

1501 . 0469

St Francis Xavier, Beaconsfield Road, Liverpool Phase 2 Intrusive Investigation

Curtins Ref: EB1310/GL/3547

Revision: C

Issue Date: 05 December 2014

Client Name: KIER Construction-Northern

Client Address: Kier House, Windward Drive, Estuary Park, Speke, Liverpool, L24
8QR

Site Address: St Francis Xavier School, Beaconsfield Road, Liverpool

Curtins
Merchant Exchange
17-19 Whitworth Street West
Manchester M1 5WG
Tel: 0161 236 2394
www.curtins.com

STRUCTURES • CIVILS • ENVIRONMENTAL • INFRASTRUCTURE • TRANSPORT PLANNING • SUSTAINABILITY • EXPERT ADVISORY SERVICES
Birmingham • Bristol • Cardiff • Douglas • Edinburgh • Kendal • Leeds • Liverpool • London • Manchester • Nottingham





EB1310/GL/3547 St Francis Xavier, Beaconsfield Road, Liverpool

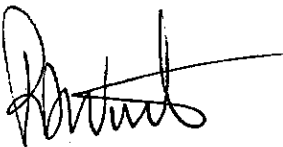


Phase 2 Intrusive Investigation

Client: Kier Construction-Northern
Project: St Francis Xavier, Beaconsfield Road, Liverpool
Report Type: Phase 2 – Intrusive Investigation
Report Reference: EB1310/GL/3547
Revision: C
Report Status: Issue 01
Date: 05 December 2014

Report Author(s)	Signature	Date
G Lownsborough BSc (Hons) FGS Environmental Engineer		05 December 2014

Checked	Signature	Date
D E Mason BSc (Hons) MSc CEng MCIWEM C.WEM FGS Associate		05 December 2014

Authorised	Signature	Date
P D Winterburn BSc (Hons) CEng MICE MStructE MCIWEM C.WEM Technical Director		05 December 2014

For and on behalf of **Curtins**

Executive Summary

Appointment

In January 2014 Curtins were instructed by KIER Construction- Northern to undertake a Phase 1 Geo-Environmental Detailed Desk Top Study and a Phase 2 Intrusive Site Investigation of a site located at St Francis Xavier, Beaconsfield Road, Liverpool.

The site is centred on national grid reference 341470, 387690 with an area of 8.89ha. A location plan can be found in Appendix A1.

Development Proposals

It is understood that development proposals for the site comprise the construction of a number of all-weather pitches, two grassed playing fields, new two storey sports centre and science block and refurbishments to the existing school building.

Fieldworks

The site work was carried out between 18th and 29th August 2014. The locations of exploratory holes were indicated on drawings provided by the Engineer, where possible, in general accordance with the practices set out in BS 10175:2011, BS 5930:2010 and ISO 1997:2007.

The locations of the exploratory holes were restricted by existing buildings and services. Site work comprised of two Cable percussion boreholes designated BH01 and BH02, fifty six Window Sample Boreholes designated WS01 to WS61 (excluding WS07, 11, 12, 20 & 21) and four Hand excavated trial pits designated TP01 to TP04. The positions of all locations are shown on the site plan in Appendix 2.

The depths of boreholes and trial pits, descriptions of strata encountered and comments on groundwater conditions are given in the borehole and trial pit records, Appendix 3. Samples were collected for environmental purposes in amber glass jars and kept in a cool box.

Perforated standpipes, surrounded by pea shingle and protected by a stopcock cover were installed in boreholes BH01, WS01, WS03, WS05, WS10, WS13, WS15, WS16, WS17, WS26, WS30, WS31, WS35, WS36, WS37, WS42, WS43, WS45, WS47, WS50, WS53, WS56, WS58, WS59 and WS61, as detailed in the borehole records.

Plate load tests were carried out at four locations, the results are presented in Appendix 2.

Ground Model

The sequence of the strata encountered during the investigation generally confirms the anticipated geology as interpreted from the geological map. The sequence may be summarised as topsoil or made ground overlying sandstone. Locally the made ground was separated from the sandstone by a thin veneer of sand or clay.

Topsoil and made ground were encountered across the site to depths up to 3.00m. The greatest thicknesses of made ground were located along the northern side of the site where up to 3m were encountered. Moving southwards across the playing field area the thickness of made ground generally reduces to depths in the range 0.15 to 1.20m.

Phase 2 Intrusive Investigation

Natural strata was encountered across the site in all boreholes except WS38. A thin layer of sand was encountered in WS17, WS28 and WS56 separating the made ground from the underlying sandstone. A thin layer of clay was encountered in WS50 separating the made ground from the underlying sandstone.

Laboratory Testing

Seventy Eight soil samples taken from within the Made Ground and natural material across the site and a programme of environmental chemistry testing was scheduled reflecting the findings of the desk study and on-site observations.

With reference to the Tier 1 Thresholds initial assessment shows that the thresholds have been exceeded in the Topsoil/Made Ground with respect to the proposed end use (School buildings).

It is considered that the levels of sulphate encountered within the Made Ground will not present a risk to the proposed end user. However consideration should be made with respect to buried concrete requirements as specified in BRE Special Digest 1: 2005.

Quantitative Risk Assessment – Human Health

Elevations of metals, sulphate, PAH's and TPH's were encountered on site above the relevant tier 1 thresholds.

The observed concentrations of PAH's could present a risk of harm to the proposed end user by risk of direct contact and ingestion. Various PAH's were recorded at elevated concentrations in BH01 at 0.50m bgl, BH02 at 0.30m bgl, WS09 at 0.30m bgl, WS13 at 0.80m bgl, WS14 at 0.30m bgl, WS15 at 0.30m bgl, WS17 at 0.80m bgl, WS22 at 0.30m bgl, WS35 at 0.20m bgl, WS38 at 0.50m bgl, WS41 at 0.45m bgl, WS42 at 0.20m bgl, WS51 at 0.10m bgl, WS53 at 0.80m bgl and WS54 at 0.30m bgl.

Due to the relatively widespread occurrences of PAH's it is recommended that 300mm of 'clean and inert cover' is provided to soft landscaped areas to break the source-pathway-receptor linkage. Building construction and hard standing / car parking will be sufficient to break pathways.

The majority of the significantly elevated samples are located around the existing school buildings. This is likely to be associated with tarmac and ash in this area.

The bulk of the samples obtained across the playing fields do not exceed the relevant tier one thresholds. However in six locations Benzo(a)pyrene is slightly elevated, considering the intended end use these thresholds are considered to be conservative. If the Category 4 Screening Levels 'residential without plant uptake' (C4SL) are utilised then all samples with the exception of WS14 are below these thresholds. As such it is believed that the only risk presented to site users is from WS14 and therefore this area was delineated.

Benzo[a]pyrene was observed close to and above Tier 1 thresholds in three of the four delineation locations within the samples, with maximum recorded concentrations of 2.1mg/kg in WS4B at a depth of 0.40m bgl; 1.2mg/kg in WS4D at 0.5m bgl; and 1.0mg/kg in WS4C at 0.45m bgl.

The three elevated samples are located towards the north western boundary and away from the playing fields. The proposed development of the school buildings and associated works will not be

Phase 2 Intrusive Investigation

located in this area of the site; however, based on the level of contamination encountered it will be necessary to excavate this hotspot and removed from site.

Asbestos (Chrysotile) was encountered at detectable limits within the shallow made ground soils at three locations across the site (BH01 0.5m bgl, BH02 0.3m bgl and WS53 0.8m bgl).

This asbestos contamination was delineated to further assess the risk to end users.

Asbestos (Chrysotile) was encountered at detectable limits within the shallow made ground soils at one location across the additional delineation holes, located in WS3B 0.5m bgl. This infers that the asbestos hotspots are fairly limited and not considered to be a site wide issue.

It is recommended that any impacted material should be either encapsulated on site by building construction or hard standing, or removed from site to a suitably licensed disposal facility. Depending on the outcome of the delineation exercise a limited picking operation may be undertaken to remove the risk.

Quantification of the asbestos has indicated a concentration below 0.001%. The analysis results indicate that there is little likelihood of potentially breathable fibres being generated and soils where fibres were initially detected are not likely to be classed as Hazardous Waste for disposal.

Although there would not appear to be a significant risk to future development there is nevertheless asbestos fibres in certain locations. These will need to be adequately managed during construction and the presence recorded in the development Health and Safety File.

Inferred hotspot locations can be seen in drawing no. EB1310/L001

Quantitative Risk Assessment – Controlled Waters

Groundwater was not recorded in any of the exploratory holes formed during this investigation.

However Leachable testing was undertaken to assess the risk to groundwater. No significant leachable contamination was encountered, therefore the risk to groundwater is considered Low. The nearest surface water is due to the lack of leachable contamination encountered on site, the risk to surface water is considered to be Low.

PAH contamination appears to originate from the shallow made ground consisting of tarmac and ash demonstrated in BH02 at 0.30m which showed significantly elevated concentrations of PAH's. However the sample from the same borehole at 0.50m showed no significant contamination. Therefore we believe that the PAH contamination is not migrating and will not pose a risk to controlled waters.

Quantitative Risk Assessment – Ground Gases

An initial programme of six gas monitoring visits over three months was proposed within twenty five borehole locations.

Gas monitoring has been undertaken across the site on six occasions. Barometric pressure has been recorded at between 994mb and 1013mb during the visits. A maximum flow of 1.6 has been recorded; a maximum of 9.5% CO₂ was recorded in WS35. No Methane CH₄ has been recorded.

Phase 2 Intrusive Investigation

With reference to Situation A non-traditional construction as defined by the NHBC and the modified Wilson & Card classification as contained within CIRIA C665, the maximum carbon dioxide concentration indicates a CS2 regime requiring 3 points of gas protection measures for public buildings.

Quantitative Risk Assessment – Construction Materials

It is considered that the levels of sulphate encountered within the Topsoil/Made Ground will not present a risk to the proposed end user. However consideration should be made with respect to buried concrete requirements as specified in BRE Special Digest 1: 2005.

Quantitative Risk Assessment – Water Supply Pipes

Elevated concentrations of inorganics, metals, TPH and PAH contamination with respect to the protection of water supply pipes were determined within the Topsoil/Made Ground. Therefore, it is recommended that appropriate materials for water supply pipes would comprise Barrier Pipes (PE/AL/PE). The exact requirements are to be confirmed with the relevant utility supplier.

Waste Classification

An initial assessment for the waste classification of the shallow soils encountered on site has been carried out using the Waste Soils Characterisation Assessment Tool, Cat-WasteSoil, developed by McArdle and Atkins. This online tool gives a rapid assessment of contaminated soils and their classification as either hazardous or non-hazardous waste.

The seventy eight samples collected have been entered into this Cat-WasteSoil tool. WS43 has recorded high concentrations of Lead at 0.2m bgl, WS51 recorded high concentrations of Zinc and Copper at 0.1m bgl, and BH02 recorded concentrations of Benzo(a)anthracene at 0.30m bgl. Initial classification of these shallow soil samples are classed as hazardous waste for Metals in WS43 and WS51 and PAH in BH02.

Further WAC environmental analysis of the shallow soils encountered during the redevelopment of the site will need to be carried out to classify the material as clean and inert or hazardous if the material is to be taken off site.

Excavations

Excavation will be required through granular made ground and weathered bedrock. Excavation in rock may require the use of hydraulic breakers or similar.

On the basis of observations on site, together with the results of in-situ and laboratory tests, it is considered that excavations to less than 1.00m may not stand unsupported in the short term in granular made ground. Side support for safety purposes should of course be provided to all excavations which appear unstable, and those in excess of 1.20m deep, in accordance with Health and Safety Regulations.

Groundwater should not be expected in shallow excavations for foundations or services.

Road and Hardstanding Design

Plate bearing tests determined modulus of sub-grade reaction values between 8.5 and 11.8MN/m²/m and CBR values of 0.4 and 0.7%. It is considered that these results are not truly representative as the plate load tests had to be undertaken on the surface due to site constraints.

Further inspection of the sub-surface strata reveals that a CBR value of 2% should be attainable at road / pavement construction depth.

Formations should be proof rolled and any areas of soft or deleterious material should be excavated and replaced with a properly compacted granular fill.

It is recommended that this is confirmed during the development works.

Buried Concrete

The site has been classified in accordance with BRE Special Digest 1, and laboratory testing undertaken accordingly. It is recommended that the guidelines given in BRE Special Digest 1. The results of chemical tests indicate sulphate concentrations in the soil between <10mg/l and 490mg/l as 2:1 water/soil extract, with pH values in the range 6.3 to 11.3.

It is recommended that for conventional shallow foundations the groundwater should be regarded as mobile. On the basis of the laboratory test results it is considered that a Design Sulphate Class for this material may be taken as DS-1. The site conditions would suggest that an ACEC class for the site of AC-1 would be appropriate.

Phase 2 Intrusive Investigation

Table of contents

1.0	Introduction	10
1.1	Project Background	10
1.2	Scope of Works	10
2.0	Summary of Phase 1 Desk Study	11
2.1	Current Setting	11
2.2	Site History	11
2.3	Surrounding Land Use	11
2.4	Geology	12
2.5	Hydrogeology	12
2.6	Landfills	13
2.7	Mining and Radon	13
2.8	Unexploded Ordnance	13
2.9	Public Utility Information	14
2.10	Existing Reports	14
2.11	Other Significant Features Potentially Affecting Re-Development	14
2.12	Conceptual Model	14
3.0	Phase 2 Investigation Proposal	17
4.0	Fieldwork	18
4.1	General	18
4.2	Light Cable Percussive Borehole Investigation	18
4.3	Window Sampling Borehole Investigation	19
4.4	Trial Pits	19
5.0	Laboratory Testing	20
5.1	Environmental Chemistry Testing	20
5.1.1	Soil Analysis	20
5.1.2	Groundwater Analysis	21
5.2	Geotechnical Testing	21

Phase 2 Intrusive Investigation

6.0	Ground Conditions	22
6.1	Made Ground / Topsoil	22
6.2	Natural Strata.....	22
6.3	Groundwater	22
7.0	Geochemical Ground and Groundwater Assessment	23
7.1	Overall Assessment.....	23
7.2	Site Soils	25
7.2.1	Organics	27
7.2.2	Inorganics	28
7.2.3	Waste Classification	29
7.2.4	Mining and Radon.....	29
7.2.5	Water Supply Pipes	29
7.3	Controlled Waters	30
7.4	Soil Gases	30
7.5	Delineation works	30
8.0	Geotechnical Assessment	33
8.1	Structural Design	33
8.2	Assessment of Strata Conditions	33
8.3	Foundation Design	33
8.4	Ground Floor Slab Design	34
8.5	Excavations	34
8.6	Chemical Attack on Buried Concrete.....	34
8.7	Road and Hardstanding Design	34
9.0	Pre-Remediation Constraints and Outline Remediation Strategy	35

Appendices

Appendix A1 – Site Location Plan

Appendix A2 – Exploratory Borehole Location Plan

Appendix A3 – Exploratory Hole Logs

Appendix A4 – Chemical and Geotechnical Laboratory Test Results

Appendix A5 – Gas Monitoring Results

Appendix A6 – Tier 1 Thresholds

Appendix A7 – Conceptual Site Model and Risk Assessment

Phase 2 Intrusive Investigation

1.0 Introduction

1.1 Project Background

In January 2014 Curtins were instructed by KIER Construction Northern to undertake a Phase 1 Geo-Environmental Detailed Desk Top Study of a site located at St Francis Xavier, Beaconsfield Road, Liverpool.

The site is centred on national grid reference 341470, 387690 with an area of 8.89ha. A location plan can be found in Appendix A1.

It is understood that development proposals for the site comprise the construction of a number of all-weather pitches, two grassed playing fields, new two storey sports center and science block and refurbishments to the existing school building.

1.2 Scope of Works

A Phase 1 desk top study was undertaken principally to provide an overview of the geo-environmental setting of the site of interest with a brief assessment of any risks that could be presented to site users and the wider environment.

The Phase 2 Ground Investigation was undertaken in order to provide an assessment of the ground conditions on the subject site with respect to geotechnical properties and any potential contamination in the underlying soils and/or groundwater. The ground investigation was undertaken to confirm the geo-environmental conceptual model and associated risk determined in the Detailed Desk Top Study undertaken by Curtins in February 2014.

Specifically the Phase 2 report is intended to determine,

- a) If there is a risk of the proposed end user being adversely impacted upon by potential contamination in shallow site soils that may be present on the site due to its known current, recent and historical use
- b) Undertake an initial assessment with respect to the significant risk of pollution to groundwater and/or surface water from potential contamination that maybe present on the site due to its known historical use.
- c) If there is a risk to the end user from landfill type gases that could potentially accumulate under the proposed buildings.
- d) Recommendations for the design of foundations and building ground floor slabs.
- e) Recommendations for the specification of sub-structure concrete.

2.0 Summary of Phase 1 Desk Study

This section of the report presents a summary of Curtins Phase 1 Detailed Desk Top Study of the site, document reference no. EB1310/GL/3547, dated 27th February 2014.

2.1 Current Setting

The site is centred on national grid reference 341470, 387690 with an area of 8.89ha. A location plan can be found in Appendix A1.

The site is currently occupied by St Francis Xavier School with playing fields and associated car parking.

2.2 Site History

According to the earliest map, dated 1893, the site is predominantly open fields dissected by hedgerow and wooded areas. There is a large pond west of the site. To the north east and south east corners of the site are a number of small buildings, suspected to be farmhouses. In 1927 to the eastern side of the site a number of houses and associated gardens/yards have been developed. By 1951 the site has now been cleared and is a sports ground bounded with large embankments. The site has been significantly altered compared to the previous historical map. All of the existing farmhouse buildings have been demolished; all woodland is now sparse and only occupies a small area towards the south of the site. The large pond along the western boundary has now been infilled.

In 1970 the site has been developed on with the newly established college building St Francis Xavier College and associated small buildings surrounding the college and two tennis courts to the west of the college. The building is located on the southern boundary of the site

By 2006 the site shows a new building on the western boundary of the site west of the existing college. The site remains the same from 2006 to present day.

2.3 Surrounding Land Use

The first map of the areas surrounding site from 1893, consist predominantly of open fields and wooded areas to the north and North West 100m of the site boundary. South west corner adjacent to the site are strawberry fields and 50 m south adjacent to the site boundary are several buildings occupying most of the land.

By 1927, along the western side of the site approximately 100m is a newly established tramway. By 1936 and 1937 the surrounding area had been significantly developed with several residential housing sites 100-150m north west and south west of the tramline. A recreational ground is located 120m west of the site boundary. On the eastern side adjacent to the site is a tennis court, south west approximately 100m there has been housing developments. North east 100m from the site is the newly established Abbots Lea School and north adjacent to the site boundary is a sports ground with embankments surrounding the playing fields, shown in the maps from 1952. South east of the site 110m shows slight development of residential homes. The tram line is no longer shown on the map it has been redeveloped as a road.

Phase 2 Intrusive Investigation

The map from 1954-1971 shows adjacent to the site on the western boundary is the newly established Holmrook Day Special School. 130m south west shows the Calderstones Park and recreational grounds. North east 120m of the site boundary is the High Lee Sports Grounds for St Francis Xavier's College. South of the site boundary 50m is Strawberry Field Children's Home. Between 1966-1990 maps a new building has been constructed on the former site of the polytechnic university. An electrical substation is also shown 200m north-west. South west 130m of the site boundary show new housing developments. There is continued development around the site until the present day, however the surrounding area remains predominantly unchanged.

2.4 Geology

A study of the Envirocheck records and British Geological Survey (BGS) 1:50,000 mapping records (Bedrock and Superficial Editions) for Runcorn (Sheet 097) indicates the following geological succession underlying the site.

Rock Name	Rock Type	Geological Age
Chester Pebble Beds Formation	Pebbly (Gravelly) Sandstone	Scythian-Scythian

There are no fault lines within 1000m of the site.

There are no BGS boreholes located within close proximity to the site.

Due to historical evidence of development and redevelopment in and around the site area, it is expected that there will be some variable deposits of made ground across the site.

The Envirocheck Report confirms that there is a low risk to no hazard from the following ground stability hazards on and around the site; running sands, shrinking or swelling clay, compressible ground and ground dissolution. The hazards from collapsible ground and landslides are confirmed to be negligible.

2.5 Hydrogeology

The 1:100,000 Sheet 16 West Cheshire Vulnerability Map indicates that the site, corresponding with the underlying solid geology, the site is underlain by a Principal Aquifer.

These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Soils present on the site are classed as high leaching potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise.

The site eastern half of the site is situated within a Source Protection Zone III (SPZ) - The total area needed to support the discharge from the protected groundwater source.

Phase 2 Intrusive Investigation

The nearest surface water feature is pond in Calderstones Park located 379m south west of the site.

There are no surface water abstractions within 1000m of the site. There are no potable water abstractions within 1000m of the site.

There is one active groundwater abstractions within 1000m of the site. Located 1000m east, Abstraction type no specified. The licence has now been revoked.

There are no Pollution incidents, Discharge Consents, Local Authority Pollution Prevention and Controls permits arising from the site.

The site lies in Flood Zone 1 and is therefore at no risk from flooding.

2.6 Landfills

The Envirocheck report confirms that there are five BGS Recorded Landfill sites within 1000m of the site. The closest is located 456m south east of the site at Childwall College, types of waste are not specified. The landfill site is now closed.

There are four historical landfill recorded within 1000m of the site. This is located 457m south east of the site. Limited information is available for this landfill.

There is one recorded Registered Landfill site within 1000m of the site. This is located 672m north west from the site at Woolton Quarry, Quarry Street, Liverpool. Authorised waste included construction waste, inert Non-Hazardous and timber. Prohibited waste included inflammable waste, liquid and sludge, notifiable and putrescible waste. The landfills licence is now lapsed.

2.7 Mining and Radon

There are eleven BGS Recorded Mineral Sites located within 1000m of the site of interest. The closest is located 87m south west from the site of interest, Woolton Hill, Liverpool and was an open cast sandstone quarry. Mining activity at the sites has now ceased.

The Envirocheck report confirms that the site is within an area which is highly unlikely to be affected by coal mining activity. The site lies outside a coal mining referral area, and as such, a Coal Authority report has not been obtained.

Both the Radon Atlas for England and Wales, and the Envirocheck Report confirm that the site is in a lower probability radon area, as less than 1% of homes are above the action level. No radon protective measures are necessary in the construction of new dwellings or extensions.

2.8 Unexploded Ordnance

The site of interest is located near Liverpool city centre.

Risk mapping for UXOs has placed the site within a high risk area.

Areas designated as high risk are those that show a high density of bombing hits (50+ bombs per 1000 acres) and abundant potential WWII targets. In high-risk regions, further action to mitigate UXB risk is considered essential.

Historical maps for the site and surrounding area do not show any evidence of bomb damage post WWII. There are no primary Luftwaffe targets within 1000m of the site.

Phase 2 Intrusive Investigation

The site has been redeveloped since the end of WW2, increasing the likelihood of detecting any UXO items that may be present on-site.

In light of these findings and in accordance with CIRIA's publication on managing UXO risks, it is recommended that no further action is warranted to address the level of UXO risk at the Site.

2.9 Public Utility Information

Public utility information have been obtained as a part of this report.

2.10 Existing Reports

No previous reports have been made available for review at the time of writing this report.

2.11 Other Significant Features Potentially Affecting Re-Development

No other significant features are noted that could potentially affect re-development.

2.12 Conceptual Model

The following sub-sections present a non-exhaustive list of the possible sources, pathways and receptors that exist within the site conceptual model.

Potential source-pathway-receptor linkages that may arise are discussed in the following section, the Qualitative Risk Assessment.

A Diagrammatic Conceptual Model is provided in Appendix A3.

2.12.1 Potential Sources

Potential Source (S1): Made-ground Soils On Site
<p>Likely to be present on-site due to historical evidence of development and demolition. It should be noted that poorly managed demolition can result in material such as asbestos or heating oils being present in the sub-soils.</p> <p>The nature and type of contamination may include, amongst others; ash and fill, hydrocarbons (e.g. fuel oils), heavy metals, herbicides / pesticides and asbestos.</p>
Potential Source (S2): Made-ground Soils Off Site
<p>As with on-site made-ground soils, off-site soils have been exposed to similar patterns of development and demolition so there is potential for contamination to be present in made ground around the site.</p> <p>Potential contaminants could arise due to geological origin, construction activities, atmospheric deposition and land management. The nature and type of general contamination may include, amongst others; ash and fill, hydrocarbons (e.g. fuel oils), heavy metals and asbestos.</p>

Phase 2 Intrusive Investigation

Potential Source (S3): Natural Soils both On and Off Site

Regionally elevated levels of metals may be present within the shallow soils, however the superficial and bedrock deposits beneath the site and within the immediate surrounding area are not considered to present significant sources of natural contamination.

Potential Source (S4): Ground Gas Generating Sources

May be present due to made ground deposits across the site from historical developments and land use. There are 10 landfills recorded within 500m of the site and a pond previously on site which has since been backfilled with unknown material.

There are no records of organic rich drift deposits (e.g. peat) or coal measures.

Potential Source (S5): Geological Deposits with Potential to Generate Radon

Both the Radon Atlas for England and Wales, and the Envirocheck report confirm that the site is in a lower probability radon area, as less than 1% of homes are above the action level. No radon protective measures are necessary in the construction of new dwellings or extensions.

Potential Source (S6): Unexploded Ordnance

Risk mapping for UXOs has placed the site within a high risk area. The historical maps for the site and surrounding area show no bomb damage post WWII and there were no primary targets located within 1000m of the site.

It should be taken into consideration that the site and surrounding area has undergone several stages of redevelopment since this time, lowering the risk of UXO on site.

Potential Source (S7): Mining Workings

No mining works are considered to affect the site.

2.12.2 Potential Pathways

Potential Pathway (P1): Direct Contact, Ingestion and Inhalation (dust and vapours)

May occur where the end user is exposed to; solid, dust or volatile components of made-ground soils on site.

Potential Pathway (P2): Vertical Migration

May occur within the made-ground deposits on-site both upwards, due to processes including; capillary action, burrowing animals inducing soil mixing, and downwards into the natural deposits due to processes including; infiltration and burrowing animals. Includes ground gas migration.

Soils of negligible leaching potential are found onsite. Overlying a principle aquifer within the bedrock.

Phase 2 Intrusive Investigation

Potential Pathway (P3): Horizontal Migration

May occur within the made-ground or natural deposits due to processes including; the influence of perched or natural groundwater flow patterns and natural or man-made high permeability zones, e.g. sand lenses or drainage runs or pores/voids within natural and made-ground soils for ground gases.

Potential Pathway (P4): Collapse

Unlikely on this site.

2.12.3 Potential Receptors

Potential Receptor (R1): End Users

Students, employees, visitors, site maintenance staff and the general public.

Potential Receptor (R2): Controlled Waters (Groundwater)

Corresponding with the underlying solid geology, the site is underlain by a Principal Aquifer. There is one active groundwater abstractions within 1000m of the site. Located 379m south west, used for the disposal of radioactive waste.

There are no potable water abstractions within 1000m of the site. The site is situated within a Source Protection Zone (SPZ) III.

Potential Receptor (R3): Controlled Waters (Surface Waters)

There are no surface water abstractions within 1000m of the site.

The nearest surface water feature is pond in Calderstones Park located 379m south west of the site.

Potential Receptor (R4): Construction Workers

Whilst unlikely, during the development of the site, construction workers may come into contact with any contamination that is on site. However, wearing the correct personal protective equipment will reduce the risk.

Potential Receptor (R5): Construction Materials

Buried concrete and water supply pipes.

Potential Receptor (R6): Local Ecology

Protected species and local habitats; e.g. hedgerow, grassland and water.

3.0 Phase 2 Investigation Proposal

3.1 General

The Phase 1 Desk Top Study Conceptual Site Model highlighted that there could be a generally **Negligible** to **Moderate** risk of harm being presented to the proposed end user, construction workers, surface water, groundwater (Principal Aquifer), buildings and infrastructure, services, neighbours and the general public.

It is understood that the aim of this site investigation is to investigate and characterise areas of land around the existing St Francis Xavier Building which are intended to be occupied by a number of all-weather pitches, two grassed playing fields, a new two story sports centre and science block and refurbishments to the existing school buildings.

Review of the Desk Study identified that a site investigation was required to investigate potentially contaminating material, to quantify the site condition prior to the sites redevelopment; and to provide foundation design for the proposed accommodation. A strategy for the Phase 2 intrusive investigation was derived accordingly and comprised the following operations:

- Logging and sampling of representative soils in fifty six no. window sample boreholes to 5m depth below existing ground level.
- Logging and sampling of representative soils in two no. Light Cable Percussive boreholes to 15m depth below existing ground level
- Logging of representative soils in four hand dug trial pits to investigate existing foundation design.
- Environmental Chemistry testing of fifty seven made-ground samples taken from the exploratory holes for a suite of chemicals reflecting the known industrial/historical use of the site and surrounding area.
- Environmental Chemistry testing of twenty one natural samples taken from the exploratory holes for a suite of chemicals reflecting the known industrial/historical use of the site and surrounding area.
- Perforated gas and groundwater monitoring standpipes, surrounded by pea shingle and protected by a stopcock cover.
- Suitable geotechnical testing to allow a satisfactory foundation, roads and hardstanding assessment.

4.0 Fieldwork

4.1 General

The site work was carried out on 18th August to 27th August 2014. The locations of exploratory holes were determined by the Engineer, in general accordance with BS 10175:2011, BS 5930:2010 and ISO 1997:2007.

Light cable percussive boreholes were advanced at two locations referenced LCP01 and LCP02. Drive-in window sampler boreholes were advanced at fifty six locations referenced WS01 to WS61, and hand dug trial pits were excavated at four locations referenced TP01 to TP04. Exploratory hole positions are shown in Appendix A2. The depths of boreholes and trial pits, descriptions of strata encountered and comments on groundwater conditions are given in the borehole and trial pit records in Appendix A3.

Representative disturbed samples were taken at the depths shown on the borehole and trial pit records and dispatched to the laboratory. Standard penetration tests, were carried out in the window sample boreholes in the various strata to assess the relative density or consistency. The values of penetration resistance are given in the borehole records.

Samples were collected for environmental purposes in amber glass jars and kept in a cool box. Perforated standpipes, surrounded by pea shingle and protected by a stopcock cover were installed in boreholes BH01, WS01, WS03, WS05, WS10, WS13, WS15, WS16, WS17, WS26, WS30, WS31, WS35, WS36, WS37, WS42, WS43, WS45, WS47, WS50, WS53, WS56, WS58, WS59 and WS61, as detailed in the borehole records.

