practice.

2.0 Context & Purpose

2.1 Proposed Development

It is understood that MCCL propose to re-develop the site from industrial/ commercial use to a Nursing Home. The proposed development will include a multi-storey build, with accosiated access road, parking, green spaces and private gardens.

The proposed development intends to retain the existing entrance for the new development. There is a stream on site noted in the proposed site plan which is proposed to be utilised as a feature within the development.

The new build Nursing Home is a multi-storey build, including 90 bedrooms over the 3 storeys and 4 retirement cottages which will incorportate Newbrook House. Newbrook House will be carefully retained, protected and incorportated into the Nursing Home facility. Newbrook House is the listed build on site, located to the south-west of the site, which will be converting for Admin/ Visiting Lounge/ Dinning.

Below is an extract of the ground floor from the proposed site plan, a detailed proposed site plan is included in Appendix A.

2.2 Purpose

A Phase 1 Desk Study is required prior to the development of the site to support the planning application. The Report is therefore designed to address the likely requirements of the Phase 2 Ground Investigation for the building warrant to discharge any requirements for possible contamination risk. The assessment will adhere to the principal aims of BS 1075:2011 regarding the consideration of potential soil and groundwater contamination and ground gas.

In summary the Report will:

- Assess the likelihood of finding contamination, its nature and extent.
- Evaluate the environmental setting of the site and identify sensitive receptors.
- Consider the requirements for an intrusive Site Investigation and define key elements.

3.0 Scope of Work

The scope of works for the Phase 1 Desk Study is as follows:

3.1 Documentary Research

- Review the Site history, location & surroundings.
- Review the current Site use including adjacent areas.
- Review commercial database information, Geological Survey Spatial Resources, GeoHive Database
- Review relevant investigative reports conducted on the site and within the surrounding area.

3.2 Third Party Information

In completing this assessment, Ardmore Point Ltd has utilised the following information:

- Location Plan provided by Client's Architect.
- Proposed Site Plan provided by the Client's Architect.
- Historical Maps
- Geological Survey Spatial Resources
- GeoHive Database

3.3 Limitations

The Report provides an assessment of the potential contamination status of the ground below the site based upon the available information Ardmore Point Ltd obtained, reviewed, and evaluated in preparing this Report for the Client. Ardmore Point Ltd.'s conclusions, opinions and recommendations are based upon this information.

4.0 Site Setting

4.1 Site Location

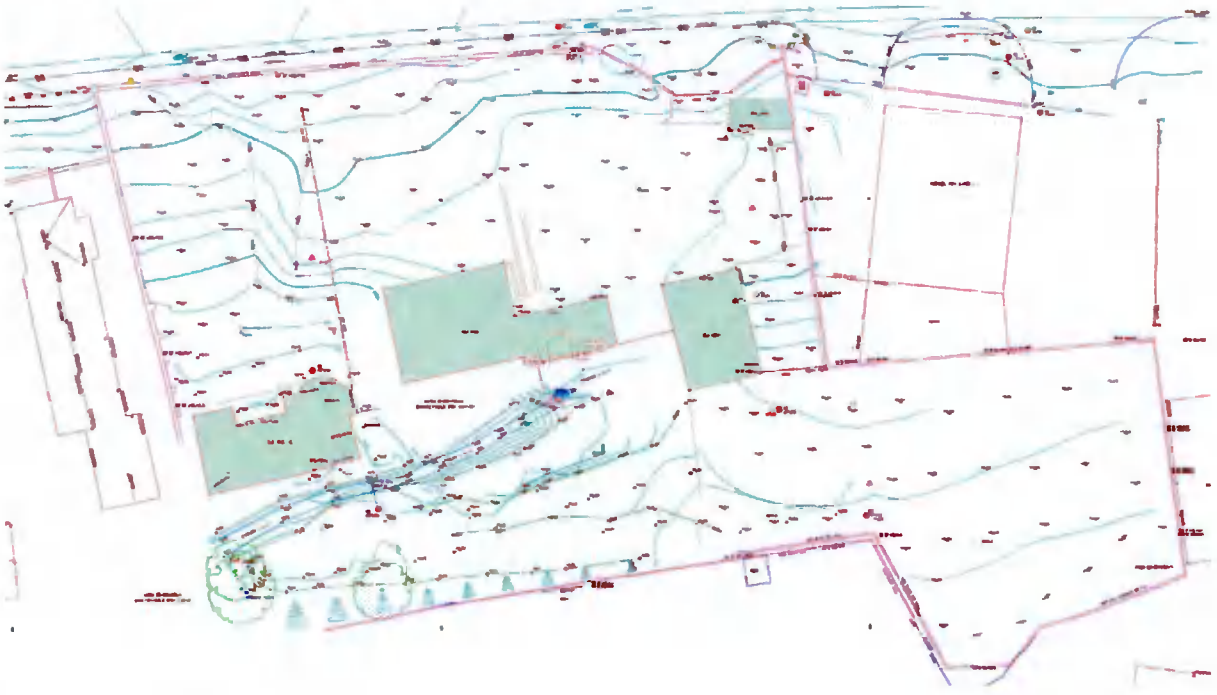
The site is located on Taylor's Lane road, in Rathfarnham, Dublin. The nearest postcode is D16 N9C2. The site is located in Dublin, approximately 4.4 miles south of the centre of Dublin. The site may be located by National Grid reference SG 141 846.

A site location plan showing the location of the site is included in Appendix B.

4.2 Site Description

The site is irregular in shape, with an area of approximately 0.63 hectares. The site is bounded on the north by Taylor's Lane, the west by a Petrol Station and the south and west by residential property. The site is a brownfield site. The was under a mix of built property, soft and hard landscaping. The site is gently sloping; there is an approximate 3.00m declining slope from south to north.

Below is an extract of the Topographical Survey, the detailed survey is included in Appendix C.



4.2.1 Existing Structures

Located to the south-west of the site is a build known as Newbrook House. Newbrook House is a Protected Structure and as such must be incorporated into the proposed development.

The build is described as a "Detached single- and two-storey house, c.1840. Roughcast rendered walls. Slate hung to west. Gothic windows with a Y-tracery, some set-in bow fronted elevation. Hipped slate roof, conical to bow, with chimney stack to rere."

The house is said to date back to the mid-18th Century, when Newbrook House and Kingston were built as part of the Newbrook Mill on Taylor's Lane.

The build was in visibly in poor condition, with significant cracking evident on the front elevation of the build.

4.3 Current Site Use

The site is currently derelict and in poor condition, formerly a Builders Merchant.

4.4 Site Walkover

A site walkover was conducted by an Ardmore Point representative in December 2020. The site is gated with security cameras, the site was accessed from the gated entrance on Taylor's Lane.

Overhead services were recorded on site, it is considered underground services will be on site for the existing build. The builds on site recorded as 'Old Sheds' are in poor condition, they are brick built, crumbling in places with collapsing roofs. The 'Old Sheds' are not considered safe for use. There is waste, such as timber, metal fencing in locations across the site.

4.4.1 Ecology & Archaeology

Following the initial site walkover it was found no areas of ecological or archaeological significance where found, further to this no examples of invasive plant species were identified, such as Japanese Knotweed or Giant Hogweed. The site will continue to be reviewed throughout the ground investigation and if findings change then the ground investigation will be adapted in accordance with BS 10175 and BS 5930.

4.5 Hydrology

It is known that an unnamed what feature is located on site as identifies within the proposed site plan and site topographical survey. The water quality of the water feature is unknown.

5.0 Geological Records

Geological records from the Geological Survey Spatial Resources were obtained and reviews by Ardmore Point for the site and surrounding area.

5.1 Superficial Geology

The Geological Survey Spatial Resources did not have any geological records for the superficial deposits on site or within the local area. Local knowledge would suggest that the site is underlain by clay.

5.2 Bedrock Geology

The Geological Survey Spatial Resources indicates that the site is underlain by:

- Granite and Slate Schist, Quartzite and Coticule formed approximately 100,000 years ago.
- Granite, Granodiorite and slate, schist and greywacke formed approximately 500,000 years ago.
- Siluro-Devonian granitic rocks & appinite and Lower-Middle Ordovician slate, sandstone, greywacke, conglomerate.

The Geological Survey Spatial Resources extracts are included in Appendix D.

5.3 Historical Site Investigation Records

The Geological Survey Spatial Resources did not record previous borehole records or intrusive ground investigation on site. An intrusive site investigation was recorded approximately 550m east of the site boundary, at St. Edna's Museum.

In May 2005 IGSL released a Site Investigation Report for a site at St Enda's Rathfarnham, the intrusive works included trial pits, dynamic probes, and window samples.

- The dynamic probe refused on hard ground between 2.20 to 3.00m.
- The window sample and trial pit exploratory holes all encountered stiff brown gravelly clay.

With consideration of the superficial deposits encountered within the IGSL Site Investigation, it is considered probable that the superficial deposits on site will be in line with those encountered at St Enda's Rathfarnham.

The Geological Survey Spatial Resources Historical Site Investigation Records are included in Appendix E.

6.0 Historical Settings

A review of the history of the site and surrounding radius has been conducted based on historical maps by GeoHive. Details of the findings are provided in the table below.

