

BAM CONSTRUCTION LIMITED

**WAST – WESTERN GATEWAY SITE
WREXHAM**

**FACTUAL REPORT ON
GROUND INVESTIGATION**

Contract: W11/40822

Date: JUNE 2011

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**FACTUAL REPORT ON
GROUND INVESTIGATION**

carried out at

**WAST – WESTERN GATEWAY SITE
WREXHAM**

Prepared for

BAM CONSTRUCTION LIMITED

c/o Arup
4 Pierhead Street
Capital Waterside
Cardiff
CF10 4QP

Contract No: W11/40822

Date: JUNE 2011

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1.0 INTRODUCTION

- 1.1 On the instructions of Arup, Consulting Engineers to BAM Construction Limited, a ground investigation was undertaken to determine ground and groundwater conditions at WAST (Wales Ambulance Stations) – Western Gateway site.
- 1.2 This report has been prepared for the sole use of the Client for the purpose described and no extended duty of care to any third party is implied or offered. Third parties using any information contained within this report do so at their own risk.
- 1.3 The comments given in this report and the opinions expressed herein are based on the information received, the conditions encountered during site works, and on the results of tests made in the field and laboratory. However, there may be conditions prevailing at the site which have not been disclosed by the investigation and which have not been taken into account in the report.
- 1.4 The comments on groundwater conditions are based on observations made at the time the site work was carried out. It should be noted that groundwater levels vary owing to seasonal or other effects.

2.0 SITE SETTING

2.1 Site Location

- 2.1.1 The site is situated off Croesnewydd Road, approximately 1km to the west of the town centre of Wrexham and may be located by Grid reference SJ 320 502. A site location plan is included in Appendix 1, Figure A1.1.

2.2 Site Description

- 2.2.1 At the time of the investigation the site consisted of two vacant plots of land. The land to the west was approximately 110m by 120m in size and the land in the east of the site was approximately 300m by 30-100m in size. The site comprised level soft standing ground to the east, south and west, and sloped upwards to a level gravelled area to the north.
- 2.2.2 The site was dissected by a small river running in a northwest to southeast direction. Two approximately 4m high spoil mounds were located adjacently to one another in the north of the site.
- 2.2.3 The site was bound to the north by a hospital car park, to the east by industrial units, to the west by farmland and to the south and southwest by residential buildings.
- 2.2.4 A site plan is included in Appendix 1, Figure A1.2.

3.0 SITE WORK

- 3.1 The site work was carried out between the 21st February and the 8th March 2011. The locations of exploratory holes were indicated by the Engineer, and the site works carried out on the basis of the practices set out in BS 10175:2001, ref. 5.1, and BS 5930:1999 ref. 5.2.
- 3.2 Four boreholes, designated BH01 to BH04 were sunk by light cable percussion method, eighteen boreholes, designated WS01 to WS06, WS08 and WS10 to WS20 were undertaken by drive-in window sampler technique, seventeen dynamic probe holes, designated DP01 to DP06, DP08 and DP11 to DP20 were carried out and twenty eight trial pits, designated TP01 to TP07 and TP09 to TP29, were dug by mechanical excavator.
- 3.3 Exploratory holes WS07, WS09, DP07, TP08, CBR06, CBR11, CBR18, CBR19 and CBR23 to CBR28 could not be carried out due to ecological restrictions on the site.
- 3.4 Twenty eight TRL dynamic cone penetrometer tests, designated CBR01 to CBR05, CBR07 to CBR10, CBR12, CBR13, CBR15 to CBR17, CBR20 to CBR22 and CBR29 to CBR45, were undertaken and four pits, designated SA01 to SA04, were dug by mechanical excavator for the purpose of carrying out soakaway tests.
- 3.5 The positions of the exploratory holes are shown on the site plans, Appendix 1, Figure A1.2 to A1.4. The depths of the exploratory holes, descriptions of strata encountered and comments on groundwater conditions are given in the exploratory holes records, Appendix 2. Photographs of the trial pits are presented in Appendix 6.
- 3.6 Representative disturbed and undisturbed samples were taken at the depths shown on the exploratory hole records and despatched to the laboratory. Standard (split-barrel and cone) penetration tests, ref. 5.3 were carried out in the light cable percussion and window sampler boreholes in the various strata to assess the relative density or consistency. The values of penetration resistance are given in the borehole records.
- 3.7 Samples were collected for environmental purposes in plastic tubs and amber glass jars and kept in a cool box.
- 3.8 Perforated standpipes, surrounded by pea shingle and protected by a stopcock cover were installed in boreholes BH01 to BH04, WS01 to WS04, WWS06, WS08, and WS10 to WS19, as detailed in the borehole records.
- 3.9 The ground levels and locations of the borehole and trial pits were determined using traditional surveying techniques.
- 3.10 One gas and groundwater monitoring visit was undertaken after completion of the site works and the results are presented in Appendix 5.

4.0 LABORATORY TESTS

4.1 Geotechnical Testing

4.1.1 All soil samples were prepared in accordance with BS1377: Part One: 1990 ref. 5.3 and representative sub-samples were taken for testing. The following tests were carried out:

- Moisture content
- Plasticity indices
- Bulk density
- Particle size distribution

4.1.2 The results of these tests are shown in Appendix 3.

4.2 Chemical Testing

4.2.1 The suites of chemical analyses were indicated by the Engineer. The chemical analyses were carried out on seventy eight samples of soil and eleven samples of leachate. The nature of the analyses is detailed below:

4.2.2 **Metals screen** - arsenic, cadmium, chromium, lead, mercury, selenium, boron (water soluble), copper, nickel and zinc

4.2.3 **Organic Screen** - total petroleum hydrocarbons (TPH) – C₆ to C₄₀ and aromatic/aliphatic hydrocarbons, polycyclic aromatic hydrocarbons (PAH) – USEPA 16 suite, monohydric phenols

4.2.4 **Inorganics Screen** - cyanide (total)

4.2.5 **Others** - pH, organic matter, asbestos, BRE SD1 suite, waste acceptance criteria testing

4.2.6 The results of these tests are shown in Appendix 4.

5.0 REFERENCES

5.1 British Standards Institute: BS 10175 'Code of practice for the investigation of potentially contaminated sites', BSI 2001.

5.2 British Standards Institute: BS 5930 'Code of practice for site investigations', BSI 1999.

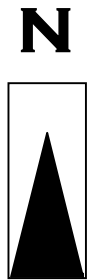
5.3 British Standard 1377:1990, Part 9, 'Methods of Test for Soils for Civil Engineering Purposes'.

For and on behalf of Ian Farmer Associates (1998) Limited

M L Hirst-Watson
BSc FGS
Senior Engineering Geologist

J A Latimer
BSc (Hons) FGS
Director

APPENDIX 1
DRAWINGS

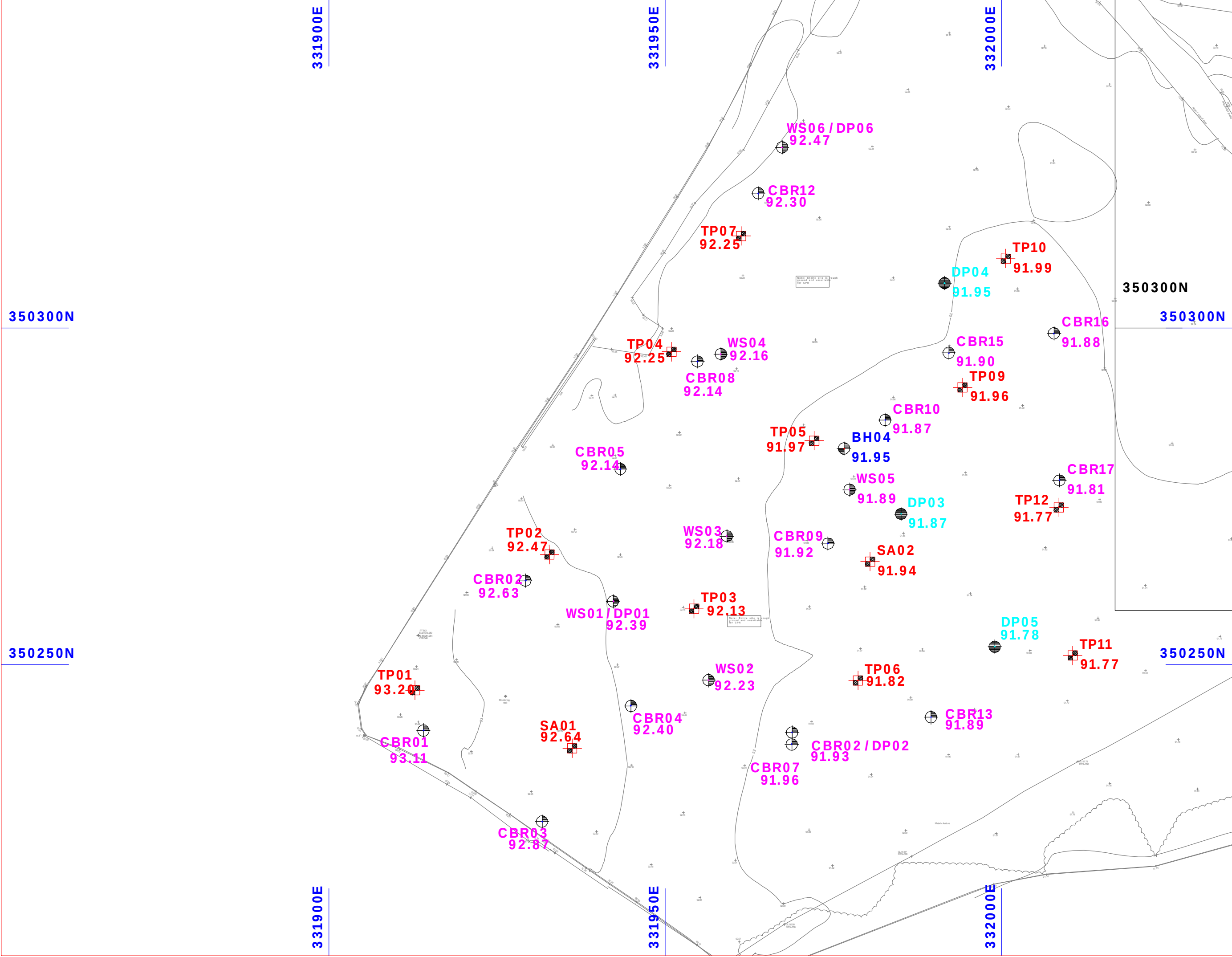


PROJECT: WAST – Western Gateway Site

FIGURE No. A1.1.

SCALE : As above

TITLE: Site Location Plan



Key: height colours
as code colour



PROJECT: WAS Western Gateway Site	
FIGURE NO: A2.2	Scale: 1:500 A3
TITLE: Exploratory Hole Location Plan	



Site Surveying Services - AMJ C.E.S.
32 Downton Road
Cheltenham
Tel 01204411144
Fax 01204376338
www.ianfarmer.co.uk
Land Engineering Surveyors
TSA member

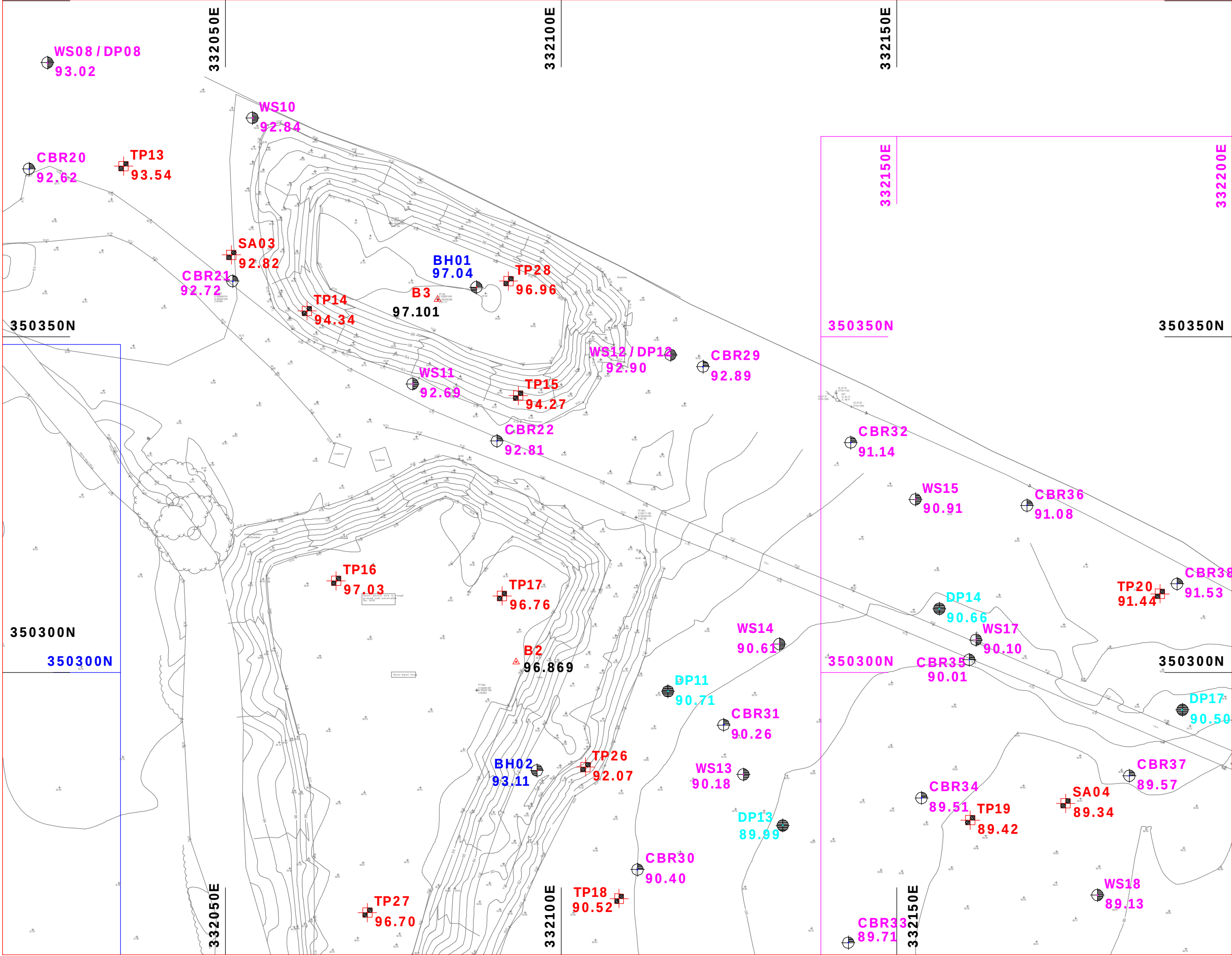
Setting Out & Control Surveys
Topographic/Volumetric Surveys
GPS Specialists using also
GPS Post Process to tie any site
to OS without trip point or BM
Construction Line Registered
TSA member

Client / Location: Ian Farmer Associates
WAGT - Western Gateway Site
Drawing Title: S.I. Survey

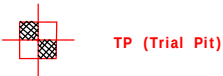
Additional Comments:
To use 2000 datum
all work to 100 spec, some by GPS
contact us for details

Drawing Number: sss-3772-01
Drawn By: JF
Date: 12/03/11

Revision: A
Checked By: JF
Scale: 1:500, A3



Key: height colours
as code colour



Ogl=52
Original Ground Level



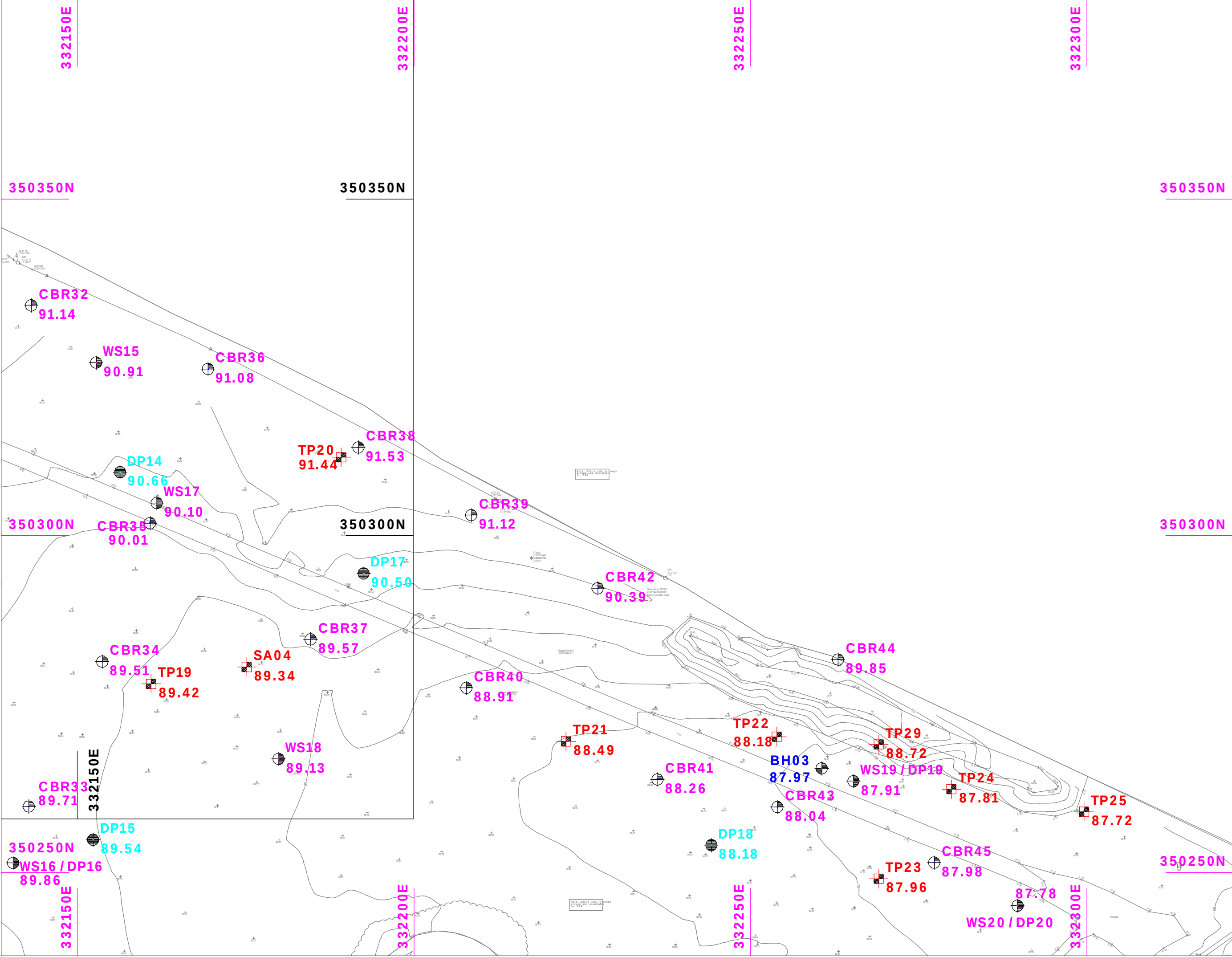
PH (Pokehole)

CP/CBH
(Cable Percussive)

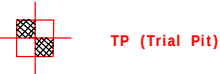
PROJECT: WAST Western Gateway Site
FIGURE NO.: J.3
TITLE: Exploratory Hole Location Plan
Scale: 1:500 A3



Site Surveying Services - AMJ C.E.S.
102 Downton Road
Cheltenham, Gloucestershire
Tel: 01204 441144
Fax: 01204 441144
www.ianfarmer.co.uk
Land Engineering Surveyors
Client: Location: Ian Farmer Associates
WAST - Western Gateway Site
Drawing Title: S.I. Survey
Additional Comments:
To use 02/09/2012 site spec,
all work to site spec, some by GPS
contact us for details
Drawing Number: sss-3772@awarenham
Drawn By: JF
Date: 11/03/11
Setting Out & Control Surveys
Topographic/Volumetric Surveys
GPS Specialists using also
GPS Post Process to tie any site
to OS without trip point or BM
Construction Line Registered
TSA member
Client / Location: Ian Farmer Associates
WAST - Western Gateway Site
Drawing Title: S.I. Survey
Additional Comments:
To use 02/09/2012 site spec,
all work to site spec, some by GPS
contact us for details
Drawing Number: sss-3772@awarenham
Drawn By: JF
Date: 11/03/11
Scale: 1:500, A3



Key: height colours
as code colour



TP (Trial Pit)



WS(Window sample)

Ogl=52
Original Ground Level



BH (Borehole)

PH (Pokehole)

CP/CBH
(Cable Percussive)

PROJECT: WAS1 Western Gateway Site	
FIGURE NO: A4.1	Scale: 1:500 A3
TITLE: Exploratory Hole Location Plan	



Site Surveying Services - AMJ C.E.S. 1st Downham Road Chesham Lancs BB8 4AU Tel 01204411144 Fax 01204376338 www.ianfarmer.co.uk Land Engineering Surveyors TSA member	
Client / Location: Ian Farmer Associates WAS1 - Western Gateway Site Drawing Title: S.I. Survey	
Additional Comments: To use 02/09/2012 see spec, all work to spec, some by gps contact us for details Drawing Number: sss-3772@ianfarmer Drawn By: JF Date: 11/03/11	
Setting Out & Control Surveys Topographic/Volumetric Surveys GPS Post Process to tie any site to OS without trip point or BM Construction Line Registered TSA member	
Checked By: JF Scale: 1:500, A3	

APPENDIX 2

SITE WORK

APPENDIX 2

GENERAL NOTES ON SITE WORKS

A2.1 SITE WORK

A2.1.1 Light Cable Percussion Boring

For routine soil exploration to depths in excess of 3m, the light cable percussion rig is generally employed for boring through soils and weak rocks. It consists of a powered winch and tripod frame, with running wheels that are permanently attached so that the rig may be towed behind a suitable vehicle. The rig is towed into position and set up using its own winching system.

The locations of services are checked to make sure the borehole is not situated unacceptably near any services. Regardless of the proximity of services, a CAT scan is undertaken at the borehole location and a trial hole dug to 1.20m by hand.

Boreholes are advanced in soil by the percussive action of the cable tool. The force of the cylindrical tool as it is dropped a short distance cuts a plug of cohesive soil that is removed by the tool.

In non-cohesive soils, the borehole is advanced by a 'shell', otherwise known as a 'bailer' or 'sand pump', which incorporates a clack valve. Material is transferred into the shell and retained by the clack valve. The water level in a borehole is maintained above that in the surrounding granular soil to allow for temporary reductions in the head of water as the shell is withdrawn from the borehole. Water should flow from the borehole into the surrounding soil at all times to prevent 'piping' and loosening the soil at the base of the hole. The casing is always advanced with the borehole in granular soil so that material is drawn from the base rather than the borehole sides.

Obstructions to boring are overcome by fitting a serrated chiselling ring to the base of the percussion tool. For large obstructions, a heavy chisel with a hardened cutting edge may have to be used.

Disturbed samples are taken in polythene bags, jars or tubs that are sealed against air or water loss.

Undisturbed samples are generally taken in cohesive materials at changes in strata and at one metre intervals to 5 metres then at 1.5 metre intervals to the full depths of the borehole. The general purpose open-tube sampler is suitable for firm to stiff clays, but is often used to retrieve disturbed samples of weak rocks, soft or hard clay and also clayey sand or silts. This has been adopted for routine use, and usually consists of a 100mm internal diameter tube (U100), which is capable of taking soil samples up to 450mm in length. The undisturbed samples are sealed at each end using micro-crystalline wax to prevent drying.

Standard penetration tests are generally carried out in non-cohesive soils but also in stiff clays and soft rocks at frequencies similar to that of undisturbed sampling.

A2.1.2 Drive-in Window Sampler

The drive-in window sampler consists of a series of cylindrical sample tubes, generally varying in diameter from 80mm to 35mm. A cutting shoe is fitted to the bottom of each tube, while a window, representing about a quarter of the circumference, is cut along the length of the tube.

The largest diameter tube is driven into the ground using a small vibrating breaker. The sample tube is extracted by means of a ratchet or hydraulic extraction system.

The borehole is extended by using progressively smaller diameter tubes.

Soil samples are extracted through the window of the tube.

A2.1.3 Dynamic Probing Heavy, DPH

This covers the determination of the resistance of in-situ soil to a 90° cone being driven dynamically, ref 5.3. Dynamic Probing can be used to determine presence of variations in strata, however, since samples are not recovered, it should be carried out in conjunction with sampling.

In principle, the test consists of driving a 90° cone of 15cm² cross-sectional area into the ground using a 50kg drop hammer falling a standard height of 500mm. At regular intervals, in order to minimise friction on the shaft, the rods are turned.

The results are recorded as the number of blows of the hammer to drive the cone 100mm, N_{100} , together with the torque to turn the rods.

As an approximate correlation, the resistance determined by the DPH may be related to the SPT 'N' value as:

$$\text{'N' value} = 2 \times N_{100}$$

A2.2 IN-SITU TESTS

A2.2.1 Standard Penetration Test

The Standard Penetration Test is carried out in accordance with the proposals recommended by BS 1377, Part 9, 1990, ref 5.3.

The standard penetration test, **SPT**, covers the determination of the resistance of soils to the penetration of a split barrel sampler. A 50mm diameter split barrel sampler is driven 450mm into the soil using a 65kg hammer with a 760mm drop. The penetration resistance is expressed as the number of blows required to obtain 300mm penetration below an initial seating drive of 150mm through any disturbed ground at the bottom of the borehole. The number of blows to achieve the standard penetration of 300mm is reported as the 'N' value.

The test is generally carried out in fine soils, however, it may also be carried out in coarse granular soils, weak rocks and glacial tills using the same procedure as for the SPT but with a 50mm diameter, 60° apex solid cone replacing the split spoon sampler, **CPT**.

When attempting the standard penetration test in very dense material or weathered rocks it may be necessary to terminate the test before completion to prevent damage to the equipment. In these circumstances it is important to distinguish how the blow count relates to the penetration of the sampler. This may be achieved in the following manner:

- Where the seating drive has been completed, the test drive is terminated if 50 blows are reached before the full penetration of 300mm is achieved. The penetration for 50 blows is recorded and an approximate N value obtained by linear extrapolation of the number of blows for the partial test drive.
- If the seating drive of 150mm is not achieved within the first 25 blows, the penetration after 25 blows is recorded and the test drive then commenced.
- For tests in soft rocks, the test drive should be terminated after 100 blows where the penetration of 300mm has not been achieved.

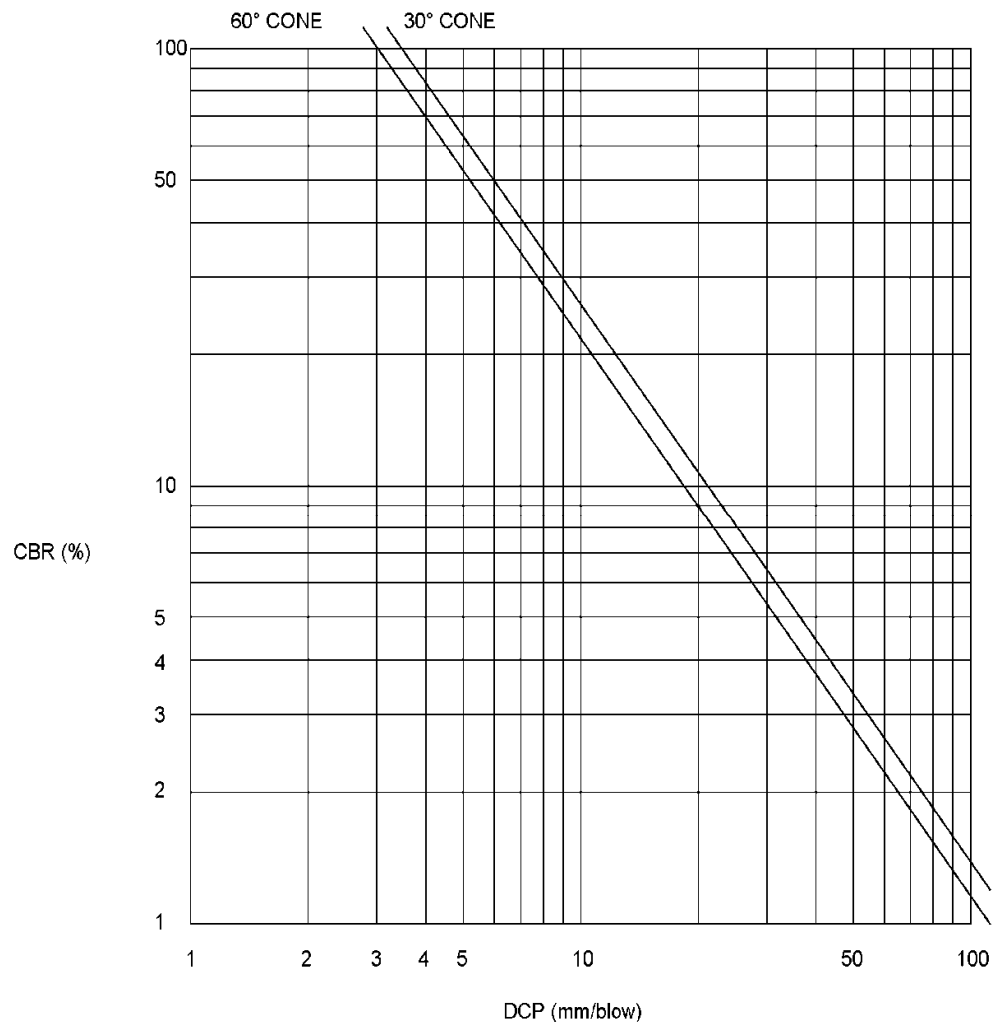
The N-value obtained from the Standard Penetration Test may be used to assess the relative density of sands and gravels as follows:

Term	SPT N-Value : Blows/300mm Penetration
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Over 50

A2.2.2 Dynamic Cone Penetrometer, DCP

The dynamic cone penetrometer consists of a 16mm diameter rod with a 20mm diameter, 60° cone of tempered steel at one end. The impact is provided by means of an 8kg sliding hammer falling 575mm. The total weight of the instrument is about 12kg.

The correlation of DCP to California Bearing Ratio, CBR, has been determined to be as below.



A2.3 SAMPLES

U(x) represents undisturbed 100mm diameter sample with (x) being the number of blows required to obtain sample.

U NR| indicates undisturbed sample not recovered

B represents large bulk disturbed samples

D represents small disturbed sample

J represents chemical disturbed sample

W represents water sample

▽ represents water strike

▼ represents level to which water rose

A2.4 DESCRIPTION OF SOILS

A2.4.1 General

The procedures and principles given in Section 6 of BS 5930, ref. 5.2 have been used in the soil descriptions contained within this report.



**IAN FARMER
ASSOCIATES**

Site

WAST - Western Gateway Site

**Borehole
Number**

BH01

Boring Method

Cable Percussion

Casing Diameter

200mm cased to 9.00m
150mm cased to 19.40m

Ground Level (mOD)

97.04

Client

BAM Construction Limited

**Job
Number**

40822

Location

332087.41 E 350357.36 N

Dates

02/03/2011-
03/03/2011

Engineer

Arup

Sheet

1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50-1.00	J1 B2				96.64	(0.40) 0.40	MADE GROUND: Clay, stone and brick fill (driller's description).			
1.00 1.20-1.65	J3 U4 0.32		DRY	26 blows			MADE GROUND: Loose, brown/dark brown, slightly clayey, slightly gravelly, medium SAND. Gravel is angular to subrounded, fine and medium including quartz, sandstone and occasional brick.			
1.65-1.70	D5									
2.00-2.45 2.00-2.45 2.00-2.45	SPT N=7 B7 D6	1.50	DRY	1,2/2,2,1,2		(3.90)				
2.80 3.00-3.45	D8 U9 0.45	2.90	DRY	55 blows						
3.45-3.50	D10									
4.00-4.45 4.00-4.45 4.00-4.45	SPT N=37 B12 D11	3.00	DRY	2,1/2,12,12,11	92.74	4.30	Medium dense, brown, slightly clayey, slightly silty, medium to coarse SAND and angular to subrounded, fine to coarse GRAVEL including sandstone, quartz and siltstone.			
4.80	D13									
5.00-5.45 5.00-5.45 5.00-5.45	SPT N=13 B15 D14	4.50	DRY	3,2/2,3,3,5		(1.50)				
5.80	D16				91.24	5.80	Below 5.00m: low cobble content of sandstone.			
6.00-6.45 6.00-6.45	SPT N=11 B17	5.90	DRY	3,3/2,3,4,2			Medium dense, red brown, slightly gravelly, medium to coarse SAND. Gravel is subangular to subrounded, fine to coarse including sandstone and siltstone. With low cobble content.			
7.00	D18			slight seepage(1) at 6.50m.		(2.00)				
7.50-7.95	U19 0.45	7.40	DAMP	29 blows	89.24	7.80	Firm, brown, sandy CLAY.			
7.95-8.00	D20									
9.00-9.45 9.00-9.45 9.00-9.45	SPT N=35 B22 D21	8.90	DRY	2,3/4,7,10,14		(2.20)	Below 9.00m: very stiff.			
					87.04	10.00				

Remarks

Samples marked "J" comprise 1 x amber jar and 1 x plastic tub.
Excavating from 0.00m to 1.20m for 1.00 hour.

**Scale
(approx)**

1:50

**Logged
By**

HH

Figure No.

40822.BH01

							Site WAST - Western Gateway Site		Borehole Number BH01		
Boring Method Cable Percussion		Casing Diameter 200mm cased to 9.00m 150mm cased to 19.40m			Ground Level (mOD) 97.04		Client BAM Construction Limited			Job Number 40822	
		Location 332087.41 E 350357.36 N			Dates 02/03/2011- 03/03/2011		Engineer Arup			Sheet 2/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr	
10.00	D23						Very dense, brown, clayey, very sandy, subrounded and rounded, fine to coarse GRAVEL including sandstone and siltstone.				
10.50-10.95 10.50-10.95	SPT(C) N=50 B24	10.40	DRY	8,10/12,10,14,14							
							Below 10.50m: with medium cobble content.				
11.50	D25					(3.00)					
12.00-12.45 12.00-12.45	B27 D26			Water strike(2) at 12.00m, rose to 11.70m in 20 mins. 3,2/2,2,1,3			Below 12.00m: loose with high cobble content and bands of silty clay.				
12.00-12.45	SPT N=8	11.90	11.70								
13.00	D28				84.04	13.00	Soft, orange brown, slightly sandy SILT.				
13.50-13.95 13.50-13.95	SPT N=7 B29	13.40	12.00	2,2/1,2,2,2		(0.80)					
					83.24	13.80	Dense, brown, sandy, subangular to rounded, fine to coarse GRAVEL including sandstone, siltstone and quartz. With high cobble content.				
14.50	D30										
15.00-15.45 15.00-15.45	SPT(C) N=44 B31	14.90	12.90	2,3/7,10,12,15		(3.30)					
16.00	D32										
16.50-16.95 16.50-16.95	SPT(C) N=46 B33	16.40	12.10	7,10/12,10,12,12							
					79.94	17.10	Stiff, brown, sandy, gravelly CLAY with low cobble content. Gravel is subangular to rounded, fine to coarse including sandstone, mudstone and siltstone.				
17.50	D34										
18.00-18.30 18.00-18.45	SPT(C) 50/145 B35	17.90	12.20	12,13/18,32		(2.90)	Below 18.00m: very stiff.				
19.00	D36										
19.50-19.78	SPT(C) 50/125	19.40	12.50	10,15/23,27	77.04	20.00					
Remarks Chiselling from 10.30m to 10.50m for 0.50 hours.								Scale (approx)	Logged By		
								1:50	HH		
								Figure No. 40822.BH01			



**IAN FARMER
ASSOCIATES**

Site WAST - Western Gateway Site	Borehole Number BH02
Boring Method Cable Percussion	Job Number 40822
Casing Diameter 200mm cased to 9.00m 150mm cased to 14.90m	Engineer Arup
Location 332096.43 E 350285.4 N	Sheet 1/2
Ground Level (mOD) 93.11	Dates 04/03/2011- 07/03/2011
Client BAM Construction Limited	

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50 0.50-1.00	J1 B2						MADE GROUND: Soft, dark brown, sandy, very gravelly, slightly organic CLAY. Gravel is subangular to subrounded, fine to coarse including sandstone, siltstone, mudstone and limestone.			
1.00	J3									
1.20-1.65 1.20-1.65 1.20-1.65	SPT N=8 B5 D4		DRY	2,2/1,3,2,2			Below 1.20m: fabric material, timber fragments, metal fragments including nails and rootlets (domestic waste).			
1.80	D6									
2.00-2.45 2.00-2.45	SPT N=6 B7	1.50	DRY	1,1/1,2,2,1		(3.90)				
2.70	D8						Below 2.70m: plastic bags.			
3.00-3.45 3.00-3.45	SPT N=9 B9	2.90	DRY	3,2/2,1,3,3			Below 3.00m: high domestic waste content.			
3.70	D10									
4.00-4.45 4.00-4.45 4.00-4.45	SPT N=10 B12 D11	3.90	DRY	3,2/2,1,3,4	89.21	3.90 (1.10)	Firm, light brown, very sandy, gravelly CLAY with low cobble content. Gravel is subangular to rounded, fine to coarse including siltstone, mudstone, sandstone and dark grey weathered shale/mudstone.			
4.70	D13									
5.00-5.45 5.00-5.45 5.00-5.45	SPT N=17 B15 D14	4.50	DRY	3,4/4,3,3,7	88.11	5.00 (1.00)	Medium dense, brown, very clayey, fine to coarse SAND and subangular to rounded, fine to coarse GRAVEL including sandstone and siltstone.			
5.70	D16									
6.00-6.45 6.00-6.45 6.00-6.45	SPT N=17 B18 D17	5.90	DRY	4,4/4,3,4,6	87.11	6.00	Firm, locally stiff, brown, sandy, very gravelly CLAY. Gravel is subangular to rounded, fine to coarse including sandstone and siltstone. With low cobble content.			
7.00	D19									
7.50-7.95 7.50-7.95 7.50-7.95	SPT N=12 B21 D20	7.40	DRY	4,4/3,3,3,3		(4.00)	Below 7.50m: gravel includes weathered shale/mudstone.			
8.50	D22									
9.00-9.45 9.00-9.45	SPT(C) N=20 B23	8.90	DRY	4,4/5,5,5,5						
				slight seepage(1) at 9.50m.	83.11	10.00				

Remarks

Samples marked "J" comprise 1 x amber jar and 1 x plastic tub.
Chiselling from 6.70m to 7.00m for 0.50 hours. Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)
1:50

Logged By
TB

Figure No.
40822.BH02



**IAN FARMER
ASSOCIATES**

Site

WAST - Western Gateway Site

**Borehole
Number**

BH02

Boring Method

Cable Percussion

Casing Diameter

200mm cased to 9.00m
150mm cased to 14.90m

Ground Level (mOD)

93.11

Client

BAM Construction Limited

**Job
Number**

40822

Location

332096.43 E 350285.4 N

Dates

04/03/2011-
07/03/2011

Engineer

Arup

Sheet

2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00	D24						Medium dense, brown, silty, fine to coarse SAND and subangular to rounded, fine to coarse GRAVEL including sandstone and siltstone.			
10.50-10.95 10.50-10.95	SPT(C) N=27 B25	10.40	DAMP	2,1/4,7,7,9		(2.60)	Below 10.50m: becoming very gravelly, fine to coarse sand.			
11.50	D26						Below 11.50m: very silty.			
12.00-12.45 12.00-12.45 12.00-12.45	SPT N=38 B28 D27	11.90	11.50	5,7/6,9,11,12			Below 12.00m: dense.			
13.00	D29				80.51	12.60	Stiff, brown, sandy, slightly gravelly CLAY. Gravel is angular to subrounded, fine to coarse including siltstone and sandstone.			
13.50-13.87 13.50-13.95	SPT(C) 50/220 B30	13.40	DRY	10,15/18,18,14		(2.90)	Below 13.50m: very stiff.			
							At 14.00m: low cobble content.			
14.50	D31									
15.00-15.22	SPT(C) 25*/95 50/125	14.90	DRY	16,9/21,29	77.61	15.50	Complete at 15.50m			

Remarks

Chiselling from 13.50m to 13.80m for 0.75 hours.

**Scale
(approx)**

1:50

**Logged
By**

TB

Figure No.

40822.BH02



Boring Method Cable Percussion	Casing Diameter 200mm cased to 8.50m 150mm cased to 17.90m	Ground Level (mOD) 87.97	Client BAM Construction Limited	Job Number 40822
	Location 332260.66 E 350265.45 N	Dates 28/02/2011- 01/03/2011	Engineer Arup	Sheet 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1				87.67	(0.30) 0.30	MADE GROUND: Stone and soil fill (driller's description).			
						(0.90)	Brown, slightly clayey, slightly gravelly, medium SAND. Gravel is subangular to subrounded, fine to coarse including sandstone, siltstone and quartz.			
1.20-1.65 1.20-1.65 1.20-1.65	SPT N=11 B3 D2		DRY	2,2/3,3,2,3	86.77	1.20	Medium dense, light brown, clayey, slightly silty, medium to coarse SAND and subangular to subrounded, fine to coarse GRAVEL including sandstone and quartz.		▼1	
1.80	D4			Water strike(1) at 1.80m, rose to 1.40m in 20 mins.		(1.50)	Below 2.00m: low cobble content of sandstone.		▼2	
2.00-2.45 2.00-2.45	B5 SPT N=14	1.50	1.80	3,2/3,4,4,3						
2.70	D6			Water strike(2) at 2.70m, rose to 2.00m in 20 mins.	85.27	2.70	Medium dense, light brown, slightly silty, sandy, subangular to subrounded, fine to coarse GRAVEL including sandstone, siltstone, quartz and igneous lithologies.		▼2	
3.00-3.45 3.00-3.45	B7 SPT(C) N=16	2.90	2.00	2,4/4,4,4,4			Below 3.00m: low cobble content of sandstone and siltstone. Below 3.70m: very sandy.			
3.70	D8						At 4.00m: locally dense and high cobble content.			
4.00-4.45 4.00-4.45	SPT(C) N=41 B9	3.90	3.60	3,7/12,11,10,8		(3.60)				
4.70	D10									
5.00-5.45 5.00-5.45	SPT(C) N=22 B11	4.90	4.50	4,5/5,6,5,6						
5.70	D12									
6.00-6.45 6.00-6.45	SPT(C) N=23 B13	5.90	5.60	5,5/6,5,6,6						
					81.67	6.30	Firm, brown, slightly sandy, slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse including sandstone and siltstone.			
						(0.60)				
7.00	D14				81.07	6.90	Brown, slightly clayey, gravelly, medium SAND. Gravel is subangular to subrounded, fine to coarse including sandstone, siltstone, quartz and mudstone.			
						(0.60)				
7.50-7.95 7.50-7.95 7.50-7.95	SPT 50/295 B16 D15	7.40	DRY	6,6/15,9,10,16	80.47	7.50	Stiff, brown, slightly sandy, slightly gravelly, silty CLAY. Gravel is subangular to subrounded, fine to coarse including sandstone, siltstone, mudstone, quartz and occasional lenses of silt.		▼3	
8.50	D17						Below 8.50m: very stiff, sandy and slightly silty. Silt lenses absent.			
9.00-9.28 9.00-9.28 9.00-9.45	SPT 50/125 D18 B19	8.90	8.80	10,15/18,32						

Remarks

Excavating from 0.00m to 1.20m for 1.00 hour.

**Scale
(approx)**
1:50

**Logged
By**
HH

Figure No.
40822.BH03



**IAN FARMER
ASSOCIATES**

Site
WAST - Western Gateway Site

**Borehole
Number**
BH03

Boring Method
Cable Percussion

Casing Diameter
200mm cased to 8.50m
150mm cased to 17.90m

Ground Level (mOD)
87.97

Client
BAM Construction Limited

**Job
Number**
40822

Location
332260.66 E 350265.45 N

Dates
28/02/2011-
01/03/2011

Engineer
Arup

Sheet
2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00	D20									
10.50-10.78	SPT(C) 25*/135 50/145	10.40	10.30	10,15/21,29						
10.50-10.95	D21									
11.00-11.50	B22					(5.50)	Below 11.00m: very sandy.			
12.00-12.23	SPT(C) 25*/125 50/105	11.90	11.70	12,13/34,16						
12.00-12.45	B21									
13.00	D22			Water strike(3) at 13.00m, rose to 8.00m in 20 mins.	74.97	13.00	Soft, brown, clayey, sandy SILT.		V3	
13.50-13.95	SPT N=42 B24	13.40	9.70	4,10/8,11,11,12	74.47	(0.50)				
13.50-13.95	D23					13.50	Dense, brown, silty, fine and medium SAND.			
14.50	D25						Below 14.50m: firm.			
15.00-15.45	SPT N=35 B26	14.90	10.60	4,5/7,10,8,10						
15.00-15.45										
16.00	D27									
16.50-16.95	SPT N=41 B28	16.40	11.40	5,8/10,10,10,11		(6.50)				
16.50-16.95										
17.50	D29									
18.00-18.45	SPT N=40	17.90	12.50	6,6/6,12,10,12						
18.00-18.45										
19.00	B30									
19.50-19.95	SPT N=45 B32			8,10/10,10,12,13						
19.50-19.95	D31									
19.50-19.95					67.97	20.00				

Remarks

**Scale
(approx)**
1:50

**Logged
By**
HH

Figure No.
40822.BH03



Site WAST - Western Gateway Site	Borehole Number BH04
Boring Method Cable Percussion	Job Number 40822
Casing Diameter 200mm cased to 9.80m	Engineer Arup
Ground Level (mOD) 91.95	Sheet 1/2
Location 331976.61 E 350282.08 N	
Dates 07/03/2011- 08/03/2011	

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1				91.65	(0.30) 0.30	Grass over: Dark brown TOPSOIL.			
1.20-1.65 1.20-1.65	SPT N=7 B2		DRY	2,2/1,2,2,2	90.75	(0.90) 1.20	Soft, brown, slightly silty, slightly sandy, gravelly CLAY. Gravel is subangular to subrounded, fine to coarse including sandstone and siltstone.			
1.80	D3									
2.00-2.45 2.00-2.45 2.00-2.45	SPT N=17 B5 D4	1.50	DRY	2,4/7,3,3,4		(1.80)	Below 2.00m: stiff and very sandy.			
2.70	D6									
3.00-3.45 3.00-3.45 3.00-3.45	SPT N=10 B8 D7	2.90	DRY	2,5/3,2,2,3	88.95	3.00	Loose to medium dense, brown, clayey, sandy, angular to subrounded, fine to coarse GRAVEL including sandstone, siltstone and quartz.			
3.70	D9									
4.00-4.45 4.00-4.45	SPT(C) N=9 B10	3.00	DAMP	slight seepage(1) at 3.70m. 3,3/2,2,2,3		(3.00)			▽1 ▽2 ▽2	
4.70	D11			Water strike(2) at 4.50m, rose to 4.10m in 20 mins.						
5.00-5.45 5.00-5.45	SPT(C) N=23 B12	4.50	4.50	4,4/4,5,6,8			Below 5.00m: medium dense, slightly clayey, very sandy with medium cobble content.			
5.70	D13									
6.00-6.45 6.00-6.45	SPT(C) N=42 B14	5.90	5.60	9,9/12,10,10,10	85.95	6.00	Dense, brown, silty, slightly gravelly, fine to coarse SAND with medium subangular cobble content. Gravel is angular to subrounded, fine to coarse including sandstone, siltstone and quartz.		▽3	
7.00	D15					(2.10)				
7.50-7.95 7.50-7.95	SPT(C) N=41 B16	7.40	6.80	7,9/10,11,10,10			Below 7.50m: very silty with occasional bands of firm clay.			
8.50	D17				83.85	8.10	Stiff, brown, sandy, gravelly CLAY. Gravel is angular to subrounded, fine to coarse including sandstone, mudstone and siltstone.			
9.00-9.36 9.00-9.45	SPT(C) 50/210 B18	8.90	DRY	10,12/16,16,18			Below 9.00m: very stiff.			
10.00-10.32	SPT(C) 50/170	9.80	7.00	Water strike(3) at 9.50m, rose to 6.70m in 20 mins. 9,13/17,20,13		(2.35)			▽3	

Remarks

Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)
1:50

Logged By
TB

Figure No.
40822.BH04



**IAN FARMER
ASSOCIATES**

Site

WAST - Western Gateway Site

**Borehole
Number**

BH04

Boring Method

Cable Percussion

Casing Diameter

200mm cased to 9.80m

Ground Level (mOD)

91.95

Client

BAM Construction Limited

**Job
Number**

40822

Location

331976.61 E 350282.08 N

Dates

07/03/2011-
08/03/2011

Engineer

Arup

Sheet

2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					81.50	(2.35) 10.45	Complete at 10.45m			

Remarks

**Scale
(approx)**

1:50

**Logged
By**

TB

Figure No.

40822.BH04

IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Number WS01	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 92.39		Client BAM Construction Limited		Job Number 40822	
		Location 331942.26 E 350259.33 N		Dates 22/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1			92.09	(0.30) 0.30	Grass over TOPSOIL (driller's description).			
					(0.90)	Brown, clayey, very gravelly, fine and medium SAND. Gravel is subangular to rounded, fine to coarse including sandstone.			
1.30	D2			91.19	1.20	Brown, clayey, sandy, angular and subangular, fine to coarse GRAVEL including sandstone and mudstone.			
1.90	D3				(1.80)				
2.70	D4								
				89.39	3.00	Brown SAND and subangular to rounded, fine to coarse GRAVEL of various lithologies including sandstone and mudstone.			
3.70	D5		Water strike(1) at 3.70m.		(2.00)			Σ1	
4.70	D6			87.39	5.00				
						Complete at 5.00m			
Remarks Recovery: 1.20-2.00m = 65-75%, 2.00-3.00m = 45-55%, 3.00-4.00m = 45-55% and 4.00-5.00m = 45-55%. Excavating from 0.00m to 1.20m for 1.00 hour.								Scale (approx)	Logged By
								1:50	IJ
								Figure No. 40822.WS01	



Site WAST - Western Gateway Site		Number WS02
Excavation Method Drive-in Window Sampler	Dimensions	Ground Level (mOD) 92.23
Client BAM Construction Limited		Job Number 40822
Location 331956.49 E 350247.62 N		Dates 21/02/2011
Engineer Arup		Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1			91.93	(0.30) 0.30	Grass over TOPSOIL (driller's description).			
					(0.90)	MADE GROUND: Brown, fine to coarse SAND and subrounded and rounded, fine to coarse GRAVEL of sandstone.			
1.20-1.65 1.20-1.65 1.30	SPT N=10 D2 D3		1,1/2,3,3,2	91.03	1.20 (0.40)	MADE GROUND: Loose to medium dense, brown, clayey, sandy, angular and subangular, fine to coarse GRAVEL including sandstone and brick.			
1.90 2.00-2.45 2.00-2.45	D4 SPT N=7 D5		2,2/2,1,2,2	90.63	1.60 (0.40)	Firm, brown, sandy CLAY with bands of silt and occasional angular and subangular, fine gravel including mudstone (possible made ground).			
2.50	J6			90.23	2.00	Loose, brown, clayey, sandy, angular and subangular, fine to coarse GRAVEL including coal, sandstone and siltstone.			
2.90 3.00-3.45 3.00-3.45	D7 D8 SPT N=19		Water strike(1) at 3.00m. 4,6/6,5,4,4	89.23	3.00	Medium dense, brown SAND and angular to rounded, fine to coarse GRAVEL including sandstone and mudstone.		W1	
3.50	D9								
4.00-4.45	SPT N=4		4,2/1,1,1,1		(2.00)	At 4.00m: loose.			
4.50	D10			87.23	5.00	Complete at 5.00m			

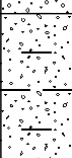
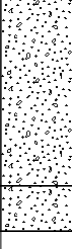
Remarks

Recovery: 1.20-2.00m = 60-70%, 2.00-3.00m = 70-80%, 3.00-4.00m = 50-60% and 4.00-5.00m = 60-70%.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)
1:50

Logged By
IJ

Figure No.
40822.WS02

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Number WS03	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 92.18		Client BAM Construction Limited		Job Number 40822	
		Location 331959.19 E 350269.02 N		Dates 21/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1			91.88	(0.30) 0.30	Grass over TOPSOIL (driller's description).			
1.20-1.65 1.20-1.65 1.30	SPT N=13 D2 D3		1,1/2,3,4,4		(1.70)	Firm, brown, sandy, gravelly CLAY. Gravel is angular to subrounded, fine to coarse including sandstone and pockets of silt.			
1.80	D4								
2.00-2.45 2.00-2.45	SPT N=5 D5		3,3/2,1,1,1	90.18	2.00	Loose, brown, clayey, very sandy, angular to subrounded, fine to coarse GRAVEL including sandstone and bands of sand.			
2.50	D6				(1.00)				
3.00-3.45	SPT(C) N=8		2,3/3,2,1,2	89.18	3.00	Loose, brown, locally clayey SAND and subangular to rounded, fine to coarse GRAVEL of various lithologies including mudstone. With bands of sand.			
3.50	D7								
4.00-4.45	SPT(C) N=9		Water strike(1) at 4.00m. 1,3/2,2,2,3		(2.20)				
4.50	D8								
5.00-5.45 5.30	SPT(C) N=30 D9		2,3/5,7,9,9	86.98 86.68	5.20 (0.30) 5.50	Brown, very clayey SAND and angular to rounded, fine to coarse GRAVEL of various lithologies including sandstone.			
						Complete at 5.50m			
Remarks Excavating from 0.00m to 1.00m for 1.00 hour.							Scale (approx) 1:50	Logged By IJ	Figure No. 40822.WS03

IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Number WS04	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 92.16		Client BAM Construction Limited		Job Number 40822	
		Location 331958.3 E 350296.11 N		Dates 22/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1			91.86	(0.30) 0.30	Grass over TOPSOIL (driller's description).			
					(0.90)	Brown, very clayey, slightly gravelly, fine and medium SAND with roots. Gravel is subrounded and rounded, fine to coarse of sandstone.			
1.20-1.65 1.20-1.65 1.30	SPT N=15 D2 D3		2,4/4,4,3,4	90.96	1.20 (0.60)	Medium dense, brown, clayey, sandy, angular to rounded, fine to coarse GRAVEL including sandstone and quartz.			
1.80	D4			90.36	1.80	Loose to medium dense, brown, very sandy, subangular to rounded occasionally tabular, fine to coarse GRAVEL including sandstone and mudstone.			
2.00-2.45 2.00-2.45	SPT N=10 D5		3,3/2,2,3,3						
2.40	D6								
2.90 3.00-3.45 3.00-3.45	D7 SPT N=5 D8		3,2/2,1,1,1		(3.00)				
3.50	D9					At 3.00m: loose.			
4.00-4.45	SPT(C) N=15		Water strike(1) at 4.00m. 3,3/4,3,4,4			At 4.00m: medium dense.		Σ1	
4.50	D10			87.36 87.16	4.80 (0.20) 5.00	Brown SAND and subangular to rounded, fine to coarse GRAVEL of various lithologies.			
						Complete at 5.00m			
Remarks Recovery: 1.20-2.00m = 75-85%, 2.00-3.00m = 60-70%, 3.00-4.00m = 50-60% and 4.00-5.00m = 70-80%. Excavating from 0.00m to 1.20m for 1.00 hour.							Scale (approx) 1:50	Logged By IJ	Figure No. 40822.WS04



Excavation Method Drive-in Window Sampler	Dimensions	Ground Level (mOD) 91.89	Client BAM Construction Limited	Job Number 40822
	Location 331977.43 E 350275.92 N	Dates 22/02/2011	Engineer Arup	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50-1.00	B1			91.59	(0.30) 0.30	Grass over TOPSOIL (driller's description).		
					(0.90)	Brown, clayey, gravelly, fine and medium SAND. Gravel is subrounded and rounded, fine to coarse of sandstone.		
1.20-1.65 1.20-1.65 1.30	SPT N=11 D2 D3		3,2/2,2,3,4	90.69	1.20	Firm, brown, sandy, gravelly CLAY. Gravel subrounded and rounded, fine to coarse including sandstone.		
1.80	D4			90.29	1.60	Medium dense, brown, very, clayey SAND and angular to rounded, fine to coarse GRAVEL including sandstone. Clay nodules present.		
2.00-2.45 2.00-2.45 2.10	SPT N=11 D5 D6		1,1/3,2,2,4		(1.00)			
2.80	D7			89.29	2.60	Loose, brown, slightly clayey SAND and angular to rounded, fine to coarse GRAVEL including sandstone and mudstone.		▽1
3.00-3.45	SPT(C) N=6		Water strike(1) at 2.90m. 1,1/1,2,2,1		(1.90)			
3.50	D8							
4.00-4.45	SPT(C) N=9		2,2/2,3,2,2					
				87.39	4.50	Brown, slightly gravelly, fine to coarse SAND. Gravel is subrounded and rounded, fine to medium including mudstone.		
4.70	D9			86.89	(0.50) 5.00	Complete at 5.00m		

Remarks

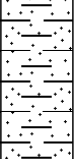
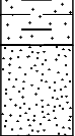
Recovery: 1.20-2.00m = 80-90%, 2.00-3.00m = 60-70%, 3.00-4.00m = 45-50% and 4.00-5.00m = 50-60%.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)
1:50

Logged By
IJ

Figure No.
40822.WS05

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Number WS06	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 92.47		Client BAM Construction Limited		Job Number 40822	
		Location 331967.4 E 350326.8 N		Dates 22/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1			92.17	(0.30) 0.30	Grass over TOPSOIL (driller's description).			
					(0.90)	Brown, very clayey, fine and medium SAND with occasional subangular to subrounded, fine and medium GRAVEL of sandstone.			
1.20-1.65 1.20-1.65 1.30	SPT N=9 D2 D3		1,1/1,2,3,3	91.27	1.20 (0.40)	Firm, brown, sandy CLAY with occasional angular and subangular, fine to coarse gravel of sandstone.			
1.90 2.00-2.45 2.00-2.45	D4 SPT N=9 D5		1,1/2,2,2,3	90.87 90.47	1.60 (0.40) 2.00	Brown and grey, sandy, angular and subangular, fine to coarse GRAVEL including limestone, quartz and sandstone.			
2.40	D6					Loose, brown, clayey, slightly sandy, angular to rounded, fine to coarse GRAVEL including sandstone and mudstone.			
3.00-3.45 3.10	SPT(C) N=5 D7		Water strike(1) at 2.90m. 1,1/1,2,1,1		(1.70)				
3.80	D8			88.77	3.70 (0.30)	Brown SAND and angular to subrounded, fine to coarse GRAVEL including sandstone.			
4.00-4.45	SPT(C) N=8		2,2/2,2,1,3	88.47	4.00	Loose, grey, brown, slightly sandy, subangular to rounded, fine to coarse GRAVEL including sandstone.			
4.50	D9				(1.00)				
				87.47	5.00				
						Complete at 5.00m			
Remarks Recovery: 1.20-2.00m = 65-75%, 2.00-3.00m = 75-85%, 3.00-4.00m = 70-80% and 4.00-5.00m = 10-20%.								Scale (approx) 1:50	Logged By IJ
								Figure No. 40822.WS06	

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Number WS08	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 93.02		Client BAM Construction Limited		Job Number 40822	
		Location 332023.54 E 350390.76 N		Dates 01/03/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1				(1.20)	MADE GROUND: Dark grey brown, sandy, angular and subangular, fine to coarse GRAVEL including concrete and brick.			
1.20-1.65 1.30	SPT(C) N=6 D2		1,2/1,2,2,1	91.82 91.62	1.20 (0.20) 1.40	MADE GROUND: Firm, dark brown, very sandy CLAY.			
1.90 2.00-2.45	D3 SPT(C) N=7		1,2/2,1,2,2		(1.40)	Firm, brown, sandy CLAY with occasional angular and subangular, coarse gravel of coal and sandstone. Silt lenses present.			
2.40	D4		Water strike(1) at 2.60m.	90.22	2.80			▽1	
3.00-3.45 3.10	SPT(C) N=4 D5		1,1/1,1,1,1		(0.60)	Loose, brown, fine to coarse SAND.			
				89.62	3.40	Stiff, grey brown CLAY.			
3.90 4.00-4.45	D6 SPT(C) N=50		6,10/12,13,12,13		(1.05)	At 4.00m: very stiff.			
				88.57	4.45				
						Complete at 4.45m			
Remarks Recovery: 1.20-2.00m = 85-95%, 2.00-3.00m = 95-100% and 3.00-4.00m = 90-100%. Excavating from 0.00m to 1.20m for 1.00 hour.							Scale (approx) 1:50	Logged By IJ	Figure No. 40822.WS08



**IAN FARMER
ASSOCIATES**

Site

WAST - Western Gateway Site

**Number
WS10**

Excavation Method

Drive-in Window Sampler

Dimensions

Ground Level (mOD)

92.84

Client

BAM Construction Limited

**Job
Number
40822**

Location

332054.08 E 350382.55 N

Dates

01/03/2011

Engineer

Arup

**Sheet
1/1**

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1			92.44	(0.40) 0.40	MADE GROUND: Roadstone (driller's description).			
					(0.80)	MADE GROUND: Brown, clayey SAND and angular to rounded, fine to coarse GRAVEL including sandstone and brick.			
1.20-1.65 1.30	SPT(C) N=4 D2		1,0/1,1,1,1 Water strike(1) at 1.50m.	91.64 91.44	1.20 (0.20) 1.40	Soft, grey pseudo fibrous, plastic PEAT.			
					(0.60)	Brown, locally clayey SAND and angular and subangular, fine to coarse GRAVEL of sandstone.			
1.90 2.00-2.45 2.10	D3 SPT(C) N=4 D4		1,1/1,1,1,1	90.84 90.54	2.00 (0.30) 2.30	Loose, brown, silty, fine SAND.			
						Firm, brown, slightly gravelly CLAY. Gravel is angular to subrounded, fine occasionally medium including siltstone, mudstone and coal.			
2.70	D5								
3.00-3.45	SPT(C) N=14		2,3/3,4,4,3						
3.20	D6				(2.30)				
3.70	D7								
4.00-4.45 4.10	SPT(C) N=22 D8		5,5/5,6,6,5			At 4.00m: stiff.			
4.60	D9			88.24	4.60				
4.82 4.90 5.00-5.44	D10 D11 SPT(C) 50/290		8,10/12,13,14,11		(0.84)	Dense, brown, silty, gravelly, fine and medium SAND. Gravel is subangular to subrounded, fine and medium. Between 4.80m and 4.85m: black angular and subangular fine to coarse pocket of coal.			
				87.40	5.44	Complete at 5.44m			

Remarks

Recovery: 1.20-2.00m = 90-100%, 2.00-3.00m = 90-100%, 3.00-4.00m = 85-95% and 4.00-5.00m = 95-100%.
Excavating from 0.00m to 1.20m for 1.00 hour.