The ground level and co-ordinates at the borehole and trial pit locations, reported on the records, were determined by survey.

Groundwater and gas monitoring visits were undertaken on the 11th September 2014, a further five visits will be undertaken to complete the monitoring. The results are presented in Appendix A5.

The locations of the exploratory holes, a copy of which is contained within Appendix A2.

4.2 Light Cable Percussive Borehole Investigation

Two boreholes, designated LCP01 and LCP02 were undertaken by Light Cable Percussive technique. The depths of boreholes, descriptions of strata encountered and comments on groundwater conditions are given in the borehole record sheets.

Samples were collected for environmental purposes in amber glass jars and kept in a cool box. Perforated standpipes, surrounded by pea shingle and protected by a stopcock cover were installed in LCP01, as detailed in the borehole records. The ground levels at the borehole were not determined.

The depths of the samples recovered are shown on the relevant exploratory hole log presented in Appendix A3 of this report

4.3 Window Sampling Borehole Investigation

Fifty six boreholes, designated WS01 to WS61 undertaken by drive-in window sampler technique, five of the boreholes were not undertaken due to access on the site. The depths of boreholes, descriptions of strata encountered and comments on groundwater conditions are given in the borehole record sheets.

Samples were collected for environmental purposes in amber glass jars and kept in a cool box. Perforated standpipes, surrounded by pea shingle and protected by a stopcock cover were installed in boreholes as detailed in the borehole records. The ground levels at the borehole were not determined.

The depths of the samples recovered are shown on the relevant exploratory hole log presented in Appendix A3 of this report.

4.4 Trial Pits

Four trial pits were dug by hand at the positions shown on the site plan. The depths of trial pits, descriptions of strata encountered and comments on groundwater conditions are given in the trial pit records, Appendix A3.

5.0 Laboratory Testing

5.1 Environmental Chemistry Testing

A programme of environmental chemistry testing was scheduled reflecting the findings of the desk study and on-site observations.

The sampling positions (boreholes) were generally located in a non-targeted, systematic array to give adequate and representative coverage of the site accounting for the historical site use, proposed end use and the immediate environmental setting.

5.1.1 Soil Analysis

The nature and type of soil contamination potentially present on the site was considered to include, amongst others; organic matter, ash and fill, hydrocarbons (e.g. fuel oils), heavy metals and asbestos the extent of which is captured by the broad environmental testing suite listed in Table 5.1.1 below.

Table 5.1.1 Environmental Chemistry Analysis Suite: Soils

Suite Ref	Analysis	LOD	Suite Ref	Analysis	LOD
Suite A	Asbestos Screen		Suite B	pH	
	pH			Soil Organic Matter	
	Soil Organic Matter			Arsenic	5 mg/kg
	Arsenic	5 mg/kg		Boron (water soluble)	1 mg/kg
	Boron (water soluble)	1 mg/kg		Cadmium	0.5 mg/kg
	Cadmium	0.5 mg/kg		Chromium	5 mg/kg
	Chromium	5 mg/kg		Chromium VI	5 mg/kg
	Chromium VI	5 mg/kg		Copper	5 mg/kg
	Copper	5 mg/kg		Lead	5 mg/kg
	Lead	5 mg/kg		Mercury	0.1 mg/kg
	Mercury	0.1 mg/kg		Nickel	5 mg/kg
	Nickel	5 mg/kg		Selenium	5 mg/kg
	Selenium	5 mg/kg		Zinc	5 mg/kg
	Zinc	5 mg/kg			
	Cyanide (total)	10 mg/kg		Cyanide (total)	10 mg/kg
	Sulphate (total)	200 mg/kg		Sulphate (total)	200 mg/kg
	Sulphide	2 mg/kg		Sulphide	2 mg/kg
	Sulphur (elemental)	20 mg/kg		Sulphur (elemental)	20 mg/kg
	Phenols (screen)	1 mg/kg		Phenols (screen)	1 mg/kg
	USEPA16 PAH	0.1 mg/kg		USEPA16 PAH	0.1 mg/kg
	TPH (CWG Banding - Aro/Alk Split)	0.01 mg/kg to 0.1 mg/kg		TPH (CWG Banding)	0.01 mg/kg to 0.1 mg/kg

Fifty eight soil samples taken from across the site were tested for Suite A (shallow samples) and twenty one tested for Suite B.

The results of the environmental chemistry analyses can be referred to in Appendix A4 of this report.

5.1.2 Groundwater Analysis

Representative groundwater samples were unable to be obtained from any of the exploratory holes. Leachable testing was undertaken to assess the risk to groundwater.

5.2 Geotechnical Testing

All soil samples were prepared in accordance with BS1377: Part One: 1990 and representative sub-samples were taken for testing. The following tests were carried out:

- 56 No. pH value
- 56 No. Soluble sulphate Content
- 1 No. Plasticity indices
- 1 No. Moisture Contents

6.0 Ground Conditions

The sequence of the strata encountered during the investigation generally confirms the anticipated geology as interpreted from the geological map.

The sequence may be summarised as topsoil or made ground overlying sandstone. Locally the made ground was separated from the sandstone by a thin veneer of sand or clay.

The sequence and indicative thicknesses of strata are provided below.

6.1 Made Ground / Topsoil

Topsoil and made ground were encountered across the site to depths up to 3.00m. The greatest thicknesses of made ground were located along the northern side of the site where up to 3m were encountered. Moving southwards across the playing field area the thickness of made ground generally reduces to depths in the range 0.15 to 1.20m.

Across the area of existing buildings the thickness of made ground was typically less than 1.50m with an average thickness about 0.75m. A maximum thickness of made ground of 1.60m was encountered in this area in WS37.

Made ground was predominantly of sand. Brick, plastic, concrete, tarmac ash and slag were noted within these materials. Occasional cobbles were noted. At the majority of locations the made ground rested directly on weathered sandstone at depths in the range 0.01 to 3.00m. WS38 was terminated within made ground at a depth of 1.26m due to an obstruction.

6.2 Natural Strata

Natural strata was encountered across the site in all boreholes except WS38. A thin layer of sand was encountered in WS17, WS28 and WS56 separating the made ground from the underlying sandstone. A thin layer of clay was encountered in WS50 separating the made ground from the underlying sandstone.

Sandstone was encountered in all boreholes except WS38 at depths in the range 0.01 to 3.00m. The depth to sandstone reflects the thickness of made ground indicated above. Sandstone was encountered at a maximum depth of 3.00m on the northern site boundary. The depth to sandstone generally reduced moving south across the site.

Sandstone was generally described as weathered with the upper part recovered as red brown sand. The competence of the sandstone generally increased with depth of penetration. All boreholes, except WS38, were terminated within sandstone at depths in the range 0.30 to 3.35m.

6.3 Groundwater

Groundwater was not encountered in any of the exploratory holes.

Leachable testing was undertaken to assess the risk to groundwater.

7.0 Geochemical Ground and Groundwater Assessment

7.1 Overall Assessment

The Phase 1 Desk Top Study Conceptual Site Model highlighted that there could be a generally **Negligible** to **Moderate** risk of harm being presented to the proposed end user, construction workers, surface water, groundwater (Principal aquifer beneath the solid geology), buildings and infrastructure, services, neighbours and the general public.

A strategy for a Phase 2 ground investigation was consequently developed with reference to this information, the initial conceptual site model and the proposed development use as School Buildings.

This section of the report includes the assessment of the potential contamination, solid, liquid and gas, identified on the subject site which may present a risk to the proposed end users, associated utilities and the wider environment.

Curtins use a tiered approach in assessing the risk from potential contamination, such assessment being based on the known history of the site as determined by the desk study in conjunction with observations made during the ground investigation. This assessment is based solely on the results of the chemical and other testing data obtained as part of Curtins Consulting's investigation.

Under the Contaminated Land (England) Regulations 2000 a Local Authority has from time to time to survey the land within its boundaries to identify "Contaminated Land". This is land "in such condition, by reason of substances in, on, or under the land, that: significant harm is being caused, or pollution of controlled waters is being or likely to be caused".

In guidance published by the Environment Agency, the risk to end users or controlled waters is determined through an assessment of pollutant linkages between a source of contamination and a sensitive receptor such as house occupants, plants grown in gardens or groundwater abstracted for drinking. This is termed a source-pathway-receptor relationship.

With respect to this investigation the source is taken as being a point or area of contamination within the ground. The pathway is a mechanism by which the contamination could reach the receptor.

For instance this could be through eating contaminated soil or plants contaminated through taking up contamination in the soil through their roots, inhaling contaminated dust or drinking contaminated water. Other pathways include directly causing degradation of buried building materials such as plastic or concrete. Further indirect pathways include groundwater transporting contamination to a groundwater abstraction point or to a river or stream and thus causing it to become polluted.

In order to assess whether a potential pollutant linkage is significant with respect to human health, the Environment Agency and the Department of the Environment, Food and Rural Affairs (DEFRA), published in 2002 guidance referred to as the Contaminated Land Exposure Assessment Model (CLEA).

The software originally developed with this model was withdrawn in October 2006 and subsequently reissued in January 2009 (CLEA v1.04).

Phase 2 Intrusive Investigation

A model for assessing the potential for pollution of controlled waters and for deriving a safe concentration in ground and groundwater is the Environment Agency's publication "Remedial Targets Methodology - Hydrogeological Risk Assessment for Land Contamination".

These models have a common approach, which is one of a tiered assessment. At each stage of the assessment further detail can be applied to the model to provide a detailed interpretation on a site by site basis. This is to determine whether the criteria are being met to prevent contamination of controlled waters and to protect human health and the environment.

This assessment is the first tier in the process. It is a comparison between various sets of generic criteria and the result of testing from the investigation. Where available these criteria are drawn from the CLEA guidance itself in the form of Soil Guideline Values (SGV's).

These values have been derived from lengthy research applying knowledge of the toxicity and carcinogenicity of substances and the mechanism by which each acts in the environment.

To date there are SGV's published for only eleven determinands and consequently Curtins Consulting utilise Generic Assessment Criteria (GAC's) to supplement these for the Tier 1 assessment as shown in Appendix A6 of this report.

Currently, within the UK, there are no Tier 1 assessment values published by regulatory bodies for a wide range of organic compounds, petroleum hydrocarbons, volatile and semi-volatile compounds. Therefore other guidance maybe referred to, for example the TPH Criteria Working Group series of documents, the LQM/CIEH and EIC/AGS/CL:AIRE published thresholds.

In relation to the standards for controlled waters, there are currently no generic groundwater standards or surface water standards that are necessarily applicable to all sites.

However, dependant on the receptor identified as being at risk, the Surface Water (Abstraction for Drinking Water) and or the Environment Agency's national Environmental Quality Standards (EQS's) are considered appropriate (and are considered acceptable to the Regulators) and are used in this Tier 1 assessment.

In addition, and in particular where the groundwater or surface water could not be found or sampled in sufficient quantity, a soil leaching test (BS EN 12457:2002) can be undertaken to provide a preliminary assessment of the potential for contaminants in the soil to pollute ground or surface water. The results are compared, again dependant on the receptor identified as being at risk, against the EA EQS's and or UK Drinking Water Standards.

Once contaminants of concern have been identified by the Tier 1 assessment, qualitative and or quantitative risk assessments maybe undertaken to determine whether a viable source-pathway-receptor linkage is present.

In the case of this site the proposed end use the site is defined as 'Residential without the Consumption of Produce'.

7.2 Site Soils

As discussed previously, fifty six window sample boreholes were undertaken in total across the development site. Representative samples of the site soils were taken from each of the borehole locations.

Given that the proposed end use of the site is a school with attached playing fields, the report compares the chemistry analysis results for a conservative assessment against 'Residential without plant uptake' end use.

The results of the environmental testing can be referred to in Appendix A4. Copies of the Tier 1 thresholds are contained within Appendix A6.

Soil organic matter (SOM) has a strong bearing on the availability of potential contaminants and therefore influences the Tier 1 thresholds. The average soil organic matter (SOM) values for the shallow site soils across the development site is more than 6%, and therefore for comparison against Tier 1 thresholds a conservative SOM of 6.0% has been adopted.

The locations where 'Residential without Consumption of Produce' Tier 1 thresholds have been exceeded are shown in Table 7.2 below.

Table 7.2 Location of exceeded Tier 1 Thresholds for 'Residential without Consumption of Produce'

Location	Depth (m)	Strata	Contaminant	Concentration (mg/kg)	Tier 1 (mg/kg)
BH01	0.50	Made Ground	Arsenic	100	35
			Lead	620	450
			Sulphate	3600	2400
			Chrysotile	-	-
			Benzo(a)pyrene	2.10	1.04
BH02	0.30	Made Ground	Arsenic	140	35
			Lead	1100	450
			Chrysotile	-	-
			Benzo(a)Anthracene	43	9.04
			Benzo(a)Pyrene	35	1.04
			Benzo(b/k)Fluoranthene	61	10.3
			Dibenzo(ah)Anthracene	5.5	1.03
			Indeno(123-cd)Pyrene	17	10.3
WS09	0.30	Made Ground	Benzo(a)pyrene	1.80	1.04
WS13	0.80	Made Ground	Benzo(a)pyrene	1.20	1.04
WS14	0.30	Made Ground	Benzo(a)Anthracene	16	9.04
			Benzo(a)Pyrene	10	1.04
			Benzo(b/k)Fluoranthene	17	10.3
			Dibenzo(ah)Anthracene	1.50	1.03
WS15	0.30	Made Ground	Benzo(a)pyrene	1.1	1.04

Phase 2 Intrusive Investigation

WS17	0.15	Made Ground	Sulphate	6500	2400
WS17	0.80		Benzo(a)pyrene	1.60	1.04
WS22	0.30	Made Ground	Benzo(a)pyrene	1.70	1.04
WS31	0.30	Made Ground	Arsenic	42	35
WS35	0.20	Made Ground	Benzo(a)pyrene	3.3	1.04
WS36	0.60	Made Ground	Sulphate	5000	2400
WS38	0.50	Made Ground	Sulphate	4900	
			Benzo(a)pyrene	1.20	1.04
WS41	0.45	Made Ground	Benzo(a)pyrene	2.50	1.04
WS42	0.20	Made Ground	Arsenic	53	35
			Benzo(a)Anthracene	21	9.04
			Benzo(a)Pyrene	25	1.04
			Benzo(b/k)Fluoranthene	47	10.3
			Dibenzo(ah)Anthracene	3.4	1.03
			Indeno(123-cd)Pyrene	12	10.3
WS43	0.20	Made Ground	Arsenic	410	35
			Lead	1800	450
			Sulphate	3100	2400
WS47	0.30	Made Ground	Arsenic	47	35
WS49	0.30			87	
WS51	0.10	Made Ground	Arsenic	57	35
			Benzo(a)Anthracene	28	9.04
			Benzo(a)Pyrene	29	1.04
			Benzo(b/k)Fluoranthene	57	10.3
			Dibenzo(ah)Anthracene	3.8	1.03
			Indeno(123-cd)Pyrene	15	10.3
			Sulphate	3200	2400
			TPH (C21-35 Aromatic)	2300	1330
WS53	0.80	Made Ground	Chrysotile	-	-
			Benzo(a)pyrene	2.70	1.04
WS54	0.30	Made Ground	Benzo(a)pyrene	1.40	1.04
WS59	0.30	Made Ground	Arsenic	65	35

7.2.1 Organics

- Poly Aromatic Hydrocarbons (PAH's)

A number of Poly Aromatic Hydrocarbons (PAH's) were observed above Tier 1 'Residential without plant uptake' thresholds at concentrations which could present a risk of to the proposed end user at fifteen locations across the site.

The observed concentrations of PAH's could present a risk of harm to the proposed end user by risk of direct contact and ingestion.

Benzo[a]pyrene was observed above Tier 1 thresholds at a concentration which could present a risk of to the proposed end user in a number of locations within the site soils, with a maximum recorded concentration of 35mg/kg in BH02 at a depth of 0.30m bgl.

Benzo[a]anthracene was observed above Tier 1 thresholds at a concentration which could present a risk of to the proposed end user in a number of locations within the made ground, with a maximum recorded concentration of 43mg/kg in BH02 at a depth of 0.30m bgl.

Benzo(b/k)fluoranthene was observed above Tier 1 thresholds at a concentration which could present a risk of to the proposed end user in several locations within the made ground, with a maximum recorded concentration of 61mg/kg in BH02 at a depth of 0.30m bgl.

Dibenzo[ah]anthracene was observed above Tier 1 thresholds at a concentration which could present a risk of to the proposed end user in four locations within the made ground, with a recorded maximum concentration of 5.5mg/kg BH02 at a depth of 0.30.

Indeno(123-cd)Pyrene was observed above Tier 1 thresholds at a concentration which could present a risk of to the proposed end user in three locations within the made ground, with a recorded maximum concentration of 17mg/kg BH02 at a depth of 0.30.

Due to the relatively widespread occurrences of PAH's it is recommended that 300mm of 'clean and inert cover' is provided to soft landscaped areas to break the source-pathway-receptor linkage. Building structure and hard standing / car parking will also be sufficient to break pathways.

The majority of the significantly elevated samples are located around the existing school buildings. This is likely to be associated with tarmac and ash in this area.

The bulk of the samples obtained across the playing fields do not exceed the relevant tier one thresholds. However in six locations Benzo(a)pyrene is slightly elevated, considering the intended end use these thresholds are considered to be conservative. If the Category 4 Screening Levels 'residential without plant uptake' (C4SL) are utilised then all samples with the exception of WS14 are below these thresholds. As such it is believed that the only risk presented to site users is from WS14, this area has been delineated as described in section 7.5.

- Total Petroleum Hydrocarbons (TPHs)

TPH (C21-35 Aromatic) was observed above the Tier 1 thresholds at concentrations which could present a risk to end users in one location at a concentration of 2300mg/kg in WS51 at 0.10m bgl. It is recommended that any impacted material should be either encapsulated on site by building construction / hard standing or 300mm of clean and inert capping in soft landscaped areas, or removed from site to a suitably licensed disposal facility.

7.2.2 Inorganics

- Sulphate

Sulphate was observed above the Tier 1 thresholds at concentrations which could present a risk to sub-surface building materials in two locations in the shallow and natural material, with the highest concentration being 6500mg/kg in WS17 at 0.15m bgl.

It is considered that the levels of sulphate encountered within the made-ground will not present a risk to the proposed end user. However consideration should be made with respect to buried concrete requirements as specified in BRE Special Digest 1: 2005.

- Asbestos

Asbestos (Chrysotile) was encountered at detectable limits within the shallow made ground soils at three locations across the site (BH01 0.5m bgl, BH02 0.3m bgl and WS53 0.8m bgl).

A 'detection' of asbestos indicates a potential risk to ground workers and end users. Further investigation, delineation and quantification will be required to accurately assess the risk presented to site end users and ground workers at these locations.

Following further delineation and quantification of asbestos across the site, it is recommended that any impacted material should be either encapsulated on site by building construction or hard standing, or removed from site to a suitably licensed disposal facility.

This was delineated as described in section 7.5.

Quantification of the asbestos has indicated a concentration below 0.001%. The analysis results indicate that there is little likelihood of potentially breathable fibres being generated and soils where fibres were initially detected are not likely to be classed as Hazardous Waste for disposal.

Although there would not appear to be a significant risk to future development there is nevertheless asbestos fibres in certain locations. These will need to be adequately managed during construction and the presence recorded in the development Health and Safety File.

- Arsenic

Arsenic was observed above the Tier 1 thresholds at concentrations which could present a risk to end users in nine locations, with the highest concentration being 410mg/kg in WS43 at 0.20m bgl.

It is recommended that any impacted material should be either encapsulated on site by building construction / hard standing or 300mm of clean and inert capping in soft landscaped areas, or removed from site to a suitably licensed disposal facility.

- **Lead**

Lead was observed above the Tier 1 thresholds at concentrations which could present a risk to end users in three locations, with the highest concentration being 1800mg/kg in WS43 at 0.20m bgl.

It is recommended that any impacted material should be either encapsulated on site by building construction / hard standing or 300mm of clean and inert capping in soft landscaped areas, or removed from site to a suitably licensed disposal facility.

7.2.3 Waste Classification

An initial assessment for the waste classification of the shallow soils encountered on site has been carried out using the Waste Soils Characterisation Assessment Tool, Cat-WasteSoil, developed by McArdle and Atkins. This online tool gives a rapid assessment of contaminated soils and their classification as either hazardous or non-hazardous waste.

The seventy eight samples collected have been entered into this Cat-WasteSoil tool. WS43 has recorded high concentrations of Lead at 0.2m bgl and WS51 recorded high concentrations of Zinc and Copper at 0.1m bgl. Initial classification of these shallow soil samples are classed as hazardous waste for Metals. In other locations made-ground soils are likely to be classed as Non-Hazardous for disposal purposes

Further WAC environmental analysis of the shallow soils encountered during the redevelopment of the site will need to be carried out to classify material initially considered to be clean and inert or hazardous if the material is to be taken off site.

7.2.4 Mining and Radon

Both the Radon Atlas for England and Wales, and the Envirocheck Report confirm that the site is in a lower probability radon area, as less than 1% of homes are above the action level. No radon protective measures are necessary in the construction of new dwellings or extensions

There are eleven BGS Recorded Mineral Sites located within 1000m of the site of interest. The closest is located 87m south west from the site of interest, Woolton Hill, Liverpool and was an open cast sandstone quarry. Mining activity at the sites has now ceased.

The Envirocheck report confirms that the site is within an area which is highly unlikely to be affected by coal mining activity. The site lies outside a coal mining referral area, and as such, a Coal Authority report has not been obtained.

7.2.5 Water Supply Pipes

With reference to the UKWIR publication 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' document reference 10/WM/03/21 advice is given on the appropriate materials for these ground conditions.

Elevated concentrations of TPH contamination with respect to the protection of water supply pipes were determined within the Topsoil/Made Ground. Therefore, it is recommended that appropriate materials for water supply pipes would comprise Barrier Pipes (PE/AL/PE). The exact requirements are to be confirmed with the relevant utility supplier.

7.3 Controlled Waters

Groundwater was not recorded in any of the exploratory holes formed during this investigation.

Leachable testing was undertaken to assess the risk to groundwater. No significant leachable contamination was encountered, therefore the risk to groundwater is considered **Low**.

The nearest surface water is 379m away. Due to the lack of leachable contamination encountered on site, the risk to surface water is considered to be **Low**.

PAH contamination appears to originate from the shallow made ground consisting of tarmac and ash demonstrated in BH02 at 0.30m which showed significantly elevated concentrations of PAH's. However the sample from the same borehole at 0.50m showed no significant contamination. Therefore we believe that the PAH contamination is not migrating and will not pose a risk to controlled waters.

7.4 Soil Gases

7.4.1 Asphyxiant, Noxious or Explosive Gases

Standpipe installations were incorporated in LCP01, WS01, 03, 05, 10, 13, 15, 16, 17, 26, 30, 31, 35, 36, 37, 41, 43, 45, 47, 50, 53, 58, 59 and 61 as detailed in the borehole records.

Gas monitoring has been undertaken across the site on six occasions. Barometric pressure has been recorded at between 994mb and 1013mb during the visits.

On the two monitoring occasions no flow has been recorded, a maximum of 9.5% CO₂ was recorded in WS35. Methane CH₄ 0.2% has been recorded to date in LCP01.

With reference to Situation A non-traditional construction as defined by the NHBC and the modified Wilson & Card classification as contained within CIRIA C665, the maximum carbon dioxide concentration indicates a CS2 regime requiring 3 points of gas protection measures for public buildings.

7.5 Delineation works

7.5.1 Field Works

The chemical analysis of the samples taken from site indicated elevated metals, hydrocarbons and asbestos in a number of locations. The metals can be effectively mitigated through encapsulation by hardstanding or clean and inert capping. Asbestos and hydrocarbons however will need delineating to ensure that it will not pose a risk to end users or site workers.

A delineation exercise of four hotspots, WS14 for PAH, and WS53, LCP02 and LCP01 for Asbestos was carried out in October 2014 and comprised four shallow window sample boreholes to around

1m depth located typically 3m to 5m from each of the original borehole locations, but subject to access and location constraints. Soil samples were collected at the same depth the original sample had been collected and also at a greater depth in order to assess the lateral and vertical extent of the possible contaminant hotspot at each of the four locations. The samples underwent environmental chemical analysis for the contaminants of concern at each of the location.

7.5.2 Site Soils

As discussed previously, twenty two additional samples were taken in total from the hotspot areas located around the original borehole locations.

The report compares the chemistry analysis results for a conservative assessment against 'Residential without plant uptake' end use.

The results of the environmental testing can be referred to in Appendix A4. Copies of the Tier 1 thresholds are contained within Appendix A6.

Soil organic matter (SOM) has a strong bearing on the availability of potential contaminants and therefore influences the Tier 1 thresholds. The average soil organic matter (SOM) values for the shallow site soils across the development site is more than 6%, and therefore for comparison against Tier 1 thresholds a conservative SOM of 6.0% has been adopted.

The locations where 'Residential without Consumption of Produce' Tier 1 thresholds have been exceeded are shown below.

7.5.3 Asbestos

Asbestos (Chrysotile) was encountered at detectable limits within the shallow made ground soils at one location across the additional holes, located in WS3B 0.5m bgl. This infers that the asbestos hotspots are fairly limited and not considered to be a site wide issue.

It is recommended that any impacted material should be either encapsulated on site by building construction or hard standing, or removed from site to a suitably licensed disposal facility. Depending on the outcome of the delineation exercise a limited picking operation may be undertaken to remove the risk.

Quantification of the asbestos has indicated a concentration below 0.001%. The analysis results indicate that there is little likelihood of potentially breathable fibres being generated and soils where fibres were initially detected are not likely to be classed as Hazardous Waste for disposal.

Although there would not appear to be a significant risk to future development there is nevertheless asbestos fibres in certain locations. These will need to be adequately managed during construction and the presence recorded in the development Health and Safety File.

An estimate of the hotspot locations is provided on drawing no EB1310/L001 within Appendix A2

7.5.4 Organics

Poly Aromatic Hydrocarbons (PAH's)

Phase 2 Intrusive Investigation

The preliminary investigation observed concentrations of PAH's which could present a risk of harm to the proposed end user by risk of direct contact and ingestion. Various PAH's were recorded at elevated concentrations in WS14 at 0.30m bgl and as a result delineation works were undertaken around this original location.

Soil samples were collected at the same depth as the original sample and at a greater depth in order to assess the lateral and vertical extent of the possible contaminant hotspot at the four locations. The samples underwent environmental chemical analysis for the contaminants of concern at each of the location.

Benzo[a]pyrene was observed close to and above Tier 1 thresholds in three of the four locations within the samples, with maximum recorded concentrations of 2.1mg/kg in WS4B at a depth of 0.40m bgl; 1.2mg/kg in WS4D at 0.5m bgl; and 1.0mg/kg in WS4C at 0.45m bgl.

The three elevated samples are located towards the north western boundary and away from the playing fields. The proposed development of the school buildings and associated works will not be located in this area of the site; however based on the level of contamination encountered it will be necessary to excavate this hotspot and removed from site.

An estimate of the hotspot location is provided on drawing no EB1310/L001 within Appendix A2.

8.0 Geotechnical Assessment

8.1 Structural Design

It is understood that the proposed development comprises additional school facilities.

Layouts and details of the proposed development are not available. Accordingly the comments and recommendations below should be reviewed as design details become available.

8.2 Assessment of Strata Conditions

Made Ground/Topsoil

Topsoil and made ground were encountered across the site to depths up to 3.00m. The greatest thicknesses of made ground were located along the northern side of the site where up to 3m were encountered.

Moving southwards across the playing field area the thickness of made ground generally reduces to depths in the range 0.15 to 1.20m. Across the area of existing buildings the thickness of made ground was typically less than 1.50m with an average thickness about 0.75m. A maximum thickness of made ground of 1.60m was encountered in this area in WS37.

Made ground was predominantly of sand. Brick, plastic, concrete, tarmac ash and slag were noted within these materials. Occasional cobbles were noted. At the majority of locations the made ground rested directly on weathered sandstone at depths in the range 0.01 to 3.00m. WS38 was terminated within made ground at a depth of 1.26m due to an obstruction.

Natural Strata

Natural strata was encountered across the site in all boreholes except WS38. A thin layer of sand was encountered in WS17, WS28 and WS56 separating the made ground from the underlying sandstone. A thin layer of clay was encountered in WS50 separating the made ground from the underlying sandstone.

Sandstone was encountered in all boreholes except WS38 at depths in the range 0.01 to 3.00m. The depth to sandstone reflects the thickness of made ground indicated above. Sandstone was encountered at a maximum depth of 3.00m on the northern site boundary. The depth to sandstone generally reduced moving south across the site.

Sandstone was generally described as weathered with the upper part recovered as red brown sand. The competence of the sandstone generally increased with depth of penetration. All boreholes, except WS38, were terminated within sandstone at depths in the range 0.30 to 3.35m.

8.3 Foundation Design

It is recommended that structural loads are carried on traditional spread foundations bearing on weathered sandstone. Foundation excavations should be extended through made ground and where necessary brought up by mass concrete trench fill. Across the majority of the site foundation excavations in the range 0.50 to 1.50m deep are likely to be required. If structures are proposed towards the northern part of the site then excavation up to about 3m may be required.

Square pad foundations up to 2m by 2m on weathered sandstone may be designed based on a presumed bearing capacity of 400kN/m² assuming that the material has the characteristics of a dense sand or very weak rock. Strip foundations of similar width may be designed based on a presumed bearing capacity of 200kN/m².

8.4 Ground Floor Slab Design

Depending on building locations formation beneath ground floor slabs may comprise either weathered sandstone or loose and medium dense granular made ground. In order to minimise differential settlement made ground may be removed and re-compacted and /or reinforcement may be incorporated into floor slabs.

8.5 Excavations

Excavation will be required through granular made ground and weathered bedrock. Excavation in rock may require the use of hydraulic breakers or similar.

On the basis of observations on site, together with the results of in-situ and laboratory tests, it is considered that excavations to less than 1.00m may not stand unsupported in the short term in granular made ground. Side support for safety purposes should of course be provided to all excavations which appear unstable, and those in excess of 1.20m deep, in accordance with Health and Safety Regulations.