Table 1: Historical Land Uses

Date	Site Description	Regional Description
1837 - 1842	A Paper Mill is located to the west of the site. The east of site is undeveloped, assumed agricultural land. Potential water body on site.	A road bounds the site to the north. The surrounding area is predominantly undeveloped agricultural land. Paper mill recorded approximately 325m north-west. Cloth factory recorded approximately 590m north. Quarry recorded approximately 850m east.
1837 – 1842	No Change	No Change
1888 – 1913	Newbrook House noted on site. Development on Paper Mill. "Sluices" noted to the south and south-east of the site.	Residential developments on Taylor's Lane bounding the site. Surrounding area still predominantly undeveloped agricultural land with localised small developments.
1995	Paper Mill no longer recorded on site. Unknown development on site.	Surrounding area predominantly residential developments. Build noted east of site potential petrol station. Note: map provided is not annotated, no potential hazards specifically noted.
2000	Further development on site.	Build noted east of site potential petrol station. Potential car garage bounding the site to the east. Site bounded west and south by residential properties, north by Taylor's Lane and residential properties.
2005	No Significant Change	No Significant Change
2005 – 2012	No Significant Change	No Significant Change
2011 – 2013	No Significant Change	No Significant Change
2020	No Significant Change	Further development in all directions. Petrol Station noted bounding the site to the east. Car wash, tyre shop and coach company bounding the site to the east. Note: extracted from Google Maps

Extracts of the Geohive Historical Maps are included in Appendix F.

From a review of the available historical maps a series of potential hazards and contaminative sources were identified. An active petrol station is located bounding the site to the east, the petrol station was first recorded in 1995 but may have been active years prior. Bounding the site to the east is an active car wash, tyre shop and coach company, identified in the 2020 maps. These potential sources of contamination are still active; these builds were recorded on historical maps; the original use of the builds is unknown.

To summarise the potential sources of contamination identified off-site from historical maps include petrol station, car wash, tyre shop and coach company.

7.0 Hydrology & Flooding

A search was made of records held by the various regulatory authorities and other statutory bodies to determine the prevalent hydrological features surrounding the site. It should be noted that a flood risk assessment is out with the scope of this report.

7.1 Local Hydrology

It is known an unnamed water feature exists on site, considered to be a stream as noted in the proposed site plan.

7.2 Groundwater Flooding

From review of the Geological Survey Ireland Spatial Resources the site is not considered to be a groundwater flood zone and is not considered to be within 250m a groundwater flood zone from the following searches:

- Groundwater Flooding Data (GSI)
- Groundwater Flooding Probability Map (GSI)
- Groundwater Flooding High Probability (GSI)
- Groundwater Flooding Medium Probability (GSI)
- Groundwater Flooding Low Probability (GSI)
- Historical Flooding (GSI)
- Maximum Historical Groundwater Flooding (GSI)
    - Groundwater
    - Groundwater/ Surface Water

The Geological Survey Spatial Resources Groundwater Extracts are included in Appendix G

7.3 Hydrography

From review of the GeoHive Hydrography Maps it is considered no hydrographic features have been identified from the following searches:

- Marine Institute – Biologically Sensitive Area
- Boundaries Seawater Line
- Dive Sites
- Flood Maps
- Marine Institute – Greencastle Codling Protected Area
- Inland Fisheries Ireland – Angling Structures
- Lakes and Resevoirs
- Marine, Bouy, Donegal County Council
- Mean Wave Period
- Marine Institute – Sea Areas
- Sea Surface Salinity
- Sedimentary Samples
- Significant Wave Height
- Straight Baselines
- Survey Coverage

8.0 Environmental & Geological Hazards Assessment

Potential sources of contamination and contaminants at and within the site boundary are summarised in the table below. These are based on the desk study data obtained and published guidance. Potential sources of contamination on site and within 100m of the site were considered – builders' merchant, car garages, tanks, and car dealerships.

Table 2: Hazard Assessment – Source, Pathway, Receptor

Source	Potential Contamination of Concern		Potential Pathways	Receptor Group
The potential sources of contamination on site and within 100m of the site were considered: • builders' merchant • car garages • tanks • car dealerships • unidentified potential contaminative sources	**Metals** • Arsenic • water soluble boron • cadmium • chromium • copper • lead • mercury • nickel • zinc **Inorganic** • total cyanide • organic matter • Sulphate Aqueous Extract as SO4 Others **Petroleum Hydrocarbon** • Aliphatic C5-C6 • Aliphatic C6-C8 • Aliphatic C8-C10 • Aliphatic C10-C12 • Aliphatic C12-C16 • Aromatic C5-C7 • Aromatic C7-C8 • Aromatic C8-C10 • Aromatic C10-C12 • Aromatic C12-C16 • Aromatic C16-C21 • Aromatic C21-C35	**PAHs** • Naphthalene • Acenaphthylene • Acenaphthene • Fluorene • Phenanthrene • Anthracene • Fluoranthene • Pyrene • Benzo(a)anthracene • Chrysene • Benzo(b)fluoranthene • Benzo(k)fluoranthene • Benzo(a)pyrene • Indeno(1,2,3-c,d)pyrene • Dibenzo(a,h)anthracene • Benzo(g,h,i)perylene • Total PAH - USEPA 16 **Asbestos** • Chrysotile • Amosite • crocidolite • anthophyllite • tremolite • actinolite	Others • Ingestion of contaminated soil • Ingestion of vegetables grown in contaminated soil • Entry of contaminants by skin or eye contact with contaminated soils or dust • Inhalation of contaminated dust • Inhalation or migration of toxic/ explosives gases/ vapours	Humans • Site users • Construction workers • Neighboring site users
			• Lateral Migration • Surface run-off Infiltration	Water Environment • Groundwater •Surface Water
			Direct contact or contaminants with building materials	Buildings, Materials and Services • Concrete • Plastic pipes & services

9.0 Preliminary Concept Site Model

9.1 General

In line with existing legislation and the current good practice guidance for the management of contaminated land, assessments are undertaken using a risk-based approach. It is necessary to define a Conceptual Site Model (CSM) for the site which identifies the potential sources of contamination, the receptors and the pathways that can connect them. For there to be a risk from contamination, one or more relevant pollutant linkages must exist, connecting a contamination source, a receptor (an entity which might be affected by the contamination) and a pathway (or mechanism) by which the receptor can be exposed to the contaminant.

A discussion of potential sources, pathways and receptors and a tabulated summary of the CSM indicating potential pollutant linkages follow below. The criteria used for assessing the relevance of identified potential pollutant linkages are based on the objectives stated above. It is understood that the proposed end use of the site will be for the development of a Residential Care Home.

9.2 Potential Sources of Contamination

Potential sources of contamination are usually associated with current and former industrial activities, where the processing, storage, use, transportation and disposal of raw materials, products and wastes often leads to the contamination of underlying ground and groundwater. In addition, natural processes can also give rise to contamination such as hazardous gases.

9.2.1 Potential Sources of Contamination – On Site

The desk-based research identified potential contaminant sources on site. It is known the site is a brownfield site, with made ground on site. Further, the site is a former Builders Merchant. Potential contaminative sources may be present within the made ground on site or from remnants from when the site was an active Builders Merchant.

There is a risk of asbestos in new on site within the rubble from the demolished Builders Merchant or buried within the made ground, including: petrol station car wash, tyre shop and coach company

9.2.2 Potential Sources of Contamination – Off Site

Many of the potential current and historical off sites sources of contamination have been discounted due to the distance and direction (e.g., down inferred topographic and groundwater flow gradient) from site. From the desk-based research potential contaminant sources were identified off-site that may become a potential source of contamination on site.

9.3 Potential Migration Pathways

Without a potential migration pathway to connect the contaminant from the receptor then there is no risk. Although potentially contaminative sources have been identified, there may be sources of contaminants yet unidentified. As such potential pathways have been considered to assess the risk to people and the local environment. The following potential pathways:

- Ingestion of contaminated soil
- Ingestion of vegetables grown in contaminated soil
- Entry of contaminants by skin or eye contact with contaminated soils or dust
- Inhalation of contaminated dust

- Inhalation or migration of toxic / explosives gases / vapours
- Lateral Migration
- Surface run-off Infiltration Direct contact
- Contaminants with building materials

9.4 Potential Receptors

All potential receptors have been identified and categorised as follows:

9.4.1 Human Receptor

- Workers on site any stage of development on site
- Workers in neighboring businesses
- Residents in neighboring properties

9.4.2 Water Receptors

- Surface water on site
- Ground water
- Local watercourses

9.4.3 Property, buildings, structures & services

- Any structure that is constructed on site, including below ground structures and foundations (particularly concrete).
- Construction material associated with any structures
- All utility services

9.5 Hazard Assessment

The research has identified potential sources of contamination on site. These findings suggest that the site may be classified by the Local Authority as 'Contaminated Land'.

9.6 CSM Summary

Table 3: Preliminary Concept Site Model

Source	Pathway	Receptor
Potential contaminative sources	Human Receptor	Workers on site any stage of development on site
		Workers in neighboring businesses
		Residents in neighboring properties
	Water Receptors	Surface water on site
		Ground water
		Local Watercourses
	Environmental Receptors	The made ground on the surface strata on site
		Subsoils in deeper strata
		Plants and animals on site and within the area
		Aquatic life in the local watercourses and water bodies
	Property, buildings, structures, and services	Any structure that is constructed on site, including below ground structures and foundations (particularly concrete).
		Construction material associated with any structures
		All utility services

9.7 Mitigating Measures

As good practice the Phase 2 investigation works should include contamination testing on site. All future construction workers should remain vigilant to the possible risk of encountering isolated areas of

contaminated material. Should potentially contaminated material be encountered, further testing may be required to assess the risk to health and safety of the site workers and the environment.