**Scale
(approx)**

1:50

**Logged
By**

IJ

Figure No.

40822.WS10



Site WAST - Western Gateway Site	Number WS11
Excavation Method Drive-in Window Sampler	Client BAM Construction Limited
Dimensions	Job Number 40822
Location 332077.91 E 350342.99 N	Engineer Arup
Ground Level (mOD) 92.69	Sheet 1/1
Dates 01/03/2011	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1			92.19	(0.50) 0.50	MADE GROUND: Soil and brick fill (driller's description).			
				91.69	(0.50) 1.00	MADE GROUND: Brown SAND and angular to rounded, fine to coarse GRAVEL including sandstone.			
1.20-1.65	SPT(C) N=7		1,1/2,2,1,2			MADE GROUND: Loose, brown mottled grey, sandy, angular and subangular occasionally rounded, fine to coarse GRAVEL including sandstone, mudstone and ash.			
1.80	D2								
2.00-2.45	SPT(C) N=19		9,7/5,5,5,4		(2.24)	Below 2.00m: medium dense.			
2.80	D3								
3.00-3.24	SPT(C) 25*/110 50/130		14,11/27,23	89.45	3.24	At 3.00m: very dense.			
						Complete at 3.24m			

Remarks Recovery: 1.20-2.00m = 45-55% and 2.00-3.00m = 25-35%. Excavating from 0.00m to 1.20m for 1.00 hour.	Scale (approx) 1:50	Logged By IJ
	Figure No. 40822.WS11	



Site WAST - Western Gateway Site	Number WS12
Excavation Method Drive-in Window Sampler	Client BAM Construction Limited
Dimensions	Job Number 40822
Location 332116.34 E 350347.3 N	Engineer Arup
Ground Level (mOD) 92.90	Sheet 1/1
Dates 28/02/2011	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1			92.70 92.60	(0.20) 0.20 (0.10) 0.30	MADE GROUND: Brown TOPSOIL (driller's description). MADE GROUND: Compact road stone (driller's description).			
1.20-1.65 1.30	SPT(C) N=6 D2		1,2/2,2,1,1	91.70	1.20	MADE GROUND: Brown, slightly clayey SAND and subangular to rounded, fine to coarse GRAVEL including sandstone.			
1.80	D3			91.30	1.60	MADE GROUND: Loose, brown, very clayey, sandy, subangular to rounded, fine to coarse GRAVEL including sandstone.			
2.00-2.45	SPT(C) N=5		1,1/2,1,1,1	90.90	2.00	Soft, brown, very sandy, slightly gravelly CLAY with subrounded and rounded, fine to coarse gravel including sandstone. With pockets of sand.			
2.50	D4					Loose, brown, clayey, fine to coarse SAND and angular and subangular, fine to coarse GRAVEL including sandstone, mudstone and coal.			
3.00-3.45	SPT(C) N=3		1,0/1,0,1,1		(2.00)	Below 3.00m: very loose.			
3.50	D5								
4.00-4.45	SPT(C) N=3		1,0/1,1,0,1	88.90	4.00	Very loose, brown, fine to coarse SAND and angular and subangular, fine to coarse GRAVEL including sandstone and mudstone.			
4.50	D6				(1.60)				
5.00-5.45 5.10	SPT(C) N=16 D7		Water strike(1) at 4.90m. 2,3/4,4,4,4			Below 5.00m: medium dense.			
5.80	D8			87.30	5.60	Firm, brown CLAY with occasional lenses of silt and occasional angular and subangular, fine gravel of mudstone.			
6.00-6.45	SPT(C) N=6		1,1/1,1,2,2	86.45	(0.85) 6.45				
						Complete at 6.45m			

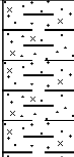
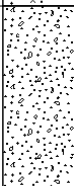
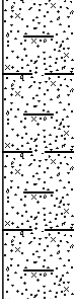
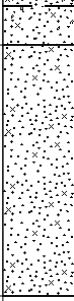
Remarks

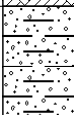
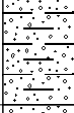
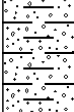
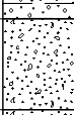
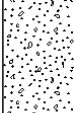
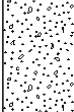
Recovery: 1.20-2.00m = 70-80%, 2.00-3.00m = 60-70%, 3.00-4.00m = 50-60%, 4.00-5.00m = 60-70% and 5.00-6.00m = 85-95%.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)
1:50

Logged By
IJ

Figure No.
40822.WS12

IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Number WS13	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 90.18		Client BAM Construction Limited		Job Number 40822	
		Location 332127.21 E 350284.82 N		Dates 02/03/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-1.20	B1			89.98	(0.20) 0.20	Grass over TOPSOIL (driller's description).			
					(1.10)	Firm, brown, slightly silty, sandy CLAY.			
1.20-1.65 1.40	SPT(C) N=7 D2		1,2/2,2,1,2	88.88	1.30	Loose, brown, medium to coarse SAND and subangular to subrounded, fine to coarse GRAVEL including sandstone, quartz, quartzite and siltstone.			
1.70	D3				(1.20)				
2.00-2.45	SPT(C) N=6		2,1/1,1,2,2			Loose, brown, slightly clayey, slightly silty, gravelly, medium to coarse SAND. Gravel is subangular to subrounded, fine to coarse including sandstone, siltstone, mudstone and igneous lithologies. With low cobble content throughout.			
2.30	D4			87.68	2.50				
2.50	D5								
2.80	D6								
3.00-3.45	SPT(C) N=7		1,2/1,2,2,2			Very loose, brown, slightly silty, medium to coarse SAND.			
					(2.30)				
3.80	D7								
4.00-4.45	SPT(C) N=9		1,2/2,2,2,3						
4.50	D8			85.38	4.80	At 6.00m: loose to medium dense.			
4.80	D9								
5.00-5.45	SPT(C) N=3		1,0/1,0,1,1 Water strike(1) at 5.10m.			Complete at 6.45m			
5.30	D10				(1.65)				
5.80	D11								
6.00-6.45	SPT(C) N=10		1,2/2,2,3,3	83.73	6.45				
Remarks Recovery: 1.20-2.00m = 75%, 2.00-3.00m = 60%, 3.00-4.00m = 50%, 4.00-5.00m = 45% and 5.00-6.00m = 60%. Excavating from 0.00m to 1.20m for 1.00 hour.								Scale (approx) 1:50	Logged By HH
								Figure No. 40822.WS13	

IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Number WS14	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 90.61		Client BAM Construction Limited		Job Number 40822	
		Location 332132.56 E 350304.21 N		Dates 24/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1			90.31	(0.30) 0.30	Grass over TOPSOIL (driller's description).			
					(1.40)	Soft, brown, sandy, slightly gravelly CLAY. Gravel is subrounded and rounded, fine to coarse including mudstone.			
1.20-1.65 1.20	SPT(C) N=1 J2		1,0/0,0,0,1			Below 1.20m: very soft.			
2.00-2.45 2.10	SPT(C) N=8 D3		2,2/2,2,2,2	88.91	1.70	Firm, brown, sandy, gravelly CLAY. Gravel is subrounded and rounded, fine to coarse including sandstone and mudstone. Bands of sand present.			
2.50	D4			88.01	2.60	Brown, clayey SAND and rounded and subrounded, fine to coarse GRAVEL of various lithologies.			
2.80	D5				(0.60)				
3.00-3.45	SPT(C) N=3		1,1/1,1,1,0	87.41	3.20	Loose, brown SAND and rounded and subrounded, fine to coarse GRAVEL including sandstone and mudstone.			
3.70	D6								
4.00-4.45	SPT(C) N=5		1,1/1,1,1,2						
4.70	J7				(3.25)				
5.00-5.45	SPT(C) N=6		2,2/2,1,1,2						
			Water strike(1) at 5.60m.						
6.00-6.45	SPT(C) N=10		1,2/3,2,2,3	84.16	6.45	Complete at 6.45m			
Remarks Recovery: 1.20-2.00m = 70-80%, 2.00-3.00m = 90-100%, 3.00-4.00m = 35-45%, 4.00-5.00m = 35-45%. Excavating from 0.00m to 1.20m for 1.00 hour.							Scale (approx) 1:50	Logged By IJ	Figure No. 40822.WS14



**IAN FARMER
ASSOCIATES**

Site WAST - Western Gateway Site	Number WS15
Excavation Method Drive-in Window Sampler	Client BAM Construction Limited
Dimensions	Job Number 40822
Location 332152.82 E 350325.75 N	Engineer Arup
Ground Level (mOD) 90.91	Sheet 1/1
Dates 24/02/2011	

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1			90.61	(0.30) 0.30	Grass over TOPSOIL (driller's description).			
					(0.90)	Brown, fine to coarse SAND and subrounded and rounded, fine to coarse GRAVEL of sandstone and mudstone (possible made ground).			
1.20-1.65	SPT(C) N=6		1,1/1,2,1,2	89.71	1.20	Loose, brown, clayey SAND and angular to subrounded, fine to coarse GRAVEL including limestone and sandstone (possible made ground).			
1.50	D2				(0.80)				
2.00-2.45	SPT(C) N=11		2,2/2,3,3,3	88.91	2.00	Medium dense, brown, fine to coarse SAND and angular to subrounded, fine to coarse GRAVEL including sandstone.			
2.60	D3								
3.00-3.45	SPT(C) N=13		2,3/4,4,2,3		(2.10)				
3.20	D4								
4.00-4.45	SPT(C) N=12		1,2/3,3,2,4	86.81	4.10	Firm, brown, sandy, gravelly CLAY. Gravel is rounded and subrounded, fine to coarse including sandstone, occasional coal and mudstone.			
4.00	D5								
					(1.40)	Below 4.80m: silty with thin laminations.			
5.00-5.45	SPT(C) N=7		1,2/2,1,2,2	85.41	5.50	Very loose, brown, slightly gravelly, fine to coarse SAND. Gravel is rounded and subrounded, fine to coarse including sandstone.		Σ1	
5.00	J6								
5.70	J7		Water strike(1) at 5.70m.		(0.95)				
6.00-6.45	SPT(C) N=1		1,0/0,1,0,0	84.46	6.45				
						Complete at 6.45m			

Remarks

Recovery: 1.20-2.00m = 50-60%, 2.00-3.00m = 50-60%, 3.00-4.00m = 60-70%, 4.00-5.00m = 90-100% and 5.00-6.00m = 60-70%.
Excavating from 0.00m to 1.20m for 1.00 hour.

Scale (approx)
1:50

Logged By
IJ

Figure No.
40822.WS15



**IAN FARMER
ASSOCIATES**

Site WAST - Western Gateway Site	Number WS16
Excavation Method Drive-in Window Sampler	Client BAM Construction Limited
Dimensions	Job Number 40822
Location 332140.47 E 350251.42 N	Engineer Arup
Ground Level (mOD) 89.86	Sheet 1/1
Dates 24/02/2011	

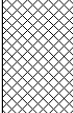
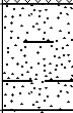
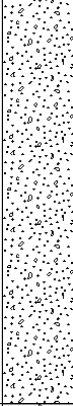
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50-1.00	B1			89.56	(0.30) 0.30	Grass over TOPSOIL (driller's description).			
1.20-1.65	SPT(C) N=8		1,3/2,2,2,2	88.36	(1.20) 1.50	Firm, brown, sandy, gravelly CLAY. Gravel is angular and subangular, fine to coarse including sandstone.			
2.00-2.45	SPT(C) N=14		3,4/4,3,4,3		(2.50)	Medium dense, brown, slightly clayey, fine to coarse SAND and angular to subrounded, fine to coarse GRAVEL including sandstone.			
3.00-3.45	SPT N=13		3,4/4,3,3,3	85.86	4.00	Complete at 4.00m			

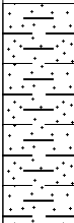
Remarks
Recovery: 1.20-2.00m = 55-65%, 2.00-3.00m = 45-55%.
Excavating from 0.00m to 1.20m for 1.00 hour.

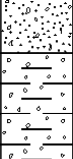
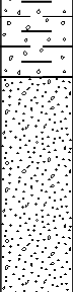
Scale (approx)
1:50

Logged By
IJ

Figure No.
40822.WS16

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Number WS17
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 90.10		Client BAM Construction Limited		Job Number 40822
		Location 332161.83 E 350304.85 N		Dates 25/02/2011		Engineer Arup		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50-1.00	B1			89.70	(0.40) 0.40	MADE GROUND: Stone fill (driller's description).		
1.20-1.65 1.30	SPT(C) N=4 D2		1,0/0,0,0,4	88.90	1.20 (0.80)	MADE GROUND: Brown, very silty, fine to coarse SAND and angular to subrounded, fine to coarse GRAVEL including sandstone.		
2.00-2.45 2.00	SPT(C) N=10 D3		1,1/2,3,3,2	88.20 88.00	1.90 (0.20) 2.10	Loose, brown, clayey, fine and medium SAND with pockets of clay (possible made ground).		
2.50	D4				(0.80)	Soft, very sandy CLAY with bands of sand (possible made ground).		
2.95 3.00-3.45	D5 SPT(C) N=11		1,4/2,3,3,3	87.20	2.90	Brown, clayey, silty, fine and medium SAND (possible made ground).		
4.00-4.45	SPT(C) N=10		1,1/2,2,2,4		(2.70)	Loose to medium dense, brown SAND and angular and subangular, fine to coarse GRAVEL including sandstone, siltstone, limestone and coal (possible made ground).		
4.70 5.00-5.45	D6 SPT(C) N=10		1,2/2,3,3,2					
5.70	D7		Water strike(1) at 5.50m.	84.50	5.60	Medium dense, brown, sandy, subangular to rounded, fine to coarse GRAVEL including sandstone.		▽1
6.00-6.45	SPT(C) N=18		2,2/4,5,7,2	83.65	(0.85) 6.45	Complete at 6.45m		
Remarks Recovery: 1.20-2.00m = 85-95%, 2.00-3.00m = 75-85%, 3.00-4.00m = 15-25%, 4.00-5.00m = 40-50% and 5.00-6.00m = 40-50%. Excavating from 0.00m to 1.20m for 1.00 hour.								Scale (approx) 1:50
								Logged By IJ
								Figure No. 40822.WS17

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Number WS18			
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 89.13		Client BAM Construction Limited		Job Number 40822			
		Location 332179.92 E 350266.87 N		Dates 28/02/2011		Engineer Arup		Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr		
0.50	B1				(1.50)	Soft, brown, sandy CLAY.					
1.20-1.65 1.30	SPT(C) N=8 D2		1,1/1,3,2,2	87.63	1.50	Brown, clayey, very sandy, angular to subrounded, fine to coarse GRAVEL including sandstone and mudstone.					
1.80	D3				(0.50)						
2.00-2.45	SPT(C) N=8		1,2/2,2,2,2	87.13	2.00	No recovery.					
					(1.00)						
3.00-3.45	SPT(C) N=10		3,2/2,3,2,3	86.13	3.00	Medium dense, brown, clayey, very sandy, angular to subrounded, fine to coarse GRAVEL including sandstone and mudstone.					
3.40	D4				(1.50)	At 3.70m: band of stiff, brown clay.					
3.70	D5										
4.00-4.45	SPT(C) N=11		2,2/2,2,3,4								
4.50	D6			84.63	4.50	Brown, very clayey, very sandy, subangular to subrounded fine to coarse GRAVEL including sandstone.		V1			
			Water strike(1) at 4.80m.		(0.50)						
5.00-5.45	SPT(C) N=4		1,1/0,1,1,2	84.13	5.00	Loose, brown, clayey, gravelly, fine and medium, occasionally coarse SAND. Gravel is subrounded, fine and medium including mudstone.					
					(1.45)						
5.70	D7										
6.00-6.45	SPT(C) N=3		1,0/1,0,1,1	82.68	6.45	Complete at 6.45m					
Remarks Window sample hole was relocated 0.40m due to obstruction. Excavating from 0.00m to 1.20m for 1.00 hour.							Scale (approx) 1:50	Logged By IJ			
							Figure No. 40822.WS18				

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Number WS19	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 87.91		Client BAM Construction Limited		Job Number 40822	
		Location 332265.38 E 350263.57 N		Dates 25/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	B1			87.61	(0.30) 0.30	Grass over TOPSOIL (driller's description).			
					(0.90)	Brown, clayey, slightly gravelly, fine and medium SAND. Gravel is subrounded and rounded, fine and medium including mudstone.			
1.20-1.65 1.30	SPT(C) N=2 D2		1,0/0,1,0,1	86.71	1.20 (0.60)	Very loose, brown, clayey, fine to coarse SAND and angular and subangular, fine to coarse GRAVEL including sandstone.			
1.90 2.00-2.45 2.20	D3 SPT(C) N=17 D4		2,2/3,4,5,5	86.11	1.80 (1.20)	Stiff, brown, slightly gravelly CLAY with silt. Gravel is angular to rounded, fine to coarse including sandstone and coal.			
2.80 3.00-3.45 3.40	D5 SPT(C) N=8 D6		Water strike(1) at 2.70m. 2,2/1,2,2,3	84.91	3.00 (1.45)	Loose, brown, gravelly, fine to coarse SAND. Gravel is angular and subangular, fine to coarse including mudstone and siltstone.			
4.00-4.45	SPT(C) N=7		3,1/1,2,1,3	83.46	4.45	Complete at 4.45m			
Remarks Recovery: 1.20-2.00m = 75-85%, 2.00-3.00m = 85-95% and 3.00-4.00m = 60-70%. Excavating from 0.00m to 1.20m for 1.00 hour.							Scale (approx) 1:50	Logged By IJ	Figure No. 40822.WS19

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Number WS20	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD) 87.78		Client BAM Construction Limited		Job Number 40822	
		Location 332289.75 E 350245.07 N		Dates 25/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.50-1.00	B1			87.48	(0.30) 0.30	Grass over TOPSOIL (driller's description).			
					(0.90)	Brown, very clayey, fine and medium SAND with nodules of clay.			
1.30 1.20-1.65	D2 SPT(C) N=0		Water strike(1) at 1.20m. 1,0/0,0,0,0	86.58	1.20 (0.50)	Very soft, brown, sandy SILT.			V1
1.80	D3			86.08	1.70 (0.30)	Soft, grey brown mottled orange, very sandy CLAY.			
2.00-2.45	SPT N=4		1,0/0,1,2,1	85.78	2.00	Loose, brown, fine to coarse SAND and subangular to rounded, fine to coarse GRAVEL including sandstone and mudstone.			
2.40	D4				(1.00)				
				84.78	3.00	Complete at 3.00m			
Remarks Recovery: 1.20-2.00m = 80-90%, 2.00-3.00m = 30-40%. Excavating from 0.00m to 1.20m for 1.00 hour.								Scale (approx) 1:50	Logged By IJ
								Figure No. 40822.WS20	



**IAN FARMER
ASSOCIATES**

Site
WAST - Western Gateway Site

**Probe
Number**
DP01

Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
92.39

Client
BAM Construction Limited

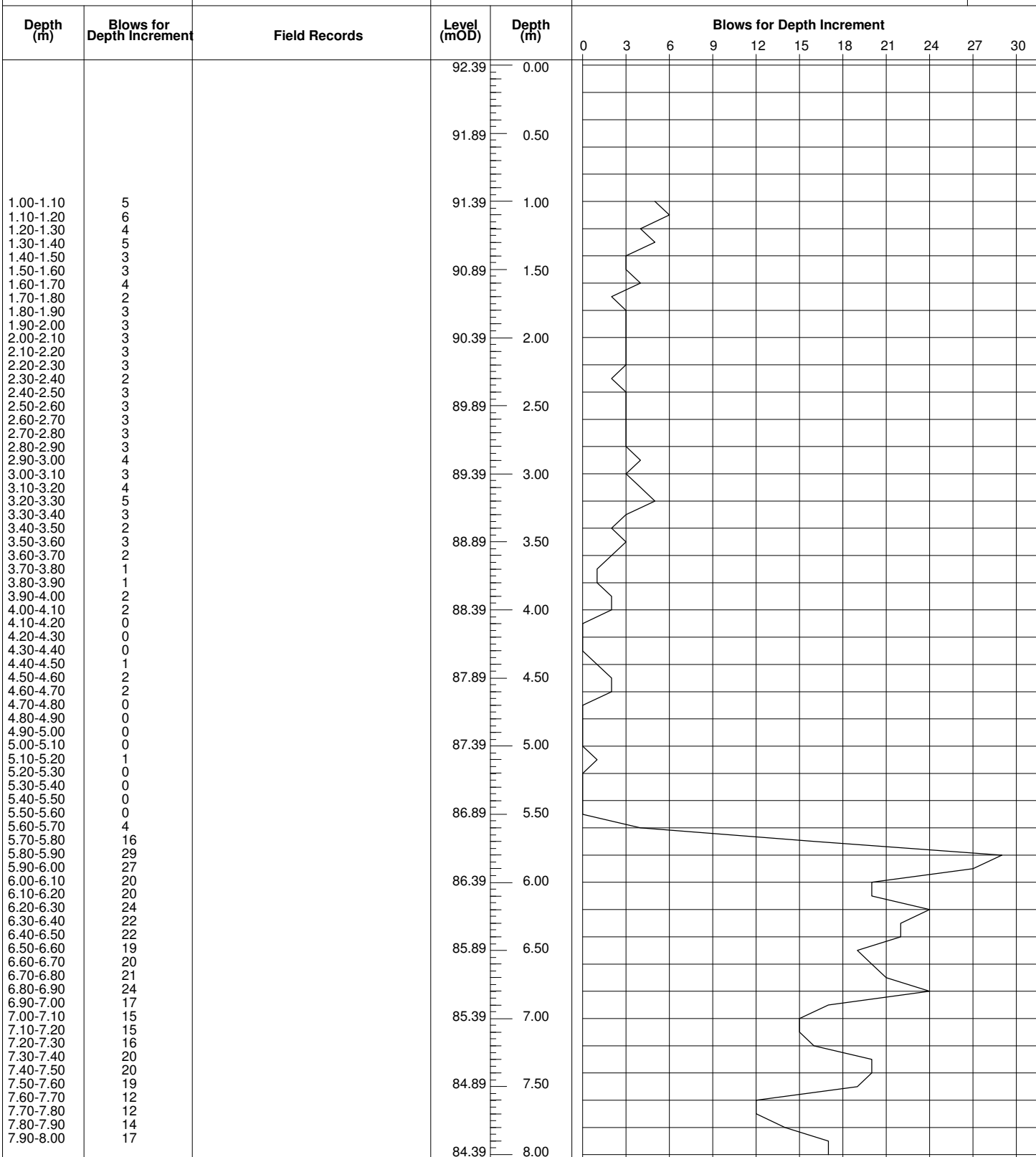
**Job
Number**
40822

Location
331942.26 E 350259.33 N

Dates
22/02/2011

Engineer
Arup

Sheet
1/2



Remarks

Scale (approx)
1:40

Logged By
n/a

Figure No.
40822.DP01



IAN FARMER
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Site

WAST - Western Gateway Site

Probe
Number

DP01

Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
92.39

Client
BAM Construction Limited

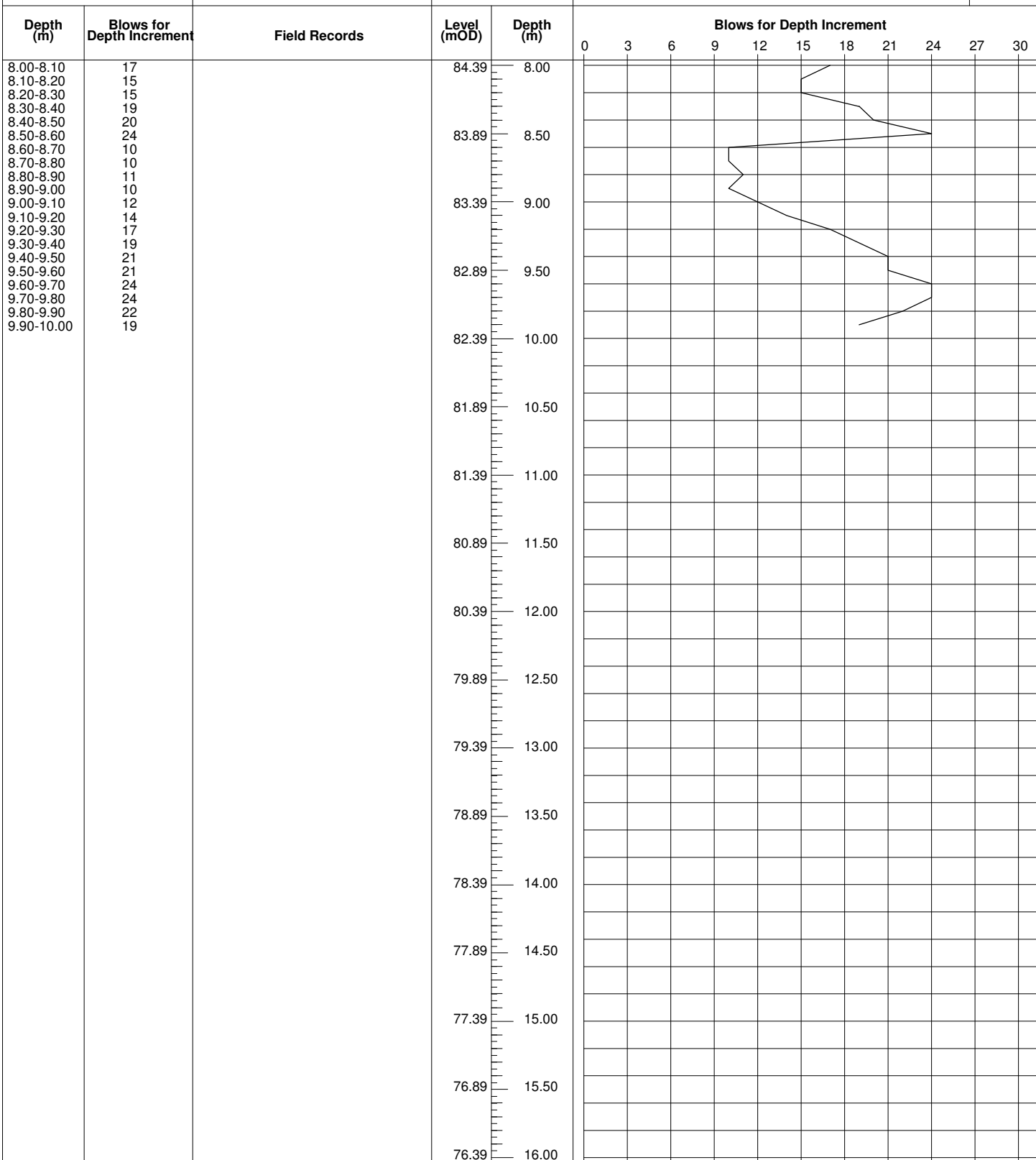
Job
Number
40822

Location
331942.26 E 350259.33 N

Dates
22/02/2011

Engineer
Arup

Sheet
2/2



Remarks

Scale (approx) 1:40
Logged By n/a
Figure No. 40822.DP01



**IAN FARMER
ASSOCIATES**

Site WAST - Western Gateway Site	Probe Number DP02
Client BAM Construction Limited	Job Number 40822
Engineer Arup	Sheet 1/1

Method Dynamic Probe	Cone Dimensions	Ground Level (mOD) 91.93
	Location 331968.9 E 350239.86 N	Dates 23/02/2011

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment
0.00-0.10	0		91.93	0.00	
0.10-0.20	0				
0.20-0.30	0				
0.30-0.40	0				
0.40-0.50	0				
0.50-0.60	0		91.43	0.50	
0.60-0.70	1				
0.70-0.80	2				
0.80-0.90	4				
0.90-1.00	2				
1.00-1.10	2		90.93	1.00	
1.10-1.20	2				
1.20-1.30	4				
1.30-1.40	4				
1.40-1.50	6				
1.50-1.60	5		90.43	1.50	
1.60-1.70	2				
1.70-1.80	2				
1.80-1.90	1				
1.90-2.00	2				
2.00-2.10	4		89.93	2.00	
2.10-2.20	2				
2.20-2.30	2				
2.30-2.40	3				
2.40-2.50	2				
2.50-2.60	3		89.43	2.50	
2.60-2.70	2				
2.70-2.80	3				
2.80-2.90	3				
2.90-3.00	2				
3.00-3.10	5		88.93	3.00	
3.10-3.20	8				
3.20-3.30	3				
3.30-3.40	2				
3.40-3.50	2				
3.50-3.60	2		88.43	3.50	
3.60-3.70	2				
3.70-3.80	2				
3.80-3.90	2				
3.90-4.00	2				
4.00-4.10	3		87.93	4.00	
4.10-4.20	7				
4.20-4.30	2				
4.30-4.40	2				
4.40-4.50	3				
4.50-4.60	3		87.43	4.50	
4.60-4.70	9				
4.70-4.80	7				
4.80-4.90	7				
4.90-5.00	7				
5.00-5.10	8		86.93	5.00	
5.10-5.20	10				
5.20-5.30	10				
5.30-5.40	9				
5.40-5.50	8				
5.50-5.60	8		86.43	5.50	
5.60-5.70	6				
5.70-5.80	6				
5.80-5.90	9				
5.90-6.00	6				
6.00-6.10	10		85.93	6.00	
6.10-6.20	17				
6.20-6.30	20				
6.30-6.40	12				
6.40-6.50	14				
6.50-6.60	14		85.43	6.50	
6.60-6.70	20				
6.70-6.80	17				
6.80-6.90	14				
6.90-7.00	21				
7.00-7.10	21		84.93	7.00	
7.10-7.20	14				
7.20-7.30	18				
7.30-7.40	26				
7.40-7.50	40				
7.50-7.60	40		84.43	7.50	
7.60-7.70	34				
7.70-7.80	50				
			83.93	8.00	

Remarks

Scale (approx) 1:40	Logged By n/a
Figure No. 40822.DP02	



**IAN FARMER
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Site

WAST - Western Gateway Site

**Probe
Number**

DP03

Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
91.87

Client
BAM Construction Limited

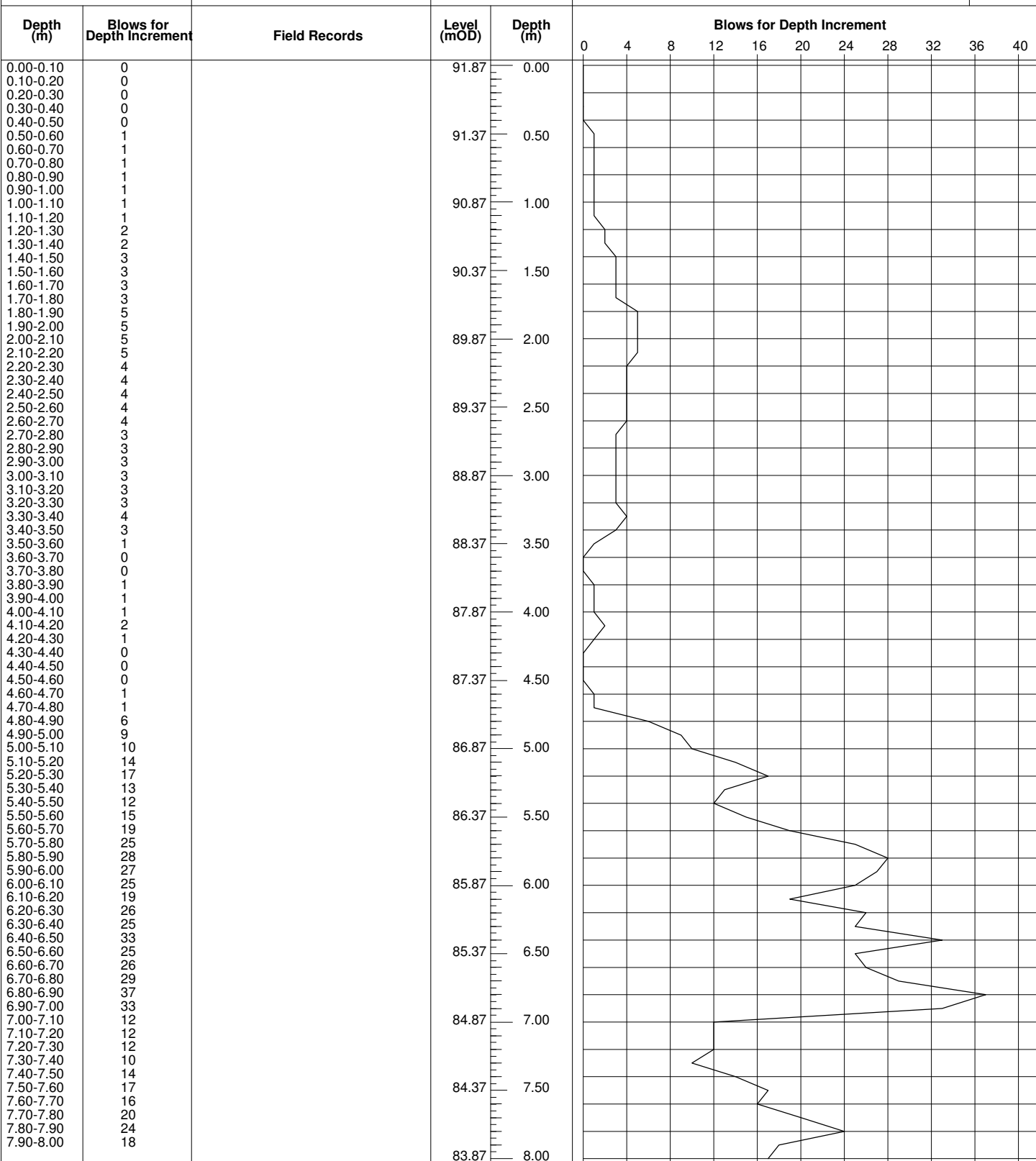
**Job
Number**
40822

Location
331985.08 E 350272.31 N

Dates
21/02/2011

Engineer
Arup

Sheet
1/2



Remarks

Scale (approx)
1:40

Logged By
n/a

Figure No.
40822.DP03



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Site

WAST - Western Gateway Site

Probe
Number

DP03

Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
91.87

Client
BAM Construction Limited

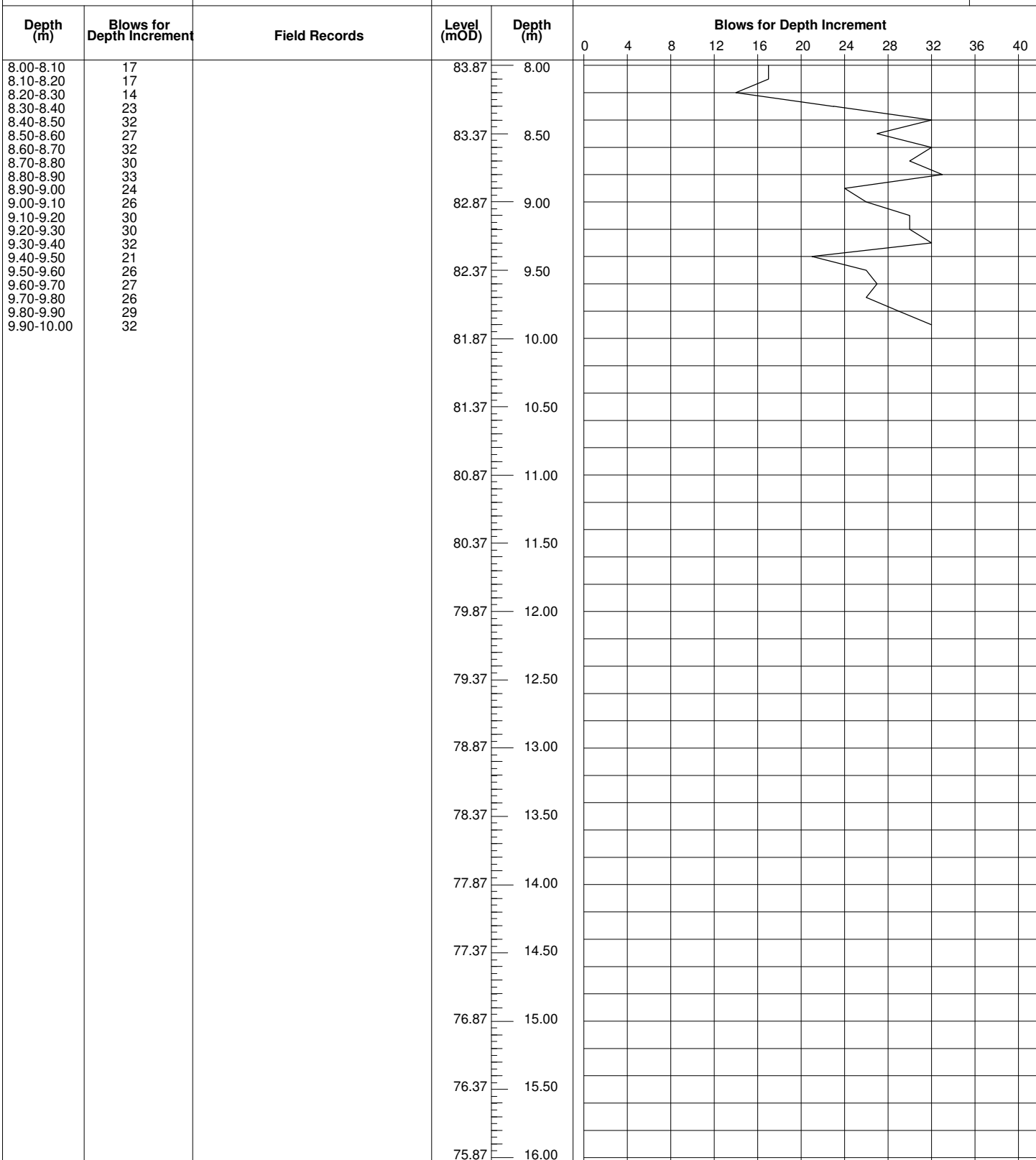
Job
Number
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Location
331985.08 E 350272.31 N

Dates
21/02/2011

Engineer
Arup

Sheet
2/2



Remarks

Scale (approx) 1:40
Logged By n/a
Figure No. 40822.DP03



**IAN FARMER
ASSOCIATES**

Site WAST - Western Gateway Site	Probe Number DP04
Client BAM Construction Limited	Job Number 40822
Engineer Arup	Sheet 1/1

Method Dynamic Probe	Cone Dimensions	Ground Level (mOD) 91.95
	Location 331991.54 E 350306.65 N	Dates 23/02/2011

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment
0.00-0.10	0		91.95	0.00	
0.10-0.20	0				
0.20-0.30	0				
0.30-0.40	0				
0.40-0.50	0				
0.50-0.60	0		91.45	0.50	
0.60-0.70	0				
0.70-0.80	1				
0.80-0.90	1				
0.90-1.00	1				
1.00-1.10	1		90.95	1.00	
1.10-1.20	1				
1.20-1.30	1				
1.30-1.40	2				
1.40-1.50	3				
1.50-1.60	5		90.45	1.50	
1.60-1.70	3				
1.70-1.80	2				
1.80-1.90	4				
1.90-2.00	2				
2.00-2.10	2		89.95	2.00	
2.10-2.20	3				
2.20-2.30	4				
2.30-2.40	3				
2.40-2.50	3				
2.50-2.60	3		89.45	2.50	
2.60-2.70	3				
2.70-2.80	2				
2.80-2.90	2				
2.90-3.00	3				
3.00-3.10	2		88.95	3.00	
3.10-3.20	2				
3.20-3.30	1				
3.30-3.40	2				
3.40-3.50	3				
3.50-3.60	1		88.45	3.50	
3.60-3.70	2				
3.70-3.80	2				
3.80-3.90	2				
3.90-4.00	1		87.95	4.00	
4.00-4.10	0				
4.10-4.20	0				
4.20-4.30	1				
4.30-4.40	1				
4.40-4.50	2		87.45	4.50	
4.50-4.60	2				
4.60-4.70	1				
4.70-4.80	3				
4.80-4.90	2				
4.90-5.00	2		86.95	5.00	
5.00-5.10	1				
5.10-5.20	2				
5.20-5.30	2				
5.30-5.40	2				
5.40-5.50	2		86.45	5.50	
5.50-5.60	1				
5.60-5.70	0				
5.70-5.80	0				
5.80-5.90	0				
5.90-6.00	4				
6.00-6.10	10		85.95	6.00	
6.10-6.20	9				
6.20-6.30	8				
6.30-6.40	7				
6.40-6.50	12				
6.50-6.60	11		85.45	6.50	
6.60-6.70	16				
6.70-6.80	23				
6.80-6.90	22				
6.90-7.00	16				
7.00-7.10	24		84.95	7.00	
7.10-7.20	34				
7.20-7.30	36				
7.30-7.40	35				
7.40-7.50	33				
7.50-7.60	19		84.45	7.50	
7.60-7.70	16				
7.70-7.80	22				
7.80-7.90	25				
7.90-8.00	50		83.95	8.00	

Remarks

Scale (approx) 1:40	Logged By n/a
Figure No. 40822.DP04	



Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
91.78

Client
BAM Construction Limited

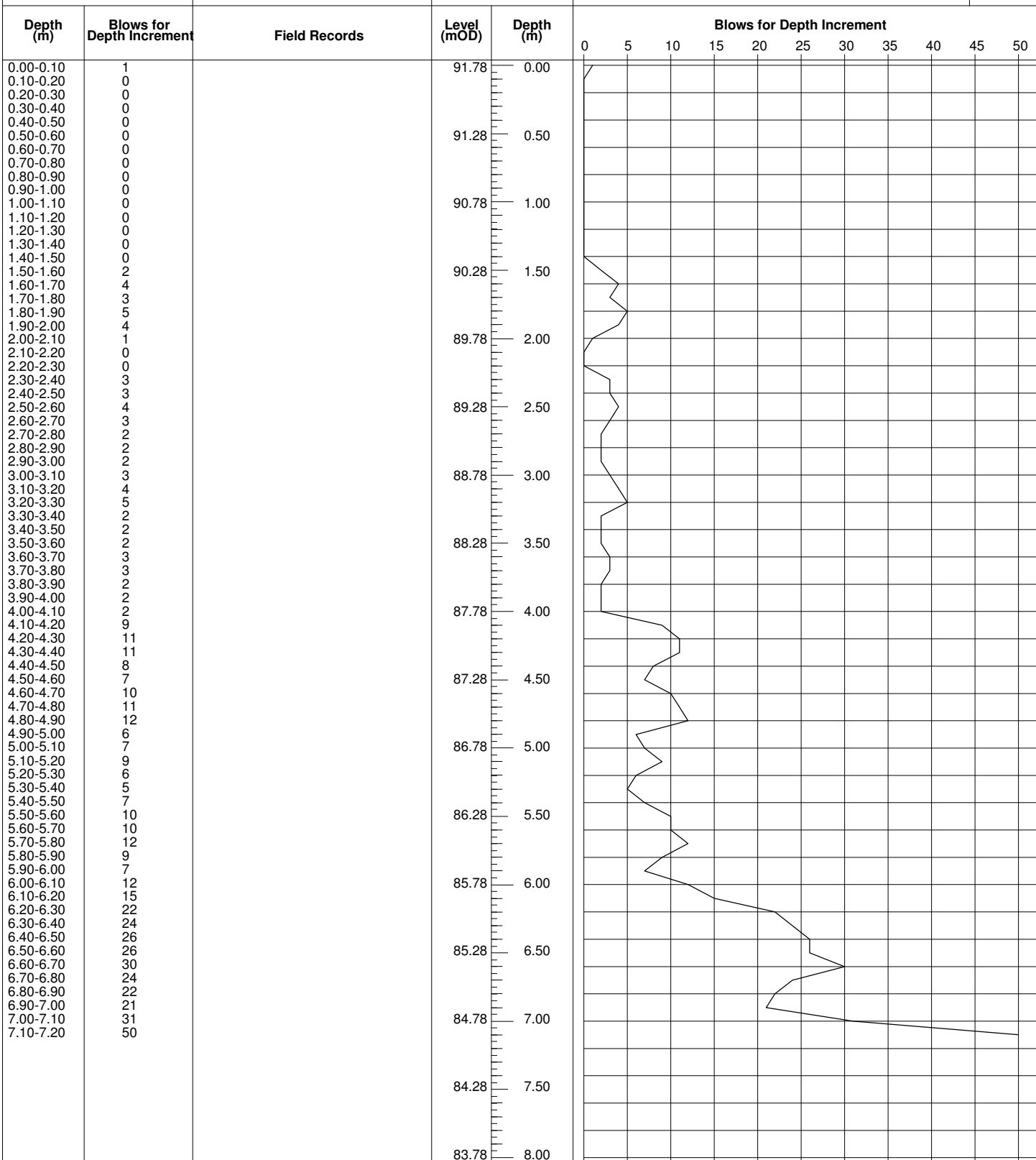
Job
Number
40822

Location
331998.99 E 350252.6 N

Dates
23/02/2011

Engineer
Arup

Sheet
1/1

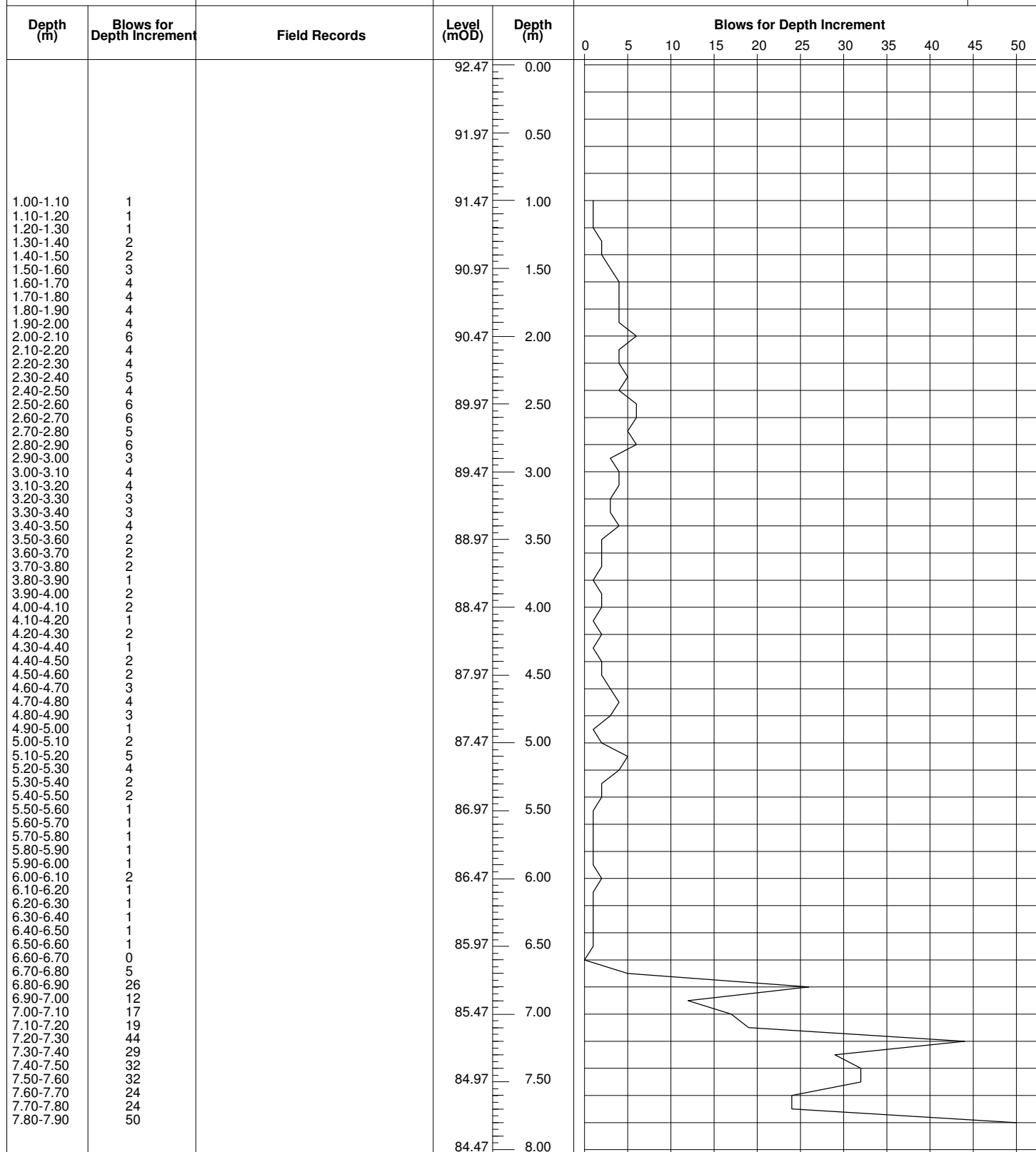


Remarks

Scale (approx) 1:40
Logged By n/a
Figure No. 40822.DP05



Site	WAST - Western Gateway Site	Probe Number	DP06
Method	Dynamic Probe	Client	BAM Construction Limited
Cone Dimensions		Job Number	40822
Ground Level (mOD)	92.47	Engineer	Arup
Location	331967.4 E 350326.8 N	Dates	22/02/2011
		Sheet	1/1



Remarks

Scale (approx)	1:40	Logged By	n/a
Figure No.			
40822.DP06			



IAN FARMER
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Site

WAST - Western Gateway Site

Probe
Number

DP08

Method
Super Heavy Dynamic Probe

Cone Dimensions

Ground Level (mOD)

93.02

Client

BAM Construction Limited

Job
Number
40822

Location

332023.54 E 350390.76 N

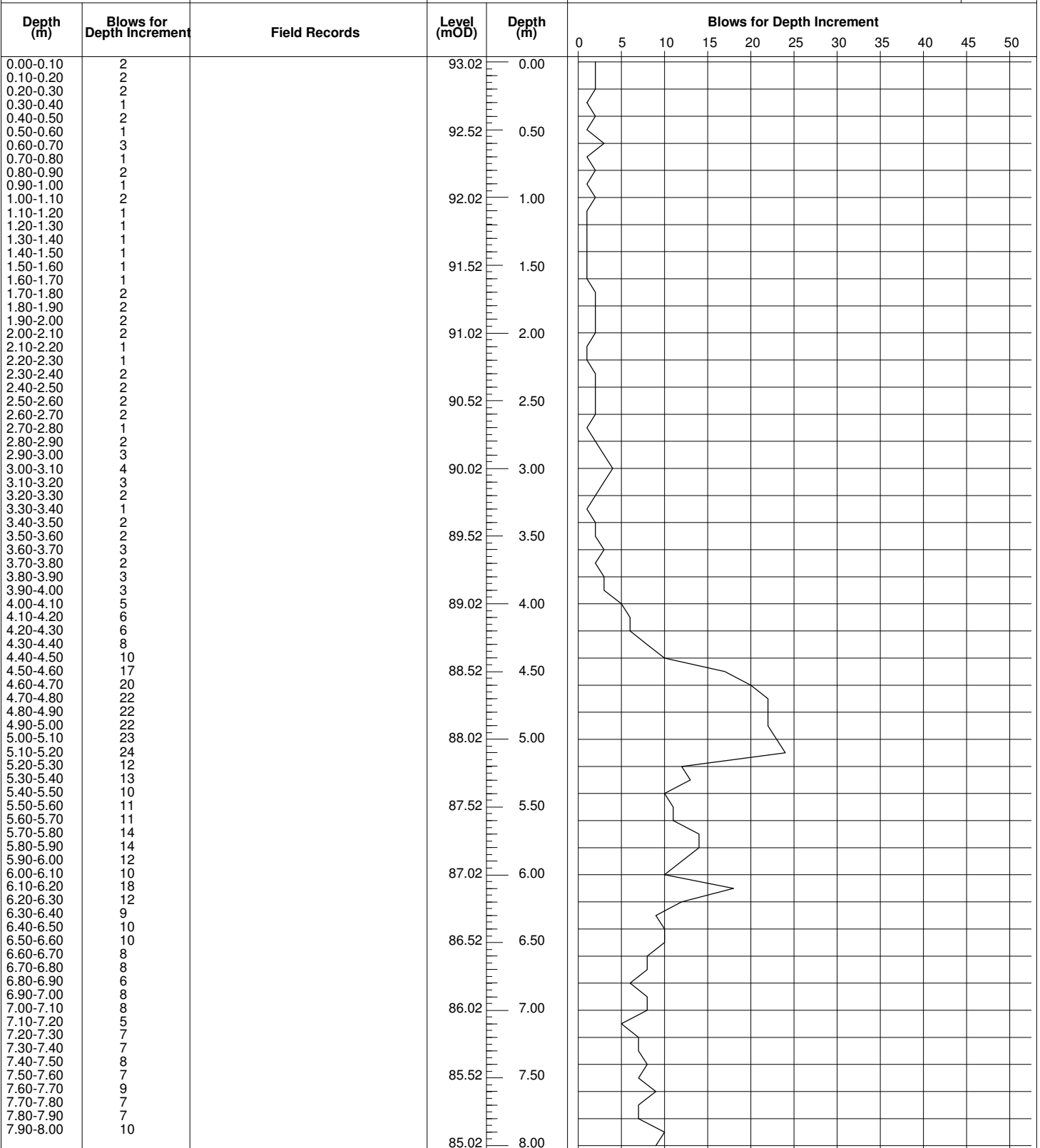
Dates

28/02/2011

Engineer

Arup

Sheet
1/2



Remarks

Scale
(approx)

1:40

Logged
By

n/a

Figure No.