Groundwater should not be expected in shallow excavations for foundations or services.

8.6 Chemical Attack on Buried Concrete

The site has been classified in accordance with BRE Special Digest 1 and laboratory testing undertaken accordingly. It is recommended that the guidelines given in BRE Special Digest 1, be adopted.

The results of chemical tests indicate sulphate concentrations in the soil between <10mg/l and 490mg/l as 2:1 water/soil extract, with pH values in the range 6.3 to 11.3. It is recommended that for conventional shallow foundations the groundwater should be regarded as mobile.

On the basis of the laboratory test results it is considered that a Design Sulphate Class for this material may be taken as DS-1. The site conditions would suggest that an ACEC class for the site of AC-1 would be appropriate.

8.7 Road and Hardstanding Design

Plate bearing tests determined modulus of sub-grade reaction values between 8.5 and 11.8MN/m²/m and CBR values of 0.4 and 0.7%. It is considered that these results are not truly representative as the plate load tests had to be undertaken on the surface due to site constraints. Further inspection of the sub-surface strata reveals that a CBR value of 2% should be attainable at road / pavement construction depth.

Formations should be proof rolled and any areas of soft or deleterious material should be excavated and replaced with a properly compacted granular fill.

9.0 Pre-Remediation Constraints and Outline Remediation Strategy

This section of the report describes general constraints to development currently thought to exist on the site of interest.

9.1 Invasive Plants

The presence of the invasive plants, Japanese Knotweed and or Giant Hogweed, was not apparent during the fieldwork.

9.2 Services

Public utility information was provided by the client.

All window sample borehole locations were positioned clear of all services as shown on service drawings and scanned using CAT service detector before and during hand excavation of a starter pit.

9.4 Land Condition and Outline Remediation

The sequence of the strata encountered during the investigation generally confirms the anticipated geology as interpreted from the geological map.

Given that the current and proposed end use of the site (School Building) is directly accounted for by published UK guidance the report compares the chemistry analysis results against 'Residential without the Consumption of Produce'.

Soil organic matter (SOM) has a strong bearing on the availability of potential contaminants and therefore influences the Tier 1 thresholds. The average soil organic matter (SOM) values for the shallow site soils across the development site is more than 6%, one of the broadly modelled SOM percentages, and therefore for comparison against Tier 1 thresholds a conservative SOM of 6.0% has been adopted.

It is considered that the levels of sulphate encountered within the Made Ground will not present a risk to the proposed end user. However consideration should be made with respect to buried concrete requirements as specified in BRE Special Digest 1: 2005 LCP01 is located within an area of soft landscaping which is to be converted to a car park during development of the site.

Metal (Arsenic and Lead) and TPH contamination encountered could be similarly mitigated by the provision of encapsulation on site by building construction / hard standing or provision of 300mm of clean and inert capping for soft landscaped areas, as an alternative this material could be removed from site to a suitably licensed disposal facility.

Asbestos (Chrysotile) was encountered at detectable limits within the shallow made ground soils at three locations across the site (BH01 0.5m bgl, BH02 0.3m bgl and WS53 0.8m bgl). These areas have been further delineated.

Phase 2 Intrusive Investigation

The majority of the significantly elevated PAH samples are located around the existing school buildings. This is likely to be associated with tarmac and ash in this area.

The bulk of the samples obtained across the playing fields do not exceed the relevant tier one thresholds. However in six locations Benzo(a)pyrene is slightly elevated, considering the intended end use these thresholds are considered to be conservative. If the Category 4 Screening Levels 'residential without plant uptake' (C4SL) are utilised then all samples with the exception of WS14 are below these thresholds. As such it is believed that the only risk presented to site users is from WS14 and it is therefore this area was delineated.

As discussed previously, twenty two additional samples were taken in total from the hotspot areas located around the original borehole locations as part of a delineation exercise.

Asbestos (Chrysotile) was encountered at detectable limits within the shallow made ground soils at one location across the additional holes, located in WS3B 0.5m bgl. This infers that the asbestos hotspots are fairly limited and not considered to be a site wide issue.

It is recommended that any impacted material should be either encapsulated on site by building construction or hard standing, or removed from site to a suitably licensed disposal facility. Depending on the outcome of the delineation exercise a limited picking operation may be undertaken to remove the risk.

Quantification of the asbestos has indicated a concentration below 0.001%. The analysis results indicate that there is little likelihood of potentially breathable fibres being generated and soils where fibres were initially detected are not likely to be classed as Hazardous Waste for disposal.

Although there would not appear to be a significant risk to future development there is nevertheless asbestos fibres in certain locations. These will need to be adequately managed during construction and the presence recorded in the development Health and Safety File.

Benzo[a]pyrene was observed close to and above Tier 1 thresholds in three of the four delineation locations within the samples, with maximum recorded concentrations of 2.1mg/kg in WS4B at a depth of 0.40m bgl; 1.2mg/kg in WS4D at 0.5m bgl; and 1.0mg/kg in WS4C at 0.45m bgl.

The three elevated samples are located towards the north western boundary and away from the playing fields. The proposed development of the school buildings and associated works will not be located in this area of the site; however based on the level of contamination encountered it will be necessary to excavate this hotspot and removed from site.

Inferred hotspot locations can be seen in drawing no EB1310/L001 within Appendix A2

An initial assessment for the waste classification of the shallow soils encountered on site has been carried out using the Waste Soils Characterisation Assessment Tool, Cat-WasteSoil, developed by McArdle and Atkins. This online tool gives a rapid assessment of contaminated soils and their classification as either hazardous or non-hazardous waste.

The seventy eight samples collected have been entered into this Cat-WasteSoil tool. WS43 has recorded high concentrations of Lead at 0.2m bgl, WS51 recorded high concentrations of Zinc and Copper at 0.1m bgl, and BH02 recorded concentrations of Benzo(a)anthracene at 0.30m bgl. Initial

Phase 2 Intrusive Investigation

classification of these shallow soil samples are classed as hazardous waste for Metals in WS43 and WS51 and PAH in BH02.

Further WAC environmental analysis of the shallow soils encountered during the redevelopment of the site will need to be carried out to classify the material as clean and inert or hazardous if the material is to be taken off site.

Groundwater was not recorded in any of the exploratory holes formed during this investigation.

Leachable testing was undertaken to assess the risk to groundwater. No significant leachable contamination was encountered, therefore the risk to groundwater is considered Low.

The nearest surface water is 379m away. Due to the lack of leachable contamination encountered on site, the risk to surface water is considered to be Low.

PAH contamination appears to originate from the shallow made ground consisting of tarmac and ash demonstrated in BH02 at 0.30m which showed significantly elevated concentrations of PAH's. However the sample from the same borehole at 0.50m showed no significant contamination. Therefore we believe that the PAH contamination is not migrating and will not pose a risk to controlled waters.

Gas monitoring has been undertaken across the site on six occasions to date. Barometric pressure has been recorded at between 994mb and 1013mb during the visits. A flow of 1.6 has been recorded, a maximum of 9.5% CO₂ was recorded in WS35. Methane CH₄ 0.2% has been recorded to date in LCP01.

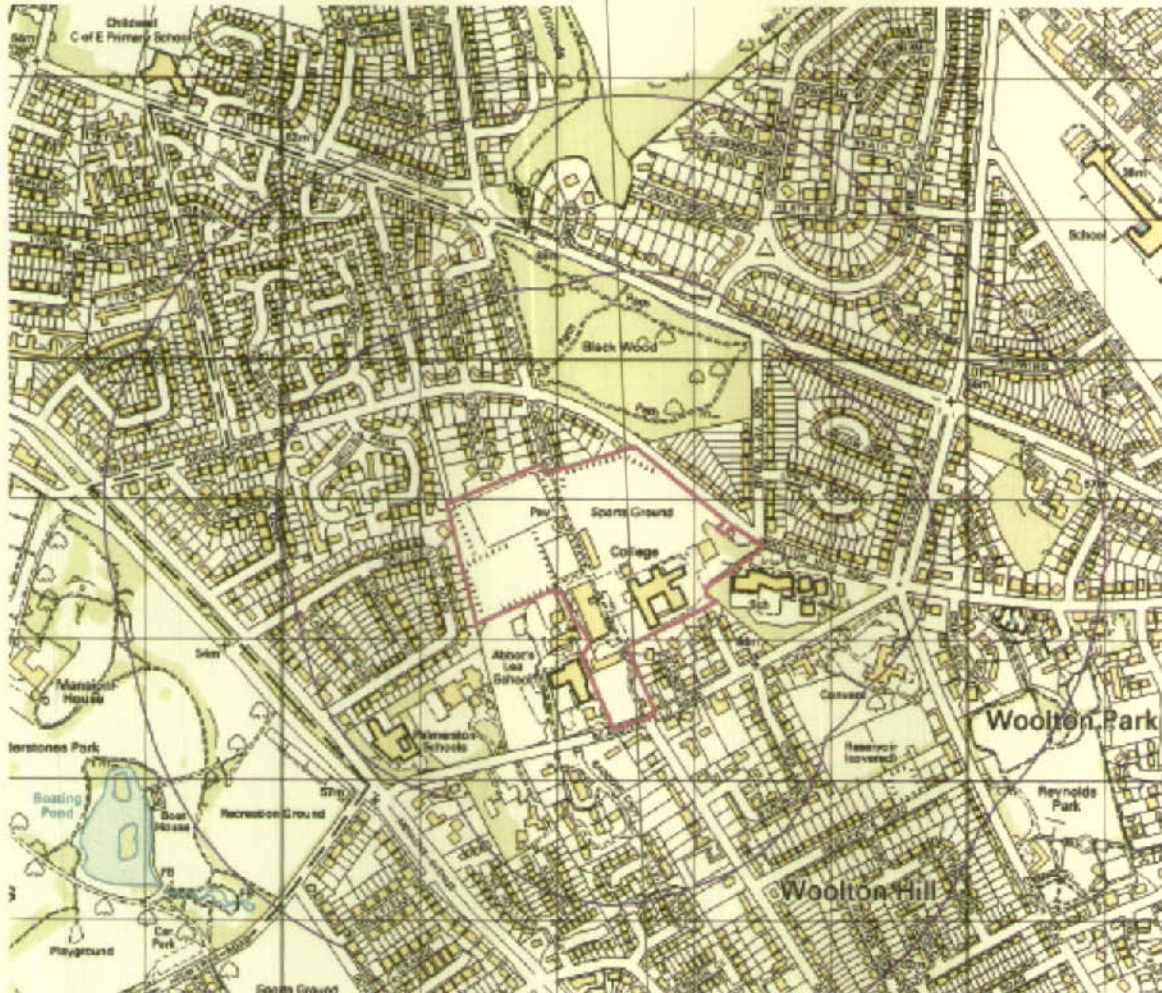
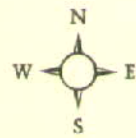
With reference to Situation A non-traditional construction as defined by the NHBC and the modified Wilson & Card classification as contained within CIRIA C665, the maximum carbon dioxide concentration indicates a CS2 regime requiring 3 points of gas protection measures for public buildings.

Elevated concentrations of TPH contamination with respect to the protection of water supply pipes were determined within the Topsoil/Made Ground. Therefore, it is recommended that appropriate materials for water supply pipes would comprise Barrier Pipes (PE/AL/PE). The exact requirements are to be confirmed with the relevant utility supplier.

Both the Radon Atlas for England and Wales, and the Envirocheck Report confirm that the site is in a lower probability radon area, as less than 1% of homes are above the action level. No radon protective measures are necessary in the construction of new dwellings or extensions.

Appendix A1- Site Plans

Site Location Plan



Crown copyright. Licence Number 100020245

Key

Approximate site boundary

Project

St Francis Xavier, Beaconsfield Road,
Liverpool

Drawing Title

Site Location Plan

Job Reference

EB1310/GL/3547

Date

034703.2014

Author

GL

Checked

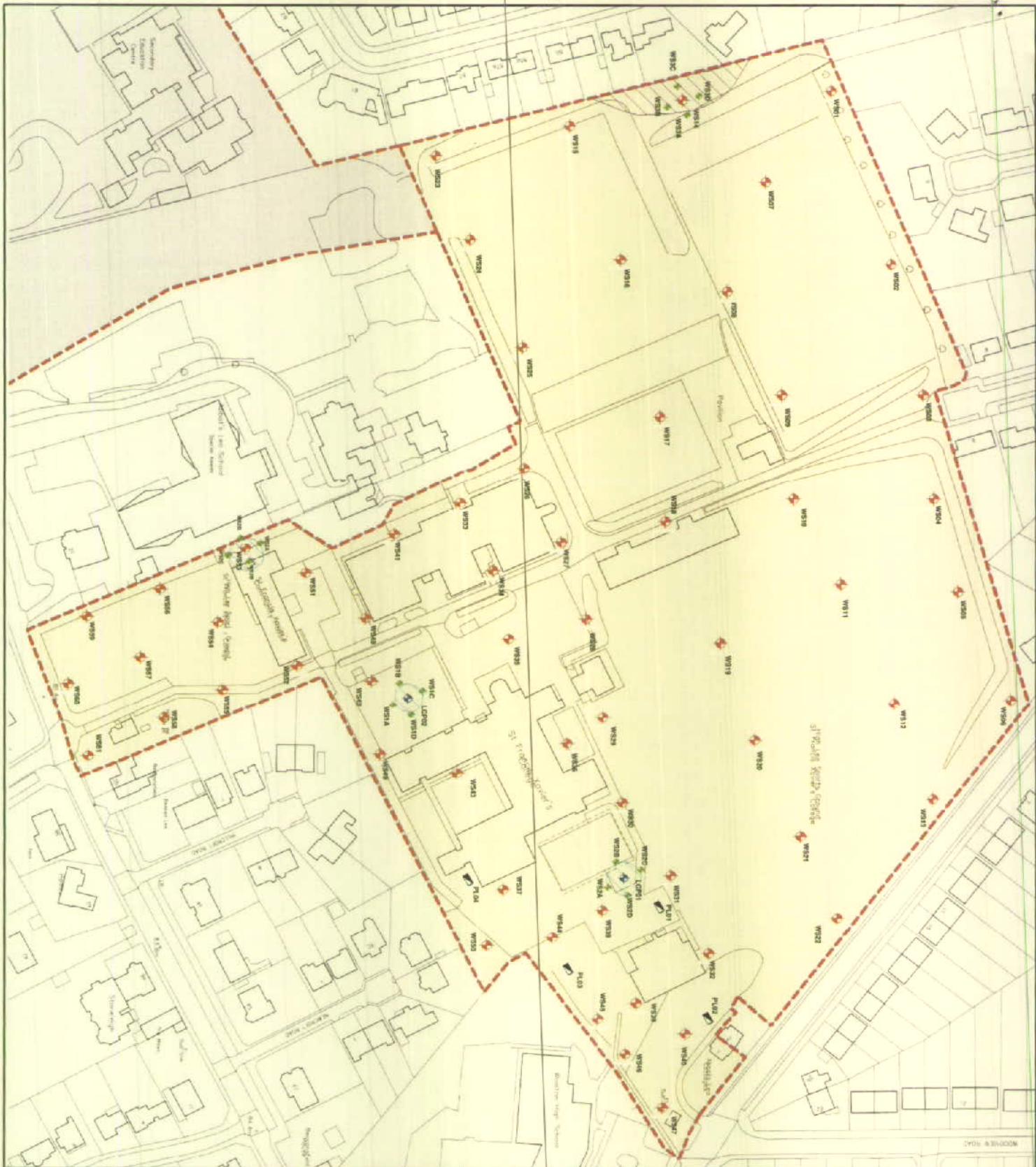
DM









10 Oxford Court,
Bishopsgate,
Manchester
M2 3WQ

Tel: 0161 236 2394

Appendix A2 – Exploratory Hole Location Plan



Notes:
1. Do not scale from this drawing

-  Window Sample Boreholes x 61 (5m depth, with 30 installs)
-  Light Cable Percussion x 2 (15m depth, with 2 installs)
-  Plate Load Tests x 4
-  Delineation Window Samples Boreholes
-  Hatched area denotes elevated of PAH Benzo(a)pyrene
-  Hatched area denotes detection of Asbestos

Rev.	Description:	Date:	By	Chkd
------	--------------	-------	----	------



Curtis Consulting Ltd
Marchant Exchange, 17-19 Wilknot Street West, Manchester M1 5WG
t 0161 226 2294
e marchant@curtis.com
www.curtis.com

Branches: Cheng • Environment • Infrastructure • Transport Planning • Sustainability • Export/Import Services
Divisions: Retail • Cargo • Freight • Engineering • Finance • Logistics • Land • Linerpool • London • Maritime • Multinational

Information






Si Francis Xavier





Window Sample Delineation Plan

Scale:	Size:	First Issue:	Drawing:	Checklist:
	A3		AW	DM

EB1310B L001

Appendix A3 – Exploratory Hole Logs

 IAN FARMER ASSOCIATES					Site St Francis Xavier School		Borehole Number BH01			
Boring Method Cable Percussion		Casing Diameter		Ground Level (mOD) 80.87	Client Curtins Consulting		Job Number 41498			
		Location 341584.7 E 387711.9 N		Dates 18/08/2014	Engineer Curtins Consulting		Sheet 1/1			
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30 0.30 0.50 0.50 0.50-1.00	D1 J2 D4 J5 B3				80.67	(0.20) 0.20	Grass over MADE GROUND: Friable, dark brown, slightly sandy SILT with frequent roots and occasional rootlets (TOPSOIL).			
						(1.00)	MADE GROUND: Dark brown, gravelly, fine to coarse SAND with occasional ash. Gravel is angular to subrounded, fine to coarse of brick, concrete, clinker, slag and occasional flint.			
1.20-1.65	SPT(C) N=37		DRY	3,4/4,5,11,17	79.67 79.47	1.20 (0.20) 1.40	MADE GROUND: Dense, dark brown mottled orange brown, gravelly, clayey, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of sandstone and occasional flint and brick.			
2.00-2.12 2.00 2.00 2.00-2.12 2.00-2.50	SPT 25*/25 50/95 D6 J7 D9 B8		DRY	25/39,11	78.37	(1.10) 2.50	Weathered SANDSTONE, recovered as dense, red brown mottled light grey, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse.			
							Complete at 2.50m			
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Borehole remained dry during drilling. Water added from 2.20m to 2.50m. Excavating from 0.00m to 1.20m for 1.00 hour.							Scale (approx) 1:40		Logged By DO	
							Figure No. 41498.BH01			

 IAN FARMER ASSOCIATES						Site St Francis Xavier School		Borehole Number BH02	
Boring Method Cable Percussion		Casing Diameter 		Ground Level (mOD) 81.90		Client Curtins Consulting		Job Number 41498	
		Location 341512.2 E 387624.9 N		Dates 18/08/2014		Engineer Curtins Consulting		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30 0.30 0.50-0.68 0.50 0.50 0.50-0.68 0.50-0.95	D1 J2 SPT 25*/85 50/90 D5 J6 D4 B3			20,5/41,9	81.85 81.50 80.90	0.05 (0.35) 0.40 (0.60) 1.00	MADE GROUND: Tarmacadam. MADE GROUND: Dark brown mottled orange brown, clayey, gravelly, fine to coarse SAND with low cobble content of subrounded sandstone and brick. Gravel is subangular to subrounded, fine to coarse of brick, concrete, slag and occasional flint. Weathered SANDSTONE, recovered as dense, red brown mottled yellow brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Complete at 1.00m	  	
Remarks Borehole backfilled on completion. Samples marked J comprise 1 x amber jar and 1 x vial. Borehole remained dry during drilling. Chiselling from 0.90m to 1.00m for 100 hours. Excavating from 0.00m to 1.00m for 1.00 hour.								Scale (approx) 1:50	Logged By DO
								Figure No. 41498.BH02	



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS01

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
72.24

Client
Curtins Consulting

Job
Number
41498

Location
341270.8 E 387791 N

Dates
21/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30 0.30 0.50-1.00	D1 J2 B3			72.09 71.84	(0.15) 0.15 (0.25) 0.40	Grass over MADE GROUND: Friable, dark brown, slightly sandy SILT with occasional roots and rootlets.			
0.80 0.80	D4 J5				(0.80)	MADE GROUND: Dark brown, silty, gravelly, fine and medium SAND with occasional fragments of wood and metal. Gravel is subangular to subrounded, fine to coarse of flint, brick and sandstone.			
1.20-1.65 1.20-1.65	SPT N=8 D6		2,2/3,1,2,2	71.04	1.20	MADE GROUND: Orange brown, gravelly, fine to coarse SAND with low cobble content of subrounded sandstone. Gravel is angular to subrounded, fine to coarse of brick, flint and sandstone.			
1.90 1.90 2.00-2.23	D7 J8 SPT 25"/125 50/105		7,18/31,19	70.24 70.01	(0.80) 2.00 (0.23) 2.23	MADE GROUND: Loose, orange brown speckled black, gravelly, fine to coarse SAND with occasional fragments of wood. Gravel is angular to subrounded, fine to coarse of sandstone, flint and brick.			
2.00-2.23	D9					Weathered SANDSTONE recovered as very dense, red brown, gravelly, fine to coarse sand, Gravel is angular to subrounded, fine to coarse.			
						Terminated at 2.23m			

Remarks

Window sample hole remained dry during excavation.
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole terminated at 2.23m due to refusal.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale
(approx)

1:40

Logged
By

DO

Figure No.

41498.WS01



IAN FARMER
ASSOCIATES

Site St Francis Xavier School					Number WS02					
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 72.77		Client Curtins Consulting		Job Number 41498		
		Location 341338.9 E 387825.8 N		Dates 21/08/2014		Engineer Curtins Consulting		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
0.30 0.30 0.50-1.00	D1 J2 B3			72.57 72.37	(0.20) 0.20 (0.20) 0.40	Grass over MADE GROUND: Friable dark brown, slightly sandy, clayey SILT with occasional roots and rootlets. MADE GROUND: Dark brown, silty, gravelly, fine and medium SAND with occasional rootlets. Gravel is angular to subrounded, coarse of sandstone and occasional flint and brick.				
0.80 0.80	D4 J5				(0.80)	MADE GROUND: Orange brown, silty, gravelly, fine and medium SAND with low cobble content of subrounded sandstone and flint. Gravel is angular to subrounded, medium to coarse including sandstone, flint and brick.				
1.20-1.65 1.20-1.65	SPT N=7 D6		1,0/1,0,1,5	71.57	1.20	MADE GROUND: Loose, orange brown, silty, gravelly, fine and medium SAND. Gravel is angular to subrounded, fine to coarse of flint, brick and sandstone.				
1.70-1.87 1.70 1.70 1.70-1.87	SPT 25*/85 50/85 D7 J8 D9		21,4/42,8	71.07 70.90	1.70 (0.17) 1.87	Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Complete at 1.87m				
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole terminated at 1.87m due to refusal. Window sample hole backfilled on completion. Window sample hole remained dry during excavation. Excavating from 0.00m to 1.20m for 1.00 hour.							Scale (approx) 1:40		Logged By DO	
							Figure No. 41498.WS02			



IAN FARMER
ASSOCIATES

Site

St Francis Xavier School

Number
WS03

Excavation Method

Drive-in Window Sampler

Dimensions

Ground Level (mOD)

74.24

Client

Curtins Consulting

Job
Number
41498

Location

341382.8 E 387833.4 N

Dates

21/08/2014

Engineer

Curtins Consulting

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30 0.30 0.50-1.00 0.60 0.60	D1 J2 B3 D4 J5		18,7/32,18	74.06	(0.18) 0.18	Grass over MADE GROUND: Friable dark brown, sandy, clayey SILT with occasional roots and rootlets.			
					(0.82)	MADE GROUND: Light brown mottled orange, gravelly, fine to coarse SAND with low cobble content of subrounded brick and sandstone. Gravel is angular to subrounded, fine to coarse of sandstone and concrete.			
1.00-1.21	SPT 25'/105			73.24	1.00	Weathered SANDSTONE, recovered as very dense, orange, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse.			
1.00-1.21	50/105 D6			73.03	(0.21) 1.21	Complete at 1.21m			

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale
(approx)

1:40

Logged
By

DO

Figure No.

41498.WS03



**IAN FARMER
ASSOCIATES**

Site St Francis Xavier School					Number WS04				
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 77.17		Client Curtins Consulting		Job Number 41498	
		Location 341420.2 E 387835.1 N		Dates 21/08/2014		Engineer Curtins Consulting		Sheet 1/1	
Depth (rh)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (rh) (Thickness)	Description		Legend	Water
0.30 0.30 0.50	D1 J2 B3			76.97	(0.20) 0.20	Grass over MADE GROUND: Friable dark brown, sandy, clayey SILT with frequent roots and occasional rootlets (TOPSOIL).			
0.80 0.80	D4 J5			76.42	(0.55) 0.75	MADE GROUND: Dark brown, silty, slightly gravelly, fine and medium SAND. Gravel is angular to subrounded, fine to coarse of flint, brick and sandstone.			
1.20-1.65 1.20-1.65	SPT N=4 D6		2,2/1,1,1,1	75.97	1.20	MADE GROUND: Orange brown speckled black, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of flint, brick, slag and sandstone.			
1.50	D7				(1.20)	MADE GROUND: Loose to medium dense, orange brown speckled black, very gravelly, fine to coarse SAND with occasional fragments of wood and metal. Gravel is subangular to subrounded, fine to coarse of flint, brick, slag and sandstone.			
2.00-2.45 2.00-2.45	SPT N=11 D8		1,1/1,3,5,2	74.77	2.40	MADE GROUND: Loose to medium dense, dark brown mottled black, gravelly, silty, fine and medium SAND. Gravel is subangular to subrounded, fine of flint, brick and sandstone.			
2.70	D9			74.27	(0.50) 2.90	Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse.			
3.00-3.35 3.00 3.00 3.00-3.35	SPT 50/200 D10 J11 D12		2,3/5,19,26	73.82	(0.45) 3.35	Complete at 3.35m			
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole backfilled on completion. Window sample hole remained dry during excavation. Excavating from 0.00m to 1.20m for 1.00 hour.								Scale (approx) 1:40	Logged By DO
								Figure No. 41498.WS04	



IAN FARMER
ASSOCIATES

Site

St Francis Xavier School

Number
WS05

Excavation Method

Drive-in Window Sampler

Dimensions

Location

341470.7 E 387851.8 N

Ground Level (mOD)

77.40

Client

Curtins Consulting

Job

Number
41498

Dates

20/08/2014

Engineer

Curtins Consulting

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30 0.30 0.50-1.00	D1 J2 B3			77.20 76.90	(0.20) 0.20 (0.30)	Grass over MADE GROUND: Friable dark brown, slightly sandy, clayey SILT with frequent roots and occasional bags.			
0.80 0.80	D4 J5				0.50 (0.70)	MADE GROUND: Friable dark brown, silty, gravelly, fine SAND with low cobble content of subangular to subrounded sandstone. Gravel is subangular to subrounded, fine to coarse of brick, flint and sandstone.			
1.20-1.65 1.20-1.65	SPT N=8 D6		1,1/2,1,3,2	76.20	1.20	MADE GROUND: Grey brown, gravelly, fine to coarse SAND with low cobble content with occasional pieces of wood. Gravel is angular to subrounded, fine to coarse of flint and sandstone.			
1.80 2.00-2.45 2.00-2.45	D7 SPT N=11 D8		7,5/2,1,4,4		(1.80)	MADE GROUND: Loose to medium dense, orange brown mottled black and occasionally purple, gravelly, fine to coarse SAND with low cobble content of subrounded concrete and sandstone. Gravel is angular to subrounded, fine to coarse of flint, brick, concrete, tarmacadam and sandstone.			
2.50	D9								
3.00-3.28 3.00 3.00 3.00-3.28	SPT 50/125 D10 J11 D12		7,12/19,31	74.40 74.12	3.00 (0.28) 3.28	Weathered SANDSTONE recovered as very dense, orange brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse sandstone. Complete at 3.28m			

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale
(approx)

1:40

Logged
By

DO

Figure No.

41498.WS05



**IAN FARMER
ASSOCIATES**

Site
St Francis Xavier School

Number
WS06

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
77.46

Client
Curtins Consulting

**Job
Number**
41498

Location
341503 E 387858.2 N

Dates
20/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30 0.30 0.50-1.00	D1 J2 B3			77.26	(0.20) 0.20	Friable dark brown, slightly sandy, clayey SILT with frequent rootlets and occasional twigs (TOPSOIL).		
0.80 0.80	D4 J5				(1.00)	MADE GROUND: Friable, dark brown, silty, gravelly, fine SAND with low cobble content of subangular to subrounded concrete, brick and sandstone. Gravel is angular to subrounded, fine to coarse of brick, concrete, glass and sandstone.		
1.20-1.65 1.20-1.65 1.50	SPT N=6 D6 D7		1,2/1,1,2,2	76.26	1.20 (0.80)	Weathered SANDSTONE, recovered as loose, orange gravelly, fine to coarse sand with low cobble content of subrounded sandstone. Gravel is angular to subrounded, fine to coarse.		
2.00-2.42 2.00 2.00 2.00-2.42	SPT 50/265 D8 J9 D10		5,6/4,3,25,18	75.46 75.04	2.00 (0.42) 2.42	Weathered SANDSTONE, recovered as very dense, orange speckled black, gravelly, fine to coarse SAND. Gravel is subrounded, fine to coarse.		
						Complete at 2.42m		


Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 1.20m for 1.00 hour.

