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ASBESTOS GROUND CONTAMINATION INVESTIGATION
SOUTH QUAY
THE BARRY WATERFRONT CONSORTIUM
AGC-17633-12-198
JANUARY 2013

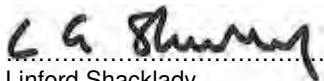
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Current Document Details

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Reports\5.4 South Quay\AGC-17633-12-198.docx

Document Revisions

| Rev | Date | Author | Checked | Approved |
|-----|------|--------|---------|----------|
|-----|------|--------|---------|----------|

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SECTION 1 INTRODUCTION

- 1.1 Merebrook Consulting Ltd (Merebrook) was commissioned by the Barry Waterfront Consortium (The Consortium) to undertake an investigation to assess the presence of asbestos at a site known as South Quay, Barry Quays (National Grid Reference 311700,167100).
- 1.2 The investigation followed the reporting of a widespread area of asbestos contamination in an adjacent parcel of land at Barry Quays known as West Pond.
- 1.3 The aim of the investigation was to provide information on the ground conditions with respect to the presence of asbestos and to give a preliminary appraisal of any remedial response.
- 1.4 The investigation positions were set out on an approximate 50m grid to give representative coverage of the site. In addition, a site walkover was conducted to identify any suspected items of asbestos on the ground surface.
- 1.5 The specific objectives of the current investigation were to:
 - i.* Assess sub-surface ground conditions present at the site with respect to the presence or absence of suspect ACMs;
 - ii.* Take samples of any identified suspected ACMs for laboratory analysis to confirm or refute the surveyor's suspicions; and
 - iii.* Take samples of soils for laboratory analysis to determine asbestos content.
- 1.6 This report has been prepared for The Consortium for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult Merebrook as to the extent to which the findings may be appropriate for their use.

SECTION 2 METHODOLOGY AND ANALYTICAL TECHNIQUES

- 2.1 A site walkover was undertaken to identify any surface asbestos contamination at the site. The walkover was undertaken on 20 November 2012 by Linford Shacklady of Merebrook. The walkover was not intended to be an exhaustive survey but it revealed that asbestos containing artefacts were apparent in several locations on the surface of the site. During the walkover thirteen samples of suspect ACMs from the surface were taken for laboratory confirmation of asbestos content. Materials sampled were assigned unique sample number e.g. S/Job Number/###. Samples were analysed for the presence of asbestos by Vintec Laboratories Limited. Analysis was by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.
- 2.2 A total of 47 trial pits were selected to give general coverage of the site on an approximate 50m grid. A JCB backhoe excavator fitted with a 600mm bucket and driver were provided by Lynch Plant Hire for excavation of trial pits.



- 2.3 Trial pits were advanced slowly at each marked location and arisings were inspected for the presence of suspected ACMs. The location of the trial pits is shown on drawing 304-001 provided in Appendix 1.
- 2.4 The investigation was conducted between 13 and 20 November 2012 by Linford Shacklady. Logging of soils in exploratory holes was undertaken. Excavation logs with detailed strata descriptions showing the depth and location of suspect ACMs are contained in Appendix 2. A photographic record was made of all trial holes and any suspected bulk asbestos findings and is provided in Appendix 3.
- 2.5 Dependent upon the depth of made ground, a minimum of one and a maximum of three representative soil samples of made ground was taken from each trial pit. The depth and location of each sample was recorded. Soil samples were submitted to IOM Laboratories (IOM) in Edinburgh for qualitative and quantitative analysis of soil/loose aggregate samples for mass determination of asbestos.
- 2.6 Soils were initially analysed qualitatively by IOM for asbestos by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248. If asbestos was detected qualitatively, a quantitative analysis was then carried out using the IOM documented in-house method based on HSE Contract Research Report No. 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248.
- 2.7 Where suspected bulk ACMs were observed in arisings from the trial pits, a representative sample was collected for laboratory analysis. Materials sampled were assigned unique sample number e.g. S/Job Number/###. Samples were analysed for the presence of asbestos by Vintec Laboratories Limited. Analysis was by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.
- 2.8 Three stockpiles of demolition material were identified on the site (Stockpiles A, B and C). Using a JCB backhoe excavator, the stockpiles were inspected for suspect asbestos containing materials. A total of four samples of suspect ACM were taken for laboratory confirmation of asbestos content. In addition, three samples of 'fines' from stockpile B and six samples of 'fines' from stockpile C were submitted to IOM Laboratories (IOM) in Edinburgh for qualitative and quantitative analysis of soil/loose aggregate samples for mass determination of asbestos using the method as described in Section 2.6. Stockpile A comprised oversize material not suitable for laboratory analysis.



SECTION 3 OBSERVATIONS AND RESULTS

- 3.1 Of the thirteen samples taken from the surface during the site walkover, ten tested positive for asbestos content. The results are summarised in Table 1 below and the results are provided in Appendix 4.

Table 1: Suspected Asbestos Containing Materials Sampled During Walkover

| Sample Number | ACM | Typical Asbestos Content ¹ | Type |
|---------------|--------------------------|---------------------------------------|--------------------|
| S/17633/05 | Gasket | variable – usually 90% | Chrysotile (white) |
| S/17633/06 | Gasket | no asbestos detected | |
| S/17633/07 | Gasket | variable – usually 90% | Chrysotile (white) |
| S/17633/08 | Floor Tile with Adhesive | 7-25% | Chrysotile (white) |
| S/17633/09 | Floor Tile with Adhesive | 7-25% | Chrysotile (white) |
| S/17633/10 | Gasket | variable – usually 90% | Chrysotile (white) |
| S/17633/11 | Cement | 10-15% | Chrysotile (white) |
| S/17633/12 | Gasket | variable – usually 90% | Chrysotile (white) |
| S/17633/17 | Cement | 10-15% | Chrysotile (white) |
| S/17633/18 | Cloth | no asbestos detected | |
| S/17633/19 | Gasket | variable – usually 90% | Chrysotile (white) |
| S/17633/20 | Rope Gasket | approaching 100% | Chrysotile (white) |
| S/17633/21 | Insulation Tape | no asbestos detected | |

1 – from HSG264

- 3.2 Out of the total of 47 trial pits excavated, four were found to contain visible bulk ACMs. All four samples of suspected ACM taken for analysis tested positive for asbestos. The certificate of analysis is provided in Appendix 4. Table 2 below summarises the products found to contain asbestos, their location and typical asbestos content for those types of materials:

Table 2: Suspected Asbestos Containing Materials Sampled During Investigation

| Sample Number | ACM | Typical Asbestos Content ¹ | Type | Location |
|---------------|--------|---------------------------------------|--------------------|----------|
| S/17633/01 | Gasket | variable – usually 90% | Chrysotile (white) | SQMTP02 |
| S/17633/02 | Gasket | variable – usually 90% | Chrysotile (white) | SQMTP15 |
| S/17633/03 | Cement | 10-15% | Chrysotile (white) | SQMTP30 |



| Sample Number | ACM | Typical Asbestos Content ¹ | Type | Location |
|---------------|--------------------|---|--|----------|
| S/17633/04 | Cement and Lagging | Cement: 10-15% Lagging: varies 6-85% | Cement: Chrysotile (white) Lagging: Amosite (brown) and Crocidolite (blue) | SQMTP37 |

1 – from HSG264

3.3 Of the four samples taken from the demolition stockpiles, none tested positive for asbestos content. The results are summarised in Table 3 below and the results are provided in Appendix 4.

Table 3: Suspected Asbestos Containing Materials Sampled in Stockpiles

| Sample Number | ACM | Typical Asbestos Content ¹ | Type |
|---------------|----------------|---------------------------------------|------|
| S/17633/13 | Bitumen Debris | no asbestos detected | |
| S/17633/14 | Bitumen Debris | no asbestos detected | |
| S/17633/15 | Bitumen Debris | no asbestos detected | |
| S/17633/16 | Bitumen Debris | no asbestos detected | |

1 – from HSG264

3.4 No asbestos was detected in the samples of fines taken from the stockpiles for laboratory analysis.

3.5 Out of the ninety-eight soil samples taken for laboratory analysis of asbestos content, 12 samples tested positive for asbestos comprising rope, free fibres, loose and bound insulation. Of these, the asbestos content in the soil sample ranged from 0.005 to 0.057%. The certificate of analysis is provided in Appendix 5 and a summary of the samples that tested positive for asbestos is given in Table 4 below:

Table 4: Summary of Qualitative and Quantitative Asbestos in Soil Results

| Trial Pit ID and Depth | ACM Type Detected | PLM Result | Total % Asbestos in Sample |
|------------------------|-------------------|------------|----------------------------|
| SQMTP04 0.05m | Free Fibres | Amosite | 0.006 |
| SQMTP06 0.20m | Free Fibres | Amosite | 0.006 |
| SQMTP10 0.80m | Free Fibres | Chrysotile | 0.008 |
| SQMTP13 0.30m | Loose Insulation | Amosite | 0.024 |
| SQMTP27 0.10m | Free Fibres | Chrysotile | 0.005 |



| Trial Pit ID and Depth | ACM Type Detected | PLM Result | Total % Asbestos in Sample |
|------------------------|-------------------|----------------------|----------------------------|
| SQMTP27 0.60m | Free Fibres | Amosite & Chrysotile | 0.005 |
| SQMTP27 1.80m | Free Fibres | Amosite & Chrysotile | 0.008 |
| SQMTP28 1.10m | Free Fibres | Chrysotile | 0.005 |
| SQMTP33 0.25m | Bound Insulation | Chrysotile | 0.052 |
| SQMTP35 0.40m | Free Fibres | Amosite | 0.006 |
| SQMTP38 0.35m | Rope | Chrysotile | 0.057 |
| SQMTP43 0.10m | Free Fibres | Amosite | 0.007 |