Good site working practices should be followed at all times, including:

- Use of appropriately qualified personnel for the task.
- Use of appropriate personal protective equipment.
- Provision of on-site washing facilities.
- Maintenance of a high standard of basic hygiene.
- Implementation of a non-smoking and eating policy within the working area, with designated clean areas set aside for these activities.
- Ensuring good hygiene is enforced on site and washing facilities are maintained on the site. Workers are discouraged from smoking, eating, or drinking without washing their hands first.

10.0 Preliminary Risk Assessment

10.1 Assessment of Environmental Risks Methodology

The identification of potential pollutant linkages is a key aspect of the evaluation of potentially contaminated land. An approach based on CIRIA report C552 has been adopted. For each of the pollutant linkages, an estimate is made of the potential 'Severity of Risk' and the 'Probability of Risk Occurring'. These are then used for an overall qualitative evaluation of the level of risk, as defined below in tables taken from CIRIA report C552.

Table 4: Preliminary Risk Assessment – Severity of Risk

Risk factor	Typical Examples
Severe	Acute risks to human health. Major pollution of the water environment.
Medium	Chronic (long-term) risk to human health. Pollution of the water environment.
Minor	Damage to non-sensitive species or ecosystems, buildings, or services.

Table 5: Preliminary Risk Assessment – Probability of Risk Occurring

Probability Rating	Description
High Likelihood	Pollutant linkage may be present, and risk is almost certain to occur in the long term, or there is evidence of harm to the receptor.
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term.
Low Likelihood	Pollutant linkage may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so.
Unlikely	Pollutant linkage may be present but the circumstances under which harm would occur are improbable.

Table 6: Preliminary Risk Assessment – Risk rating Evaluation

		Severity		
		Severe	**Medium**	**Minor**
Probability	**High Likelihood**	Very High Risk	High Risk	Moderate/ Low Risk
	Likely	High Risk	Moderate Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/ Low Risk	Very Low Risk
	Unlikely	Moderate/ Low Risk	Low Risk	Very Low Risk

10.2 Preliminary Risk Assessment

The following table details the potential risks associated with the various potential pollutant linkages identified through the assessment of the data collated in this report. The risk category should be reviewed if further information is made available or the environmental setting of the site changes, for example through a proposed change in the development layout or end use.

10.2.1 Preliminary Risk Assessment – Water Receptor

Table 7: Preliminary Risk Assessment – Water Receptor

Source	Pathway	Receptor	Severity	Probability	Risk Rating	Comment
Potential Sources of Contamination	Leaching and downward migration of contaminants in soils.	Made ground on the surface strata on site Subsoils in deeper strata	Medium	Low Likelihood	Low/ Moderate Risk	The presence of contamination within soil and groundwater beneath the site are currently unknown. It is possible that contaminants may contaminate the receptors however there is no certainty at this time. In addition, it is considered that the presence of made ground and hardcore at surface level on site will help to mitigate the downward migration of contamination into underlying shallow soils/ groundwater. On this basis the risk to groundwater beneath the site is low to moderate.
	Lateral groundwater migration Migration via man made pathways (services, service trench backfills) Surface water run off	Unnamed land drains/ ditches Local Water Features	Medium	Low Likelohood	Low/ Moderate Risk	As discussed above, the presence of contamination within soil and groundwater beneath the site are currently unknown. Given the site is derelict any potential contaminative sources on site have sat dormant for some time, assuring standard safety protocols are followed during the intrusive site investigation it is considered the risk of substances derived from the site impacting these water features is low.

10.2.2 Preliminary Risk Assessment – Human Receptor

Table 8: Preliminary Risk Assessment – Human Receptor

Source	Pathway	Receptor	Severity	Probability	Risk Rating	Comment
Potential Sources of Contamination	Soil Ingestion Dermal contact Inhalation of soil dust/ vapours Permeation/ corrosion of water supply pipes	Construction workers Future site users Neighboring site users	Severe	Low likelihood	Moderate Risk	The presence of contamination within soil and groundwater beneath the site are currently unknown. Given the current and historical use of the site it is considered that contaminants may potentially be present beneath the site. It is not known if asbestos is present on site in the soil, there is a risk that asbestos may be present in the soil. Construction workers should be made aware of the possibility of encountering unexpected contamination and a watching brief should be maintained during any excavation works undertaken at the site. Construction workers should also be provided with appropriate levels of PPE and follow personal hygiene protocols.
	Consumption of home grown produce	Future site users	Medium/ Severe	Unlikely	Low Risk/ Moderate	It is considered superficial deposits currently present at the site will be unsuitable as a growing medium as the site surface level is made up of made ground and hard landscaping. It is considered at this time that home grown produce will not be grown in the new proposed development. On this basis the risk is low/ moderate.
	Generation and migration of ground gases.	Construction workers	Medium	Low Likelihood	Low / Moderate Risk	Made ground may potentially be a sources of ground gas on site or in the immediate surrounding area. Ground gas may also be present in any areas of unidentified contamination. The risks from hazardous ground gases are low to moderate.

11.0 Conclusion

11.1 General

Current Site Use: The site is currently derelict and in poor condition, formerly a Builders Merchant.

Proposed Development: It is understood that MCCL propose to re-develop the site from industrial/ commercial use to a Nursing Home. The proposed development will include a multi-storey build, with accosiated access road, parking, green spaces and private gardens.

The proposed development intends to retain the existing entrance for the new development. There is a stream on site noted in the proposed site plan which is proposed to be utilised as a feature within the development.

The new build Nursing Home is a multi-storey build, including 90 bedrooms over the 3 storeys and 4 retirement cottages which will incorportate Newbrook House. Newbrook House will be carefully retained, protected and incorportated into the Nursing Home facility. Newbrook House is the listed build on site, located to the south-west of the site, which will be converting for Admin/ Visiting Lounge/ Dinning.

11.2 Site Setting

Location: Taylor's Lane road, in Rathfarnham, Dublin

Topography: The site is gently sloping; there is an approximate 3.00m declining slope from south to north.

Geology:
Superficial Geology – the site is underlain by clay
Bedrock Geology – the site is underlain by Granite

11.3 Hydrology

It is known an unnamed water feature exists on site, considered to be a stream as noted in the proposed site plan.

11.4 Contaminated Land

The potential sources of contamination on site and within 100m of the site were considered – builders' merchant, car garages, tanks, and car dealerships.

11.5 CSM Risk Assessment

The presence of contamination within soil and groundwater beneath the site are currently unknown. It is possible that contaminants may contaminate the receptors however there is no certainty at this time.

In addition, it is considered that the presence of made ground and hardcore at surface level on site will help to mitigate the downward migration of contamination into underlying shallow soils/ groundwater. On this basis the risk to groundwater beneath the site is low to moderate.

Given the site is derelict any potential contaminative sources on site have sat dormant for some time, assuring all relevant safety protocols are followed during the intrusive site investigation it is considered the risk of substances derived from the site impacting these water features is low.

Construction workers should be made aware of the possibility of encountering unexpected contamination and a watching brief should be maintained during any excavation works undertaken at the site. Construction workers should also be provided with appropriate levels of PPE and follow personal hygiene protocols.

It is considered superficial deposits currently present at the site will be unsuitable as a growing medium as the site surface level is made up of made ground and hard landscaping. It is considered at this time that home grown produce will not be grown in the new proposed development. On this basis the risk is low/ moderate.

Made ground may potentially be a sources of ground gas on site or in the immediate surrounding area. Ground gas may also be present in any areas of unidentified contamination. The risks from hazardous ground gases are low to moderate.

11.6 Recommendations

The actual presence of contamination in, on, or under the ground can only be confirmed by an intrusive site investigation. Based on the findings of the above it is recommended that an intrusive investigation is undertaken to assess the condition of soil beneath the site.

The site is considered a brownfield site. It is recommended an intrusive site investigation is undertaken to assess ground conditions, strength, and contamination. The intrusive site investigation should include sampling and laboratory analysis as good practice.

The data obtained from these works will be used to refine the conceptual site model and gather geotechnical and environmental information to assess any potential risks with respect to future site users, construction workers and water environment receptors pertinent to the site.

12.0 References

CLR 3, 'Documentary Research on Industrial Sites', Report by RPS Consultants Ltd, DoE 1994

Geology of Britain viewer | British Geological Survey (BGS)

CLR 11, 'Model Procedures for the Management of Land Contamination', Report by Defra and the Environment Agency, 2004

SEPA Water Quality Classification. https://www.sepa.org.uk/data-visualisation/water-classification-hub/

BS 5930:2015: Code of practice for ground investigations. British Standards Institution.

BS 10175:2011+A2:2017: Investigation of Potentially Contaminated Sites – Code of Practice. British Standards Institution.

CIRIA: 2004: Contaminated Land Risk Assessment. A Guide to Good Practice. C552. Construction Industry Research and Information Association.

EA: 2004: Model Procedures for the Management of Land Contamination. Environment Agency. Bristol. 2004.