**Scale
(approx)**
1:50

**Logged
By**
DO

Figure No.
41498.WS06



 IAN FARMER ASSOCIATES					Site St Francis Xavier School		Number WS08		
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 73.08		Client Curtins Consulting		Job Number 41498	
		Location 341354 E 387755.1 N		Dates 21/08/2014		Engineer Curtins Consulting		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.20-0.46 0.30 0.30 0.46-0.69 0.46-0.69	B1 D2 J3 SPT 25*/115 50/115 D4		15,10/31,19	72.90 72.62 72.39	(0.18) 0.18 (0.28) 0.46 (0.23) 0.69	Grass over MADE GROUND: Friable dark brown, slightly sandy, clayey SILT with frequent roots and rootlets. MADE GROUND: Dark brown, gravelly, fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse of brick, flint and sandstone. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse. Terminated at 0.69m			
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole backfilled on completion. Window sample hole remained dry during excavation. Window sample terminated at 0.69m due to refusal. Excavating from 0.00m to 0.69m for 1.00 hour.						Scale (approx) 1:40		Logged By DO	
						Figure No. 41498.WS08			



IAN FARMER
ASSOCIATES

Site St Francis Xavier School	Number WS09
----------------------------------	----------------

Excavation Method Drive-in Window Sampler	Dimensions	Ground Level (mOD) 73.50	Client Curtins Consulting	Job Number 41498
	Location 341394.9 E 387774.7 N	Dates 21/08/2014	Engineer Curtins Consulting	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20-0.45 0.30 0.30 0.45-0.67 0.45-0.67	B1 D2 J3 SPT 25'/115 50/105 D4		16,9/29,21	73.31 73.05 72.83	(0.19) 0.19 (0.26) 0.45 (0.22) 0.67	Grass over MADE GROUND: Friable, dark brown, slightly sandy, clayey SILT with occasional roots and rootlets. MADE GROUND: Dark brown, gravelly, fine to coarse SAND with occasional pieces of wood. Gravel is angular to subrounded, fine to coarse of brick, flint and sandstone. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse. Terminated at 0.67m	 	

Remarks
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.
Window sample terminated at 0.67m due to refusal.
Excavating from 0.00m to 0.67m for 1.00 hour.

Scale (approx)	Logged By
1:50	DO
Figure No. 41498.WS09	



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS10

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
77.56

Client
Curtins Consulting

Job
Number
41498

Location
341425.2 E 387778.7 N

Dates
21/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30 0.30	D1 J2			77.36	(0.20) 0.20	Grass over MADE GROUND: Friable, dark brown, gravelly, clayey SILT with frequent roots and occasional rootlets (TOPSOIL).			
				76.96	(0.40) 0.60	MADE GROUND: Dark brown, silty, slightly gravelly, fine and medium SAND. Gravel is subangular to subrounded, fine to coarse of flint, brick and sandstone.			
0.80 0.80 0.80-1.00	D4 J5 B3					MADE GROUND: Medium dense, orange speckled black, gravelly, fine to coarse SAND with low cobble content. Gravel is angular to subrounded, fine to coarse of sandstone and occasional flint and brick.			
1.20-1.65 1.20-1.65	SPT N=11 D6		1,1/2,2,3,4		(1.30)				
1.90-2.12 1.90 1.90 1.90-2.12	SPT 25'/105 50/115 D7 J8 D9		14,11/28,22	75.66 75.44	1.90 (0.22) 2.12	Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse.			
						Complete at 2.12m			

Remarks
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale
(approx)
1:40

Logged
By
DO

Figure No.
41498.WS10



St Francis Xavier School

Number
WS13

**Job
Number**
41498

Sheet
1/1

Instr

Terminated at 1.93m

DO

Figure No.
41498.WS13



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS14

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
72.49

Client
Curtins Consulting

Job
Number
41498

Location
341285.8 E 387731.7 N

Dates
21/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30 0.30 0.50-1.00	D1 J2 B3			72.34	(0.15) 0.15	Grass over MADE GROUND: Friable dark brown, slightly sandy, clayey SILT with occasional roots and rootlets.		
				72.04	(0.30) 0.45	MADE GROUND: Dark brown, silty, gravelly, fine and medium SAND with occasional pieces of wood and plastic. Gravel is subangular to subrounded, fine to coarse of flint, brick and sandstone.		
0.80 0.80	D4 J5				(0.75)	MADE GROUND: Orange brown, gravelly, fine to coarse SAND with occasional pieces of wood and plastic. Gravel is subangular to subrounded, fine to coarse of flint, brick and sandstone.		
1.20-1.65 1.20-1.65	SPT N=16 D6		1,1/2,3,5,6	71.29	1.20	MADE GROUND: Medium dense, orange brown speckled black and occasionally light brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of brick, flint and sandstone.		
1.80-2.08 1.80 1.80 1.80-2.08	SPT 25*/145 50/135 D7 J8 D9		12,13/26,24	70.69 70.29	(0.60) 1.80 (0.40) 2.20	Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse.		
						Complete at 2.20m		

Remarks
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale
(approx)
1:40

Logged
By
DO

Figure No.
41498.WS14



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS15

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
73.82

Client
Curtins Consulting

Job
Number
41498

Location
341273.3 E 387701.8 N

Dates
22/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30 0.30 0.50-1.00	D1 J2 B3			73.64 73.44	(0.18) 0.18 (0.20) 0.38	Grass over MADE GROUND: Friable, dark brown, slightly sandy SILT with frequent roots and occasional rootlets (TOPSOIL).			
0.80 0.80	D4 J5				(0.82)	MADE GROUND: Dark brown, silty, gravelly, fine and medium SAND with occasional twigs. Gravel is subangular to subrounded, fine to coarse of flint, sandstone and brick.			
1.20-1.65 1.20-1.65	SPT N=9 D6		2,2/3,2,2,2	72.62	1.20 (0.80)	MADE GROUND: Dark brown mottled orange, gravelly, fine to coarse SAND with low cobble content of subangular to subrounded of brick and sandstone. Gravel is subangular, fine to coarse of flint, sandstone and brick.			
2.00-2.42 2.00 2.00 2.00-2.41	SPT 50/265 D7 J9 D8		5,5/4,16,18,12	71.82 71.41	2.00 (0.41) 2.41	MADE GROUND: Loose, orange brown speckled black, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of flint, sandstone and occasional brick. Weathered SANDSTONE recovered as very dense, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse of sandstone. Complete at 2.41m			

Remarks
Window sample hole remained dry during excavation.
Samples marked J comprise 1 x amber jar and 1 x vial.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale
(approx)
1:50

Logged
By
DO

Figure No.
41498.WS15



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS16

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
74.12

Client
Curtins Consulting

Job
Number
41498

Location
341319.1 E 387723.9 N

Dates
22/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30 0.30 0.50-1.00	D1 J2 B3			73.97 73.77	(0.15) 0.15 (0.20) 0.35	Grass over MADE GROUND: Friable, dark brown, slightly sandy SILT with frequent roots and occasional rootlets (TOPSOIL).			
0.80 0.80	D4 J5				(0.85)	MADE GROUND: Dark brown, silty, gravelly, fine to coarse SAND with occasional rootlets. Gravel is angular to subrounded, fine to coarse of flint, sandstone and brick.			
1.20-1.61 1.20-1.61	SPT 50/255 D6		2,3/4,16,20,10	72.92 72.51	1.20 (0.41) 1.61	MADE GROUND: Dark brown mottled orange, gravelly, fine to coarse SAND with low cobble content of subrounded brick and sandstone. Gravel is angular to subrounded, fine to coarse of flint, sandstone and brick. Weathered SANDSTONE, recovered as very dense, gravelly, fine to coarse sand with occasional pocket (10mm x 10mm) of clay. Gravel is angular to subrounded, fine to coarse.			
						Complete at 1.61m			

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale
(approx)

1:50

Logged
By

DO

Figure No.

41498.WS16



**IAN FARMER
ASSOCIATES**

Site

St Francis Xavier School

Number
WS17

Excavation Method

Drive-in Window Sampler

Dimensions

Ground Level (mOD)

76.24

Client

Curtins Consulting

Job
Number
41498

Location

341387.8 E 387718.2 N

Dates

22/08/2014

Engineer

Curtins Consulting

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.15 0.15 0.30-0.80	D1 J2 B3			76.19 76.04	0.05 (0.15) 0.20	MADE GROUND: Tarmacadam.			
					(0.65)	MADE GROUND: Dark grey, sandy, subangular to subrounded, fine to coarse GRAVEL of concrete.			
0.80 0.80 0.85	D4 J5 D6			75.39	0.85 (0.35)	MADE GROUND: Orange brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of sandstone, concrete and occasional tarmacadam/asphalt.			
1.20-1.42	SPT 25"/105 50/115		13,12/33,17	75.04	1.20 (0.22)	Light brown mottled orange, silty, fine SAND.			
1.20-1.42	D7			74.82	1.42	Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse.			
						Complete at 1.42m			

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale
(approx)

1:50

Logged
By

DO

Figure No.

41498.WS17



IAN FARMER
ASSOCIATES

Site

St Francis Xavier School

Number
WS18

Excavation Method

Drive-in Window Sampler

Dimensions

Ground Level (mOD)

77.47

Client

Curtins Consulting

Job

Number
41498

Location

341438.8 E 387729.3 N

Dates

21/08/2014

Engineer

Curtins Consulting

Sheet

1/1

Depth
(m)

Sample / Tests

Water
Depth
(m)

Field Records

Level
(mOD)

Depth
(m)
(Thickness)

Description

Legend

Water

0.30
0.30
0.35-0.69
0.30
0.30-0.69

B1
D2
SPT 25'/125
50/210
J3
D4

14, 11/16, 18, 16

77.35
77.12
76.78

0.12
(0.23)
0.35
(0.34)
0.69

Grass over MADE GROUND: Friable, black, slightly sandy, clayey SILT with frequent roots and occasional rootlets.

MADE GROUND: Dark brown mottled orange, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of flint, brick and sandstone.

Weathered SANDSTONE, recovered as very dense, red brown, fine to coarse sand. Gravel is angular to subrounded, fine to coarse.

Terminated at 0.69m

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.
Window sample hole terminated at 0.69m due to refusal.
Excavating from 0.00m to 0.69m for 1.00 hour.

Scale
(approx)

1:50

Logged
By

DO

Figure No.

41498.WS18



**IAN FARMER
ASSOCIATES**

Site
St Francis Xavier School

Number
WS19

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
77.88

Client
Curtins Consulting



Job Number
41498

Location
341461.9 E 387723.1 N

Dates
20/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20 0.20 0.20-0.40 0.45-0.71 0.40 0.40 0.45-0.71	D2 J3 B1 SPT 25"/125 50/135 D4 J5 D6		13.12/22,28	77.73 77.56 77.17	(0.15) (0.13) (0.17) (0.39) 0.71	Grass over MADE GROUND: Friable dark brown, slightly sandy, clayey SILT with frequent roots and rootlets (TOPSOIL). MADE GROUND: Friable dark brown mottled orange, silty, slightly gravelly, fine and medium SAND. Gravel is angular to subrounded, fine to coarse of flint, brick and sandstone. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand with low cobble content. Gravel is angular to subrounded, fine to coarse. Terminated at 0.71m	 	

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.
Window sample hole terminated at 0.71m due to refusal.
Excavating from 0.00m to 0.71m for 1.00 hour.

Scale (approx)





1:50


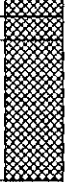
Logged By

DO

Figure No.

41498.WS19

 IAN FARMER ASSOCIATES				Site St Francis Xavier School		Number WS22			
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 78.31		Client Curtins Consulting		Job Number 41498	
		Location 341599.3 E 387797.2 N		Dates 20/08/2014		Engineer Curtins Consulting		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.30 0.30 0.30-0.90 0.80 0.80 0.90-1.20 0.90-1.20	D2 J3 B1 D4 J5 SPT 50/145 D6		8,11/24,26	78.11 77.41 77.11	0.20 0.20 (0.70) 0.90 (0.30) 1.20	MADE GROUND: Friable dark brown, slightly sandy, clayey SILT with occasional rootlets and twigs (TOPSOIL). MADE GROUND: Friable dark brown, silty, slightly gravelly, fine SAND with low cobble content. Gravel is angular to subrounded, fine to coarse of concrete, flint and sandstone. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is subangular to subrounded, fine to coarse including sandstone. Terminated at 1.20m	  		
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole backfilled on completion. Window sample hole remained dry during excavation. Window sample hole terminated at 1.20m due to refusal. Excavating from 0.00m to 1.20m for 1.00 hour.							Scale (approx) 1:50	Logged By DO	
							Figure No. 41498.WS22		

 IAN FARMER ASSOCIATES					Site St Francis Xavier School		Number WS23		
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 73.98		Client Curtins Consulting		Job Number 41498	
		Location 341302 E 387639.1 N		Dates 22/08/2014		Engineer Curtins Consulting		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30 0.30 0.50-1.00	D1 J2 B3			73.83 73.68	(0.15) (0.15) 0.30	Grass over MADE GROUND: Friable dark brown, slightly sandy, clayey SILT with frequent roots and occasional rootlets (TOPSOIL).			
0.80 0.80	D4 J5				(0.90)	MADE GROUND: Dark brown, silty, gravelly, fine and medium SAND with occasional rootlets and twigs. Gravel is angular to subrounded, fine to coarse of flint, sandstone and occasional brick.			
1.20-1.62 1.20-1.62	SPT 50/265 D6	3,9/12,18,13,7		72.78	1.20	MADE GROUND: Orange brown mottled black, gravelly, fine to coarse SAND with low cobble content of angular to subrounded, fine to coarse sandstone. Gravel is angular to subrounded, fine to coarse of flint, tarmacadam, sandstone and brick.			
1.70-1.93 1.70-1.93	SPT 25"/115 50/115 D7	15,10/31,19		72.05	1.93	Weathered SANDSTONE recovered as very dense, gravelly, fine to coarse sand. Gravel is subangular to subrounded, fine to coarse.			
						Complete at 1.93m			
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole backfilled on completion. Window sample hole remained dry during excavation. Excavating from 0.00m to 1.20m for 1.00 hour.								Scale (approx) 1:50	Logged By DO
								Figure No. 41498.WS23	



IAN FARMER
ASSOCIATES

Site

St Francis Xavier School

Number
WS24

Excavation Method

Drive-in Window Sampler

Dimensions

Ground Level (mOD)

74.43

Client

Curtins Consulting

Job
Number
41498

Location

341339.4 E 387653.4 N

Dates

22/08/2014

Engineer

Curtins Consulting

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.15-0.32	SPT 25*/95 50/70		18,7/50	74.28	(0.15)	Grass over MADE GROUND: Friable, dark brown, silty, fine to coarse SAND with frequent roots and rootlets (TOPSOIL).		
0.15-0.32	D1			74.11	(0.17)	Weathered SANDSTONE, recovered as very dense, red brown, gravelly sand. Gravel is angular to subrounded, fine to coarse.		
0.30	D2				0.32	Complete at 0.32m		
0.30	J3							

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 0.32m for 0.50 hours.

Scale
(approx)




1:50

Logged
By

DO

Figure No.

41498 WS24

 IAN FARMER ASSOCIATES						Site St Francis Xavier School		Number WS25	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 75.10		Client Curtins Consulting		Job Number 41498	
		Location 341388.8 E 387678.5 N		Dates 22/08/2014		Engineer Curtins Consulting		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30 0.30 0.30-0.50 0.50-0.80 0.50-0.80	D2 J4 B1 SPT 25*/135 50/160 D5		11,14/18,27,5	74.95 74.60 74.30	(0.15) (0.35) 0.50 (0.30) 0.80	Grass over MADE GROUND: Friable, dark brown, slightly sandy, clayey SILT with frequent roots and occasional rootlets (TOPSOIL). MADE GROUND: Orange mottled dark brown, gravelly, fine to coarse SAND with pieces of paper and plastic. Gravel is subangular to rounded, fine to coarse of flint and sandstone. Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse. Complete at 0.80m		 	
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole backfilled on completion. Window sample hole remained dry during excavation. Excavating from 0.00m to 0.81m for 1.00 hour.								Scale (approx) 1:50	Logged By DO
Figure No. 41498.WS25									



IAN FARMER
ASSOCIATES

Site

St Francis Xavier School

Number
WS26

Excavation Method

Drive-in Window Sampler

Dimensions

Ground Level (mOD)

76.60

Client

Curtins Consulting

Job
Number
41498

Location

341416.6 E 387671 N

Dates

22/08/2014

Engineer

Curtins Consulting

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30	D1			76.52	0.08	MADE GROUND: Tarmacadam.			
0.30	J2				(0.57)	MADE GROUND: Light grey speckled black, sandy, subangular to subrounded, fine to coarse			
0.50-0.80	B3			75.95	0.65	GRAVEL of limestone, concrete and occasional tarmacadam/asphalt.			
0.65-0.97	SPT 25'/125 50/190		14,11/18,19,13	75.63	(0.32)				
0.65-0.97	D4				0.97	Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse sand with occasional pockets (10mm x 10mm) of clay. Gravel is angular to subrounded, fine to coarse. Complete at 0.97m			

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 0.95m for 1.00 hour.

Scale
(approx)

1:50

Logged
By

DO

Figure No.

41498.WS26



**IAN FARMER
ASSOCIATES**

Site
St Francis Xavier School

Number
WS27

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
76.90

Client
Curtins Consulting



**Job
Number**
41498

Location
341439.1 E 387689.8 N

Dates
22/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30 0.30 0.30-0.50 0.50-0.64 0.50-0.64	D2 J3 B1 SPT 25*/70 50/70 D4		25/50	76.75 76.40 76.26	(0.15) (0.15) (0.50) (0.54)	MADE GROUND: Dark brown, gravelly, fine to coarse SAND with occasional pieces of wood, plastic and metal. MADE GROUND: Light grey, sandy, subangular to subrounded, fine to coarse GRAVEL of limestone, concrete and sandstone. Weathered SANDSTONE, recovered as very dense, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Complete at 0.64m	 	

Remarks
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 0.64m for 0.50 hours.

**Scale
(approx)**
1:50

**Logged
By**
DO

Figure No.
41498.WS27



St Francis Xavier School

Number
WS28

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)

78.15

Client	
---------------	--

Curtins Consulting

**Job
Number**
41498

Location

341479.8 E 387705.5 N

Dates¹

20/08/2014

Engineer

Curtins Consulting

Sheet

1/1

Depth
(m)

Sample / Tests

Water
Depth
(m)

Field Records

Level
(mOD)

Depth
(m)
Thickness)

Description

Legend

Water

0.20

0.25-0.45

D2
SPT 25*/50
50/145

25/39,11

78.00

77.85

77.70

(000000)

Grass over MADE GROUND: Friable, dark brown, slightly sandy, clayey SILT with frequent roots and occasional rootlets.

Dark brown mottled orange, silty, slightly gravelly, fine and medium SAND. Gravel is angular to subrounded, fine to coarse of flint and sandstone.

Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse.

Terminated at 0.45m

Remarks

Remarks
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.
Window sample hole terminated at 0.45m due to refusal.
Excavating from 0.00m to 0.45m for 0.50 hours.

Scale (approx)




1:50

Logged
By

DO

Figure No.

41498.WS28

 IAN FARMER ASSOCIATES					Site St Francis Xavier School		Number WS29		
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 78.52		Client Curtins Consulting		Job Number 41498	
		Location 341516.8 E 387701.9 N		Dates 20/08/2014		Engineer Curtins Consulting		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.20-0.50 0.30 0.30 0.40-0.67 0.40-0.67 0.50 0.50	B1 D2 J3 SPT 25"/125 50/145 D4 D5 J6		14,11/18,32	78.34 78.12 77.85	(0.18) 0.18 (0.22) 0.40 (0.27) 0.67	Grass over MADE GROUND: Dark brown, friable, slightly sandy, clayey SILT with frequent roots and occasional rootlets. MADE GROUND: Dark brown mottled black, slightly gravelly, silty, fine and medium SAND. Gravel is angular to subrounded, fine to coarse including concert, sandstone and occasional brick. Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse SAND with low cobble content. Gravel is angular to subrounded, fine to coarse. Gravel and cobbles include sandstone. Terminated at 0.67m		 	
Remarks Samples marked as J comprise 1 x amber jar and 1 x vial.								Scale (approx) 1:40	Logged By DO
								Figure No. 41498.WS29	



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS30

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
80.81

Client
Curtins Consulting

Job
Number
41498

Location
341553.4 E 387708.9 N

Dates
19/08/2014

Engineer
Curtins Consulting

Sheet
1/1




Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30 0.30 0.50-1.00	D1 J2 B3			80.75 80.56 80.41	0.06 (0.19) 0.25 (0.15) 0.40	MADE GROUND: Tarmacadam. MADE GROUND: Grey brown, sandy, subangular to subrounded, fine to coarse GRAVEL with low to medium cobble content of subrounded limestone and slag. Gravel includes limestone, concrete and brick.			
0.80 0.80	D4 J5				(1.00)	MADE GROUND: Grey brown, gravelly, fine to coarse SAND with low cobble content. Gravel is angular to subrounded, fine to coarse of concrete, brick and sandstone.			
1.20-1.54 1.20-1.54 1.40	SPT 50/190 D6 D7	1.2/3.28,19		79.41 78.96	1.40 (0.45) 1.85	MADE GROUND: Dark brown mottled black, silty, gravelly, fine SAND with low cobble content of subrounded brick and flint. Gravel is angular to subrounded, fine to coarse of concrete, brick and sandstone. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Complete at 1.85m			

Remarks
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)
1:40

Logged By
DO

Figure No.
41498.WS30

 IAN FARMER ASSOCIATES					Site St Francis Xavier School		Number WS31			
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 78.81		Client Curtins Consulting		Job Number 41498		
		Location 341578.7 E 387731.1 N		Dates 20/08/2014		Engineer Curtins Consulting		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr	
0.20-0.50	B1			78.71	(0.10)	Grass over MADE GROUND: Dark brown, friable, slightly sandy, clayey SILT with frequent roots and occasional rootlets. MADE GROUND: Dark brown mottled black, gravelly, silty, fine SAND with occasional pieces of wood and metal. Gravel is angular to subrounded, fine to coarse including brick, concrete and sandstone. Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse sand with low cobble content Gravel is angular to subrounded, fine to coarse.. Complete at 0.96m				
0.30	D2		78.51	(0.20)						
0.30	J3									
0.50	D4				(0.66)					
0.50	J5									
0.70-0.96	SPT 25"/125		11,14/23,27							
	50/135									
0.70-0.96	D6			77.85	0.96					
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole remained dry during excavation.							Scale (approx) 1:40		Logged By DO	
							Figure No. 41498.WS31			



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS32

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)

78.89

Client
Curtins Consulting

Job
Number
41498

Location



341613.6 E 387747.2 N

Dates

20/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20-0.50 0.30 0.30 0.50-0.74 0.50 0.50 0.50-0.74	B1 D2 J3 SPT 25*/135 50/105 D5 J6 D4		10,15/32,18	78.74 78.49 78.15	(0.15) 0.15 (0.25) 0.40 (0.34) 0.74	Grass over MADE GROUND: Dark brown, friable, slightly sandy, clayey SILT with frequent roots and rootlets. (Topsoil) MADE GROUND: Dark brown mottled black, fine to coarse, gravelly, silty SAND with occasional pieces of wood, paper and plastic. Gravel is angular to subrounded, fine to coarse including brick, concrete and sandstone. Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Complete at 0.74m	 	

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.

Scale
(approx)

1:40

Logged
By

DO

Figure No.



41498.WS32



**IAN FARMER
ASSOCIATES**

Site
St Francis Xavier School
Number
WS33

Excavation Method Drive-in Window Sampler	Dimensions	Ground Level (mOD) 76.77	Client Curtins Consulting	Job Number 41498
	Location 341426.4 E 387644.9 N	Dates 22/08/2014	Engineer Curtins Consulting	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.15 0.15 0.30-0.53 0.15-0.30 0.30-0.53	D2 J3 SPT 25*/105 50/125 B1 D4		17,8/23,27	76.72 76.47 76.24	0.05 (0.25) 0.30 (0.23) 0.53	MADE GROUND: Concrete slab. MADE GROUND: Grey brown mottled orange, sandy, subangular to subrounded, fine to coarse GRAVEL of limestone, concrete and sandstone. Weathered SANDSTONE recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Terminated at 0.53m	 	

Remarks
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.

Scale (approx)
1:50
Logged By
DO
Figure No.
41498.WS33





IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS34

Excavation Method Drive-in Window Sampler	Dimensions	Ground Level (mOD) 76.87	Client Curtins Consulting	Job Number 41498
	Location 341456 E 387659.6 N	Dates 26/08/2014	Engineer Curtins Consulting	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20 0.25-0.52 0.20 0.20 0.25	B1 SPT 50/115 D2 J3 D4		7,11/21,29	76.81 76.62 76.35	0.06 (0.19) 0.25 (0.27) 0.52	MADE GROUND: Paved brick surface. MADE GROUND: Light grey, sandy, subangular to subrounded, fine to coarse GRAVEL of limestone and occasional concrete and slag. Weathered SANDSTONE, recovered as very dense, red gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Terminated at 0.52m	 	

Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole backfilled on completion. Window sample hole remained dry during excavation.	Scale (approx) 1:50	Logged By DO
	Figure No. 41498.WS34	



**IAN FARMER
ASSOCIATES**

Site
St Francis Xavier School

Number
WS35

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
80.30

Client
Curtins Consulting

Job
Number
41498









Location

341480.3 E 387667.7 N

Dates
26/08/2014

Engineer
Curtins Consulting

Sheet
1/1







Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.10-0.20 0.20 0.20 0.50-0.82 0.50 0.50 0.50-0.82	B1 D2 J3 SPT 50/165 D4 J5 D6		9,16/18,22,10	80.20 80.08 79.80 79.48	0.10 0.22 (0.28) 0.50 (0.32) 0.82	MADE GROUND: Tarmacadam. MADE GROUND: Dark brown mottled black, very gravelly, coarse SAND. Gravel is subangular to subrounded, fine to coarse of flint, concrete, brick and asphalt. MADE GROUND: Orange brown speckled black, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of flint, asphalt and sandstone. Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Terminated at 0.82m	   		   

Remarks
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole remained dry during excavation.

Scale
(approx)
1:50

Logged
By
DO

Figure No.
41498.WS35

 IAN FARMER ASSOCIATES				Site St Francis Xavier School		Number WS36	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 80.93		Client Curtins Consulting	
		Location 341528.5 E 387689.6 N		Dates 26/08/2014		Engineer Curtins Consulting	
						Job Number 41498	
						Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
0.30	D1			80.73	0.20	Grass over MADE GROUND: Friable dark brown, slightly sandy, clayey SILT with frequent roots and rootlets (TOPSOIL).	    
0.30	J2			80.53	0.20	MADE GROUND: Friable dark brown, gravelly, silty, fine to coarse SAND with occasional rootlets. Gravel is angular to subrounded, fine to medium of clinker, slag and flint.	
0.50-1.00	B3				0.40		
0.80	D4				0.80		
0.80	J5						
1.20-1.46	SPT 50/110		6,9/19,31	79.73	1.20	MADE GROUND: Orange brown, gravelly, fine to coarse SAND with low cobble content of subrounded sandstone. Gravel is angular to subrounded, fine to coarse of sandstone, flint and occasional brick.	
1.20-1.46	D6			79.47	1.46	Weathered SANDSTONE recovered as very dense, red brown mottled grey, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse.	
						Terminated at 1.46m	
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole remained dry during excavation. Excavating from 0.00m to 1.20m for 1.00 hour.							
						Scale (approx) 1:50	Logged By DO
						Figure No. 41498.WS36	



**IAN FARMER
ASSOCIATES**

Site
St Francis Xavier School

Number
WS37

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
81.38

Client
Curtins Consulting

**Job
Number**
41498

Location

341587.8 E 387660.7 N

Dates
18/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30 0.30 0.50-1.00	D1 J2 B3		5,9/8,9,12,14	81.28 81.08	(0.10) (0.20) 0.30	Grass over MADE GROUND: Dark brown, friable, slightly gravelly, sandy SILT with frequent roots and occasional rootlets.			
0.80 0.80	D4 J5			80.68	0.70	MADE GROUND: Orange brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse including brick, concrete and sandstone.			
1.20-1.65 1.20-1.65	SPT N=43 D6			80.18	1.20	MADE GROUND: Light brown, clayey, fine SAND with occasional gravel sized fragments of brick.			
1.50	D7			79.78	1.60	MADE GROUND: Firm, orange brown, slightly gravelly, sandy CLAY. Gravel is angular to subrounded, fine to coarse including sandstone, mudstone and concrete.			
1.80-2.06 1.90 1.90 1.90-2.06	SPT 25'/125 50/135 D8 J10 D9		11,14/22,28	79.32	2.06	MADE GROUND: Stiff, orange brown mottled black, sandy, gravelly CLAY with occasional pieces of wood. Gravel is angular to subrounded, fine to coarse of mixed lithologies including sandstone, mudstone and coal.			
						Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse.			
						Complete at 2.06m			

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 1.20m for 1.00 hour.

**Scale
(approx)**

1:40

**Logged
By**

DO

Figure No.

41498.WS37



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS38

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)

81.07

Client
Curtins Consulting

Job
Number
41498

Location

341564.3 E 387689 N

Dates

18/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30 0.30 0.50-1.00 0.60 0.60	D1 J2 B3 D4 J5			80.92 80.82 80.47	(0.15) (0.12) (0.35) 0.60	MADE GROUND: Tarmacadam. MADE GROUND: Dark grey, sandy, subangular to subrounded, fine to coarse GRAVEL including brick, concrete and slag. MADE GROUND: Dark brown, very gravelly, fine to coarse SAND with low cobble content and occasional pieces of wood and metal. Gravel is angular to subrounded, fine to coarse including concrete, limestone and slag.		
1.00-1.26 1.00-1.26	SPT 25*/125 50/135 D6	9,16/21,29		79.81	(0.66) 1.26	MADE GROUND: Dark brown, sandy, subangular to subrounded, fine to coarse GRAVEL with low to medium cobble content. Gravel includes concrete and slag. Terminated at 1.26m		

Remarks

Window sample hole terminated at 1.26m due to refusal.
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.

Scale
(approx)

1:40

Logged
By

DO

Figure No.

41498.WS38



**IAN FARMER
ASSOCIATES**

Site

St Francis Xavier School

**Number
WS39**

Excavation Method

Drive-in Window Sampler

Dimensions

Ground Level (mOD)

80.12

Client

Curtins Consulting

**Job
Number
41498**

Location

341639.4 E 387718.5 N

Dates

18/08/2014

Engineer

Curtins Consulting

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30 0.30 0.50 0.50 0.50-1.00	D1 J2 D4 J5 B3			79.97	(0.15) 0.15	Grass over MADE GROUND: Dark brown, friable, sandy, clayey SILT with occasional roots and rootlets. (Topsoil)		
					(1.05)	MADE GROUND: Dark brown, gravelly, fine to coarse SAND with low cobble content of concrete and brick. Gravel is angular to subangular, fine to coarse including slag, flint and mudstone.		
1.20 1.20 1.20-1.65	D6 J8 D7			78.92	1.20	Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse including sandstone.		
				78.47	(0.45) 1.65	Terminated at 1.65m		

Remarks

Samples marked as J comprise 1 x amber jar and 1 x vial.
Window sample hole terminated at 1.65m due to refusal.

**Scale
(approx)**

1:40

**Logged
By**

DO

Figure No.