SECTION 4 CONCLUSION AND RECOMMENDATIONS

- 4.1 The investigation revealed the presence of asbestos containing materials across the site and distributed asbestos fibres in soils.
- 4.2 Any remedial action to reduce the risks associated with the asbestos contamination will depend upon the development proposals for the site, however the following points are made:
- 4.2.1 Bulk items of known or suspected ACMs on the site can be removed by hand picking. The nature of the items and duration of the picking will determine whether removal needs to be conducted by a licensed contractor following a statutory notification period; by non-licensed operatives following a statutory notification period; or by non-licensed operatives without a statutory notification period. One isolated clump of lagging was found during trial pitting, however, unless further quantities of lagging or similarly friable material are found, it is considered that any removal could be undertaken as notifiable non-licensed work.
- 4.2.2 No guidelines for safe threshold concentration for asbestos content in soils are currently available. The risk, through fibre inhalation, from soils containing asbestos is affected by a number of factors, primarily:
- i.* Whether the asbestos is present as loose fibres or in bound material;
 - ii.* The physical properties of the soils – loose dry soils having a greater potential for fibre release when disturbed;
 - iii.* The level of disturbance of the soil.
- 4.2.3 As detailed in ICRCL Guidance Note 64/85: Asbestos on Contaminated Sites (October 1990), laboratory studies have shown concentrations of asbestos fibres in soils as low as 0.001% can give rise to measurable concentrations in air if disturbed. These studies were conducted on dry material in a chamber which was vigorously agitated. However, under field conditions, the concentration of asbestos in soils when disturbed which may give rise to airborne concentrations approaching the control limit of 0.1 fibres cm⁻³ during boundary or personnel monitoring is likely to be orders of magnitude higher. The intrinsic moisture content of many soils

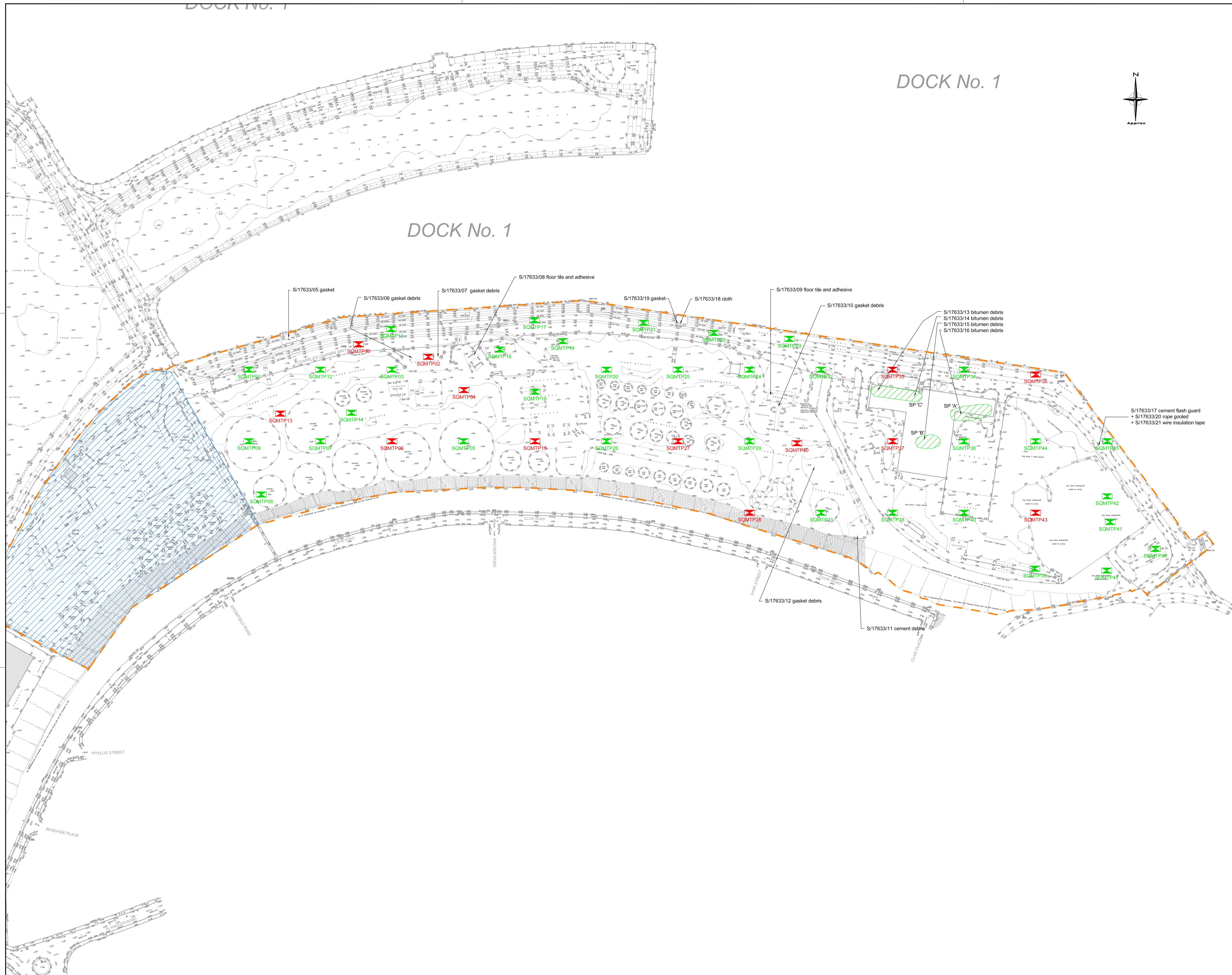


considerably reduces the likelihood of fibres becoming airborne. Furthermore, any fibres which may become airborne are quickly dispersed by air currents in an outdoor environment. Under prolonged dry conditions, or where soils are more dry and granular, damping down procedures to minimize dust generation will also prevent fibres becoming airborne.

- 4.3 Once development plans are in place, an appropriate asbestos management strategy for the site can be advised under separate cover.



APPENDIX 1 ▪ Drawing 304-001 Site Investigation Locations



- Legend**
- South Quay site boundary
 - ✕ SOMTPref Trial pit location with reference
 - ✕ SOMTPref Trial pit location with reference (with asbestos bulk or in soil)
 - No Access - CUDDY Compound
 - Bulk Asbestos sample with location reference
 - Stockpile

| | | |
|------------------|------------|-----------|
| First Issue: | 21/11/12 | - |
| Revision Details | RH LGS LGS | |
| Client | Dwn | Chd App'd |

Persimmon Special Projects Wales

Project
Barry Quays,
South Quay

Dwg Title
Site Investigation Locations

| | | | | | |
|---------|--------|---------|---------------|---------------------|----------------|
| Job No. | 17633f | Dwg No. | 304/001 | Revision | - |
| Scale | 1:1250 | Date | November 2012 | Frame Dimensions mm | (A1) 791 x 544 |
| Drawn | RH | Checked | LGS | Approved | LGS |

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Kent
Derby
Cardiff

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consulting
AN adom GROUP COMPANY

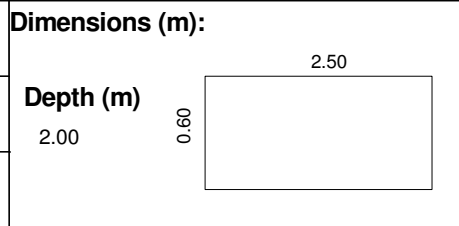
East Mill, Bridgefoot, Baber, Derbyshire, England, DE56 2UA
tel +44(0)1773 829888 fax +44(0)1773 829353 email consulting@merebrook.co.uk



APPENDIX 2 ▪ Exploratory Hole Records

Project Name
Barry Quays

Project No.
17633







Date
13/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|---|--|
| Depth (m) | Type | Results | | | |
| 0.30 | D | | 0.11 (0.54) |  | MADE GROUND: black tarmacadam |
| | | | 0.65 (0.35) |  | MADE GROUND: grey brown slightly silty sandy gravel. Gravel is medium to coarse angular concrete, brick, clinker, rare slag. Whole bricks and limestone cobbles. Occasional black ashy inclusions. |
| 1.00 | D | | 1.00 1.10 (0.90) |   | MADE GROUND: light grey gravel of medium to coarse angular concrete, flint, clinker, occasional brick light brown slightly clayey gravelly SAND. Gravel is medium to coarse angular to subrounded flint and siltstone |
| | | | 2.00 | | Trialpit Complete at 2.00 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays


Project No.
17633

Dimensions (m):

2.50

Depth (m)

2.70







Date
13/11/2012

Scale
1:25

Location: South Quay

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|-----------------------------|------|---------|-----------------------------|---|--|
| Depth (m) | Type | Results | | | |
| 0.30 | D | | 0.10 (0.50) |  | MADE GROUND: concrete slab S/17633/01 GASKET DEBRIS |
| 1.00 | D | | 0.60 (0.70) |  | MADE GROUND: black slightly ashy sandy silty gravel. Gravel is medium to coarse angular brick, concrete, clinker, slag. |
| 1.60 | D | | 1.30 (0.50) |  | MADE GROUND: reworked light brown slightly clayey gravelly sand. Gravel is medium to coarse angular to subrounded flint. Occasional black ashy inclusions. |
| | | | 1.80 (0.90) |  | MADE GROUND: reworked grey mottled orange brown sandy clay. Siltstone cobbles, rare brick fragments and black ashy inclusions. |
| | | | 2.70 | | Soft grey CLAY. Slight petroleum odour at top of strata. |
| Trialpit Complete at 2.70 m | | | | | |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
 IPP - in-situ pocket penetrometer
 PID - in-situ photoionization detector

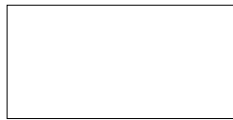
D - small disturbed sample (tub)
 J - amber glass jar (250ml)
 V - amber glass jar (60ml)
 B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633

Dimensions (m):

Depth (m)
2.50





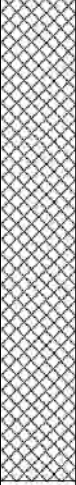
Date
13/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|-----------------------------|------|---------|-----------------------------|--|---|
| Depth (m) | Type | Results | | | |
| 0.20 | D | | (0.50) |  | MADE GROUND: turf over black slightly ashy sandy silty gravel. Gravel is medium to coarse angular brick, concrete, clinker, slag. |
| 0.80 | D | | (0.40) |  | MADE GROUND: pinkish grey sandy silty gravel. Gravel is fine to coarse angular siltstone/mudstone, concrete, clinker. Frequent black ashy inclusions. |
| | | | (1.60) |  | MADE GROUND: reworked light brown slightly clayey gravelly sand. Gravel is medium to coarse angular to subrounded flint. Occasional black ashy inclusions. Black staining with petroleum odour and water ingress at 2.5m bgl. |
| Trialpit Complete at 2.50 m | | | | | |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name

Barry Quays

Project No.