40822.DP08



IAN FARMER
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Site

WAST - Western Gateway Site

Probe
Number

DP08

Method
Super Heavy Dynamic Probe

Cone Dimensions

Ground Level (mOD)
93.02

Client
BAM Construction Limited

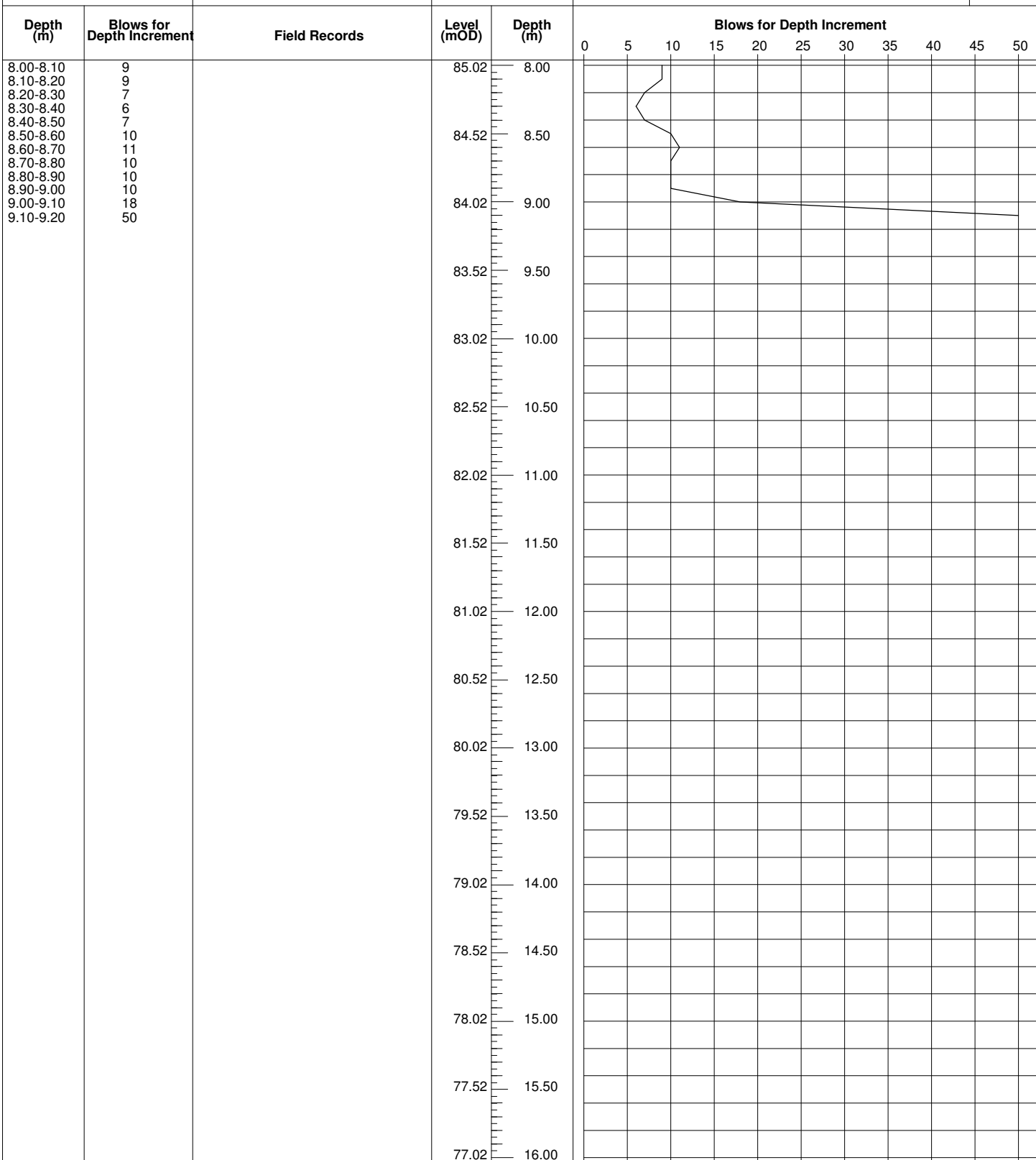
Job
Number
40822

Location
332023.54 E 350390.76 N

Dates
28/02/2011

Engineer
Arup

Sheet
2/2



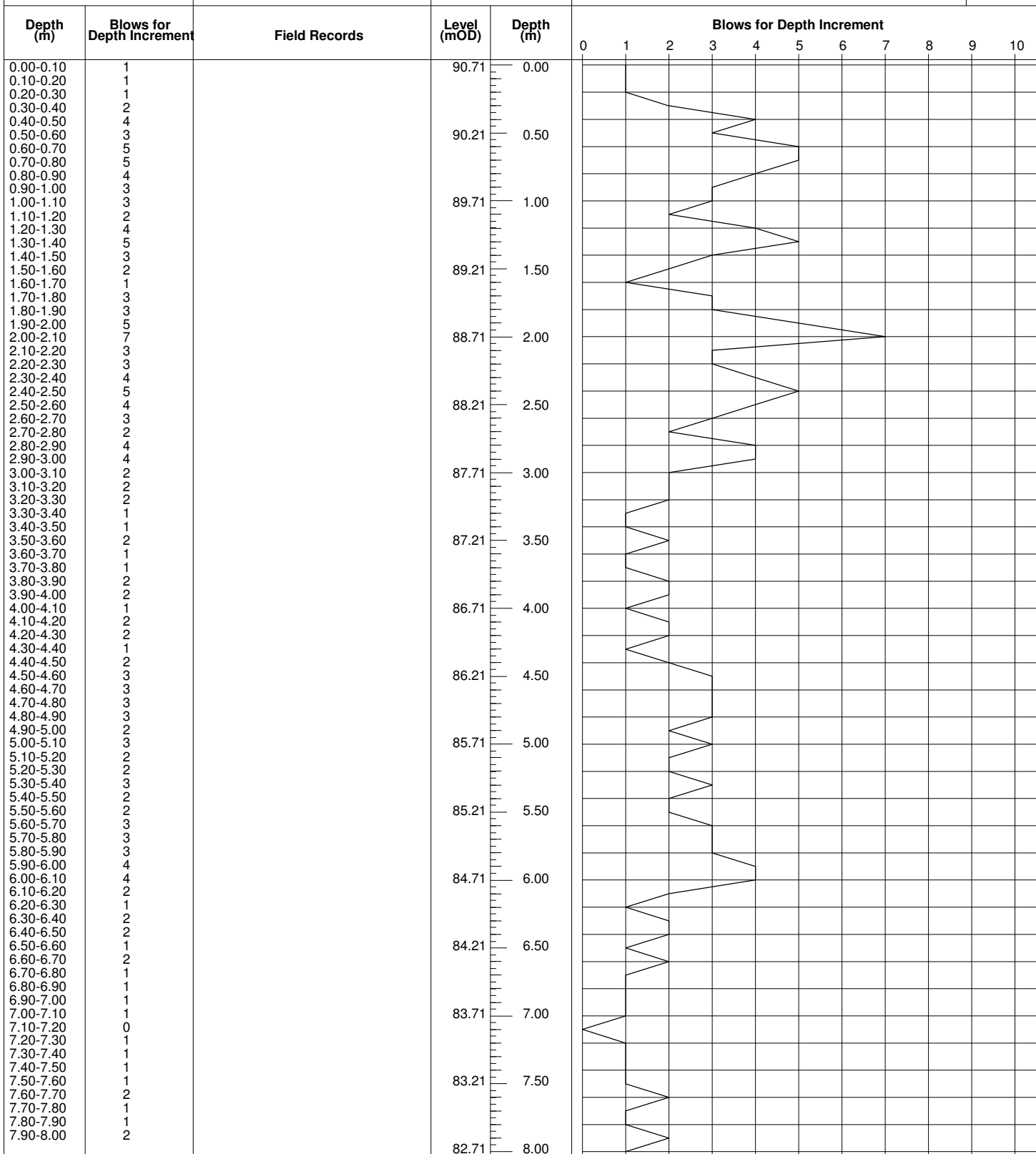
Remarks

Scale (approx) 1:40
Logged By n/a
Figure No. 40822.DP08



**IAN FARMER
ASSOCIATES**

Site WAST - Western Gateway Site	Probe Number DP11
Method Super Heavy Dynamic Probe	Job Number 40822
Cone Dimensions	Sheet 1/2
Location 332115.98 E 350297.19 N	Dates 28/02/2011
Ground Level (mOD) 90.71	Engineer Arup
Client BAM Construction Limited	



Remarks

Scale (approx)	Logged By
1:40	n/a
Figure No.	
40822.DP11	



**IAN FARMER
ASSOCIATES**

Site

WAST - Western Gateway Site

**Probe
Number**

DP11

Method
Super Heavy Dynamic Probe

Cone Dimensions

Ground Level (mOD)
90.71

Client
BAM Construction Limited

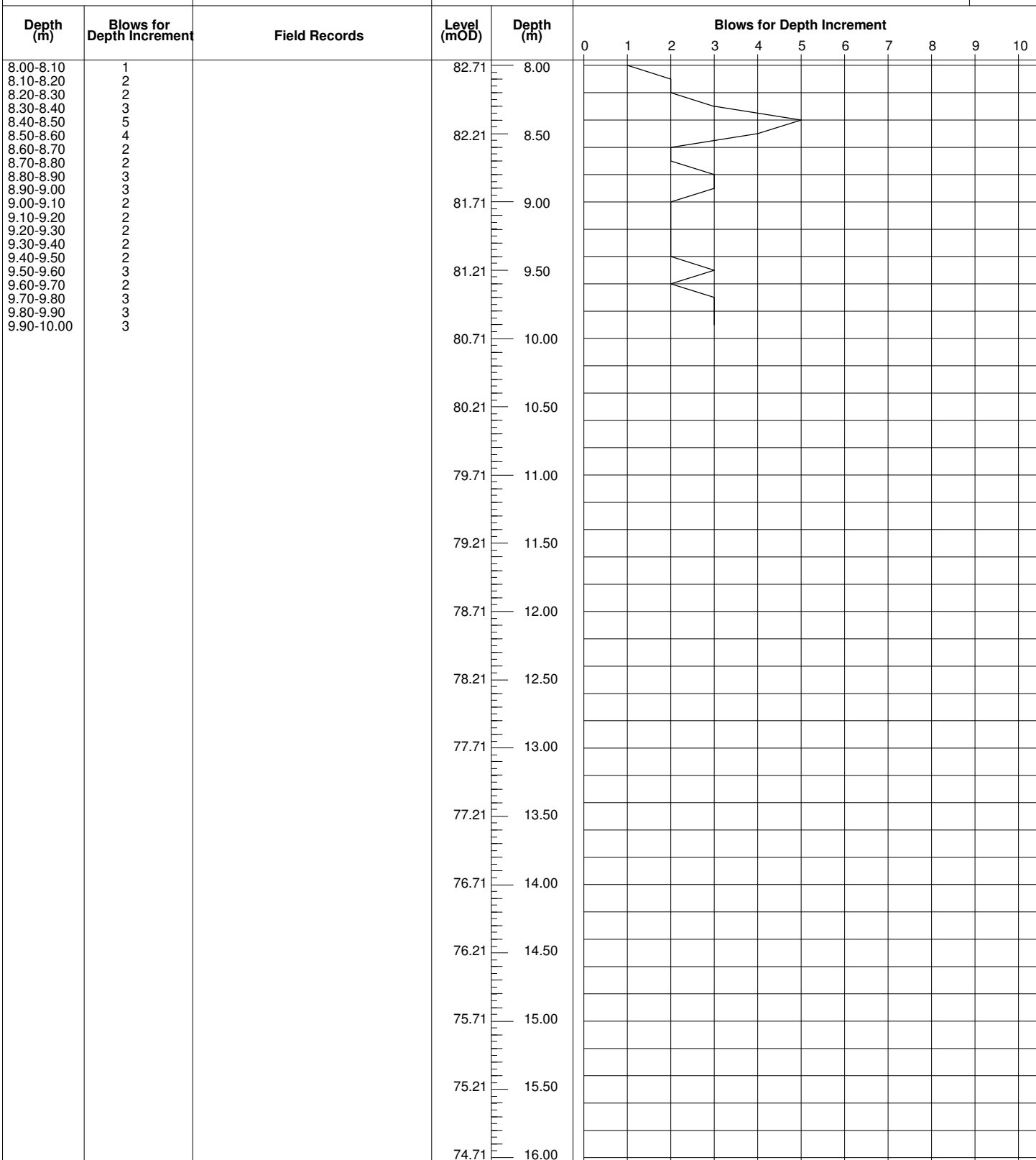
**Job
Number**
40822

Location
332115.98 E 350297.19 N

Dates
28/02/2011

Engineer
Arup

Sheet
2/2



Remarks

Scale (approx)
1:40

Logged By
n/a

Figure No.
40822.DP11



**IAN FARMER
ASSOCIATES**

Site

WAST - Western Gateway Site

**Probe
Number**

DP12

Method
Super Heavy Dynamic Probe

Cone Dimensions

Ground Level (mOD)
92.90

Client
BAM Construction Limited

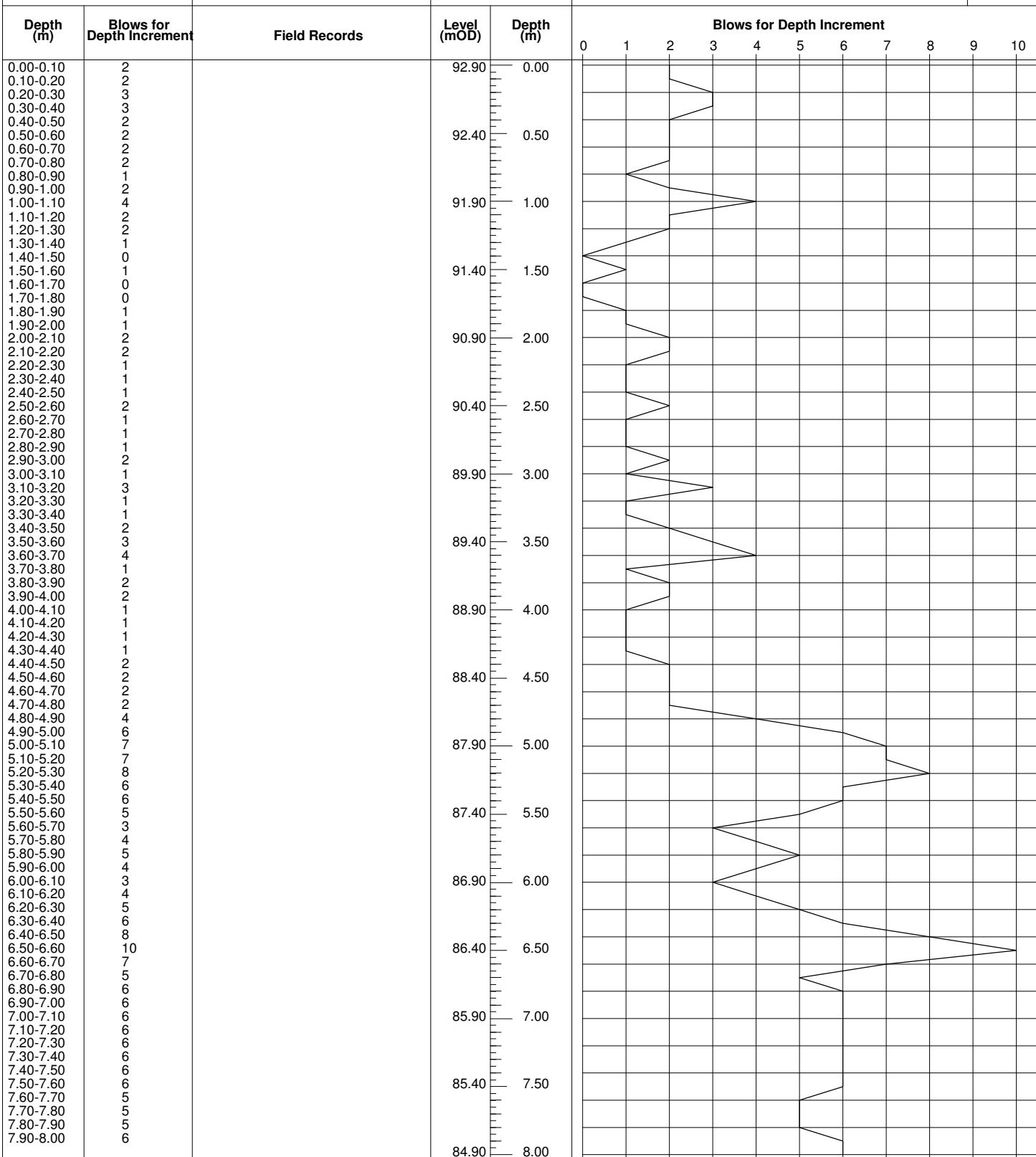
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Number**
40822

Location
332116.34 E 350347.3 N

Dates
28/02/2011

Engineer
Arup

Sheet
1/2



Remarks

Scale (approx)	Logged By
1:40	n/a
Figure No.	
40822.DP12	



**IAN FARMER
ASSOCIATES**

Site

WAST - Western Gateway Site

**Probe
Number**

DP12

Method
Super Heavy Dynamic Probe

Cone Dimensions

Ground Level (mOD)
92.90

Client
BAM Construction Limited

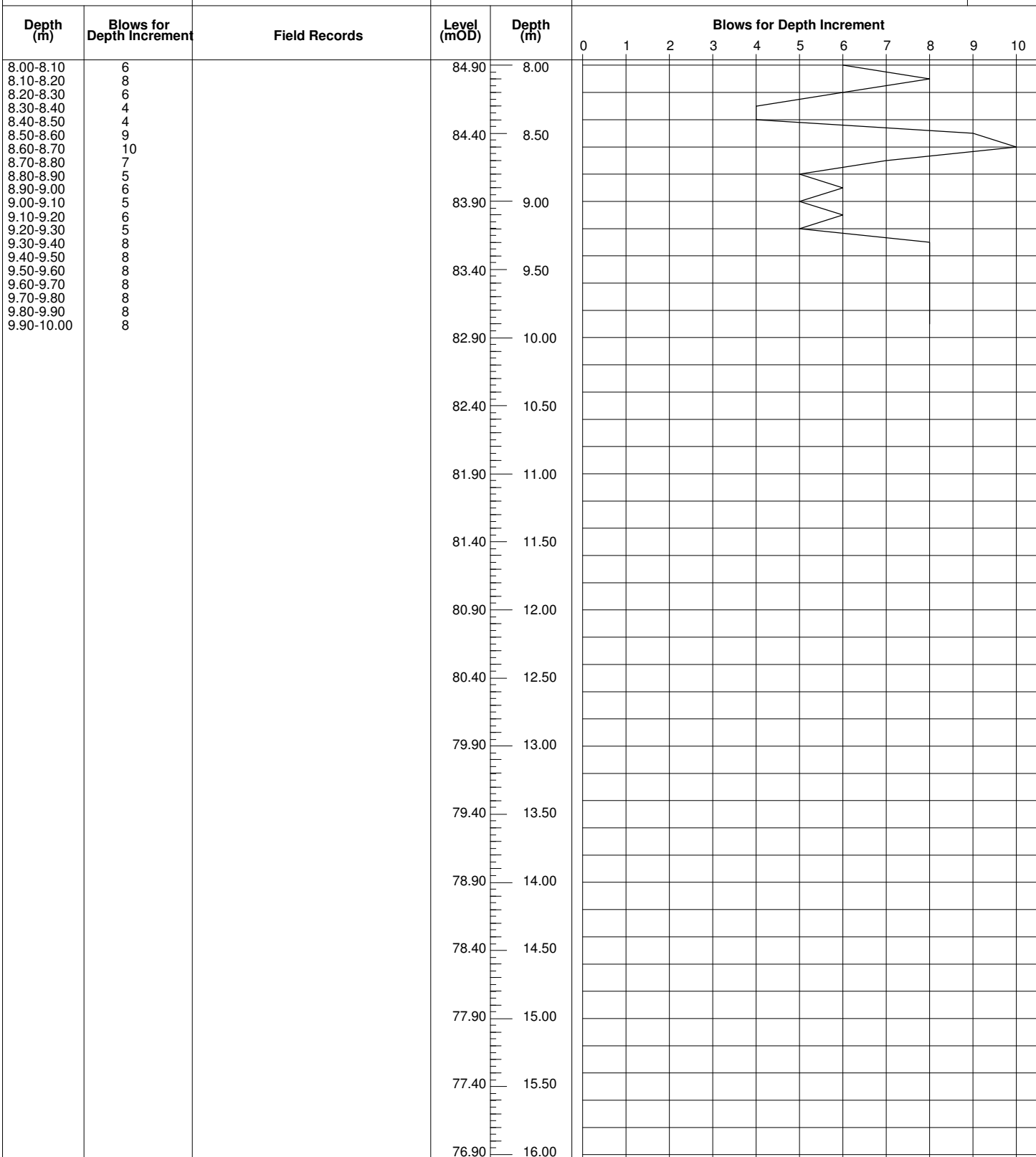
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Location
332116.34 E 350347.3 N

Dates
28/02/2011

Engineer
Arup

Sheet
2/2



Remarks

Scale (approx)
1:40

Logged By
n/a

Figure No.
40822.DP12



IAN FARMER
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Site
WAST - Western Gateway Site

Probe
Number
DP13

Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
89.99

Client
BAM Construction Limited

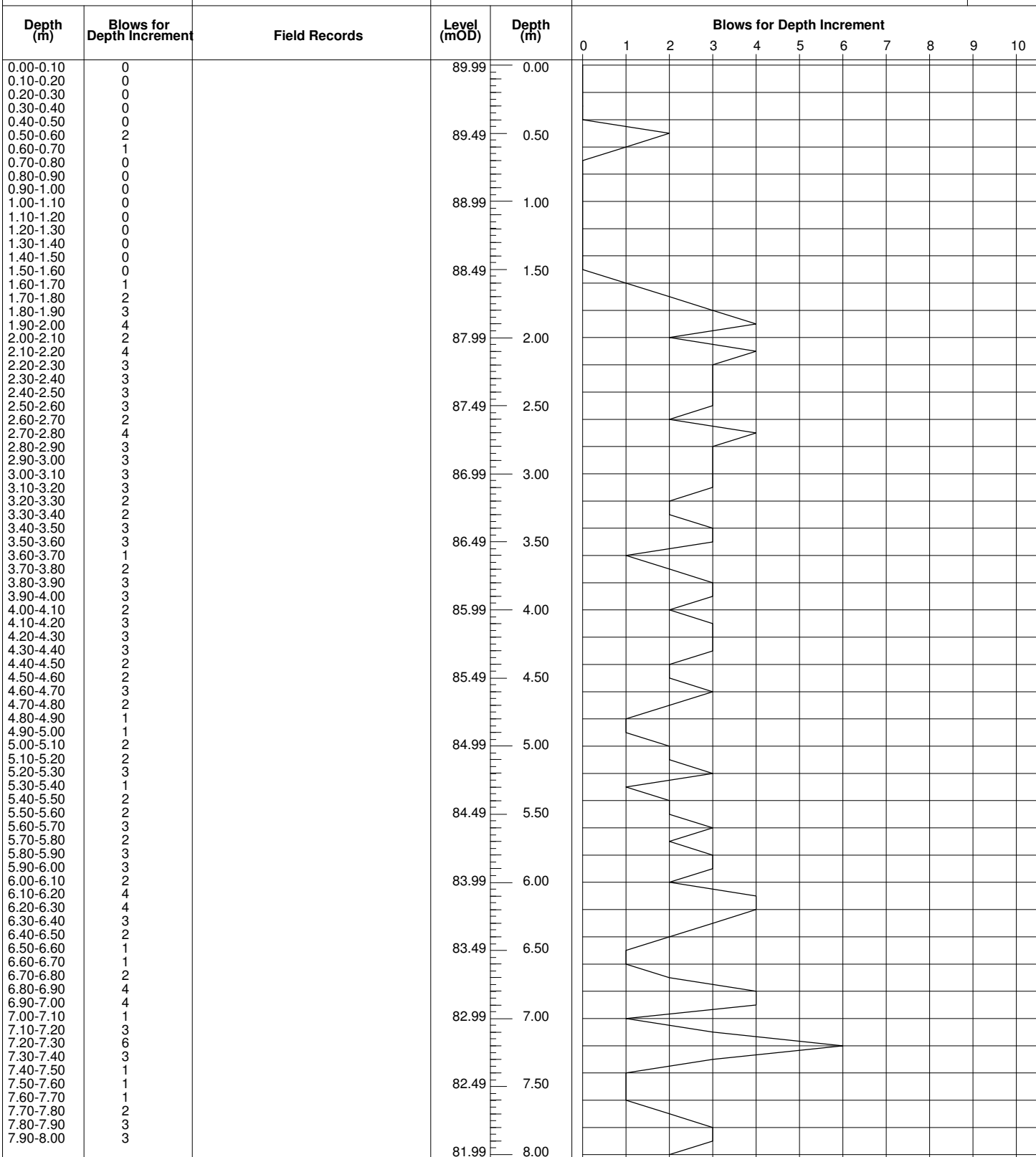
Job
Number
40822

Location
332133.07 E 350277.24 N

Dates
23/02/2011

Engineer
Arup

Sheet
1/2



Remarks

Scale (approx) 1:40
Logged By n/a
Figure No. 40822.DP13



IAN FARMER
ASSOCIATES

Site

WAST - Western Gateway Site

Probe
Number

DP13

Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
89.99

Client
BAM Construction Limited

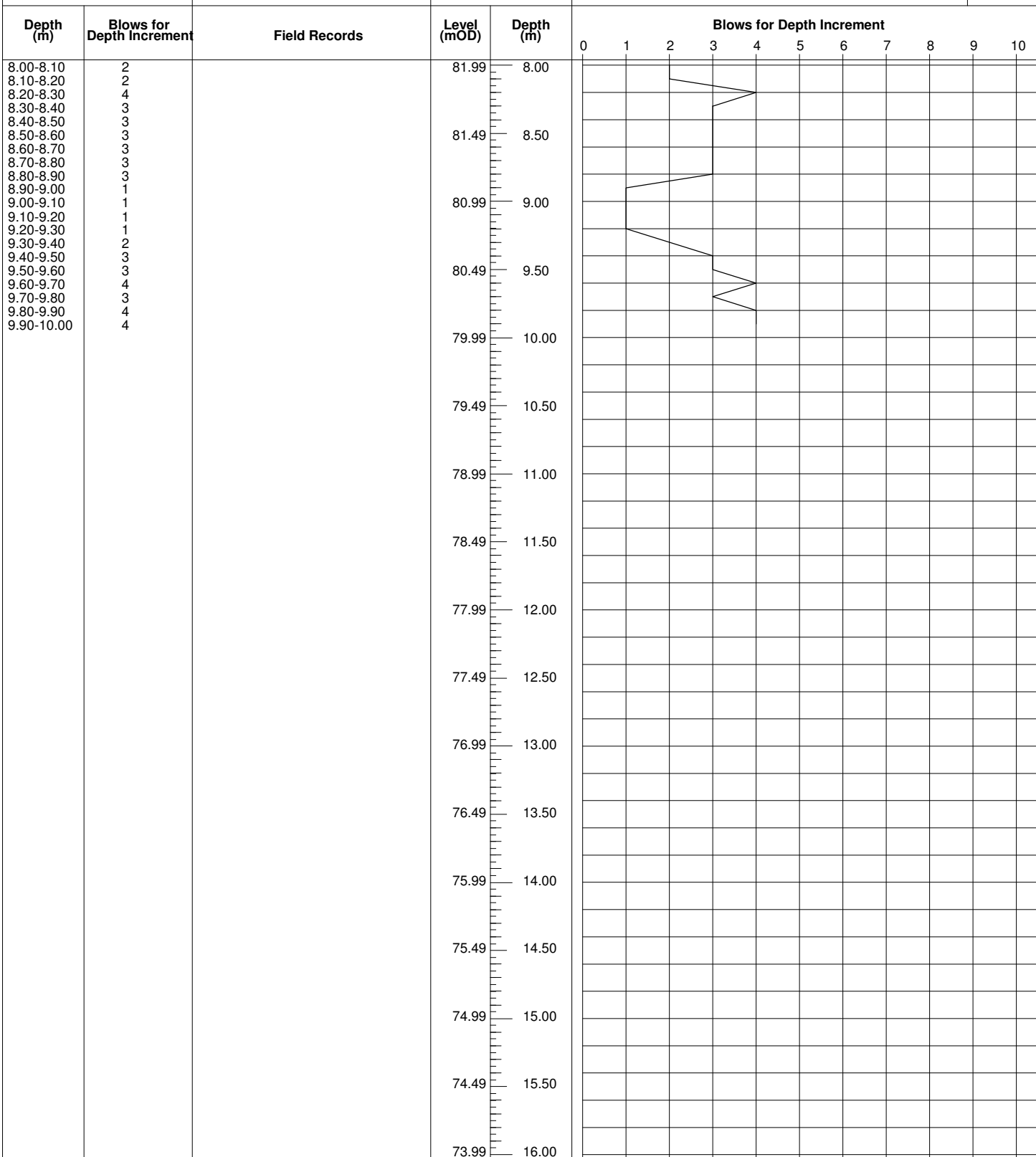
Job
Number
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Location
332133.07 E 350277.24 N

Dates
23/02/2011

Engineer
Arup

Sheet
2/2



Remarks

Scale (approx) 1:40
Logged By n/a
Figure No. 40822.DP13



**IAN FARMER
ASSOCIATES**

Site WAST - Western Gateway Site	Probe Number DP14
Client BAM Construction Limited	Job Number 40822
Engineer Arup	Sheet 1/2

Method Dynamic Probe	Cone Dimensions	Ground Level (mOD) 90.66
	Location 332156.38 E 350309.48 N	Dates 23/02/2011

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment
0.00-0.10	0		90.66	0.00	
0.10-0.20	0				
0.20-0.30	0				
0.30-0.40	0				
0.40-0.50	1				
0.50-0.60	1		90.16	0.50	
0.60-0.70	1				
0.70-0.80	2				
0.80-0.90	1				
0.90-1.00	3				
1.00-1.10	5		89.66	1.00	
1.10-1.20	4				
1.20-1.30	3				
1.30-1.40	5				
1.40-1.50	3				
1.50-1.60	2		89.16	1.50	
1.60-1.70	1				
1.70-1.80	1				
1.80-1.90	2				
1.90-2.00	2				
2.00-2.10	2		88.66	2.00	
2.10-2.20	2				
2.20-2.30	2				
2.30-2.40	2				
2.40-2.50	2				
2.50-2.60	2		88.16	2.50	
2.60-2.70	1				
2.70-2.80	1				
2.80-2.90	3				
2.90-3.00	2				
3.00-3.10	4		87.66	3.00	
3.10-3.20	5				
3.20-3.30	2				
3.30-3.40	1				
3.40-3.50	2				
3.50-3.60	2		87.16	3.50	
3.60-3.70	1				
3.70-3.80	1				
3.80-3.90	2				
3.90-4.00	2				
4.00-4.10	1		86.66	4.00	
4.10-4.20	3				
4.20-4.30	3				
4.30-4.40	2				
4.40-4.50	4				
4.50-4.60	4		86.16	4.50	
4.60-4.70	4				
4.70-4.80	1				
4.80-4.90	2				
4.90-5.00	2				
5.00-5.10	2		85.66	5.00	
5.10-5.20	2				
5.20-5.30	2				
5.30-5.40	3				
5.40-5.50	3				
5.50-5.60	4		85.16	5.50	
5.60-5.70	2				
5.70-5.80	3				
5.80-5.90	2				
5.90-6.00	2				
6.00-6.10	3		84.66	6.00	
6.10-6.20	4				
6.20-6.30	4				
6.30-6.40	3				
6.40-6.50	3				
6.50-6.60	3		84.16	6.50	
6.60-6.70	2				
6.70-6.80	2				
6.80-6.90	3				
6.90-7.00	2				
7.00-7.10	3		83.66	7.00	
7.10-7.20	3				
7.20-7.30	3				
7.30-7.40	3				
7.40-7.50	3				
7.50-7.60	3		83.16	7.50	
7.60-7.70	2				
7.70-7.80	3				
7.80-7.90	3				
7.90-8.00	3		82.66	8.00	

Remarks	Scale (approx) 1:40	Logged By n/a
	Figure No. 40822.DP14	



IAN FARMER
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Site

WAST - Western Gateway Site

Probe
Number

DP14

Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
90.66

Client
BAM Construction Limited

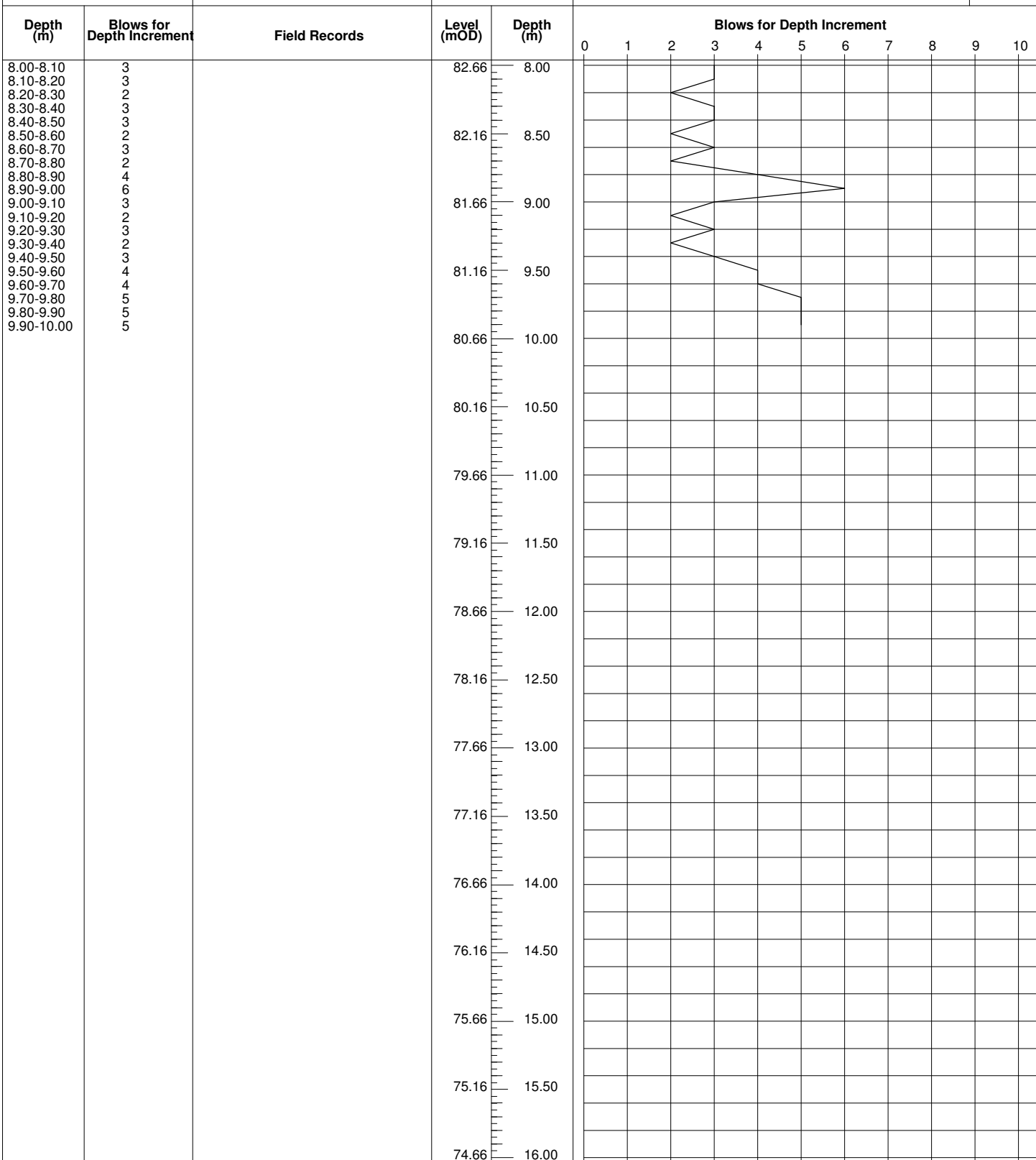
Job
Number
40822

Location
332156.38 E 350309.48 N

Dates
23/02/2011

Engineer
Arup

Sheet
2/2



Remarks

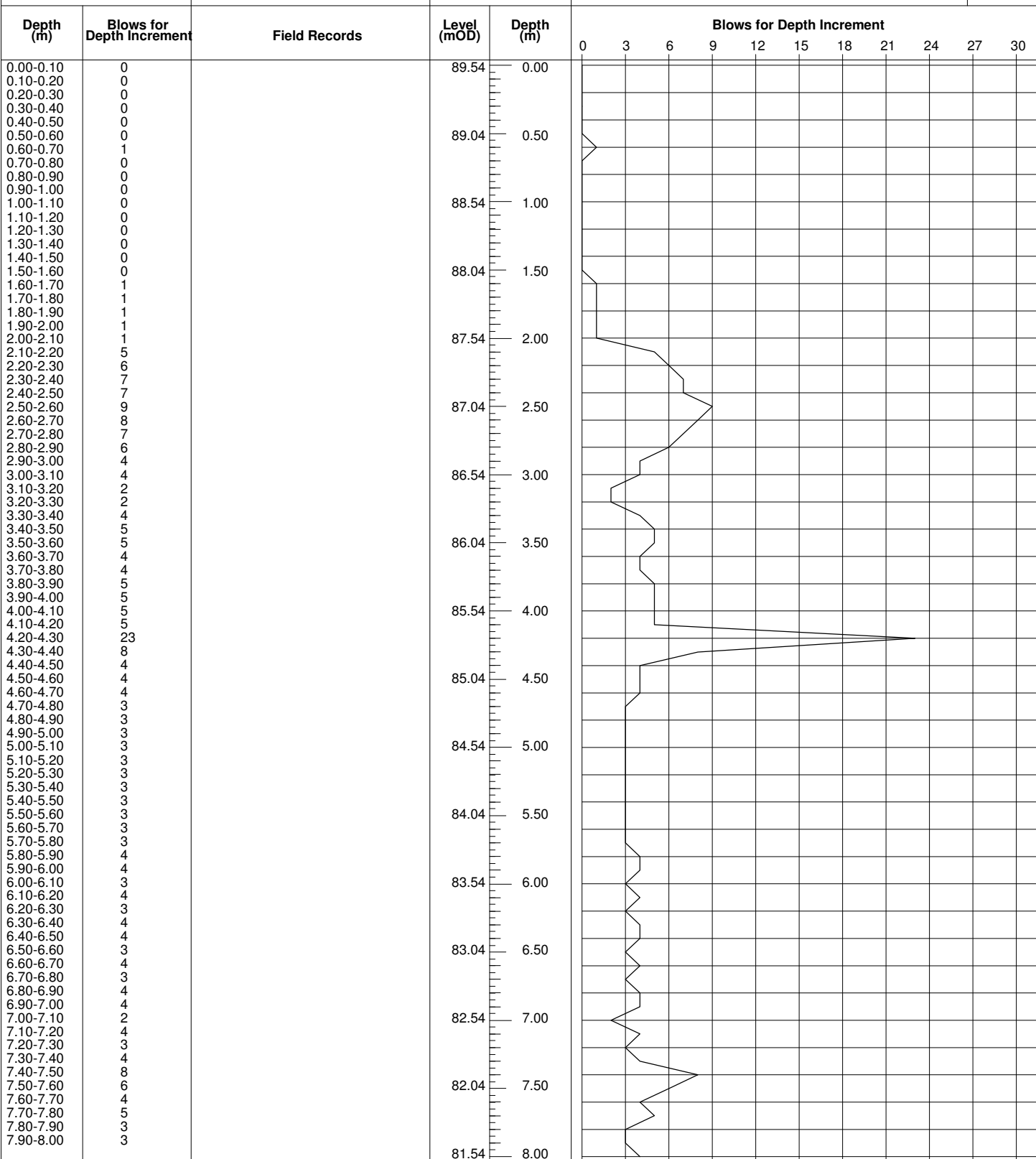
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Logged By n/a
Figure No. 40822.DP14



**IAN FARMER
ASSOCIATES**

Site WAST - Western Gateway Site	Probe Number DP15
Client BAM Construction Limited	Job Number 40822
Engineer Arup	Sheet 1/2

Method Dynamic Probe	Cone Dimensions	Ground Level (mOD) 89.54
	Location 332152.36 E 350254.86 N	Dates 23/02/2011



Remarks	Scale (approx) 1:40	Logged By n/a
	Figure No. 40822.DP15	



IAN FARMER
ASSOCIATES

Site

WAST - Western Gateway Site

Probe
Number

DP15

Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
89.54

Client
BAM Construction Limited

Job
Number
40822

Location
332152.36 E 350254.86 N

Dates
23/02/2011

Engineer
Arup

Sheet
2/2

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment												
					0	3	6	9	12	15	18	21	24	27	30		
8.00-8.10	4		81.54	8.00													
8.10-8.20	3																
8.20-8.30	5																
8.30-8.40	5																
8.40-8.50	4																
8.50-8.60	4		81.04	8.50													
8.60-8.70	4																
8.70-8.80	5																
8.80-8.90	5																
8.90-9.00	4																
9.00-9.10	5		80.54	9.00													
9.10-9.20	5																
9.20-9.30	4																
9.30-9.40	4																
9.40-9.50	5																
9.50-9.60	4		80.04	9.50													
9.60-9.70	4																
9.70-9.80	4																
9.80-9.90	4																
9.90-10.00	5																
			79.54	10.00													
			79.04	10.50													
			78.54	11.00													
			78.04	11.50													
			77.54	12.00													
			77.04	12.50													
			76.54	13.00													
			76.04	13.50													
			75.54	14.00													
			75.04	14.50													
			74.54	15.00													
			74.04	15.50													
			73.54	16.00													

Remarks

Scale
(approx)
1:40

Logged
By
n/a

Figure No.
40822.DP15



**IAN FARMER
ASSOCIATES**

Site WAST - Western Gateway Site	Probe Number DP16
Client BAM Construction Limited	Job Number 40822
Engineer Arup	Sheet 1/2

Method Dynamic Probe	Cone Dimensions	Ground Level (mOD) 89.86
	Location 332140.47 E 350251.42 N	Dates 24/02/2011

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment
			89.86	0.00	
			89.36	0.50	
			88.86	1.00	
1.00-1.10	4				
1.10-1.20	4				
1.20-1.30	3				
1.30-1.40	5				
1.40-1.50	3				
1.50-1.60	3				
1.60-1.70	3				
1.70-1.80	4				
1.80-1.90	4				
1.90-2.00	4				
2.00-2.10	1				
2.10-2.20	4				
2.20-2.30	4				
2.30-2.40	4				
2.40-2.50	5				
2.50-2.60	3				
2.60-2.70	5				
2.70-2.80	3				
2.80-2.90	2				
2.90-3.00	3				
3.00-3.10	3				
3.10-3.20	4				
3.20-3.30	4				
3.30-3.40	4				
3.40-3.50	4				
3.50-3.60	5				
3.60-3.70	3				
3.70-3.80	3				
3.80-3.90	3				
3.90-4.00	4				
4.00-4.10	5				
4.10-4.20	4				
4.20-4.30	3				
4.30-4.40	2				
4.40-4.50	1				
4.50-4.60	2				
4.60-4.70	2				
4.70-4.80	3				
4.80-4.90	3				
4.90-5.00	2				
5.00-5.10	2				
5.10-5.20	2				
5.20-5.30	2				
5.30-5.40	2				
5.40-5.50	2				
5.50-5.60	2				
5.60-5.70	3				
5.70-5.80	2				
5.80-5.90	2				
5.90-6.00	3				
6.00-6.10	2				
6.10-6.20	2				
6.20-6.30	3				
6.30-6.40	5				
6.40-6.50	5				
6.50-6.60	7				
6.60-6.70	6				
6.70-6.80	8				
6.80-6.90	9				
6.90-7.00	8				
7.00-7.10	6				
7.10-7.20	6				
7.20-7.30	6				
7.30-7.40	4				
7.40-7.50	4				
7.50-7.60	5				
7.60-7.70	4				
7.70-7.80	16				
7.80-7.90	3				
7.90-8.00	3				
			81.86	8.00	

Remarks

Scale (approx) 1:40	Logged By n/a
Figure No. 40822.DP16	



**IAN FARMER
ASSOCIATES**

Site

WAST - Western Gateway Site

**Probe
Number**

DP16

Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
89.86

Client
BAM Construction Limited

**Job
Number**
40822

Location
332140.47 E 350251.42 N

Dates
24/02/2011

Engineer
Arup

Sheet
2/2

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment													
					0	2	4	6	8	10	12	14	16	18	20			
8.00-8.10	4		81.86	8.00														
8.10-8.20	4																	
8.20-8.30	4																	
8.30-8.40	3																	
8.40-8.50	4																	
8.50-8.60	3		81.36	8.50														
8.60-8.70	4																	
8.70-8.80	4																	
8.80-8.90	4																	
8.90-9.00	5																	
9.00-9.10	4		80.86	9.00														
9.10-9.20	5																	
9.20-9.30	5																	
9.30-9.40	4																	
9.40-9.50	3																	
9.50-9.60	3		80.36	9.50														
9.60-9.70	4																	
9.70-9.80	5																	
9.80-9.90	3																	
9.90-10.00	4																	
			79.86	10.00														
			79.36	10.50														
			78.86	11.00														
			78.36	11.50														
			77.86	12.00														
			77.36	12.50														
			76.86	13.00														
			76.36	13.50														
			75.86	14.00														
			75.36	14.50														
			74.86	15.00														
			74.36	15.50														
			73.86	16.00														

Remarks

**Scale
(approx)**

1:40

**Logged
By**

n/a

Figure No.

40822.DP16



**IAN FARMER
ASSOCIATES**

Site
WAST - Western Gateway Site

**Probe
Number**
DP17

Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
90.50

Client
BAM Construction Limited

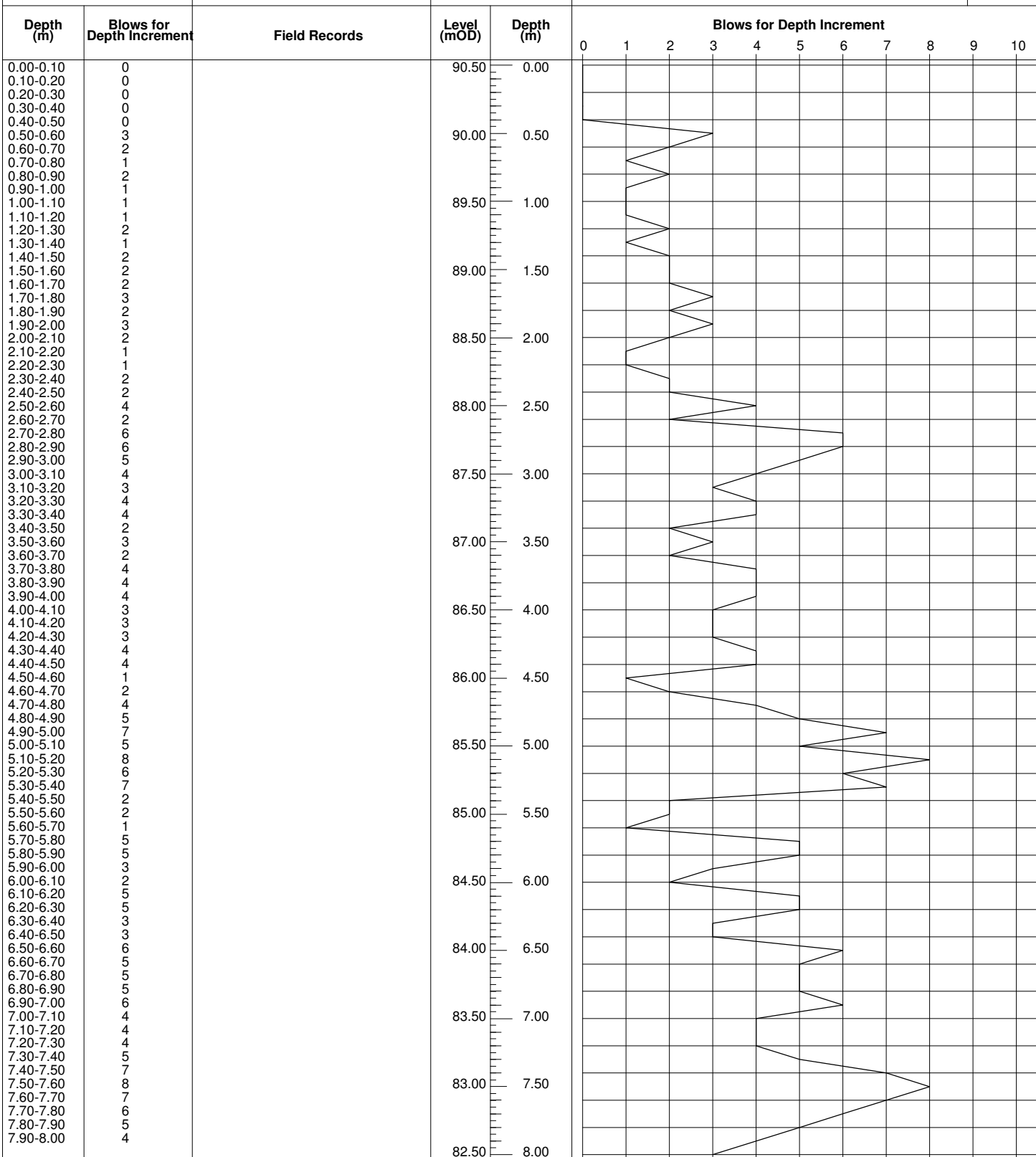
**Job
Number**
40822

Location
332192.56 E 350294.41 N

Dates
24/02/2011

Engineer
Arup

Sheet
1/2



Remarks

Scale (approx)
1:40

Logged By
n/a

Figure No.
40822.DP17



IAN FARMER
ASSOCIATES

Site

WAST - Western Gateway Site

Probe
Number

DP17

Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
90.50

Client
BAM Construction Limited

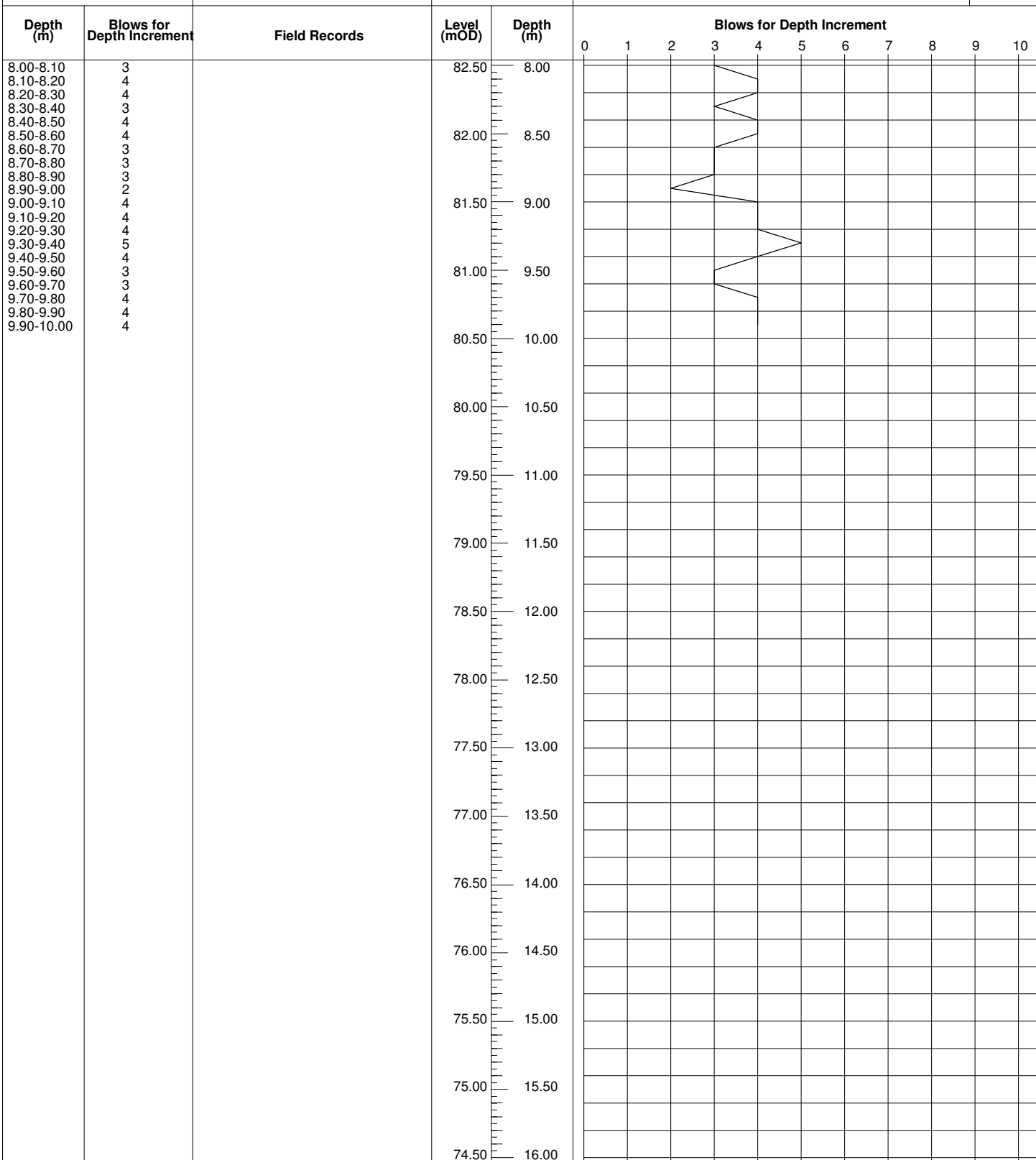
Job
Number
40822

Location
332192.56 E 350294.41 N

Dates
24/02/2011

Engineer
Arup

Sheet
2/2



Remarks

Scale (approx) 1:40
Logged By n/a
Figure No. 40822.DP17



**IAN FARMER
ASSOCIATES**

Site

WAST - Western Gateway Site

**Probe
Number**

DP18

Method
Dynamic Probe

Cone Dimensions

Ground Level (mOD)
88.18

Client
BAM Construction Limited

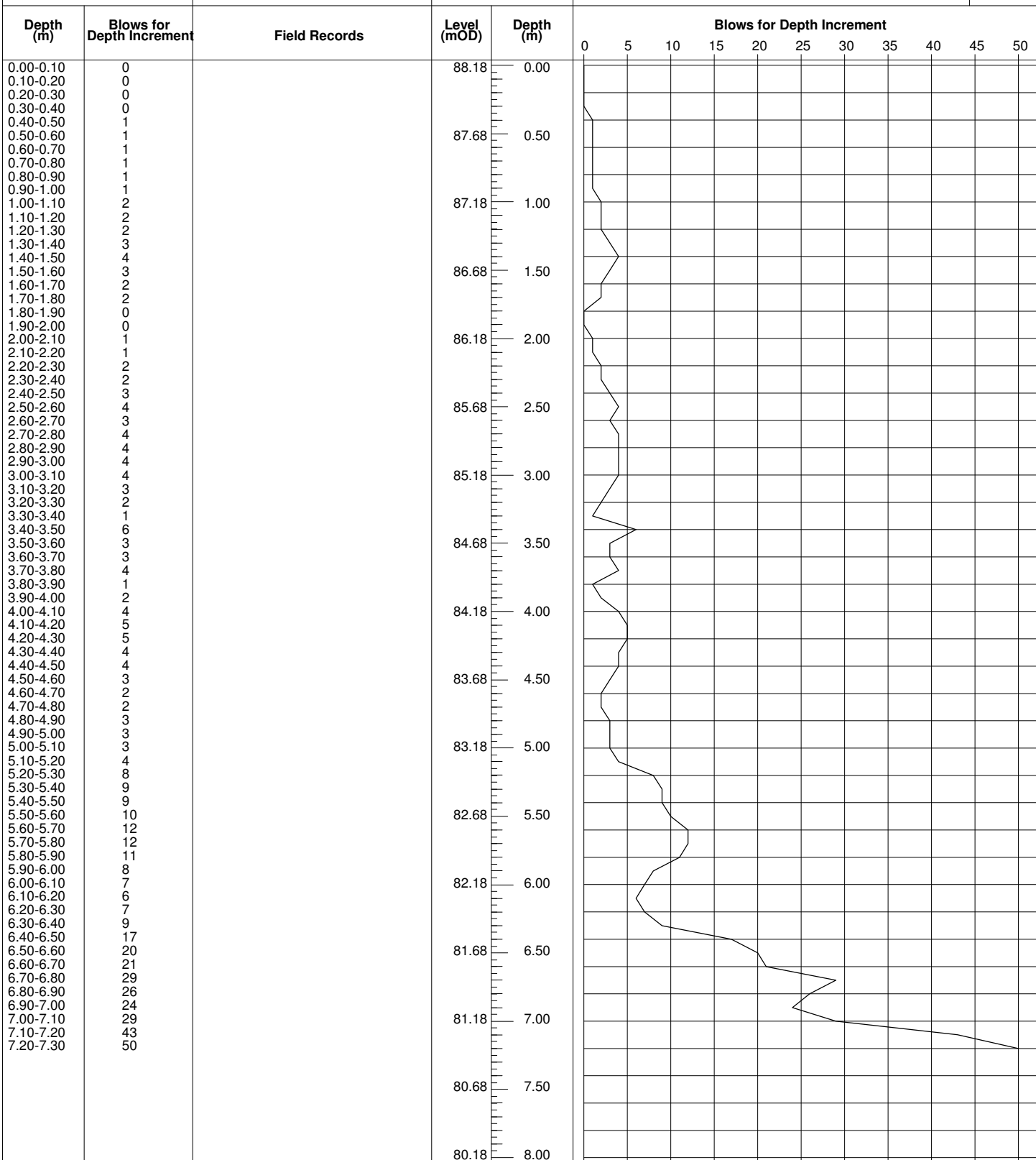
**Job
Number**
40822

Location
332244.27 E 350254.05 N

Dates
25/02/2011

Engineer
Arup

Sheet
1/1



Remarks

Scale (approx)	Logged By
1:40	n/a
Figure No.	
40822.DP18	



**IAN FARMER
ASSOCIATES**

Site WAST - Western Gateway Site	Probe Number DP19
Method Dynamic Probe	Job Number 40822
Cone Dimensions	Sheet 1/2
Location 332265.38 E 350263.57 N	Dates 25/02/2011
Ground Level (mOD) 87.91	Engineer Arup
Client BAM Construction Limited	

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment
			87.91	0.00	0 1 2 3 4 5 6 7 8 9 10
			87.41	0.50	
			86.91	1.00	
1.00-1.10	2		86.41	1.50	
1.10-1.20	2				
1.20-1.30	2				
1.30-1.40	2				
1.40-1.50	2				
1.50-1.60	2				
1.60-1.70	2				
1.70-1.80	3				
1.80-1.90	3				
1.90-2.00	2				
2.00-2.10	3				
2.10-2.20	1				
2.20-2.30	3				
2.30-2.40	3				
2.40-2.50	2				
2.50-2.60	2				
2.60-2.70	2				
2.70-2.80	3				
2.80-2.90	2				
2.90-3.00	3				
3.00-3.10	3				
3.10-3.20	3				
3.20-3.30	3				
3.30-3.40	3				
3.40-3.50	3				
3.50-3.60	2				
3.60-3.70	3				
3.70-3.80	4				
3.80-3.90	2				
3.90-4.00	2				
4.00-4.10	2				
4.10-4.20	2				
4.20-4.30	2				
4.30-4.40	2				
4.40-4.50	2				
4.50-4.60	2				
4.60-4.70	2				
4.70-4.80	5				
4.80-4.90	6				
4.90-5.00	4				
5.00-5.10	2				
5.10-5.20	2				
5.20-5.30	2				
5.30-5.40	1				
5.40-5.50	3				
5.50-5.60	4				
5.60-5.70	5				
5.70-5.80	4				
5.80-5.90	4				
5.90-6.00	5				
6.00-6.10	4				
6.10-6.20	4				
6.20-6.30	3				
6.30-6.40	2				
6.40-6.50	3				
6.50-6.60	4				
6.60-6.70	3				
6.70-6.80	3				
6.80-6.90	4				
6.90-7.00	4				
7.00-7.10	4				
7.10-7.20	4				
7.20-7.30	4				
7.30-7.40	3				
7.40-7.50	3				
7.50-7.60	2				
7.60-7.70	2				
7.70-7.80	4				
7.80-7.90	2				
7.90-8.00	2				
			79.91	8.00	

Remarks

Scale (approx) 1:40	Logged By n/a
Figure No. 40822.DP19	



IAN FARMER
ASSOCIATES

Site

WAST - Western Gateway Site

Probe
Number

DP19

Method Dynamic Probe	Cone Dimensions	Ground Level (mOD) 87.91	Client BAM Construction Limited	Job Number 40822
	Location 332265.38 E 350263.57 N	Dates 25/02/2011	Engineer Arup	Sheet 2/2

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment 0 1 2 3 4 5 6 7 8 9 10										
8.00-8.10	4		79.91	8.00											
8.10-8.20	2														
8.20-8.30	3														
8.30-8.40	3														
8.40-8.50	4														
8.50-8.60	3		79.41	8.50											
8.60-8.70	4														
8.70-8.80	4														
8.80-8.90	4														
8.90-9.00	5														
9.00-9.10	5		78.91	9.00											
9.10-9.20	4														
9.20-9.30	5														
9.30-9.40	4														
9.40-9.50	3														
9.50-9.60	2		78.41	9.50											
9.60-9.70	2														
9.70-9.80	4														
9.80-9.90	3														
9.90-10.00	5														
			77.91	10.00											
			77.41	10.50											
			76.91	11.00											
			76.41	11.50											
			75.91	12.00											
			75.41	12.50											
			74.91	13.00											
			74.41	13.50											
			73.91	14.00											
			73.41	14.50											
			72.91	15.00											
			72.41	15.50											
			71.91	16.00											

Remarks

Scale (approx)	Logged By
1:40	n/a
Figure No. 40822.DP19	

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)	Blows for Depth Increment
			87.78	0.00	
			87.28	0.50	
			86.78	1.00	
1.00-1.10	0				
1.10-1.20	0				
1.20-1.30	0				
1.30-1.40	0				
1.40-1.50	0				
1.50-1.60	0		86.28	1.50	
1.60-1.70	0				
1.70-1.80	0				
1.80-1.90	1				
1.90-2.00	1				
2.00-2.10	1		85.78	2.00	
2.10-2.20	1				
2.20-2.30	1				
2.30-2.40	1				
2.40-2.50	1				
2.50-2.60	4		85.28	2.50	
2.60-2.70	3				
2.70-2.80	6				
2.80-2.90	3				
2.90-3.00	9				
3.00-3.10	5		84.78	3.00	
3.10-3.20	2				
3.20-3.30	2				
3.30-3.40	4				
3.40-3.50	7				
3.50-3.60	5		84.28	3.50	
3.60-3.70	5				
3.70-3.80	4				
3.80-3.90	2				
3.90-4.00	4				
4.00-4.10	1		83.78	4.00	
4.10-4.20	2				
4.20-4.30	2				
4.30-4.40	2				
4.40-4.50	2				
4.50-4.60	1		83.28	4.50	
4.60-4.70	1				
4.70-4.80	4				
4.80-4.90	2				
4.90-5.00	4				
5.00-5.10	3		82.78	5.00	
5.10-5.20	2				
5.20-5.30	2				
5.30-5.40	2				
5.40-5.50	2		82.28	5.50	
5.50-5.60	2				
5.60-5.70	2				
5.70-5.80	4				
5.80-5.90	4				
5.90-6.00	5				
6.00-6.10	7		81.78	6.00	
6.10-6.20	8				
6.20-6.30	17				
6.30-6.40	22				
6.40-6.50	25				
6.50-6.60	28		81.28	6.50	
6.60-6.70	31				
6.70-6.80	50				
			80.78	7.00	
			80.28	7.50	
			79.78	8.00	