41498.WS39



IAN FARMER
ASSOCIATES

Site

St Francis Xavier School

Numbers:
WS40

Excavation Method

Drive-in Window Sampler

Dimensions

Ground Level (mOD)

79.57

Client

Curtins Consulting

Job
Number
41498

Location

341639.5 E 387738.2 N

Dates

19/08/2014

Engineer

Curtins Consulting

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30 0.30 0.50-0.90	D1 J2 B3			79.32	(0.25) 0.25	Grass over MADE GROUND: Friable dark brown, slightly sandy, clayey SILT with frequent roots and occasional rootlets (TOPSOIL).		
					(0.65)	MADE GROUND: Dark brown mottled black, silty, slightly gravelly, fine SAND with occasional rootlets and twigs. Gravel is angular to subrounded, fine to coarse of flint, concrete, brick and sandstone.		
0.80 0.80 1.00-1.30	D4 J5 SPT 25t/125 50/170		14,11/18,24,8	78.67	0.90	Weathered SANDSTONE recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse.		
1.00-1.30	D6			78.27	(0.40) 1.30	Terminated at 1.30m		

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale
(approx)

1:40

Logged
By

DO

Figure No.

41498.WS40



**IAN FARMER
ASSOCIATES**

Site St Francis Xavier School					Number WS41				
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 80.70		Client Curtins Consulting		Job Number 41498	
		Location 341444 E 387618.2 N		Dates 26/08/2014		Engineer Curtins Consulting		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20 0.20 0.20-0.45 0.45 0.45 0.80	D2 J3 B1 D4 J5 D6			80.55 80.50 80.10	(0.15) 0.15 (0.20) (0.40) 0.60	Grass over MADE GROUND: Friable dark brown, slightly gravelly, sandy SILT. Gravel is subangular to subrounded, fine to coarse of flint, glass and brick.			
					(0.60)	MADE GROUND: Dark brown, gravelly, fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse of flint, brick and asphalt.			
1.20-1.39 1.20 1.20 1.20-1.39	SPT 50/35 D7 J8 D9	9.9/50		79.50 79.30	1.20 (0.20) 1.40	MADE GROUND: Dark brown mottled orange, gravelly, fine to coarse SAND with occasional pieces of wood and metal. Gravel is angular to subrounded, fine to coarse of flint, brick, glass and occasional asphalt.			
						MADE GROUND: Dark brown mottled black, slightly gravelly, silty, fine to coarse SAND with low cobble content of subrounded brick. Gravel is angular to subrounded, fine to coarse of flint and brick.			
						Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subangular, fine to coarse.			
						Terminated at 1.40m			
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole remained dry during excavation. Excavating from 0.00m to 1.20m for 1.00 hour.							Scale (approx) 1:50	Logged By DO	Figure No. 41498.WS41



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS42

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
81.86

Client
Curtins Consulting




Job
Number
41498

Location
341503.7 E 387610.2 N

Dates
18/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20	D1			81.81	0.05	MADE GROUND: Tarmacadam.		
0.20	J2			81.66	(0.15) 0.20	MADE GROUND: Dark brown mottled grey, gravelly, fine to coarse SAND. Gravel is angular to subangular, fine to coarse including concrete and sandstone.		
0.50	D3			81.31	(0.35) 0.55	Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse sand with low cobble content. Gravel is angular to subrounded, fine to coarse.		
0.50	J4					Complete at 0.55m		

Remarks

Window sample hole backfilled on completion.
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole remained dry during excavation.

Scale
(approx)

1:40









Logged
By

DO

Figure No.
41498.WS42



**IAN FARMER
ASSOCIATES**

Site St Francis Xavier School				Number WS43					
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 81.68					
		Location 341544.4 E 387642.1 N		Client Curtins Consulting					
		Dates 26/08/2014		Engineer Curtins Consulting					
				Job Number 41498					
				Sheet 1/1					
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20 0.20 0.30-0.70 0.70-0.98 0.70 0.70-0.98	D1 J2 B3 SPT 50/125 D4 J5 D6		5,10/16,34	81.53 81.43 80.98 80.68	(0.15) 0.15 0.25 (0.45) 0.70 (0.30) 1.00	Grass over MADE GROUND: Friable, dark brown, sandy, clayey SILT (TOPSOIL). MADE GROUND: Dark brown mottled orange brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of brick and sandstone. MADE GROUND: Orange brown, gravelly, clayey, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of sandstone and occasional flint and brick. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse. Terminated at 1.00m	   		   
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole remained dry during excavation. Excavating from 0.00m to 1.20m for 1.00 hour.							Scale (approx) 1:50	Logged By DO	Figure No. 41498.WS43



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS44

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
81.02

Client
Curtins Consulting

Job
Number
41498

Location
341611.8 E 387683.3 N

Dates
18/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D1			80.72	(0.30)	Grass over MADE GROUND: Dark brown, friable, sandy, clayey SILT with frequent roots and rootlets.		
0.30	D2				0.30			
0.30	J3							
0.50-1.00	B4				(0.70)	MADE GROUND: Dark brown, gravelly, fine to coarse SAND with low cobble content. Gravel is angular to subrounded, fine to coarse including brick, glass, clinker and sandstone.		
0.80	D5							
0.80	D6			80.02	1.00			
0.80	J7							
1.00	D8				(0.42)	Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse including sandstone.		
1.00	J9							
1.20-1.42	SPT 25*/125		14,11/37,13	79.60	.42			
1.20-1.42	50/95							
1.20-1.42	D10					Complete at 1.42m		

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.
Excavating from 1.20m to 1.00m for 1.00 hour.

Scale
(approx)

1:40

Logged
By

DO

Figure No.

41498.WS44



**IAN FARMER
ASSOCIATES**

Site
St Francis Xavier School

Number
WS45

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
80.00

Client
Curtins Consulting

Job
Number
41498

Location
341657.7 E 387711.1 N

Dates
19/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30 0.30 0.30 0.50-0.80 0.80 0.80 0.90-1.07 0.80 0.90-1.35	D1 D2 J3 B4 D5 D6 SPT 25'/60 50/105 J7 D8		25/32,18	79.85 79.50 79.10 78.93	(0.15) 0.15 (0.35) 0.50 (0.40) 0.90 (0.17) 1.07	MADE GROUND: Tarmacadam. MADE GROUND: Dark brown mottled orange, gravelly, fine to coarse SAND with low cobble content. Gravel is angular to subrounded, fine to coarse including concrete, brick, slag and glass. MADE GROUND: Dark brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse including concrete, brick and sandstone. Weathered SANDSTONE, recovered as red brown, gravelly, medium and coarse sand. Gravel is angular to subrounded, fine to coarse including sandstone. Terminated at 1.07m			

Remarks
Samples marked as J comprise 1 x amber jar and 1 x vial.
Window sample hole terminated at 1.07m due to refusal.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)	Logged By
1:40	DO
Figure No. 41498.WS45	



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS46

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
79.73

Client
Curtins Consulting

Job
Number
41498

Location
341678.7 E 387726.1 N

Dates
19/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30 0.30 0.50-1.00	D1 J2 B3			79.43	(0.30) 0.30	Grass over MADE GROUND: Dark brown, sandy, clayey SILT with frequent roots and rootlets (TOPSOIL).		
					(0.60)	MADE GROUND: Dark brown, gravelly, fine to coarse SAND with low cobble content of subrounded concrete. Gravel is angular to subrounded, fine to coarse of concrete, brick, clinker and slag.		
1.00 1.00 1.20-1.44	D4 J5 SPT 25*/115 50/125 D6		16,9/27,23	78.83 78.53 78.29	0.90 (0.30) 1.20 (0.24) .44	MADE GROUND: Orange brown, gravelly, fine to coarse SAND with low cobble content of subrounded brick. Gravel is angular to subrounded, fine to coarse of concrete, brick and sandstone. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, medium to coarse sand. Gravel is angular to rounded, fine to coarse.		
1.20-1.44						Terminated at 1.44m		

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.
Window sample hole terminated at 1.44m due to refusal.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale
(approx)

1:50

Logged
By

DO

Figure No.
41498.WS46



**IAN FARMER
ASSOCIATES**

Site
St Francis Xavier School

Number
WS47

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
81.12

Client
Curtins Consulting

**Job
Number**
41498

Location
341480.4 E 387609.3 N

Dates
19/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30 0.30 0.50-0.80	D1 J2 B3			80.92	(0.20) 0.20	Grass over MADE GROUND: Friable dark brown, clayey SILT with frequent roots and occasional rootlets (TOPSOIL).			
0.80 0.80 0.90-1.14	D4 J5 SPT 25*/115 50/125		16,9/24,26	80.22 79.98	(0.70) 0.90 (0.24) 1.14	MADE GROUND: Dark brown mottled black, silty, slightly gravelly, fine SAND with low cobble content of subrounded sandstone. Gravel is angular to subrounded, fine to coarse of flint, brick and sandstone. Occasional twigs. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse.			
0.90-1.14	D6					Complete at 1.14m			
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole remained dry during excavation. Excavating from 0.00m to 1.20m for 1.00 hour.							Scale (approx) 1:40	Logged By DO	Figure No. 41498.WS47



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS48

Excavation Method
Drive-in Window Sampler

Dimensions
Samples marked J comprise 1 x amber jar and 1 x vial. to
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation. to

Ground Level (mOD)

Client
Curtins Consulting




Job
Number
41498

Location
341480.4 E 387609.3 N

Dates
26/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.20 0.20 0.30-0.65 0.20 0.30-0.65	B1 D2 SPT 50/195 J3 D4		7,9/12,12,26	81.02 80.82 80.47	0.10 (0.20) 0.30 (0.35) 0.65	Grass over MADE GROUND: Friable, dark brown, sandy SILT with frequent roots and occasional rootlets (TOPSOIL). MADE GROUND: Light grey mottled orange brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of flint, brick and occasional sandstone. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is subangular to subrounded, fine to coarse. Terminated at 0.65m	  	

Remarks
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.

Scale
(approx)
1:50

Logged
By
DO

Figure No.
41498.WS48



Site	St Francis Xavier School
-------------	--------------------------

Number
WS49

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)	81.62
--------------------	-------

Client	Curtins Consulting
---------------	--------------------

**Job
Number**
41498

Location	341534.8 E 387615.6 N
----------	-----------------------

Dates
18/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth
(m)

Sample / Tests

Water
Depth
(m)

Field Records

Level
(mOD)

Depth
(m)
(Thickness)

Description

Legend

Water

81.61

0.01

(0.29)

81.32

0.30

MADE GROUND: Tarmacadam.

Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse sand with low cobble content. Gravel is angular to subrounded, fine to coarse.

Terminated at 0.30m

Remarks

Window sample terminated at 0.30m.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)


Logged
By

1:40

DO

Figure No.

41498.WS49

 IAN FARMER ASSOCIATES				Site St Francis Xavier School		Number WS50	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 82.23		Client Curtins Consulting	
		Location 341618.1 E 387658.2 N		Dates 18/08/2014		Engineer Curtins Consulting	
						Job Number 41498	
						Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
0.30	D1			81.93	(0.30)	Grass over MADE GROUND: Dark brown, friable, sandy, clayey SILT with occasional roots and rootlets. (Topsoil).	
0.30	D2						
0.30	J3						
0.50-1.00	B4						
0.80	D5				(0.90)	MADE GROUND: Dark brown, gravelly, fine to coarse SAND with low cobble content. Gravel is angular to subrounded, fine to coarse including brick, concrete, slag and glass.	
0.80	D6						
0.80	J7						
1.20-1.65	SPT N=36		9,10/11,9,8,8	81.03	1.20		
1.20-1.65	D8			80.93	(1.30)	MADE GROUND: Light brown, slightly gravelly, silty, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse including brick and flint.	
1.50	D9			80.73	(0.20)		
					1.50		
1.80	D10				(0.45)	MADE GROUND: Stiff, orange brown mottled black, sandy, gravelly CLAY. Gravel is angular to subrounded, fine to coarse including sandstone, mudstone, brick, clinker and concrete.	
1.90	D11			80.28	1.95		
1.90	J12						
2.00-2.33	SPT 50/180		10,13/16,22,12		(0.38)	Stiff, orange brown, sandy, gravelly CLAY. Gravel is angular to subrounded, fine to coarse of mixed lithologies including sandstone, mudstone and coal.	
2.00-2.33	D13			79.90	2.33	Weathered SANDSTONE, recovered as red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse including sandstone.	
						Complete at 2.33m	
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole remained dry during excavation. Excavating from 0.00m to 1.20m for 1.00 hour.							Scale (approx) 1:40
							Logged By DO
							Figure No. 41498.WS50



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS51

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
81.38

Client
Curtins Consulting

Job
Number
41498

Location
341465.8 E 387575.4 N

Dates
26/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-0.26 0.10 0.10 0.10-0.26	SPT 25"/95 50/60 D1 J2 D3		11,14/50	81.33 81.28 81.12	0.05 (0.16) 0.26	<div>MADE GROUND: Tarmacadam.</div> <div>MADE GROUND: Black, sandy, fine and medium GRAVEL of asphalt and occasional sandstone.</div> <div>Weathered SANDSTONE, recovered as red brown, slightly gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse.</div> <div>Terminated at 0.26m</div>		

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.

Scale
(approx)

1:50

Logged
By

DO

Figure No.

41498.WS51



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS52

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
80.98

Client
Curtins Consulting



Job
Number
41498

Location
341499.2 E 387579.2 N

Dates
26/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.15-0.30 0.20 0.30-0.56 0.20 0.30-0.56	B1 D2 SPT 25*/125 50/135 J3 D4		11,14/24,26	80.83 80.68 80.42	(0.15) (0.15) (0.26) 0.56	Grass over MADE GROUND: Friable, dark brown, sandy, clayey SILT with frequent roots and occasional rootlets. MADE GROUND: Dark brown mottled orange, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of flint, sandstone and brick. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Terminated at 0.56m	 	

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.








Scale
(approx)

1:50

Logged
By

DO

Figure No.
41498.WS52

 IAN FARMER ASSOCIATES					Site St Francis Xavier School		Number WS53		
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 81.30		Client Curtins Consulting		Job Number 41498	
		Location 341451.2 E 387560.2 N		Dates 26/08/2014		Engineer Curtins Consulting		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.15 0.15 0.30-0.80	D1 J2 B3			81.15 81.10	(0.15) 0.15 0.20	MADE GROUND: Tarmacadam.			
					(0.60)	MADE GROUND: Dark brown mottled black, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of flint, brick, concrete, asphalt and glass.			
0.80-1.03 0.80 0.80 0.80-1.03	SPT 50/80 D4 J5 D6		6,14/45,5	80.50 80.27	0.80 (0.23) 1.03	MADE GROUND: Orange brown mottled black, gravelly, fine to coarse SAND with low cobble content of subangular to subrounded brick and sandstone. Gravel is angular to subrounded, fine to coarse of concrete, brick, asphalt and sandstone.			
						Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse.			
						Terminated at 1.03m			
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole remained dry during excavation.							Scale (approx) 1:50	Logged By DO	Figure No. 41498.WS53



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS54

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
81.62

Client
Curtins Consulting




Job
Number
41498

Location
341477.6 E 387554 N

Dates
26/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20-0.40 0.30 0.40-0.66 0.30 0.48-0.66	B1 D2 SPT 50/110 J3 D4		8,15/29,21	81.47 81.22 80.96	(0.15) 0.15 (0.25) 0.40 (0.26) 0.66	Grass over MADE GROUND: Friable, dark brown, slightly sandy, clayey SILT with occasional roots and rootlets (TOPSOIL). MADE GROUND: Dark brown, gravelly, silty, fine and medium SAND. Gravel is angular to subrounded, fine to coarse of flint, brick and concrete. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Terminated at 0.66m	  	

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.

Scale
(approx)

1:50

Logged
By

DO

Figure No.

41498.WS54



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS55

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
81.46

Client
Curtins Consulting



Job
Number
41498

Location
341511.7 E 387544.1 N

Dates
26/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.15-0.30 0.20 0.30-0.60 0.20 0.30-0.60	B1 D2 SPT 50/145 J3 D4		6,11/20,30	81.31 81.06 80.86	(0.15) (0.15) (0.25) (0.40) (0.20) 0.60	Grass over MADE GROUND: Friable, dark brown, clayey SILT with occasional roots and rootlets (TOPSOIL). MADE GROUND: Dark brown, silty, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of flint, sandstone and brick. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Terminated at 0.60m	 	

Remarks
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.

Scale
(approx)

1:50

Logged
By

DO

Figure No.
41498.WS55



IAN FARMER
ASSOCIATES

Site

St Francis Xavier School

Number
WS56

Excavation Method

Drive-in Window Sampler

Dimensions

Ground Level (mOD)

81.70

Client

Curtins Consulting

Job
Number
41498

Location

341466.5 E 387526.5 N

Dates

26/08/2014

Engineer

Curtins Consulting

Sheet

1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20	D1			81.60	0.10	Grass over MADE GROUND: Dark brown, slightly			
0.20	J2			81.30	(0.30)	sandy, clayey SILT with occasional roots and			
0.50-0.70	B3				0.40	rootlets (TOPSOIL).			
					(0.30)				
0.70-1.15	SPT N=50		4,7/10,10,10,20	81.00	0.70	MADE GROUND: Dark brown, silty, slightly			
0.70	D4				(0.45)	gravelly, fine SAND with frequent twigs. Gravel is			
0.70	J5					angular to subrounded, fine to coarse of flint, brick			
0.70-1.15	D6			80.55	1.15	and rare concrete.			
						Orange brown, slightly gravelly, fine SAND with			
						low cobble content of subangular sandstone.			
						Gravel is subangular to subrounded, fine to coarse			
						of flint and sandstone.			
						Weathered SANDSTONE, recovered as very			
						dense, red brown, gravelly, fine to coarse sand.			
						Gravel is angular to subrounded, fine to coarse.			
						Terminated at 1.15m			

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole remained dry during excavation.
Excavating from 0.00m to 1.15m for 1.00 hour.

Scale
(approx)

1:50

Logged
By

DO

Figure No.

41498.WS56



**IAN FARMER
ASSOCIATES**

Site
St Francis Xavier School

Number
WS57

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
81.66

Client
Curtins Consulting






Job
Number
41498

Location
341493.1 E 387516.8 N

Dates
27/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.20-0.50 0.30 0.30 0.55 0.58-0.93 0.55 0.58-0.93	B1 D2 J3 D4 SPT 50/195 J5 D6		4,4/15,20,15	81.46 81.14 81.08 80.73	(0.20) 0.20 (0.32) 0.52 0.58 (0.35) 0.93	Grass over MADE GROUND: Friable, dark brown, clayey SILT with occasional roots and rootlets (TOPSOIL). MADE GROUND: Dark brown, silty, slightly gravelly, fine and medium SAND with occasional pieces of wood and metal. Gravel is angular to subrounded, fine to coarse of flint and sandstone. MADE GROUND: Orange brown mottled dark brown, gravelly, fine to coarse SAND with rare piece of metal. Gravel is subangular to subrounded, fine to coarse of sandstone. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Terminated at 0.93m	    	

Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.

Scale
(approx)

1:50

Logged
By

DO

Figure No.
41498.WS57



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS58

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
81.53

Client
Curtins Consulting

Job
Number
41498












Location

341514.8 E 387523.4 N

Dates
27/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20 0.20 0.25-0.45 0.50-0.95 0.45 0.45 0.50-0.95	D1 J2 B3 SPT N=50 D4 J6 D7		6,10/10,12,12,16	81.38 81.23 81.03 80.58	(0.15) (0.15) (0.30) (0.20) 0.50 (0.45) 0.95	Grass over MADE GROUND: Dark brown, silty, fine SAND with occasional roots (TOPSOIL). MADE GROUND: Dark brown, slightly gravelly, silty, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of flint, brick and occasional wood. MADE GROUND: Orange brown mottled dark brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of sandstone and occasional flint and brick. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Terminated at 0.95m	   		      









Remarks

Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole remained dry during excavation.

Scale
(approx)
1:50

Logged
By
DO

Figure No.
41498.WS58

 IAN FARMER ASSOCIATES					Site St Francis Xavier School		Number WS59		
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 81.61		Client Curtins Consulting		Job Number 41498	
		Location 341482.8 E 387498.9 N		Dates 27/08/2014		Engineer Curtins Consulting		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.10-0.30 0.30 0.30 0.40-0.83 0.40-0.83	B1 D2 J3 SPT 50/275 D4		6,6/10,15,15,10	81.51 81.21 80.78	0.10 (0.30) 0.40 (0.43) 0.83	Grass over MADE GROUND: Friable, dark brown, slightly sandy, SILT with frequent roots (TOPSOIL). MADE GROUND: Dark brown, silty, gravelly, fine SAND with low cobble content of subangular sandstone. Gravel is subangular to subrounded, fine to coarse of flint, sandstone, concrete and occasional brick. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Terminated at 0.83m	 		    
Remarks Samples marked J comprise 1 x amber jar and 1 x vial. Window sample hole remained dry during excavation.							Scale (approx) 1:50	Logged By DO	
							Figure No. 41498.WS59		



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Number
WS60

Excavation Method
Drive-in Window Sampler

Dimensions

Ground Level (mOD)
81.50

Client
Curtins Consulting




Job
Number
41498

Location
341504.7 E 387490.8 N

Dates
27/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30 0.30 0.30-0.60 0.60-0.98 0.60 0.60 0.60-0.98	D2 J3 B1 SPT 50/230 D4 J5 D6		7,9/13,15,15,7	81.30 81.05 80.90 80.52	(0.20) 0.20 (0.25) (0.45) (0.45) 0.60 (0.38) 0.98	Grass over MADE GROUND: Friable, dark brown, silty, fine SAND with occasional roots, rootlets and twigs (TOPSOIL). MADE GROUND: Dark brown, silty, gravelly, fine SAND with occasional twigs. Gravel is angular to subrounded, fine to coarse of flint, sandstone and occasional brick and concrete. MADE GROUND: Orange brown, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse of brick, concrete and sandstone. Weathered SANDSTONE, recovered as very dense, red brown, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Terminated at 0.98m	  	

Remarks
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole backfilled on completion.
Window sample hole remained dry during excavation.

Scale
(approx)
1:50

Logged
By
DO

Figure No.
41498.WS60











**IAN FARMER
ASSOCIATES**

Site
St Francis Xavier School

Number
WS61

Excavation Method Drive-in Window Sampler	Dimensions	Ground Level (mOD) 81.76	Client Curtins Consulting	Job Number 41498
	Location 341527.1 E 387497.7 N	Dates 27/08/2014	Engineer Curtins Consulting	Sheet 1/1


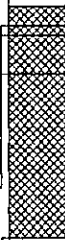
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30 0.30 0.45-0.55 0.55-0.99 0.55 0.55 0.55-0.99	D1 J2 B3 SPT 50/290 D4 J5 D6		8,9/12,12,13,13	81.56 81.31 81.21 80.76	(0.20) 0.20 (0.25) 0.45 0.55 (0.45) 1.00	Grass over MADE GROUND: Friable, dark brown, slightly sandy SILT with frequent roots and occasional rootlets (TOPSOIL). MADE GROUND: Dark brown, silty, slightly gravelly, fine and medium SAND. Gravel is angular to subrounded, fine to coarse of flint, concrete and brick. MADE GROUND: Light brown, silty, slightly gravelly, fine and medium SAND with low cobble content of subrounded flint. Gravel is angular to subrounded, fine to coarse of flint and sandstone. Weathered SANDSTONE, recovered as very dense, red brown mottled light grey, gravelly, fine to coarse sand. Gravel is angular to subrounded, fine to coarse. Terminated at 1.00m	   		   

Remarks
Samples marked J comprise 1 x amber jar and 1 x vial.
Window sample hole remained dry during excavation.

Scale (approx)
1:50

Logged By
DO

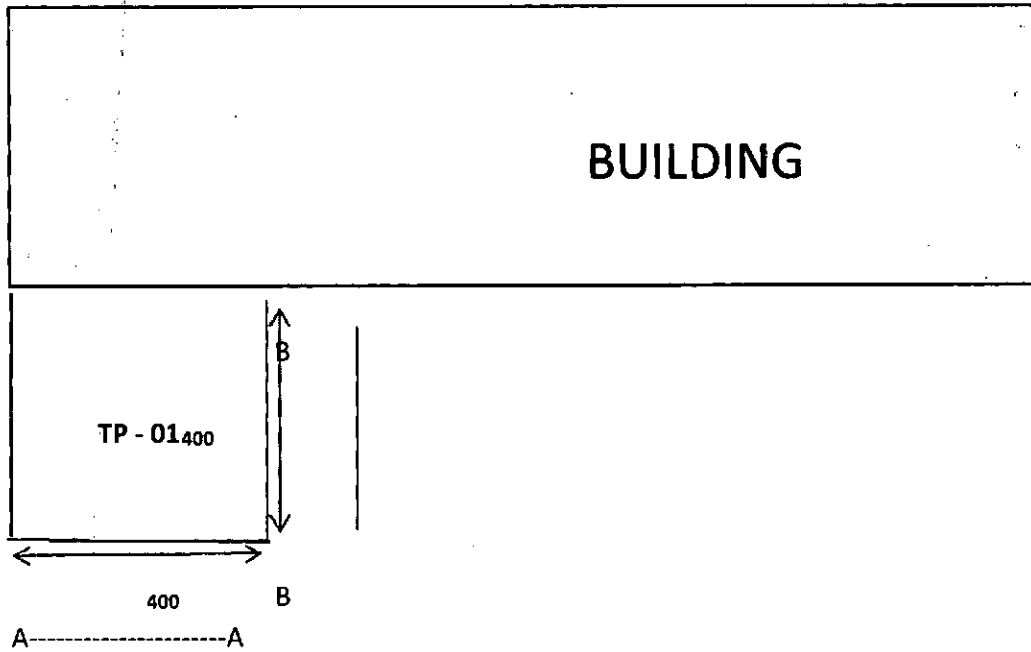
Figure No.
41498.WS61

 IAN FARMER ASSOCIATES					Site St Francis Xavier School		Trial Pit Number TP01	
Excavation Method Hand excavated		Dimensions 0.350m x 0.40m x 1.20m		Ground Level (mOD) 80.81		Client Curtins Consulting		Job Number 41498
		Location 341547.1 E 387706.1 N		Dates 29/08/2014		Engineer Curtins Consulting		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend
0.30 0.30 0.30 0.80 0.80 0.80	D1 D2 J3 D4 D5 J6			80.71 80.66 80.46 79.61	0.10 0.15 (0.20) 0.35 (0.85) 1.20	MADE GROUND: Tarmacadam. MADE GROUND: Orange, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse including brick, flint and sandstone. MADE GROUND: Dark brown mottled black, gravelly, fine to coarse SAND. Gravel is angular to subrounded, fine to coarse including concrete and asphalt. MADE GROUND: Orange brown mottled dark brown, gravelly, fine to coarse SAND with low cobble content. Gravel is angular to subrounded, fine to coarse including brick, concrete, flint and sandstone. Complete at 1.20m		
Plan					Remarks Samples marked as J comprise 1 x amber jar and 1 x vial. Trial pit remained dry and stable during excavation. Refer to sketch for foundation details.			
					Scale (approx) 1:40		Logged By DO	
							Figure No. 41498.TP01	

TP01 Drawings

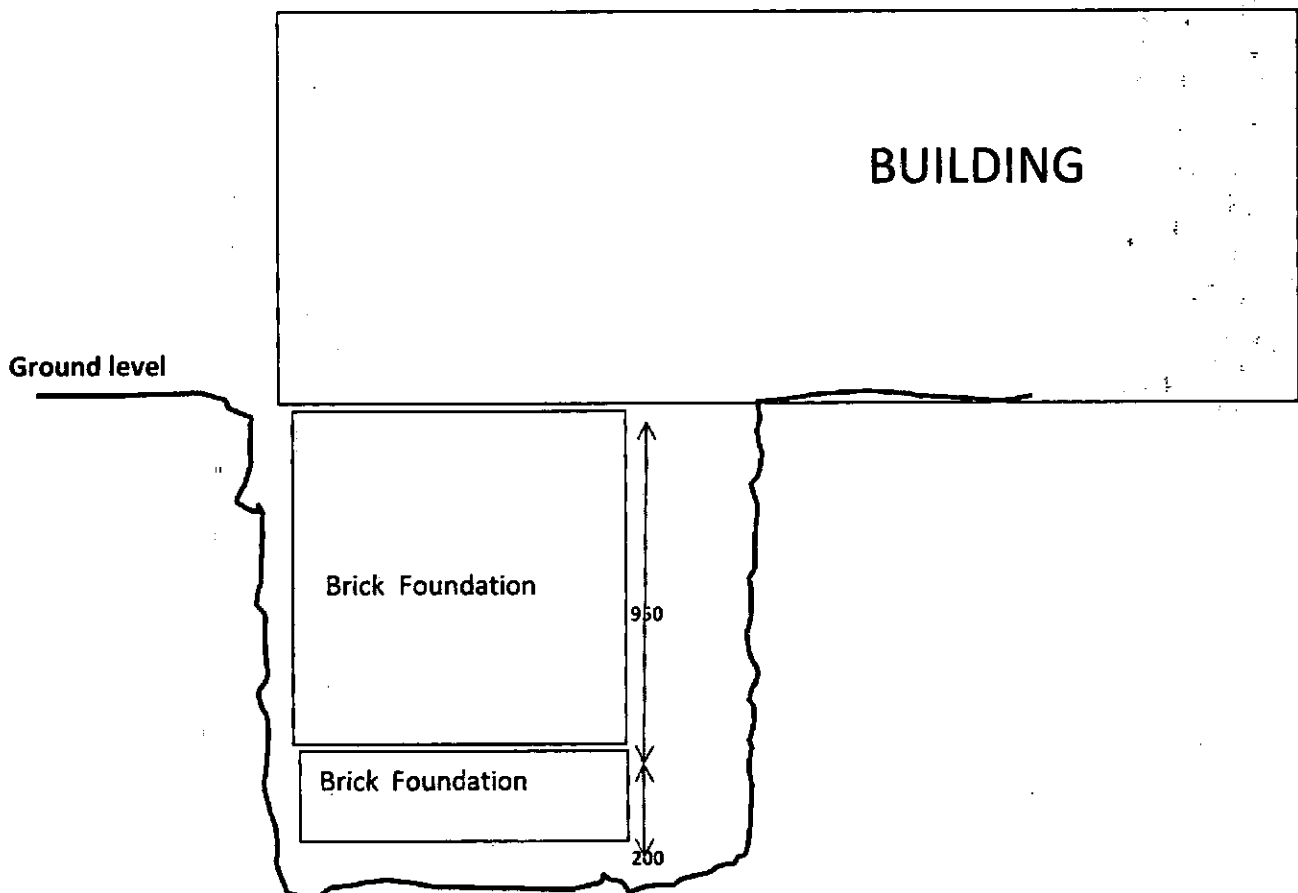
NO-1

TP -01 LOCATION PLAN



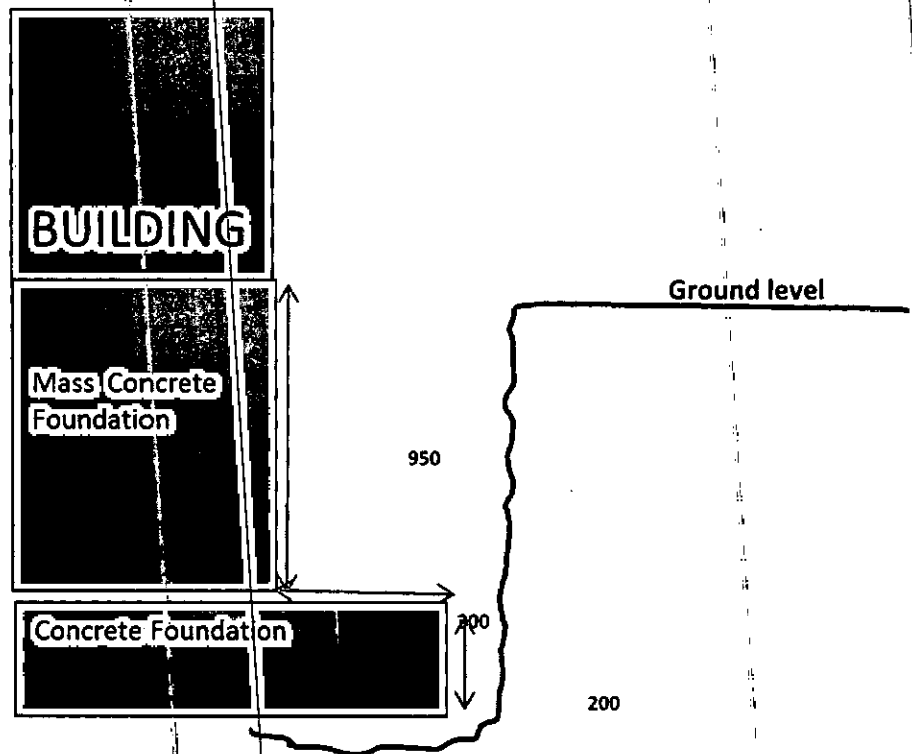
NO-2

A-----A SECTION



TP01 Drawings

NO-3 **B-----B** **SECTION**



Note - Dimensions are in(mm)



Site	St Francis Xavier School
------	--------------------------

**Trial Pit
Number**
TP02

Excavation Method
Hand excavated

Dimensions
0.40m x 0.40m x 0.40m

Ground Level (mOD)	80.80
--------------------	-------

Client	Curtins Consulting
---------------	--------------------

Job Number
41498

Location	341582.5 E 387706.2 N
----------	-----------------------

Dates 29/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth
(m)

Sample / Tests

Water
Depth
(m)

Field Records

Level
(mOD)Depth
(m)
(Thickness)

Description

Legend

Water

0.30
0.30
0.30

D1
D3
J2

80.7

0.10
(0.30)

Grass over MADE GROUND: Firm, dark brown, slightly sandy SILT with frequent roots and occasional rootlets.