17633

Dimensions (m):

Depth (m)

1.40

0.60

2.50



Date
13/11/2012

Scale
1:25

Logged By
LGS

Client: Persimmon Special Projects Wales

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|--|
| Depth (m) | Type | Results | | | |
| 0.05 | D | | 0.10 | | Dark brown silty slightly gravelly TOPSOIL. Gravel is medium angular brick, rare concrete, glass, plastic. Rootlets. |
| | | | | | CONCRETE slab with rebar. |
| | | | 0.35 | | MADE GROUND: black slightly ashy sandy silty gravel. Gravel is medium to coarse angular brick, concrete, clinker, slag. |
| 0.55 | D | | 0.55 | | MADE GROUND: reworked orange gravelly clay. Gravel is coarse angular siltstone/mudstone, rare brick and concrete. |
| | | | 0.75 | | Light orangey brown mottled grey firm gravelly CLAY. Siltstone/mudstone boulders. Gravel is coarse angular siltstone/mudstone. Slight petroleum odour. Rapid water ingress at 1.0m bgl with light brown free product floating on water surface. Large siltstone boulder obstruction at 1.4m bgl. |
| | | | (0.65) | | |
| | | | 1.40 | | Trialpit Complete at 1.40 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name

Barry Quays

Project No.

17633

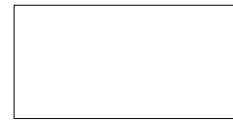
Dimensions (m):

Depth (m)

1.50

0.60

2.50



Date
13/11/2012

Scale
1:25

Logged By
LGS

Location: South Quay

Client: Persimmon Special Projects Wales

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|--|
| Depth (m) | Type | Results | | | |
| 0.30 | D | | 0.15 | | CONCRETE slab with rebar. |
| | | | 0.35 | | MADE GROUND: light brown clayey gravel. Gravel is medium to coarse angular concrete, clinker, siltstone. Siltstone cobbles. Black ashy inclusions. |
| | | | (1.15) | | Brown slightly sandy gravelly cobbly CLAY. Gravel is angular coarse siltstone. Rapid water ingress at 0.8m bgl with oily sheen on surface. |
| | | | 1.50 | | Trialpit Complete at 1.50 m |

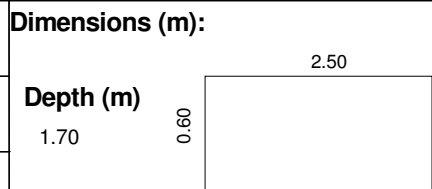
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633



Date
13/11/2012

Location: South Quay

Depth (m)

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description | |
|-----------------------------|------|---------|-----------------------------|--------|---|--|
| Depth (m) | Type | Results | | | | |
| 0.20 | D | | (0.35) | | MADE GROUND: turf over black slightly ashy sandy silty gravel. Gravel is medium to coarse angular brick, concrete, clinker, slag. | |
| | | | 0.35 | | Light brown gravelly CLAY. Gravel is medium to coarse angular mudstone. Rapid water ingress at 1.0m bgl. | |
| | | | (1.35) | | | |
| | | | 1.70 | | | |
| Trialpit Complete at 1.70 m | | | | | | |

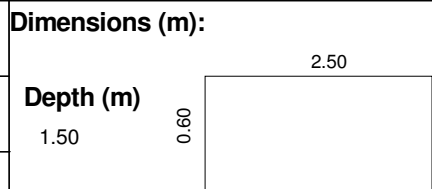
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633



Date
13/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|---|
| Depth (m) | Type | Results | | | |
| 0.35 | D | | 0.20 | | CONCRETE slab with rebar. |
| | | | (0.70) | | MADE GROUND: reddish brown stiff gravelly cobbly CLAY. Gravel is black fine to coarse angular to subrounded clinker, brick, flint, slag. Strong petrochemical odour. Rapid water ingress 0.65m bgl. |
| | | | 0.90 | | Dark grey siltsone/mudstone cobbly GRAVEL with black staining. Strong petrochemical odour. Pit walls collapsing. |
| | | | 1.50 | | Trialpit Complete at 1.50 m |

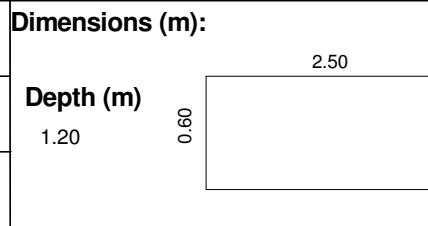
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered. Pit sides unstable.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633




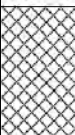


Date
13/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|---|---|
| Depth (m) | Type | Results | | | |
| 0.30 | D | | 0.25 |  | CONCRETE slab with rebar. |
| | | | (0.45) |  | MADE GROUND: reddish brown coarse siltstone gravel interbedded with greyish brown silty coarse angular gravel of concrete, rare brick, Siltstone cobbles. |
| | | | 0.70 |  | MADE GROUND: black slightly ashy sandy silty gravel. Gravel is medium to coarse angular brick, concrete, clinker, slag. Strong petrochemical odour. Slow water ingress at 0.7m bgl. |
| 1.00 | D | | 1.00 |  | Grey SILTSTONE/MUDSTONE cobbles and boulders. |
| | | | 1.20 | | Trialpit Complete at 1.20 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
 Barry Quays

Project No.
 17633

Dimensions (m):

Date
 13/11/2012

Location: South Quay

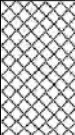



Depth (m)
 2.00



Scale
 1:25

Client: Persimmon Special Projects Wales

Logged By
 LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|-----------------------------|------|---------|-----------------------------|--|--|
| Depth (m) | Type | Results | | | |
| 0.40 | D | | 0.25 (0.45) |  | CONCRETE slab with rebar. |
| 1.00 | D | | 0.70 (0.70) |  | MADE GROUND: grey brown silty clayey gravel. Gravel is medium to coarse angular siltstone, concrete, rare brick, clinker. |
| | | | 1.40 (0.60) |  | MADE GROUND: dark grey black slightly sandy gravelly cobbly clay. Gravel is fine to coarse angular clinker, rare brick and siltstone. Black ashy inclusions. Timber fragments at 1.2m bgl. |
| | | | 2.00 |  | Greenish grey soft gravelly CLAY. Gravel is coarse angular siltstone. Slow water ingress at 1.4m bgl. |
| Trialpit Complete at 2.00 m | | | | | |

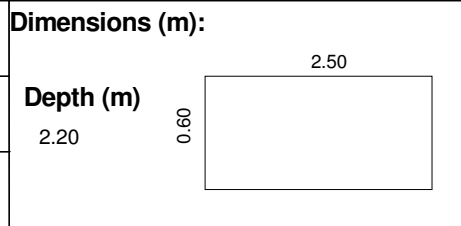
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
 IPP - in-situ pocket penetrometer
 PID - in-situ photoionization detector

D - small disturbed sample (tub)
 J - amber glass jar (250ml)
 V - amber glass jar (60ml)
 B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633



Date
14/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|---|
| Depth (m) | Type | Results | | | |
| 0.20 | D | | 0.15 | | MADE GROUND: black tarmacadam |
| | | | 0.40 | | MADE GROUND: fine to coarse angular limestone clinker |
| | | | (0.30) | | MADE GROUND: coarse brick rubble, concrete and siltstone cobbles |
| 0.80 | D | | 0.70 | | MADE GROUND: dark grey black ashy sandy gravel. Gravel is fine to medium angular brick, occasional slag, coal, flint, concrete, clinker. |
| | | | (0.40) | | |
| | | | 1.10 | | Reddish brown mottled grey gravelly CLAY. Gravel is medium to coarse angular siltstone and limestone. Limestone cobbles. Rapid water ingress at 2.2m bgl. |
| | | | (1.10) | | |
| | | | 2.20 | | Trialpit Complete at 2.20 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633

Dimensions (m):

2.50

Date
14/11/2012

Location: South Quay

Depth (m)

2.00 0.60



Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|---|
| Depth (m) | Type | Results | | | |
| 0.30 | D | | 0.12 | | MADE GROUND: black tarmacadam |
| | | | 0.30 | | MADE GROUND: fine to coarse angular limestone clinker |
| 0.60 | D | | (0.40) | | MADE GROUND: dark grey brown frequently black ashy sandy gravel. Gravel is fine to coarse angular clinker, brick, concrete and limestone. |
| | | | 0.70 | | MADE GROUND: orange brown reworked sand with occasional brick fragments. |
| | | | (0.40) | | |
| | | | 1.10 | | Grey brown sand silty cobbly GRAVEL. Gravel is medum to coarse angular siltstone/mudstone. |
| | | | (0.90) | | |
| | | | 2.00 | | Trialpit Complete at 2.00 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633

Dimensions (m):

Date
14/11/2012

Location: South Quay


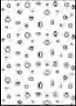


Depth (m)
2.20



Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description | |
|-----------------------------|------|---------|-----------------------------|---|--|---|
| Depth (m) | Type | Results | | | | |
| 0.20 | D | | (0.65) |  | Turf over brown silty sandy gravelly TOPSOIL. Gravel is fine to medium angular to subrounded flint, brick, clinker. Black ashy inclusions. | |
| 0.60 | D | | 0.65 (0.35) |  | Pinkish grey siltstone/limestone gravelly COBBLES. | |
| | | | 1.00 (1.00) |  | Light orange brown occasionally mottled grey very sandy soft CLAY. | 1 |
| | | | 2.00 2.20 |  | Grey very sandy CLAY. Some black staining with strong petrochemical odour at 2.2m bgl. | 2 |
| Trialpit Complete at 2.20 m | | | | | | 3 |
| | | | | | | 4 |

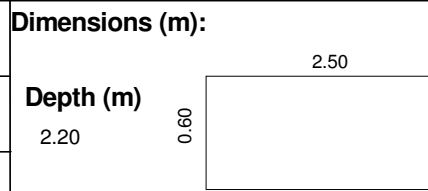
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633



Date
14/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description | |
|-----------------------------|------|---------|-----------------------------|--------|---|---|
| Depth (m) | Type | Results | | | | |
| 0.30 | D | | (1.00) | | MADE GROUND: turf over black slightly ashy sandy silty gravel. Gravel is medium to coarse angular brick, concrete, clinker, slag. | |
| 0.70 | D | | | | | |
| | | | 1.00 | | Reddish brown mottled grey gravelly CLAY. Gravel is medium to coarse angular siltstone and limestone. Limestone cobbles. | 1 |
| | | | 1.20 | | Grey stained gravelly SAND. Strong petrochemical odour. Gravel is coarse angular siltstone/mudstone. | |
| | | | (1.00) | | | 2 |
| | | | 2.20 | | | 3 |
| Trialpit Complete at 2.20 m | | | | | | 4 |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name

Barry Quays

Project No.