Geological Survey Ireland Spatial Resources https://dcenr.maps.arcgis.com/apps/MapSeries/index

GeoHive DataBase https://geohive.ie/

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Appendix A:
Proposed Site Plan

Holmes Miller

4801 - Newbrook House Luxury Suites

4801-SK-001 - SKETCH SITE LAYOUT

Appendix B:
Site Location Plan


Glendoher Park
Glendoher Park
Whitecliff
Whitecliff
Whitecliff
Kelly Brothers Limited
Taylor's Ln
Taylor's Ln
Taylor's Ln
Taylor's Ln
Taylor's Ln
Taylor's Ln
Taylor's Ln
Taylor's Ln
Morlons Coaches Dublin
Taylors Lane R133
Palmer Park
Palmer Park
Kingston Ct
Palmer Park
Palmer Park
Palmer Park
Pearse Brothers
Google

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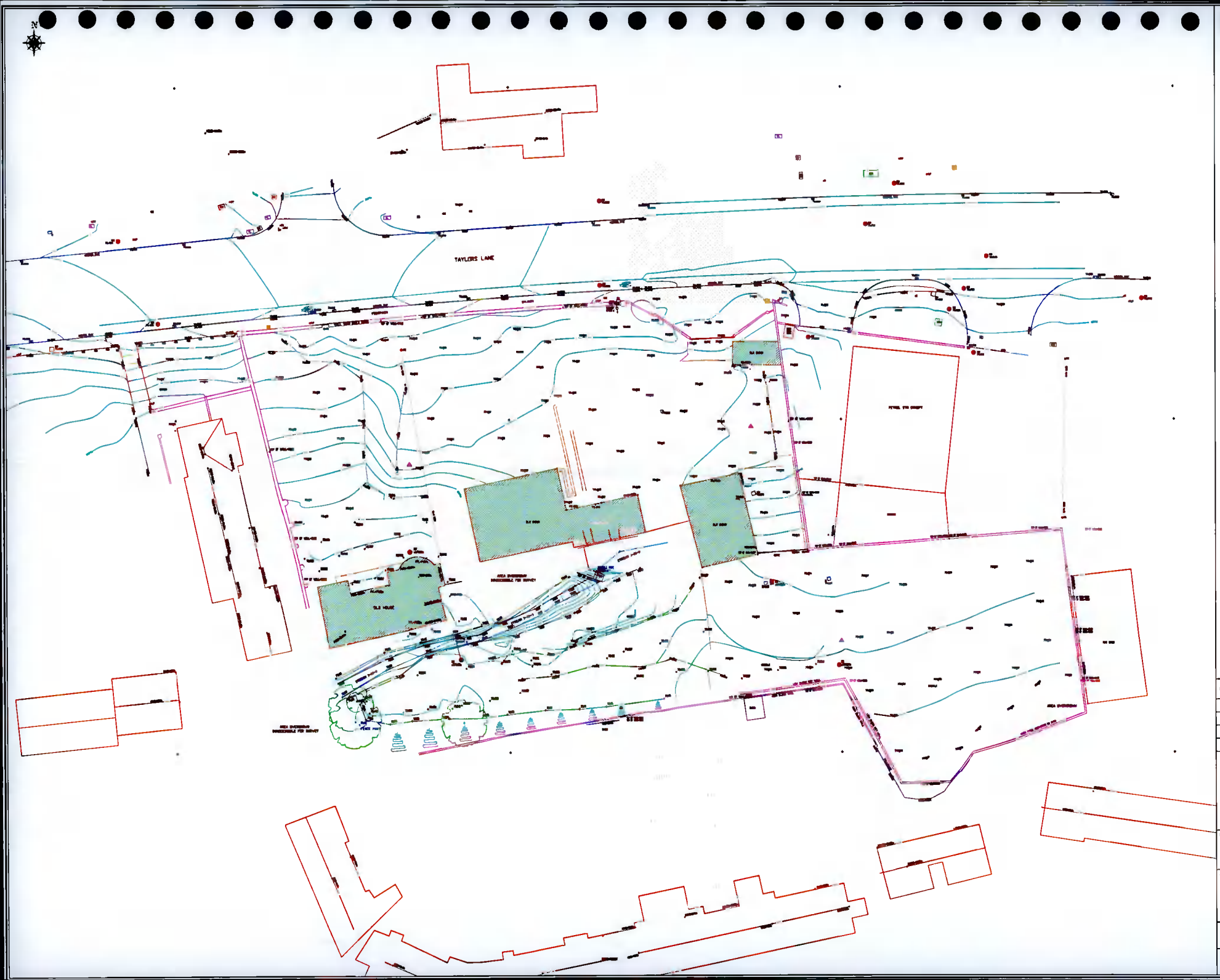
Appendix C:
Topographical Survey

July 2021
Issue 2



ABBREVIATIONS

AJ	Armstrong Junction	MH	Manhole Cover
BE	Bench	M	Monument
B	Building	NTL	NTL Cover
BC	Building Canopy	PB	Phone Box
BI	Litter Bin	P	Post
BM	Benchmark	POST	Post Box
BO	Bollard	PE	Electric Pole
BT	Bar	ROD	Earthing Rod
BS	Bus Stop	RC	Road Crown
CPS	Concrete Paving	RE	Road Edge
DP	Down Pipe	RES	Residential
D	Drain	RL	Railing
EM	Eircom Cover	RS	Road Sign
EB	O/H Electric Cover	S	Sign
OH E M	Eircom Line	SC	Stopcock
OH E M	O/H Electric Line	SV	Stuice Valve
F	Fence	ST	Steps
FL	Finish Floor Level	TR	Traffic Cover
FB	Fibre Box	TL	Traffic Light
GMTE	Gate	TM	Ticket Machine
GB	Gas Cover	T	Tree
G	Gully	TW	Wall
H	Fire Hydrant	TAC	Tactile Paving
IC	Inspection Cover	V	Vegetation Line
KC	Kerb Channel Line	W	Water Cover
K	Kerb Top	WT	Wall Top Level
LP	Lamp Post	Thres	Doorway Threshold

DATUM

BENCHMARK BASED ON ORDNANCE DATUM MALIN HEAD (OSGM02)
SURVEY GRID IS IRISH TRANSVERSE MERCATOR
Part Survey by GPS (VRS) with commensurate accuracies

REV SURV	DATE	INIT	REVISION DETAIL
A	18/03/19	KOS	SURVEY TO REAR EXTENDED

Laser Surveys
SUITE 12, BLOCK 1, BROOMHALL BUSINESS PARK,
RATHNEW, CO. WICKLOW
Tel: 0404 61401 Fax: 0404 61402
Mobile: 087 236 4811 Email: karen@lasersurveys.ie

BUILDER/ARCHITECT

bbii Architecture

JOB TITLE

Site Survey
Taylors Lane, Rathfarnham
Dublin

PROJECT No		SCALE	DATE
1902 905_ITM Survey_2D		1:250	03/03/19
SURVEYOR	DRAWN BY	DRAWING No	SHEET SIZE
KOS	CD	905_01_2D	A1

ardmore point

Appendix D:
Geological Records

July 2021
Issue 2

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Appendix C – Extractions from Geological Maps

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Appendix C – Extractions from Geological Maps
Bedrock Geological Deposits formed 100,000 years ago

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Appendix C – Extractions from Geological Maps

Bedrock Geological Deposits formed 500,000 years ago

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Appendix C – Extractions from Geological Maps

Bedrock Geological Deposits formed 1,000,000 years ago

ardmore point

Appendix E:
Historical Site Investigation Report

July 2021
Issue 2

Report on a Site Investigation
At
St. Enda's Rathfarnham
for
ESBI and OPW

Contents

Appendices

Report on a Site Investigation
at
St.Enda's Museum
Rathfarnham
for
The Office of Public Works
and
ESBI Consulting Engineers

Report No. 10747 May 2005

1 Introduction

The existing museum at St.Enda's in Rathfarnham, Dublin is to be developed by construction of a new entrance and new four storey lift and stairwell.

An investigation of sub soils in the area of development has been ordered by ESBI Engineers, on behalf of the Office of Public Works. This work was carried out by IGSL in April 2004 and consisted of a series of heavy duty Dynamic Probes to assess soil strength and Window Samples to assist in soil identification. Trial Pits were opened by a light excavator at a number of locations to examine existing foundations and to assess stratification.

This report details the findings of the investigation and comments on these relative to the new development.

2 Fieldwork

The site is located at Rathfarnham in Dublin, the development is being undertaken at St.Enda's Museum. Trial Pits, Probes and Window Samples were taken in positions indicated on the site plan enclosed with this report. Work was carried out on paved or grass areas. Protective measures were taken during the investigation to protect lawn and other surfaces.

Dynamic Probes

A tracked Competitor Probe Rig was used to establish a strength/depth pattern at each location. A 50kg hammer falling through 500mm is used to drive a 43.7mm diameter cone into the soil.

Probing is in accordance with the DPH specification of BS 1377: Part 9: 1990. In these tests, the soil resistance is measured in terms of the number of drop-hammer blows required to drive the test probe through each 100 mm increment of penetration. The results are presented in both graphical and tabular form in Appendix 1. Probing is generally terminated following successive blow counts in excess of 25, to avoid damage to the apparatus.

Where very soft soils are encountered, the probe may penetrate the soil under self-weight and blow counts of zero may be entered where this happens. Blow counts of zero do not signify a void, unless specifically mentioned.

The probes indicated the presence of soft surface material from ground level to depths of up to 0.50 metres. Firm material is then encountered and probing continued to stiffer soils at about 1.00 to 1.20 metres. Probe refusal in hard ground was recorded at depths between 2.20 and 3.00 metres. The final refusal depths should not be taken as indicative of bedrock.

Window Samples

While the Dynamic Probe gives detailed data on relative soil strength, samples are not recovered for visual assessment and identification. Consequently 100mm diameter soil cores were taken adjoining the probe locations.

Samples are recovered as core and retained in plastic liners. These liners are returned to the laboratory and extruded under geotechnical supervision. Detailed logs are prepared, these are enclosed in Appendix II. Sub samples from the cores are selected for laboratory classification analysis.