MADE GROUND: Light grey, gravelly, fine to coarse SAND with low to medium cobble content. Gravel is angular to subrounded, fine to coarse including concrete, slag and flint.

Complete at 0.40m



Plan

Remarks

Samples marked as J comprise 1 x amber jar and 1 x vial.
Trial pit remained dry and stable during excavation.
Refer to sketch for foundation details.

Scale (approx)

1:40

Logged By

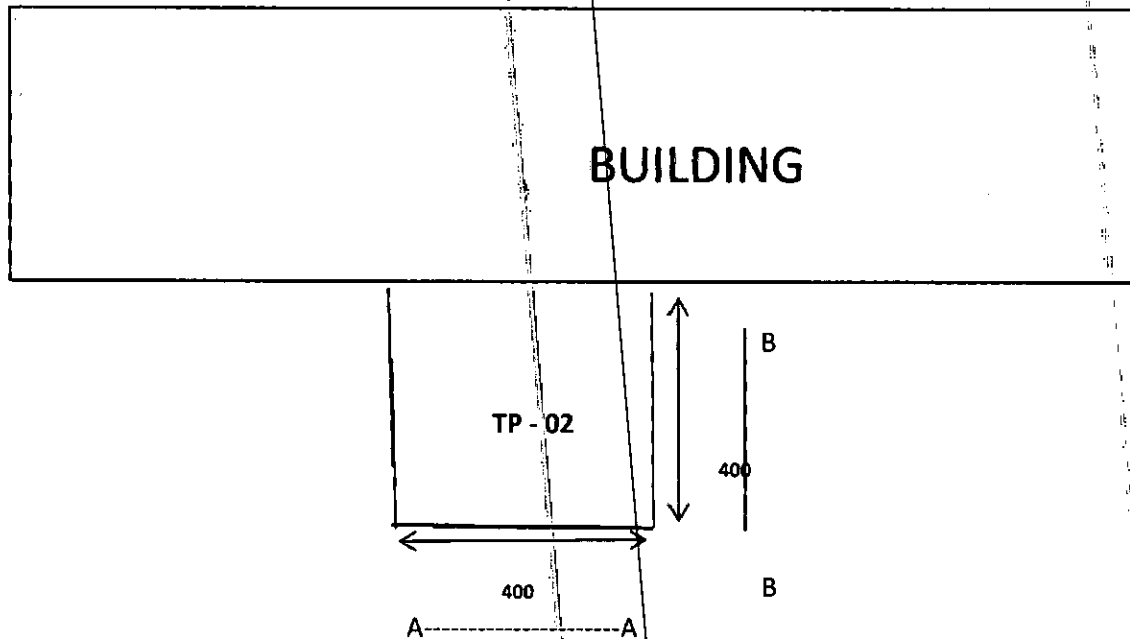
DO

Figure No.

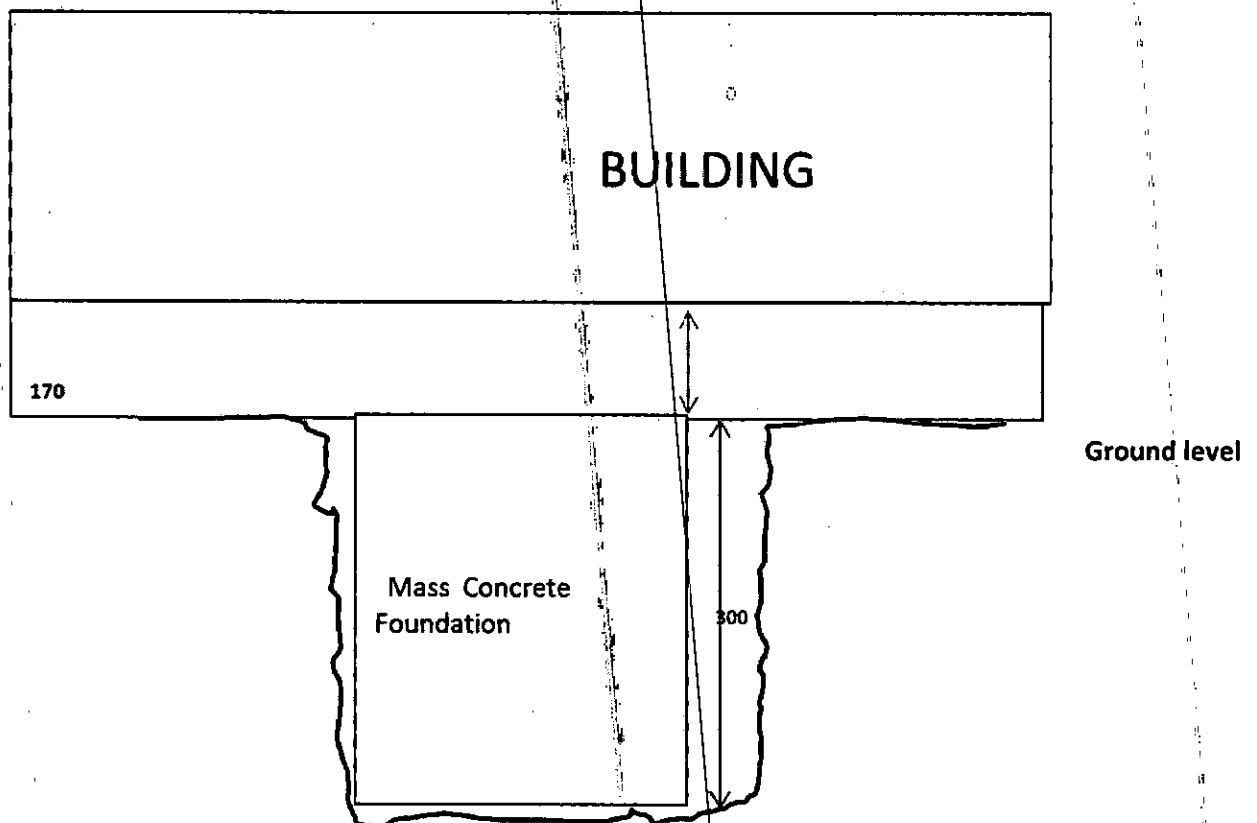
41498.TP02

TP02 Drawings

NO-1 TP -02 LOCATION PLAN

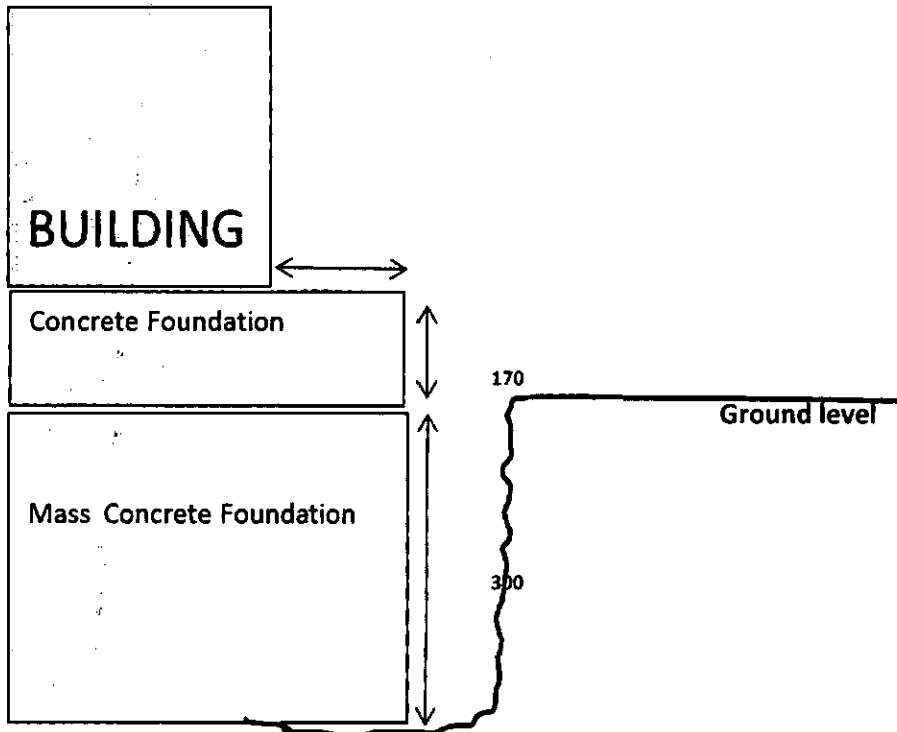


NO-2 A-----A SECTION



TP02 Drawings

NO-3 **B-----B** **SECTION**



Note - Dimensions are in(mm)



IAN FARMER
ASSOCIATES

Site
St Francis Xavier School

Trial Pit
Number
TP03

Excavation Method
Hand excavated

Dimensions
0.50m x 0.35m x 0.50m

Ground Level (mOD)
81.21

Client
Curtins Consulting


Job
Number
41498

Location
341580.8 E 387674 N

Dates
29/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30 0.30 0.30 0.30-0.50 0.50 0.50 0.50	D2 D3 J4 B1 D5 D6 J7			81.06 80.71	(0.15) 0.15 (0.35) 0.50	Grass over MADE GROUND: Dark brown mottled orange brown, friable, silty, slightly gravelly, fine SAND. Gravel is angular to subrounded, fine to coarse including flint and occasional concrete. MADE GROUND: Orange brown mottled dark brown, gravelly, fine to coarse SAND with low cobble content. Gravel is angular to subrounded, fine to coarse including brick, sandstone and flint. Complete at 0.50m		

Plan

Remarks

Refer to sketch for foundation details.
Samples marked as J comprise 1 x amber jar and 1 x vial.
Trial pit remained dry and stable during excavation.

Scale (approx)

1:40

Logged By

DO

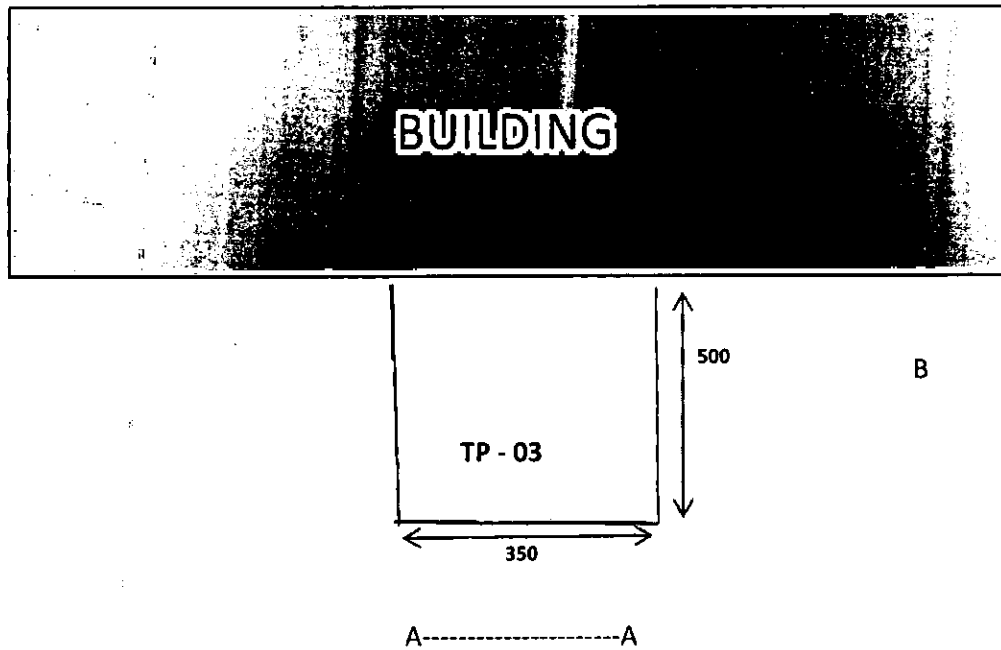
Figure No.

41498.TP03

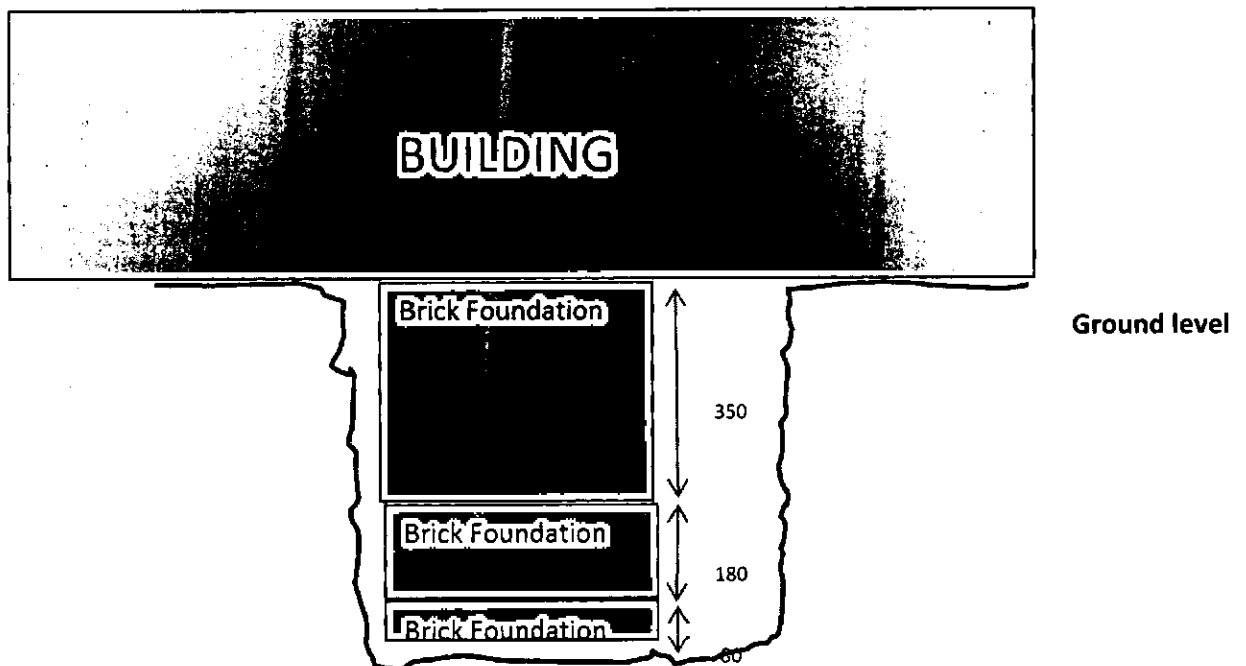
TP03 Drawings

NO-1

TP -03 LOCATION PLAN

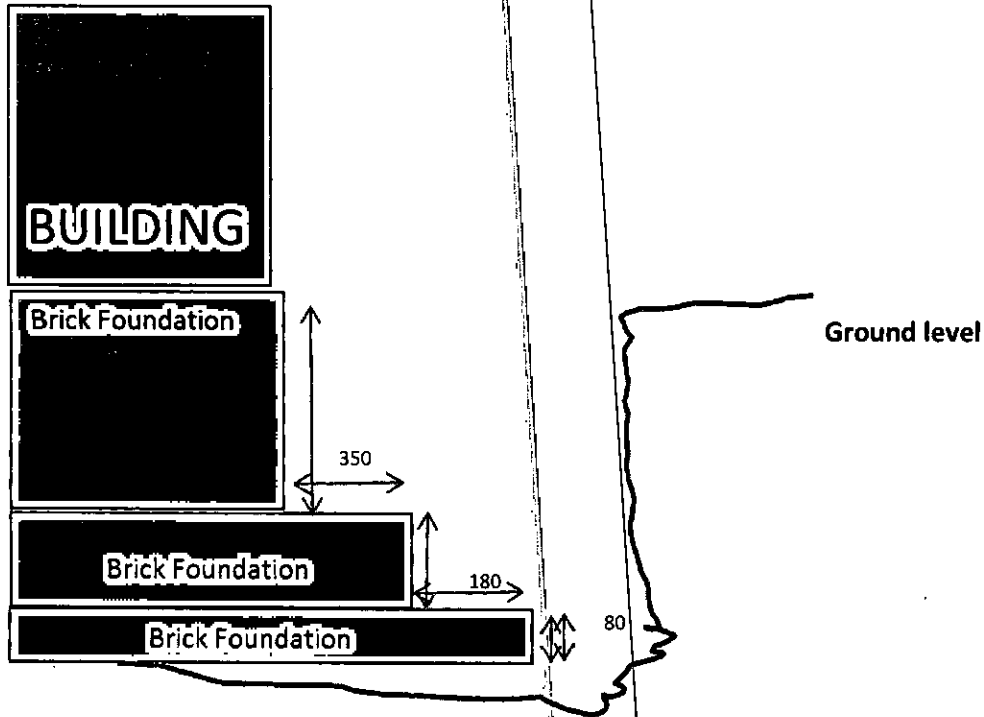


NO-2 A-----A SECTION



TP03 Drawings

N0-3 B-----B SECTION



Note - Dimensions are in(mm)



**IAN FARMER
ASSOCIATES**

Site
St Francis Xavier School

Trial Pit
Number
TP04

Excavation Method
Hand excavated

Dimensions
0.40m x 0.40m x 1.00m

Ground Level (mOD)
81.23

Client
Curtins Consulting

Job
Number
41498

Location
341562.5 E 387685.2 N

Dates
29/08/2014

Engineer
Curtins Consulting

Sheet
1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	D1			81.08	(0.15)	MADE GROUND: Tarmacadam.		
0.30	D2			80.91	(0.17)	MADE GROUND: Light grey, sandy, angular to subrounded, fine to coarse GRAVEL including concrete and brick.		
0.30	J3				0.32			
0.50-1.00	B4				(0.68)	MADE GROUND: Orange brown, gravelly, fine to coarse SAND with medium to high cobble content. Gravel is angular to subrounded, fine to coarse including brick, concrete and wood.		
0.80	D5			80.23	1.00	Complete at 1.00m		
0.80	D6							
0.80	J7							

Plan

Remarks

Samples marked as J comprise 1 x amber jar and 1 x vial.
Trial pit remained dry and stable during excavation.
Refer to sketch for foundation details.

Scale (approx)

1:40

Logged By

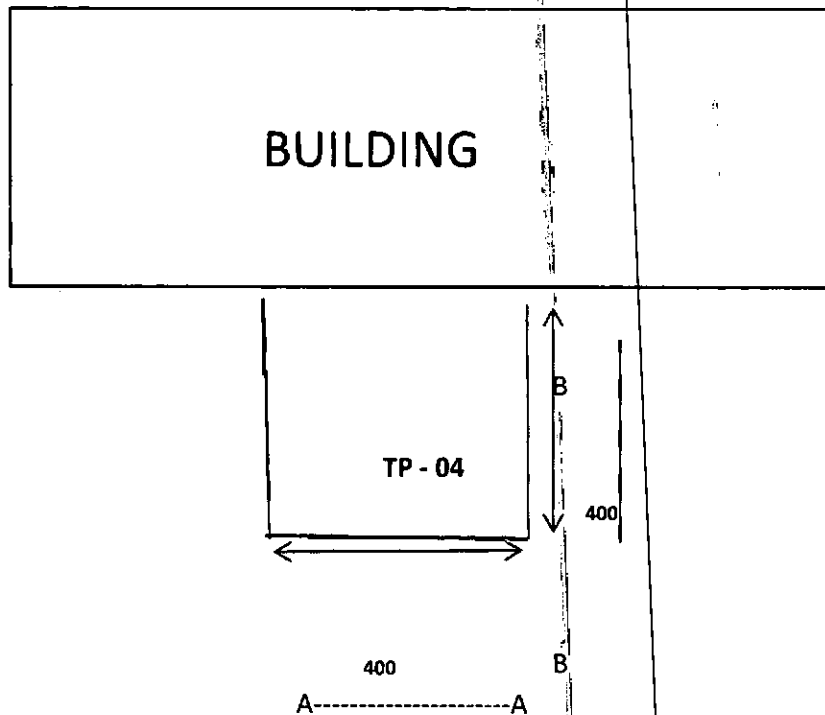
DO

Figure No.

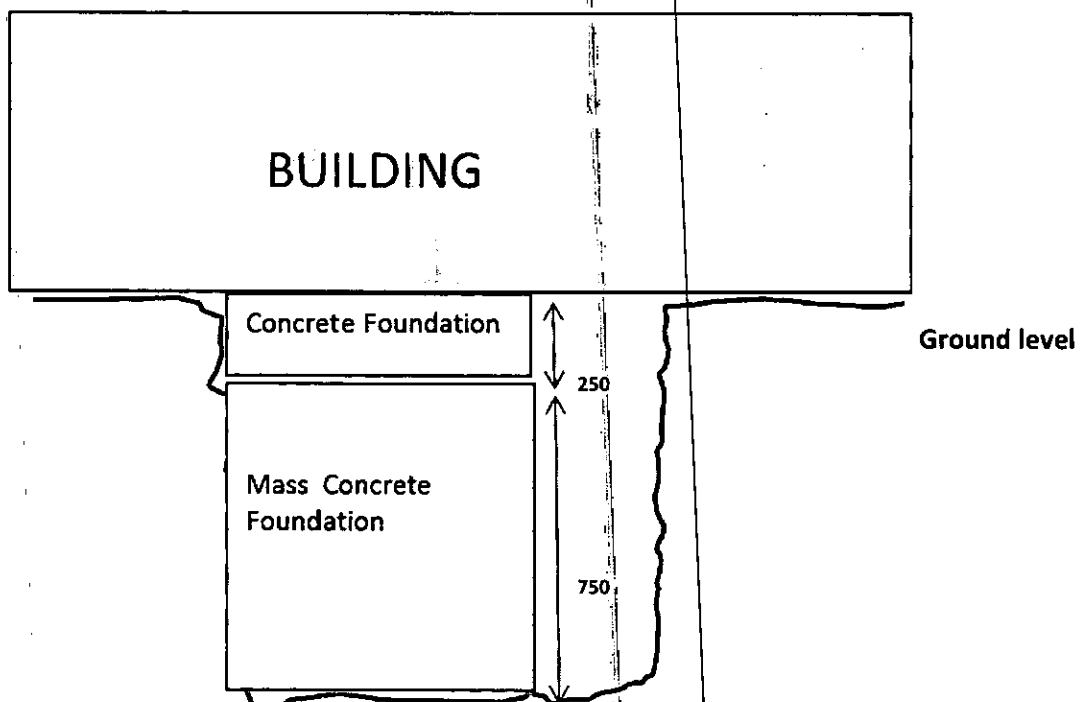
41498.TP04

TP04 Drawings

NO-1 TP-04 LOCATION PLAN

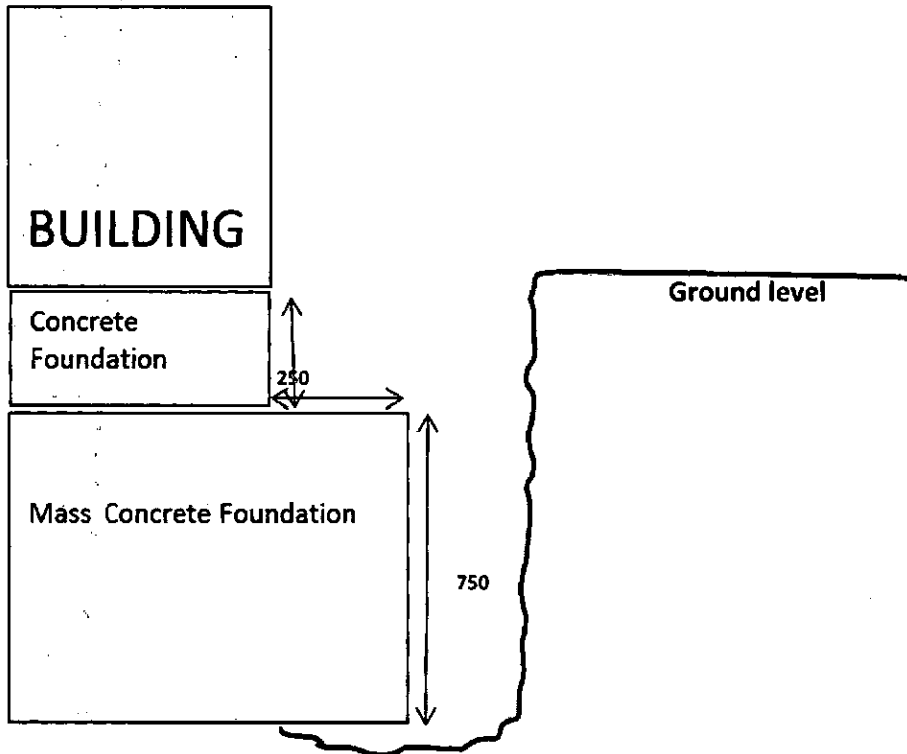


NO-2 A-----A SECTION



TP04 Drawings

NO-3 **B-----B** **SECTION**



Note - Dimensions are in(mm)

EB1310/GL/3547 St Francis Xavier, Beaconsfield Road, Liverpool



Phase 2 Intrusive Investigation

Appendix A4 – Chemical and Geotechnical Laboratory Testing Results



Scientific Analysis Laboratories Ltd

Certificate of Analysis

Hadfield House
Hadfield Street
Carnbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Scientific Analysis Laboratories is a
limited company registered in England and
Wales (No 2514788) whose address is at
Hadfield House, Hadfield Street, Manchester M16 9FE

Report Number: Supplement to 419160-2

Date of Report: 13-Oct-2014

Customer: Curtins Consulting Ltd.
10 Oxford Court
Bishopsgate
Manchester
M2 3WQ

Customer Contact: Ms Gemma Lownsbrough

Customer Job Reference: EB1310/GL/3982

Customer Purchase Order: EB885

Customer Site Reference: St Francis Xavier, Liverpool

Date Job Received at SAL: 21-Aug-2014

Date Analysis Started: 02-Sep-2014

Date Analysis Completed: 11-Sep-2014

The results reported relate to samples received in the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with QP22



Report checked
and authorised by :
Mr Ross Walker
Customer Services Manager
(Land)

Issued by :
Mr Ross Walker
Customer Services Manager
(Land)

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil
MCERTS Preparation

Analysed as Soil

SAL Reference					419160 042	419160 043	419160 044	419160 045	419160 046	419160 047	419160 048	419160 049	419160 050	419160 051
Customer Sample Reference					WS33	WS34	WS35	WS36	WS36	WS37	WS37	WS38	WS39	WS39
Date Sampled					22-AUG-2014	26-AUG-2014	26-AUG-2014	26-AUG-2014	26-AUG-2014	18-AUG-2014	18-AUG-2014	18-AUG-2014	18-AUG-2014	18-AUG-2014
Depth					0.15	0.15	0.2	0.3	0.8	0.3	1.9	0.6	0.5	1.2
Type					Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Moisture @ 105 C	T162	AR	0.1	%	2.9	4.9	13	8.5	15	7.9	4.8	2.3	13	10