17633

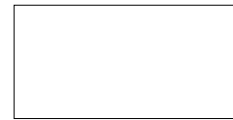
Dimensions (m):

Depth (m)

2.00

0.60

2.50







Date
14/11/2012

Scale
1:25

Logged By
LGS

Client: Persimmon Special Projects Wales

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description | |
|---------------------------|------|---------|-----------------------------|--|--|---|
| Depth (m) | Type | Results | | | | |
| 0.20 | D | | 0.10 |  | Turf over brown TOPSOIL. Rootlets. | |
| | | | (0.90) |  | MADE GROUND: dark grey/black slightly ashy sandy silty gravel. Gravel is medium to coarse angular brick, concrete, clinker, slag. | |
| 0.90 | D | | 1.00 |  | MADE GROUND: grey mottled pinkish grey clayey gravel. Gravel is coarse angular limestone/siltstone. Limestone cobbles. Rapid water ingress at 1.25m bgl. | 1 |
| | | | 1.25 |  | Greenish grey sandy cobbly CLAY. Siltstone cobbles. | |
| | | | (0.75) | | | |
| | | | 2.00 | | Trialpit Complete at 2.00 m | 2 |
| | | | | | | 3 |
| | | | | | | 4 |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633







Date
14/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|---|---|
| Depth (m) | Type | Results | | | |
| 0.30 | D | | (0.50) |  | MADE GROUND: turf over black slightly ashy sandy silty gravel. Gravel is medium to coarse angular brick, concrete, clinker, slag. Plastic surface water drain at 0.2m bgl. S/17633/02 GASKET |
| 0.80 | D | | (0.60) |  | Black medium to coarse anular clinker gravel. Strong light end hydrocarbon odour. Rapid water ingress at 1.2m bgl. |
| | | | 1.10 |  | Grey angular siltstone/limestone COBBLES and BOULDERS. |
| | | | 1.20 |  | Grey angular siltstone/limestone COBBLES and BOULDERS. |
| | | | 1.30 | | ----- Trialpit Complete at 1.30 m |

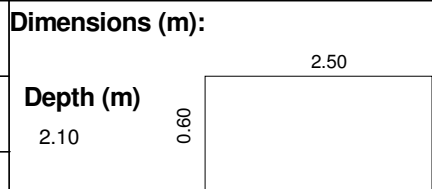
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633







Date
14/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|---|---|
| Depth (m) | Type | Results | | | |
| 0.40 | D | | 0.25 |  | CONCRETE slab with rebar. |
| 1.00 | D | | (1.15) |  | MADE GROUND: black ashy sandy silty gravel. Gravel is medium to coarse angular brick, concrete, clinker, flint. |
| | | | 1.40 |  | Grey stained medium SAND. Petrochemical odour. Rapid water ingress at 1.9m bgl. |
| | | | 1.90 |  | Soft greenish grey sandy CLAY. |
| | | | 2.10 | ----- Trialpit Complete at 2.10 m | |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633

Dimensions (m):

Depth (m)
2.00

Date
14/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|---|
| Depth (m) | Type | Results | | | |
| 0.25 | D | | 0.10 (0.30) | | MADE GROUND: black tarmacadam |
| | | | 0.40 | | MADE GROUND: grey slightly sandy gravel. Gravel is medium to coarse angular clinker, rare brick and concrete. Timber sleepers. |
| 0.75 | D | | (0.55) | | MADE GROUND: dark grey/black slightly ashy sandy silty gravel. Gravel is medium to coarse angular brick, concrete, clinker, slag, flint. Limestone cobbles. |
| | | | 0.95 | | Grey mottled yellow brown sandy gravelly cobbly CLAY. Gravel is coarse to cobble size angular siltstone/limestone. |
| | | | (1.05) | | |
| | | | 2.00 | | Trialpit Complete at 2.00 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633

Dimensions (m):

2.50

Date
14/11/2012

Location: South Quay

Depth (m)

2.30


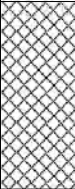


0.60



Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|-----------------------------|------|---------|-----------------------------|--|--|
| Depth (m) | Type | Results | | | |
| 0.20 | D | | 0.18 |  | CONCRETE slab with rebar. |
| 0.70 | D | | (0.62) 0.80 |  | MADE GROUND: black ashy gravelly sand. Gravel is medium to coarse angular clinker, rare brick. |
| | | | (0.30) 1.10 |  | MADE GROUND: black ashy sand with limestone cobbles and boulders. |
| | | | (1.20) 2.30 |  | Orange brown mottled grey gravelly sandy cobbly CLAY. Gravel is coarse angular siltstone and limestone. Rapid water ingress at 2.3m bgl. |
| Trialpit Complete at 2.30 m | | | | | |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633

Dimensions (m):

Depth (m)
2.20

0.60

2.50

Date
14/11/2012

Scale
1:25

Location: South Quay

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|-----------------------------|------|---------|-----------------------------|---|---------------------|
| Depth (m) | Type | Results | | | |
| 0.30 | D | | 0.10 (0.30) | MADE GROUND: orange brown sandy silty gravel with rootlets. Gravel is medium angular clinker. | |
| | | | 0.25 | MADE GROUND: dark grey black ashy sandy silty gravel with rootlets. Gravel is medium angular clinker. | |
| | | | 0.55 | MADE GROUND: orange brown sandy silty gravel with rootlets. Gravel is medium angular brick and clinker. Black ashy inclusions. | |
| 0.70 | D | | (0.45) | MADE GROUND: dark grey brown ashy sandy silty gravel with limestone cobbles and boulders. Gravel is fine to coarse angular clinker and flint. | |
| | | | 1.00 | Orange brown clayey SAND. Black staining and strong hydrocarbon odour at 1.7-1.8m bgl. | 1 |
| | | | (1.20) | | |
| | | | 2.20 | | 2 |
| Trialpit Complete at 2.20 m | | | | | |
| | | | | | 3 |
| | | | | | 4 |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633

Dimensions (m):

Date
14/11/2012

Location: South Quay



Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|---|
| Depth (m) | Type | Results | | | |
| 0.10 | D | | | | MADE GROUND: turf over black ashy sandy gravel. Gravel is fine to medium angular brick, flint, clinker, slag. Slow water ingress at 0.6m bgl. |
| 0.60 | D | | (0.90) | | |
| | | | 0.90 | | Dark orange brown medium SAND. |
| | | | (1.30) | | |
| | | | 2.20 | | Trialpit Complete at 2.20 m |

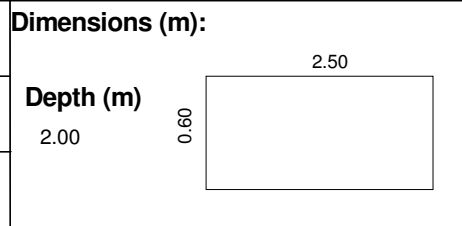
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633





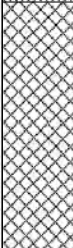

Date
15/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--|--|
| Depth (m) | Type | Results | | | |
| 0.40 | D | | 0.15 |  | MADE GROUND: black tarmacadam |
| | | | 0.30 |  | MADE GROUND: grey limestone clinker and concrete cobbles. |
| 1.00 | D | | (0.90) |  | MADE GROUND: grey brown ashy sandy gravel. Gravel is fine to coarse angular brick, concrete, clinker, rare slag. Whole bricks, limestone and concrete cobbles. |
| | | | 1.20 |  | Greenish grey sandy CLAY with orange brown sand inclusions. |
| | | | (0.80) | | |
| | | | 2.00 | | Trialpit Complete at 2.00 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name

Barry Quays

Project No.

17633

Dimensions (m):

Depth (m)

2.00

0.60

2.50

Date

15/11/2012





Scale

1:25

Logged By

LGS

Client: Persimmon Special Projects Wales

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--|--|
| Depth (m) | Type | Results | | | |
| 0.40 | D | | 0.15 |  | MADE GROUND: black tarmacadam |
| | | | 0.30 |  | MADE GROUND: grey limestone clinker and concrete cobbles. |
| 1.00 | D | | (0.90) |  | MADE GROUND: grey brown ashy sandy gravel. Gravel is fine to coarse angular brick, concrete, clinker, rare slag. Whole bricks, limestone and concrete cobbles. |
| | | | 1.20 |  | MADE GROUND: Reworked greenish grey sandy CLAY. Buried concrete pipe at 1.9m bgl. |
| | | | 2.00 | | Trialpit Complete at 2.00 m |

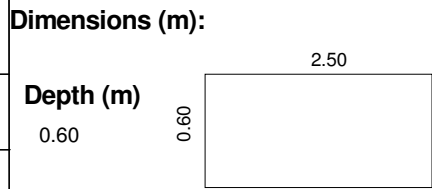
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633






Date
15/11/2012

Scale
1:25

Location: South Quay

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|-----------------------------|------|---------|-----------------------------|---|---|
| Depth (m) | Type | Results | | | |
| 0.40 | D | | 0.20 0.32 (0.28) |  | MADE GROUND: black tarmacadam |
| | | | |  | MADE GROUND: light brown sandy coarse clinker gravel. |
| 0.60 | D | | 0.60 |  | MADE GROUND: black ashy sandy gravel. Gravel is fine to coarse angular brick, concrete, clinker. Concrete cobbles and boulders. Large concrete obstruction at 0.6m bgl. |
| Trialpit Complete at 0.60 m | | | | | |

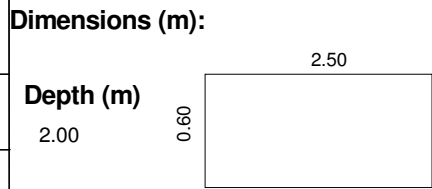
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633



Date
15/11/2012

Scale
1:25

Logged By
LGS

Location: South Quay

Client: Persimmon Special Projects Wales

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|--|
| Depth (m) | Type | Results | | | |
| 0.10 | D | | | | MADE GROUND: turf over dark grey brown slightly clayey ashy sandy silty gravel. Gravel is fine to medium angular to subrounded flint, clinker, rare brick. Rootlets. |
| 0.50 | D | | (1.00) | | |
| | | | 1.00 | | Reddish brown SAND. |
| | | | (1.00) | | |
| | | | 2.00 | | Trialpit Complete at 2.00 m |