Top soil is noted overlying firm sandy clay in WS1 and WS2, while top soil covers made ground at WS3. Stiff brown gravelly clay is encountered in all three locations at respective depths of 0.70, 0.80 and 1.10 metres. This material is a glacial till, locally referred to as brown boulder clay.

Sampling was terminated when cobbles or boulders in the glacial clay prevented further advancement. A maximum depth of 2.70 metres in the stiff brown gravelly clay was recorded in WS 1.

Trial Pits

A light rubber-tracked Mini Digger was used to open trial pits both in open areas and close to structures to examine stratification and expose existing foundations in a total of seven locations. This work was carried out under the direction of a senior geotechnical engineer, who carefully logged stratification and, where relevant, recorded dimensions of existing foundations.

Detailed records are presented in Appendix III. In several locations stiff gravelly clay was noted below surface fill and excavations were terminated in this stratum. In other positions excavations were terminated on made ground deposits.

3 Laboratory

Soil samples were taken from window samples and also recovered from the trial pits. Laboratory tests have been carried out on the brown gravelly clay to determine classification and grading parameters.
Chemical tests have also been carried out, both on the fill and made ground, to establish sulphate and pH values.
Laboratory test results are contained in Appendix IV and are briefly discussed in the following paragraphs.

Classification

Liquid and plastic limits have been determined for samples of the brown gravelly clay. Results are plotted on the Casagrande Chart, closely grouped in the CL zone. This confirms that the soils are of uniform origin, of low plasticity and sensitive to moisture content variation.

Grading

The particle size distribution for the gravelly clay has been determined for one sample using wet sieve and hydrometer analysis. The soil is evenly graded from the coarse gravel to the clay fraction.

Chemical

One sample of original clay and one sample of made ground had pH and Sulphate concentrations determined. Low sulphates and near neutral pH values were recorded.

Results obtained from the limited test schedule are typical of the glacial till (boulder clay) deposits of the Dublin area.

4. Discussion

The investigation has been carried out to determine soil stratification and characteristics at the proposed development at St.Enda's in Rathfarnham.

Trial pits have been opened to expose existing foundations and factual data on these excavations is enclosed in Appendix III.

Window Samples and Trial Pits 1 and 3B have all encountered stiff brown gravelly clay at depths varying from 0.70 to 1.10 metres. This stratum continues to 2.70 metres at WS 1.

Heavy Duty Dynamic Probing taken adjoining the Window Samples confirms the stratum as stiff, generally below 1.00 metres. Probing continued to a maximum depth of 3.00 metres.

Trial Pits 2, 4 and 6 were terminated in fill material at depths of 1.30 to 1.35 metres. The stiff brown gravelly clay would be expected to underlie the fill.

Foundations for any new development should be placed on the stiff gravelly clay (boulder clay or glacial till).

In situ and laboratory data indicates an allowable bearing pressure of 150 kN/sq.m. for conventional strip or pad foundations placed on this stratum. A general formation depth of about 1.00 to 1.20 metres is indicated, however this may deepen locally in areas where fill thickness increases.

An increase in allowable bearing is available with penetration of the glacial till. 200kN/sq.m. can be taken for foundations placed 600 to 750mm into the stratum.

Settlement in the pre-consolidated glacial clay will be low under the above loading and differential movement will be negligible.

Because of the variability in the thickness of fill encountered, careful visual examination of formation excavation is recommended to ensure uniformity and suitability of the founding medium. Any soft or suspect material should be removed and replaced by low-grade concrete.

All formation excavations should be protected from deterioration (rainfall) by blinding, or concrete placed as soon as practical after excavation.

While standard foundation excavations should remain stable in the short term, vertical support of deeper excavations may be required. Standard safety regulations prohibit personnel entering unsupported excavations greater than 1.20 metres, irrespective of soil type.

Chemical tests indicate that no special precautions are necessary to protect sub surface concrete from sulphate aggression.

IGSL/JC
MAY 2005

APPENDIX I

DYNAMIC PROBES

REPORT NO. 10747	DYNAMIC PROBE RECORD	IGSL Ltd.

CONTRACT:	St. Endas Museum, Rathfarnham	Probe No.:	DPI
		Sheet:	Sheet 1 of 1
CLIENT:	OPW	Probe Type:	Terrier 2000
ENGINEER:	ESBI	Date Started:	09/05/2005
CO-ORDINATES:	E - N -	Date Completed:	09/05/2005
HAMMER MASS (kg): 50.0 INCREMENT SIZE (mm): 100 FALL HEIGHT (mm): 500		Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples: Ref. No.	Samples: Type	Samples: Depth (m)	Probe Readings (blows / increment)	Graphic Probe Record (>25 blows is refusal)
0.0	Final depth 2.70 m								0	
									0	
									0	
									3	
									2	
									3	
									6	
									7	
									8	
1.0									7	
									8	
									8	
									7	
									11	
									20	
									15	
									10	
									11	
									12	
2.0									11	
									10	
									12	
									18	
									12	
									19	
									21	
									25	
3.0										
4.0										

Probe Type:DPH

Graphic Probe Record (>25 blows is refusal) 5 10 15 20 25

Groundwater Observations:

Remarks:

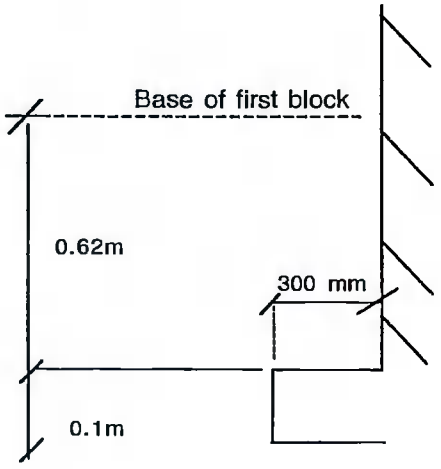
TRIAL PIT RECORD /FOUNDATION INSPECTION

I.G.S.L.

Contract: St. Endas Museum	PIT No.: TP1
No.: 10747	Sheet: 1 of 1
Location: Rathfarnham	Excavation method: Mini digger and hand
Engineer: EBSI	Ground Level:
Date: 10/5/05	

Description	Red. Level	Legend	Depth	samples Ref. No.	samples Type	samples Depth	Remarks
TOPSOIL			0.20				
MADE GROUND containing black clay, sand, gravel, red brick, granite cobbles, concrete blocks, roots and metal			0.75				
Very stiff brown sandy gravelly CLAY with cobbles			0.90				
End of trial pit at 0.9m							

Foundation Details:



Remarks	Groundwater Conditions
Located in walled garden 4.4m from corner of building	No groundwater encountered
	Logged by: Jennifer Felton

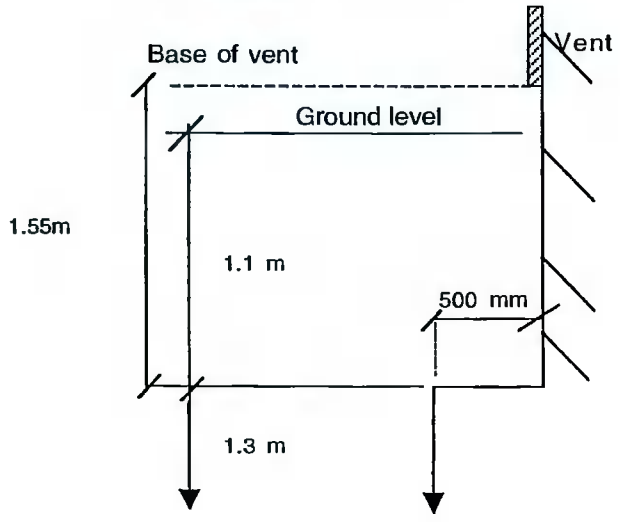
TRIAL PIT RECORD /FOUNDATION INSPECTION

I.G.S.L.

Contract: St. Endas Museum	PIT No.: TP2
No.: 10747	Sheet: 1 of 1
Location: Rathfarnham	Excavation method: Mini digger and hand
Engineer: EBSI	
Date: 10/5/05	Ground Level:

Description	Red. Level	Legend	Depth	samples Ref. No.	samples Type	samples Depth	Remarks
MADE GROUND containing black clay, sand, gravel, red brick, granite cobbles and boulders (750mm diameter), concrete blocks, roots and metal			0.20				
End of trial pit at 1.3m			1.30				

Foundation Details:



Remarks	Groundwater Conditions
Located against in walled garden at corner of old and new building Base of foundation not located	Water pooling on top of foundation Drain pipe located in excavation Turned on tap in upstairs bathroom for 30 mins Caused more water to appear on foundation
	Logged by: Jennifer Felton

REPORT NO. 10747	TRIAL PIT RECORD	IGSL Ltd.

CONTRACT:	St. Endas Museum, Rathfarnham	Trial Pit No.:	TP3A
		Sheet:	Sheet 1 of 1
CLIENT:	OPW	Excavation Method:	Mini digger
ENGINEER:	ESBI	Date Started:	10/05/2005
		Date Completed:	10/05/2005
CO-ORDINATES:	E - N -	Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Ref. No.	Type	Depth (m)		
0.0	TOPSOIL									
	MADE GROUND containing clay, sand, gravel and concrete		0.30							
	MADE GROUND (concrete slab)		0.74							
	End of Trial Pit at 0.75 m		0.75							
1.0										
2.0										
3.0										
4.0										

Groundwater Conditions: No Groundwater encountered

Stability: Stable

Remarks: 14.0m from corner of building, 14.0m from centre of octagonal platform. Located in lawn - sod and topsoil placed to one side during excavation

REPORT NO. 10747	TRIAL PIT RECORD	IGSL Ltd.