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil
MCERTS Preparation

Analysed as Soil

SAL Reference					419160 052	419160 053	419160 054	419160 055	419160 056	419160 057	419160 058	419160 059	419160 060	419160 061
Customer Sample Reference					WS40	WS41	WS41	WS42	WS43	WS44	WS44	WS45	WS46	WS47
Date Sampled					19-AUG-2014	26-AUG-2014	26-AUG-2014	18-AUG-2014	26-AUG-2014	18-AUG-2014	18-AUG-2014	19-AUG-2014	19-AUG-2014	19-AUG-2014
Depth					0.3	0.45	1.2	0.2	0.2	0.8	1.0	0.3	1.0	0.3
Type					Fill	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Moisture @ 105 C	T162	AR	0.1	%	11	13	21	5.5	10	10	15	12	14	8.5

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil
MCERTS Preparation

Analysed as Soil

SAL Reference					419160 062	419160 063	419160 064	419160 065	419160 066	419160 067	419160 068	419160 069	419160 070	419160 071
Customer Sample Reference					WS47	WS48	WS49	WS50	WS50	WS51	WS52	WS53	WS54	WS55
Date Sampled					19-AUG- 2014	26-AUG- 2014	18-AUG- 2014	18-AUG- 2014	18-AUG- 2014	28-AUG- 2014	26-AUG- 2014	26-AUG- 2014	26-AUG- 2014	26-AUG- 2014
Depth					0.8	0.2	0.3	0.8	1.9	0.1	0.3	0.8	0.3	0.2
Type					Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Topsoil
Determinand	Method	Test Sample	LOD	Units										
Moisture @ 105 C	T162	AR	0.1	%	9.2	9.1	8.7	8.8	9.5	11	12	11	17	19

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil
MCERTS Preparation

Analysed as Soil

SAL Reference					419160 072	419160 073	419160 074	419160 075	419160 076	419160 077	419160 078	419160 079
Customer Sample Reference					WS56	WS56	WS57	WS58	WS59	WS60	WS61	WS61
Date Sampled					26-AUG- 2014	26-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014
Depth					0.2	0.7	0.55	0.45	0.3	0.6	0.3	0.55
Type					Topsoil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units								
Moisture @ 105 C	T162	AR	0.1	%	13	8.0	19	12	6.7	14	7.6	11

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL/3982 Soil Metals														
SAL Reference				419160 001	419160 002	419160 003	419160 004	419160 005	419160 006	419160 007	419160 008	419160 009	419160 010	
Customer Sample Reference				BH01	BH01	BH02	BH02	WS01	WS01	WS02	WS02	WS03	WS04	
Date Sampled				21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	
Depth				0.5	2.0	0.3	0.5	0.3	1.9	0.3	1.7	0.3	0.3	
Type				Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Topsoil	Sandy Soil	Sandy Soil	Topsoil	
Determinand	Method	Test Sample	LOD	Units										
Arsenic	T6	M40	2	mg/kg	100	4	140	6	19	5	14	6	7	17
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	4	<1	<1	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	17	9	20	14	16	14	14	13	12	14
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	81	4	320	12	44	9	27	12	14	33
Lead	T6	M40	1	mg/kg	620	12	1100	39	180	27	120	87	130	170
Mercury	T6	M40	1	mg/kg	8	<1	10	<1	<1	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	24	5	29	9	16	10	14	9	9	14
Selenium	T6	M40	3	mg/kg	<3	<3	5	<3	<3	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	90	14	560	49	110	21	82	36	52	100

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL/3982 Soil Metals														
SAL Reference				419160 011	419160 012	419160 013	419160 014	419160 015	419160 016	419160 017	419160 018	419160 019	419160 020	
Customer Sample Reference				WS05	WS05	WS06	WS08	WS09	WS10	WS10	WS13	WS13	WS14	
Date Sampled				20-AUG-2014	20-AUG-2014	20-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	20-AUG-2014	20-AUG-2014	21-AUG-2014	
Depth				0.3	0.8	0.3	0.3	0.3	0.8	1.9	0.8	1.7	0.3	
Type				Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	
Determinand	Method	Test Sample	LOD	Units										
Arsenic	T6	M40	2	mg/kg	15	5	21	13	15	10	2	24	5	11
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	14	12	14	14	15	12	9	13	17	15
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	22	9	40	27	32	17	2	44	5	120
Lead	T6	M40	1	mg/kg	110	15	220	120	190	88	6	270	15	300
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	12	11	15	13	15	9	4	15	6	13
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	70	17	110	75	100	49	9	100	16	71

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil
Metals
Analysed as Soil

SAL Reference					419160 021	419160 022	419160 023	419160 024	419160 025	419160 026	419160 027	419160 028	419160 029	419160 030
Customer Sample Reference					WS15	WS15	WS16	WS17	WS17	WS18	WS19	WS19	WS22	WS23
Date Sampled					22-AUG- 2014	22-AUG- 2014	22-AUG- 2014	22-AUG- 2014	22-AUG- 2014	21-AUG- 2014	20-AUG- 2014	20-AUG- 2014	20-AUG- 2014	22-AUG- 2014
Depth					0.3	2.0	0.3	0.15	0.8	0.3	0.2	0.4	0.3	0.3
Type					Sandy Soil	Sandy Soil	Topsoil	Sandy Soil	Sandy Soil	Sandy Soil	Topsoil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Arsenic	T6	M40	2	mg/kg	12	6	13	9	6	12	5	8	17	12
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	13	12	14	8	11	11	11	12	12	17
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	30	16	23	9	14	23	8	15	31	19
Lead	T6	M40	1	mg/kg	130	81	89	37	46	180	43	69	240	72
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	13	8	13	14	8	11	8	9	13	13
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	95	34	70	22	34	73	31	50	97	59

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil
Metals
Analysed as Soil

SAL Reference					419160 032	419160 033	419160 034	419160 035	419160 036	419160 037	419160 038	419160 039	419160 040	419160 041
Customer Sample Reference					WS25	WS26	WS27	WS28	WS28	WS29	WS30	WS31	WS32	WS32
Date Sampled					22-AUG- 2014	22-AUG- 2014	22-AUG- 2014	20-AUG- 2014	20-AUG- 2014	20-AUG- 2014	19-AUG- 2014	20-AUG- 2014	20-AUG- 2014	20-AUG- 2014
Depth					0.3	0.3	0.3	0.2	0.4	0.3	0.3	0.3	0.3	0.5
Type					Sandy Soil	Sandy Soil	Sandy Soil	Topsoil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Arsenic	T6	M40	2	mg/kg	8	3	7	18	18	10	4	42	19	13
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	13	4	8	12	12	20	10	13	12	12
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	12	3	11	30	28	15	8	28	29	22
Lead	T6	M40	1	mg/kg	62	100	52	200	180	79	18	160	210	150
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	12	3	7	13	12	11	10	13	12	10
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	40	49	48	85	76	50	19	88	95	75

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL/3982														
Soil Metals					Analysed as Soil									
SAL Reference					419160 042	419160 043	419160 044	419160 045	419160 046	419160 047	419160 048	419160 049	419160 050	419160 051
Customer Sample Reference					WS33	WS34	WS35	WS36	WS36	WS37	WS37	WS38	WS39	WS39
Date Sampled					22-AUG- 2014	26-AUG- 2014	26-AUG- 2014	26-AUG- 2014	26-AUG- 2014	18-AUG- 2014	18-AUG- 2014	18-AUG- 2014	18-AUG- 2014	18-AUG- 2014
Depth					0.15	0.15	0.2	0.3	0.8	0.3	1.9	0.6	0.5	1.2
Type					Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Arsenic	T6	M40	2	mg/kg	4	6	11	26	4	10	<2	18	13	13
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	6	6	11	23	16	14	5	16	12	13
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	2	5	25	65	6	14	1	25	22	25
Lead	T6	M40	1	mg/kg	25	52	75	120	12	45	2	94	120	130
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	4	5	17	31	8	11	4	16	9	10
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	29	35	59	120	17	43	5	88	65	73

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL/3982														
Soil Metals					Analysed as Soil									
SAL Reference					419160 052	419160 053	419160 054	419160 055	419160 056	419160 057	419160 058	419160 059	419160 060	419160 061
Customer Sample Reference					WS40	WS41	WS41	WS42	WS43	WS44	WS44	WS45	WS46	WS47
Date Sampled					19-AUG- 2014	26-AUG- 2014	26-AUG- 2014	18-AUG- 2014	26-AUG- 2014	18-AUG- 2014	18-AUG- 2014	19-AUG- 2014	19-AUG- 2014	19-AUG- 2014
Depth					0.3	0.45	1.2	0.2	0.2	0.8	1.0	0.3	1.0	0.3
Type					Fill	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Arsenic	T6	M40	2	mg/kg	15	20	14	53	410	33	22	18	20	47
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	3	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	11	21	16	19	36	23	15	11	16	13
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	36	44	31	90	300	26	39	24	54	55
Lead	T6	M40	1	mg/kg	240	100	100	220	1800	130	140	51	200	280
Mercury	T6	M40	1	mg/kg	<1	<1	<1	2	9	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	10	29	14	22	53	15	15	9	15	13
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	7	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	79	100	68	160	350	50	110	48	120	62

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil
Metals

Analysed as Soil

SAL Reference					419160 062	419160 063	419160 064	419160 065	419160 066	419160 067	419160 068	419160 069	419160 070	419160 071
Customer Sample Reference					WS47	WS48	WS49	WS50	WS50	WS51	WS52	WS53	WS54	WS55
Date Sampled					19-AUG- 2014	26-AUG- 2014	18-AUG- 2014	18-AUG- 2014	18-AUG- 2014	26-AUG- 2014	26-AUG- 2014	26-AUG- 2014	26-AUG- 2014	26-AUG- 2014
Depth					0.8	0.2	0.3	0.8	1.9	0.1	0.3	0.8	0.3	0.2
Type					Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Topsoil	Topsoil
Determinand	Method	Test Sample	LOD	Units										
Arsenic	T6	M40	2	mg/kg	18	8	87	32	9	57	14	23	21	18
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1	2	3	<1	<1	<1
Chromium	T6	M40	1	mg/kg	10	8	11	16	38	36	16	13	16	17
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	26	10	56	52	19	520	74	17	37	46
Lead	T6	M40	1	mg/kg	130	39	310	310	17	210	87	28	140	190
Mercury	T6	M40	1	mg/kg	<1	<1	3	<1	<1	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	9	7	11	18	30	75	17	9	16	17
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	47	33	59	140	40	2000	240	39	99	150

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil
Metals

Analysed as Soil

SAL Reference					419160 072	419160 073	419160 074	419160 075	419160 076	419160 077	419160 078	419160 079
Customer Sample Reference					WS56	WS56	WS57	WS58	WS59	WS60	WS61	WS61
Date Sampled					26-AUG- 2014	26-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014
Depth					0.2	0.7	0.55	0.45	0.3	0.6	0.3	0.55
Type					Topsoil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units								
Arsenic	T6	M40	2	mg/kg	28	11	15	17	65	22	20	11
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	15	22	14	20	14	20	14	13
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	33	9	20	32	28	16	41	20
Lead	T6	M40	1	mg/kg	170	37	95	68	180	59	150	49
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	15	12	11	14	14	13	13	9
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	92	40	51	76	99	44	93	34

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL3982														
Soil Miscellaneous														
Analysed as Soil														
SAL Reference														
Customer Sample Reference														
Date Sampled														
Depth														
Type														
Determinand														
Method														
Test Sample														
LOD														
Units														
Asbestos ID														
Cyanide(Total)														
pH														
Phenols(Mono)														
Soil Organic Matter														
SO4(Total)														
Sulphide														
Sulphur (total)														

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL3982														
Soil Miscellaneous														
Analysed as Soil														
SAL Reference														
Customer Sample Reference														
Date Sampled														
Depth														
Type														
Determinand														
Method														
Test Sample														
LOD														
Units														
Asbestos ID														
Cyanide(Total)														
pH														
Phenols(Mono)														
Soil Organic Matter														
SO4(Total)														
Sulphide														
Sulphur (total)														

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL/3982														
Soil					Analysed as Soil									
Miscellaneous														
SAL Reference					419160 052	419160 053	419160 054	419160 055	419160 056	419160 057	419160 058	419160 059	419160 060	419160 061
Customer Sample Reference					WS40	WS41	WS41	WS42	WS43	WS44	WS44	WS45	WS46	WS47
Date Sampled					19-AUG-2014	26-AUG-2014	26-AUG-2014	18-AUG-2014	26-AUG-2014	18-AUG-2014	18-AUG-2014	19-AUG-2014	19-AUG-2014	19-AUG-2014
Depth					0.3	0.45	1.2	0.2	0.2	0.8	1.0	0.3	1.0	0.3
Type					Fill	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Asbestos ID	T27	AR			N.D.	N.D.	-	N.D.	N.D.	N.D.	-	N.D.	N.D.	N.D.
Cyanide(Total)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
pH	T7	AR			6.9	8.0	7.5	8.3	7.7	7.3	7.7	7.8	7.2	5.4
Phenols(Mono)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Soil Organic Matter	T287	M40	0.1	%	5.0	4.7	5.2	4.0	4.3	1.1	4.2	3.1	5.0	6.5
SO4(Total)	T6	M40	0.01	%	0.10	0.17	0.09	0.14	0.31	0.08	0.15	0.06	0.12	0.16
Sulphide	T546	AR	1	mg/kg	<1	<1	2	<1	<1	<1	<1	<1	<1	<1
Sulphur (total)	T6	M40	0.01	%	0.03	0.06	0.03	0.05	0.10	0.03	0.05	0.02	0.04	0.05

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL/3982														
Soil					Analysed as Soil									
Miscellaneous														
SAL Reference					419160 062	419160 063	419160 064	419160 065	419160 066	419160 067	419160 068	419160 069	419160 070	419160 071
Customer Sample Reference					WS47	WS48	WS49	WS50	WS50	WS51	WS52	WS53	WS54	WS55
Date Sampled					19-AUG-2014	26-AUG-2014	18-AUG-2014	18-AUG-2014	18-AUG-2014	26-AUG-2014	26-AUG-2014	26-AUG-2014	26-AUG-2014	26-AUG-2014
Depth					0.8	0.2	0.3	0.8	1.9	0.1	0.3	0.8	0.3	0.2
Type					Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Topsoil	Topsoil
Determinand	Method	Test Sample	LOD	Units										
Asbestos ID	T27	AR			-	N.D.	N.D.	N.D.	-	N.D.	N.D.	Chrysotile Detected	N.D.	N.D.
Cyanide(Total)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
pH	T7	AR			5.4	8.0	8.2	6.8	5.8	7.9	7.8	7.9	6.6	7.2
Phenols(Mono)	T546	AR	1	mg/kg	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
Soil Organic Matter	T287	M40	0.1	%	5.3	1.4	2.3	5.7	0.4	23	2.4	1.8	4.1	7.1
SO4(Total)	T6	M40	0.01	%	0.11	0.07	0.09	0.12	0.04	0.32	0.08	0.05	0.08	0.15
Sulphide	T546	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	2
Sulphur (total)	T6	M40	0.01	%	0.04	0.02	0.03	0.04	0.01	0.11	0.03	0.02	0.03	0.05

SAL Reference: 419160												
Project Site: St Francis Xavier, Liverpool												
Customer Reference: EB1310/GL/3982												
Soil		Analysed as Soil										
Miscellaneous												
SAL Reference				419160 072	419160 073	419160 074	419160 075	419160 076	419160 077	419160 078	419160 079	
Customer Sample Reference				WS56	WS56	WS57	WS58	WS59	WS60	WS61	WS61	
Date Sampled				26-AUG- 2014	26-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	
Depth				0.2	0.7	0.55	0.45	0.3	0.6	0.3	0.55	
Type				Topsoil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	
Determinand	Method	Test Sample	LOD	Units								
Asbestos ID	T27	AR			N.D.	-	N.D.	N.D.	N.D.	N.D.	N.D.	-
Cyanide(Total)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	2	<1
pH	T7	AR			7.1	7.3	7.3	7.8	7.7	7.3	7.5	7.4
Phenols(Mono)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
Soil Organic Matter	T287	M40	0.1	%	5.5	1.6	2.5	2.6	5.3	2.6	6.4	3.7
SO4(Total)	T6	M40	0.01	%	0.11	0.07	0.07	0.06	0.12	0.07	0.10	0.07
Sulphide	T546	AR	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
Sulphur (Total)	T6	M40	0.01	%	0.04	0.02	0.02	0.02	0.04	0.02	0.03	0.02

SAL Reference: 419160														
Project Site: St Francis Xavier, Liverpool														
Customer Reference: EB1310/GL/3982														
Soil		Analysed as Soil												
TPH														
SAL Reference					419160 002	419160 004	419160 006	419160 008	419160 012	419160 017	419160 019	419160 022	419160 025	419160 028
Customer Sample Reference					BH01	BH02	WS01	WS02	WS05	WS10	WS13	WS15	WS17	WS19
Date Sampled					21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	20-AUG-2014	21-AUG-2014	20-AUG-2014	22-AUG-2014	22-AUG-2014	20-AUG-2014
Depth					2.0	0.5	1.9	1.7	0.8	1.9	1.7	2.0	0.8	0.4
Type					Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
TPH (C8-C10)	T8	M105	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TPH (C10-C12)	T206	M105	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TPH (C12-C16)	T206	M105	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	3	<1
TPH (C16-C21)	T206	M105	1	mg/kg	<1	6	2	<1	1	<1	<1	3	13	5
TPH (C21-C35)	T206	M105	1	mg/kg	<1	30	18	4	1	2	2	23	71	14

SAL Reference: 419160														
Project Site: St Francis Xavier, Liverpool														
Customer Reference: EB1310/GL/3982														
Soil		Analysed as Soil												
TPH														
SAL Reference		419160 036	419160 041	419160 046	419160 048	419160 051	419160 054	419160 058	419160 062	419160 066	419160 073			
Customer Sample Reference		WS28	WS32	WS36	WS37	WS39	WS41	WS44	WS47	WS50	WS56			
Date Sampled		20-AUG-2014	20-AUG-2014	26-AUG-2014	18-AUG-2014	18-AUG-2014	26-AUG-2014	18-AUG-2014	19-AUG-2014	18-AUG-2014	26-AUG-2014			
Depth		0.4	0.5	0.8	1.9	1.2	1.2	1.0	0.8	1.9	0.7			
Type		Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil			
Determinand	Method	Test Sample	LOD	Units										
TPH (C8-C10)	T8	M105	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TPH (C10-C12)	T206	M105	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TPH (C12-C16)	T206	M105	1	mg/kg	<1	<1	<1	<1	<1	2	<1	<1	<1	<1
TPH (C16-C21)	T206	M105	1	mg/kg	3	3	<1	<1	4	4	11	5	<1	1
TPH (C21-C35)	T206	M105	1	mg/kg	13	17	<1	<1	35	16	42	110	<1	9

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL/3982					
Soil TPH					
Analysed as Soil					
SAL Reference				419160	
				079	
Customer Sample Reference				WS61	
Date Sampled				27-AUG-2014	
Depth				0.55	
Type				Sandy Soil	
Determinand	Method	Test Sample	LOD	Units	
TPH (C8-C10)	T8	M105	1	mg/kg	<1
TPH (C10-C12)	T206	M105	1	mg/kg	<1
TPH (C12-C18)	T206	M105	1	mg/kg	1
TPH (C18-C21)	T206	M105	1	mg/kg	17
TPH (C21-C35)	T206	M105	1	mg/kg	43

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL/3982															
Soil Total and Speciated USEPA16 PAH															
Analysed as Soil															
SAL Reference				419160	419160	419160	419160	419160	419160	419160	419160	419160	419160	419160	419160
				001	002	003	004	005	006	007	008	009	010	011	012
Customer Sample Reference				BH01	BH01	BH02	BH02	WS01	WS01	WS02	WS02	WS03	WS04	WS05	WS06
Date Sampled				21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014
Depth				0.5	2.0	0.3	0.5	0.3	1.9	0.3	1.7	0.3	0.3	0.3	0.3
Type				Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Topsoil	Sandy Soil	Sandy Soil	Sandy Soil	Topsoil	Topsoil
Determinand	Method	Test Sample	LOD	Units											
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	0.5	<0.1	8.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	0.3	<0.1	3.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	4.1	<0.1	32	0.1	0.5	0.2	0.4	<0.1	0.9	0.6	0.6
Anthracene	T207	M105	0.1	mg/kg	1.4	<0.1	17	<0.1	0.1	<0.1	<0.1	<0.1	0.3	0.2	0.2
Fluoranthene	T207	M105	0.1	mg/kg	7.5	<0.1	82	0.7	1.0	0.2	0.9	0.1	1.5	1.2	1.2
Pyrene	T207	M105	0.1	mg/kg	6.3	<0.1	70	0.7	0.9	0.2	0.8	0.1	1.4	1.1	1.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	2.2	<0.1	43	0.4	0.6	<0.1	0.5	<0.1	0.7	0.7	0.7
Chrysene	T207	M105	0.1	mg/kg	2.0	<0.1	36	0.3	0.5	<0.1	0.5	<0.1	0.6	0.6	0.6
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	3.9	<0.1	61	0.7	1.0	0.1	1.0	0.1	1.0	1.1	1.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	2.1	<0.1	35	0.4	0.6	<0.1	0.5	<0.1	0.6	0.6	0.6
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	1.0	<0.1	17	0.2	0.3	<0.1	0.2	<0.1	0.3	0.3	0.3
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	0.3	<0.1	5.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	1.2	<0.1	18	0.2	0.3	<0.1	0.3	<0.1	0.3	0.3	0.3
PAH(total)	T207	M105	0.1	mg/kg	33	<0.1	430	3.7	5.8	0.7	5.1	0.3	7.8	6.7	6.7

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil Analysed as Soil
Total and Speciated USEPA16 PAH

SAL Reference					419160 011	419160 012	419160 013	419160 014	419160 015	419180 016	419160 017	419160 018	419160 019	419160 020
Customer Sample Reference					WS05	WS05	WS06	WS08	WS09	WS10	WS10	WS13	WS13	WS14
Date Sampled					20-AUG-2014	20-AUG-2014	20-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	21-AUG-2014	20-AUG-2014	20-AUG-2014	21-AUG-2014
Depth					0.3	0.8	0.3	0.3	0.3	0.8	1.9	0.8	1.7	0.3
Type					Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	0.7	<0.1	<0.1	<0.1	<0.1	7.5
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	8.5
Phenanthrene	T207	M105	0.1	mg/kg	0.4	<0.1	0.7	0.5	3.8	0.2	<0.1	0.4	<0.1	67
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.2	0.1	1.1	<0.1	<0.1	0.1	<0.1	23
Fluoranthene	T207	M105	0.1	mg/kg	0.9	<0.1	1.6	0.9	5.3	0.5	<0.1	1.4	<0.1	60
Pyrene	T207	M105	0.1	mg/kg	0.9	<0.1	1.5	0.9	4.9	0.5	<0.1	1.5	<0.1	59
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	0.4	<0.1	0.9	0.4	1.9	0.2	<0.1	1.0	<0.1	16
Chrysene	T207	M105	0.1	mg/kg	0.4	<0.1	0.9	0.4	2.0	0.2	<0.1	1.0	<0.1	15
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	0.7	<0.1	1.7	0.6	3.1	0.4	<0.1	2.1	<0.1	17
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	0.4	<0.1	1.0	0.3	1.8	0.2	<0.1	1.2	<0.1	10
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	0.2	<0.1	0.5	0.1	0.8	<0.1	<0.1	0.6	<0.1	4.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.1	<0.1	0.3	<0.1	<0.1	0.2	<0.1	1.5
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	0.2	<0.1	0.5	0.2	0.9	<0.1	<0.1	0.7	<0.1	4.5
PAH(total)	T207	M105	0.1	mg/kg	4.5	<0.1	9.6	4.4	27	2.2	<0.1	10	<0.1	290

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil Analysed as Soil
Total and Speciated USEPA16 PAH

SAL Reference					419160 021	419160 022	419160 023	419160 024	419160 025	419160 026	419160 027	419160 028	419160 029	419160 030
Customer Sample Reference					WS15	WS15	WS16	WS17	WS17	WS18	WS19	WS19	WS22	WS23
Date Sampled					22-AUG-2014	22-AUG-2014	22-AUG-2014	22-AUG-2014	22-AUG-2014	21-AUG-2014	20-AUG-2014	20-AUG-2014	20-AUG-2014	22-AUG-2014
Depth					0.3	2.0	0.3	0.15	0.8	0.3	0.2	0.4	0.3	0.3
Type					Sandy Soil	Sandy Soil	Topsoil	Sandy Soil	Sandy Soil	Sandy Soil	Topsoil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	0.2	0.2	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	1.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	0.1	0.2	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	0.9	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	1.4	1.0	0.6	0.1	2.8	0.2	0.4	0.6	5.5	0.5
Anthracene	T207	M105	0.1	mg/kg	0.4	0.3	0.1	<0.1	0.8	<0.1	0.1	0.2	1.6	0.1
Fluoranthene	T207	M105	0.1	mg/kg	2.3	1.3	1.1	0.1	4.0	0.5	0.6	1.4	4.8	0.6
Pyrene	T207	M105	0.1	mg/kg	2.1	1.3	1.0	0.2	3.6	0.5	0.5	1.4	4.0	0.6
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	1.3	0.8	0.5	0.3	1.9	0.3	0.2	0.5	2.3	0.3
Chrysene	T207	M105	0.1	mg/kg	1.3	0.8	0.4	0.3	1.6	0.3	0.2	0.5	1.9	0.3
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	2.1	1.3	0.8	0.4	2.9	0.5	0.4	0.8	3.2	0.4
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	1.1	0.7	0.4	0.2	1.6	0.2	0.2	0.5	1.7	0.2
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	0.5	0.3	0.2	<0.1	0.7	0.1	<0.1	0.2	0.8	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	0.2	0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	0.3	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	0.6	0.4	0.2	0.1	0.7	0.1	<0.1	0.2	0.8	0.1
PAH(total)	T207	M105	0.1	mg/kg	14	8.7	5.3	1.7	22	2.7	2.6	6.3	29	3.1

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL/3982 Soil Analysed as Soil Total and Speciated USEPA16 PAH														
SAL Reference					419160 032	419160 033	419160 034	419160 035	419160 036	419160 037	419160 038	419160 039	419160 040	419160 041
Customer Sample Reference					WS25	WS26	WS27	WS28	WS28	WS29	WS30	WS31	WS32	WS32
Date Sampled					22-AUG-2014	22-AUG-2014	22-AUG-2014	20-AUG-2014	20-AUG-2014	20-AUG-2014	19-AUG-2014	20-AUG-2014	20-AUG-2014	20-AUG-2014
Depth					0.3	0.3	0.3	0.2	0.4	0.3	0.3	0.3	0.3	0.5
Type					Sandy Soil	Sandy Soil	Sandy Soil	Topsoil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	0.2	<0.1	<0.1	0.3	0.4	<0.1	<0.1	0.3	0.5	0.2
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	0.4	<0.1	0.2	0.7	0.7	0.2	<0.1	0.5	1.0	0.4
Pyrene	T207	M105	0.1	mg/kg	0.4	<0.1	0.2	0.7	0.6	0.2	<0.1	0.5	1.0	0.4
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	0.1	<0.1	0.2	0.3	0.3	0.1	<0.1	0.2	0.5	0.3
Chrysene	T207	M105	0.1	mg/kg	0.1	<0.1	0.2	0.3	0.3	0.1	<0.1	0.3	0.6	0.3
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	0.2	<0.1	0.4	0.5	0.4	0.2	<0.1	0.4	1.0	0.5
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.2	0.2	0.2	<0.1	<0.1	0.2	0.6	0.3
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.1	0.3	0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.1	0.1	0.1	<0.1	<0.1	0.2	0.3	0.2
PAH(total)	T207	M105	0.1	mg/kg	1.4	<0.1	1.5	3.2	3.1	0.8	<0.1	2.7	5.6	2.7

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL/3982 Soil Analysed as Soil Total and Speciated USEPA16 PAH														
SAL Reference					419160 042	419160 043	419160 044	419160 045	419160 046	419160 047	419160 048	419160 049	419160 050	419160 051
Customer Sample Reference					WS33	WS34	WS35	WS36	WS36	WS37	WS37	WS38	WS39	WS39
Date Sampled					22-AUG-2014	26-AUG-2014	26-AUG-2014	26-AUG-2014	26-AUG-2014	18-AUG-2014	18-AUG-2014	18-AUG-2014	18-AUG-2014	18-AUG-2014
Depth					0.15	0.15	0.2	0.3	0.8	0.3	1.9	0.6	0.5	1.2
Type					Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	2.7	0.1	<0.1	<0.1	<0.1	2.4	<0.1	0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	1.0	<0.1	<0.1	<0.1	<0.1	0.8	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	6.3	0.2	<0.1	<0.1	<0.1	3.8	0.2	0.3
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	5.5	0.2	<0.1	<0.1	<0.1	3.3	0.2	0.3
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	4.0	0.1	<0.1	<0.1	<0.1	1.5	0.1	0.2
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	3.8	0.1	<0.1	<0.1	<0.1	1.5	0.1	0.2
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	6.0	0.2	<0.1	<0.1	<0.1	2.3	0.2	0.3
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	3.3	0.1	<0.1	<0.1	<0.1	1.2	0.1	0.2
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	1.3	<0.1	<0.1	<0.1	<0.1	0.6	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	1.5	<0.1	<0.1	<0.1	<0.1	0.7	<0.1	0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	<0.1	37	1.0	<0.1	<0.1	<0.1	19	0.9	1.7