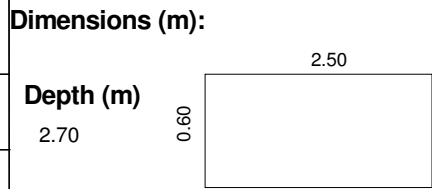
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633






Date
15/11/2012

Scale
1:25

Logged By
LGS

Location: South Quay

Client: Persimmon Special Projects Wales

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--|---|
| Depth (m) | Type | Results | | | |
| 0.30 | D | | 0.20 |  | MADE GROUND: turf over pinkish grey silty sandy gravel. Gravel is medium angular clinker, rare brick. Black ashy inclusions. |
| 0.60 | D | | (1.30) |  | MADE GROUND: black ashy sandy gravel. Gravel is fine to coarse angular brick, concrete, clinker, coal, slag. |
| 1.50 | D | | 1.50 |  | Reddish brown slightly clayey sandy GRAVEL. Gravel is fine to medium angular siltstone/limestone with occasional angular to subrounded flint. Slight petrochemical odour. Water ingress at 2.5m bgl with oily sheen on water surface. |
| | | | 2.70 | | Trialpit Complete at 2.70 m |

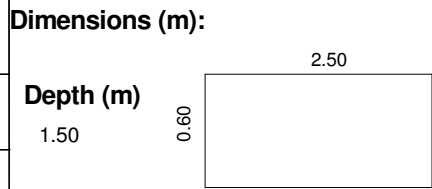
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
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Project Name
Barry Quays

Project No.
17633





Date
15/11/2012

Scale
1:25

Logged By
LGS

Location: South Quay

Client: Persimmon Special Projects Wales

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|---|--|
| Depth (m) | Type | Results | | | |
| 0.20 | D | | (1.00) |  | MADE GROUND: turf over dark grey brown slightly clayey ashy sandy silty gravel. Gravel is fine to medium angular to subrounded flint, clinker, rare brick, coal, slag. Limestone cobbles and boulders. |
| 0.60 | D | | | | |
| | | | 1.00 |  | Dark grey cobbly (siltstone/mudstone) CLAY. Rapid water ingress at 1.0m bgl. |
| | | | (0.50) | | |
| | | | 1.50 | | Trialpit Complete at 1.50 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
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PID - in-situ photoionization detector

D - small disturbed sample (tub)
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B - bulk disturbed sample

Project Name

Barry Quays

Project No.

17633

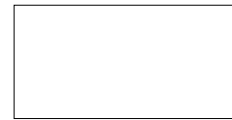
Dimensions (m):

Depth (m)

2.50

0.60

2.50



Date
15/11/2012

Scale
1:25

Logged By
LGS

Location: South Quay

Client: Persimmon Special Projects Wales

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description | |
|---------------------------|------|---------|-----------------------------|--------|--|-----------------------------|
| Depth (m) | Type | Results | | | | |
| 0.10 | D | | (2.50) | | MADE GROUND: dark grey brown/black sandy gravel. Gravel is fine to coarse angular brick, concrete, pottery, glass, timber, clinker, slag, coal, metal. Whole bricks. | |
| 0.60 | D | | | | | |
| 1.80 | D | | | | | |
| | | | | | 2.50 | Trialpit Complete at 2.50 m |

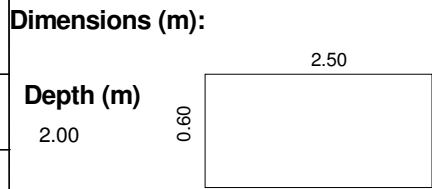
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
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Project Name
Barry Quays

Project No.
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Date
15/11/2012

Scale
1:25

Location: South Quay

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|--|
| Depth (m) | Type | Results | | | |
| 0.20 | D | | (1.80) | | MADE GROUND: dark grey black ashy sandy gravel. Gravel is fine to coarse angular clinker, slag, coal, rare brick. Angular limestone cobbles. |
| 1.10 | D | | | | |
| 1.70 | D | | | | |
| | | | 1.80 | | Grey SILTSTONE. |
| | | | 2.00 | | Trialpit Complete at 2.00 m |

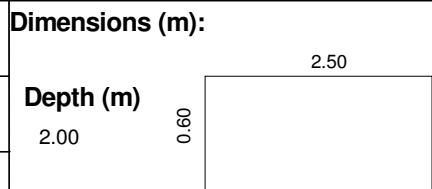
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
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V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633



Date
15/11/2012

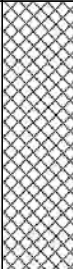

Location: South Quay

Depth (m)
2.00

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|-----------------------------|------|---------|-----------------------------|--|--|
| Depth (m) | Type | Results | | | |
| 0.25 | D | | (0.90) |  | MADE GROUND: turf over dark grey brown mottled black silty clayey sandy gravel. Gravel is fine to coarse angular brick, concrete, clinker. Black ashy inclusions. Limestone cobbles at 0.7m bgl. |
| 0.75 | D | | 0.90 | | |
| | | | (1.10) |  | Blueish grey cobbly CLAY. Cobbles are siltstone and limestone. Rapid water ingress fills pit at 1.7m bgl. |
| | | | 2.00 | | |
| Trialpit Complete at 2.00 m | | | | | |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
 IPP - in-situ pocket penetrometer
 PID - in-situ photoionization detector

D - small disturbed sample (tub)
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Project Name
Barry Quays

Project No.
17633



Date
15/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|---|
| Depth (m) | Type | Results | | | |
| 0.30 | D | | (2.00) | | MADE GROUND: Turf over dark grey brown silty sandy ashy gravel. Gravel is fine to coarse angular brick, flint, concrete, clinker, wood, metal. Brick wall foundation at end of pit. Becoming wet and odourous at 1.8m bgl. Rapid water ingress at 2.0m bgl. Pit sides unstable. |
| 0.70 | D | | | | |
| | | | 2.00 | | S/17633/03 CEMENT DEBRIS |
| | | | | | Trialpit Complete at 2.00 m |

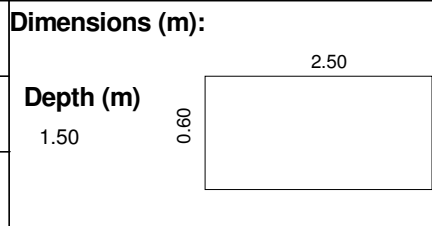
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

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B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633



Date
16/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|--|
| Depth (m) | Type | Results | | | |
| 0.30 | D | | 0.25 | | CONCRETE slab with rebar. |
| 0.80 | D | | (1.25) | | MADE GROUND: Grey fine to coarse angular limestone clinker. Rare brick fragments. Water ingress at 1.2m bgl. |
| | | | 1.50 | | Trialpit Complete at 1.50 m |

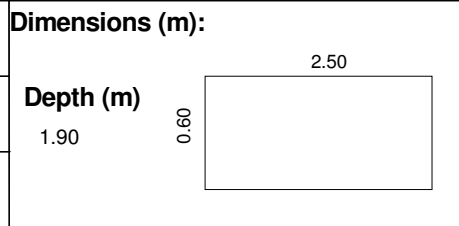
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
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B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633



Date
16/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|--|
| Depth (m) | Type | Results | | | |
| 0.40 | D | | (0.80) | | MADE GROUND: dark brown silty gravelly clay. Gravel is coarse angular brick and concrete. Rootlets. Black ashy inclusions. |
| | | | 0.80 | | CONCRETE slab. |
| | | | (0.50) | | |
| | | | 1.30 | | Orange brown SAND. |
| | | | (0.60) | | |
| | | | 1.90 | | Trialpit Complete at 1.90 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name

Barry Quays

Project No.

17633

Dimensions (m):

2.50

Date
16/11/2012

Location: South Quay

Depth (m)






0.70

0.60

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|-----------------------------|------|---------|-----------------------------|---|---|
| Depth (m) | Type | Results | | | |
| 0.25 | D | | 0.20 |  | MADE GROUND: black tarmacadam |
| | | | 0.32 |  | MADE GROUND: dark grey brown sandy ashy gravel. Gravel is fine coarse angular brick, concrete, clinker. |
| | | | 0.50 |  | CONCRETE slab. |
| 0.60 | D | | 0.70 |  | MADE GROUND: black ashy gravel of fine to medium angular slag, coal, clinker, brick and concrete. |
| | | | 0.75 |  | CONCRETE slab obstruction. |
| Trialpit Complete at 0.70 m | | | | | |

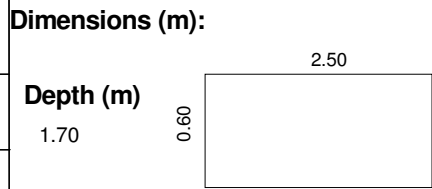
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
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Project Name
Barry Quays

Project No.
17633








Date
16/11/2012

Scale
1:25

Logged By
LGS

Location: South Quay

Client: Persimmon Special Projects Wales

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|---|---|
| Depth (m) | Type | Results | | | |
| 0.40 | D | | 0.15 |  | MADE GROUND: black tarmacadam |
| | | | 0.35 |  | MADE GROUND: buff sandy gravel of medium limestone clinker. |
| | | | (0.30) |  | MADE GROUND: black ashy sandy gravel of fine to medium clinker, slag, coal, rare brick. |
| 0.90 | D | | 0.65 |  | MADE GROUND: pinkish brown sandy clayey gravel with black ashy inclusions. Gravel is medium to coarse angular concrete, clinker, brick. |
| | | | (0.65) | | |
| 1.70 | D | | 1.30 |  | CONCRETE slab obstruction. |
| | | | (0.40) | | |
| | | | 1.70 | | ----- Trialpit Complete at 1.70 m |

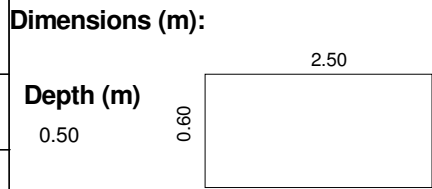
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633



Date
16/11/2012

Scale
1:25

Logged By
LGS

Location: South Quay

Client: Persimmon Special Projects Wales

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|--|
| Depth (m) | Type | Results | | | |
| 0.40 | D | | 0.15 | | MADE GROUND: black tarmacadam |
| | | | 0.35 | | MADE GROUND: buff sandy gravel of medium limestone clinker. |
| | | | 0.50 | | MADE GROUND: black ashy sandy gravel. Gravel is fine to coarse angular brick, flint, concrete. Redundant cable at 0.5m bgl. End at 0.5m to avoid damage. |
| | | | | | Trialpit Complete at 0.50 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
 Barry Quays