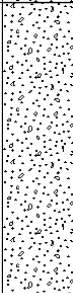
Produced by the GEOTECHNICAL DATAbase SYstem (GEODASY) (C) all rights reserved

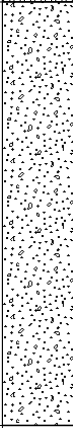
 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP01	
Excavation Method JCB 3CX		Dimensions 2.60m x 0.80m x 2.70m		Ground Level (mOD) 93.20		Client BAM Construction Limited		Job Number 40822	
		Location 331912.79 E 350246.13 N		Dates 21/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30 0.30	B2 J1			92.80	(0.40) 0.40	Grass over MADE GROUND: Dark brown, gravelly, sandy TOPSOIL including brick, quartz and sandstone.			
0.80 0.80	B4 J3					Brown, medium to coarse SAND and subrounded and rounded, fine and medium GRAVEL including sandstone, quartz and siltstone. Medium cobble content of sandstone.			
1.30 1.30	B6 J5				(2.30)	At 1.30m: slightly clayey.			
2.30 2.30	B7 D8			90.50	2.70	Below 2.00m: slightly clayey absent. At 2.30m: coal fragments, occasional tabular gravel.			
						Complete at 2.70m			
Plan						Remarks			
.						Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Major spalling of trial pit sides below 0.40m. Trial pit remained dry during excavation. Trial pit terminated at 2.70m due to collapsing of sides.			
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.						Scale (approx)		Logged By	Figure No.
						1:50		HH	40822.TP01

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend
0.20 0.20 0.50 0.50	B2 J1 B4 J3			92.17	(0.30) 0.30	Grass over MADE GROUND: Dark brown, slightly gravelly, sandy TOPSOIL including subangular to subrounded, fine to coarse brick and quartz.	
0.90 0.90	B6 J5			91.57	(0.60) 0.90	Brown, slightly clayey, sandy, subangular to subrounded, fine and medium GRAVEL.	
1.90 1.90	B7 D8				(2.40)	Brown, clayey, silty, very sandy, subangular to rounded, fine to coarse GRAVEL including igneous lithologies, sandstone, quartz and siltstone.	
2.90 2.90	B9 D10		seepage(1) at 3.30m.	89.17	3.30	At 2.50m: medium cobble content and low boulder content of sandstone.	
						Complete at 3.30m	

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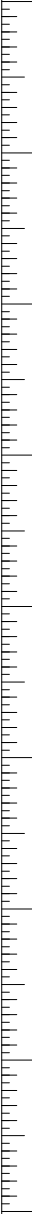
 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP03	
Excavation Method JCB 3CX		Dimensions 2.50m x 0.60m x 3.30m		Ground Level (mOD) 92.13		Client BAM Construction Limited		Job Number 40822	
		Location 331954.32 E 350258.26 N		Dates 22/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30 0.30	B2 J1			91.98	(0.15) 0.15	Grass over MADE GROUND: Dark brown, slightly sandy TOPSOIL.			
0.80 0.80	B4 J3			91.43	(0.55) 0.70	Brown, slightly clayey, slightly gravelly, medium SAND. Gravel is angular and subangular, fine and medium including quartz and sandstone (possible made ground).			
1.70 1.70 1.70	HV 240kPa B5 D6		240,240,240/Av. 240.00		(2.30)	Brown, slightly clayey, medium to coarse SAND and angular to subrounded, fine to coarse GRAVEL including sandstone, quartz, siltstone and mudstone. With medium cobble content and low boulder content of sandstone.			
2.20 2.20	B7 D8					Between 1.70m and 2.10m: band of stiff, brown, slightly sandy, clayey silt. Below 2.10m: coal fragments.			
3.20 3.20	B9 D10			89.13 88.83	3.00 (0.30) 3.30	Brown, very sandy, subangular to rounded, fine to coarse GRAVEL including quartz, sandstone and siltstone.			
						Complete at 3.30m			
Plan						Remarks			
.						Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Spalling of trial pit sides below 1.00m. Trial pit wet below 3.00m. Trial pit terminated at 3.30m due to lateral expansion of pit due to collapsing of trial pit sides.			
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						Scale (approx) 1:50	Logged By HH	Figure No. 40822.TP03	

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP04		
Excavation Method JCB 3CX		Dimensions 2.70m x 0.70m x 3.20m		Ground Level (mOD) 92.25		Client BAM Construction Limited		Job Number 40822		
		Location 331950.95 E 350296.44 N		Dates 21/02/2011		Engineer Arup		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water	
0.20 0.20 0.50 0.50	B2 J1 B4 J3			92.15 91.85	(0.10) 0.10 (0.30) 0.40 (0.50)	Grass over MADE GROUND: Dark brown, sandy, gravelly TOPSOIL. Gravel is angular and subangular, fine to coarse including quartz, brick, tarmac and siltstone. MADE GROUND: Dark brown, slightly clayey, gravelly, medium SAND including brick and tarmac.				
0.90 0.90	B6 J5			91.35	0.90	Brown, slightly clayey, slightly gravelly, fine and medium SAND. Brown, slightly clayey, fine and medium SAND and subangular to rounded, fine to coarse GRAVEL including quartz, sandstone and siltstone. Medium cobble and low boulder content.				
2.00 2.00	B7 D8				(2.10)					
2.90 2.90	B9 D10		Water strike(1) at 2.90m.	89.25 89.05	3.00 (0.20) 3.20	Brown, sandy, subangular to rounded, fine to coarse GRAVEL including quartz, sandstone and siltstone. With medium cobble content. Complete at 3.20m			▽1	
Plan 						Remarks Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Major spalling of trial pit sides below 0.60m during excavation (bowl shape, undermining spoil and surfaces cracking).				
						Scale (approx) 1:50		Logged By HH		Figure No. 40822.TP04

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP05		
Excavation Method JCB 3CX		Dimensions 2.70m x 0.70m x 3.10m		Ground Level (mOD) 91.97		Client BAM Construction Limited		Job Number 40822		
		Location 331972.15 E 350283.22 N		Dates 21/02/2011		Engineer Arup		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water	
0.20 0.20 0.40 0.40 0.90	B2 J1 B4 J3 J5		Water strike(1) at 2.80m.	91.67	(0.30) 0.30	Grass over MADE GROUND: Dark brown, sandy, slightly gravelly TOPSOIL with occasional brick fragments, quartz, sandstone and rootlets.				
							Brown, slightly clayey, fine and medium SAND and angular to subrounded, fine to coarse GRAVEL including sandstone, quartz, siltstone and igneous lithologies. With medium cobble content.			
						(2.80)	Below 1.00m: clayey with low boulder content and locally becoming sandy gravel.			
1.90 1.90	B6 D7						Below 2.80m: slightly clayey.			
2.90 2.90	B8 D9			88.87	3.10	Complete at 3.10m				
Plan 						Remarks Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Major spalling of trial pit sides between 0.30m to 2.90m, sides collapsed to 2.20m then collapsed again at 3.10m.				
						Scale (approx) 1:50		Logged By HH		
						Figure No. 40822.TP05				



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 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP07		
Excavation Method JCB 3CX		Dimensions 2.70m x 0.60m x 3.00m		Ground Level (mOD) 92.25		Client BAM Construction Limited		Job Number 40822		
		Location 331961.3 E 350313.65 N		Dates 21/02/2011		Engineer Arup		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
0.30	B2			92.05	(0.20)	Grass over: TOPSOIL.				
0.30	J1				(0.20)	Brown, slightly silty, slightly gravelly, fine SAND.				
0.80	B4			91.65	(0.40)	Brown, clayey, silty, very sandy, subangular to rounded, fine to coarse GRAVEL including quartz, sandstone, siltstone and igneous lithologies. With high cobble content.				
0.80	J3				0.60					
										
1.80	B5				(2.40)	At 1.50m: medium cobble content.				
1.80	D6									
2.80	B7		Water strike(1) at 2.80m.							
2.80	D8				89.25	3.00				
						Complete at 3.00m				
Plan						Remarks Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Trial pit terminated at 3.00m due to being unable to extend deeper as major spalling/collapse of trial pit sides.				
						Scale (approx)	Logged By	Figure No.		
						1:50	HH	40822.TP07		

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP09		
Excavation Method JCB 3CX		Dimensions 2.80m x 0.60m x 3.80m		Ground Level (mOD) 91.96		Client BAM Construction Limited		Job Number 40822		
		Location 331994.2 E 350291.13 N		Dates 22/02/2011		Engineer Arup		Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water	
0.40 0.40	B2 J1		Water strike(1) at 3.10m.	91.76	(0.20) 0.20	Grass over MADE GROUND: Dark brown, sandy TOPSOIL with rootlets and rags (plastic). Light brown, sandy, clayey SILT (possible made ground).				
0.80 0.80	B4 J3				(1.15)					
1.40 1.40	B5 D6				90.61	1.35	Light brown, medium to coarse SAND and angular to subrounded, fine to coarse GRAVEL including sandstone, siltstone, mudstone and quartz. Low boulder content and low cobble content of sandstone. Below 1.60m: clayey.			
2.40 2.40	B7 D8					(2.45)				
3.40 3.40	B9 D10				88.16	3.80	At 3.20m: slightly clayey.			
						Complete at 3.80m				
Plan 						Remarks Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Major spalling of trial pit sides below 1.40m during excavation. Trial pit terminated at 3.80m due to sides collapsing.				
						Scale (approx) 1:50		Logged By HH		
						Figure No. 40822.TP09				

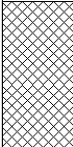
 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP10	
Excavation Method JCB 3CX		Dimensions 2.50m x 0.60m x 3.00m		Ground Level (mOD) 91.99		Client BAM Construction Limited		Job Number 40822	
		Location 332000.61 E 350310.27 N		Dates 21/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.10 0.10 0.40 0.40	B1 D2 B4 J3			91.74	(0.25) 0.25 (0.65)	Grass over MADE GROUND: Dark brown, sandy, slightly gravelly TOPSOIL. Gravel is angular and subangular to rounded, fine to coarse including quartz, sandstone and rootlets. Light brown, slightly clayey, silty, fine and medium SAND.			
0.90 0.90	B6 J5			91.09	0.90	Light brown, clayey, medium to coarse SAND and subangular to rounded, fine to coarse GRAVEL including sandstone, siltstone, quartz and igneous lithologies. Low cobble and boulder content of sandstone.			
1.90 1.90	B7 D8				(2.10)	At 2.00m: pockets of grey, medium sand.			
2.90 2.90	B9 D10		Water strike(1) at 3.00m.	88.99	3.00	Complete at 3.00m			
Plan 						Remarks Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Trial pit terminated at 3.00m due to major spalling of trial pit sides.			
						Scale (approx) 1:50		Logged By HH	
						Figure No. 40822.TP10			

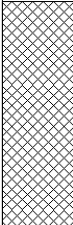
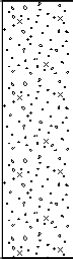
Client BAM Construction Limited	Job Number 40822
Engineer Arup	Sheet 1/1

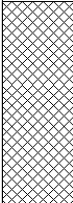
Description	Legend
Grass over MADE GROUND: Dark brown, sandy TOPSOIL with rootlets.	
Brown, sandy, slightly gravelly SILT. Gravel is angular to subrounded, fine to coarse including quartz, sandstone and siltstone.	
Below 0.70m: slightly clayey.	
Brown, very silty, medium to coarse SAND and angular to subrounded, fine to coarse GRAVEL including sandstone, siltstone, quartz, mudstone and occasional coal fragments. Medium cobble content of sandstone.	
Below 2.00m: coarse sand and gravel.	
Brown, sandy, angular to subrounded and rounded, medium to coarse GRAVEL including sandstone, siltstone and quartz. Medium cobble content.	
Complete at 3.70m	

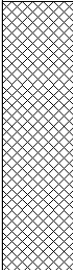
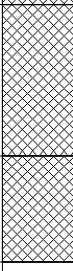
Remarks		
Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Major spalling of trial pit sides below 1.10m during excavation.		
Scale (approx)	Logged By	Figure No.
1:50	HH	40822.TP11

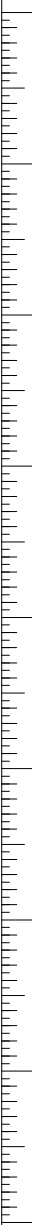
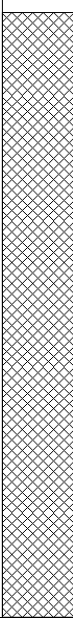
 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP12	
Excavation Method JCB 3CX		Dimensions 2.60m x 0.60m x 3.60m		Ground Level (mOD) 91.77		Client BAM Construction Limited		Job Number 40822	
		Location 332008.49 E 350273.31 N		Dates 22/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30 0.30	B2 J1			91.57	(0.20) 0.20	Grass over MADE GROUND: Dark brown, sandy TOPSOIL with rootlets.			
0.80 0.80	B4 J3				(1.10)	Brown, sandy, slightly clayey, slightly gravelly SILT. Gravel is angular and subangular, fine and medium including quartz and sandstone.			
1.30 1.30	B5 D6			90.47	1.30	Below 0.60m: clayey.			
2.30 2.30	B7 D8				(2.30)	Light brown, clayey, medium SAND and angular to subrounded, fine to coarse GRAVEL. Low cobble content of siltstone and sandstone.			
3.30 3.30	B9 D10		Water strike(1) at 3.30m.			Below 3.00m: slightly clayey.			▽1
				88.17	3.60	Complete at 3.60m			
Plan						Remarks			
.						Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Major collapse of trial pit sides below 1.50m during excavation.			
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						Scale (approx)	Logged By	Figure No.	
						1:50	HH	40822.TP12	

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP13	
Excavation Method JCB 3CX		Dimensions		Ground Level (mOD) 93.54		Client BAM Construction Limited		Job Number 40822	
		Location 332034.86 E 350375.37 N		Dates 02/03/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50 0.50	B2 J1				(1.00)	MADE GROUND: Brown, slightly sandy, clayey SILT.			
1.10 1.10	B4 J3			92.54	1.00 (0.40)	MADE GROUND: Dark grey/dark brown, very sandy, angular and subangular, fine to coarse GRAVEL including limestone, brick, plastics, metal fragments and timber sleepers.			
1.80 1.80	B5 D6			92.14 91.94	1.40 (0.20) 1.60 (0.90)	Orange brown, fine to coarse SAND and subangular to rounded, fine to coarse GRAVEL including sandstone, mudstone and siltstone.			
						Firm, orange brown mottled light grey and orange, slightly silty, sandy CLAY with fine and medium lenses of sand.			
2.80 2.80	B7 D8			91.04	2.50	Orange brown slightly mottled light grey and orange, very sandy SILT.			
					(1.50)	Below 3.00m: grey bands of silt.			
3.80 3.80	B9 D10			89.54	4.00	Complete at 4.00m			
Plan 						Remarks Samples marked "J" comprise 1 x amber jar and 1 x plastic tub. Major spalling of trial pit sides below 1.90m during excavation.			
						Scale (approx) 1:50		Logged By TB	
						Figure No. 40822.TP13			

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP14	
Excavation Method JCB 3CX		Dimensions 2.60m x 0.80m x 3.70m		Ground Level (mOD) 94.34		Client BAM Construction Limited		Job Number 40822	
		Location 332062.15 E 350353.82 N		Dates 02/03/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50 0.50	B2 J1				(1.50)	MADE GROUND: Brown, silty, gravelly, fine to coarse SAND with low subangular cobble content. Gravel is angular to subrounded, fine to coarse including sandstone, mudstone, siltstone and brick.			
1.00 1.00	B4 J3			92.84	1.50 (0.50)	MADE GROUND: Grey, very sandy, angular and subangular, fine to coarse GRAVEL including limestone, brick and tarmac.			
1.60 1.60	B5 D6			92.34	2.00	Brown, slightly silty, sandy, subangular to rounded, fine to coarse GRAVEL including sandstone, siltstone and mudstone. With medium subangular to subrounded cobble content.			
2.10 2.10	B7 D8				(1.70)	Below 2.70m: with high cobble content.			
3.00 3.00	B9 D10								
3.70 3.70	D12 B11			90.64	3.70	Complete at 3.70m			
Plan 						Remarks Samples marked "J" comprise 1 x amber jar and 1 x plastic tub. Major spalling of trial pit sides below 2.40m during excavation. Trial pit remained dry during excavation.			
						Scale (approx) 1:50		Logged By TB	
						Figure No. 40822.TP14			

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP15			
Excavation Method JCB 3CX		Dimensions 2.50m x 0.90m x 3.90m		Ground Level (mOD) 94.27		Client BAM Construction Limited		Job Number 40822			
		Location 332093.6 E 350341.24 N		Dates 01/03/2011		Engineer Arup		Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water		
0.50	J1				(1.40)	MADE GROUND: Orange brown, slightly silty, slightly gravelly, fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse including sandstone and siltstone.					
1.00	B2					MADE GROUND: Tarmacadam.					
1.80	B3			92.87	1.40 (0.15)	MADE GROUND: Light grey, angular and subangular, fine to coarse GRAVEL including limestone.					
1.80	D4			92.72	1.55 (0.15)	Brown, slightly clayey, sandy, angular to subrounded, fine to coarse GRAVEL including sandstone, siltstone and mudstone. With occasional clayey pockets and high cobble content. Cobbles are subangular to rounded of sandstone, siltstone and mudstone.					
				92.57	1.70						
2.80	B5				(2.20)	Below 2.00m: with medium boulder content.					
2.80	D6										
3.80	B7										
3.80	D8			90.37	3.90	Complete at 3.90m					
Plan						Remarks					
						Samples marked "J" comprise 1 x amber jar and 1 x plastic tub. Major spalling of trial pit sides below 1.70m during excavation. Trial pit remained dry during excavation.					
						Scale (approx)		Logged By		Figure No.	
						1:50		TB		40822.TP15	

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP16	
Excavation Method JCB 3CX		Dimensions 2.10m x 1.70m x 3.50m		Ground Level (mOD) 97.03		Client BAM Construction Limited		Job Number 40822	
		Location 332066.52 E 350313.63 N		Dates 01/03/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50 0.50	B2 J1				(1.80)	MADE GROUND: Stiff, brown, sandy, gravelly CLAY with some pockets of sand. Gravel is subangular to subrounded, fine to coarse including sandstone, siltstone, brick and sandstone flags. With medium cobble content.			
1.00 1.00	B4 J3								
2.00 2.00	B5 D6			95.23	1.80 (1.00)	MADE GROUND: Brown, fine to coarse SAND and firm, sandy, slightly gravelly CLAY (mixed strata).			
3.00 3.00	B7 D8			94.23	2.80 (0.70)	MADE GROUND: Brown, slightly clayey, slightly gravelly, fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse including sandstone and siltstone.			
				93.53	3.50	Complete at 3.50m			
Plan 						Remarks Samples marked "J" comprise 1 x amber jar and 1 x plastic tub. Trial pit remained dry during excavation. Trial pit terminated at 3.50m due to major spalling of trial pit - sides collapsed.			
						Scale (approx) 1:50		Logged By TB	
								Figure No. 40822.TP16	

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP17	
Excavation Method JCB 3CX		Dimensions 2.50m x 0.90m x 4.00m		Ground Level (mOD) 96.76		Client BAM Construction Limited		Job Number 40822	
		Location 332091.22 E 350311.37 N		Dates 01/03/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50 0.50 1.00 1.00 2.00 2.00 3.00 4.00 4.00	B2 J1 B4 J3 B5 D6 B7 D10 B9			92.76	 (4.00)	MADE GROUND: Dark brown/grey, very clayey, very gravelly, organic, fine to coarse SAND with medium cobble content. Cobbles are subangular of sandstone, concrete and tarmacadam. Gravel is subangular to subrounded, fine to coarse including sandstone, siltstone, brick, timber and rootlets. Below 1.90m: organic odour noted. Below 2.60m: many organic pockets of clay. At 3.60m: some scrap plastic material.			
						Complete at 4.00m			
Plan 						Remarks Samples marked "J" comprise 1 x amber jar and 1 x plastic tub. Major spalling of trial pit sides below 1.30m during excavation. Trial pit remained dry during excavation.			
						Scale (approx) 1:50	Logged By TB	Figure No. 40822.TP17	



WAST - Western Gateway Site

**Trial Pit
Number**
TP18

JCB 3CX

2.60m x 0.60m x 4.20m

90.52

BAM Construction Limited

**Job
Number**
40822

332108.67 E 350266.35 N

24/02/2011

Arup

Sheet
1/1

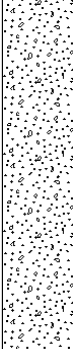
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	
0.30 0.30	B2 J1		240,240,240/Av. 240.00	90.37	(0.15) 0.15 (0.45)	Grass over MADE GROUND: Dark brown, sandy TOPSOIL with rootlets.		
0.70 0.70	B4 J3			89.92	0.60 (0.55)	MADE GROUND: Soft, brown, slightly gravelly, clayey SILT. Gravel is angular and subangular, fine to medium including ceramic, sandstone, quartz and siltstone.		
1.20 1.20	B5 D6			89.37	1.15	Soft, red brown, sandy, slightly gravelly SILT. Gravel is subrounded, fine and medium including quartz, siltstone and sandstone.		
2.20 2.30 2.30 2.30 2.30	B7 HV 240kPa D8 B9 D10				(3.05)	Brown, slightly clayey, sandy, subangular to rounded, fine to coarse GRAVEL including quartz, siltstone, mudstone, sandstone and igneous lithologies. Occasional organic bands of sand noted throughout. With medium cobble content of various lithologies.		
3.20 3.20	B11 D12					Below 2.20m: low boulder content.		
4.20 4.20	D14 B13				86.32	4.20	Between 2.30m and 2.50m; isolated pockets of stiff brown, slightly sandy, slightly gravelly CLAY. Below 2.60m: clayey.	
							Complete at 4.20m	

Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub.
Slight spalling of trial pit sides below 1.80m during excavation.

1:50

HH

40822.TP18

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP19	
Excavation Method JCB 3CX		Dimensions 2.50m x 0.60m x 4.10m		Ground Level (mOD) 89.42		Client BAM Construction Limited		Job Number 40822	
		Location 332160.95 E 350278.02 N		Dates 24/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30	B2			89.22	(0.20)	Grass over MADE GROUND: Dark brown, sandy TOPSOIL.			
0.30	J1				0.20	MADE GROUND: Soft, brown, slightly gravelly, sandy SILT. Gravel is angular to subrounded, fine to coarse including sandstone, quartz, siltstone, clinker and brick.			
0.90	B4			88.62	0.80	Firm, brown, sandy, clayey SILT.			
0.90	J3				(0.50)	Below 1.00m: pockets of dark grey organic clay.			
1.40	B5			88.12	1.30	Brown, medium and coarse SAND and angular to subrounded, occasionally tabular, fine to coarse GRAVEL including sandstone, quartz, siltstone, igneous lithologies and coal fragments. With low cobble content.			
1.40	D6								
2.40	B7				(2.80)				
2.40	D8								
3.40	B9								
3.40	D10			85.32	4.10	Complete at 4.10m			
Plan						Remarks			
.						Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Slight spalling of trial pit sides below 1.60m during excavation. Trial pit damp below 3.20m.			
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						Scale (approx)	Logged By	Figure No.	
						1:50	HH	40822.TP19	



WAST - Western Gateway Site

**Trial Pit
Number
TP20**

JCB 3CX

2.50m x 0.60m x 2.80m

91.44

BAM Construction Limited

**Job
Number**
40822

332189 21 E 350311 7 N

22/02/2011

Arup

Sheet
1/1

Sample / Tests

Field Records

Depth
(m)
(Thickness)

Description

Legend

Water

0.30

J1

0.80

J3

1.80

D6

2.80

D8

88.64

2.80

Grass over MADE GROUND: Dark brown, sandy, gravelly TOPSOIL with rootlets. Gravel is angular and subangular, fine to medium including quartz.

MADE GROUND: Dark grey brown, sandy, angular and subangular, fine to coarse GRAVEL including ceramic, brick and sandstone.

Brown, slightly silty, very sandy, subrounded and rounded, fine to coarse GRAVEL with low cobble content. Gravel includes sandstone, quartz and coal fragments (possible made ground).

Below 1.40m: grey brown.

Complete at 2.80m

Plan

Remarks

Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub.
Spalling of trial pit sides below 0.60m during excavation.
Trial pit terminated at 2.80m due to collapsing of sides.

Scale (approx)

1:50

Logged By

HH

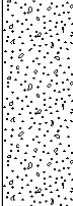
Figure No.

40822.TP20

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP21	
Excavation Method JCB 3CX		Dimensions 2.50m x 0.60m x 4.20m		Ground Level (mOD) 88.49		Client BAM Construction Limited		Job Number 40822	
		Location 332222.63 E 350269.49 N		Dates 24/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30 0.30	B2 J1			88.29	(0.20) 0.20	Grass over MADE GROUND: Dark brown, sandy TOPSOIL with rootlets and occasional brick fragments.			
					(0.70)	MADE GROUND: Brown, sandy, slightly gravelly SILT. Gravel is angular and subangular, fine to coarse including quartz, mudstone, sandstone, ceramic and clinker.			
0.90 0.90	B4 J3			87.59	0.90	Brown, slightly gravelly, sandy, clayey SILT. Gravel is angular to subrounded, fine to coarse including sandstone, quartz, siltstone and mudstone.			
					(0.70)				
1.60 1.60	B5 D6			86.89	1.60	Brown, slightly clayey, coarse SAND and subangular to rounded, fine to coarse GRAVEL including quartz, mudstone, siltstone, sandstone and igneous lithologies. With low cobble content and occasional black organic pockets of shale.			
						Below 2.50m: grey/black and brown mottling.			
2.60 2.60	B7 D8				(2.60)				
3.60 3.60	B9 D10					below 3.80m: fine to coarse, slightly silty sand.			
4.00 4.00	B11 D12		Water strike(1) at 4.10m.	84.29	4.20	Complete at 4.20m			
Plan						Remarks			
.						Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Trial pit sides remained stable during excavation.			
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						Scale (approx) 1:50	Logged By HH	Figure No. 40822.TP21	

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP22			
Excavation Method JCB 3CX		Dimensions 2.60m x 0.60m x 4.10m		Ground Level (mOD) 88.18		Client BAM Construction Limited		Job Number 40822			
		Location 332253.98 E 350270.15 N		Dates 24/02/2011		Engineer Arup		Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water		
0.30	B2		100,80,80/Av. 86.67	87.58	(0.60)	Grass over MADE GROUND: Dark grey/brown, slightly clayey, gravelly, medium to coarse SAND. Gravel is angular and subangular, fine to coarse including brick, sandstone, siltstone, ceramic and concrete.			▽1		
0.30	J1				0.60	Firm, brown, sandy, slightly gravelly, clayey SILT. Gravel is angular and subangular, fine to medium including sandstone, quartz and siltstone.					
0.70	J3				(0.60)	Brown, slightly clayey, silty, very sandy, subangular to subrounded, fine to coarse GRAVEL including sandstone and quartz. With medium cobble content of sandstone.					
1.00	HV 90kPa				1.20	Below 2.00m: clayey. Low boulder content.					
1.20	B4				(1.80)	At 2.40m: stiff band of clay.					
1.20	D5										
2.20	B6										
2.20	D7				3.00	Light brown, silty, very gravelly, medium to coarse SAND. Gravel is subangular to rounded, fine to coarse including sandstone, quartz and siltstone. With low cobble content of sandstone and siltstone.					
2.40	B8				(0.70)						
2.40	D9				3.70						
3.00	B10		Water strike(1) at 3.00m.	85.18	3.00						
3.00	D11				(0.70)						
4.00	B12			84.48	3.70						
4.00	D13				3.70						
4.00						Complete at 4.10m					
Plan						Remarks Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Slight spalling of trial pit sides below 2.30m during excavation.					
						Scale (approx) 1:50		Logged By HH		Figure No. 40822.TP22	

Client BAM Construction Limited	Job Number 40822
Engineer Arup	Sheet 1/1

Description	Legend
Grass over MADE GROUND: Dark brown, sandy TOPSOIL with rootlets.	
MADE GROUND: Soft, dark brown, sandy, slightly gravelly SILT. Gravel is angular and subangular, fine to medium including brick, sandstone and siltstone.	
Red brown, sandy, slightly gravelly, clayey SILT. Gravel is subangular to subrounded, fine to coarse including sandstone, siltstone and quartz.	
Brown, medium and coarse SAND and angular to subrounded, fine to coarse GRAVEL including sandstone, siltstone, igneous lithologies and quartz. With low cobble content and low boulder content.	
Between 2.50m and 2.60m: nodules of stiff clay.	
Very stiff, brown, slightly sandy, slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse including sandstone, quartz, siltstone and mudstone.	
Complete at 3.50m	

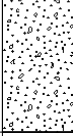
Remarks		
Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Major spalling of trial pit sides below 1.00m during excavation. Trial pit terminated at 3.50m due to collapsing of sides.		
Scale (approx)	Logged By	Figure No.
1:50	HH	40822.TP23

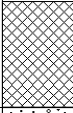
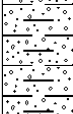
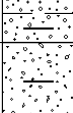
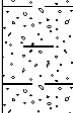


Excavation Method JCB 3CX	Dimensions 2.40m x 0.60m x 3.00m	Ground Level (mOD) 87.81	Client BAM Construction Limited	Job Number 40822
	Location 332279.92 E 350262.37 N	Dates 24/02/2011	Engineer Arup	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.40	B2			87.51	(0.30)	Grass over MADE GROUND: Dark brown sandy TOPSOIL.		
0.40	J1			87.21	(0.30)	Brown, sandy, slightly gravelly SILT (possible made ground).		
0.70	B4				(0.30)			
0.70	J3			86.71	(0.50)	Brown, sandy, clayey SILT.		
1.10	B5				1.10			
1.10	D6					Brown, slightly clayey, very sandy, angular to rounded, fine to coarse GRAVEL including sandstone, siltstone, mudstone and quartz. With low cobble and low boulder content.		
			Water strike(1) at 1.70m.		(1.90)			
2.10	B7							
2.10	D8							
2.90	B9			84.81	3.00			
2.90	D10					Complete at 3.00m		

Plan										Remarks		
.	.	.	.	.	.	.	.	.	.	Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Major spalling of trial pit sides below 1.70m during excavation. Trial pit terminated at 3.00m due to collapsing of sides.		
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										Scale (approx) 1:50		
										Logged By HH		Figure No. 40822.TP24

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP25	
Excavation Method JCB 3CX		Dimensions 2.60m x 0.60m x 2.20m		Ground Level (mOD) 87.72		Client BAM Construction Limited		Job Number 40822	
		Location 332299.61 E 350259.02 N		Dates 24/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.30 0.30	B2 J1		Water strike(1) at 1.20m.	87.62	(0.10) 0.10 (0.40)	Grass over MADE GROUND: Dark brown, sandy TOPSOIL with rootlets.		V1	
0.70 0.70	B4 J3			87.22	0.50	MADE GROUND: Dark brown, slightly sandy, slightly gravelly SILT. Gravel is angular and subangular, fine and medium.			
1.30 1.30	B5 D6			86.52	1.20	Brown, sandy, slightly gravelly, clayey SILT. Gravel is subangular to subrounded, fine to coarse including sandstone, siltstone and mudstone.			
2.20 2.20	D8 B7				(1.00)	Grey/brown, slightly clayey, silty, medium and coarse SAND and subangular to subrounded, fine to coarse GRAVEL. With low cobble content and occasional nodules of silt and clay.			
				85.52	2.20	Complete at 2.20m			
Plan 						Remarks Samples marked "J" comprise 1 x amber jar, 1 x vial and 1 x plastic tub. Spalling of trial pit sides below ground level. Trial pit terminated at 2.20m due to collapsing of sides.			
						Scale (approx) 1:50		Logged By HH	
						Figure No. 40822.TP25			

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP26	
Excavation Method JCB 3CX		Dimensions 2.40m x 0.70m x 4.00m		Ground Level (mOD) 92.07		Client BAM Construction Limited		Job Number 40822	
		Location 332103.64 E 350285.92 N		Dates 01/03/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50 0.50	B2 J1			91.37	(0.70) 0.70	Grass over MADE GROUND: Brown, slightly clayey, gravelly, slightly organic, fine to coarse SAND with rootlets. Gravel is angular to subrounded, fine to coarse including brick, timber fragments, sandstone and siltstone. With medium cobble content. Cobbles are subangular including brick, concrete and sandstone.			
1.00 1.00	B4 J3					Firm, orange brown, sandy, slightly gravelly, friable CLAY. Gravel is subangular to subrounded, fine and medium including sandstone and siltstone.			
2.00 2.00	B5 D6				(1.80)	Below 1.80m: not friable, gravel is fine to coarse.			
2.60 2.60	B7 D8			89.57	2.50	Light brown and light grey, slightly clayey, very sandy, subangular to rounded, fine to coarse GRAVEL of various lithologies including sandstone, siltstone and mudstone. With medium cobble content.			
3.60 3.60	B9 D10			88.07	4.00	Complete at 4.00m			
Plan 						Remarks Samples marked "J" comprise 1 x amber jar and 1 x plastic tub. Slight spalling of trial pit sides below 2.50m during excavation. Trial pit remained dry during excavation.			
						Scale (approx) 1:50		Logged By TB	
						Figure No. 40822.TP26			



WAST - Western Gateway Site

**Trial Pit
Number**
TP27

JCB 3CX

1.70m x 2.00m x 3.40m

96.70

BAM Construction Limited

Job Number
40822

332071 18 F 350264 29 N

01/03/2011

Arup

Sheet
1/1

Depth
(m)

Sample / Tests

Water
Depth
(m)

Field Records

Level
(mOD)Depth
(m)
(Thickness)

Description

Legend

Water

0.50	0.50
------	------

B2
J1

1.00
1.00

B4
J3

2.00	2.00
------	------

B5
D6

3.00	3.00
------	------

B7
D8

93.30

3.40

Grass over MADE GROUND: Orange brown, slightly silty, very gravelly, fine to coarse SAND with medium cobble content. Cobbles are of concrete and sandstone. Gravel is angular to subrounded, fine to coarse including brick, sandstone and siltstone.

Complete at 3.40m

Plan

Remarks

Samples marked "J" comprise 1 x amber jar and 1 x plastic tub.
Trial pit terminated at 3.40m due to major spalling throughout entire excavation.
Trial pit remained dry during excavation.

Scale (approx)

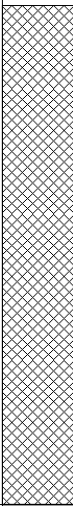
1:50

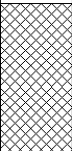
Logged By

TB

Figure No.

40822.TP27

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP28	
Excavation Method JCB 3CX		Dimensions 2.20m x 2.10m x 3.30m		Ground Level (mOD) 96.96		Client BAM Construction Limited		Job Number 40822	
		Location 332092.18 E 350358.27 N		Dates 01/03/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50 0.50 1.00 1.00 2.00 2.00 3.00 3.00	B2 J1 B4 J3 B5 D6 B7 D8			93.66	 (3.30)	MADE GROUND: Orange brown, slightly silty, gravelly, fine to coarse SAND. Gravel is subangular to rounded, fine to coarse including sandstone and siltstone.			
						Complete at 3.30m			
Plan						Remarks			
.						Samples marked "J" comprise 1 x amber jar and 1 x plastic tub. Trial pit terminated at 3.30m due to major spalling of trial pit sides. Trial pit remained dry during excavation.			
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.									
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.									
						Scale (approx)		Logged By	
						1:50		TB	
								Figure No. 40822.TP28	

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number TP29	
Excavation Method JCB 3CX		Dimensions 1.30m x 0.80m x 1.00m		Ground Level (mOD) 88.72		Client BAM Construction Limited		Job Number 40822	
		Location 332269.11 E 350269.01 N		Dates 01/03/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50-1.00 0.50-1.00	B2 J1			87.72	(1.00) 1.00	MADE GROUND: Firm, brown, very sandy, gravelly CLAY. Gravel is angular to subrounded, fine to coarse including sandstone, brick and siltstone.			
						Complete at 1.00m			
Plan						Remarks			
.						Samples marked "J" comprise 1 x amber jar and 1 x plastic tub. Trial pit excavated into an existing mound of spoil.			
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						Scale (approx) 1:50	Logged By TB	Figure No. 40822.TP29	



WAST - Western Gateway Site

**Trial Pit
Number**
SA01

JCB 3CX

1.80m x 0.75m x 1.50m

92.64

BAM Construction Limited

**Job
Number**
40822

331936 17 F 350237 52 N

28/02/2011

Arup

Sheet
1/1

Sample / Tests

Field Records

Depth
(m)
(Thickness)

Description

Legend

Water

1.00
1.00

B1
D2

92.44

91.14

(0 20)

0.20

(1.30)

1.50

Grass over: Dark brown, sandy TOPSOIL.

Brown, slightly silty, very sandy, subangular to rounded, fine to coarse GRAVEL with medium cobble content of sandstone, siltstone and mudstone.

Complete at 1.50m

Plan

Remarks

Trial pit excavated to carry out soakaway test.
Slight spalling of trial pit sides below 0.20m during excavation.
Trial pit remained dry during excavation.

Scale (approx)

1:50

Logged By

TB

Figure No.

40822.SA01



WAST - Western Gateway Site

**Trial Pit
Number**
SA02

JCB 3CX

1.80m x 0.65m x 2.00m

91.94

BAM Construction Limited

**Job
Number**
40822

331980 46 F 350265 23 N

28/02/2011

Arup

Sheet
1/1

Sample / Tests

Field Records

Depth
(m)
(Thickness)

Description

Legend

Water

B1
D2

89.94

(1.80)

Grass over: Dark brown, slightly clayey, sandy TOPSOIL.
Firm, brown, sandy CLAY.

Below 1.00m: gravely. Gravel is subangular to rounded, fine to coarse including sandstone and siltstone. With rare cobbles.

Below 1.50m: very sandy with medium cobble content.

Complete at 2.00m

Plan

Remarks

Trial pit excavated to carry out soakaway test.
Trial pit remained dry and stable during excavation.

Scale (approx)

1:50

Logged By

TB

Figure No.

40822.SA02

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number SA03	
Excavation Method JCB 3CX		Dimensions 1.70m x 0.65m x 1.70m		Ground Level (mOD) 92.82		Client BAM Construction Limited		Job Number 40822	
		Location 332050.93 E 350362.16 N		Dates 28/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.80 0.80 1.50 1.50	B1 D2 B3 D4			92.17 91.82 91.12	(0.65) 0.65 (0.35) 1.00 (0.70) 1.70	MADE GROUND: Grey, sandy, angular and subangular, fine to coarse GRAVEL including limestone. Brown, clayey, sandy, subangular to rounded, fine to coarse GRAVEL including sandstone and siltstone. Brown, slightly gravelly, fine to coarse SAND. Gravel is subangular to rounded, fine to coarse including sandstone and siltstone. Complete at 1.70m		  	
Plan						Remarks Trial pit excavated to carry out soakaway test. Trial pit remained dry and stable during excavation.			
						Scale (approx) 1:50		Logged By TB	
						Figure No. 40822.SA03			

 IAN FARMER ASSOCIATES						Site WAST - Western Gateway Site		Trial Pit Number SA04	
Excavation Method JCB 3CX		Dimensions 1.70m x 0.60m x 2.00m		Ground Level (mOD) 89.34		Client BAM Construction Limited		Job Number 40822	
		Location 332175.16 E 350280.52 N		Dates 28/02/2011		Engineer Arup		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.20 0.20 0.50 0.50	B1 D2 B3 D4			88.94	(0.40) 0.40	Grass over: Dark brown, sandy TOPSOIL with rootlets.			
					(1.00)	Soft, brown, sandy, slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse including sandstone, mudstone and siltstone.	  		
1.50 1.50	B5 D6			87.94	1.40 (0.60)	Light brown, clayey, sandy, subangular to rounded, fine to coarse GRAVEL including sandstone and siltstone.			
				87.34	2.00	Complete at 2.00m			
Plan						Remarks			
.						Trial pit excavated to carry out soakaway test. Trial pit remained dry and stable during excavation.			
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.									
						Scale (approx) 1:50	Logged By TB	Figure No. 40822.SA04	

SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365: 1991

BRE Digest 365, Figure 2, Page 5



Client: BAM Construction Limited

Site: WAST - Western Gateway Site

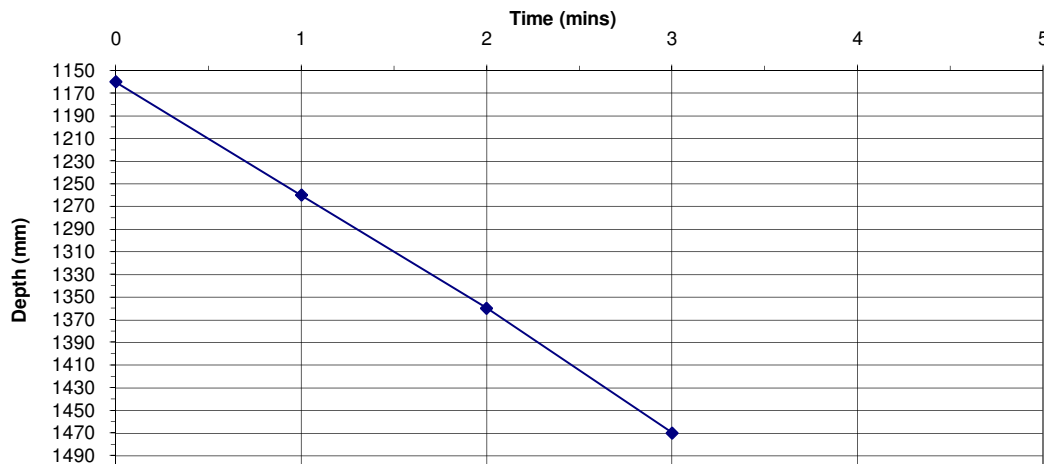
Job No: W11/40822

Test No:

SA01 Test 1

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (mm)		Size of Soakaway	Length (m) =	1.80
0	1160			Width (m) =	0.75
1	1260			Depth (m) =	1.50
2	1360				
3	1470				
				Depth to water at start of test =	1160mm
				Depth to water at end of test =	1470mm
				Depth to water at 75% level =	1238mm
				Depth to water at 50% level =	1315mm
				Depth to water at 25% level =	1393mm
				Base area of pit (m ²) =	1.350
				Eff area of loss 75 - 25% (m ²) =	2.294
				Volume outflow 75 - 25% (m ³) =	0.209
				From the graph:	
				tp 75 (min) =	0.75
				tp 25 (min) =	2.25
				Soil infiltration rate, f, (m/s) =	1.01E-03
				Soil infiltration rate, f, (m/s) =	n/a
				Carried out by:	TB
				Date:	28/02/2011
				Input by:	KMH
				Date:	09/03/2011
				Checked by:	MHW
				Date:	09/03/2011



Notes

SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365: 1991

BRE Digest 365, Figure 2, Page 5



Client: BAM Construction Limited

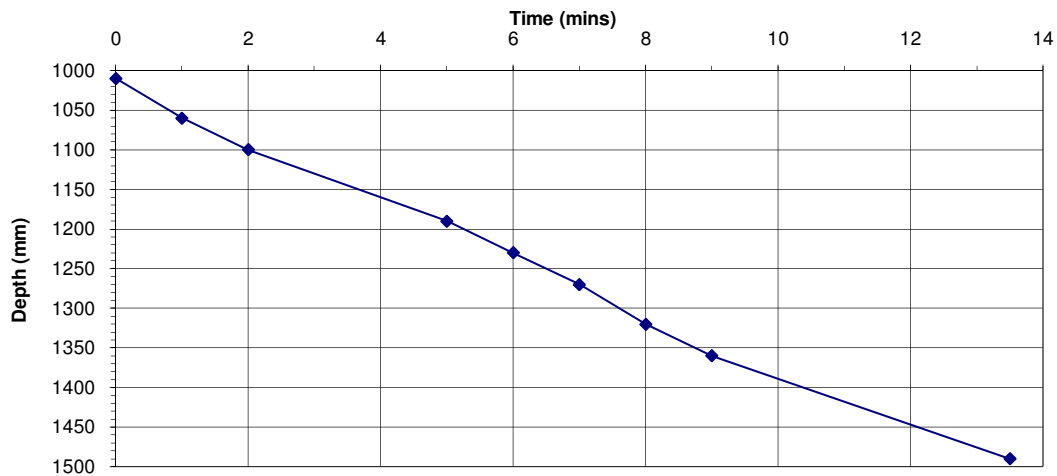
Site: WAST - Western Gateway Site

Job No: W11/40822

Test No: SA01 Test 2

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (mm)		Size of Soakaway	Length (m) =	1.80
0	1010			Width (m) =	0.75
1	1060			Depth (m) =	1.50
2	1100				
5	1190			Depth to water at start of test =	1010mm
6	1230			Depth to water at end of test =	1490mm
7	1270			Depth to water at 75% level =	1130mm
8	1320			Depth to water at 50% level =	1250mm
9	1360			Depth to water at 25% level =	1370mm
13.5	1490				
				Base area of pit (m ²) =	1.350
				Eff area of loss 75 - 25% (m ²) =	2.625
				Volume outflow 75 - 25% (m ³) =	0.324
				From the graph:	
				tp 75 (min) =	3
				tp 25 (min) =	9
				Soil infiltration rate, f, (m/s) =	3.43E-04
				Soil infiltration rate, f, (m/s) =	n/a
				Carried out by:	TB
				Date:	28/02/2011
				Input by:	KMH
				Date:	09/03/2011
				Checked by:	MHW
				Date:	09/03/2011



Notes

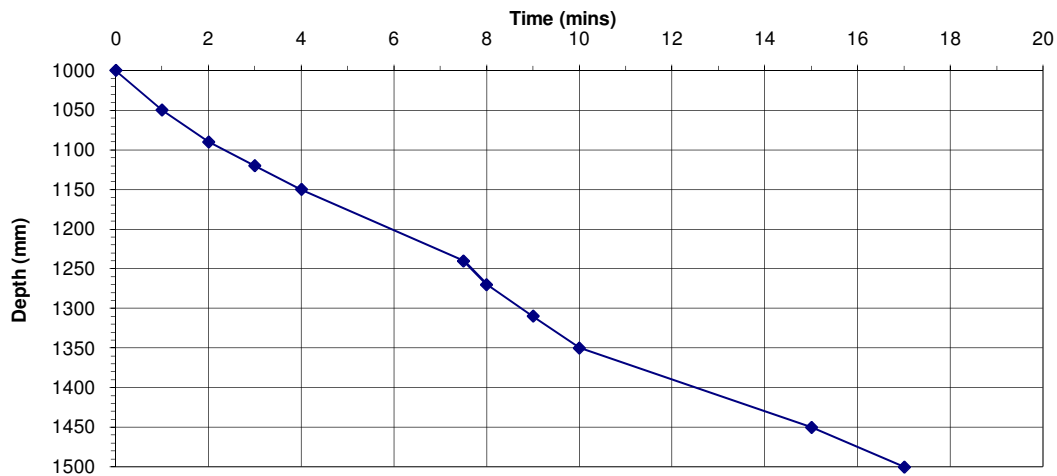
BRE Digest 365, Figure 2, Page 5



Job No:	W11/40822
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Test No:

SA01 Test 3

[illegible]

Notes

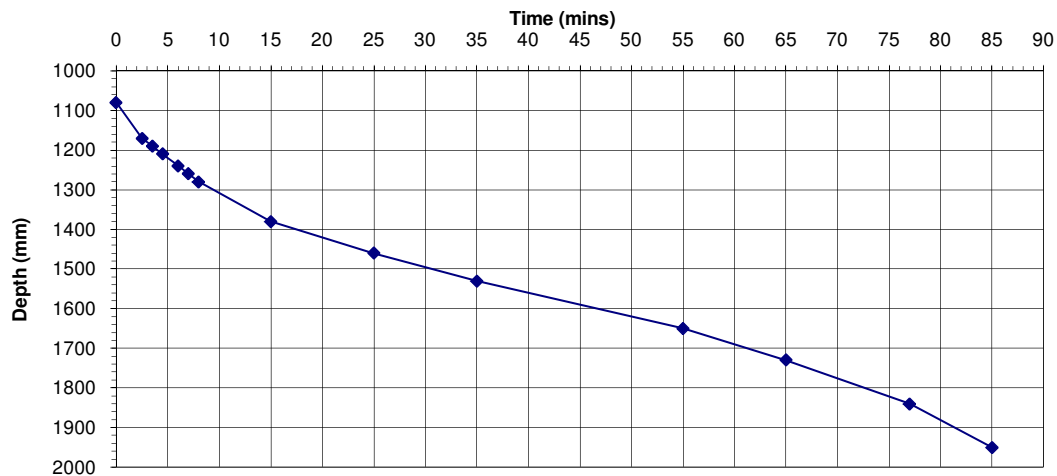
BRE Digest 365, Figure 2, Page 5



Job No:	W11/40822
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Test No:

SA02 Test 1

[illegible]

Notes

SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365: 1991

BRE Digest 365, Figure 2, Page 5



Client: BAM Construction Limited

Site: WAST - Western Gateway Site

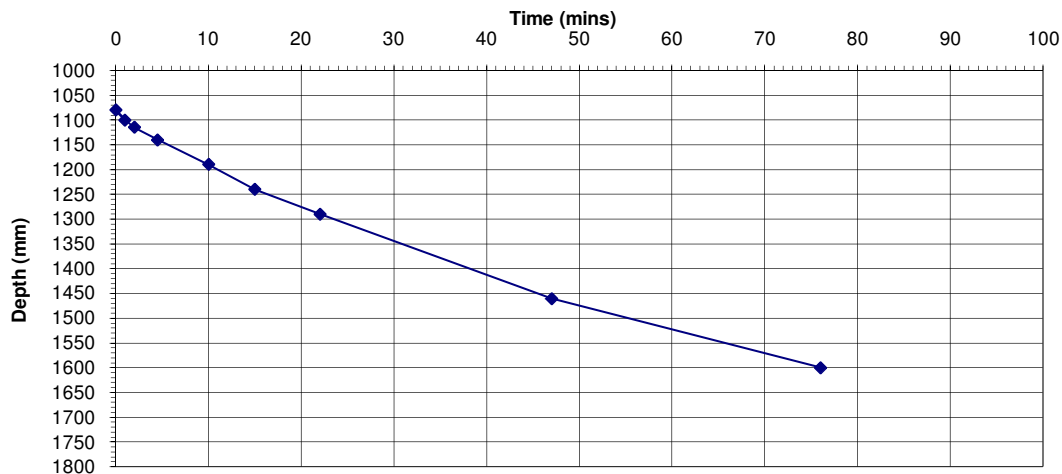
Job No: W11/40822

Test No:

SA02 Test 2

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (mm)		Size of Soakaway	Length (m) =	1.80
0	1080			Width (m) =	0.65
1	1100			Depth (m) =	2.00
2	1115				
4.5	1140			Depth to water at start of test =	1080mm
10	1190			Depth to water at end of test =	1600mm
15	1240			Depth to water at 75% level =	1210mm
22	1290			Depth to water at 50% level =	1340mm
47	1460			Depth to water at 25% level =	1470mm
76	1600				
				Base area of pit (m ²) =	1.170
				Eff area of loss 75 - 25% (m ²) =	4.404
				Volume outflow 75 - 25% (m ³) =	0.304
				From the graph:	
				tp 75 (min) =	12
				tp 25 (min) =	48
				Soil infiltration rate, f, (m/s) =	3.20E-05
				Soil infiltration rate, f, (m/s) =	n/a
				Carried out by:	TB
				Date:	28/02/2011
				Input by:	KMH
				Date:	09/03/2011
				Checked by:	MHW
				Date:	09/03/2011



Notes

BRE Digest 365, Figure 2, Page 5



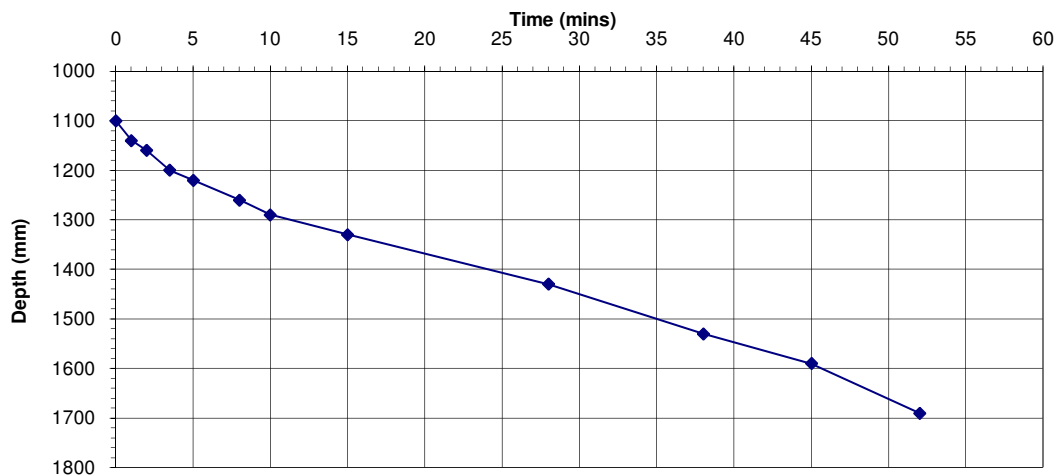
Site:	WAST - Western Gateway Site
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Job No:	W11/40822
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Test No:

SA03 Test 1

Time (min)	Depth (mm)		Size of Soakaway	Length (m) =	1.70
0	1100			Width (m) =	0.65
1	1140			Depth (m) =	1.70
2	1160				
3.5	1200	Depth to water at start of test =			1100mm
5	1220	Depth to water at end of test =			1690mm
8	1260	Depth to water at 75% level =			1248mm
10	1290	Depth to water at 50% level =			1395mm
15	1330	Depth to water at 25% level =			1543mm
28	1430				
38	1530	Base area of pit (m²) =			1.105
45	1590	Eff area of loss 75 - 25% (m²) =			2.539
52	1690	Volume outflow 75 - 25% (m³) =			0.326
		From the graph:			
		Soil infiltration rate, f, (m/s) =			6.49E-05
		Soil infiltration rate, f, (m/s) =			n/a
		Carried out by:	TB	Date:	28/02/2011
		Input by:	KMH	Date:	09/03/2011
		Checked by:	MHW	Date:	09/03/2011



Notes

BRE Digest 365, Figure 2, Page 5

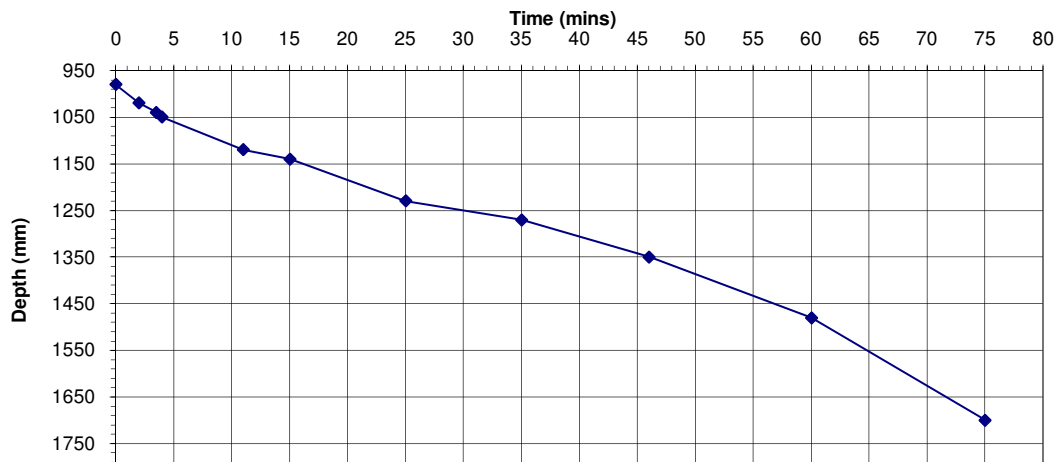


Job No:	W11/40822
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Test No:

SA03 Test 2

Time (min)	Depth (mm)		Size of Soakaway	Length (m) =	1.70
0	980			Width (m) =	0.65
2	1020			Depth (m) =	1.70
3.5	1040				
4	1050	Depth to water at start of test =			980mm
11	1120	Depth to water at end of test =			1700mm
15	1140	Depth to water at 75% level =			1160mm
25	1230	Depth to water at 50% level =			1340mm
35	1270	Depth to water at 25% level =			1520mm
46	1350				
60	1480	Base area of pit (m²) =			1.105
75	1700	Eff area of loss 75 - 25% (m²) =			2.797
		Volume outflow 75 - 25% (m³) =			0.398
		From the graph:			
		tp 75 (min) =			17
		tp 25 (min) =			63
		Soil infiltration rate, f, (m/s) =			5.15E-05
		Soil infiltration rate, f, (m/s) =			n/a
		Carried out by:	TB	Date:	28/02/2011
		Input by:	KMH	Date:	09/03/2011
		Checked by:	MHW	Date:	09/03/2011



Notes

SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365: 1991

BRE Digest 365, Figure 2, Page 5



Client: BAM Construction Limited

Site: WAST - Western Gateway Site

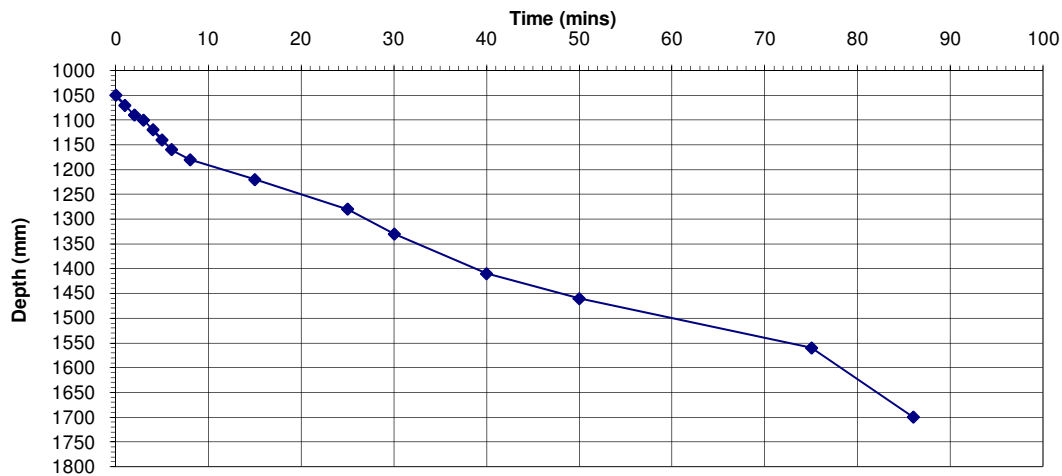
Job No: W11/40822

Test No:

SA03 Test 3

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (mm)		Size of Soakaway	Length (m) =	1.70
0	1050			Width (m) =	0.65
1	1070			Depth (m) =	1.70
2	1090				
3	1100			Depth to water at start of test =	1050mm
4	1120			Depth to water at end of test =	1700mm
5	1140			Depth to water at 75% level =	1213mm
6	1160			Depth to water at 50% level =	1375mm
8	1180			Depth to water at 25% level =	1538mm
15	1220				
25	1280			Base area of pit (m ²) =	1.105
30	1330			Eff area of loss 75 - 25% (m ²) =	2.633
40	1410			Volume outflow 75 - 25% (m ³) =	0.359
50	1460				
75	1560			From the graph:	
86	1700			tp 75 (min) =	13
				tp 25 (min) =	70
				Soil infiltration rate, f, (m/s) =	3.99E-05
				Soil infiltration rate, f, (m/s) =	n/a
				Carried out by:	TB
				Input by:	KMH
				Checked by:	MHW
				Date:	28/02/2011
				Date:	09/03/2011
				Date:	09/03/2011



Notes

BRE Digest 365, Figure 2, Page 5

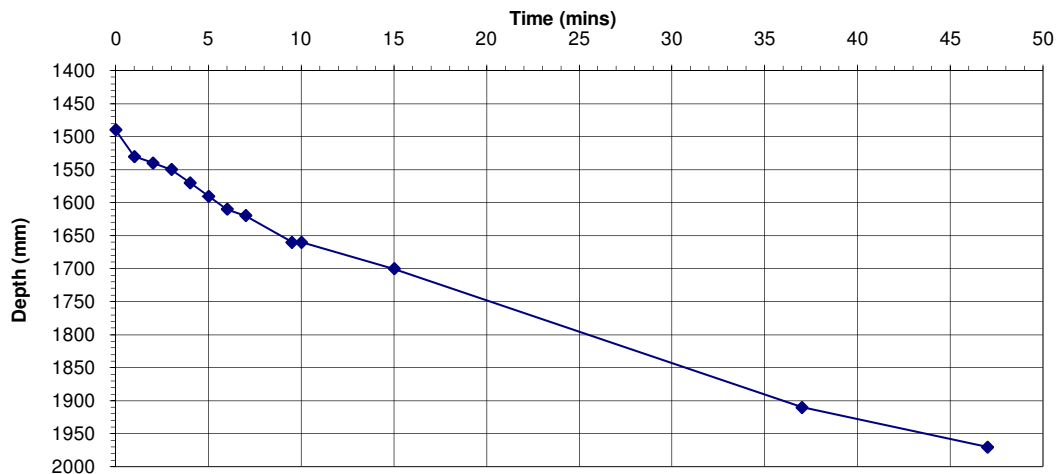


Job No:	W11/40822
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Test No:

SA04 Test 1

Time (min)	Depth (mm)		Size of Soakaway	Length (m) =	1.70
0	1490			Width (m) =	0.60
1	1530			Depth (m) =	2.00
2	1540				
3	1550	Depth to water at start of test =		1490mm	
4	1570	Depth to water at end of test =		1970mm	
5	1590	Depth to water at 75% level =		1610mm	
6	1610	Depth to water at 50% level =		1730mm	
7	1620	Depth to water at 25% level =		1850mm	
9.5	1660				
10	1660	Base area of pit (m²) =		1.020	
15	1700	Eff area of loss 75 - 25% (m²) =		2.262	
37	1910	Volume outflow 75 - 25% (m³) =		0.245	
47	1970				
		From the graph:			
		tp 75 (min) =		6	
		tp 25 (min) =		31	
		Soil infiltration rate, f, (m/s) =		7.21E-05	normal test
		Soil infiltration rate, f, (m/s) =		n/a	pit with stone
		Carried out by:	TB	Date:	28/02/2011
		Input by:	KMH	Date:	09/03/2011
		Checked by:	MHW	Date:	09/03/2011



Notes

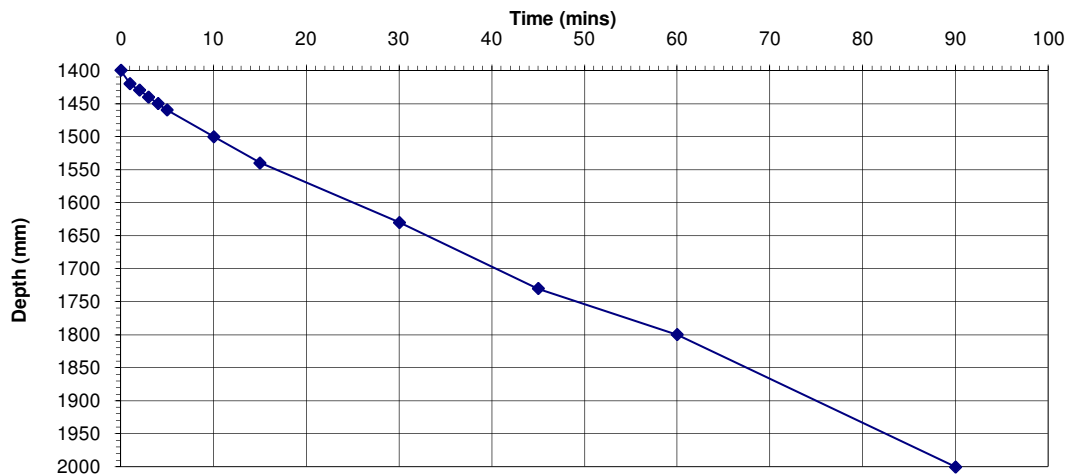
BRE Digest 365, Figure 2, Page 5



Job No:	W11/40822
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Test No:	SA04 Test 2
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Time (min)	Depth (mm)		Size of Soakaway	Length (m) =	1.70
0	1400			Width (m) =	0.60
1	1420			Depth (m) =	2.00
2	1430				
3	1440	Depth to water at start of test =			1400mm
4	1450	Depth to water at end of test =			2000mm
5	1460	Depth to water at 75% level =			1550mm
10	1500	Depth to water at 50% level =			1700mm
15	1540	Depth to water at 25% level =			1850mm
30	1630				
45	1730	Base area of pit (m²) =			1.020
60	1800	Eff area of loss 75 - 25% (m²) =			2.400
90	2000	Volume outflow 75 - 25% (m³) =			0.306
		From the graph:			
		tp 75 (min) =			17
		tp 25 (min) =			67
		Soil infiltration rate, f, (m/s) =			4.25E-05
		Soil infiltration rate, f, (m/s) =			n/a
		Carried out by:	TB	Date:	28/02/2011
		Input by:	KMH	Date:	09/03/2011
		Checked by:	MHW	Date:	10/03/2011



Notes

BRE Digest 365, Figure 2, Page 5



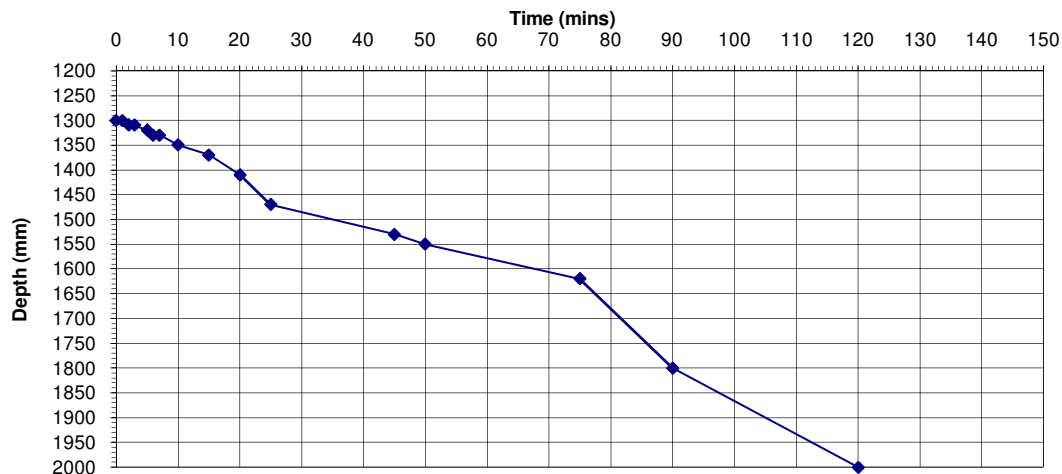
Site:	WAST - Western Gateway Site
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Job No:	W11/40822
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Test No:

SA04 Test 3

Time (min)	Depth (mm)		Size of Soakaway	Length (m) =	1.70
0	1300			Width (m) =	0.60
1	1300			Depth (m) =	2.00
2	1310				
3	1310	Depth to water at start of test = 1300mm			
5	1320	Depth to water at end of test = 2000mm			
6	1330	Depth to water at 75% level = 1475mm			
7	1330	Depth to water at 50% level = 1650mm			
10	1350	Depth to water at 25% level = 1825mm			
15	1370				
20	1410	Base area of pit (m²) = 1.020			
25	1470	Eff area of loss 75 - 25% (m²) = 2.630			
45	1530	Volume outflow 75 - 25% (m³) = 0.357			
50	1550	From the graph: tp 75 (min) = 25 tp 25 (min) = 94			
75	1620				
90	1800				
120	2000				
		Soil infiltration rate, f, (m/s) =		3.28E-05	normal test
		Soil infiltration rate, f, (m/s) =		n/a	pit with stone
		Carried out by:	TB	Date:	28/02/2011
		Input by:	KMH	Date:	09/03/2011
		Checked by:	MHW	Date:	10/03/2011

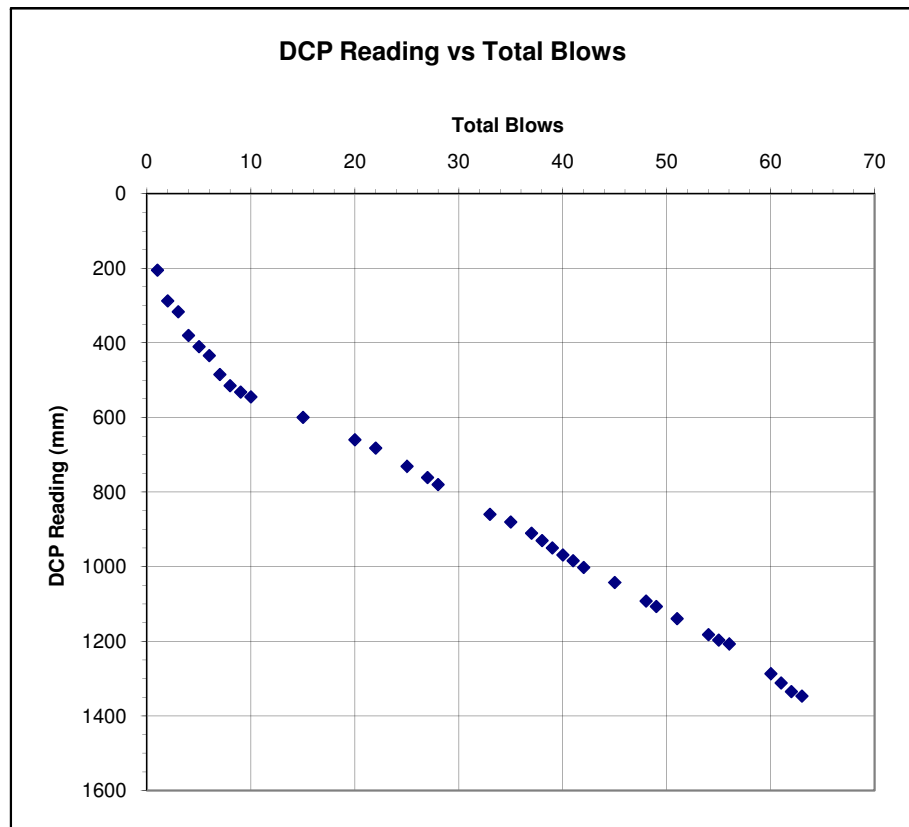


Notes

TRL Dynamic Cone Penetrometer Test

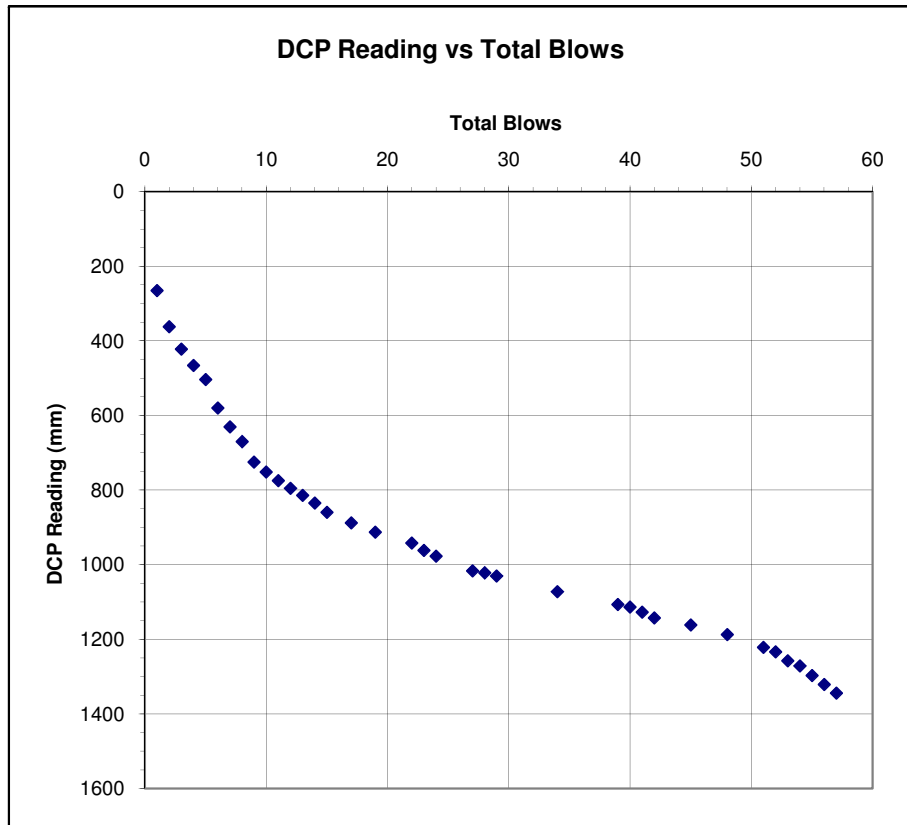
Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 23/02/2011		
Engineer: Arup						
Number: CBR01		Test: 1		DCP zero reading (mm):		132
Location: E 331931.69 N 350226.63				Ground Level (mOD): 92.87		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	132	380	248	4	62.0	3.8
2	380	545	165	10	27.5	9.1
3	545	682	137	22	11.4	23.0
4	682	1347	665	63	16.2	15.9

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



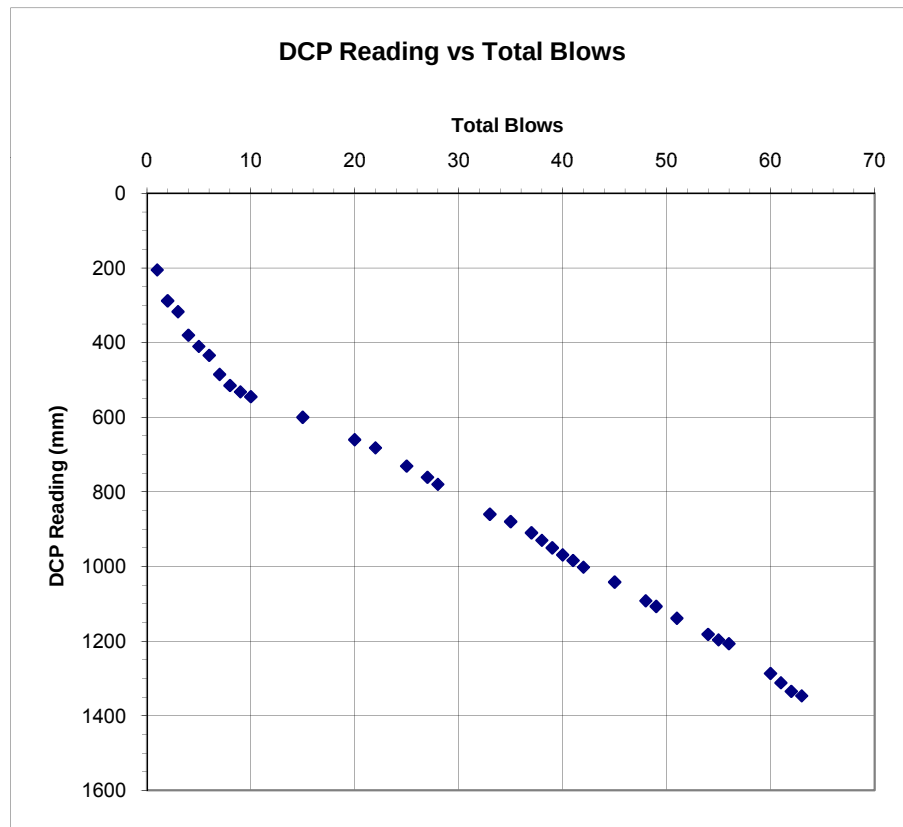
				TRL Dynamic Cone Penetrometer Test		
Project: WAST - Western Gateway Site Client: BAM Construction Limited Engineer: Arup				Project No: 40822		
				Date: 23/02/2011		
Number: CBR02 Test: 1				DCP zero reading (mm): 132		
Location: E 331929.22 N 350262.41				Ground Level (mOD): 92.63		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	132	362	230	2	115.0	2.0
2	362	752	390	10	48.8	5.0
3	752	977	225	24	16.1	16.0
4	977	1234	257	52	9.2	29.0
5	1234	1344	110	57	22.0	11.5

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



				TRL Dynamic Cone Penetrometer Test		
Project: WAST - Western Gateway Site Client: BAM Construction Limited Engineer: Arup				Project No: 40822		
				Date: 23/02/2011		
Number: CBR03 Test: 1				DCP zero reading (mm): 132		
Location: E 331931.69 N 350226.63				Ground Level (mOD): 92.87		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	132	380	248	4	62.0	3.8
2	380	545	165	10	27.5	9.1
3	545	682	137	22	11.4	23.0
4	682	1347	665	63	16.2	15.9

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)





**IAN FARMER
ASSOCIATES**
Geotechnical & Environmental Specialists

TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Project No: 40822

Client: BAM Construction Limited

Date: 23/02/2011

Engineer: Arup

Number: CBR04 **Test:** 1

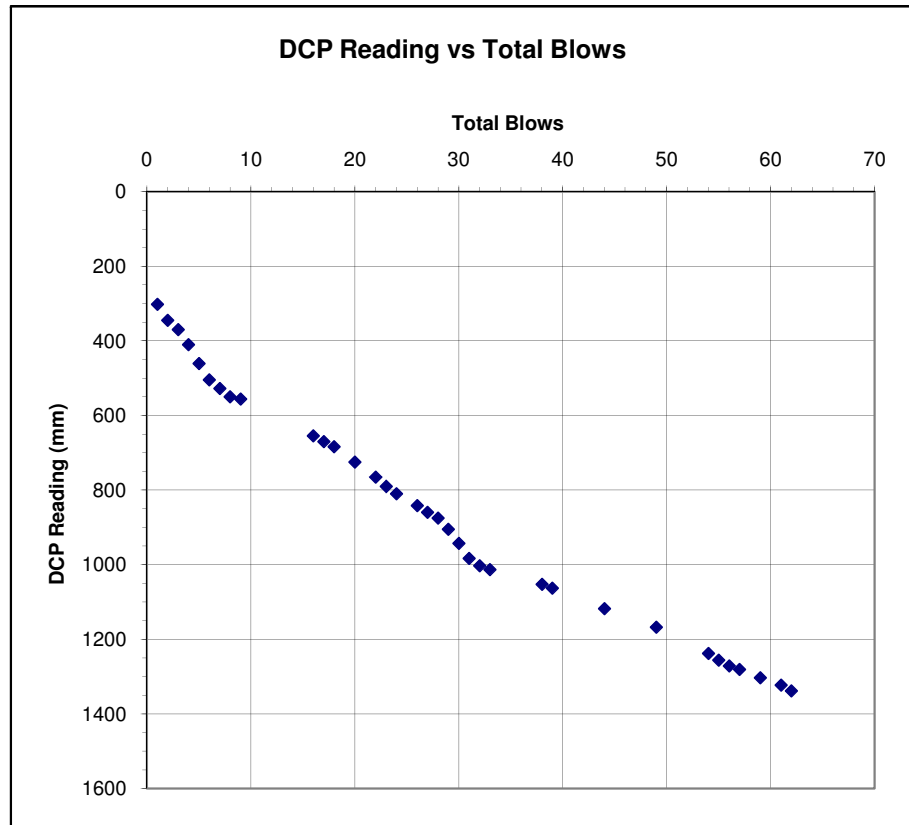
DCP zero reading (mm): 177

Location: E 331944.95
N 350243.81

Ground Level (mOD): 92.40

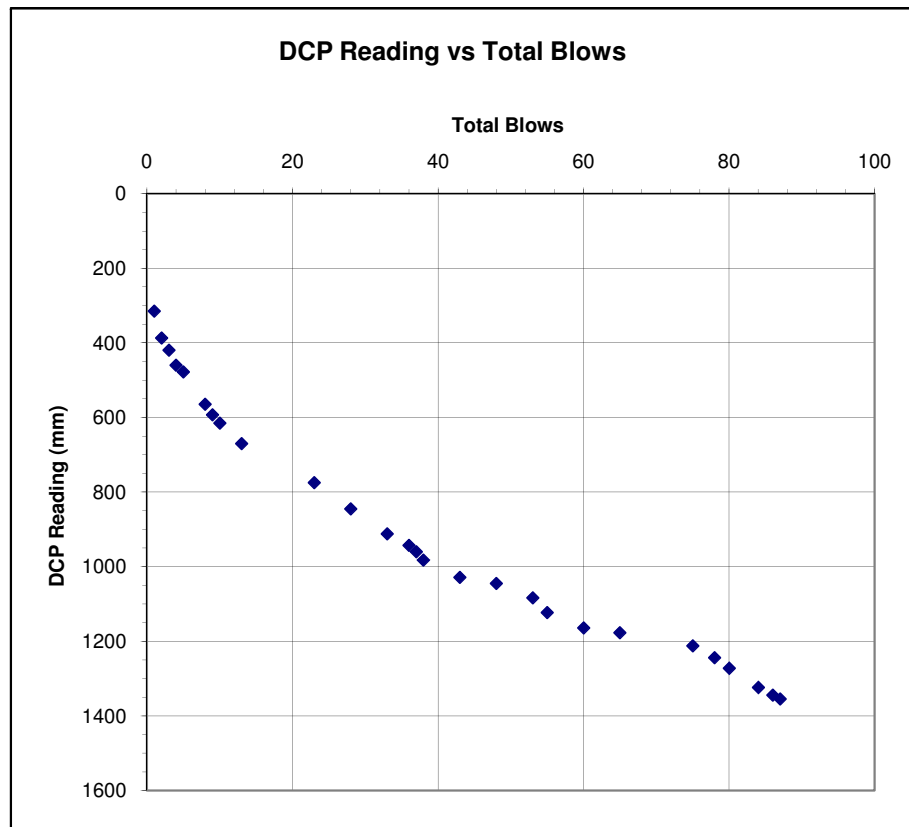
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	177	528	351	7	50.1	4.8
2	528	875	347	28	16.5	15.6
3	875	1003	128	32	32.0	7.7
4	1003	1338	335	62	11.2	23.6

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



				TRL Dynamic Cone Penetrometer Test		
Project: WAST - Western Gateway Site Client: BAM Construction Limited Engineer: Arup				Project No: 40822		
				Date: 23/02/2011		
Number: CBR05		Test: 1		DCP zero reading (mm): 200		
Location: E 331943.37 N 350279.04				Ground Level (mOD): 92.14		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	200	387	187	2	93.5	2.5
2	387	615	228	10	28.5	8.8
3	615	1164	549	60	11.0	24.0
4	1164	1212	48	75	3.2	88.3
5	1212	1335	123	87	10.3	25.8

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)





**IAN FARMER
ASSOCIATES**
Geotechnical & Environmental Specialists

TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Project No: 40822

Client: BAM Construction Limited

Date: 07/03/2011

Engineer: Arup

Number: CBR07 **Test:** 1

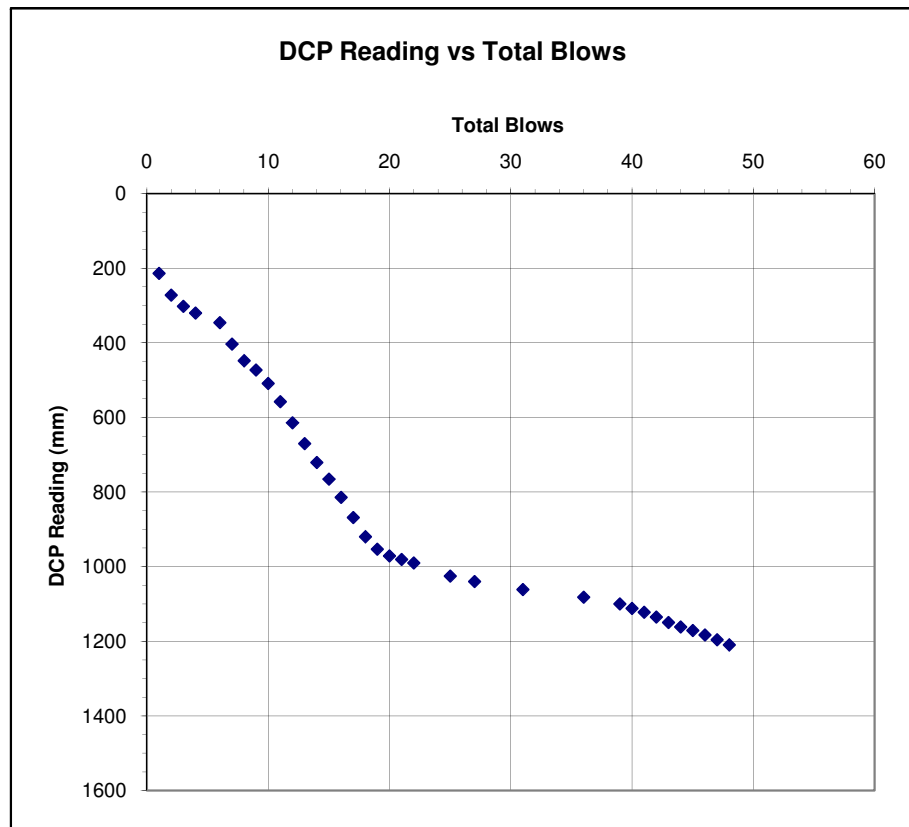
DCP zero reading (mm): 74

Location: E 331968.84
N 350238.1

Ground Level (mOD): 91.96

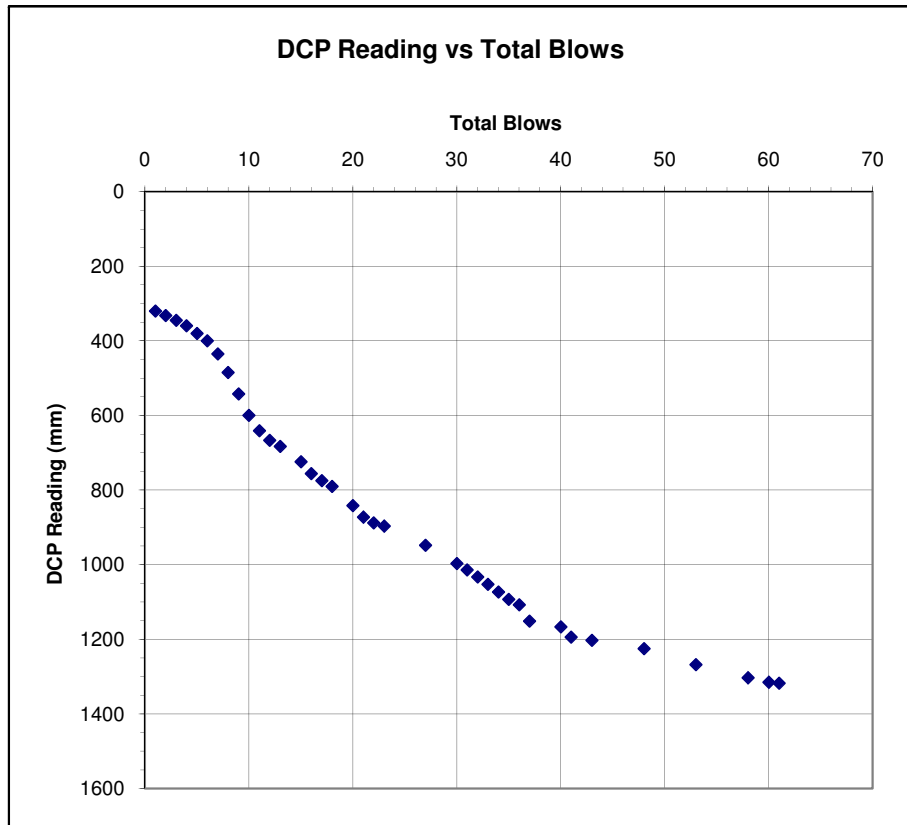
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	74	272	198	2	99.0	2.3
2	272	346	74	6	18.5	13.8
3	346	971	625	20	44.6	5.4
4	971	1100	129	39	6.8	39.9
5	1100	1210	110	48	12.2	21.4

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



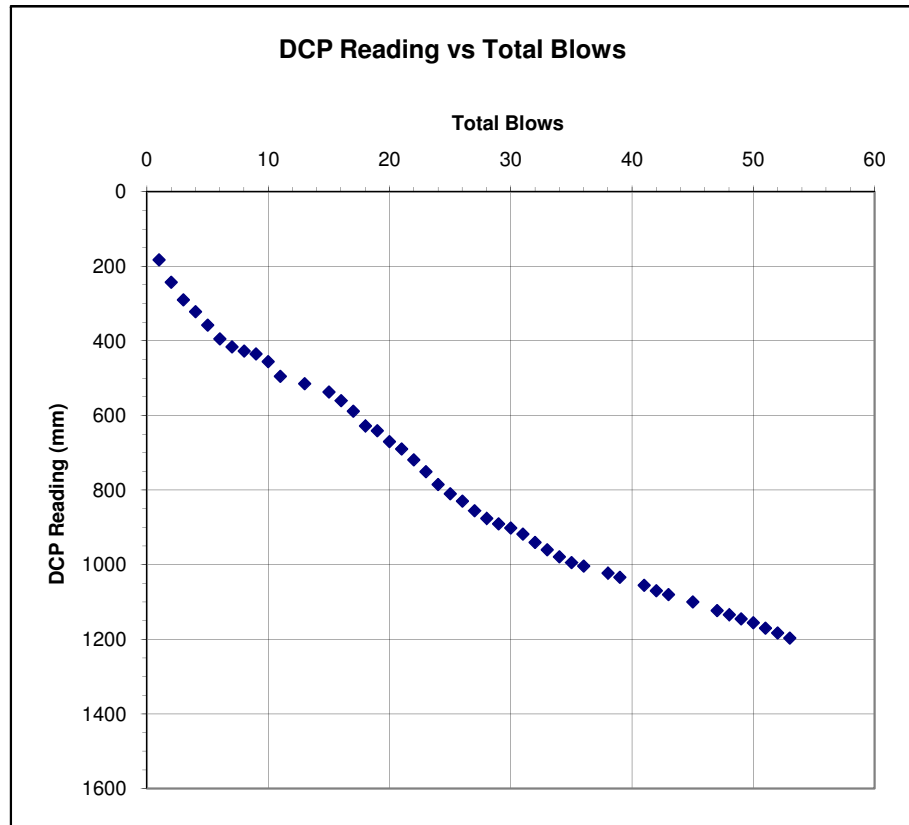
				TRL Dynamic Cone Penetrometer Test		
Project: WAST - Western Gateway Site Client: BAM Construction Limited Engineer: Arup				Project No: 40822		
				Date: 23/02/2011		
Number: CBR08		Test: 1		DCP zero reading (mm): 175		
Location: E 331954.83 N 350295.01				Ground Level (mOD): 92.14		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	175	400	225	6	37.5	6.6
2	400	641	241	11	48.2	5.0
3	641	1151	510	37	19.6	13.0
4	1151	1318	167	61	7.0	38.9

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



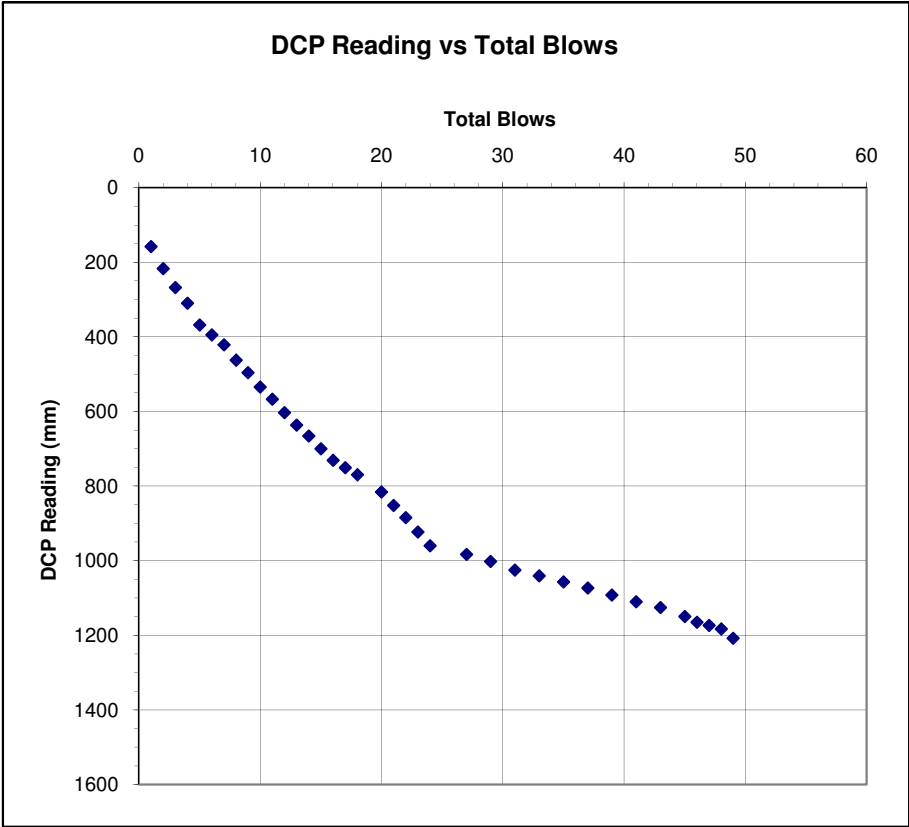
				TRL Dynamic Cone Penetrometer Test		
Project: WAST - Western Gateway Site Client: BAM Construction Limited Engineer: Arup				Project No: 40822		
				Date: 07/03/2011		
Number: CBR09		Test: 1		DCP zero reading (mm): 54		
Location: E 331974.23 N 350267.91				Ground Level (mOD): 91.92		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	54	395	341	6	56.8	4.2
2	395	537	142	15	15.8	16.4
3	537	979	442	34	23.3	10.9
4	979	1197	218	53	11.5	22.9

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



				TRL Dynamic Cone Penetrometer Test		
Project: WAST - Western Gateway Site Client: BAM Construction Limited Engineer: Arup				Project No: 40822		
				Date: 07/03/2011		
Number: CBR10		Test: 1		DCP zero reading (mm): 65		
Location: E 331982.72 N 350286.31				Ground Level (mOD): 91.87		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	65	368	303	5	60.6	3.9
2	368	960	592	24	31.2	8.0
3	960	1183	223	48	9.3	28.6

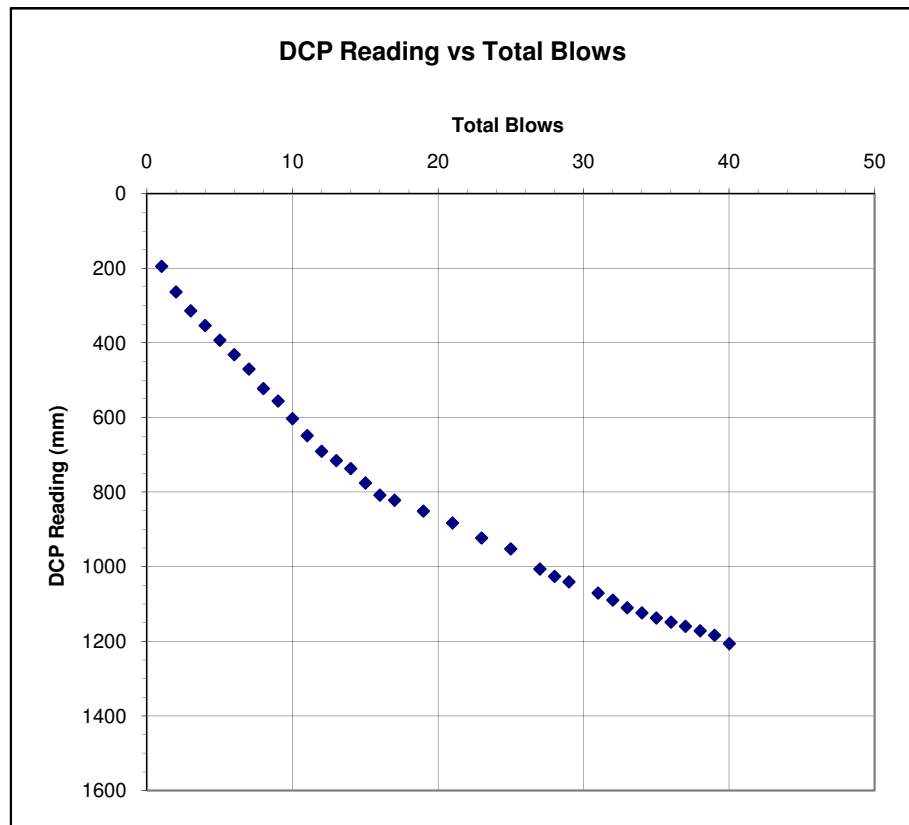
Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 07/03/2011		
Engineer: Arup						
Number: CBR11		Test: 1		DCP zero reading (mm): 76		
Location: E N				Ground Level (mOD):		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	76	264	188	2	94.0	2.5
2	264	691	427	12	42.7	5.7
3	691	1206	515	40	18.4	13.9

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Project No: 40822

Client: BAM Construction Limited

Date: 23/02/2011

Engineer: Arup

Number: CBR12 **Test:** 1

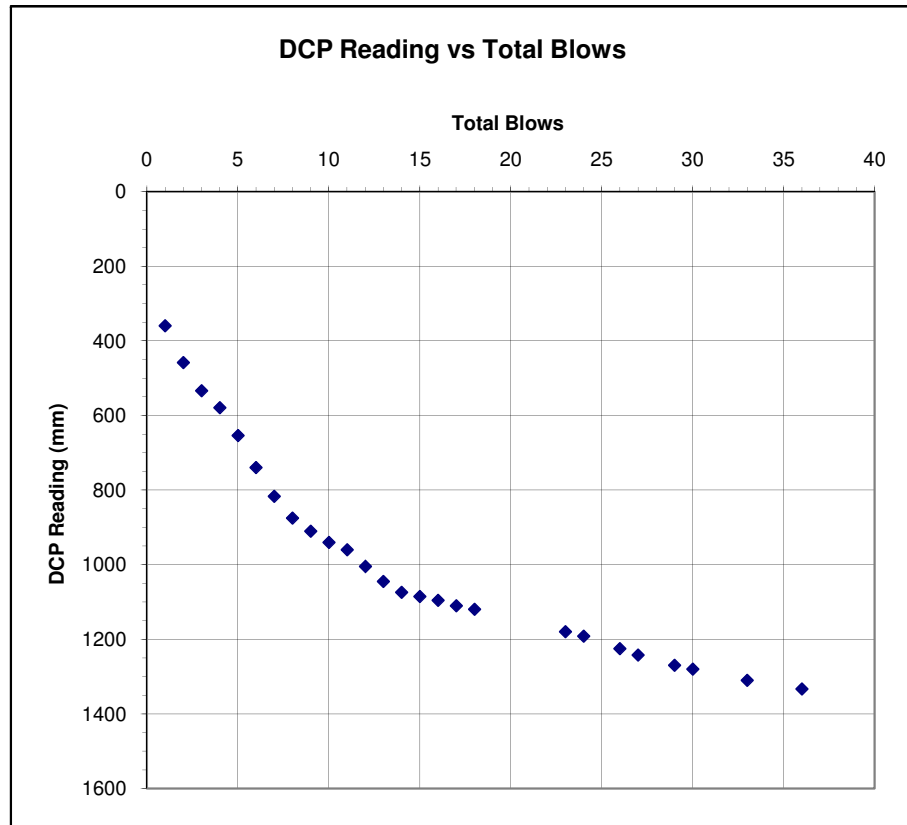
DCP zero reading (mm): 125

Location: E 331963.87
N 350319.99

Ground Level (mOD): 92.30

Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	125	875	750	8	93.8	2.5
2	875	1074	199	14	33.2	7.5
3	1074	1333	259	36	11.8	22.3

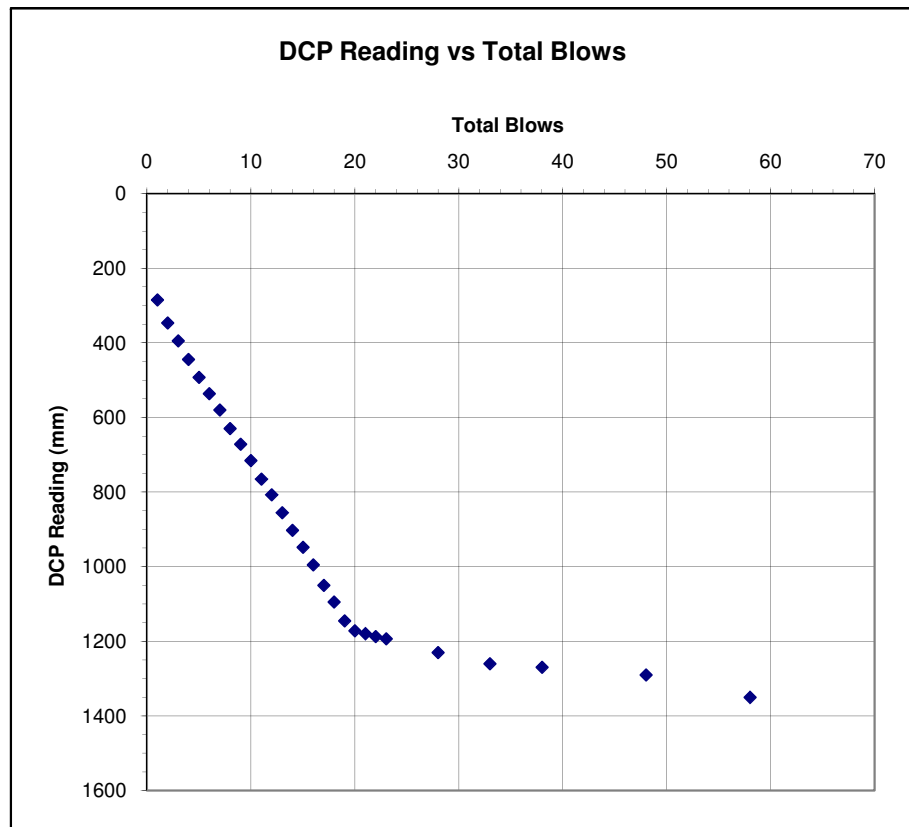
Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



TRL Dynamic Cone Penetrometer Test

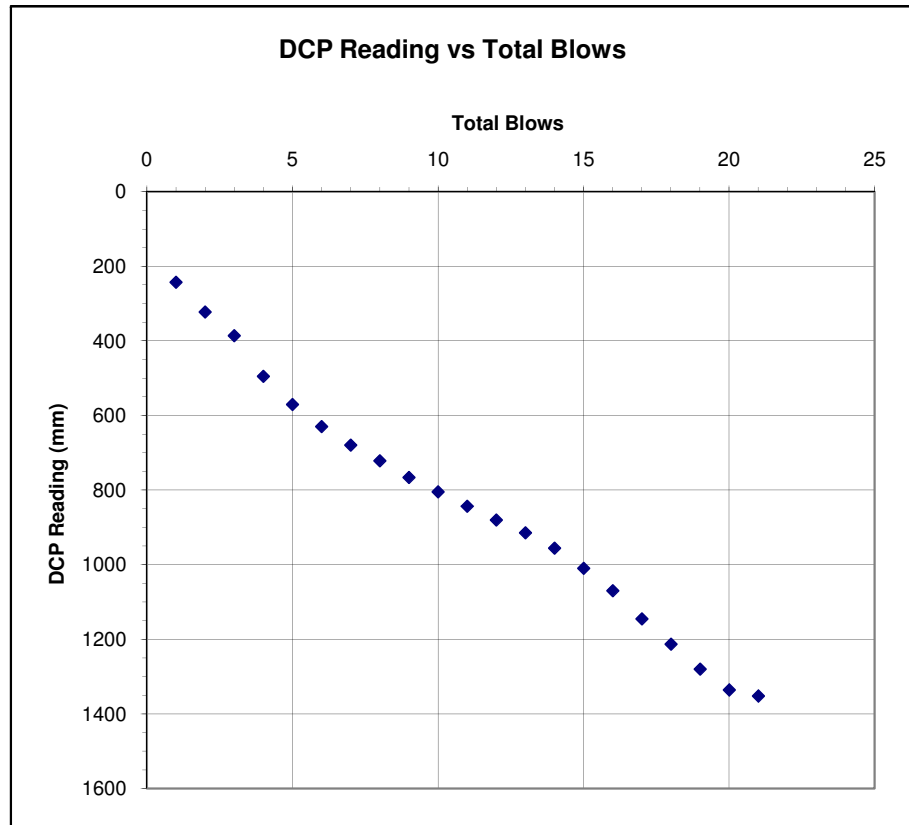
Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 23/02/2011		
Engineer: Arup						
Number: CBR15		Test: 1		DCP zero reading (mm):		125
Location:		E 331992.16 N 350296.27		Ground Level (mOD):		91.90
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	125	1172	1047	20	52.4	4.6
2	1172	1350	178	58	4.7	59.0

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



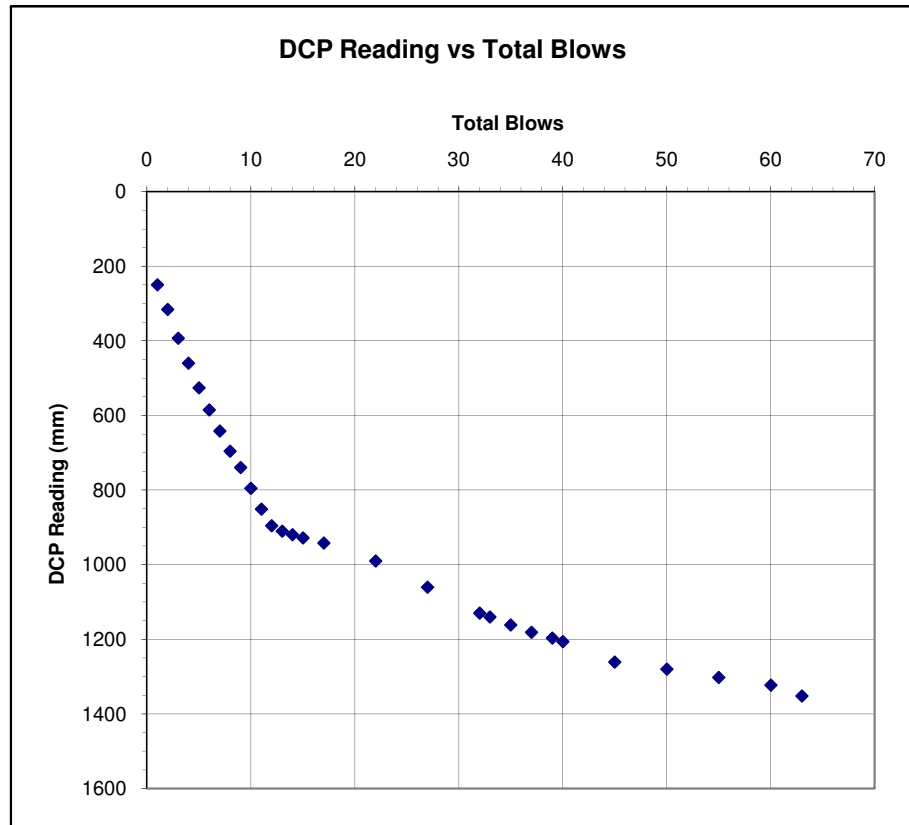
				TRL Dynamic Cone Penetrometer Test		
Project: WAST - Western Gateway Site Client: BAM Construction Limited Engineer: Arup				Project No: 40822		
				Date: 23/02/2011		
Number: CBR16		Test: 1		DCP zero reading (mm): 117		
Location: E 332007.79 N 350299.18				Ground Level (mOD): 91.88		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	117	571	454	5	90.8	2.6
2	571	1010	439	15	43.9	5.5
3	1010	1336	326	20	65.2	3.7

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



				TRL Dynamic Cone Penetrometer Test		
Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 23/02/2011		
Engineer: Arup						
Number: CBR17		Test: 1		DCP zero reading (mm):		120
Location: E 332008.61 N 350277.32				Ground Level (mOD): 91.81		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	120	896	776	12	64.7	3.7
2	896	1261	365	45	11.1	23.8
3	1261	1323	62	60	4.1	67.4

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)





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TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Project No: 40822

Client: BAM Construction Limited

Date: 02/03/2011

Engineer: Arup

Number: CBR20 **Test:** 1

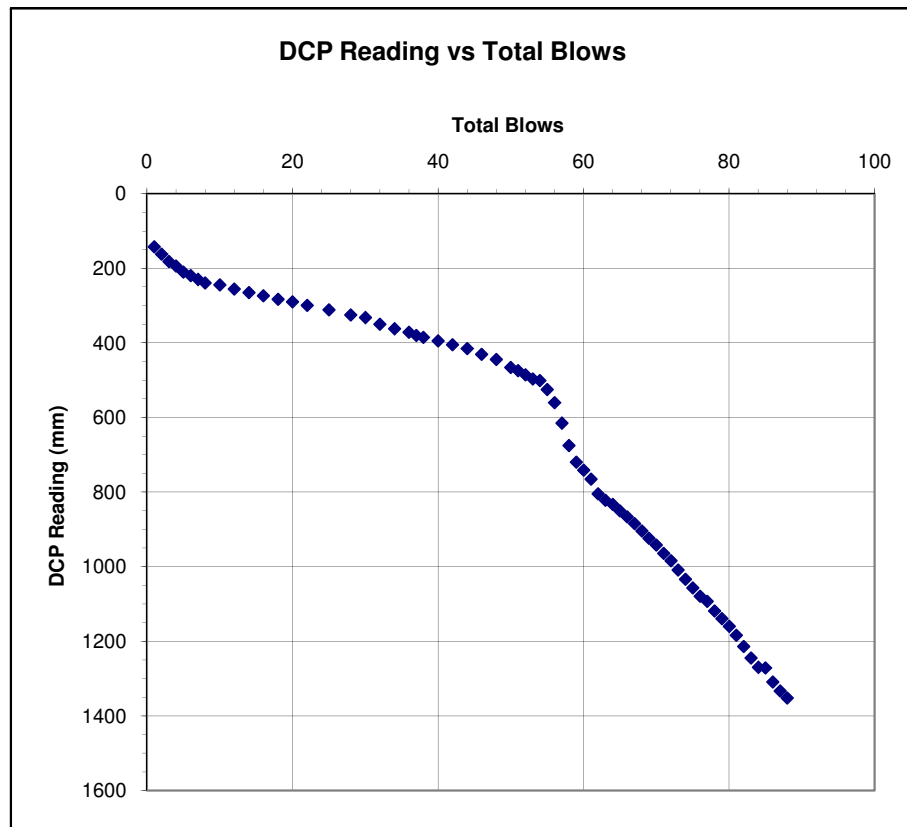
DCP zero reading (mm): 120

Location: E 332020.79
N 350374.96

Ground Level (mOD): 92.62

Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	120	283	163	18	9.1	29.4
2	283	501	218	54	6.1	45.0
3	501	765	264	61	37.7	6.5
4	765	1352	587	88	21.7	11.7

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)





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TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Project No: 40822

Client: BAM Construction Limited

Date: 03/03/2011

Engineer: Arup

Number: CBR21 **Test:** 1

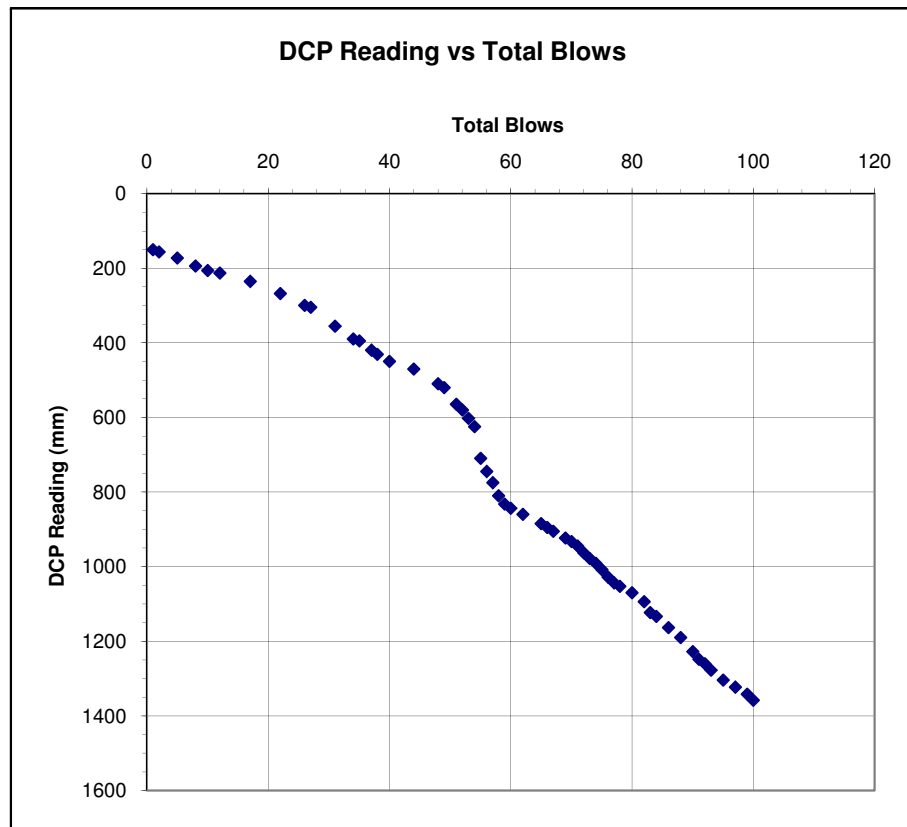
DCP zero reading (mm): 120

Location: E 332051.11
N 350358.27

Ground Level (mOD): 92.72

Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	120	305	185	27	6.9	39.5
2	305	510	205	48	9.8	27.2
3	510	810	300	58	30.0	8.3
4	810	933	123	70	10.3	25.8
5	933	1358	425	100	14.2	18.3

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Project No: 40822

Client: BAM Construction Limited

Date: 03/03/2011

Engineer: Arup

Number: CBR22 **Test:** 1

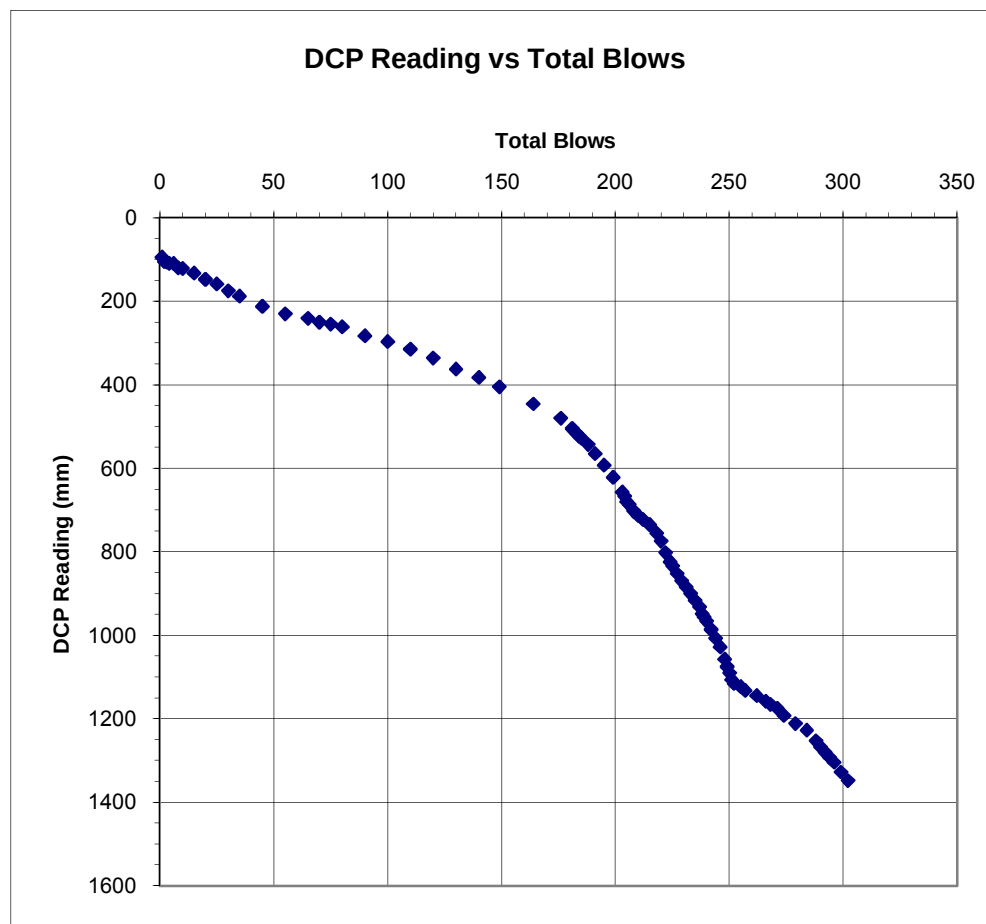
DCP zero reading (mm): 90

Location: E 332030.46
N 350334.49

Ground Level (mOD): 92.81

Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	90	480	390	176	2.2	130.2
2	480	1090	610	250	8.2	32.5
3	1090	1347	257	302	4.9	55.8

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)





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TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Project No: 40822