CONTRACT:	St. Endas Museum, Rathfarnham	Trial Pit No.:	TP3B
		Sheet:	Sheet 1 of 1
CLIENT:	OPW	Excavation Method:	Mini digger
ENGINEER:	ESBI	Date Started:	10/05/2005
		Date Completed:	10/05/2005
CO-ORDINATES:	E - N -	Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Ref. No.	Type	Depth (m)		
0.0	MADE GROUND consisting of hardcore and tarmacadam underlying gravel		0.20							
	MADE GROUND containing clay, sand, gravel, cobbles and red brick									
	Stiff brown sandy gravelly CLAY with occasional cobbles		0.70			P5901	B	1.20	58.0	
1.0										
	End of Trial Pit at 1.50 m		1.50							
2.0										
3.0										
4.0										

Groundwater Conditions: No Groundwater encountered

Stability: Stable

Remarks: 10.4m from corner of building, 9.5m from centre of octagonal platform. Located in gravel pathway - gravel and hardcore placed to one side during excavation

REPORT NO. 10747	TRIAL PIT RECORD	IGSL Ltd.

CONTRACT:	St. Endas Museum, Rathfarnham	Trial Pit No.:	TP4
		Sheet:	Sheet 1 of 1
CLIENT:	OPW	Excavation Method:	Mini digger
ENGINEER:	ESBI	Date Started:	10/05/2005
		Date Completed:	10/05/2005
CO-ORDINATES:	E - N -	Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples: Ref. No.	Samples: Type	Samples: Depth (m)	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	MADE GROUND containing whole red bricks, concrete blocks, clay, gravel, granite cobbles, wire and wood									
1.0										
	End of Trial Pit at 1.35 m		1.35							
2.0										
3.0										
4.0										

Groundwater Conditions: No Groundwater encountered

Stability: Unstable pit walls

Remarks: Located in courtyard in front of metal stairs

TRIAL PIT RECORD /FOUNDATION INSPECTION

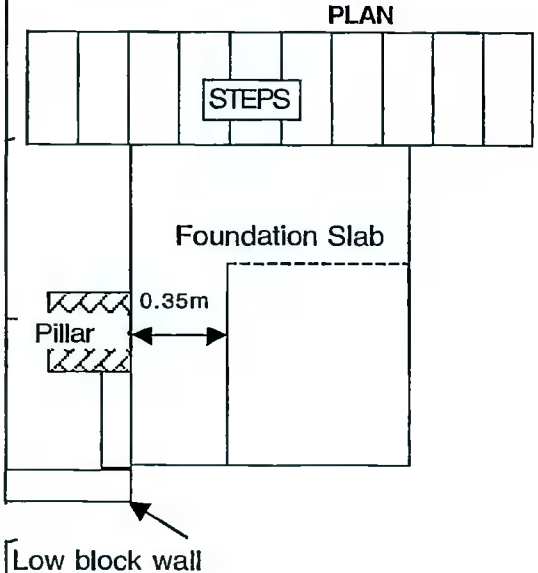
I.G.S.L.

Contract: St. Endas Museum	PIT No.: TP5
No.: 10747	Sheet: 1 of 1
Location: Rathfarnham	Excavation method: Mini digger and hand
Engineer: EBSI	
Date: 10/5/05	Ground Level:

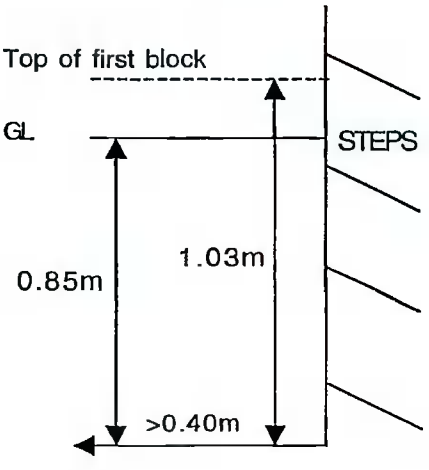
Description	Red. Level	Legend	Depth	samples Ref. No.	samples Type	samples Depth	Remarks
MADE GROUND consisting of hardcore			0.20				
MADE GROUND containing black clay, sand, gravel, red brick, granite cobbles and boulders, concrete blocks, polystyrene, wire and plastic			0.85				
End of trial pit at 0.85m							

Foundation Details:

PLAN



SECTION



Remarks	Groundwater Conditions
Located in courtyard by concrete steps Base of foundation not located	No groundwater encountered
	Logged by: Jennifer Felton

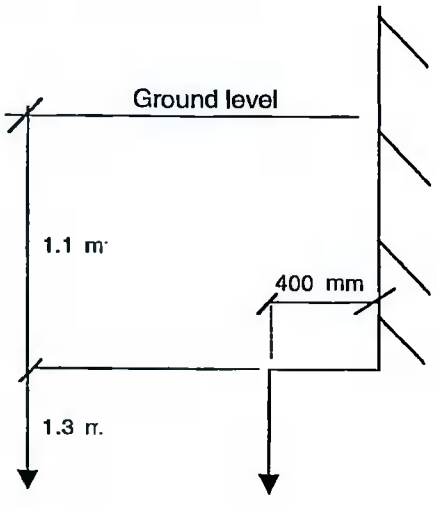
TRIAL PIT RECORD /FOUNDATION INSPECTION

I.G.S.L.

Contract: St. Endas Museum	PIT No.: TP6
No.: 10747	Sheet: 1 of 1
Location: Rathfarnham	Excavation method: Mini digger and hand
Engineer: EBSI	Ground Level:
Date: 10/5/05	

Description	Red. Level	Leg end	Depth	samples Ref. No.	samples Type	samples Depth	Remarks
TOPSOIL			0.20				
MADE GROUND containing black clay, sand, gravel, red brick, granite cobbles, concrete blocks, roots and metal			1.30				
End of trial pit at 1.3m							

Foundation Details:



Remarks	Groundwater Conditions
Located against South wall of building Obstuction at 1.3m (possible boulders) Base of foundation not located	No groundwater encountered
	Logged by: Jennifer Felton

APPENDIX IV

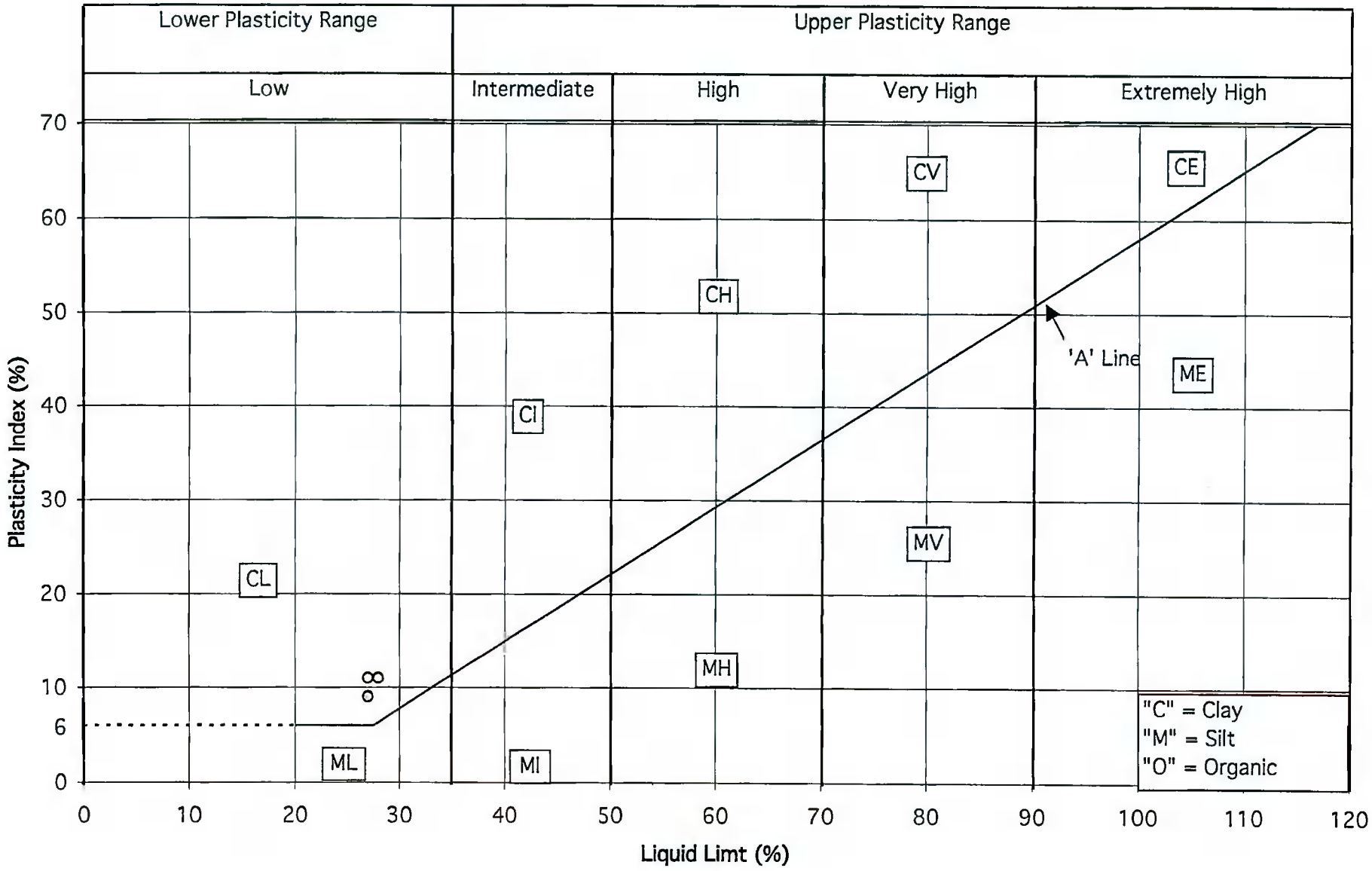
LABORATORY

10747	CLASSIFICATION TEST RESULTS	TO BS 1377:1990:PART2:CL 4 & 5	IGSL

Contract: ST ENDA'S RATHFARNHAM

WS No.	Depth (M)	Ref No.	Description	Passing 425um %	Test Code	Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Classification	Water Content %
1	1.00	WS1.1	Brown sandy gravelly CLAY		A	27	18	9	C L	16.73
2	1.30	WS2.1	Brown sandy gravelly CLAY		A	28	17	11	C L	19.05
TP3B	1.20	5901	Brown sandy gravelly CLAY		A	27	16	11	C L	18.55