Project No.
 17633

Dimensions (m):

Date
 19/11/2012

Location: South Quay

Depth (m)
 2.00



Scale
 1:25

Client: Persimmon Special Projects Wales

Logged By
 LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|---|
| Depth (m) | Type | Results | | | |
| | | | 0.05 | | MADE GROUND: black tarmacadam |
| | | | 0.20 | | CONCRETE slab |
| | | | 0.42 | | MADE GROUND: buff sandy gravel of medium limestone clinker. |
| 0.45 | D | | 0.65 | | MADE GROUND: black ashy sandy gravel. Gravel is fine to coarse angular brick, concrete, clinker, slag. Limestone cobbles. |
| 0.80 | D | | (0.45) | | MADE GROUND: dark grey brown clayey sandy gravel. Gravel is fine to coarse angular brick, concrete, clinker, slag. Limestone cobbles. |
| | | | 1.10 | | MADE GROUND: grey brown clayey sand gravel. Gravel is fine to coarse angular clinker, are brick. Black asy inclusions. Limestone boulders. Large diameter concrete pipe at 1.1m bgl bisects east edge of pit. |
| 1.80 | D | | (0.90) | | |
| | | | 2.00 | | Trialpit Complete at 2.00 m |

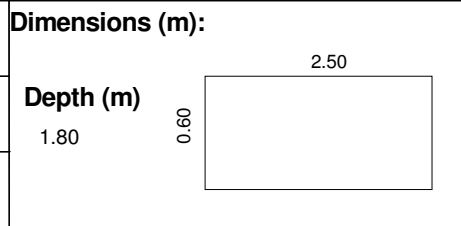
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
 IPP - in-situ pocket penetrometer
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D - small disturbed sample (tub)
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Project Name
Barry Quays

Project No.
17633



Date
19/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|--|
| Depth (m) | Type | Results | | | |
| 0.20 | D | | 0.12 | | MADE GROUND: black tarmacadam |
| 0.75 | D | | (1.68) | | Dark grey brown clayey sandy gravel. Gravel is fine to coarse angular brick, clinker, concrete, flint, metal and timber. Limestone cobbles. Concrete pipe fragment with black odorous sludge (petrochemical) at 1.6m bgl. S/17633/04 CEMENT DEBRIS WITH LAGGING |
| | | | 1.80 | | Trialpit Complete at 1.80 m |

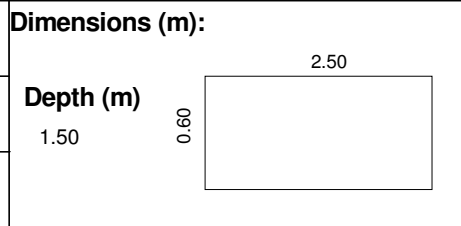
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
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B - bulk disturbed sample

Project Name
Barry Quays

Project No.
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


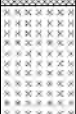
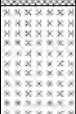

Date
19/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|---|--|
| Depth (m) | Type | Results | | | |
| 0.35 | D | | 0.15 0.30 |    | CONCRETE slab with rebar. MADE GROUND: grey brown sandy gravel of medium angular clinker. MADE GROUND: darg grey brown black sandy gravel. Gravel is fine to coarse angular brick, concrete, clinker, rare slag. Black ashy inclusions. Limestone cobbles. |
| 0.70 | D | | (0.80) |  | Dark grey SILTSTONE. |
| | | | 1.10 1.50 |   | Trialpit Complete at 1.50 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
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D - small disturbed sample (tub)
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V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633

Dimensions (m):

Date
19/11/2012

Location: South Quay



Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|---|
| Depth (m) | Type | Results | | | |
| 0.10 | D | | 0.20 | | Turf over brown sandy silty gravelly TOPSOIL. Rootlets. Gravel is fine to medium angular brick, limestone, flint. |
| | | | (1.30) | | Reddish brown clayey silty GRAVEL (marl). Gravel is fine to coarse angular siltstone/limestone. |
| | | | 1.50 | | Trialpit Complete at 1.50 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name

Barry Quays

Project No.

17633

Dimensions (m):

2.50

Date
19/11/2012

Location: South Quay

Depth (m)

0.50

0.60



Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|---|
| Depth (m) | Type | Results | | | |
| 0.10 | D | | 0.20 | | MADE GROUND: pinkish grey fine to medium angular limestone gravel over geotextile membrane. Rootlets. |
| | | | (0.30) | | Grey SILSTONE cobbles and boulders. |
| | | | 0.50 | | ----- Trialpit Complete at 0.50 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
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D - small disturbed sample (tub)
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Project Name
Barry Quays

Project No.
17633

Dimensions (m):

Date
19/11/2012

Location: South Quay

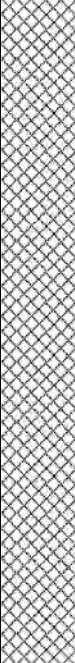
Depth (m)
2.20



Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--|---|
| Depth (m) | Type | Results | | | |
| 0.30 | D | | (2.20) |  | MADE GROUND: dark grey brown ashy clayey sandy silty gravel. Gravel is fine to coarse angular brick (with whole bricks), concrete, timber, metal, clinker. Black ashy inclusions. |
| 0.60 | D | | | | |
| 1.60 | D | | | | |
| | | | | | Trialpit Complete at 2.20 m |

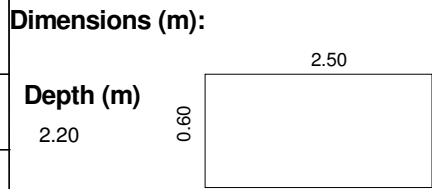
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
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V - amber glass jar (60ml)
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Project Name
Barry Quays

Project No.
17633



Date
19/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|---|
| Depth (m) | Type | Results | | | |
| 0.20 | D | | (2.50) | | MADE GROUND: dark grey brown ashy clayey sandy silty gravel. Gravel is fine to coarse angular brick (with whole bricks), concrete, timber, metal, clinker. Black ashy inclusions. |
| 1.00 | D | | | | |
| 1.90 | D | | | | |
| | | | | | Trialpit Complete at 2.20 m |

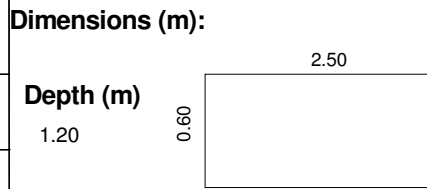
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633



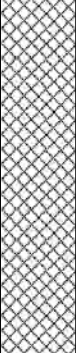

Date
19/11/2012

Scale
1:25

Location: South Quay

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|---|---|
| Depth (m) | Type | Results | | | |
| 0.10 | D | | (1.20) |  | MADE GROUND: dark grey brown ashy clayey sandy silty gravel. Gravel is fine to coarse angular brick (with whole bricks), concrete, timber, metal, clinker. Black ashy inclusions. |
| 0.50 | D | | | | |
| 0.90 | D | | | | |
| | | | 1.20 |  | MADE GROUND: brick base obstruction |
| | | | 1.30 | | Trialpit Complete at 1.20 m |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name

Barry Quays

Project No.

17633

Dimensions (m):

Depth (m)

2.50

0.60

2.50



Date
19/11/2012

Scale
1:25

Logged By
LGS

Client: Persimmon Special Projects Wales

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|---|
| Depth (m) | Type | Results | | | |
| 0.20 | D | | (1.85) | | MADE GROUND: turf over dark grey brown black sandy gravel. Gravel is fine to medium angular flint, rare brick, clinker, metal. Black ashy inclusions. Rootlets. |
| 0.60 | D | | | | |
| 1.50 | D | | | | |
| | | | 1.85 | | MADE GROUND: yellow brown reworked sand with occasional brick fragments. |
| | | | (0.65) | | |
| | | | 2.50 | | Trialpit Complete at 2.50 m |

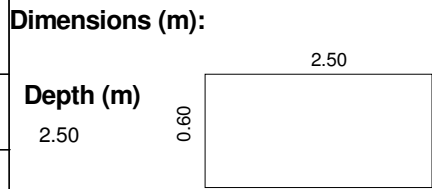
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633



Date
19/11/2012

Location: South Quay

Depth (m)
2.50

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|---|
| Depth (m) | Type | Results | | | |
| 0.30 | D | | 0.15 | | MADE GROUND: black tarmacadam |
| | | | 0.40 | | MADE GROUND: dark grey black ashy sandy gravel. Gravel is fine to coarse angular coal, clinker, slag, brick, concrete. |
| | | | 0.60 | | MADE GROUND: limestone cobbles and boulders |
| 0.80 | D | | | | MADE GROUND: reddish brown mottled grey black ashy slightly clayey sandy gravel. Gravel is fine to coarse angular clinker, coal, flint, rare brick. |
| 1.80 | D | | (2.00) | | |
| | | | 2.60 | | Trialpit Complete at 2.50 m |

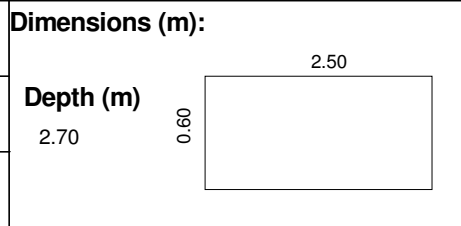
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633



Date
19/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|---------------------------|------|---------|-----------------------------|--------|--|
| Depth (m) | Type | Results | | | |
| 0.25 | D | | (0.80) | | MADE GROUND: turf over dark grey black ashy sandy gravel. Gravel is fine to medium angular coal, rare slag and brick, clinker, metal. |
| 0.75 | D | | 0.80 | | MADE GROUND: orange brown mottled yellow brown reworked gravelly sandy clay. Gravel is coarse angular limestone/siltstone. Water ingress at 2.7 m bgl. |
| | | | (1.90) | | |
| | | | 2.70 | | Trialpit Complete at 2.70 m |

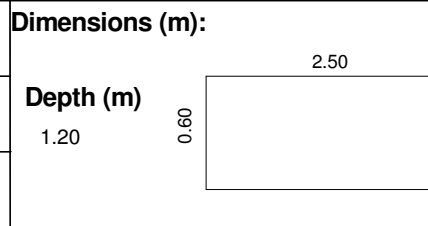
Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). Groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

Project Name
Barry Quays

Project No.
17633





Date
19/11/2012

Location: South Quay

Scale
1:25

Client: Persimmon Special Projects Wales

Logged By
LGS

| Samples & In Situ Testing | | | Depth in metres (thickness) | Legend | Stratum Description |
|-----------------------------|------|---------|-----------------------------|---|--|
| Depth (m) | Type | Results | | | |
| 0.10 | D | | (0.60) |  | MADE GROUND: black ashy sangy gravel. Gravel is fine to coarse angular clinker, rare brick, coal. Redundant metal pipe at 0.10m bgl. Second larger metal pipe bisects pit at 0.3m bgl. |
| 0.55 | D | | 0.60 (0.60) |  | Reddish brown gravelly CLAY. Gravel is medium to coarse angular limestone. |
| Trialpit Complete at 1.20 m | | | | | |

Remarks: Hole positioned with Garmin Etrex Vista hand held GPS (+/- 4m accuracy). No groundwater encountered.