Client: BAM Construction Limited

Date: 03/03/2011

Engineer: Arup

Number: CBR29 **Test:** 1

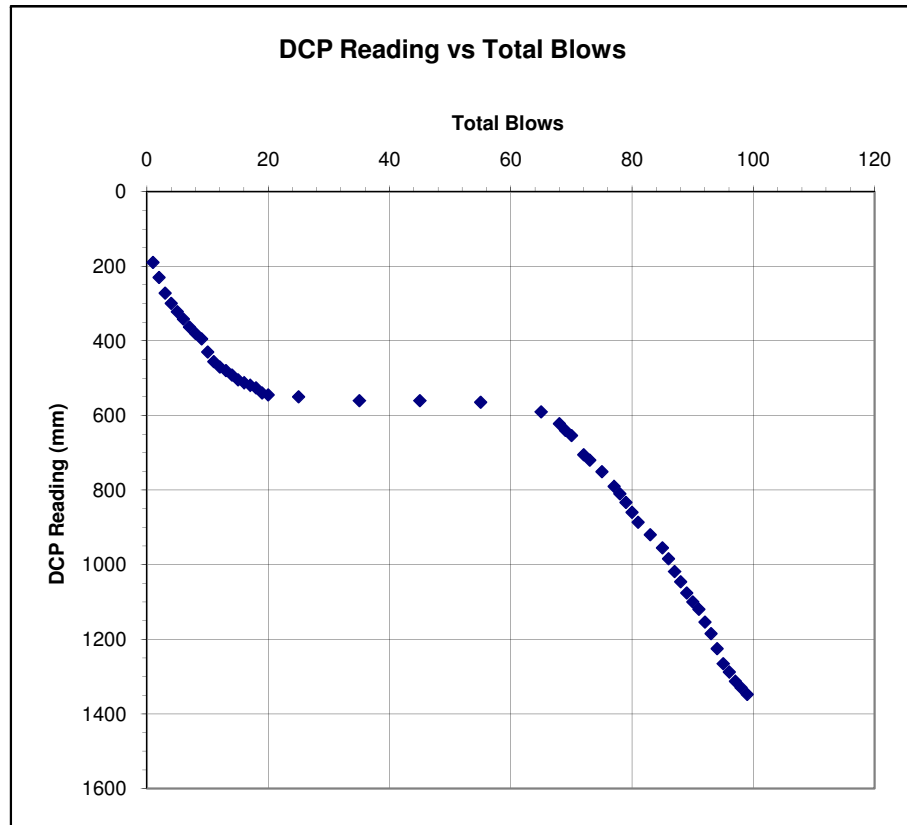
DCP zero reading (mm): 140

Location: E 332121.20
N 350345.54

Ground Level (mOD): 92.89

Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	140	272	132	3	44.0	5.5
2	272	540	268	19	16.8	15.4
3	540	590	50	65	1.1	276.5
4	590	1348	758	99	22.3	11.3

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



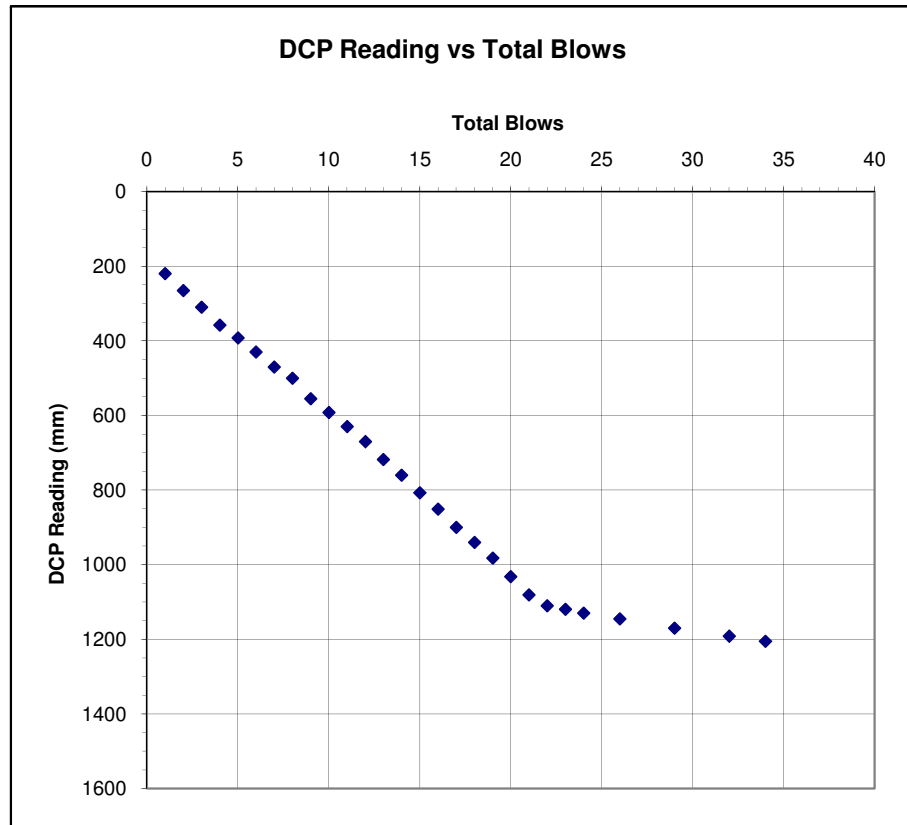


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TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 04/03/2011		
Engineer: Arup						
Number: CBR30		Test: 1		DCP zero reading (mm): 69		
Location:		E 332111.44 N 350270.66		Ground Level (mOD): 90.40		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	69	1110	1041	22	47.3	5.1
2	1110	1205	95	34	7.9	33.9

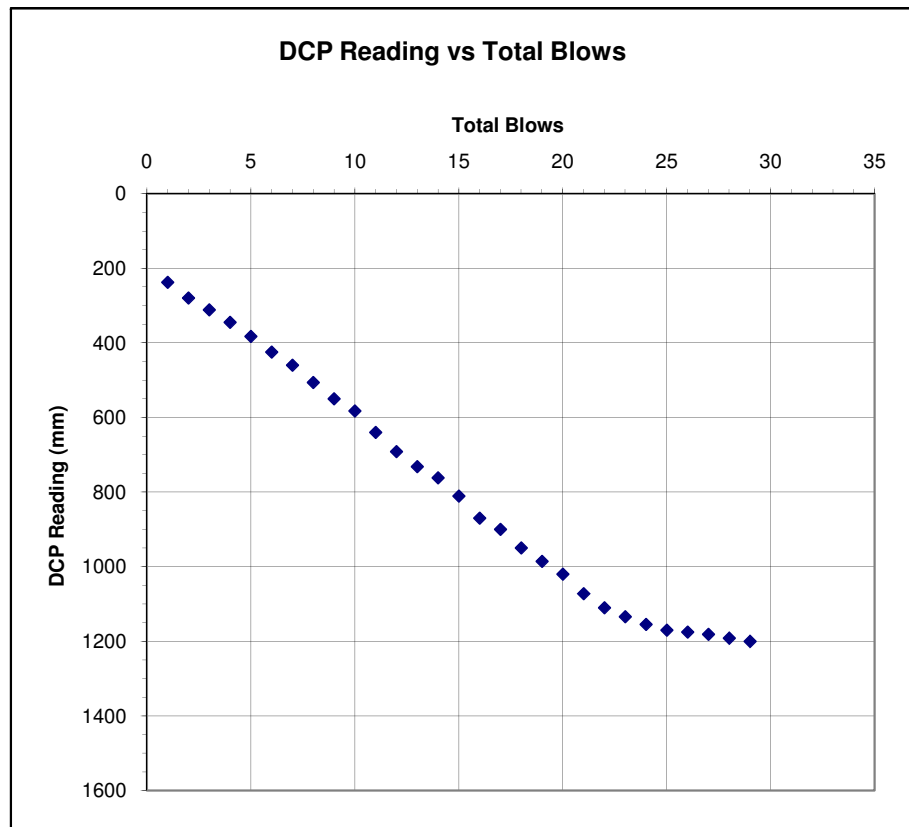
Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 04/03/2011		
Engineer: Arup						
Number: CBR31		Test: 1		DCP zero reading (mm): 58		
Location:		E 332124.28 N 350292.2		Ground Level (mOD): 90.26		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	58	1134	1076	23	46.8	5.2
2	1134	1200	66	29	11.0	23.9

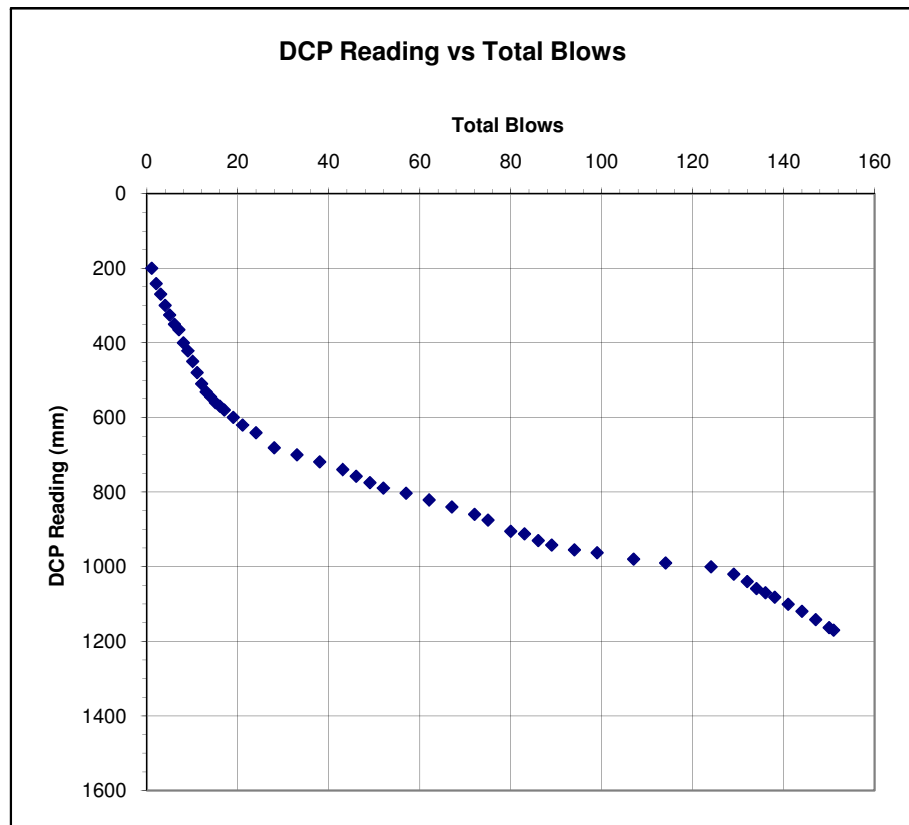
Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 03/03/2011		
Engineer: Arup						
Number: CBR32		Test: 1		DCP zero reading (mm): 55		
Location: E 332124.28 N 350292.2				Ground Level (mOD): 90.26		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	55	560	505	15	33.7	7.3
2	560	700	140	33	7.8	34.5
3	700	955	255	94	4.2	66.6
4	955	1000	45	124	1.5	196.7
5	1000	1170	170	151	6.3	43.2

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)





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TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Project No: 40822

Client: BAM Construction Limited

Date: 04/03/2011

Engineer: Arup

Number: CBR33 **Test:** 1

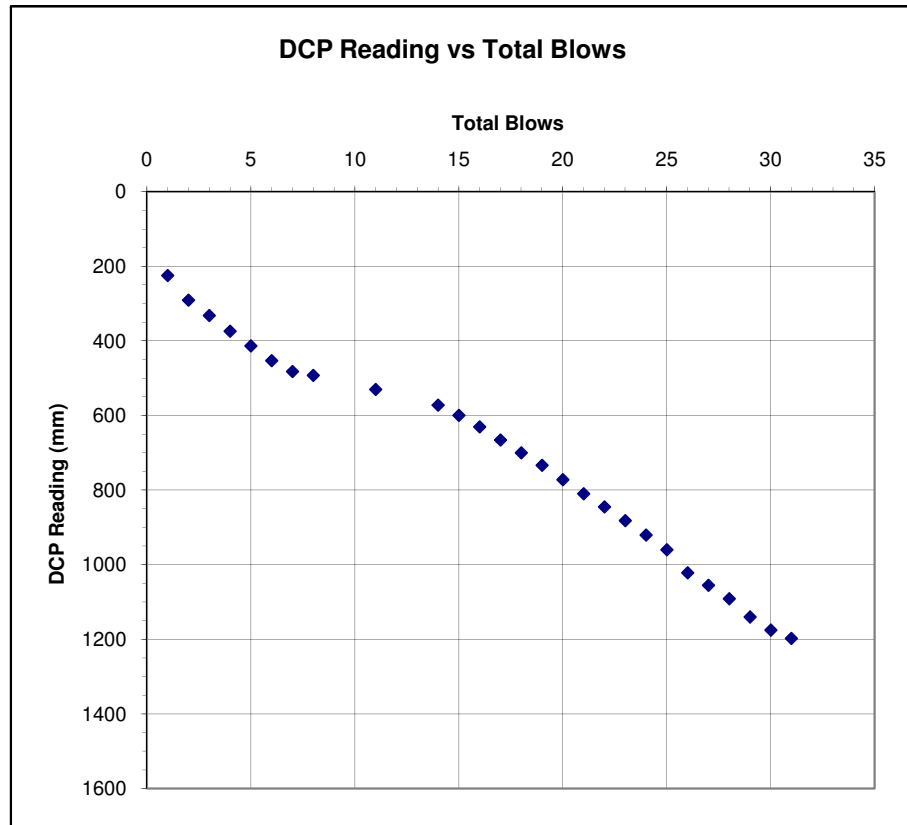
DCP zero reading (mm): 70

Location: E 332142.82
N 350259.79

Ground Level (mOD): 89.71

Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	70	453	383	6	63.8	3.7
2	453	600	147	15	16.3	15.8
3	600	1198	598	31	37.4	6.6

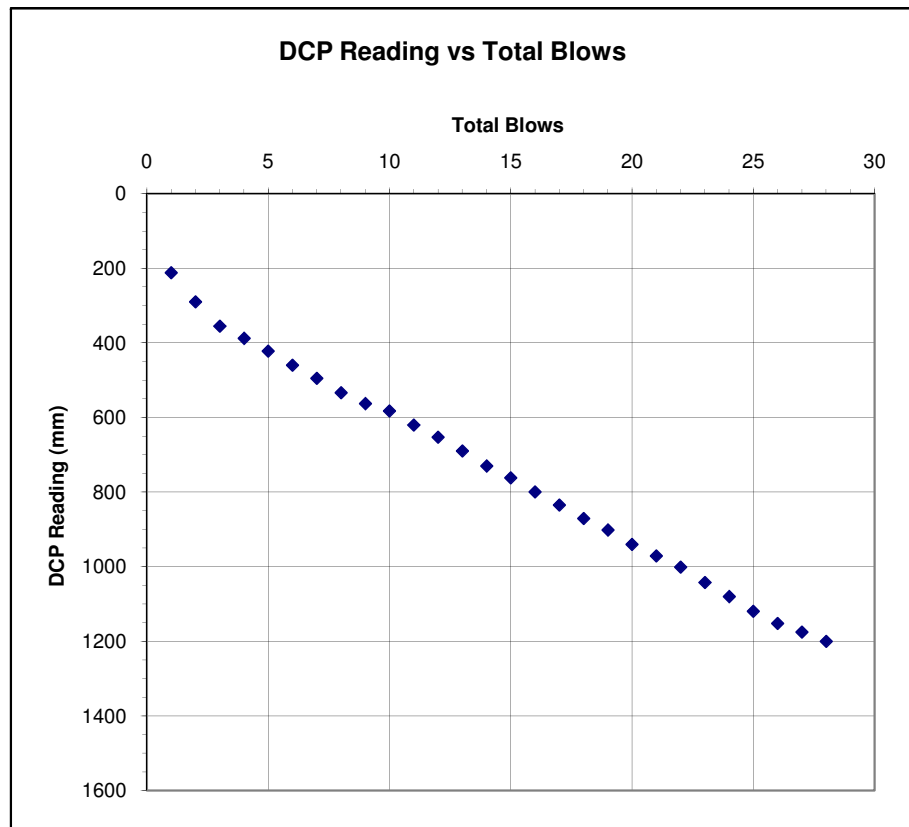
Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 04/03/2011		
Engineer: Arup						
Number: CBR34		Test: 1		DCP zero reading (mm): 69		
Location:		E 332153.73 N 350281.32		Ground Level (mOD): 89.51		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	69	355	286	3	95.3	2.4
2	355	1200	845	28	33.8	7.3

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



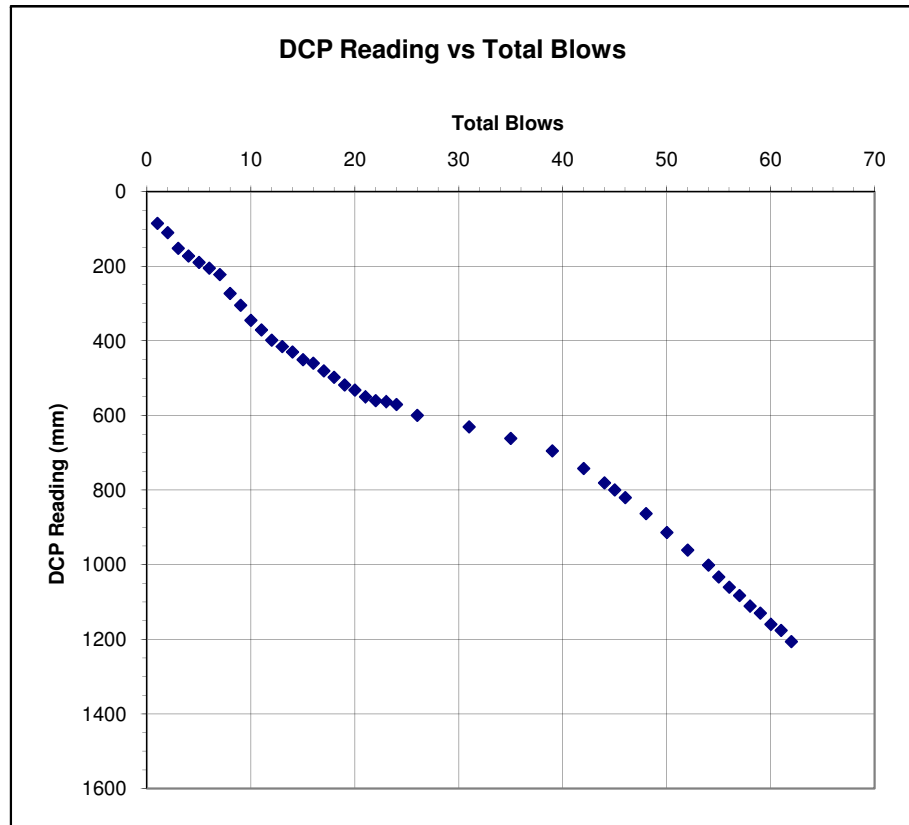


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TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 03/03/2011		
Engineer: Arup						
Number: CBR35		Test: 1		DCP zero reading (mm): 68		
Location: E 332160.82 N 350301.87				Ground Level (mOD): 90.01		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	68	371	303	11	27.5	9.1
2	371	600	229	26	15.3	16.9
3	600	742	142	42	8.9	30.0
4	742	1206	464	62	23.2	10.9

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)





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TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Client: BAM Construction Limited

Engineer: Arup

Project No: 40822

Date: 03/03/2011

Number: CBR36 **Test:** 1

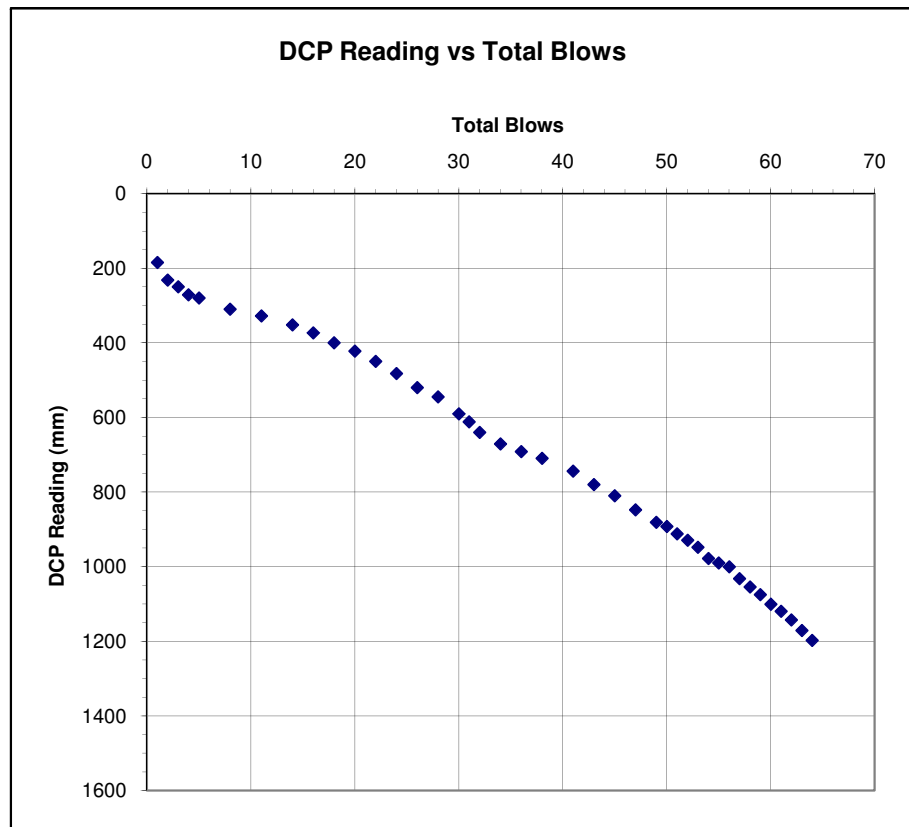
DCP zero reading (mm): 93

Location: E 332169.44
N 350324.83

Ground Level (mOD): 91.08

Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	93	280	187	5	37.4	6.6
2	280	450	170	22	10.0	26.5
3	450	780	330	43	15.7	16.4
4	780	1198	418	64	19.9	12.8

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



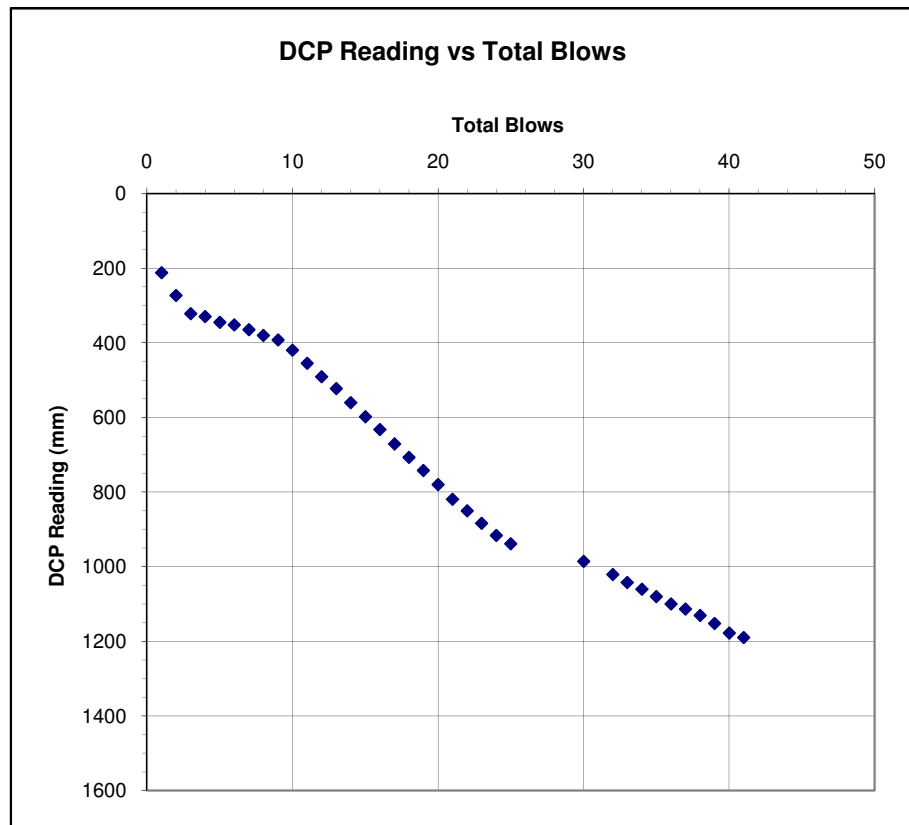


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TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 03/03/2011		
Engineer: Arup						
Number: CBR37		Test: 1		DCP zero reading (mm): 65		
Location: E 332184.67 N 350284.63				Ground Level (mOD): 89.57		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	65	322	257	3	85.7	2.7
2	322	392	70	9	11.7	22.5
3	392	939	547	25	34.2	7.2
4	939	986	47	30	9.4	28.3
5	986	1190	204	41	18.5	13.8

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Project No: 40822

Client: BAM Construction Limited

Date: 03/03/2011

Engineer: Arup

Number: CBR38 **Test:** 1

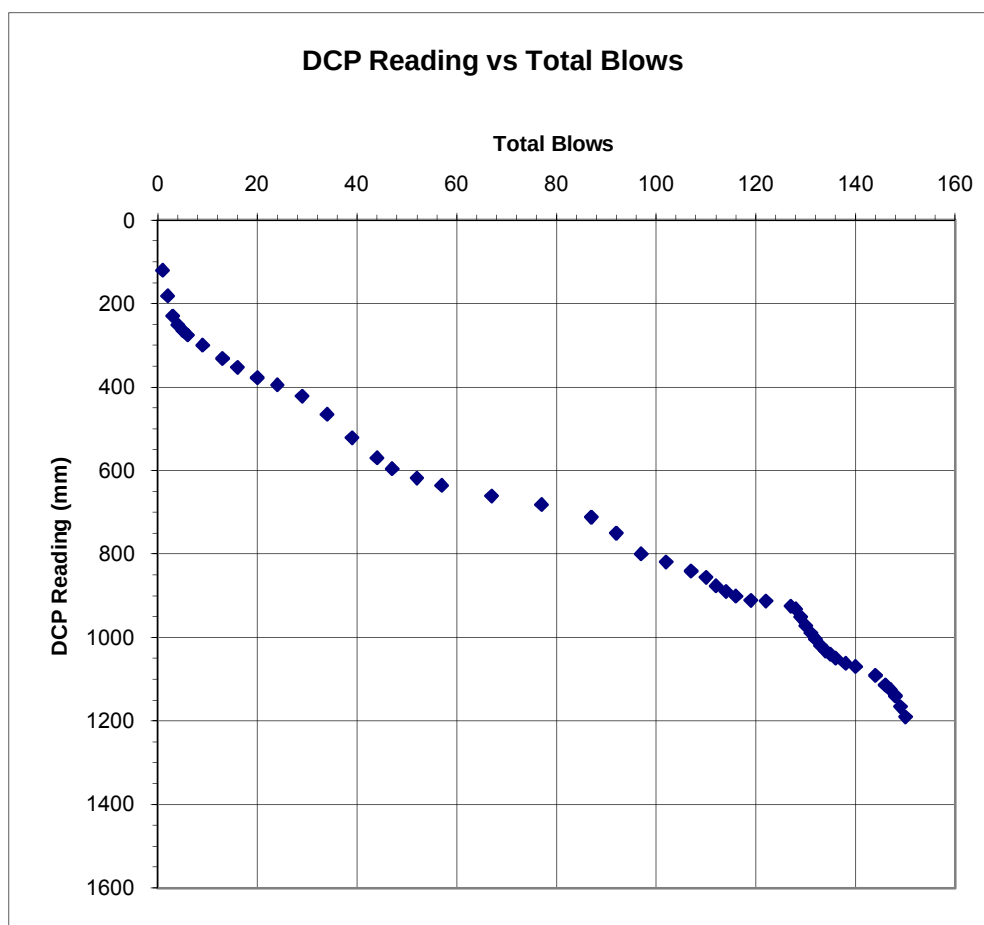
DCP zero reading (mm): 52

Location: E 332191.77
N 350313.17

Ground Level (mOD): 91.53

Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	52	230	178	3	59.3	4.0
2	230	596	366	47	8.3	32.2
3	596	712	116	87	2.9	98.0
4	712	800	88	97	8.8	30.3
5	800	925	125	127	4.2	66.8
6	925	1041	116	135	14.5	17.9
7	1041	1091	50	135	135.0	1.7
8	1091	1190	99	150	6.6	41.1

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



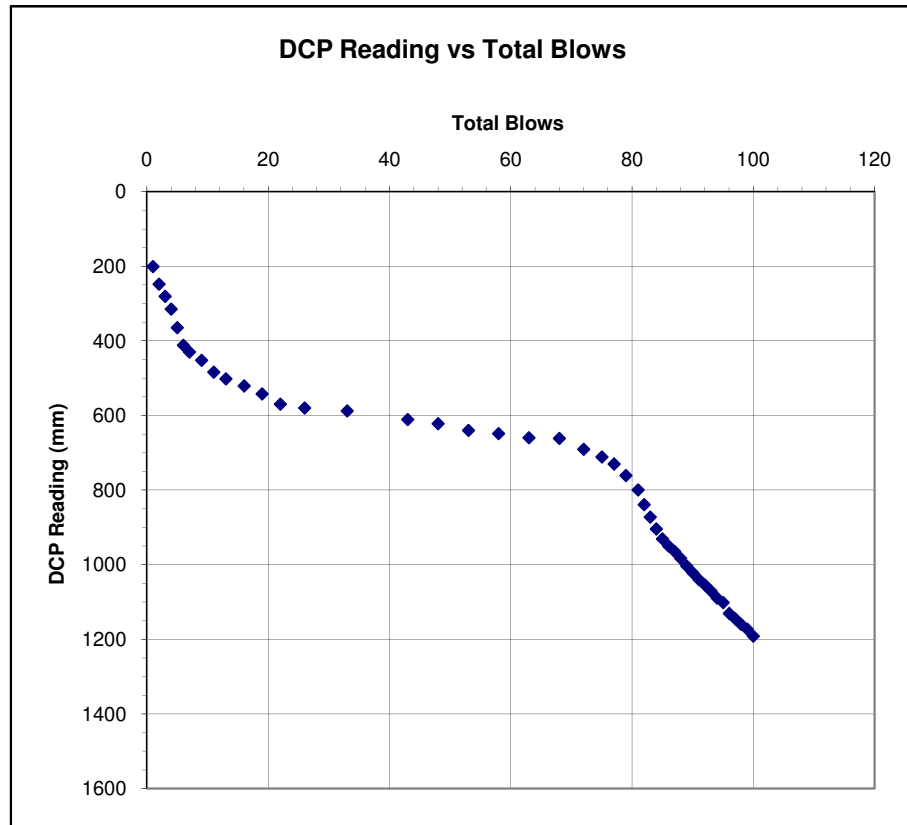


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TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 03/03/2011		
Engineer: Arup						
Number: CBR39		Test: 1		DCP zero reading (mm): 62		
Location: E 332208.55 N 350303.05				Ground Level (mOD): 91.12		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	62	412	350	6	58.3	4.1
2	412	570	158	22	9.9	26.8
3	570	662	92	68	2.0	145.1
4	662	761	99	79	9.0	29.6
5	761	904	143	84	28.6	8.7
6	904	1192	288	100	18.0	14.2

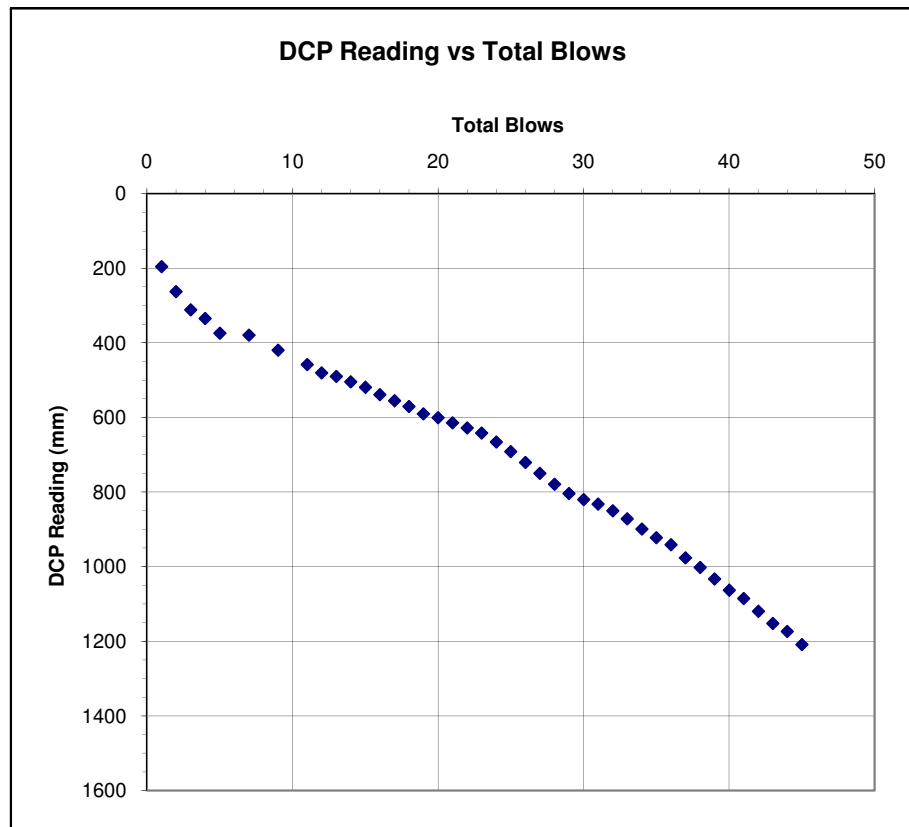
Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 03/03/2011		
Engineer: Arup						
Number: CBR40		Test: 1		DCP zero reading (mm): 70		
Location: E 332207.83 N 350277.41				Ground Level (mOD): 88.91		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	70	374	304	5	60.8	3.9
2	374	642	268	23	14.9	17.4
3	642	779	137	28	27.4	9.1
4	779	872	93	33	18.6	13.7
5	872	1209	337	45	28.1	8.9

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Project No: 40822

Client: BAM Construction Limited

Date: 03/03/2011

Engineer: Arup

Number: CBR41 **Test:** 1

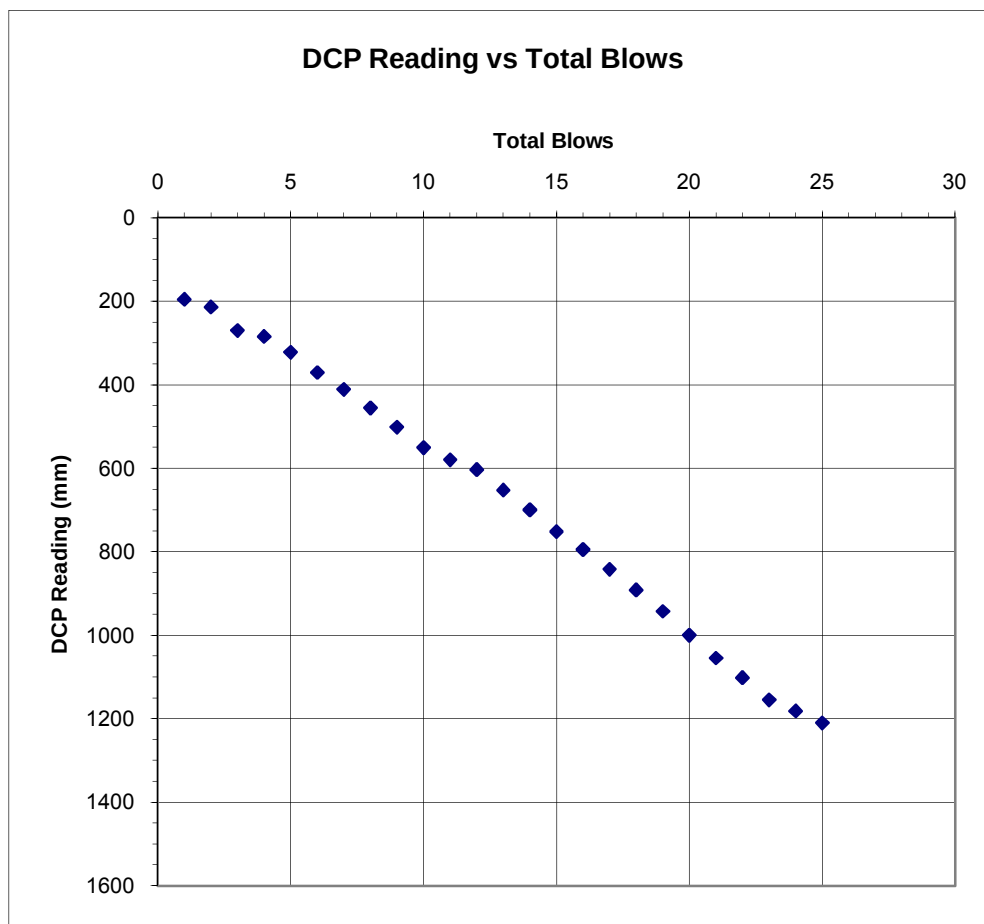
DCP zero reading (mm): 70

Location: E 332236.25
N 350263.82

Ground Level (mOD): 88.26

Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	70	1210	1140	25	45.6	5.3

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Project No: 40822

Client: BAM Construction Limited

Date: 03/03/2011

Engineer: Arup

Number: CBR42 **Test:** 1

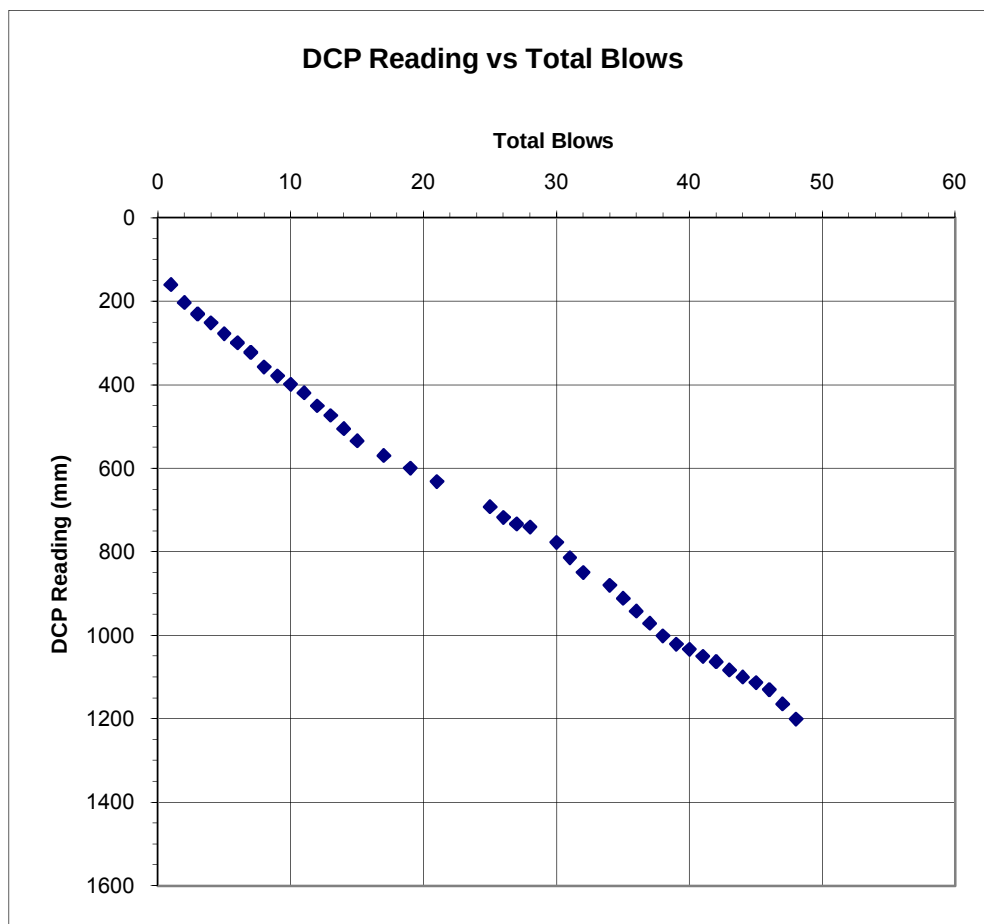
DCP zero reading (mm): 81

Location: E 332227.34
N 350292.21

Ground Level (mOD): 90.39

Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	81	204	123	2	61.5	3.9
2	204	570	366	17	24.4	10.3
3	570	778	208	30	16.0	16.1
4	778	1201	423	48	23.5	10.7

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



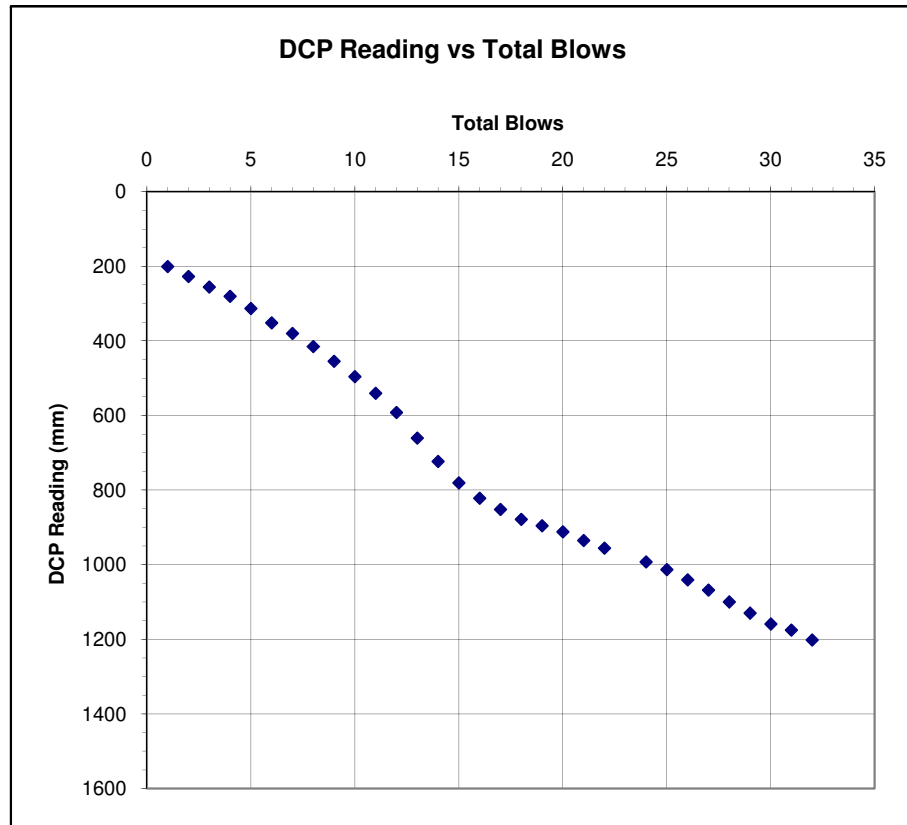


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TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 03/03/2011		
Engineer: Arup						
Number: CBR43		Test: 1		DCP zero reading (mm):		110
Location: E 332254.08 N 350259.71				Ground Level (mOD): 88.04		
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	110	455	345	9	38.3	6.4
2	455	822	367	16	52.4	4.6
3	822	993	171	24	21.4	11.9
5	993	1202	209	32	26.1	9.6

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)





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TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site

Project No: 40822

Client: BAM Construction Limited

Date: 03/03/2011

Engineer: Arup

Number: CBR44 **Test:** 1

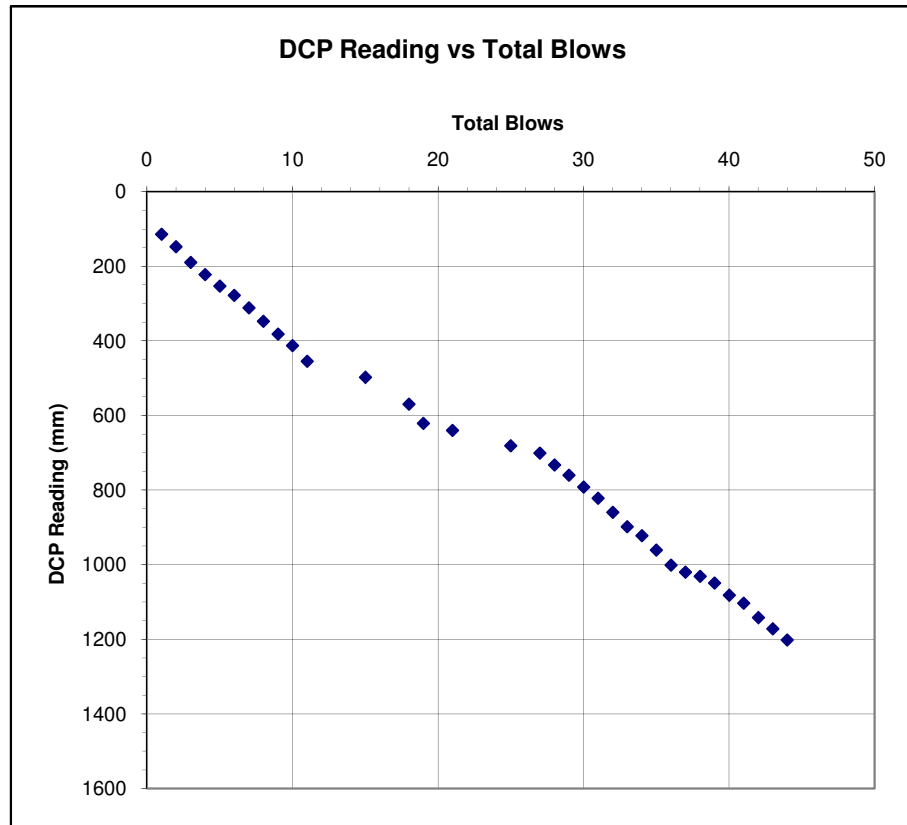
DCP zero reading (mm): 78

Location: E 332263.08
N 350281.60

Ground Level (mOD): 89.85

Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	78	455	377	11	34.3	7.2
2	455	520	65	17	10.8	24.3
3	520	621	101	19	50.5	4.8
4	621	701	80	27	10.0	26.5
5	701	1202	501	44	29.5	8.4

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



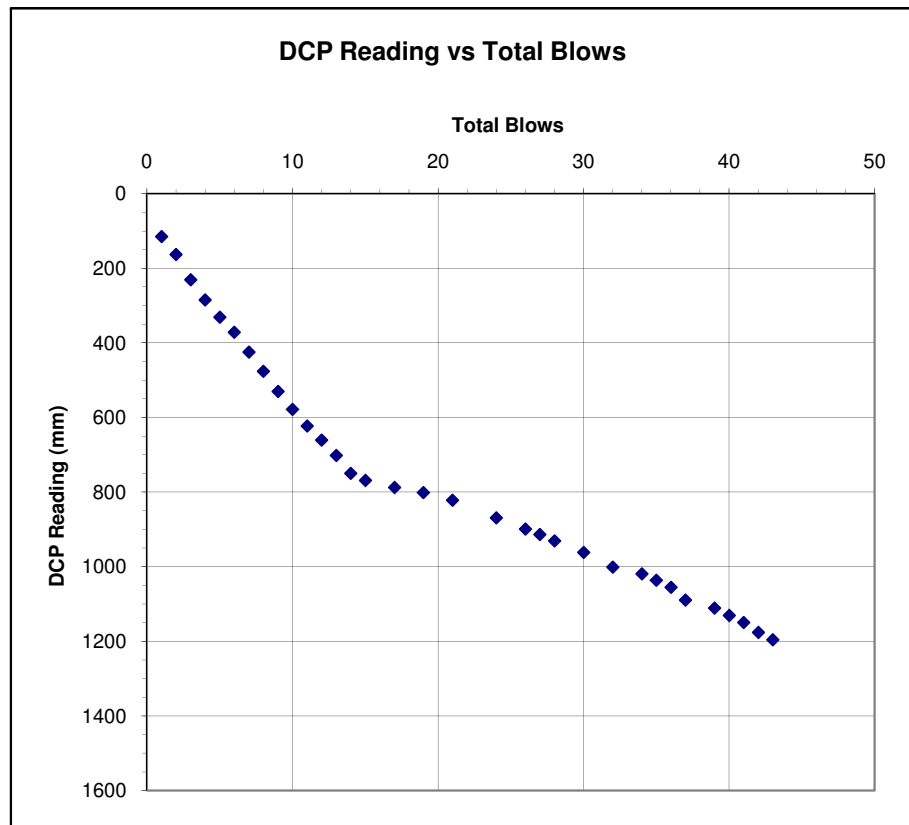


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TRL Dynamic Cone Penetrometer Test

Project: WAST - Western Gateway Site				Project No: 40822		
Client: BAM Construction Limited				Date: 03/03/2011		
Engineer: Arup						
Number:	CBR45	Test:	1	DCP zero reading (mm):	65	
Location: E 332277.36 N 350251.47				Ground Level (mOD):	87.98	
Layer	Depth below g.l.(mm)		Layer Thickness	Total Blows at Base of Layer	DCP value (mm/blow)	Equivalent CBR (%)
	Top	Base				
1	65	750	685	14	48.9	4.9
2	750	822	72	21	10.3	25.7
3	822	1176	354	42	16.9	15.3

Derivation of CBR value from DCP based on TRRL Road Note 8 (60 degree cone)



APPENDIX 3
LABORATORY TESTS

APPENDIX 3

GENERAL NOTES ON LABORATORY TESTS ON SOILS

A3.1 GENERAL

A3.1.1 Where applicable all tests are carried out in accordance with the relevant British Standard. The laboratory test procedures are as below:

Test Name	Procedures BS1377:1990 Part:Clause
Moisture Content	2:3
Liquid Limit	2:4
Plastic Limit and Plastic Index	2:5
Linear Shrinkage	2:6
Particle Size Distribution	2:9
Loss on Ignition	3:4*
Sulphate content	3:5
Chloride Content	3:7*
pH Value	3:9
Compaction Test	4:3*
Moisture condition Value	4:5
California Bearing Ratio	4:7
Consolidation	5:3
Bulk Density	7:2*
Laboratory Vane Tests	7:3*
Shear Box	7:4*
Triaxial Compression	
Total Stress Single-Stage	7:8
Total Stress Multi-Stage	7:9
Effective Stress	Note 1*
Permeability	Note 2*
Desiccation	Note 3*
In-situ density by Sand replacement	Part 9
Core Cutter	Part 9
Nuclear density	Part 9
	BS812
	Part:Clause
Ten % fines (Dry and Soaked)	111
Aggregate crushing value	110
Particle density and water absorption	2
Particle size distribution	103
Moisture content – oven drying	109
Soundness	121

BS:1881
Part:Clause

Chloride Content	124:10.2
Sulphate content	124:10.3
Curing/density and compressive strength of concrete tubes	116-111-114
Location of reinforcement	204
Carbonation	Note 4
Resistivity	Note 5
Sampling of concrete dust by drilling	Note 6
Half cell potential	Note 7

Note 1 - Manual of soils laboratory testing volume 3: 1985, section 19.2 by K.H. Head

Note 2 - Manual of soils laboratory testing volume 2: 1985, section 10.7 by K.H. Head

Note 3 - BRE Information paper IP4 issued February 1993

Note 4 - BRE Information paper IP6/81

Note 5 - In-house document number 109

Note 6 - In-house document number 112

Note 7 - ASTM C876-91

* Tests are not included in UKAS accreditation

- A3.1.2 Any discussion in this report is based on the values and results obtained from the appropriate tests. Due allowance should be made, when considering any result in isolation, of the possible inaccuracy of any such individual result. Details of the accuracy of results are included in this section, where applicable.

14 Faraday Close, District 15, Pattinson North Industrial Estate, Washington, Tyne & Wear, NE38 8QJ.
Tel. 0191 4166375 Fax. 0191 4191578 Email. lab@ifawashington.co.uk Internet. www.ianfarmerassociates.co.uk

Ian Farmer Associates (1998) Ltd
17 Rivington Court
Warrington
Cheshire
WA1 4RT

F.A.O. Mr A Latimer

TEST REPORT - 40822/1

Site : WAST - Western Gateway Site

Job Number : 40822

Originating Client : Bam Construction Limited

Originating Reference : 40822

Date Sampled : Not Given

Date Scheduled : 29/03/11

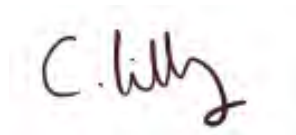
Date Testing Started : 13/04/11

Date Testing Finished : 28/04/11

Remarks :

- First Report for above Job Number
- Samples will be disposed of 28 days after the report is issue unless otherwise agreed
- This report may contain results from tests which are not included within the scope of the UKAS accreditation. Please see final sheet for details.