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL3982

Soil
Analysed as Soil
Total and Speciated USEPA16 PAH

SAL Reference				419160 052	419160 053	419160 054	419160 055	419160 056	419160 057	419160 058	419160 059	419160 060	419160 061
Customer Sample Reference				WS40	WS41	WS41	WS42	WS43	WS44	WS44	WS45	WS46	WS47
Date Sampled				19-AUG- 2014	26-AUG- 2014	26-AUG- 2014	18-AUG- 2014	26-AUG- 2014	18-AUG- 2014	18-AUG- 2014	19-AUG- 2014	19-AUG- 2014	19-AUG- 2014
Depth				0.3	0.45	1.2	0.2	0.2	0.8	1.0	0.3	1.0	0.3
Type				Fill	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units									
Naphthalene	T207	M105	0.1	mg/kg	<0.1	0.2	<0.1	0.1	0.2	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	0.3	<0.1	0.7	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	0.3	<0.1	0.5	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	0.3	5.9	0.5	8.9	<0.1	<0.1	0.4	<0.1	0.2
Anthracene	T207	M105	0.1	mg/kg	<0.1	1.4	<0.1	3.9	<0.1	<0.1	<0.1	<0.1	0.2
Fluoranthene	T207	M105	0.1	mg/kg	0.5	9.5	0.9	34	<0.1	<0.1	1.0	<0.1	0.4
Pyrene	T207	M105	0.1	mg/kg	0.6	9.0	0.9	33	<0.1	<0.1	1.0	<0.1	0.4
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	0.3	2.9	0.3	21	<0.1	<0.1	0.4	<0.1	0.2
Chrysene	T207	M105	0.1	mg/kg	0.4	2.9	0.4	19	<0.1	<0.1	0.4	<0.1	0.2
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	0.5	4.3	0.6	47	<0.1	<0.1	0.8	<0.1	0.4
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	0.3	2.5	0.3	25	<0.1	<0.1	0.4	<0.1	0.2
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	0.2	1.1	0.1	12	<0.1	<0.1	0.2	<0.1	0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	0.3	<0.1	3.4	<0.1	<0.1	<0.1	<0.1	0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	0.2	1.3	0.2	13	<0.1	<0.1	0.3	<0.1	0.2
PAH(total)	T207	M105	0.1	mg/kg	3.3	42	4.2	220	0.2	<0.1	4.9	<0.1	2.3

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL3982

Soil
Analysed as Soil
Total and Speciated USEPA16 PAH

SAL Reference				419160 062	419160 063	419160 064	419160 065	419160 066	419160 067	419160 068	419160 069	419160 070	419160 071
Customer Sample Reference				WS47	WS48	WS49	WS50	WS50	WS51	WS52	WS53	WS54	WS55
Date Sampled				19-AUG- 2014	26-AUG- 2014	18-AUG- 2014	18-AUG- 2014	18-AUG- 2014	26-AUG- 2014	26-AUG- 2014	26-AUG- 2014	26-AUG- 2014	26-AUG- 2014
Depth				0.8	0.2	0.3	0.8	1.9	0.1	0.3	0.8	0.3	0.2
Type				Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Topsoil	Topsoil
Determinand	Method	Test Sample	LOD	Units									
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.3	0.2	<0.1	1.6	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.2	0.2	<0.1	0.8	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	0.2	<0.1	2.3	1.7	<0.1	7.5	0.2	0.1	0.5
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.7	0.5	<0.1	4.5	<0.1	0.1	0.2
Fluoranthene	T207	M105	0.1	mg/kg	0.4	<0.1	3.5	2.7	<0.1	53	0.6	3.1	3.3
Pyrene	T207	M105	0.1	mg/kg	0.4	<0.1	2.9	2.2	<0.1	53	0.6	3.9	3.0
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	0.2	<0.1	1.1	1.1	<0.1	28	0.3	1.8	1.4
Chrysene	T207	M105	0.1	mg/kg	0.2	<0.1	1.3	1.0	<0.1	24	0.3	1.9	1.2
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	0.5	<0.1	2.0	2.1	<0.1	57	0.6	5.2	2.8
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	0.2	<0.1	0.8	1.0	<0.1	29	0.3	2.7	1.4
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.4	0.5	<0.1	15	0.2	1.3	0.7
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	0.1	0.1	<0.1	3.8	<0.1	0.4	0.2
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	0.1	<0.1	0.5	0.6	<0.1	16	0.2	1.5	0.8
PAH(total)	T207	M105	0.1	mg/kg	2.2	<0.1	16	14	<0.1	290	3.3	22	16

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL/3982 Soil Total and Speciated USEPA16 PAH Analysed as Soil												
SAL Reference				419160 072	419160 073	419160 074	419160 075	419160 076	419160 077	419160 078	419160 079	
Customer Sample Reference				WS55	WS56	WS57	WS58	WS59	WS60	WS61	WS61	
Date Sampled				26-AUG-2014	26-AUG-2014	27-AUG-2014	27-AUG-2014	27-AUG-2014	27-AUG-2014	27-AUG-2014	27-AUG-2014	
Depth				0.2	0.7	0.55	0.45	0.3	0.6	0.3	0.55	
Type				Topsoil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	
Determinand	Method	Test Sample	LOD	Units								
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Phenanthrene	T207	M105	0.1	mg/kg	0.6	0.4	0.4	0.2	0.3	0.5	0.6	0.9
Anthracene	T207	M105	0.1	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2	0.3
Fluoranthene	T207	M105	0.1	mg/kg	1.5	0.6	0.7	0.8	0.6	0.7	0.9	0.9
Pyrene	T207	M105	0.1	mg/kg	1.4	0.5	0.6	0.7	0.5	0.6	0.9	0.9
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	0.7	0.2	0.3	0.4	0.2	0.3	0.7	0.8
Chrysene	T207	M105	0.1	mg/kg	0.7	0.2	0.3	0.3	0.2	0.3	0.7	0.8
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	1.5	0.5	0.6	0.8	0.5	0.6	1.1	1.2
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	0.7	0.2	0.3	0.4	0.3	0.3	0.6	0.7
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	0.4	0.1	0.1	0.2	0.1	0.1	0.3	0.3
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	0.4	0.2	0.2	0.2	0.2	0.2	0.4	0.4
PAH(total)	T207	M105	0.1	mg/kg	8.1	2.9	3.5	4.0	2.9	3.7	6.4	7.5

SAL Reference: 419160 Project Site: St Francis Xavier, Liverpool Customer Reference: EB1310/GL/3982															
Soil TPH (CWG)						Analysed as Soil									
SAL Reference						419160 001	419160 003	419160 005	419160 007	419160 009	419160 010	419160 011	419160 013	419160 014	419160 015
Customer Sample Reference						BH01	BH02	WS01	WS02	WS03	WS04	WS05	WS06	WS08	WS09
Date Sampled						21-AUG- 2014	21-AUG- 2014	21-AUG- 2014	21-AUG- 2014	21-AUG- 2014	21-AUG- 2014	20-AUG- 2014	20-AUG- 2014	21-AUG- 2014	21-AUG- 2014
Depth						0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Type						Sandy Soil	Sandy Soil	Sandy Soil	Topsoil	Sandy Soil	Topsoil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units											
Benzene	T54	AR	1	µg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
Toluene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EthylBenzene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
M/P Xylene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
O Xylene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl tert-Butyl Ether	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TPH (C5-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C10-C12 aliphatic)	T8	M105	1	mg/kg	<1	(9) <10	<1	<1	<1	(9) <10	<1	<1	<1	<1	<1
TPH (C12-C16 aliphatic)	T8	M105	1	mg/kg	1	14	<1	<1	<1	(9) <10	<1	<1	<1	<1	<1
TPH (C16-C21 aliphatic)	T8	M105	1	mg/kg	3	21	<1	1	<1	(9) <10	<1	<1	<1	<1	<1
TPH (C21-C35 aliphatic)	T8	M105	1	mg/kg	15	120	4	8	3	(9) <10	2	5	2	2	3
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C10-C12 aromatic)	T8	M105	1	mg/kg	<1	(9) <10	<1	<1	<1	(9) <10	<1	<1	<1	<1	<1
TPH (C12-C16 aromatic)	T8	M105	1	mg/kg	2	26	<1	1	5	(9) <10	<1	2	<1	<1	2
TPH (C16-C21 aromatic)	T8	M105	1	mg/kg	18	430	7	7	28	13	5	19	5	11	11
TPH (C21-C35 aromatic)	T8	M105	1	mg/kg	42	1100	24	20	53	13	17	42	15	30	30

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil
TPH (CWG) Analysed as Soil

SAL Reference					419160 016	419160 018	419160 020	419160 021	419160 023	419160 024	419160 026	419160 027	419160 029	419160 030
Customer Sample Reference					WS10	WS13	WS14	WS15	WS16	WS17	WS18	WS19	WS22	WS23
Date Sampled					21-AUG- 2014	20-AUG- 2014	21-AUG- 2014	22-AUG- 2014	22-AUG- 2014	22-AUG- 2014	21-AUG- 2014	20-AUG- 2014	20-AUG- 2014	22-AUG- 2014
Depth					0.8	0.8	0.3	0.3	0.3	0.15	0.3	0.2	0.3	0.3
Type					Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Topsoll	Sandy Soil	Sandy Soil	Topsoll	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Benzene	T54	AR	1	µg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	<1	(13) <1	(13) <1	(13) <1	(13) <1
Toluene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EthylBenzene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
M/P Xylene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
O Xylene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl tert-Butyl Ether	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TPH (C5-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C10-C12 aliphatic)	T8	M105	1	mg/kg	<1	<1	<1	<1	<1	(9) <10	<1	<1	<1	<1
TPH (C12-C16 aliphatic)	T8	M105	1	mg/kg	<1	<1	<1	<1	<1	(9) <10	<1	<1	<1	<1
TPH (C16-C21 aliphatic)	T8	M105	1	mg/kg	<1	<1	<1	1	<1	(9) <10	<1	<1	<1	<1
TPH (C21-C35 aliphatic)	T8	M105	1	mg/kg	2	10	3	5	2	190	2	<1	2	<1
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C10-C12 aromatic)	T8	M105	1	mg/kg	<1	<1	<1	<1	<1	(9) <10	<1	<1	<1	<1
TPH (C12-C16 aromatic)	T8	M105	1	mg/kg	<1	2	2	8	<1	(9) <10	2	<1	4	1
TPH (C16-C21 aromatic)	T8	M105	1	mg/kg	4	8	8	30	5	(9) <10	10	2	16	5
TPH (C21-C35 aromatic)	T8	M105	1	mg/kg	11	25	22	59	14	(9) <10	21	9	24	15

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil
TPH (CWG) Analysed as Soil

SAL Reference					419160 032	419160 033	419160 034	419160 035	419160 037	419160 038	419160 039	419160 040	419160 042	419160 043
Customer Sample Reference					WS25	WS26	WS27	WS28	WS29	WS30	WS31	WS32	WS33	WS34
Date Sampled					22-AUG- 2014	22-AUG- 2014	22-AUG- 2014	20-AUG- 2014	20-AUG- 2014	19-AUG- 2014	20-AUG- 2014	20-AUG- 2014	22-AUG- 2014	26-AUG- 2014
Depth					0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.15	0.15
Type					Sandy Soil	Sandy Soil	Sandy Soil	Topsoil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Benzene	T54	AR	1	µg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
Toluene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
M/P Xylene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
O Xylene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl tert-Butyl Ether	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TPH (C5-C6 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C10-C12 aliphatic)	T8	M105	1	mg/kg	(9) <10	(9) <10	<1	<1	<1	(9) <10	<1	<1	<1	<1
TPH (C12-C16 aliphatic)	T8	M105	1	mg/kg	(9) <10	(9) <10	<1	<1	<1	(9) <10	<1	<1	<1	<1
TPH (C16-C21 aliphatic)	T8	M105	1	mg/kg	(9) <10	(9) <10	<1	<1	<1	(9) <10	<1	<1	<1	<1
TPH (C21-C35 aliphatic)	T8	M105	1	mg/kg	11	24	3	2	<1	51	<1	3	<1	<1
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C10-C12 aromatic)	T8	M105	1	mg/kg	(9) <10	(9) <10	<1	<1	<1	(9) <10	<1	<1	<1	<1
TPH (C12-C16 aromatic)	T8	M105	1	mg/kg	10	(9) <10	<1	<1	<1	(9) <10	<1	1	<1	<1
TPH (C16-C21 aromatic)	T8	M105	1	mg/kg	45	(9) <10	9	5	3	(9) <10	4	7	<1	<1
TPH (C21-C35 aromatic)	T8	M105	1	mg/kg	130	(9) <10	31	17	10	(9) <10	13	19	1	<1

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil
TPH (CWG) Analysed as Soil

SAL Reference					419160 044	419160 045	419160 047	419160 049	419160 050	419160 052	419160 053	419160 055	419160 056	419160 057
Customer Sample Reference					WS35	WS36	WS37	WS38	WS39	WS40	WS41	WS42	WS43	WS44
Date Sampled					26-AUG- 2014	26-AUG- 2014	18-AUG- 2014	18-AUG- 2014	18-AUG- 2014	19-AUG- 2014	26-AUG- 2014	18-AUG- 2014	26-AUG- 2014	18-AUG- 2014
Depth					0.2	0.3	0.3	0.6	0.5	0.3	0.45	0.2	0.2	0.8
Type					Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Fill	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units										
Benzene	T54	AR	1	µg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
Toluene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EthylBenzene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
M/P Xylene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
O Xylene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl tert-Butyl Ether	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TPH (C5-C6 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C10-C12 aliphatic)	T8	M105	1	mg/kg	(9) <10	<1	<1	(9) <10	<1	<1	(9) <10	(9) <10	<1	<1
TPH (C12-C16 aliphatic)	T8	M105	1	mg/kg	(9) <10	<1	<1	(9) <10	<1	<1	(9) <10	(9) <10	<1	<1
TPH (C16-C21 aliphatic)	T8	M105	1	mg/kg	(9) <10	<1	<1	14	<1	<1	(9) <10	(9) <10	<1	<1
TPH (C21-C35 aliphatic)	T8	M105	1	mg/kg	31	1	<1	180	5	4	16	99	1	<1
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C10-C12 aromatic)	T8	M105	1	mg/kg	(9) <10	<1	<1	(9) <10	<1	<1	(9) <10	(9) <10	<1	<1
TPH (C12-C16 aromatic)	T8	M105	1	mg/kg	(9) <10	<1	<1	(9) <10	1	<1	(9) <10	(9) <10	<1	<1
TPH (C16-C21 aromatic)	T8	M105	1	mg/kg	43	4	<1	46	3	4	(9) <10	160	<1	<1
TPH (C21-C35 aromatic)	T8	M105	1	mg/kg	160	11	<1	160	12	11	15	580	<1	<1

SAL Reference: 419160
Project Site: St Francis Xavier, Liverpool
Customer Reference: EB1310/GL/3982

Soil
TPH (CWG) Analysed as Soil

SAL Reference					419160 059	419160 060	419160 061	419160 063	419160 064	419160 065	419160 067	419160 068	419160 069	419160 070
Customer Sample Reference					WS45	WS46	WS47	WS48	WS49	WS50	WS51	WS52	WS53	WS54
Date Sampled					19-AUG- 2014	19-AUG- 2014	19-AUG- 2014	26-AUG- 2014	18-AUG- 2014	18-AUG- 2014	26-AUG- 2014	26-AUG- 2014	26-AUG- 2014	26-AUG- 2014
Depth					0.3	1.0	0.3	0.2	0.3	0.8	0.1	0.3	0.8	0.3
Type					Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Topsoil
Determinand	Method	Test Sample	LOD	Units										
Benzene	T54	AR	1	µg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
Toluene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EthylBenzene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
M/P Xylene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
O Xylene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl tert-Butyl Ether	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TPH (C5-C6 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C10-C12 aliphatic)	T8	M105	1	mg/kg	<1	<1	<1	<1	(9) <10	<1	(9) <10	<1	(9) <10	<1
TPH (C12-C16 aliphatic)	T8	M105	1	mg/kg	<1	<1	<1	<1	(9) <10	<1	36	<1	20	1
TPH (C16-C21 aliphatic)	T8	M105	1	mg/kg	<1	<1	<1	<1	(9) <10	<1	89	<1	29	1
TPH (C21-C35 aliphatic)	T8	M105	1	mg/kg	3	4	17	2	160	5	230	2	110	3
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C10-C12 aromatic)	T8	M105	1	mg/kg	<1	<1	<1	<1	(9) <10	<1	(9) <10	<1	(9) <10	<1
TPH (C12-C16 aromatic)	T8	M105	1	mg/kg	<1	<1	1	<1	(9) <10	2	83	<1	29	2
TPH (C16-C21 aromatic)	T8	M105	1	mg/kg	2	4	6	2	(9) <10	12	910	5	420	19
TPH (C21-C35 aromatic)	T8	M105	1	mg/kg	<1	11	4	2	(9) <10	24	2300	15	1300	48

SAL Reference: 419160												
Project Site: St Francis Xavier, Liverpool												
Customer Reference: EB1310/GL3982												
Soil												
TPH (CWG)												
Analysed as Soil												
SAL Reference					419160 071	419160 072	419160 074	419160 075	419160 076	419160 077	419160 078	
Customer Sample Reference					WS55	WS56	WS57	WS58	WS59	WS60	WS61	
Date Sampled					26-AUG- 2014	26-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	27-AUG- 2014	
Depth					0.2	0.2	0.55	0.45	0.3	0.6	0.3	
Type					Topsoil	Topsoil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	
Determinand	Method	Test Sample	LOD	Units								
Benzene	T54	AR	1	µg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1	
Toluene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	
EthylBenzene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	
M/P Xylene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	
O Xylene	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	
Methyl tert-Butyl Ether	T54	AR	1	µg/kg	<1	<1	<1	<1	<1	<1	<1	
TPH (C5-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
TPH (C10-C12 aliphatic)	T8	M105	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	
TPH (C12-C16 aliphatic)	T8	M105	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	
TPH (C16-C21 aliphatic)	T8	M105	1	mg/kg	<1	<1	<1	<1	1	<1	1	
TPH (C21-C35 aliphatic)	T8	M105	1	mg/kg	6	8	2	3	5	3	6	
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
TPH (C10-C12 aromatic)	T8	M105	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	
TPH (C12-C16 aromatic)	T8	M105	1	mg/kg	<1	1	2	<1	2	1	1	
TPH (C16-C21 aromatic)	T8	M105	1	mg/kg	7	8	8	9	8	5	12	
TPH (C21-C35 aromatic)	T8	M105	1	mg/kg	22	22	22	24	21	14	25	

Index to symbols used in Supplement to 419160-2

Value	Description
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
AR	As Received
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
N.D.	Not Detected
13	Results have been blank corrected.
9	LOD raised due to dilution of sample
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Supplemental report issued to include the PAH results
Asbestos was subcontracted to REC Asbestos
"Fill" samples are outside the scope of our MCERTS accreditation. Results are UKAS only

Method Index

Value	Description
T6	ICP/OES
T8	GC/FID
T7	Probe
T54	GC/MS (Headspace)
T546	Colorimetry (CF)

T206	GC/FID (MCERTS)
T207	GC/MS (MCERTS)
T27	PLM
T162	Grav (1 Dec) (105 C)
T287	Calc TOC/0.58

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Moisture @ 105 C	T162	AR	0.1	%	N	001-030,032-079
Arsenic	T6	M40	2	mg/kg	M	001-030,032-051,053-079
Arsenic	T6	M40	2.0	mg/kg	U	052
Boron (water-soluble)	T6	AR	1	mg/kg	N	001-030,032-079
Cadmium	T6	M40	1	mg/kg	M	001-030,032-051,053-079
Cadmium	T6	M40	1	mg/kg	U	052
Chromium	T6	M40	1	mg/kg	M	001-030,032-051,053-079
Chromium	T6	M40	1	mg/kg	U	052
Chromium VI	T6	AR	1	mg/kg	N	001-030,032-079
Copper	T6	M40	1	mg/kg	M	001-030,032-051,053-079
Copper	T6	M40	1	mg/kg	U	052
Lead	T6	M40	1	mg/kg	M	001-030,032-051,053-079
Lead	T6	M40	1	mg/kg	U	052
Mercury	T6	M40	1	mg/kg	M	001-030,032-051,053-079
Mercury	T6	M40	1	mg/kg	U	052
Nickel	T6	M40	1	mg/kg	M	001-030,032-051,053-079
Nickel	T6	M40	1	mg/kg	U	052
Selenium	T6	M40	3	mg/kg	M	001-030,032-051,053-079
Selenium	T6	M40	3	mg/kg	U	052
Zinc	T6	M40	1	mg/kg	M	001-030,032-051,053-079
Zinc	T6	M40	1	mg/kg	U	052
Asbestos ID	T27	AR			SU	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
Cyanide(Total)	T546	AR	1	mg/kg	M	001-030,032-051,053-079
Cyanide(Total)	T546	AR	1	mg/kg	U	052
pH	T7	AR			M	001-030,032-051,053-079
pH	T7	AR			U	052
Phenols(Mono)	T546	AR	1	mg/kg	M	001-030,032-051,053-079
Phenols(Mono)	T546	AR	1	mg/kg	U	052
Soil Organic Matter	T287	M40	0.1	%	N	001-030,032-079
SO4(Total)	T6	M40	0.01	%	N	001-030,032-079
Sulphide	T546	AR	1	mg/kg	N	001-030,032-079
Sulphur (total)	T6	M40	0.01	%	N	001-030,032-079
TPH (C8-C10)	T8	M105	1	mg/kg	U	002,004,006,008,012,017,019,022,025,028,036,041,046,048,051,054,058,062,066,073,079
TPH (C10-C12)	T206	M105	1	mg/kg	M	002,004,006,008,012,017,019,022,025,028,036,041,046,048,051,054,058,062,066,073,079
TPH (C12-C16)	T206	M105	1	mg/kg	M	002,004,006,008,012,017,019,022,025,028,036,041,046,048,051,054,058,062,066,073,079
TPH (C16-C21)	T206	M105	1	mg/kg	M	002,004,006,008,012,017,019,022,025,028,036,041,046,048,051,054,058,062,066,073,079
TPH (C21-C35)	T206	M105	1	mg/kg	M	002,004,006,008,012,017,019,022,025,028,036,041,046,048,051,054,058,062,066,073,079
Naphthalene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079
Naphthalene	T207	M105	0.1	mg/kg	U	052
Acenaphthylene	T207	M105	0.1	mg/kg	U	001-030,032-079
Acenaphthene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079
Acenaphthene	T207	M105	0.1	mg/kg	U	052
Fluorene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079
Fluorene	T207	M105	0.1	mg/kg	U	052
Phenanthrene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079
Phenanthrene	T207	M105	0.1	mg/kg	U	052
Anthracene	T207	M105	0.1	mg/kg	U	001-030,032-079
Fluoranthene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079
Fluoranthene	T207	M105	0.1	mg/kg	U	052
Pyrene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079
Pyrene	T207	M105	0.1	mg/kg	U	052
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	U	052
Chrysene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079
Chrysene	T207	M105	0.1	mg/kg	U	052
Benzo(b,k)Fluoranthene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079
Benzo(b,k)Fluoranthene	T207	M105	0.1	mg/kg	U	052
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	U	052
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	U	052
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	U	052
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001-030,032-051,053-079
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	U	052
PAH(total)	T207	M105	0.1	mg/kg	U	001-030,032-079
Benzene	T54	AR	1	µg/kg	U	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
Toluene	T54	AR	1	µg/kg	U	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
EthylBenzene	T54	AR	1	µg/kg	U	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
m/P Xylene	T54	AR	1	µg/kg	U	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
O Xylene	T54	AR	1	µg/kg	U	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
Methyl tert-Butyl Ether	T54	AR	1	µg/kg	U	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C5-C6 aliphatic)	T54	AR	0.010	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C6-C8 aliphatic)	T54	AR	0.010	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C8-C10 aliphatic)	T54	AR	0.010	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C10-C12 aliphatic)	T8	M105	1	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C12-C16 aliphatic)	T8	M105	1	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C16-C21 aliphatic)	T8	M105	1	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C21-C35 aliphatic)	T8	M105	1	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C6-C7 aromatic)	T54	AR	0.010	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C7-C8 aromatic)	T54	AR	0.010	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C8-C10 aromatic)	T54	AR	0.010	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C10-C12 aromatic)	T8	M105	1	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C12-C16 aromatic)	T8	M105	1	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C16-C21 aromatic)	T8	M105	1	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078
TPH (C21-C35 aromatic)	T8	M105	1	mg/kg	N	001,003,005,007,009-011,013-016,018,020-021,023-024,026-027,029-030,032-035,037-040,042-045,047,049-050,052-053,055-057,059-061,063-065,067-072,074-078



a CONCEPT LIFE SCIENCES company

Scientific Analysis Laboratories is a
limited company registered in England and
Wales (No 2514788) whose address is at
Hadfield House, Hadfield Street, Manchester M16 9FE

Scientific Analysis Laboratories Ltd

Certificate of Analysis

Hadfield House
Hadfield Street
Combrook
Manchester
M16 9FE

Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 423020-1

Date of Report: 30-Sep-2014

Customer: Curtins Consulting Ltd.
10 Oxford Court
Bishopsgate
Manchester
M2 3WQ

Customer Contact: Ms Gemma Lownsbrough

Customer Job Reference: EB1310/GL/3982

Customer Purchase Order: EB885

Customer Site Reference: St Francis Xavier, Liverpool

Date Job Received at SAL: 21-Aug-2014

Date Analysis Started: 19-Sep-2014

Date Analysis Completed: 30-Sep-2014

The results reported relate to samples received in the laboratory.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with QP22



Report checked
and authorised by :
Mr Ross Walker
Customer Services Manager
(Land)

Issued by :
Mr Ross Walker
Customer Services Manager
(Land)

SAL Reference: 423020									
Project Site: St Francis Xavier, Liverpool									
Customer Reference: EB1310/GL/3982									
Leachate					Analysed as Water				
Miscellaneous									
SAL Reference					423020 001	423020 002	423020 003	423020 004	423020 005
Customer Sample Reference					BH01 (419160/001)	BH02 (419160/003)	WS42 (419160/055)	WS43 (419160/056)	WS47 (419160/061)
Date Sampled					18-AUG-2014	18-AUG-2014	18-AUG-2014	26-AUG-2014	19-AUG-2014
Determinand	Method	Test Sample	LOD	Units					
As (Dissolved)	T281	10:1	0.2	µg/l	20	18	4.6	21	5.4
Pb (Dissolved)	T281	10:1	0.3	µg/l	6.2	16	-	22	-

SAL Reference: 423020									
Project Site: St Francis Xavier, Liverpool									
Customer Reference: EB1310/GL/3982									
Leachate					Analysed as Water				
Miscellaneous									
SAL Reference					423020 006	423020 007	423020 008	423020 009	
Customer Sample Reference					WS49 (419160/064)	WS51 (419160/067)	WS53 (419160/069)	WS59 (419160/076)	
Date Sampled					18-AUG-2014	26-AUG-2014	26-AUG-2014	27-AUG-2014	
Determinand	Method	Test Sample	LOD	Units					
As (Dissolved)	T281	10:1	0.2	µg/l	13	8.0	7.5	19	

SAL Reference: 423020					
Project Site: St Francis Xavier, Liverpool					
Customer Reference: EB1310/GL/3982					
Leachate			Analysed as Water		
TPH (CWG) with MTBE, BTEX					
SAL Reference					423020 007
Customer Sample Reference					WS51 (419160/067)
Date Sampled					26-AUG-2014
Determinand	Method	Test Sample	LOD	Units	
Benzene	T54	10:1	1	µg/l	(13) <1
EthylBenzene	T54	10:1	1	µg/l	<1
M/P Xylene	T54	10:1	1	µg/l	<1
Methyl tert-Butyl Ether	T54	10:1	1	µg/l	<1
O Xylene	T54	10:1	1	µg/l	<1
Toluene	T54	10:1	1	µg/l	<1
TPH (C5-C6 aliphatic)	T215	10:1	0.010	mg/l	<0.010
TPH (C6-C8 aliphatic)	T215	10:1	0.010	mg/l	<0.010
TPH (C8-C10 aliphatic)	T215	10:1	0.010	mg/l	<0.010
TPH DW(C10-C12 aliphatic)	T81	10:1	0.01	mg/l	<0.01
TPH DW(C12-C16 aliphatic)	T81	10:1	0.01	mg/l	<0.01
TPH DW(C16-C21 aliphatic)	T81	10:1	0.01	mg/l	0.01
TPH DW(C21-C35 aliphatic)	T81	10:1	0.01	mg/l	0.05
TPH (C6-C7 aromatic)	T215	10:1	0.010	mg/l	<0.010
TPH (C7-C8 aromatic)	T215	10:1	0.010	mg/l	<0.010
TPH (C8-C10 aromatic)	T215	10:1	0.010	mg/l	<0.010
TPH DW(C10-C12 aromatic)	T81	10:1	0.01	mg/l	<0.01
TPH DW(C12-C16 aromatic)	T81	10:1	0.01	mg/l	0.03
TPH DW(C16-C21 aromatic)	T81	10:1	0.01	mg/l	0.18
TPH DW(C21-C35 aromatic)	T81	10:1	0.01	mg/l	0.35

Index to symbols used in 423020-1

Value	Description
10:1	Leachate
13	Results have been blank corrected.
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

These samples have been analysed exceeding recommended holding times. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T54	GC/MS (Headspace)
T81	GC/FID (LV)
T215	GC/MS (Headspace)(LV)
T281	ICP/MS (Filtered)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
As (Dissolved)	T281	10:1	0.2	µg/l	U	001-009
Pb (Dissolved)	T281	10:1	0.3	µg/l	U	001-002,004
Benzene	T54	10:1	1	µg/l	U	007
EthylBenzene	T54	10:1	1	µg/l	U	007
M/P Xylene	T54	10:1	1	µg/l	U	007
Methyl tert-Butyl Ether	T54	10:1	1	µg/l	U	007
O Xylene	T54	10:1	1	µg/l	U	007
Toluene	T54	10:1	1	µg/l	U	007
TPH (C5-C6 aliphatic)	T215	10:1	0.010	mg/l	N	007
TPH (C6-C8 aliphatic)	T215	10:1	0.010	mg/l	N	007
TPH (C8-C10 aliphatic)	T215	10:1	0.010	mg/l	N	007
TPH DW(C10-C12 aliphatic)	T81	10:1	0.01	mg/l	N	007
TPH DW(C12-C16 aliphatic)	T81	10:1	0.01	mg/l	N	007
TPH DW(C16-C21 aliphatic)	T81	10:1	0.01	mg/l	N	007
TPH DW(C21-C35 aliphatic)	T81	10:1	0.01	mg/l	N	007
TPH (C6-C7 aromatic)	T215	10:1	0.010	mg/l	N	007
TPH (C7-C8 aromatic)	T215	10:1	0.010	mg/l	N	007
TPH (C8-C10 aromatic)	T215	10:1	0.010	mg/l	N	007
TPH DW(C10-C12 aromatic)	T81	10:1	0.01	mg/l	N	007
TPH DW(C12-C16 aromatic)	T81	10:1	0.01	mg/l	N	007
TPH DW(C16-C21 aromatic)	T81	10:1	0.01	mg/l	N	007
TPH DW(C21-C35 aromatic)	T81	10:1	0.01	mg/l	N	007