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample



APPENDIX 3 ▪ Photographs



Plate 1: SQMTP01



Plate 2: SQMTP02



Plate 3: SQMTP03



Plate 4: SQMTP04



Plate 5: SQMTP05



Plate 6: SQMTP06



Plate 7: SQMTP07



Plate 8: SQMTP08



Plate 9: SQMTP09



Plate 10: SQMTP10



Plate 11: SQMTP11



Plate 12: SQMTP12



Plate 13: SQMTP13



Plate 14: SQMTP14



Plate 15: SQMTP15 (arising)



Plate 16: SQMTP16



Plate 17: SQMTP17



Plate 18: SQMTP18



Plate 19: SQMTP19



Plate 20: SQMTP20



Plate 21: SQMTP21



Plate 22: SQMTP22



Plate 23: SQMTP23



Plate 24: SQMTP24



Plate 25: SQMTP25



Plate 26: SQMTP26



Plate 27: SQMTP27



Plate 28: SQMTP28



Plate 29: SQMTP29



Plate 30: SQMTP30



Plate 31: SQMTP31



Plate 32: SQMTP32



Plate 33: SQMTP33



Plate 34: SQMTP34



Plate 35: SQMTP35



Plate 36: SQMTP36



Plate 37: SQMTP37



Plate 38: SQMTP38



Plate 39: SQMTP39



Plate 40: SQMTP40



Plate 41: SQMTP41



Plate 42: SQMTP42



Plate 43: SQMTP43



Plate 44: SQMTP44



Plate 45: SQMTP45



Plate 46: SQMTP46



Plate 47: SQMTP47



Plate 48: Stockpile A (oversize)



Plate 49: Stockpile B



Plate 50: Stockpile C



Plate 51: S/17633/01 Gasket (SQMTP02)

Result: Chrysotile



Plate 52: S/17633/02 Gasket (SQMTP15)

Result: Chrysotile



Plate 53: S/17633/03 Cement (SQMTP30)

Result: Chrysotile



Plate 54: S/17633/04 Cement with Lagging applied (SQMTP37)

Result: Chrysotile (Cement); Amosite and Crocidolite (Lagging)



Plate 55: S/17633/05 Gasket to Pipe Flange

Result: Chrysotile



Plate 56: S/17633/06 Gasket

Result: No Asbestos Detected



Plate 57: S/17633/07 Gasket

Result: Chrysotile



Plate 58: S/17633/08 Floor Tile with Adhesive

Result: Chrysotile



Plate 59: S/17633/09 Floor Tile with Adhesive

Result: Chrysotile



Plate 60: S/17633/10 Gasket

Result: Chrysotile



Plate 61: S/17633/11 Cement

Result: Chrysotile



Plate 62: S/17633/12 Gasket

Result: Chrysotile



Plate 63: S/17633/13 Bitumen

Result: No Asbestos Detected



Plate 64: S/17633/14 Bitumen

Result: No Asbestos Detected



Plate 65: S/17633/15 Bitumen

Result: No Asbestos Detected



Plate 66: S/17633/16 Bitumen

Result: No Asbestos Detected



Plate 67: S/17633/17 Cement Flash Guards in Fuse Box

Result: Chrysotile



Plate 68: S/17633/18 Cloth to Pipe Bracket

Result: No Asbestos Detected



Plate 69: S/17633/19 Gasket in base of Duct

Result: Chrysotile



Plate 70: S/17633/20 Rope Gasket in Fuse Box

Result: Chrysotile



Plate 71: S/17633/21 Insulation Tape to Wire in Fuse Box

Result: No Asbestos Detected



APPENDIX 4 ▪ Vintec Certificates of Analysis (Bulk ACM)

Analytical Report Number : J002014
Client : Merebrook Consulting
Client Reference : Project 17633f - Barry Quays : South Quay

| Vintec Reference | Sample Description | Asbestos Content | Comments |
|------------------|--|----------------------|---|
| BS001679 | S-17633-01 - Gasket | Chrysotile | |
| BS001680 | S-17633/02 - Gasket | Chrysotile | |
| BS001681 | S-17633/03 - Cement | Chrysotile | |
| BS001682 | S-17633/04 - Cement with Lagging adhered | Amo + Chrys + Croc | a - Chrysotile identified in material described as Cement b - Amosite and Crocidolite identified in the Lagging |
| BS001683 | S-17633/05 - Gasket | Chrysotile | |
| BS001684 | S-17633/06 - Gasket | No Asbestos Detected | |
| BS001685 | S-17633/07 - Gasket | Chrysotile | |
| BS001686 | S-17633/08 - Floor Tile with Adhesive | Chrysotile | Present in Floor Tile only |
| BS001687 | S-17633/09 - Floor Tile with Adhesive | Chrysotile | Present in Tile & Bitumen |
| BS001688 | S-17633/10 - Gasket | Chrysotile | |
| BS001689 | S-17633/11 - Cement | Chrysotile | |
| BS001690 | S-17633/12 - Gasket | Chrysotile | |
| BS001691 | S-17633/13 - Bitumen Debris | No Asbestos Detected | |
| BS001692 | S-17633/14 - Bitumen Debris | No Asbestos Detected | |
| BS001693 | S-17633/15 - Bitumen Debris | No Asbestos Detected | |
| BS001694 | S-17633/16 - Bitumen Debris | No Asbestos Detected | |
| BS001695 | S-17633/17 - Cement Flash Guard | Chrysotile | |
| BS001696 | S-17633/18 - Cloth | No Asbestos Detected | |
| BS001697 | S-17633/19 - Gasket | Chrysotile | |
| BS001698 | S-17633/20 - Rope Gasket | Chrysotile | |
| BS001699 | S-17633/21 - Insulation Tape | No Asbestos Detected | |



APPENDIX 5 ▪ IOM Certificate of Analysis (Soils)

CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: Merebrook Consulting
Suite 2b East Mill
Bridgefoot
Belper
Derbyshire
DE56 2UA

CONTRACT NO: 31730

PROJECT NO: 610

DATE OF ISSUE: 28.11.12

DATE SAMPLES RECEIVED: 21.11.12

DATE SAMPLES ANALYSED: 21-28.11.12

SAMPLE DESCRIPTION: Seventy soil/loose aggregate samples each weighing approximately 0.6-1.3kg.

ANALYSIS REQUESTED: Qualitative and quantitative analysis of soil/loose aggregate samples for mass determination of asbestos.

METHODS:

Qualitative - The samples were analysed qualitatively for asbestos by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative - The analysis was carried out using our documented in-house method based on HSE Contract Research Report No. 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies *et al*, 1996) and HSG 248. Our method includes initial examination of the entire sample, detailed analysis of a representative sub-sample and quantification by hand picking/weighing and/or fibre counting/sizing as appropriate.

RESULTS:

Initial Screening

Asbestos was detected in ten of the seventy soil samples by stereo-binocular and polarised light microscopy.

A summary of the qualitative and quantitative results are given in Tables 1 & 2 respectively.

RESEARCH CONSULTING SERVICES

Multi-disciplinary specialists in Occupational and Environmental Health and Hygiene

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Telephone: +44 (0)131 449 8000, Facsimile: +44 (0)131 449 8084, Email: iom@iom-world.org

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RESULTS: (cont.)

Table 1: Qualitative Results

| IOM sample number | Client sample number | ACM type detected | PLM result |
|-------------------|----------------------|-------------------|----------------------|
| S19352 | SQMTP01 0.30m | - | No Asbestos Detected |
| S19353 | SQMTP01 1.00m | - | No Asbestos Detected |
| S19354 | SQMTP02 0.30m | - | No Asbestos Detected |
| S19355 | SQMTP02 1.00m | - | No Asbestos Detected |
| S19356 | SQMTP02 1.60m | - | No Asbestos Detected |
| S19357 | SQMTP03 0.20m | - | No Asbestos Detected |
| S19358 | SQMTP03 0.80m | - | No Asbestos Detected |
| S19359 | SQMTP04 0.05m | Free Fibres | Amosite |
| S19360 | SQMTP04 0.55m | - | No Asbestos Detected |
| S19361 | SQMTP05 0.30m | - | No Asbestos Detected |
| S19362 | SQMTP06 0.20m | Free Fibres | Amosite |
| S19363 | SQMTP07 0.35m | - | No Asbestos Detected |
| S19364 | SQMTP08 0.30m | - | No Asbestos Detected |
| S19421 | SQMTP08 1.00m | - | No Asbestos Detected |
| S19365 | SQMTP09 0.40m | - | No Asbestos Detected |
| S19366 | SQMTP09 1.00m | - | No Asbestos Detected |
| S19367 | SQMTP10 0.20m | - | No Asbestos Detected |
| S19368 | SQMTP10 0.80m | Free Fibres | Chrysotile |
| S19369 | SQMTP11 0.30m | - | No Asbestos Detected |
| S19370 | SQMTP11 0.60m | - | No Asbestos Detected |
| S19371 | SQMTP12 0.20m | - | No Asbestos Detected |
| S19372 | SQMTP12 0.60m | - | No Asbestos Detected |
| S19373 | SQMTP13 0.30m | Loose Insulation | Amosite |
| S19374 | SQMTP13 0.70m | - | No Asbestos Detected |
| S19375 | SQMTP14 0.20m | - | No Asbestos Detected |
| S19376 | SQMTP14 0.90m | - | No Asbestos Detected |
| S19377 | SQMTP15 0.30m | - | No Asbestos Detected |
| S19378 | SQMTP15 0.80m | - | No Asbestos Detected |
| S19379 | SQMTP16 0.40m | - | No Asbestos Detected |
| S19380 | SQMTP16 1.00m | - | No Asbestos Detected |
| S19381 | SQMTP17 0.25m | - | No Asbestos Detected |
| S19382 | SQMTP17 0.75m | - | No Asbestos Detected |
| S19383 | SQMTP18 0.20m | - | No Asbestos Detected |
| S19384 | SQMTP18 0.70m | - | No Asbestos Detected |
| S19385 | SQMTP19 0.30m | - | No Asbestos Detected |
| S19386 | SQMTP19 0.70m | - | No Asbestos Detected |
| S19387 | SQMTP20 0.10m | - | No Asbestos Detected |
| S19388 | SQMTP20 0.60m | - | No Asbestos Detected |
| S19389 | SQMTP21 0.40m | - | No Asbestos Detected |
| S19390 | SQMTP21 1.00m | - | No Asbestos Detected |
| S19391 | SQMTP22 0.40m | - | No Asbestos Detected |
| S19392 | SQMTP22 1.00m | - | No Asbestos Detected |
| S19393 | SQMTP23 0.40m | - | No Asbestos Detected |
| S19394 | SQMTP23 0.60m | - | No Asbestos Detected |
| S19395 | SQMTP24 0.10m | - | No Asbestos Detected |

Our detection limit for this method is 0.001%.