Authorised By:



Craig Lilley

Position :

Quality Manager

Date : 28/04/11

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Site : WAST - Western Gateway Site

Job Number
40822

Client : BAM Construction Limited

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**DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT
AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX**

Borehole/ Trial Pit	Depth (m)	Sample	Natural / Sieved	Natural Moisture Content %	Sample Passing 425µm Sieve		Liquid Limit %	Plastic Limit %	Plasticity Index %	Liquidity Index	Class	Description / Remarks
					Percentage %	Moisture Content %						
BH01	1.20	U4	Natural	9.6	93	10		NP				Brown slightly gravelly SAND
BH01	3.00	U9	Natural	8.9	97	9.0		NP				Brown slightly gravelly SAND
BH01	7.50	U19	Natural	18	100	18		NP				Brown SAND
BH01	9.00	D21	Natural	16	50	28	30	14	16	0.88	CL	Brown slightly sandy slightly gravelly slightly silty CLAY
BH03	4.00	B9	Natural	7.5								Brown slightly silty slightly clayey very sandy very cobbly GRAVEL
BH04	1.80	D3	Sieved	11	23	32	40	20	20	0.60	CI	Brown very sandy clayey GRAVEL
SA01	1.00	B1	Natural	13								Brown slightly silty slightly clayey sandy GRAVEL including cobbles
SA02	1.00	B1	Natural	16	70	21	23	15	8	0.75	CL	Brown clayey silty very sandy GRAVEL including cobbles
TP02	0.90	B6	Natural	13								Brown slightly silty slightly clayey sandy GRAVEL
TP03	1.70	B5	Natural	20								Brown slightly sandy very clayey SILT
TP05	1.90	B6	Natural	14								Brown slightly clayey silty sandy GRAVEL
TP07	0.80	B4	Natural	16								Brown slightly silty slightly clayey sandy cobbly GRAVEL
TP09	0.40	B2	Natural	22	98	22	52	28	24	-0.25	CH	Brown very silty CLAY
TP11	0.30	B2	Natural	26	99	27	43	23	20	0.20	CI	Brown slightly sandy silty CLAY
TP11	1.30	B5	Natural	17								Brown slightly clayey silty SAND and GRAVEL
TP13	2.80	D8	Natural	26	92	27	25	16	9	1.22	CL	Brown slightly sandy CLAY
TP14	2.10	B7	Natural	8.4								Brown slightly sandy GRAVEL
TP15	3.80	B7	Natural	8.3								Brown, slightly clayey, sandy GRAVEL including cobbles.
TP16	2.00	B5	Natural	16	86	18	27	15	12	0.25	CL	Brown, slightly sandy, slightly gravelly SILT/CLAY and SAND.
TP17	4.00	B9	Natural	17								Brown silty clayey very gravelly SAND
TP20	1.80	B5	Natural	9.2								Brown slightly silty slightly clayey sandy GRAVEL
TP22	1.20	B4	Natural	17								Brown slightly silty slightly clayey sandy GRAVEL including cobbles
TP23	0.70	B4	Natural	23	98	23	38	21	17	0.12	CI	Brown sandy CLAY
TP24	2.10	B7	Natural	20								Brown slightly silty slightly clayey sandy GRAVEL including cobbles
TP27	2.00	B5	Natural	13								Brown slightly silty slightly clayey very gravelly SAND
TP28	3.00	B7	Natural	10								Brown slightly silty slightly clayey slightly gravelly SAND
WS02	1.90	D4	Natural	21	86	24	35	18	17	0.35	CL/CI	Brown silty CLAY
WS03	1.20	D2	Natural	12	47	19	23	15	8	0.50	CL	Brown gravelly slightly sandy silty CLAY
WS06	1.30	D3	Natural	25	94	26	42	22	20	0.20	CI	Brown silty CLAY
WS08	3.90	D6	Natural	19	100	19	39	17	22	0.09	CI	Brown silty CLAY
WS10	4.60	D9	Natural	13								Brown silty clayey slightly gravelly SAND
WS12	5.80	D8	Natural	20	50	35	46	17	29	0.62	CI	Brown slightly silty CLAY
WS14	0.50	B1	Natural	17	53	27	36	20	16	0.44	CI	Brown slightly gravelly slightly silty CLAY
WS17	0.50	B1	Natural	18								Brown slightly clayey very silty SAND and GRAVEL
WS17	2.00	D3	Natural	20	100	20		NP				Brown slightly clayey slightly sandy SILT
WS19	1.90	D3	Natural	19	87	21	32	17	15	0.27	CL	Brown slightly sandy slightly silty CLAY

Method of Preparation : BS 1377:PART 1:1990:7.4 Preparation of samples for classification tests BS 1377:PART 2:1990:4.2 & 5.2 Sample preparations

Method of Test : BS 1377:PART 2:1990:3.2 Determination of moisture content 4.3 Determination of the liquid limit 5.3 Determination of the plastic limit and plasticity index

Site : WAST - Western Gateway Site

Job Number
40822

Client : BAM Construction Limited

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DETERMINATION OF MOISTURE CONTENT / BULK DENSITY / DRY DENSITY

Method of Preparation : BS 1377:PART 1:1990:8.2,8.3,8.4

Method of Test : BS 1377:PART 2:1990:7 Determination of Density

Site : WAST - Western Gateway Site

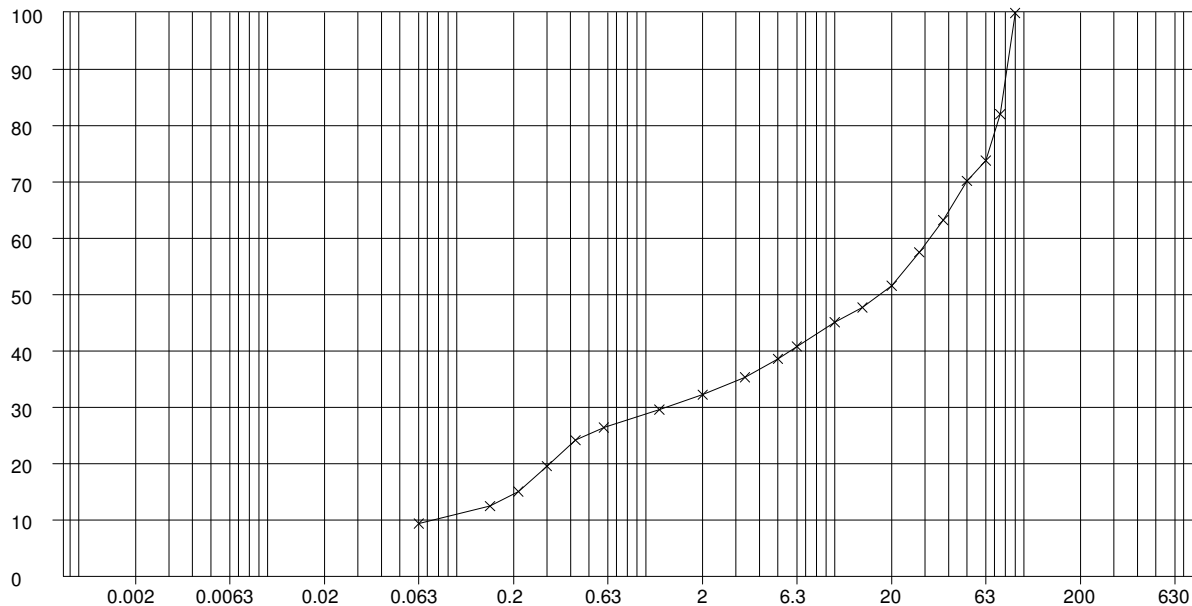
Client : BAM Construction Limited

Job Number
40822

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
BH03	4.00	B9	N/A	Brown slightly silty slightly clayey very sandy very cobbly GRAVEL



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	82
63 mm	74
50 mm	70
37.5 mm	63
28 mm	58
20 mm	52
14 mm	48
10 mm	45
6.3 mm	41
5 mm	39
3.35 mm	35
2 mm	32
1.18 mm	30
600 µm	26
425 µm	24
300 µm	20
212 µm	15
150 µm	12
63 µm	9

Grading Analysis	
D85	77.5 mm
D60	32.1 mm
D10	81.0 µm
Uniformity Coefficient	398.4

Particle Proportions	
Cobbles + Boulders	27%
Gravel	41%
Sand	23%
Silt/Clay	9%

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

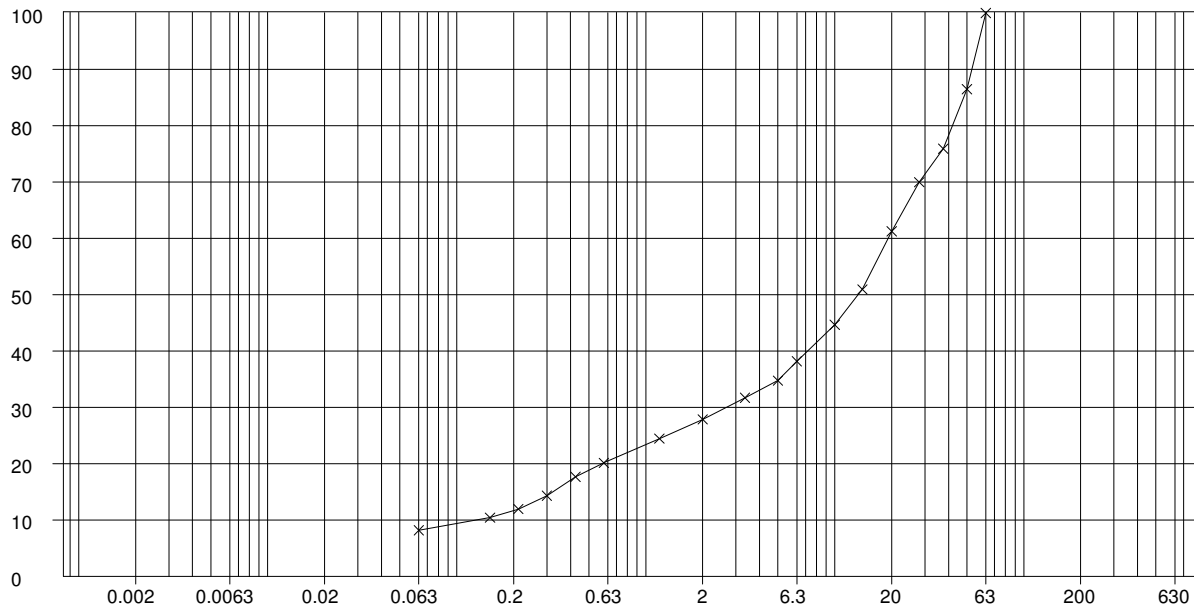
Client : BAM Construction Limited

Job Number
40822

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
SA01	1.00	B1	N/A	Brown slightly silty slightly clayey sandy GRAVEL including cobbles



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Grading Analysis	
D85	48.2 mm
D60	19.3 mm
D10	133.0 µm
Uniformity Coefficient	144.8

Particle Proportions	
Cobbles + Boulders	3%
Gravel	69%
Sand	20%
Silt/Clay	8%

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	86
37.5 mm	76
28 mm	70
20 mm	61
14 mm	51
10 mm	45
6.3 mm	38
5 mm	35
3.35 mm	32
2 mm	28
1.18 mm	24
600 µm	20
425 µm	18
300 µm	14
212 µm	12
150 µm	10
63 µm	8

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

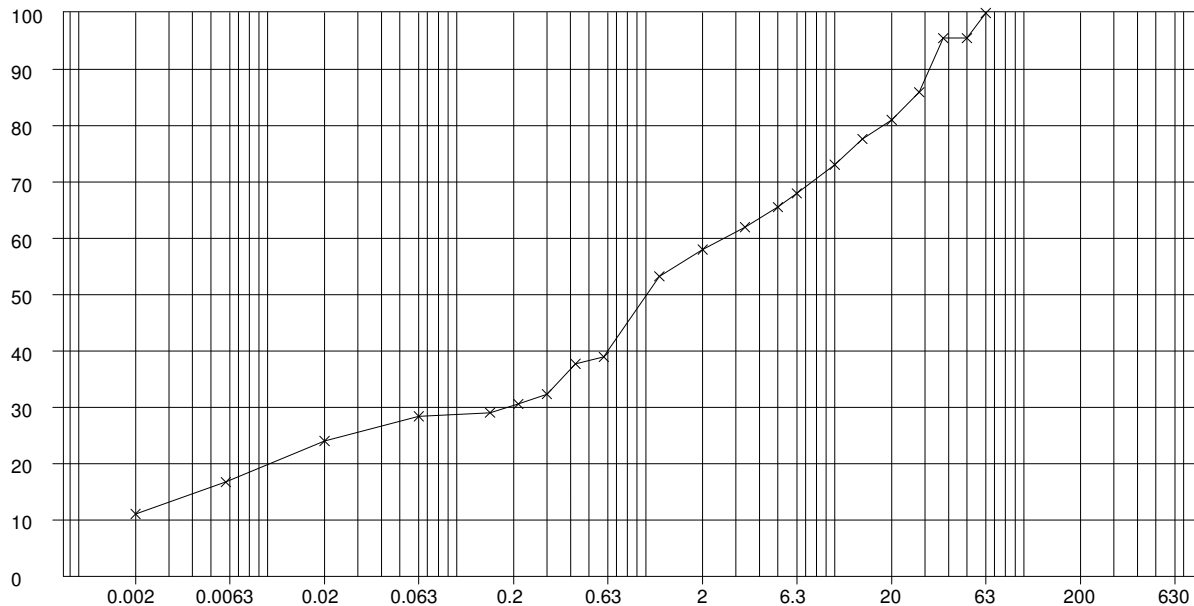
Client : BAM Construction Limited

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40822

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
SA02	1.00	B1	Pipette	Brown clayey silty very sandy GRAVEL including cobbles



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Grading Analysis	
D85	26.5 mm
D60	2.7 mm
D10	-
Uniformity Coefficient	-

Particle Proportions	
Cobbles + Boulders	1%
Gravel	41%
Sand	30%
Silt	17%
Clay	11%

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	96
37.5 mm	96
28 mm	86
20 mm	81
14 mm	78
10 mm	73
6.3 mm	68
5 mm	66
3.35 mm	62
2 mm	58
1.18 mm	53
600 μm	39
425 μm	38
300 μm	32
212 μm	31
150 μm	29
63 μm	28
20 μm	24
6 μm	17
2 μm	11

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

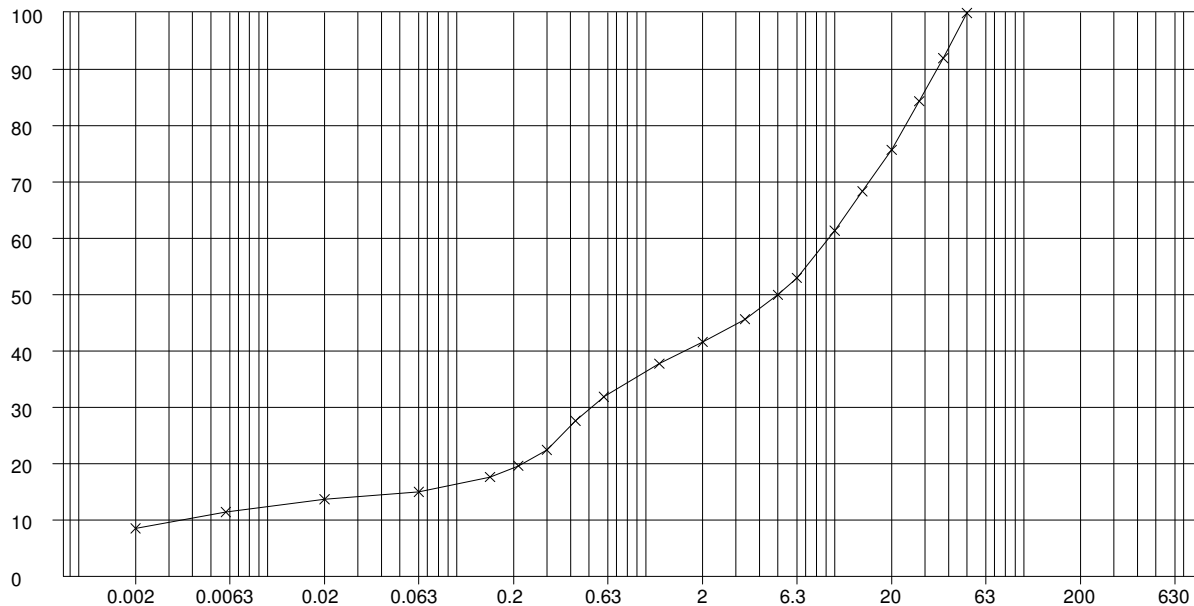
Client : BAM Construction Limited

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP02	0.90	B6	Pipette	Brown slightly silty slightly clayey sandy GRAVEL



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Grading Analysis	
D85	28.8 mm
D60	9.4 mm
D10	4.0 µm
Uniformity Coefficient	2348.0

Particle Proportions	
Cobbles + Boulders	0%
Gravel	58%
Sand	27%
Silt	6%
Clay	9%

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	92
28 mm	84
20 mm	76
14 mm	68
10 mm	61
6.3 mm	53
5 mm	50
3.35 mm	46
2 mm	42
1.18 mm	38
600 µm	32
425 µm	28
300 µm	22
212 µm	20
150 µm	18
63 µm	15
20 µm	14
6 µm	11
2 µm	9

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

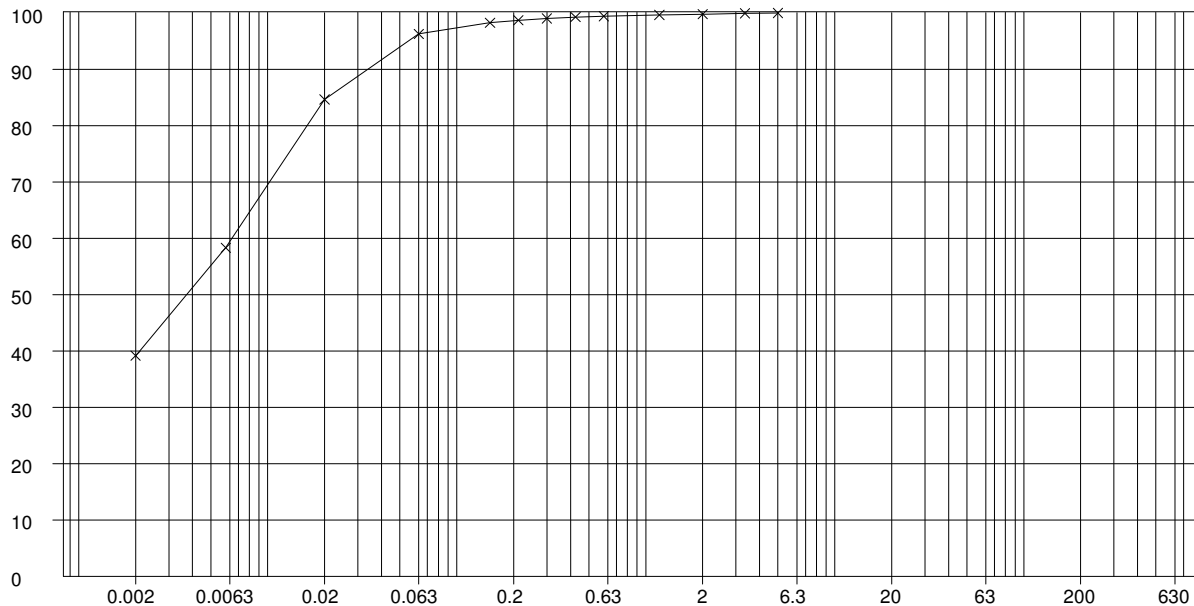
Client : BAM Construction Limited

Job Number
40822

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP03	1.70	B5	Pipette	Brown slightly sandy very clayey SILT



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Grading Analysis	
D85	21.3 µm
D60	6.9 µm
D10	-
Uniformity Coefficient	-

Particle Proportions	
Cobbles + Boulders	0%
Gravel	0%
Sand	4%
Silt	57%
Clay	39%

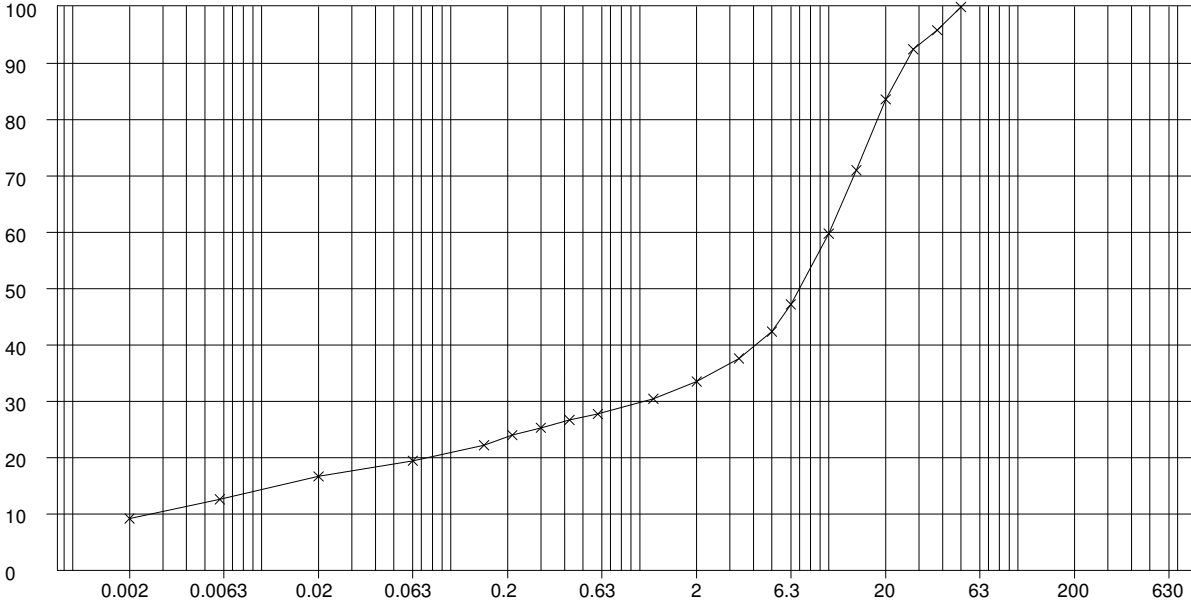
Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
28 mm	100
20 mm	100
14 mm	100
10 mm	100
6.3 mm	100
5 mm	100
3.35 mm	100
2 mm	100
1.18 mm	100
600 µm	99
425 µm	99
300 µm	99
212 µm	99
150 µm	98
63 µm	96
20 µm	85
6 µm	58
2 µm	39

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

 IAN FARMER ASSOCIATES				Laboratory Test Report - 40822/1																									
Site : WAST - Western Gateway Site				Job Number 40822																									
Client : BAM Construction Limited				Page 9 / 23																									
DETERMINATION OF PARTICLE SIZE DISTRIBUTION																													
Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description																									
TP05	1.90	B6	Pipette	Brown slightly clayey silty sandy GRAVEL																									
 <table><tr><td>CLAY</td><td>Fine</td><td>Medium</td><td>Coarse</td><td>Fine</td><td>Medium</td><td>Coarse</td><td>Fine</td><td>Medium</td><td>Coarse</td><td>COBBLES</td><td>BOULDERS</td></tr><tr><td></td><td colspan="3">SILT</td><td colspan="3">SAND</td><td colspan="3">GRAVEL</td><td></td><td></td></tr></table>				CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS		SILT			SAND			GRAVEL					Sieve / Particle Size	% Passing
				CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS														
	SILT			SAND			GRAVEL																						
200 mm	100																												
150 mm	100																												
125 mm	100																												
90 mm	100																												
75 mm	100																												
63 mm	100																												
50 mm	100																												
37.5 mm	96																												
28 mm	93																												
20 mm	84																												
14 mm	71																												
10 mm	60																												
6.3 mm	47																												
5 mm	42																												
3.35 mm	38																												
2 mm	34																												
1.18 mm	30																												
600 µm	28																												
425 µm	27																												
300 µm	25																												
212 µm	24																												
150 µm	22																												
63 µm	19																												
20 µm	17																												
6 µm	13																												
2 µm	9																												
Grading Analysis <table><tr><td>D85</td><td>21.3 mm</td></tr><tr><td>D60</td><td>10.1 mm</td></tr><tr><td>D10</td><td>3.0 µm</td></tr><tr><td></td><td></td></tr><tr><td>Uniformity Coefficient</td><td>3474.0</td></tr></table> Particle Proportions <table><tr><td>Cobbles + Boulders</td><td>0%</td></tr><tr><td>Gravel</td><td>66%</td></tr><tr><td>Sand</td><td>14%</td></tr><tr><td>Silt</td><td>10%</td></tr><tr><td>Clay</td><td>9%</td></tr></table>				D85	21.3 mm	D60	10.1 mm	D10	3.0 µm			Uniformity Coefficient	3474.0	Cobbles + Boulders	0%	Gravel	66%	Sand	14%	Silt	10%	Clay	9%						
D85	21.3 mm																												
D60	10.1 mm																												
D10	3.0 µm																												
Uniformity Coefficient	3474.0																												
Cobbles + Boulders	0%																												
Gravel	66%																												
Sand	14%																												
Silt	10%																												
Clay	9%																												
Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests																													
Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C																													
Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution																													
Remarks :																													

Site : WAST - Western Gateway Site

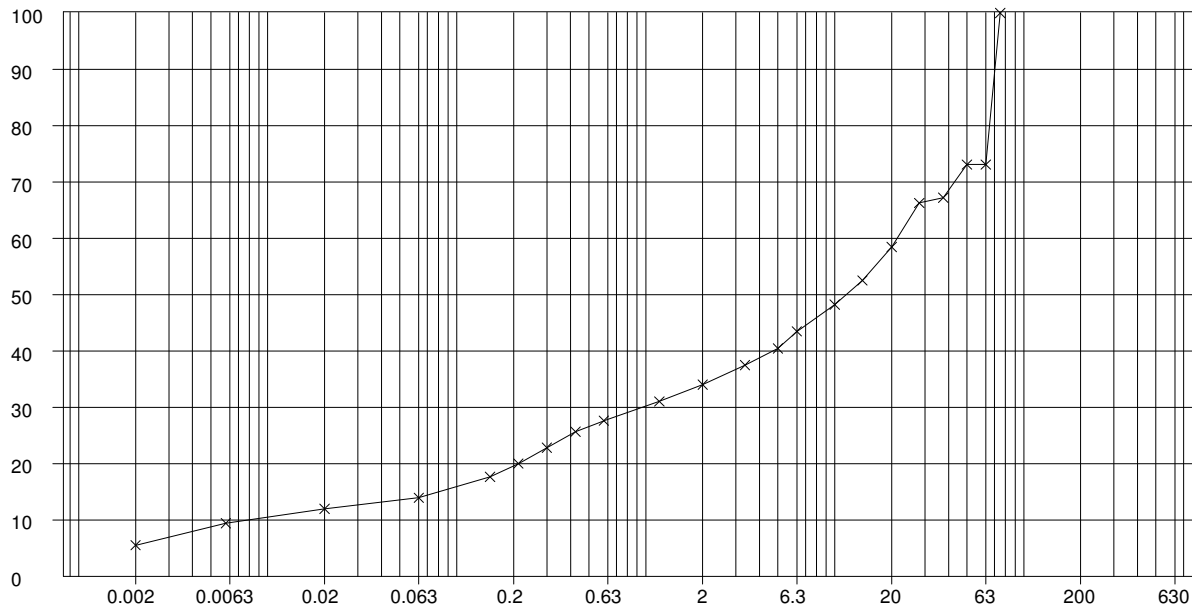
Client : BAM Construction Limited

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40822

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP07	0.80	B4	Pipette	Brown slightly silty slightly clayey sandy cobbley GRAVEL



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	73
50 mm	73
37.5 mm	67
28 mm	66
20 mm	58
14 mm	53
10 mm	48
6.3 mm	43
5 mm	40
3.35 mm	38
2 mm	34
1.18 mm	31
600 µm	28
425 µm	26
300 µm	23
212 µm	20
150 µm	18
63 µm	14
20 µm	12
6 µm	9
2 µm	6

Grading Analysis	
D85	68.3 mm
D60	21.6 mm
D10	9.0 µm
Uniformity Coefficient	2368.9

Particle Proportions	
Cobbles + Boulders	27%
Gravel	39%
Sand	20%
Silt	8%
Clay	6%

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

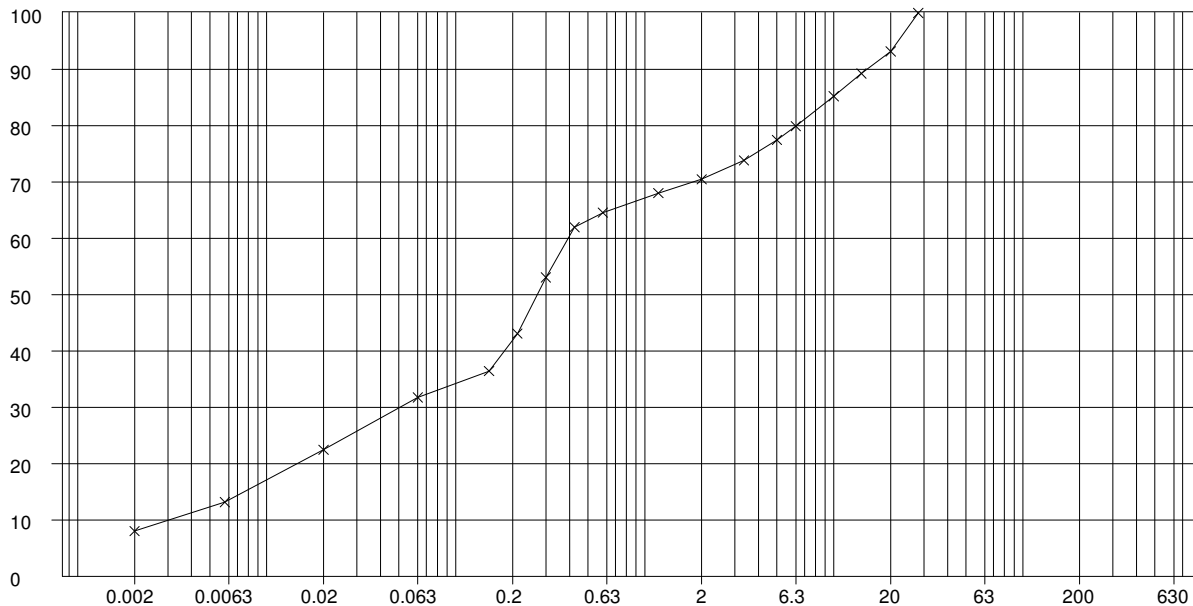
Client : BAM Construction Limited

Job Number
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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP11	1.30	B5	Pipette	Brown slightly clayey silty SAND and GRAVEL



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Grading Analysis	
D85	9.8 mm
D60	397.0 µm
D10	4.0 µm
Uniformity Coefficient	113.4

Particle Proportions	
Cobbles + Boulders	0%
Gravel	30%
Sand	39%
Silt	23%
Clay	8%

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
28 mm	100
20 mm	93
14 mm	89
10 mm	85
6.3 mm	80
5 mm	77
3.35 mm	74
2 mm	70
1.18 mm	68
600 µm	65
425 µm	62
300 µm	53
212 µm	43
150 µm	36
63 µm	32
20 µm	22
6 µm	13
2 µm	8

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

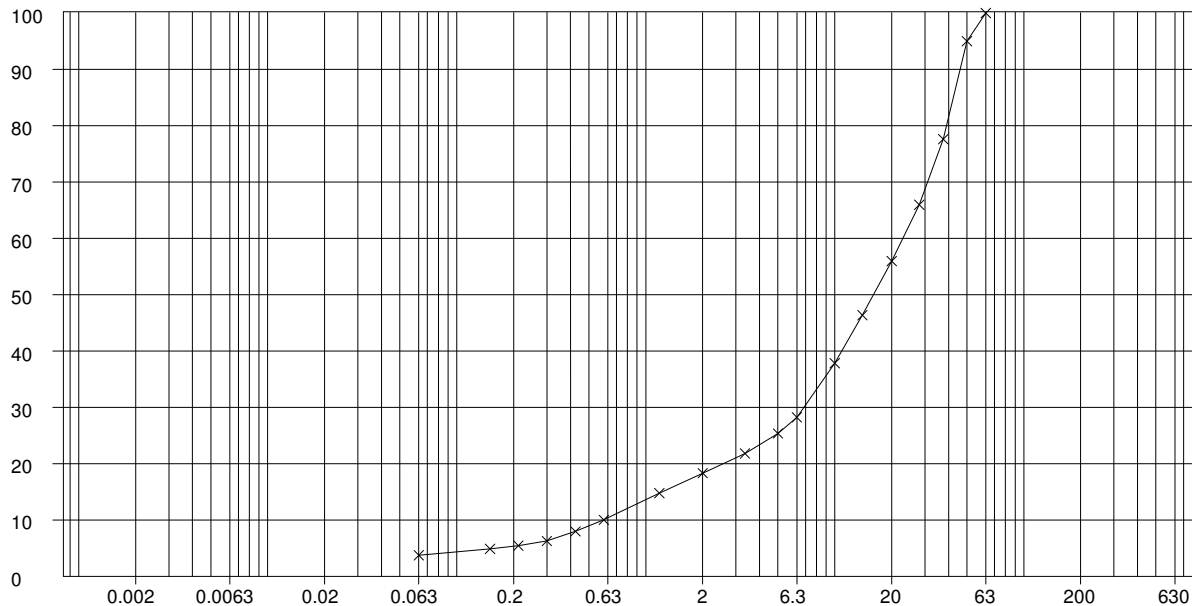
Client : BAM Construction Limited

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40822

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP14	2.10	B7	N/A	Brown slightly sandy GRAVEL



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	95
37.5 mm	78
28 mm	66
20 mm	56
14 mm	46
10 mm	38
6.3 mm	28
5 mm	25
3.35 mm	22
2 mm	18
1.18 mm	15
600 µm	10
425 µm	8
300 µm	6
212 µm	5
150 µm	5
63 µm	4

Grading Analysis	
D85	42.8 mm
D60	23.2 mm
D10	597.0 µm
Uniformity Coefficient	38.9

Particle Proportions	
Cobbles + Boulders	1%
Gravel	81%
Sand	15%
Silt/Clay	3%

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

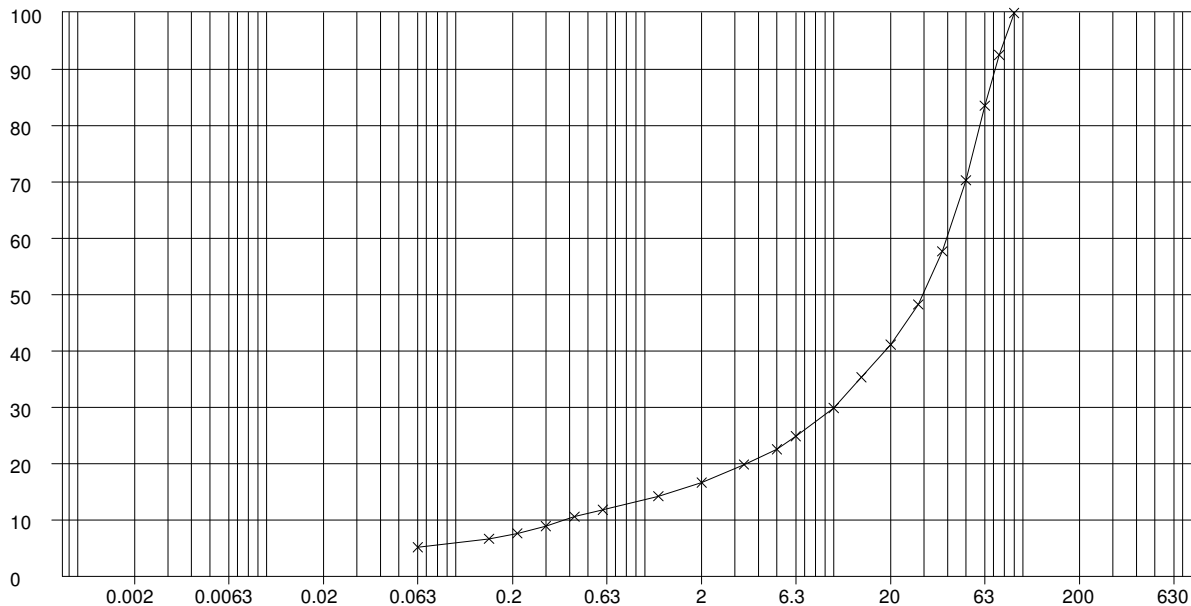
Client : BAM Construction Limited

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP15	3.80	B7	N/A	Brown, slightly clayey, sandy GRAVEL including cobbles.



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	93
63 mm	84
50 mm	70
37.5 mm	58
28 mm	48
20 mm	41
14 mm	35
10 mm	30
6.3 mm	25
5 mm	23
3.35 mm	20
2 mm	17
1.18 mm	14
600 µm	12
425 µm	11
300 µm	9
212 µm	8
150 µm	7
63 µm	5

Grading Analysis	
D85	64.9 mm
D60	39.8 mm
D10	380.0 µm
Uniformity Coefficient	104.7

Particle Proportions	
Cobbles + Boulders	19%
Gravel	64%
Sand	12%
Silt/Clay	5%

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

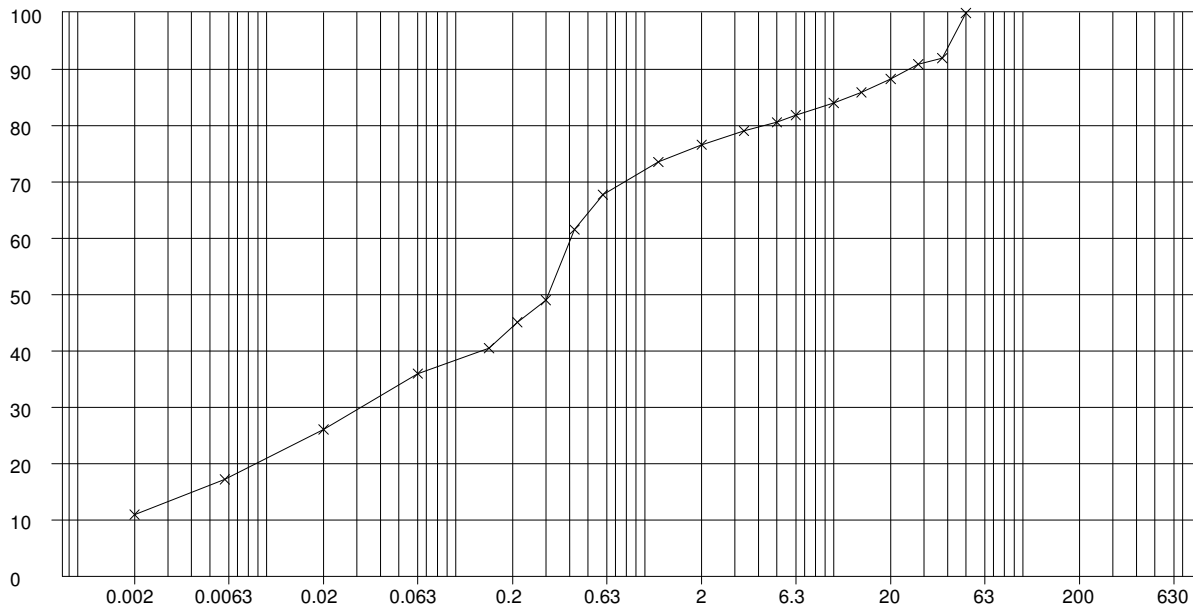
Client : BAM Construction Limited

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP16	2.00	B5	Pipette	Brown, slightly sandy, slightly gravelly SILT/CLAY and SAND.



Site : WAST - Western Gateway Site

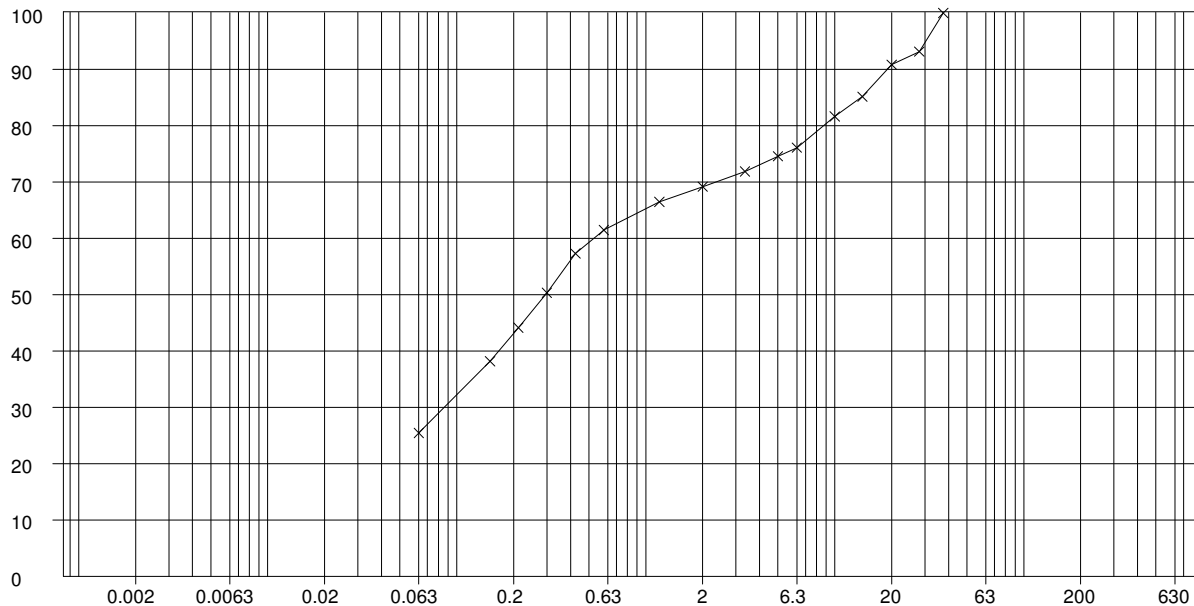
Client : BAM Construction Limited

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP17	4.00	B9	N/A	Brown silty clayey very gravelly SAND



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
28 mm	93
20 mm	91
14 mm	85
10 mm	82
6.3 mm	76
5 mm	75
3.35 mm	72
2 mm	69
1.18 mm	66
600 µm	61
425 µm	57
300 µm	50
212 µm	44
150 µm	38
63 µm	25

Grading Analysis	
D85	13.8 mm
D60	538.0 µm
D10	-
Uniformity Coefficient	-

Particle Proportions	
Cobbles + Boulders	0%
Gravel	31%
Sand	44%
Silt/Clay	25%

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

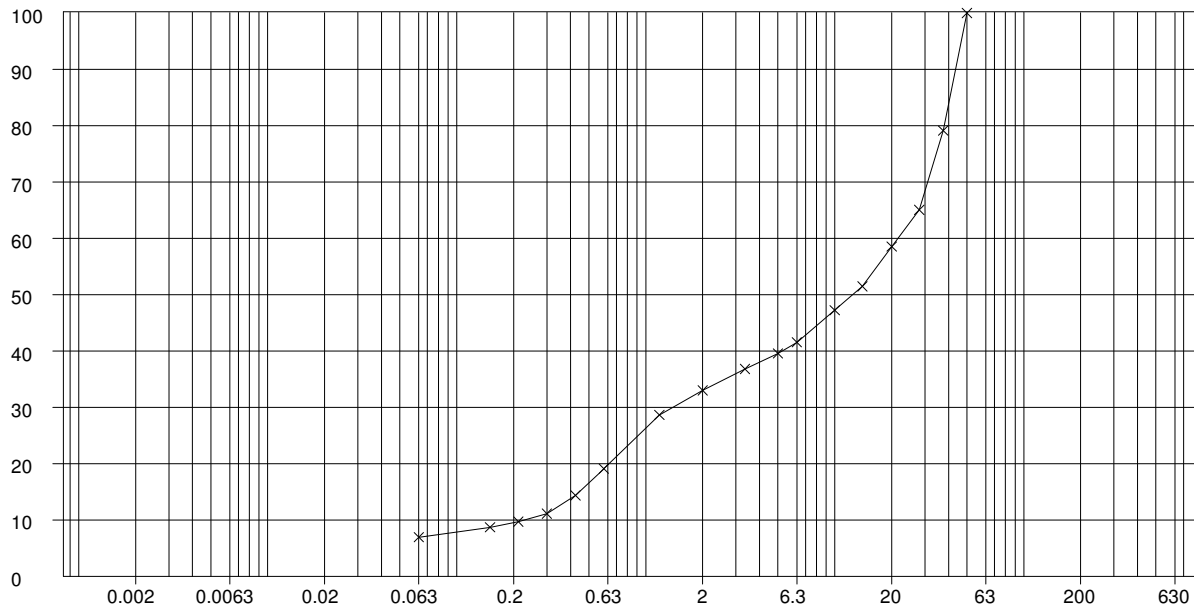
Client : BAM Construction Limited

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP20	1.80	B5	N/A	Brown slightly silty slightly clayey sandy GRAVEL



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	79
28 mm	65
20 mm	59
14 mm	51
10 mm	47
6.3 mm	42
5 mm	40
3.35 mm	37
2 mm	33
1.18 mm	29
600 µm	19
425 µm	14
300 µm	11
212 µm	10
150 µm	9
63 µm	7

Grading Analysis	
D85	41.0 mm
D60	21.8 mm
D10	230.0 µm
Uniformity Coefficient	94.8

Particle Proportions	
Cobbles + Boulders	0%
Gravel	67%
Sand	26%
Silt/Clay	7%

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

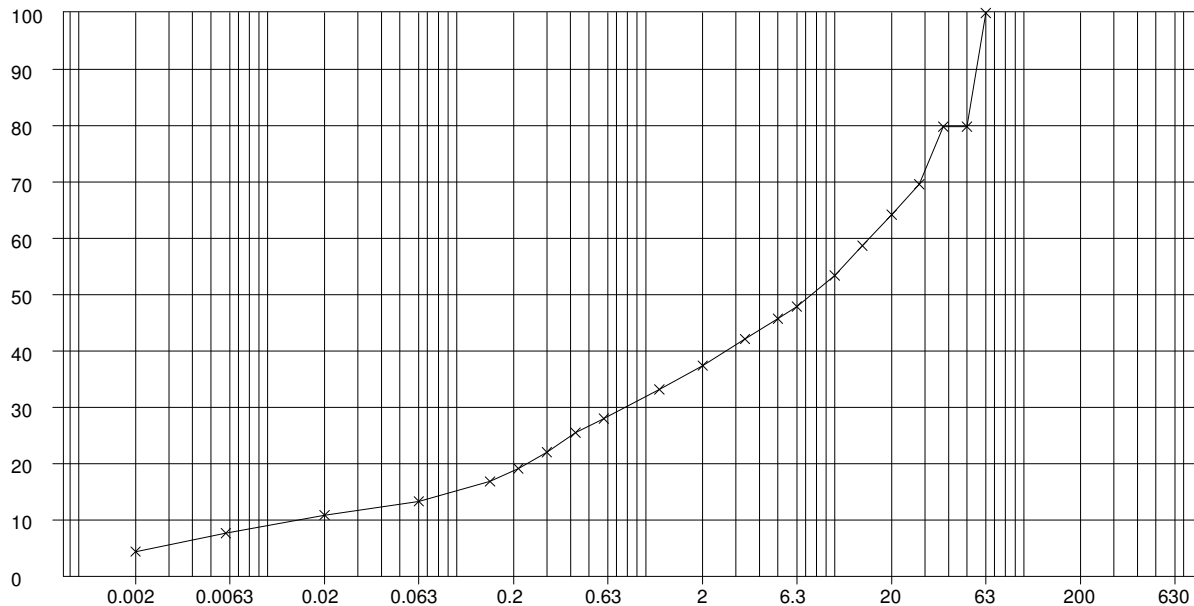
Client : BAM Construction Limited

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP22	1.20	B4	Pipette	Brown slightly silty slightly clayey sandy GRAVEL including cobbles



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	80
37.5 mm	80
28 mm	70
20 mm	64
14 mm	59
10 mm	53
6.3 mm	48
5 mm	46
3.35 mm	42
2 mm	37
1.18 mm	33
600 µm	28
425 µm	26
300 µm	22
212 µm	19
150 µm	17
63 µm	13
20 µm	11
6 µm	8
2 µm	4

Grading Analysis	
D85	53.3 mm
D60	15.4 mm
D10	16.0 µm
Uniformity Coefficient	951.9

Particle Proportions	
Cobbles + Boulders	4%
Gravel	58%
Sand	24%
Silt	9%
Clay	4%

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

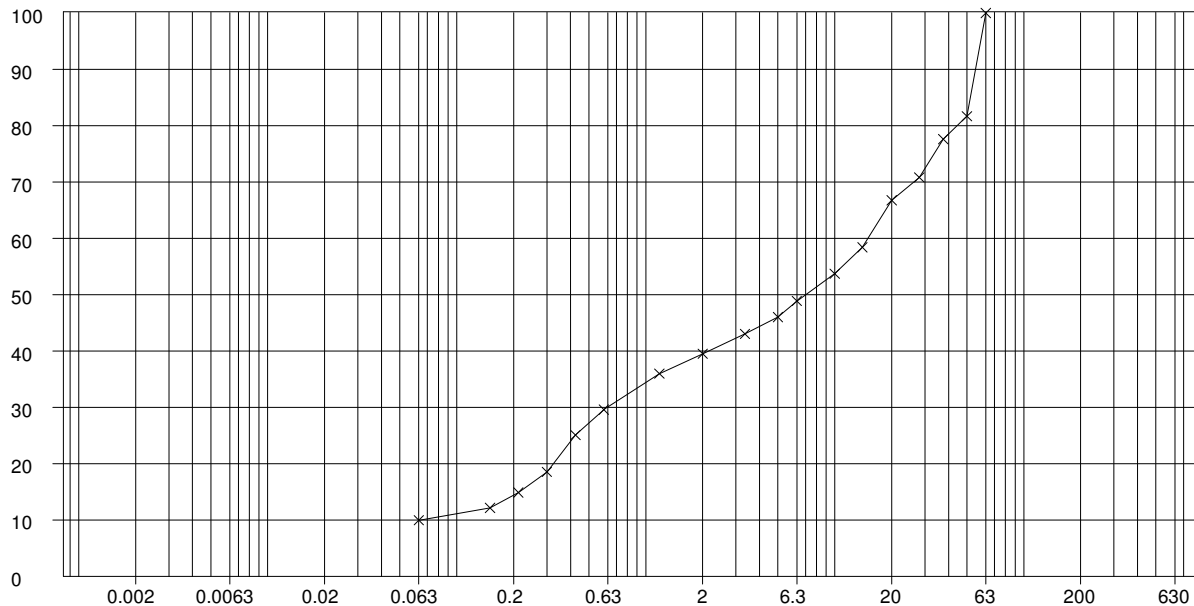
Job Number
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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP24	2.10	B7	N/A	Brown slightly silty slightly clayey sandy GRAVEL including cobbles



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	82
37.5 mm	78
28 mm	71
20 mm	67
14 mm	58
10 mm	54
6.3 mm	49
5 mm	46
3.35 mm	43
2 mm	40
1.18 mm	36
600 µm	30
425 µm	25
300 µm	19
212 µm	15
150 µm	12
63 µm	10

Grading Analysis	
D85	52.4 mm
D60	15.1 mm
D10	65.0 µm
Uniformity Coefficient	234.3

Particle Proportions	
Cobbles + Boulders	4%
Gravel	57%
Sand	30%
Silt/Clay	9%

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

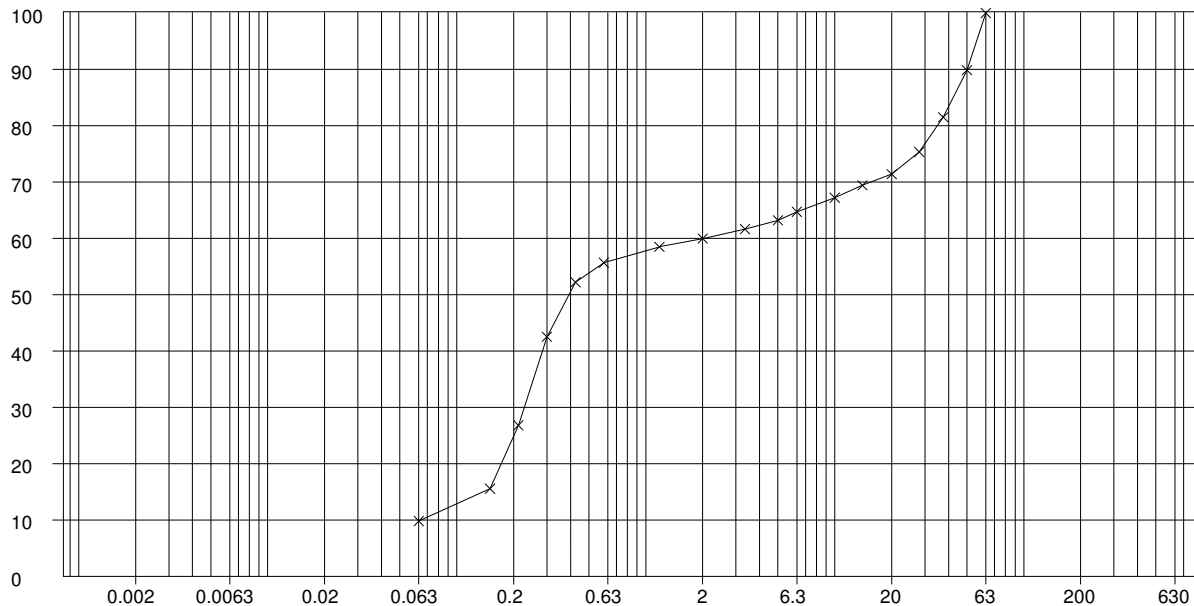
Client : BAM Construction Limited

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP27	2.00	B5	N/A	Brown slightly silty slightly clayey very gravelly SAND



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Grading Analysis	
D85	42.7 mm
D60	2.0 mm
D10	66.0 µm
Uniformity Coefficient	30.8

Particle Proportions	
Cobbles + Boulders	2%
Gravel	38%
Sand	50%
Silt/Clay	10%

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	90
37.5 mm	82
28 mm	75
20 mm	71
14 mm	69
10 mm	67
6.3 mm	65
5 mm	63
3.35 mm	62
2 mm	60
1.18 mm	59
600 µm	56
425 µm	52
300 µm	43
212 µm	27
150 µm	16
63 µm	10

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

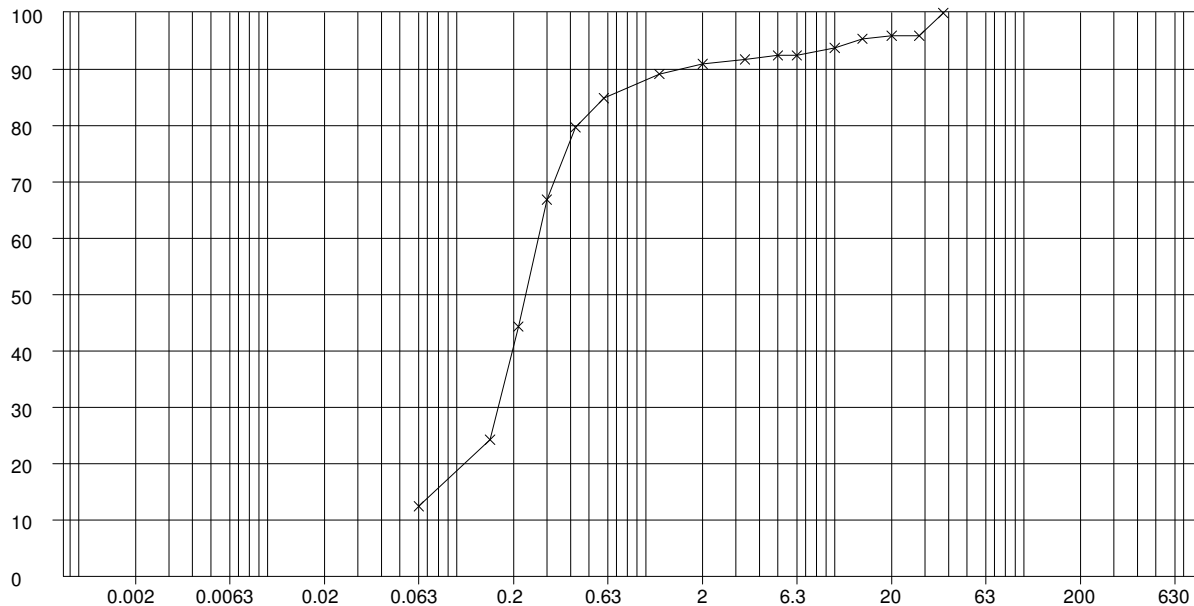
Client : BAM Construction Limited

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
TP28	3.00	B7	N/A	Brown slightly silty slightly clayey slightly gravelly SAND



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Grading Analysis	
D85	616.2 µm
D60	273.2 µm
D10	-
Uniformity Coefficient	-

Particle Proportions	
Cobbles + Boulders	0%
Gravel	9%
Sand	79%
Silt/Clay	12%

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
28 mm	96
20 mm	96
14 mm	95
10 mm	94
6.3 mm	92
5 mm	92
3.35 mm	92
2 mm	91
1.18 mm	89
600 µm	85
425 µm	80
300 µm	67
212 µm	44
150 µm	24
63 µm	12

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with washing dispersant, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

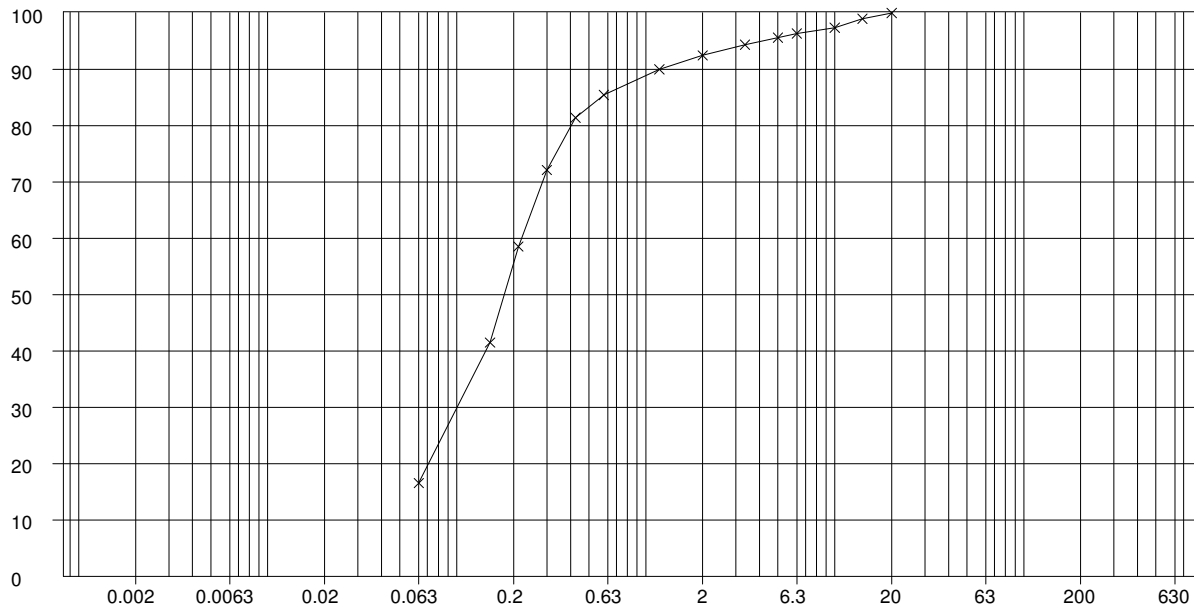
Client : BAM Construction Limited

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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
WS10	4.60	D9	N/A	Brown silty clayey slightly gravelly SAND



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	100
28 mm	100
20 mm	100
14 mm	99
10 mm	97
6.3 mm	96
5 mm	96
3.35 mm	94
2 mm	92
1.18 mm	90
600 µm	85
425 µm	81
300 µm	72
212 µm	59
150 µm	42
63 µm	17

Grading Analysis	
D85	580.0 µm
D60	221.4 µm
D10	-
Uniformity Coefficient	-

Particle Proportions	
Cobbles + Boulders	0%
Gravel	8%
Sand	76%
Silt/Clay	16%

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with washing dispersant, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Site : WAST - Western Gateway Site

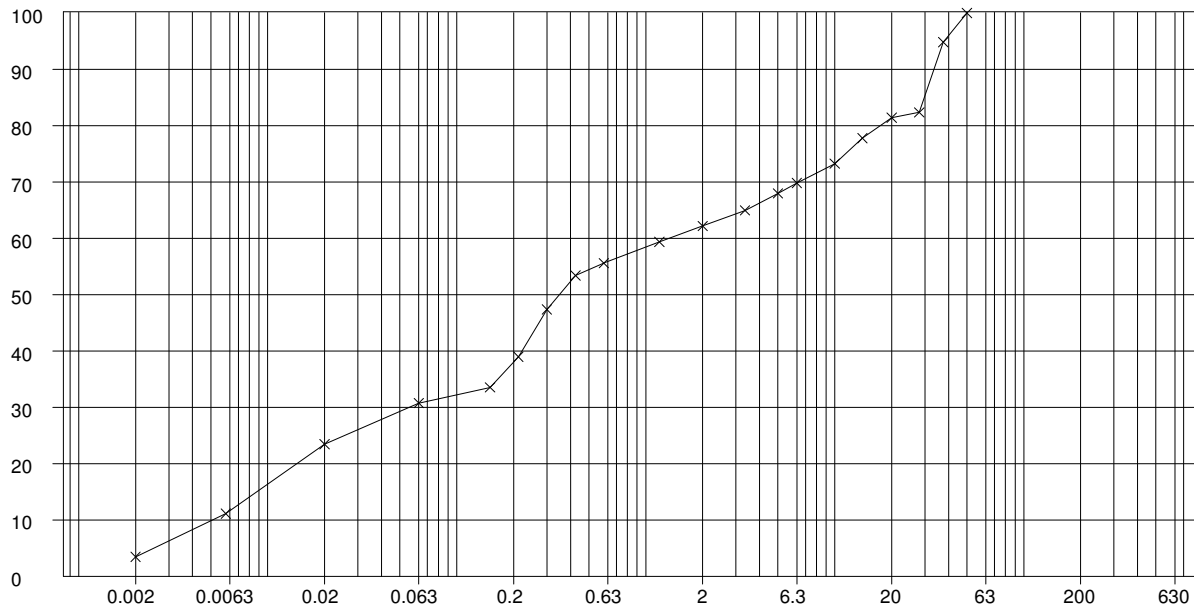
Client : BAM Construction Limited

Job Number
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DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Borehole / Trial Pit	Depth (m)	Sample	Pipette/ Hydrometer	Description
WS17	0.50	B1	Pipette	Brown slightly clayey very silty SAND and GRAVEL



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOULDERS
	SILT			SAND			GRAVEL				

Sieve / Particle Size	% Passing
200 mm	100
150 mm	100
125 mm	100
90 mm	100
75 mm	100
63 mm	100
50 mm	100
37.5 mm	95
28 mm	82
20 mm	81
14 mm	78
10 mm	73
6.3 mm	70
5 mm	68
3.35 mm	65
2 mm	62
1.18 mm	59
600 µm	56
425 µm	53
300 µm	47
212 µm	39
150 µm	34
63 µm	31
20 µm	23
6 µm	11
2 µm	3

Grading Analysis	
D85	30.0 mm
D60	1.4 mm
D10	5.0 µm
Uniformity Coefficient	252.3

Particle Proportions	
Cobbles + Boulders	0%
Gravel	38%
Sand	32%
Silt	27%
Clay	3%

Method of Preparation : BS 1377:PART 1:1990:7.3 Initial preparation 7.4.5 Particle size tests

Preparation Details : Sample washed with no dispersant used, Oven Dried at 105 - 110°C

Method of Test : BS 1377:PART 2:1990:9 Determination of particle size distribution

Remarks :

Test Report : **40822/1**

Site : WAST - Western Gateway Site
Job Number : 40822
Originating Client : Bam Construction Limited

All opinions and interpretations contained within this report are outside of our Scope of Accreditation.

The following tests contained within this report are not UKAS Accredited.

Date of Issue : 28/04/11

APPENDIX 4
CHEMICAL TESTS



2139

Certificate of Analysis

Date: 17/06/2011

Certificate Number: 11-48141-1

Client: Ian Farmer Associates
17 Rivington Court
Hardwick Grange
Woolston
Warrington
Cheshire
WA1 4RT

Our Reference: 11-48141

Client Reference: 40822

Contract Title: WAST - Western Gateway Site

Description: 78 soil samples, 11 leachate samples

Date Received: 31/03/2011

Date Started: 31/03/2011

Date Completed: 17/06/2011

Test Procedures: Identified by prefix DETSn, details available upon request.

Notes: **This report supersedes 11-48141. Mercury added to 321809 & 321812.**
Observations and interpretations are outside the scope of UKAS accreditation



Approved By: Rob Brown, Business Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Information in Support of the Analytical Results

Inorganic soil analysis was carried out on dried sample, crushed to pass a 425um sieve, in accordance with BS1377.

Organics soil analysis was carried out on 'as recieved' sample.

Deviating Sample criteria is based upon guidance in BS ISO 5667-3 : 2003 and BS ISO 18512 : 2007.