Code: A -Air dried, -425 micron specimen N - Natural specimen after removal of coarse material


Lower Plasticity Range
Upper Plasticity Range
Low
Intermediate
High
Very High
Extremely High
Plasticity Index (%)
Liquid Limt (%)
0
6
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70
80
90
100
110
120
CL
ML
CI
MI
CH
MH
CV
MV
CE
ME
'A' Line
"C" = Clay
"M" = Silt
"O" = Organic

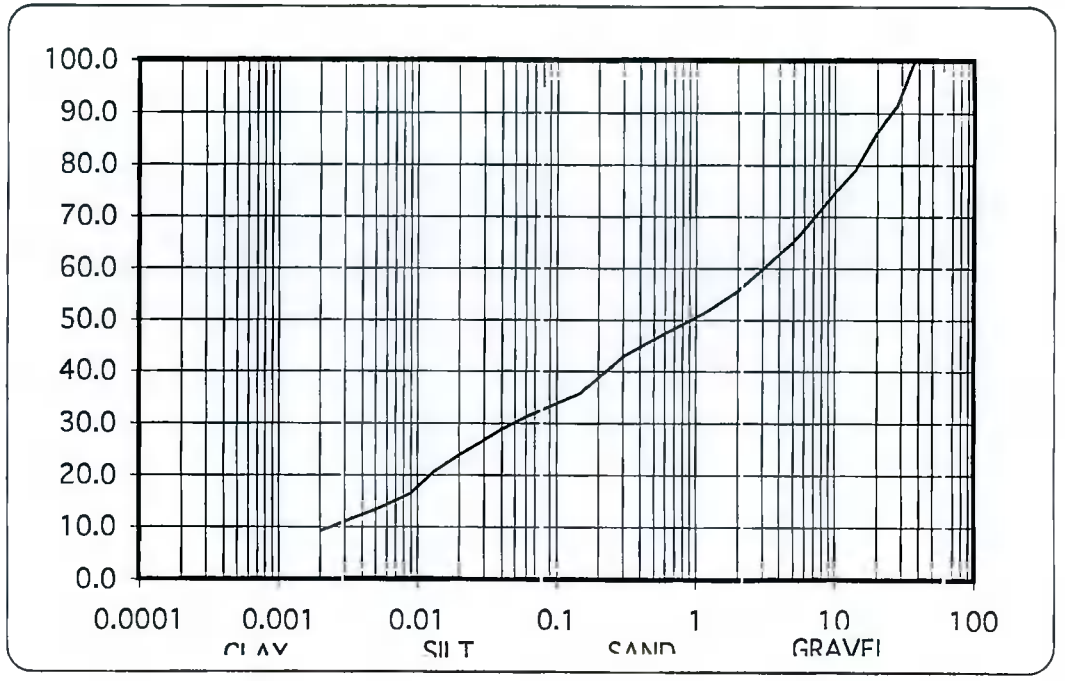
Report No.10747

PARTICLE SIZE ANALYSIS

I.G.S.L

CONTRACT: ST ENDA'S
LOCATION No. WS 2
SAMPLE No. WS2
DEPTH: 1.50
TEST METHOD: Wet Sieve and Hydrometer
DESCRIPTION: Brown silty sandy gravelly CLAY

particle size	%passing	
75	100.0	COBBLES
63	100.0	
50	100.0	
37.5	100.0	
28	91.4	
20	86.3	GRAVEL
14	78.9	
10	74.5	
6.3	68.1	
5	65.0	
3.35	60.8	
2	55.5	
1.18	51.4	
0.6	47.3	
0.425	45.0	SAND
0.3	42.7	
0.15	35.8	
0.063	31.3	
0.04	28.8	
0.03	26.7	
0.02	23.9	
0.013	20.5	SILT/CLAY
0.009	16.4	
0.005	13.2	
0.002	9.1	



Report No. 10747	SULPHATE CONTENT & pH	IGSL

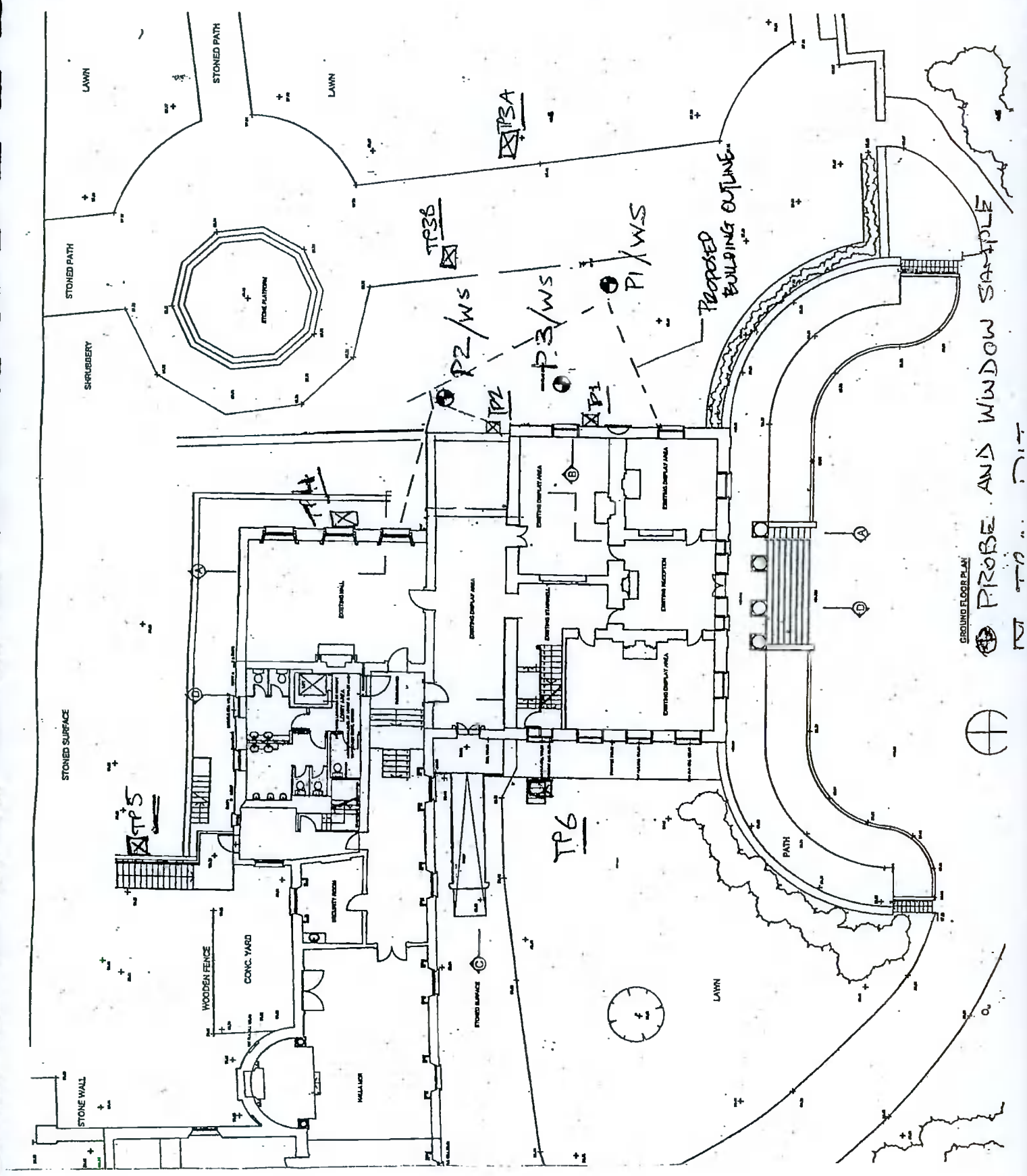
Contract: ST ENDA'S RATHFARNHAM

Location TP/WS	Depth (m)	Reference No.	Description	WATER Parts per 100,000	SOIL Percentage Sulphates	pH
WS 3	1.00	WS1.1	Clay/Rubble Fill		0.09	8.1
TP3B	1.20	5901	Clay		0.04	7.8