RESULTS: (cont.)

Table 1: Qualitative Results

| IOM sample number | Client sample number | ACM type detected | PLM result |
|-------------------|----------------------|-------------------|----------------------|
| S19396 | SQMTP24 0.50m | - | No Asbestos Detected |
| S19397 | SQMTP25 0.30m | - | No Asbestos Detected |
| S19398 | SQMTP25 0.60m | - | No Asbestos Detected |
| S19399 | SQMTP25 1.50m | - | No Asbestos Detected |
| S19400 | SQMTP26 0.20m | - | No Asbestos Detected |
| S19401 | SQMTP26 0.60m | - | No Asbestos Detected |
| S19402 | SQMTP27 0.10m | Free Fibres | Chrysotile |
| S19403 | SQMTP27 0.60m | Free Fibres | Amosite & Chrysotile |
| S19404 | SQMTP27 1.80m | Free Fibres | Amosite & Chrysotile |
| S19405 | SQMTP28 0.20m | - | No Asbestos Detected |
| S19406 | SQMTP28 1.10m | Free Fibres | Chrysotile |
| S19407 | SQMTP28 1.70m | - | No Asbestos Detected |
| S19408 | SQMTP29 0.25m | - | No Asbestos Detected |
| S19409 | SQMTP29 0.75m | - | No Asbestos Detected |
| S19410 | SQMTP30 0.30m | - | No Asbestos Detected |
| S19411 | SQMTP30 0.70m | - | No Asbestos Detected |
| S19412 | SQMTP31 0.30m | - | No Asbestos Detected |
| S19413 | SQMTP31 0.80m | - | No Asbestos Detected |
| S19414 | SQMTP32 0.40m | - | No Asbestos Detected |
| S19415 | SQMTP33 0.25m | Bound Insulation | Chrysotile |
| S19416 | SQMTP33 0.60m | - | No Asbestos Detected |
| S19417 | SQMTP34 0.40m | - | No Asbestos Detected |
| S19418 | SQMTP34 0.90m | - | No Asbestos Detected |
| S19419 | SQMTP34 1.70m | - | No Asbestos Detected |
| S19420 | SQMTP35 0.40m | Free Fibres | Amosite |

Our detection limit for this method is 0.001%.

Table 2: Quantitative Analysis Results

| Client Sample Number | Sample weight (g) | % Asbestos by hand picking/weighing | % Asbestos by fibre counting/sizing | Total % Asbestos in Sample |
|----------------------|-------------------|-------------------------------------|-------------------------------------|----------------------------|
| SQMTP04 0.05m | 921 | 0.006 | - | 0.006 |
| SQMTP06 0.20m | 881 | 0.006 | - | 0.006 |
| SQMTP10 0.80m | 859 | 0.008 | - | 0.008 |
| SQMTP13 0.30m | 682 | 0.024 | - | 0.024 |
| SQMTP27 0.10m | 888 | 0.005 | - | 0.005 |
| SQMTP27 0.60m | 791 | 0.005 | - | 0.005 |
| SQMTP27 1.80m | 1165 | 0.008 | - | 0.008 |
| SQMTP28 1.10m | 825 | 0.005 | - | 0.005 |
| SQMTP33 0.25m | 1050 | 0.052 | - | 0.052 |
| SQMTP35 0.40m | 1035 | 0.006 | - | 0.006 |

- not applicable

The detection limit for this method is around 0.0001% with a limit of quantification of 0.001%.

CONTRACT NO: 31730
PROJECT NO: 610
DATE OF ISSUE: 28.11.12

COMMENTS:

IOM Consulting cannot accept responsibility for samples that have been incorrectly collected or despatched by external clients.

Any opinions and interpretations expressed herein are outwith the scope of our UKAS accreditation.



Authorised by:

S Clark
Mineralogy Section Manager

CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: Merebrook Consulting
Suite 2b East Mill
Bridgefoot
Belper
Derbyshire
DE56 2UA

CONTRACT NO: 31741

PROJECT NO: 610

DATE OF ISSUE: 29.11.12

DATE SAMPLES RECEIVED: 22.11.12

DATE SAMPLES ANALYSED: 29.11.12

SAMPLE DESCRIPTION: Thirty seven soil/loose aggregate samples each weighing approximately 0.6-1.1kg.

ANALYSIS REQUESTED: Qualitative and quantitative analysis of soil/loose aggregate samples for mass determination of asbestos.

METHODS:

Qualitative - The samples were analysed qualitatively for asbestos by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative - The analysis was carried out using our documented in-house method based on HSE Contract Research Report No. 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies *et al*, 1996) and HSG 248. Our method includes initial examination of the entire sample, detailed analysis of a representative sub-sample and quantification by hand picking/weighing and/or fibre counting/sizing as appropriate.

RESULTS:

Initial Screening

Asbestos was detected in two of the thirty seven soil samples by stereo-binocular and polarised light microscopy.

A summary of the qualitative and quantitative results are given in Tables 1 & 2 respectively.

RESEARCH CONSULTING SERVICES

Multi-disciplinary specialists in Occupational and Environmental Health and Hygiene

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CONTRACT NO: 31741
 PROJECT NO: 610
 DATE OF ISSUE: 29.11.12

RESULTS: (cont.)

Table 1: Qualitative Results

| IOM sample number | Client sample number | ACM type detected | PLM result |
|-------------------|----------------------|-------------------|----------------------|
| S19422 | SQMTP36 0.45m | - | No Asbestos Detected |
| S19423 | SQMTP36 0.80m | - | No Asbestos Detected |
| S19424 | SQMTP36 1.80m | - | No Asbestos Detected |
| S19425 | SQMTP37 0.20m | - | No Asbestos Detected |
| S19426 | SQMTP37 0.75m | - | No Asbestos Detected |
| S19427 | SQMTP38 0.35m | Rope | Chrysotile |
| S19428 | SQMTP38 0.70m | - | No Asbestos Detected |
| S19429 | SQMTP39 0.10m | - | No Asbestos Detected |
| S19430 | SQMTP40 0.10m | - | No Asbestos Detected |
| S19431 | SQMTP41 0.30m | - | No Asbestos Detected |
| S19432 | SQMTP41 0.60m | - | No Asbestos Detected |
| S19433 | SQMTP41 1.60m | - | No Asbestos Detected |
| S19434 | SQMTP42 0.20m | - | No Asbestos Detected |
| S19435 | SQMTP42 1.00m | - | No Asbestos Detected |
| S19436 | SQMTP42 1.90m | - | No Asbestos Detected |
| S19437 | SQMTP43 0.10m | Free Fibres | Amosite |
| S19438 | SQMTP43 0.50m | - | No Asbestos Detected |
| S19439 | SQMTP43 0.90m | - | No Asbestos Detected |
| S19440 | SQMTP44 0.20m | - | No Asbestos Detected |
| S19441 | SQMTP44 0.60m | - | No Asbestos Detected |
| S19442 | SQMTP44 1.50m | - | No Asbestos Detected |
| S19443 | SQMTP45 0.30m | - | No Asbestos Detected |
| S19444 | SQMTP45 0.80m | - | No Asbestos Detected |
| S19445 | SQMTP45 1.80m | - | No Asbestos Detected |
| S19446 | SQMTP46 0.25m | - | No Asbestos Detected |
| S19447 | SQMTP46 0.75m | - | No Asbestos Detected |
| S19448 | SQMTP47 0.10m | - | No Asbestos Detected |
| S19449 | SQMTP47 0.55m | - | No Asbestos Detected |
| S19450 | Stockpile B Fines R1 | - | No Asbestos Detected |
| S19451 | Stockpile B Fines R2 | - | No Asbestos Detected |
| S19452 | Stockpile B Fines R3 | - | No Asbestos Detected |
| S19453 | Stockpile C Fines R1 | - | No Asbestos Detected |
| S19454 | Stockpile C Fines R2 | - | No Asbestos Detected |
| S19455 | Stockpile C Fines R3 | - | No Asbestos Detected |
| S19456 | Stockpile C Fines R4 | - | No Asbestos Detected |
| S19457 | Stockpile C Fines R5 | - | No Asbestos Detected |
| S19458 | Stockpile C Fines R6 | - | No Asbestos Detected |

Our detection limit for this method is 0.001%.

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RESULTS: (cont.)

Table 2: Quantitative Analysis Results

| Client Sample Number | Sample weight (g) | % Asbestos by hand picking/weighing | % Asbestos by fibre counting/sizing | Total % Asbestos in Sample |
|----------------------|-------------------|-------------------------------------|-------------------------------------|----------------------------|
| SQMTP38 0.35m | 1143 | 0.057 | - | 0.057 |
| SQMTP43 0.10m | 750 | 0.007 | - | 0.007 |

- not applicable

The detection limit for this method is around 0.0001% with a limit of quantification of 0.001%.

COMMENTS:

IOM Consulting cannot accept responsibility for samples that have been incorrectly collected or despatched by external clients.

Any opinions and interpretations expressed herein are outwith the scope of our UKAS accreditation.



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