Note: $SO_4 = SO_3 \times 1.2$

APPENDIX V

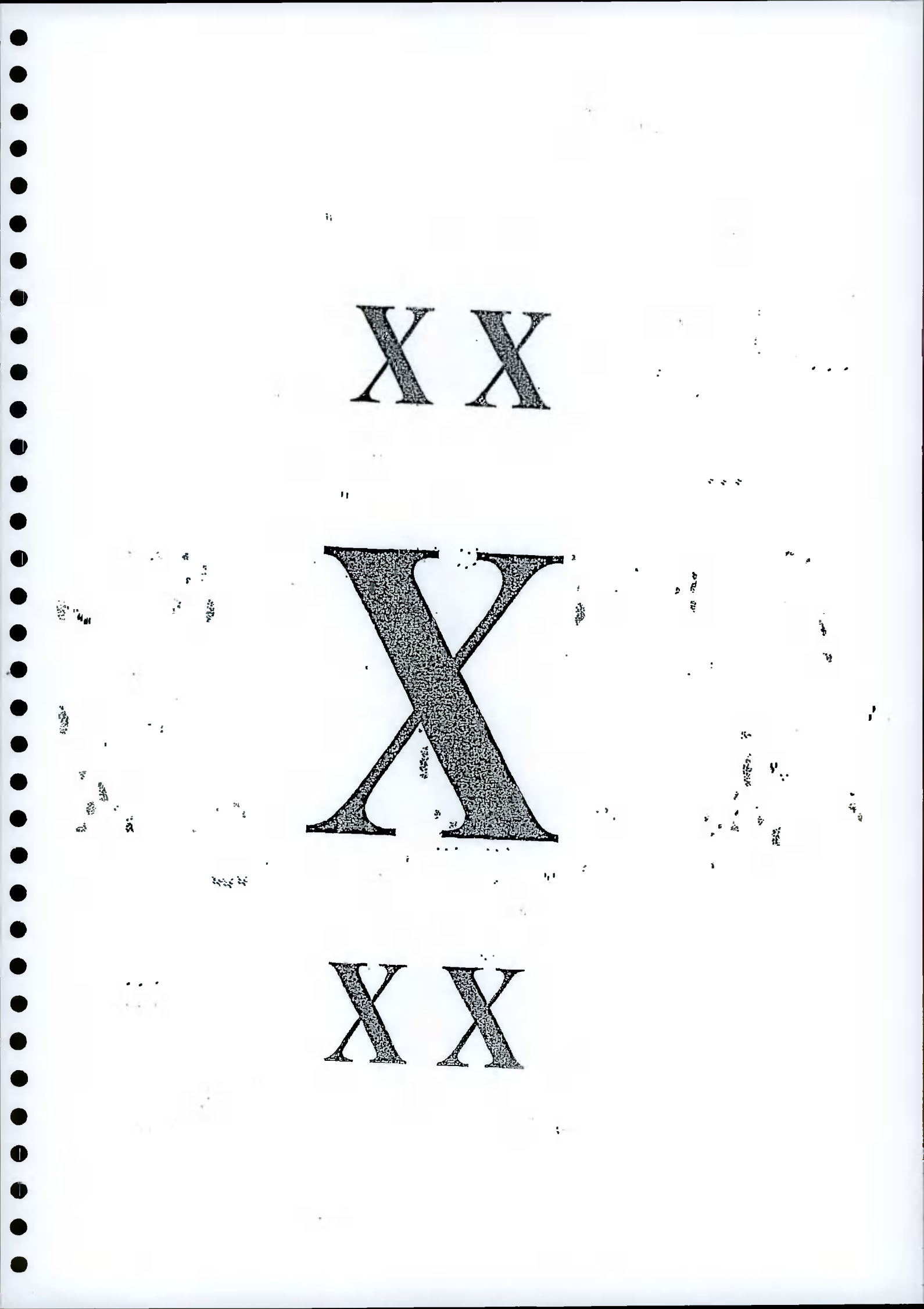
SITE PLAN



ST. ENDA'S MUSEUM RATHFARNHAM

SITE INVESTIGATION LOCATION PLAN

IGSL Ltd. ***Report 10747***



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Appendix F:
Historical Maps

July 2021
Issue 2

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Historical Map 1837 – 1842

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Historical Map 1837 – 1842

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Historical Maps 1888- 1913

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Historical Map 1995

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Historical Maps 2000

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Historical Maps 2005

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Historical Maps 2005 – 2012

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Historical Maps 2011 – 2013

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Google Maps 2020

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Appendix G:
Groundwater Flooding

July 2021
Issue 2

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Groundwater Flooding

REPORT NO. 10747	DYNAMIC PROBE RECORD	IGSL Ltd.

CONTRACT:	St. Endas Museum, Rathfarnham	Probe No.:	DP2
		Sheet:	Sheet 1 of 1
CLIENT:	OPW	Probe Type:	Terrier 2000
ENGINEER:	ESBI	Date Started:	09/05/2005
CO-ORDINATES:	E - N -	Date Completed:	09/05/2005
HAMMER MASS (kg) : 50.0 INCREMENT SIZE (mm) : 100 FALL HEIGHT (mm) : 500		Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples: Ref. No.	Samples: Type	Samples: Depth (m)	Probe Type:DPH: Probe Readings (blows / increment)	Graphic Probe Record (>25 blows is refusal)
0.0	Final depth 2.20 m								0 0 0 2 2 2 3 5 5 8 5 7 6 7 8 7 6 10 7 8 9 25	5 10 15 20 25
1.0										
2.0										
3.0										
4.0										

Groundwater Observations:

Remarks:

REPORT NO. 10747	DYNAMIC PROBE RECORD	IGSL Ltd.

CONTRACT:	St. Enda's Museum, Rathfarnham	Probe No.:	DP3
		Sheet:	Sheet 1 of 1
CLIENT:	OPW	Probe Type:	Terrier 2000
ENGINEER:	ESBI	Date Started:	09/05/2005
CO-ORDINATES:	E - N -	Date Completed:	09/05/2005
HAMMER MASS (kg) : 50.0 INCREMENT SIZE (mm) : 100 FALL HEIGHT (mm) : 500		Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples Ref. No.	Samples Type	Samples Depth (m)	Probe Readings (blows / increment)	Probe Type:DPH Graphic Probe Record (>25 blows is refusal) 5 10 15 20 25
0.0	Final depth 3.00 m								0	
									0	
									0	
									0	
									3	
									7	
									4	
									4	
									2	
									3	
1.0									2	
									6	
									7	
									24	
									14	
									10	
									12	
									9	
									6	
									9	
2.0									16	
									15	
									11	
									9	
									10	
									8	
									13	
									14	
									14	
3.0									25	
4.0										

Groundwater Observations:

Remarks:

APPENDIX II

WINDOW SAMPLES

REPORT NO. 10747	WINDOW SAMPLE RECORD	IGSL Ltd.

CONTRACT:	St. Endas Museum, Rathfarnham	Probe No:	WSI
CLIENT:	OPW	Sheet:	Sheet 1 of 1
ENGINEER:	ESBI	Date Started:	09/05/2005
CO-ORDINATES:	E - N -	Date Completed:	09/05/2005
Ground Level (mOD):	-	Sampled By:	B. Henderson
		Logged By:	Jenny

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Depth to Water (m)	Depth of Sample Run (m)	Recovery (%)	Blowcount	Test Results (kPa) Vane	Test Results (kPa) Penetrometer
0.0	TOPSOIL					0.00m-1.00m	100			
	Firm brown sandy gravelly CLAY		0.30							
	Stiff to very stiff brown sandy gravelly CLAY with occasional cobbles		0.70							
1.0						1.00m-2.00m	100			
2.0						2.00m-3.00m	100			
	Final depth, 2.70 m		2.70							
3.0										
4.0										

General Remarks :

Installations :

REPORT NO. 10747	WINDOW SAMPLE RECORD	IGSL Ltd.

CONTRACT:	St. Endas Museum, Rathfarnham	Probe No:	WS2
		Sheet:	Sheet 1 of 1
CLIENT:	OPW	Date Started:	09/05/2005
ENGINEER:	ESBI	Date Completed:	09/05/2005
CO-ORDINATES:	E - N -	Sampled By:	B. Henderson
Ground Level (mOD):	-	Logged By:	Jenny

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Depth to Water (m)	Depth of Sample Run (m)	Recovery (%)	Blowcount	Test Results (kPa) Vane	Test Results (kPa) Penetrometer
0.0	TOPSOIL					0.00m-1.00m	100			
	Firm brown sandy gravelly CLAY		0.30							
	Stiff to very stiff brown sandy gravelly CLAY with occasional cobbles		0.80			1.00m-2.00m	100			
1.0										
2.0	Final depth, 2.00 m		2.00							
3.0										
4.0										

General Remarks :

Installations :

REPORT NO. 10747	WINDOW SAMPLE RECORD	IGSL Ltd.

CONTRACT:	St. Endas Museum, Rathfarnham	Probe No:	WS3
		Sheet:	Sheet 1 of 1
CLIENT:	OPW	Date Started:	09/05/2005
ENGINEER:	ESBI	Date Completed:	09/05/2005
CO-ORDINATES:	E - N -	Sampled By:	B. Henderson
Ground Level (mOD):	-	Logged By:	Jenny

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Depth to Water (m)	Depth of Sample Run (m)	Recovery (%)	Blowcount	Test Results (kPa) Vane	Test Results (kPa) Penetrometer
0.0	TOPSOIL					0.00m-1.00m	100			
	MADE GROUND containing brown sandy gravelly clay with concrete and tarmacadam		0.40							
1.0	Stiff brown sandy gravelly CLAY with cobbles		1.10			1.00m-2.00m	60			
	NO RECOVERY - pushing cobble		1.60							
2.0	Final depth, 2.00 m		2.00							
3.0										
4.0										

General Remarks :

Installations :

APPENDIX III

TRIAL PITS