Where DETS has not carried out the sampling, the laboratory has carried out this testing on samples as supplied by the client. Test results relate only to items tested

ACCREDITATION STATUS

- * Denotes test not included in laboratory scope of accreditation
- # Denotes test that holds MCERTS accreditation, however, MCERTS accreditation is only implied if the report carries the MCERTS logo
- \$ Denotes tests completed by an approved subcontractor
- I/S Denotes insufficient sample to carry out test
- U/S Denotes that the sample is not suitable for testing

DEVIATING SAMPLES

- ! Denotes sample may be deviating due to one or more of the following
- 1 Sample not received in appropriate containers
- 2 Sample exceeded holding times
- 3 Sample temperature exceeded tolerance
- 4 Sample received without a Sampled Date or Time (waters only)
- a Inorganic analysis may be deviating
- b Organic analysis may be deviating
- c Asbestos analysis may be deviating, as not received in a separate container
- n/a Denotes sample is not deviating

COMMENTS ON DEVIATING SAMPLES

Although UKAS accreditation is still applicable to deviating samples, it should be noted that the results of any deviating samples may be compromised

DISPOSAL

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month

Liquids - 2 weeks

Asbestos (test portion) - 6 months

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321751	321752	321753	321754	321755
			Sample ID	BH01	BH01	BH01	BH01	BH01
			Depth	0.50	5.00	7.95	12.00	16.50
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				!,3	n/a	n/a	n/a	n/a
Arsenic	mg/kg	DETS 042#		6.0				
Cadmium	mg/kg	DETS 042#		0.5				
Chromium	mg/kg	DETS 042#		13				
Copper	mg/kg	DETS 042#		11				
Lead	mg/kg	DETS 042#		38				
Mercury	mg/kg	DETS 081#		< 0.05				
Nickel	mg/kg	DETS 042#		12				
Selenium	mg/kg	DETS 042#		< 0.5				
Zinc	mg/kg	DETS 042#		43				
Cyanide total	mg/kg	DETS 067#		0.2				
Total Sulphate as SO4	%	DETS 075#			< 0.01	< 0.01	< 0.01	0.01
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#			12	< 10	14	18
Total Sulphur as S	%	DETS 064			0.02	0.01	0.02	0.03
pH		DETS 008#		8.7	8.7	8.9	8.7	8.8
Aliphatic C5-C6	mg/kg	DETS 072*		< 0.01				
Aliphatic C6-C8	mg/kg	DETS 072*		< 0.01				
Aliphatic C8-C10	mg/kg	DETS 072*		< 0.01				
Aliphatic C10-C12	mg/kg	DETS 072#		< 1.5				
Aliphatic C12-C16	mg/kg	DETS 072#		< 1.2				
Aliphatic C16-C21	mg/kg	DETS 072#		< 1.5				
Aliphatic C21-C35	mg/kg	DETS 072*		< 3.4				
Aromatic C5-C7	mg/kg	DETS 072*		< 0.01				
Aromatic C7-C8	mg/kg	DETS 072*		< 0.01				
Aromatic C8-C10	mg/kg	DETS 072*		< 0.01				
Aromatic C10-C12	mg/kg	DETS 072#		< 0.9				
Aromatic C12-C16	mg/kg	DETS 072#		< 0.5				
Aromatic C16-C21	mg/kg	DETS 072#		< 0.6				
Aromatic C21-C35	mg/kg	DETS 072#		< 1.4				
Aliphatic C5-C35	mg/kg	DETS 072*		< 10				
Aromatic C5-C35	mg/kg	DETS 072*		< 10				
TPH Ali/Aro	mg/kg	DETS 072*		< 10				

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

		Lab No.	321751	321752	321753	321754	321755
		Sample ID	BH01	BH01	BH01	BH01	BH01
		Depth	0.50	5.00	7.95	12.00	16.50
		Sample Ref					
		Sample Type					
Test	Units	DETSxx					
Acenaphthene	mg/kg	DETS 050	< 0.1				
Acenaphthylene	mg/kg	DETS 050	< 0.1				
Anthracene	mg/kg	DETS 050	< 0.1				
Benzo(a)anthracene	mg/kg	DETS 050	< 0.1				
Benzo(a)pyrene	mg/kg	DETS 050	< 0.1				
Benzo(b)fluoranthene	mg/kg	DETS 050	< 0.1				
Benzo(k)fluoranthene	mg/kg	DETS 050	< 0.1				
Benzo(g,h,i)perylene	mg/kg	DETS 050	< 0.1				
Chrysene	mg/kg	DETS 050	< 0.1				
Dibenzo(a,h)anthracene	mg/kg	DETS 050	< 0.1				
Fluoranthene	mg/kg	DETS 050	< 0.1				
Fluorene	mg/kg	DETS 050	< 0.1				
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	< 0.1				
Naphthalene	mg/kg	DETS 050	< 0.1				
Phenanthrene	mg/kg	DETS 050	< 0.1				
Pyrene	mg/kg	DETS 050	< 0.1				
PAH	mg/kg	DETS 050	< 1.6				
EPH (C35-C40)	mg/kg	DETS 051	< 10				
EPH (C6-C10)	mg/kg	DETS 051	< 10				
EPH (C10-C35)	mg/kg	DETS 051	< 10				
Phenol - Monohydric	mg/kg	DETS 067#	< 0.3				

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321756	321757	321758	321759	321760
			Sample ID	BH01	BH02	BH02	BH02	BH02
			Depth	19.00	0.50	7.00	12.00	14.50
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				n/a	!,3	n/a	n/a	n/a
Arsenic	mg/kg	DETS 042#			8.3			
Cadmium	mg/kg	DETS 042#			0.9			
Chromium	mg/kg	DETS 042#			15			
Copper	mg/kg	DETS 042#			27			
Lead	mg/kg	DETS 042#			72			
Mercury	mg/kg	DETS 081#			0.09			
Nickel	mg/kg	DETS 042#			15			
Selenium	mg/kg	DETS 042#			< 0.5			
Zinc	mg/kg	DETS 042#			77			
Cyanide total	mg/kg	DETS 067#			0.1			
Total Sulphate as SO4	%	DETS 075#		0.03		0.01	0.01	0.01
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#		83		31	28	38
Total Sulphur as S	%	DETS 064		0.17		0.02	0.07	0.05
pH		DETS 008#		8.7	8.5	8.3	8.5	8.7
Aliphatic C5-C6	mg/kg	DETS 072*			< 0.01			
Aliphatic C6-C8	mg/kg	DETS 072*			< 0.01			
Aliphatic C8-C10	mg/kg	DETS 072*			< 0.01			
Aliphatic C10-C12	mg/kg	DETS 072#			< 1.5			
Aliphatic C12-C16	mg/kg	DETS 072#			< 1.2			
Aliphatic C16-C21	mg/kg	DETS 072#			< 1.5			
Aliphatic C21-C35	mg/kg	DETS 072*			< 3.4			
Aromatic C5-C7	mg/kg	DETS 072*			< 0.01			
Aromatic C7-C8	mg/kg	DETS 072*			< 0.01			
Aromatic C8-C10	mg/kg	DETS 072*			< 0.01			
Aromatic C10-C12	mg/kg	DETS 072#			< 0.9			
Aromatic C12-C16	mg/kg	DETS 072#			< 0.5			
Aromatic C16-C21	mg/kg	DETS 072#			< 0.6			
Aromatic C21-C35	mg/kg	DETS 072#			< 1.4			
Aliphatic C5-C35	mg/kg	DETS 072*			< 10			
Aromatic C5-C35	mg/kg	DETS 072*			< 10			
TPH Ali/Aro	mg/kg	DETS 072*			< 10			

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321756	321757	321758	321759	321760
			Sample ID	BH01	BH02	BH02	BH02	BH02
			Depth	19.00	0.50	7.00	12.00	14.50
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Acenaphthene	mg/kg	DETS 050			< 0.1			
Acenaphthylene	mg/kg	DETS 050			< 0.1			
Anthracene	mg/kg	DETS 050			< 0.1			
Benzo(a)anthracene	mg/kg	DETS 050			< 0.1			
Benzo(a)pyrene	mg/kg	DETS 050			< 0.1			
Benzo(b)fluoranthene	mg/kg	DETS 050			< 0.1			
Benzo(k)fluoranthene	mg/kg	DETS 050			< 0.1			
Benzo(g,h,i)perylene	mg/kg	DETS 050			< 0.1			
Chrysene	mg/kg	DETS 050			< 0.1			
Dibenzo(a,h)anthracene	mg/kg	DETS 050			< 0.1			
Fluoranthene	mg/kg	DETS 050			< 0.1			
Fluorene	mg/kg	DETS 050			< 0.1			
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050			< 0.1			
Naphthalene	mg/kg	DETS 050			< 0.1			
Phenanthrene	mg/kg	DETS 050			< 0.1			
Pyrene	mg/kg	DETS 050			< 0.1			
PAH	mg/kg	DETS 050			< 1.6			
EPH (C35-C40)	mg/kg	DETS 051			18			
EPH (C6-C10)	mg/kg	DETS 051			< 10			
EPH (C10-C35)	mg/kg	DETS 051			54			
Phenol - Monohydric	mg/kg	DETS 067#			< 0.3			

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321761	321762	321763	321764	321765
			Sample ID	BH03	BH04	BH04	SA02	TP01
			Depth	7.50	4.00	7.50	1.00	0.30
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				n/a	n/a	n/a	n/a	!,3
Arsenic	mg/kg	DETS 042#						8.6
Cadmium	mg/kg	DETS 042#						0.7
Chromium	mg/kg	DETS 042#						17
Copper	mg/kg	DETS 042#						16
Lead	mg/kg	DETS 042#						110
Mercury	mg/kg	DETS 081#						0.09
Nickel	mg/kg	DETS 042#						13
Selenium	mg/kg	DETS 042#						0.6
Zinc	mg/kg	DETS 042#						71
Cyanide total	mg/kg	DETS 067#						0.2
Total Sulphate as SO4	%	DETS 075#		0.04	0.02	0.01	0.01	
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#		140	17	26	12	
Total Sulphur as S	%	DETS 064		0.11	0.02	0.04	< 0.01	
pH		DETS 008#		8.6	8.6	8.6	8.2	7.7
Aliphatic C5-C6	mg/kg	DETS 072*						< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*						< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*						< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#						< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#						< 1.2
Aliphatic C16-C21	mg/kg	DETS 072#						< 1.5
Aliphatic C21-C35	mg/kg	DETS 072*						< 3.4
Aromatic C5-C7	mg/kg	DETS 072*						< 0.01
Aromatic C7-C8	mg/kg	DETS 072*						< 0.01
Aromatic C8-C10	mg/kg	DETS 072*						< 0.01
Aromatic C10-C12	mg/kg	DETS 072#						< 0.9
Aromatic C12-C16	mg/kg	DETS 072#						< 0.5
Aromatic C16-C21	mg/kg	DETS 072#						< 0.6
Aromatic C21-C35	mg/kg	DETS 072#						< 1.4
Aliphatic C5-C35	mg/kg	DETS 072*						< 10
Aromatic C5-C35	mg/kg	DETS 072*						< 10
TPH Ali/Aro	mg/kg	DETS 072*						< 10

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

		Lab No.	321761	321762	321763	321764	321765
		Sample ID	BH03	BH04	BH04	SA02	TP01
		Depth	7.50	4.00	7.50	1.00	0.30
		Sample Ref					
		Sample Type					
Test	Units	DETSxx					
Acenaphthene	mg/kg	DETS 050					< 0.1
Acenaphthylene	mg/kg	DETS 050					< 0.1
Anthracene	mg/kg	DETS 050					< 0.1
Benzo(a)anthracene	mg/kg	DETS 050					< 0.1
Benzo(a)pyrene	mg/kg	DETS 050					< 0.1
Benzo(b)fluoranthene	mg/kg	DETS 050					< 0.1
Benzo(k)fluoranthene	mg/kg	DETS 050					< 0.1
Benzo(g,h,i)perylene	mg/kg	DETS 050					< 0.1
Chrysene	mg/kg	DETS 050					< 0.1
Dibenzo(a,h)anthracene	mg/kg	DETS 050					< 0.1
Fluoranthene	mg/kg	DETS 050					< 0.1
Fluorene	mg/kg	DETS 050					< 0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050					< 0.1
Naphthalene	mg/kg	DETS 050					< 0.1
Phenanthrene	mg/kg	DETS 050					< 0.1
Pyrene	mg/kg	DETS 050					< 0.1
PAH	mg/kg	DETS 050					< 1.6
EPH (C35-C40)	mg/kg	DETS 051					< 10
EPH (C6-C10)	mg/kg	DETS 051					< 10
EPH (C10-C35)	mg/kg	DETS 051					< 10
Phenol - Monohydric	mg/kg	DETS 067#					< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321766	321767	321768	321769	321770
			Sample ID	TP01	TP02	TP02	TP02	TP03
			Depth	1.30	0.20	0.50	0.90	0.30
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				!,3	!,3	n/a	!,3	!,3
Arsenic	mg/kg	DETS 042#		7.6	8.1		8.3	5.3
Cadmium	mg/kg	DETS 042#		0.6	1.0		0.7	0.5
Chromium	mg/kg	DETS 042#		16	18		16	10
Copper	mg/kg	DETS 042#		16	16		15	9
Lead	mg/kg	DETS 042#		33	120		250	180
Mercury	mg/kg	DETS 081#		< 0.05	0.07		< 0.05	0.08
Nickel	mg/kg	DETS 042#		21	15		20	12
Selenium	mg/kg	DETS 042#		0.7	0.7		< 0.5	< 0.5
Zinc	mg/kg	DETS 042#		42	62		40	60
Cyanide total	mg/kg	DETS 067#			0.2			
Total Sulphate as SO4	%	DETS 075#				0.02		
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#				18		
Total Sulphur as S	%	DETS 064				0.02		
pH		DETS 008#		8.2	7.4	7.6	8.1	8.4
Aliphatic C5-C6	mg/kg	DETS 072*			< 0.01			
Aliphatic C6-C8	mg/kg	DETS 072*			< 0.01			
Aliphatic C8-C10	mg/kg	DETS 072*			< 0.01			
Aliphatic C10-C12	mg/kg	DETS 072#			< 1.5			
Aliphatic C12-C16	mg/kg	DETS 072#			< 1.2			
Aliphatic C16-C21	mg/kg	DETS 072#			< 1.5			
Aliphatic C21-C35	mg/kg	DETS 072*			< 3.4			
Aromatic C5-C7	mg/kg	DETS 072*			< 0.01			
Aromatic C7-C8	mg/kg	DETS 072*			< 0.01			
Aromatic C8-C10	mg/kg	DETS 072*			< 0.01			
Aromatic C10-C12	mg/kg	DETS 072#			< 0.9			
Aromatic C12-C16	mg/kg	DETS 072#			< 0.5			
Aromatic C16-C21	mg/kg	DETS 072#			< 0.6			
Aromatic C21-C35	mg/kg	DETS 072#			< 1.4			
Aliphatic C5-C35	mg/kg	DETS 072*			< 10			
Aromatic C5-C35	mg/kg	DETS 072*			< 10			
TPH Ali/Aro	mg/kg	DETS 072*			< 10			

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321766	321767	321768	321769	321770
			Sample ID	TP01	TP02	TP02	TP02	TP03
			Depth	1.30	0.20	0.50	0.90	0.30
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Acenaphthene	mg/kg	DETS 050			< 0.1			
Acenaphthylene	mg/kg	DETS 050			< 0.1			
Anthracene	mg/kg	DETS 050			< 0.1			
Benzo(a)anthracene	mg/kg	DETS 050			< 0.1			
Benzo(a)pyrene	mg/kg	DETS 050			< 0.1			
Benzo(b)fluoranthene	mg/kg	DETS 050			< 0.1			
Benzo(k)fluoranthene	mg/kg	DETS 050			< 0.1			
Benzo(g,h,i)perylene	mg/kg	DETS 050			< 0.1			
Chrysene	mg/kg	DETS 050			< 0.1			
Dibenzo(a,h)anthracene	mg/kg	DETS 050			< 0.1			
Fluoranthene	mg/kg	DETS 050			< 0.1			
Fluorene	mg/kg	DETS 050			< 0.1			
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050			< 0.1			
Naphthalene	mg/kg	DETS 050			< 0.1			
Phenanthrene	mg/kg	DETS 050			< 0.1			
Pyrene	mg/kg	DETS 050			< 0.1			
PAH	mg/kg	DETS 050			< 1.6			
EPH (C35-C40)	mg/kg	DETS 051			< 10			
EPH (C6-C10)	mg/kg	DETS 051			< 10			
EPH (C10-C35)	mg/kg	DETS 051			< 10			
Phenol - Monohydric	mg/kg	DETS 067#			< 0.3			

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321771	321772	321773	321774	321775
			Sample ID	TP04	TP05	TP06	TP06	TP07
			Depth	0.20	0.90	0.20	1.90	0.30
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				!,3	!,3	!,3	n/a	!,3
Arsenic	mg/kg	DETS 042#		12	8.3	10		7.5
Cadmium	mg/kg	DETS 042#		1.8	0.8	0.9		0.7
Chromium	mg/kg	DETS 042#		20	15	21		16
Copper	mg/kg	DETS 042#		20	14	22		14
Lead	mg/kg	DETS 042#		290	72	480		500
Mercury	mg/kg	DETS 081#		0.11	< 0.05	0.12		0.15
Nickel	mg/kg	DETS 042#		19	20	22		22
Selenium	mg/kg	DETS 042#		< 0.5	0.9	0.8		1
Zinc	mg/kg	DETS 042#		200	42	110		67
Cyanide total	mg/kg	DETS 067#		0.1		0.3		
Total Sulphate as SO4	%	DETS 075#			0.02		0.02	
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#			< 10		< 10	
Total Sulphur as S	%	DETS 064			0.01		< 0.01	
pH		DETS 008#		8.1	8.2	6.9	7.7	7.5
Aliphatic C5-C6	mg/kg	DETS 072*		< 0.01		< 0.01		
Aliphatic C6-C8	mg/kg	DETS 072*		< 0.01		< 0.01		
Aliphatic C8-C10	mg/kg	DETS 072*		< 0.01		< 0.01		
Aliphatic C10-C12	mg/kg	DETS 072#		< 1.5		< 1.5		
Aliphatic C12-C16	mg/kg	DETS 072#		< 1.2		< 1.2		
Aliphatic C16-C21	mg/kg	DETS 072#		< 1.5		< 1.5		
Aliphatic C21-C35	mg/kg	DETS 072*		35		< 3.4		
Aromatic C5-C7	mg/kg	DETS 072*		< 0.01		< 0.01		
Aromatic C7-C8	mg/kg	DETS 072*		< 0.01		< 0.01		
Aromatic C8-C10	mg/kg	DETS 072*		< 0.01		< 0.01		
Aromatic C10-C12	mg/kg	DETS 072#		< 0.9		< 0.9		
Aromatic C12-C16	mg/kg	DETS 072#		0.8		< 0.5		
Aromatic C16-C21	mg/kg	DETS 072#		5.7		< 0.6		
Aromatic C21-C35	mg/kg	DETS 072#		78		< 1.4		
Aliphatic C5-C35	mg/kg	DETS 072*		35		< 10		
Aromatic C5-C35	mg/kg	DETS 072*		84		< 10		
TPH Ali/Aro	mg/kg	DETS 072*		120		< 10		

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321771	321772	321773	321774	321775
			Sample ID	TP04	TP05	TP06	TP06	TP07
			Depth	0.20	0.90	0.20	1.90	0.30
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Acenaphthene	mg/kg	DETS 050	< 0.1			< 0.1		
Acenaphthylene	mg/kg	DETS 050	< 0.1			< 0.1		
Anthracene	mg/kg	DETS 050	< 0.1			< 0.1		
Benzo(a)anthracene	mg/kg	DETS 050	0.1			< 0.1		
Benzo(a)pyrene	mg/kg	DETS 050	0.4			< 0.1		
Benzo(b)fluoranthene	mg/kg	DETS 050	0.3			< 0.1		
Benzo(k)fluoranthene	mg/kg	DETS 050	< 0.1			< 0.1		
Benzo(g,h,i)perylene	mg/kg	DETS 050	0.2			< 0.1		
Chrysene	mg/kg	DETS 050	0.2			< 0.1		
Dibenzo(a,h)anthracene	mg/kg	DETS 050	< 0.1			< 0.1		
Fluoranthene	mg/kg	DETS 050	0.3			< 0.1		
Fluorene	mg/kg	DETS 050	< 0.1			< 0.1		
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	0.2			< 0.1		
Naphthalene	mg/kg	DETS 050	< 0.1			< 0.1		
Phenanthrene	mg/kg	DETS 050	< 0.1			< 0.1		
Pyrene	mg/kg	DETS 050	0.4			< 0.1		
PAH	mg/kg	DETS 050	2.2			< 1.6		
EPH (C35-C40)	mg/kg	DETS 051	25			< 10		
EPH (C6-C10)	mg/kg	DETS 051	< 10			< 10		
EPH (C10-C35)	mg/kg	DETS 051	110			< 10		
Phenol - Monohydric	mg/kg	DETS 067#	< 0.3			< 0.3		

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321776	321777	321778	321779	321780
			Sample ID	TP07	TP09	TP09	TP10	TP10
			Depth	1.80	0.40	0.80	0.40	0.90
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample			n/a	!	3	!	3	n/a
Arsenic	mg/kg	DETS 042#		7.1	7.6	5.6		
Cadmium	mg/kg	DETS 042#		0.6	0.7	0.5		
Chromium	mg/kg	DETS 042#		15	17	11		
Copper	mg/kg	DETS 042#		13	12	11		
Lead	mg/kg	DETS 042#		620	260	290		
Mercury	mg/kg	DETS 081#		0.07	0.08	0.06		
Nickel	mg/kg	DETS 042#		19	22	17		
Selenium	mg/kg	DETS 042#		0.6	1.1	0.8		
Zinc	mg/kg	DETS 042#		60	57	46		
Cyanide total	mg/kg	DETS 067#		< 0.1	< 0.1			
Total Sulphate as SO4	%	DETS 075#	< 0.01					< 0.01
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#	16					14
Total Sulphur as S	%	DETS 064	0.01					< 0.01
pH		DETS 008#	7.9	7.6	7.7	7.6	7.9	
Aliphatic C5-C6	mg/kg	DETS 072*		< 0.01	< 0.01			
Aliphatic C6-C8	mg/kg	DETS 072*		< 0.01	< 0.01			
Aliphatic C8-C10	mg/kg	DETS 072*		< 0.01	< 0.01			
Aliphatic C10-C12	mg/kg	DETS 072#		< 1.5	< 1.5			
Aliphatic C12-C16	mg/kg	DETS 072#		< 1.2	< 1.2			
Aliphatic C16-C21	mg/kg	DETS 072#		< 1.5	< 1.5			
Aliphatic C21-C35	mg/kg	DETS 072*		< 3.4	< 3.4			
Aromatic C5-C7	mg/kg	DETS 072*		< 0.01	< 0.01			
Aromatic C7-C8	mg/kg	DETS 072*		< 0.01	< 0.01			
Aromatic C8-C10	mg/kg	DETS 072*		< 0.01	< 0.01			
Aromatic C10-C12	mg/kg	DETS 072#		< 0.9	< 0.9			
Aromatic C12-C16	mg/kg	DETS 072#		< 0.5	< 0.5			
Aromatic C16-C21	mg/kg	DETS 072#		< 0.6	< 0.6			
Aromatic C21-C35	mg/kg	DETS 072#		< 1.4	< 1.4			
Aliphatic C5-C35	mg/kg	DETS 072*		< 10	< 10			
Aromatic C5-C35	mg/kg	DETS 072*		< 10	< 10			
TPH Ali/Aro	mg/kg	DETS 072*		< 10	< 10			

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321776	321777	321778	321779	321780
			Sample ID	TP07	TP09	TP09	TP10	TP10
			Depth	1.80	0.40	0.80	0.40	0.90
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Acenaphthene	mg/kg	DETS 050			< 0.1	< 0.1		
Acenaphthylene	mg/kg	DETS 050			< 0.1	< 0.1		
Anthracene	mg/kg	DETS 050			< 0.1	< 0.1		
Benzo(a)anthracene	mg/kg	DETS 050			< 0.1	< 0.1		
Benzo(a)pyrene	mg/kg	DETS 050			< 0.1	< 0.1		
Benzo(b)fluoranthene	mg/kg	DETS 050			< 0.1	< 0.1		
Benzo(k)fluoranthene	mg/kg	DETS 050			< 0.1	< 0.1		
Benzo(g,h,i)perylene	mg/kg	DETS 050			< 0.1	< 0.1		
Chrysene	mg/kg	DETS 050			< 0.1	< 0.1		
Dibenzo(a,h)anthracene	mg/kg	DETS 050			< 0.1	< 0.1		
Fluoranthene	mg/kg	DETS 050			< 0.1	< 0.1		
Fluorene	mg/kg	DETS 050			< 0.1	< 0.1		
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050			< 0.1	< 0.1		
Naphthalene	mg/kg	DETS 050			< 0.1	< 0.1		
Phenanthrene	mg/kg	DETS 050			< 0.1	< 0.1		
Pyrene	mg/kg	DETS 050			< 0.1	< 0.1		
PAH	mg/kg	DETS 050			< 1.6	< 1.6		
EPH (C35-C40)	mg/kg	DETS 051			< 10	< 10		
EPH (C6-C10)	mg/kg	DETS 051			< 10	< 10		
EPH (C10-C35)	mg/kg	DETS 051			< 10	< 10		
Phenol - Monohydric	mg/kg	DETS 067#			< 0.3	< 0.3		

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321781	321782	321783	321784	321785
			Sample ID	TP11	TP12	TP13	TP13	TP14
			Depth	0.90	0.80	0.50	1.10	1.00
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				!,3	!,3	!,3	!,3	!,3
Arsenic	mg/kg	DETS 042#		7.7	6.6	6.0	5.1	5.5
Cadmium	mg/kg	DETS 042#		0.7	0.5	0.4	0.2	0.2
Chromium	mg/kg	DETS 042#		16	15	15	9	9
Copper	mg/kg	DETS 042#		15	11	11	9	8
Lead	mg/kg	DETS 042#		940	290	47	27	27
Mercury	mg/kg	DETS 081#		0.06	< 0.05	0.06	0.1	< 0.05
Nickel	mg/kg	DETS 042#		21	20	12	9	8
Selenium	mg/kg	DETS 042#		0.7	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	mg/kg	DETS 042#		71	47	55	35	27
Cyanide total	mg/kg	DETS 067#				0.1	0.1	< 0.1
Total Sulphate as SO4	%	DETS 075#			0.02			
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#			16			
Total Sulphur as S	%	DETS 064			0.01			
pH		DETS 008#		7.4	7.7	7.5	8.2	8.3
Aliphatic C5-C6	mg/kg	DETS 072*				< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*				< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*				< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#				< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#				< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	mg/kg	DETS 072#				< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	mg/kg	DETS 072*				4.0	< 3.4	< 3.4
Aromatic C5-C7	mg/kg	DETS 072*				< 0.01	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*				< 0.01	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*				< 0.01	< 0.01	< 0.01
Aromatic C10-C12	mg/kg	DETS 072#				< 0.9	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#				< 0.5	< 0.5	< 0.5
Aromatic C16-C21	mg/kg	DETS 072#				< 0.6	< 0.6	< 0.6
Aromatic C21-C35	mg/kg	DETS 072#				< 1.4	< 1.4	< 1.4
Aliphatic C5-C35	mg/kg	DETS 072*				< 10	< 10	< 10
Aromatic C5-C35	mg/kg	DETS 072*				< 10	< 10	< 10
TPH Ali/Aro	mg/kg	DETS 072*				< 10	< 10	< 10

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321781	321782	321783	321784	321785
			Sample ID	TP11	TP12	TP13	TP13	TP14
			Depth	0.90	0.80	0.50	1.10	1.00
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Acenaphthene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Naphthalene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	DETS 050				< 0.1	< 0.1	< 0.1
PAH	mg/kg	DETS 050				< 1.6	< 1.6	< 1.6
EPH (C35-C40)	mg/kg	DETS 051				< 10	69	< 10
EPH (C6-C10)	mg/kg	DETS 051				< 10	< 10	< 10
EPH (C10-C35)	mg/kg	DETS 051				< 10	210	< 10
Phenol - Monohydric	mg/kg	DETS 067#				< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321786	321787	321788	321789	321790
			Sample ID	TP15	TP16	TP16	TP17	TP17
			Depth	0.50	0.50	1.00	1.00	4.00
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				!,3	!,3	n/a	!,3	n/a
Arsenic	mg/kg	DETS 042#		4.1	6.8		7.3	
Cadmium	mg/kg	DETS 042#		0.2	0.4		0.6	
Chromium	mg/kg	DETS 042#		7	19		22	
Copper	mg/kg	DETS 042#		8	17		15	
Lead	mg/kg	DETS 042#		23	26		59	
Mercury	mg/kg	DETS 081#		< 0.05	< 0.05		0.05	
Nickel	mg/kg	DETS 042#		8	23		14	
Selenium	mg/kg	DETS 042#		< 0.5	0.5		< 0.5	
Zinc	mg/kg	DETS 042#		23	51		83	
Cyanide total	mg/kg	DETS 067#		< 0.1	< 0.1		0.1	
Total Sulphate as SO4	%	DETS 075#				< 0.01		0.05
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#				13		100
Total Sulphur as S	%	DETS 064				< 0.01		0.03
pH		DETS 008#		8.4	8.4	8.4	8.3	8.2
Aliphatic C5-C6	mg/kg	DETS 072*		< 0.01	< 0.01		< 0.01	
Aliphatic C6-C8	mg/kg	DETS 072*		< 0.01	< 0.01		< 0.01	
Aliphatic C8-C10	mg/kg	DETS 072*		< 0.01	< 0.01		< 0.01	
Aliphatic C10-C12	mg/kg	DETS 072#		< 1.5	< 1.5		< 1.5	
Aliphatic C12-C16	mg/kg	DETS 072#		< 1.2	< 1.2		< 1.2	
Aliphatic C16-C21	mg/kg	DETS 072#		< 1.5	< 1.5		1.7	
Aliphatic C21-C35	mg/kg	DETS 072*		< 3.4	< 3.4		70	
Aromatic C5-C7	mg/kg	DETS 072*		< 0.01	< 0.01		< 0.01	
Aromatic C7-C8	mg/kg	DETS 072*		< 0.01	< 0.01		< 0.01	
Aromatic C8-C10	mg/kg	DETS 072*		< 0.01	< 0.01		< 0.01	
Aromatic C10-C12	mg/kg	DETS 072#		< 0.9	< 0.9		< 0.9	
Aromatic C12-C16	mg/kg	DETS 072#		< 0.5	< 0.5		< 0.5	
Aromatic C16-C21	mg/kg	DETS 072#		< 0.6	< 0.6		9.6	
Aromatic C21-C35	mg/kg	DETS 072#		< 1.4	< 1.4		210	
Aliphatic C5-C35	mg/kg	DETS 072*		< 10	< 10		72	
Aromatic C5-C35	mg/kg	DETS 072*		< 10	< 10		220	
TPH Ali/Aro	mg/kg	DETS 072*		< 10	< 10		290	

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321786	321787	321788	321789	321790
			Sample ID	TP15	TP16	TP16	TP17	TP17
			Depth	0.50	0.50	1.00	1.00	4.00
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Acenaphthene	mg/kg	DETS 050	< 0.1	< 0.1		< 0.1		
Acenaphthylene	mg/kg	DETS 050	< 0.1	< 0.1		< 0.1		
Anthracene	mg/kg	DETS 050	< 0.1	< 0.1		< 0.1		
Benzo(a)anthracene	mg/kg	DETS 050	< 0.1	< 0.1		1.2		
Benzo(a)pyrene	mg/kg	DETS 050	< 0.1	< 0.1		3.1		
Benzo(b)fluoranthene	mg/kg	DETS 050	< 0.1	< 0.1		2.5		
Benzo(k)fluoranthene	mg/kg	DETS 050	< 0.1	< 0.1		1.1		
Benzo(g,h,i)perylene	mg/kg	DETS 050	< 0.1	< 0.1		1.9		
Chrysene	mg/kg	DETS 050	< 0.1	< 0.1		1.3		
Dibenzo(a,h)anthracene	mg/kg	DETS 050	< 0.1	< 0.1		0.7		
Fluoranthene	mg/kg	DETS 050	< 0.1	< 0.1		3.6		
Fluorene	mg/kg	DETS 050	< 0.1	< 0.1		< 0.1		
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	< 0.1	< 0.1		2.0		
Naphthalene	mg/kg	DETS 050	< 0.1	< 0.1		< 0.1		
Phenanthrene	mg/kg	DETS 050	< 0.1	< 0.1		< 0.1		
Pyrene	mg/kg	DETS 050	< 0.1	< 0.1		3.4		
PAH	mg/kg	DETS 050	< 1.6	< 1.6		21		
EPH (C35-C40)	mg/kg	DETS 051	< 10	< 10		180		
EPH (C6-C10)	mg/kg	DETS 051	< 10	< 10		< 10		
EPH (C10-C35)	mg/kg	DETS 051	< 10	< 10		550		
Phenol - Monohydric	mg/kg	DETS 067#	< 0.3	< 0.3		< 0.3		

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321791	321792	321793	321794	321795
			Sample ID	TP18	TP18	TP19	TP20	TP20
			Depth	0.30	0.70	0.30	0.30	0.80
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				!,3	!,3	!,3	!,3	!,3
Arsenic	mg/kg	DETS 042#		12	8.4	10	9.6	14
Cadmium	mg/kg	DETS 042#		0.9	0.6	0.8	0.8	1.2
Chromium	mg/kg	DETS 042#		34	23	28	24	21
Copper	mg/kg	DETS 042#		22	13	21	19	15
Lead	mg/kg	DETS 042#		370	160	330	65	40
Mercury	mg/kg	DETS 081#		0.1	< 0.05	0.09	0.15	0.07
Nickel	mg/kg	DETS 042#		31	23	27	19	25
Selenium	mg/kg	DETS 042#		1.2	1.5	1.1	0.6	< 0.5
Zinc	mg/kg	DETS 042#		95	65	86	55	51
Cyanide total	mg/kg	DETS 067#		0.1		0.1	< 0.1	< 0.1
Total Sulphate as SO4	%	DETS 075#						
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#						
Total Sulphur as S	%	DETS 064						
pH		DETS 008#		7.6	7.9	7.3	7.2	8.0
Aliphatic C5-C6	mg/kg	DETS 072*		< 0.01		< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*		< 0.01		< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*		< 0.01		< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#		< 1.5		< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#		< 1.2		< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	mg/kg	DETS 072#		< 1.5		< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	mg/kg	DETS 072*		< 3.4		< 3.4	< 3.4	< 3.4
Aromatic C5-C7	mg/kg	DETS 072*		< 0.01		< 0.01	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*		< 0.01		< 0.01	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*		< 0.01		< 0.01	< 0.01	< 0.01
Aromatic C10-C12	mg/kg	DETS 072#		< 0.9		< 0.9	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#		< 0.5		< 0.5	< 0.5	< 0.5
Aromatic C16-C21	mg/kg	DETS 072#		< 0.6		< 0.6	< 0.6	< 0.6
Aromatic C21-C35	mg/kg	DETS 072#		< 1.4		< 1.4	< 1.4	< 1.4
Aliphatic C5-C35	mg/kg	DETS 072*		< 10		< 10	< 10	< 10
Aromatic C5-C35	mg/kg	DETS 072*		< 10		< 10	< 10	< 10
TPH Ali/Aro	mg/kg	DETS 072*		< 10		< 10	< 10	< 10

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321791	321792	321793	321794	321795
			Sample ID	TP18	TP18	TP19	TP20	TP20
			Depth	0.30	0.70	0.30	0.30	0.80
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Acenaphthene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Naphthalene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	< 0.1
PAH	mg/kg	DETS 050	< 1.6			< 1.6	< 1.6	< 1.6
EPH (C35-C40)	mg/kg	DETS 051	< 10			< 10	< 10	< 10
EPH (C6-C10)	mg/kg	DETS 051	< 10			< 10	< 10	< 10
EPH (C10-C35)	mg/kg	DETS 051	< 10			< 10	19	< 10
Phenol - Monohydric	mg/kg	DETS 067#	< 0.3			< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321796	321797	321798	321799	321800
			Sample ID	TP21	TP21	TP22	TP23	TP23
			Depth	0.30	0.90	0.30	0.30	0.70
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				!,3	!,3	!,3	!,3	!,3
Arsenic	mg/kg	DETS 042#		11	8.2	6.0	9.7	7.3
Cadmium	mg/kg	DETS 042#		0.8	0.7	0.7	1.1	0.6
Chromium	mg/kg	DETS 042#		30	23	12	19	15
Copper	mg/kg	DETS 042#		22	15	15	35	15
Lead	mg/kg	DETS 042#		340	65	140	370	220
Mercury	mg/kg	DETS 081#		0.14	0.05	0.14	0.19	0.06
Nickel	mg/kg	DETS 042#		24	25	17	25	19
Selenium	mg/kg	DETS 042#		0.9	1.6	< 0.5	0.6	1
Zinc	mg/kg	DETS 042#		87	58	120	170	55
Cyanide total	mg/kg	DETS 067#		0.1		0.5	0.4	
Total Sulphate as SO4	%	DETS 075#						
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#						
Total Sulphur as S	%	DETS 064						
pH		DETS 008#		7.7	8.0	8.2	7.8	8.0
Aliphatic C5-C6	mg/kg	DETS 072*		< 0.01		< 0.01	< 0.01	
Aliphatic C6-C8	mg/kg	DETS 072*		< 0.01		< 0.01	< 0.01	
Aliphatic C8-C10	mg/kg	DETS 072*		< 0.01		< 0.01	< 0.01	
Aliphatic C10-C12	mg/kg	DETS 072#		< 1.5		< 1.5	< 1.5	
Aliphatic C12-C16	mg/kg	DETS 072#		< 1.2		< 1.2	< 1.2	
Aliphatic C16-C21	mg/kg	DETS 072#		< 1.5		< 1.5	< 1.5	
Aliphatic C21-C35	mg/kg	DETS 072*		< 3.4		< 3.4	< 3.4	
Aromatic C5-C7	mg/kg	DETS 072*		< 0.01		< 0.01	< 0.01	
Aromatic C7-C8	mg/kg	DETS 072*		< 0.01		< 0.01	< 0.01	
Aromatic C8-C10	mg/kg	DETS 072*		< 0.01		< 0.01	< 0.01	
Aromatic C10-C12	mg/kg	DETS 072#		< 0.9		< 0.9	< 0.9	
Aromatic C12-C16	mg/kg	DETS 072#		< 0.5		< 0.5	< 0.5	
Aromatic C16-C21	mg/kg	DETS 072#		< 0.6		0.7	< 0.6	
Aromatic C21-C35	mg/kg	DETS 072#		< 1.4		1.5	< 1.4	
Aliphatic C5-C35	mg/kg	DETS 072*		< 10		< 10	< 10	
Aromatic C5-C35	mg/kg	DETS 072*		< 10		< 10	< 10	
TPH Ali/Aro	mg/kg	DETS 072*		< 10		< 10	< 10	

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321796	321797	321798	321799	321800
			Sample ID	TP21	TP21	TP22	TP23	TP23
			Depth	0.30	0.90	0.30	0.30	0.70
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Acenaphthene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	
Acenaphthylene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	
Anthracene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	
Benzo(a)anthracene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	
Benzo(a)pyrene	mg/kg	DETS 050	< 0.1			0.1	< 0.1	
Benzo(b)fluoranthene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	
Benzo(k)fluoranthene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	
Benzo(g,h,i)perylene	mg/kg	DETS 050	< 0.1			0.1	< 0.1	
Chrysene	mg/kg	DETS 050	< 0.1			0.1	< 0.1	
Dibenzo(a,h)anthracene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	
Fluoranthene	mg/kg	DETS 050	< 0.1			0.1	< 0.1	
Fluorene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	
Naphthalene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	
Phenanthrene	mg/kg	DETS 050	< 0.1			< 0.1	< 0.1	
Pyrene	mg/kg	DETS 050	< 0.1			0.2	0.1	
PAH	mg/kg	DETS 050	< 1.6			< 1.6	< 1.6	
EPH (C35-C40)	mg/kg	DETS 051	< 10			< 10	< 10	
EPH (C6-C10)	mg/kg	DETS 051	< 10			< 10	< 10	
EPH (C10-C35)	mg/kg	DETS 051	19			35	24	
Phenol - Monohydric	mg/kg	DETS 067#	< 0.3			< 0.3	< 0.3	

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321801	321802	321803	321804	321805
			Sample ID	TP24	TP25	TP25	TP26	TP26
			Depth	0.40	0.30	0.70	0.50	1.00
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				!,3	!,3	!,3	!,3	!,3
Arsenic	mg/kg	DETS 042#		6.2	14	7.6	10	8.2
Cadmium	mg/kg	DETS 042#		0.5	1.5	0.6	1.0	1.0
Chromium	mg/kg	DETS 042#		10	24	14	23	17
Copper	mg/kg	DETS 042#		12	42	12	75	14
Lead	mg/kg	DETS 042#		280	420	380	220	180
Mercury	mg/kg	DETS 081#		< 0.05	0.33	< 0.05	0.17	< 0.05
Nickel	mg/kg	DETS 042#		14	30	19	21	18
Selenium	mg/kg	DETS 042#		< 0.5	1.2	0.7	0.7	0.8
Zinc	mg/kg	DETS 042#		40	230	57	140	63
Cyanide total	mg/kg	DETS 067#		< 0.1	0.5		0.2	
Total Sulphate as SO4	%	DETS 075#						0.02
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#						18
Total Sulphur as S	%	DETS 064						0.02
pH		DETS 008#		8.0	7.7	8.1	8.2	8.0
Aliphatic C5-C6	mg/kg	DETS 072*		< 0.01	< 0.01		< 0.01	
Aliphatic C6-C8	mg/kg	DETS 072*		< 0.01	< 0.01		< 0.01	
Aliphatic C8-C10	mg/kg	DETS 072*		< 0.01	< 0.01		< 0.01	
Aliphatic C10-C12	mg/kg	DETS 072#		< 1.5	< 1.5		< 1.5	
Aliphatic C12-C16	mg/kg	DETS 072#		< 1.2	< 1.2		< 1.2	
Aliphatic C16-C21	mg/kg	DETS 072#		< 1.5	< 1.5		< 1.5	
Aliphatic C21-C35	mg/kg	DETS 072*		< 3.4	< 3.4		< 3.4	
Aromatic C5-C7	mg/kg	DETS 072*		< 0.01	< 0.01		< 0.01	
Aromatic C7-C8	mg/kg	DETS 072*		< 0.01	< 0.01		< 0.01	
Aromatic C8-C10	mg/kg	DETS 072*		< 0.01	< 0.01		< 0.01	
Aromatic C10-C12	mg/kg	DETS 072#		< 0.9	< 0.9		< 0.9	
Aromatic C12-C16	mg/kg	DETS 072#		< 0.5	< 0.5		< 0.5	
Aromatic C16-C21	mg/kg	DETS 072#		< 0.6	< 0.6		< 0.6	
Aromatic C21-C35	mg/kg	DETS 072#		< 1.4	2.4		< 1.4	
Aliphatic C5-C35	mg/kg	DETS 072*		< 10	< 10		< 10	
Aromatic C5-C35	mg/kg	DETS 072*		< 10	< 10		< 10	
TPH Ali/Aro	mg/kg	DETS 072*		< 10	< 10		< 10	

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321801	321802	321803	321804	321805
			Sample ID	TP24	TP25	TP25	TP26	TP26
			Depth	0.40	0.30	0.70	0.50	1.00
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Acenaphthene	mg/kg	DETS 050	< 0.1	< 0.1			< 0.1	
Acenaphthylene	mg/kg	DETS 050	< 0.1	< 0.1			< 0.1	
Anthracene	mg/kg	DETS 050	< 0.1	< 0.1			< 0.1	
Benzo(a)anthracene	mg/kg	DETS 050	< 0.1	0.3			< 0.1	
Benzo(a)pyrene	mg/kg	DETS 050	< 0.1	0.5			< 0.1	
Benzo(b)fluoranthene	mg/kg	DETS 050	< 0.1	0.4			< 0.1	
Benzo(k)fluoranthene	mg/kg	DETS 050	< 0.1	0.1			< 0.1	
Benzo(g,h,i)perylene	mg/kg	DETS 050	< 0.1	0.4			< 0.1	
Chrysene	mg/kg	DETS 050	< 0.1	0.5			< 0.1	
Dibenzo(a,h)anthracene	mg/kg	DETS 050	< 0.1	< 0.1			< 0.1	
Fluoranthene	mg/kg	DETS 050	< 0.1	0.4			< 0.1	
Fluorene	mg/kg	DETS 050	< 0.1	< 0.1			< 0.1	
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	< 0.1	0.2			< 0.1	
Naphthalene	mg/kg	DETS 050	< 0.1	< 0.1			< 0.1	
Phenanthrene	mg/kg	DETS 050	< 0.1	0.1			< 0.1	
Pyrene	mg/kg	DETS 050	< 0.1	0.6			< 0.1	
PAH	mg/kg	DETS 050	< 1.6	3.7			< 1.6	
EPH (C35-C40)	mg/kg	DETS 051	< 10	19			32	
EPH (C6-C10)	mg/kg	DETS 051	< 10	< 10			< 10	
EPH (C10-C35)	mg/kg	DETS 051	< 10	93			51	
Phenol - Monohydric	mg/kg	DETS 067#	< 0.3	< 0.3			< 0.3	

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321806	321807	321808	321809	321810
			Sample ID	TP26	TP27	TP27	TP27	TP28
			Depth	3.60	0.50	1.00	3.00	0.50
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample			n/a	!	3	!	3	!
Arsenic	mg/kg	DETS 042#			5.5	5.1	5.9	4.8
Cadmium	mg/kg	DETS 042#			0.3	0.3	0.3	0.2
Chromium	mg/kg	DETS 042#			17	11	14	10
Copper	mg/kg	DETS 042#			11	9	11	7
Lead	mg/kg	DETS 042#			38	34	38	25
Mercury	mg/kg	DETS 081#		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	mg/kg	DETS 042#			10	10	10	9
Selenium	mg/kg	DETS 042#		< 0.5	< 0.5	< 0.5	< 0.5	0.5
Zinc	mg/kg	DETS 042#			37	37	45	27
Cyanide total	mg/kg	DETS 067#		< 0.1	< 0.1			< 0.1
Total Sulphate as SO4	%	DETS 075#	0.02				0.03	
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#	17				41	
Total Sulphur as S	%	DETS 064	< 0.01				0.04	
pH		DETS 008#	8.1	8.4	8.6	8.6	8.4	
Aliphatic C5-C6	mg/kg	DETS 072*		< 0.01	< 0.01			< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*		< 0.01	< 0.01			< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*		< 0.01	< 0.01			< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#		< 1.5	< 1.5			< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#		< 1.2	< 1.2			< 1.2
Aliphatic C16-C21	mg/kg	DETS 072#		< 1.5	< 1.5			< 1.5
Aliphatic C21-C35	mg/kg	DETS 072*		< 3.4	< 3.4			< 3.4
Aromatic C5-C7	mg/kg	DETS 072*		< 0.01	< 0.01			< 0.01
Aromatic C7-C8	mg/kg	DETS 072*		< 0.01	< 0.01			< 0.01
Aromatic C8-C10	mg/kg	DETS 072*		< 0.01	< 0.01			< 0.01
Aromatic C10-C12	mg/kg	DETS 072#		< 0.9	< 0.9			< 0.9
Aromatic C12-C16	mg/kg	DETS 072#		< 0.5	< 0.5			< 0.5
Aromatic C16-C21	mg/kg	DETS 072#		< 0.6	< 0.6			< 0.6
Aromatic C21-C35	mg/kg	DETS 072#		< 1.4	< 1.4			< 1.4
Aliphatic C5-C35	mg/kg	DETS 072*		< 10	< 10			< 10
Aromatic C5-C35	mg/kg	DETS 072*		< 10	< 10			< 10
TPH Ali/Aro	mg/kg	DETS 072*		< 10	< 10			< 10

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321806	321807	321808	321809	321810
			Sample ID	TP26	TP27	TP27	TP27	TP28
			Depth	3.60	0.50	1.00	3.00	0.50
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Acenaphthene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Acenaphthylene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Anthracene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Benzo(a)anthracene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Benzo(a)pyrene	mg/kg	DETS 050			< 0.1	0.1		< 0.1
Benzo(b)fluoranthene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Benzo(k)fluoranthene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Benzo(g,h,i)perylene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Chrysene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Dibenzo(a,h)anthracene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Fluoranthene	mg/kg	DETS 050			< 0.1	0.2		< 0.1
Fluorene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Naphthalene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Phenanthrene	mg/kg	DETS 050			< 0.1	< 0.1		< 0.1
Pyrene	mg/kg	DETS 050			< 0.1	0.2		< 0.1
PAH	mg/kg	DETS 050			< 1.6	< 1.6		< 1.6
EPH (C35-C40)	mg/kg	DETS 051			< 10	< 10		< 10
EPH (C6-C10)	mg/kg	DETS 051			< 10	< 10		< 10
EPH (C10-C35)	mg/kg	DETS 051			< 10	20		< 10
Phenol - Monohydric	mg/kg	DETS 067#			< 0.3	< 0.3		< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321811	321812	321813	321814	321815
			Sample ID	TP28	TP28	TP29	WS02	WS02
			Depth	1.00	3.00	0.50	0.50	1.20
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				!,3	n/a	!,3	!,1,3	n/a
Arsenic	mg/kg	DETS 042#		4.6	4.9	6.4	6.8	
Cadmium	mg/kg	DETS 042#		0.2	0.3	0.5	0.5	
Chromium	mg/kg	DETS 042#		11	13	15	14	
Copper	mg/kg	DETS 042#		8	8	13	11	
Lead	mg/kg	DETS 042#		24	32	35	38	
Mercury	mg/kg	DETS 081#		< 0.05	< 0.05	< 0.05	< 0.05	
Nickel	mg/kg	DETS 042#		10	9	19	17	
Selenium	mg/kg	DETS 042#		0.5	< 0.5	< 0.5	0.6	
Zinc	mg/kg	DETS 042#		28	33	45	37	
Cyanide total	mg/kg	DETS 067#		< 0.1		< 0.1		
Total Sulphate as SO4	%	DETS 075#			0.01			0.01
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#			11			11
Total Sulphur as S	%	DETS 064			< 0.01			0.01
pH		DETS 008#		8.4	8.4	8.5	8.2	8.3
Aliphatic C5-C6	mg/kg	DETS 072*		< 0.01		< 0.01		
Aliphatic C6-C8	mg/kg	DETS 072*		< 0.01		< 0.01		
Aliphatic C8-C10	mg/kg	DETS 072*		< 0.01		< 0.01		
Aliphatic C10-C12	mg/kg	DETS 072#		< 1.5		< 1.5		
Aliphatic C12-C16	mg/kg	DETS 072#		< 1.2		< 1.2		
Aliphatic C16-C21	mg/kg	DETS 072#		< 1.5		< 1.5		
Aliphatic C21-C35	mg/kg	DETS 072*		< 3.4		< 3.4		
Aromatic C5-C7	mg/kg	DETS 072*		< 0.01		< 0.01		
Aromatic C7-C8	mg/kg	DETS 072*		< 0.01		< 0.01		
Aromatic C8-C10	mg/kg	DETS 072*		< 0.01		< 0.01		
Aromatic C10-C12	mg/kg	DETS 072#		< 0.9		< 0.9		
Aromatic C12-C16	mg/kg	DETS 072#		< 0.5		< 0.5		
Aromatic C16-C21	mg/kg	DETS 072#		< 0.6		< 0.6		
Aromatic C21-C35	mg/kg	DETS 072#		< 1.4		< 1.4		
Aliphatic C5-C35	mg/kg	DETS 072*		< 10		< 10		
Aromatic C5-C35	mg/kg	DETS 072*		< 10		< 10		
TPH Ali/Aro	mg/kg	DETS 072*		< 10		< 10		

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321811	321812	321813	321814	321815
			Sample ID	TP28	TP28	TP29	WS02	WS02
			Depth	1.00	3.00	0.50	0.50	1.20
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Acenaphthene	mg/kg	DETS 050	< 0.1			< 0.1		
Acenaphthylene	mg/kg	DETS 050	< 0.1			< 0.1		
Anthracene	mg/kg	DETS 050	< 0.1			< 0.1		
Benzo(a)anthracene	mg/kg	DETS 050	< 0.1			< 0.1		
Benzo(a)pyrene	mg/kg	DETS 050	< 0.1			< 0.1		
Benzo(b)fluoranthene	mg/kg	DETS 050	< 0.1			< 0.1		
Benzo(k)fluoranthene	mg/kg	DETS 050	< 0.1			< 0.1		
Benzo(g,h,i)perylene	mg/kg	DETS 050	< 0.1			< 0.1		
Chrysene	mg/kg	DETS 050	< 0.1			< 0.1		
Dibenzo(a,h)anthracene	mg/kg	DETS 050	< 0.1			< 0.1		
Fluoranthene	mg/kg	DETS 050	< 0.1			< 0.1		
Fluorene	mg/kg	DETS 050	< 0.1			< 0.1		
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	< 0.1			< 0.1		
Naphthalene	mg/kg	DETS 050	< 0.1			< 0.1		
Phenanthrene	mg/kg	DETS 050	< 0.1			< 0.1		
Pyrene	mg/kg	DETS 050	< 0.1			< 0.1		
PAH	mg/kg	DETS 050	< 1.6			< 1.6		
EPH (C35-C40)	mg/kg	DETS 051	< 10			< 10		
EPH (C6-C10)	mg/kg	DETS 051	< 10			< 10		
EPH (C10-C35)	mg/kg	DETS 051	< 10			< 10		
Phenol - Monohydric	mg/kg	DETS 067#	< 0.3			< 0.3		

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321816	321817	321818	321819	321820
			Sample ID	WS03	WS04	WS05	WS08	WS10
			Depth	1.80	2.00	1.30	1.90	1.30
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				n/a	n/a	n/a	n/a	n/a
Arsenic	mg/kg	DETS 042#						
Cadmium	mg/kg	DETS 042#						
Chromium	mg/kg	DETS 042#						
Copper	mg/kg	DETS 042#						
Lead	mg/kg	DETS 042#						
Mercury	mg/kg	DETS 081#						
Nickel	mg/kg	DETS 042#						
Selenium	mg/kg	DETS 042#						
Zinc	mg/kg	DETS 042#						
Cyanide total	mg/kg	DETS 067#						
Total Sulphate as SO4	%	DETS 075#		< 0.01	< 0.01	0.01	< 0.01	0.06
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#		12	< 10	13	30	160
Total Sulphur as S	%	DETS 064		0.01	< 0.01	< 0.01	< 0.01	0.06
pH		DETS 008#		8.5	8.5	7.9	8.2	7.8
Aliphatic C5-C6	mg/kg	DETS 072*						
Aliphatic C6-C8	mg/kg	DETS 072*						
Aliphatic C8-C10	mg/kg	DETS 072*						
Aliphatic C10-C12	mg/kg	DETS 072#						
Aliphatic C12-C16	mg/kg	DETS 072#						
Aliphatic C16-C21	mg/kg	DETS 072#						
Aliphatic C21-C35	mg/kg	DETS 072*						
Aromatic C5-C7	mg/kg	DETS 072*						
Aromatic C7-C8	mg/kg	DETS 072*						
Aromatic C8-C10	mg/kg	DETS 072*						
Aromatic C10-C12	mg/kg	DETS 072#						
Aromatic C12-C16	mg/kg	DETS 072#						
Aromatic C16-C21	mg/kg	DETS 072#						
Aromatic C21-C35	mg/kg	DETS 072#						
Aliphatic C5-C35	mg/kg	DETS 072*						
Aromatic C5-C35	mg/kg	DETS 072*						
TPH Ali/Aro	mg/kg	DETS 072*						

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

Lab No.	321816	321817	321818	321819	321820
Sample ID	WS03	WS04	WS05	WS08	WS10
Depth	1.80	2.00	1.30	1.90	1.30
Sample Ref					
Sample Type					

Test	Units	DETSxx
Acenaphthene	mg/kg	DETS 050
Acenaphthylene	mg/kg	DETS 050
Anthracene	mg/kg	DETS 050
Benzo(a)anthracene	mg/kg	DETS 050
Benzo(a)pyrene	mg/kg	DETS 050
Benzo(b)fluoranthene	mg/kg	DETS 050
Benzo(k)fluoranthene	mg/kg	DETS 050
Benzo(g,h,i)perylene	mg/kg	DETS 050
Chrysene	mg/kg	DETS 050
Dibenzo(a,h)anthracene	mg/kg	DETS 050
Fluoranthene	mg/kg	DETS 050
Fluorene	mg/kg	DETS 050
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050
Naphthalene	mg/kg	DETS 050
Phenanthrene	mg/kg	DETS 050
Pyrene	mg/kg	DETS 050
PAH	mg/kg	DETS 050
EPH (C35-C40)	mg/kg	DETS 051
EPH (C6-C10)	mg/kg	DETS 051
EPH (C10-C35)	mg/kg	DETS 051
Phenol - Monohydric	mg/kg	DETS 067#

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

			Lab No.	321821	321822	321823	321824	321825
			Sample ID	WS11	WS13	WS14	WS14	WS15
			Depth	1.80	1.40	1.20	2.10	5.70
			Sample Ref					
			Sample Type					
Test	Units	DETSxx						
Deviating Sample				n/a	n/a	!,3	n/a	!,3
Arsenic	mg/kg	DETS 042#				6.8		7.6
Cadmium	mg/kg	DETS 042#				0.6		0.5
Chromium	mg/kg	DETS 042#				19		11
Copper	mg/kg	DETS 042#				11		16
Lead	mg/kg	DETS 042#				170		31
Mercury	mg/kg	DETS 081#				< 0.05		< 0.05
Nickel	mg/kg	DETS 042#				16		18
Selenium	mg/kg	DETS 042#				0.5		< 0.5
Zinc	mg/kg	DETS 042#				50		41
Cyanide total	mg/kg	DETS 067#						
Total Sulphate as SO4	%	DETS 075#		0.02	0.01		< 0.01	
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#		14	13		< 10	
Total Sulphur as S	%	DETS 064		0.02	< 0.01		< 0.01	
pH		DETS 008#		8.4	8.2	8.0	8.0	7.8
Aliphatic C5-C6	mg/kg	DETS 072*						
Aliphatic C6-C8	mg/kg	DETS 072*						
Aliphatic C8-C10	mg/kg	DETS 072*						
Aliphatic C10-C12	mg/kg	DETS 072#						
Aliphatic C12-C16	mg/kg	DETS 072#						
Aliphatic C16-C21	mg/kg	DETS 072#						
Aliphatic C21-C35	mg/kg	DETS 072*						
Aromatic C5-C7	mg/kg	DETS 072*						
Aromatic C7-C8	mg/kg	DETS 072*						
Aromatic C8-C10	mg/kg	DETS 072*						
Aromatic C10-C12	mg/kg	DETS 072#						
Aromatic C12-C16	mg/kg	DETS 072#						
Aromatic C16-C21	mg/kg	DETS 072#						
Aromatic C21-C35	mg/kg	DETS 072#						
Aliphatic C5-C35	mg/kg	DETS 072*						
Aromatic C5-C35	mg/kg	DETS 072*						
TPH Ali/Aro	mg/kg	DETS 072*						

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

Lab No.	321821	321822	321823	321824	321825
Sample ID	WS11	WS13	WS14	WS14	WS15
Depth	1.80	1.40	1.20	2.10	5.70
Sample Ref					
Sample Type					

Test	Units	DETSxx
Acenaphthene	mg/kg	DETS 050
Acenaphthylene	mg/kg	DETS 050
Anthracene	mg/kg	DETS 050
Benzo(a)anthracene	mg/kg	DETS 050
Benzo(a)pyrene	mg/kg	DETS 050
Benzo(b)fluoranthene	mg/kg	DETS 050
Benzo(k)fluoranthene	mg/kg	DETS 050
Benzo(g,h,i)perylene	mg/kg	DETS 050
Chrysene	mg/kg	DETS 050
Dibenzo(a,h)anthracene	mg/kg	DETS 050
Fluoranthene	mg/kg	DETS 050
Fluorene	mg/kg	DETS 050
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050
Naphthalene	mg/kg	DETS 050
Phenanthrene	mg/kg	DETS 050
Pyrene	mg/kg	DETS 050
PAH	mg/kg	DETS 050
EPH (C35-C40)	mg/kg	DETS 051
EPH (C6-C10)	mg/kg	DETS 051
EPH (C10-C35)	mg/kg	DETS 051
Phenol - Monohydric	mg/kg	DETS 067#

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

		Lab No.	321826	321827	321828
		Sample ID	WS17	WS19	WS20
		Depth	1.30	0.50	1.30
		Sample Ref			
		Sample Type			
Test	Units	DETSxx			
Deviating Sample			n/a	n/a	n/a
Arsenic	mg/kg	DETS 042#			
Cadmium	mg/kg	DETS 042#			
Chromium	mg/kg	DETS 042#			
Copper	mg/kg	DETS 042#			
Lead	mg/kg	DETS 042#			
Mercury	mg/kg	DETS 081#			
Nickel	mg/kg	DETS 042#			
Selenium	mg/kg	DETS 042#			
Zinc	mg/kg	DETS 042#			
Cyanide total	mg/kg	DETS 067#			
Total Sulphate as SO4	%	DETS 075#	0.03	0.02	0.03
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#	91	48	37
Total Sulphur as S	%	DETS 064	0.01	0.02	0.02
pH		DETS 008#	7.9	7.7	7.8
Aliphatic C5-C6	mg/kg	DETS 072*			
Aliphatic C6-C8	mg/kg	DETS 072*			
Aliphatic C8-C10	mg/kg	DETS 072*			
Aliphatic C10-C12	mg/kg	DETS 072#			
Aliphatic C12-C16	mg/kg	DETS 072#			
Aliphatic C16-C21	mg/kg	DETS 072#			
Aliphatic C21-C35	mg/kg	DETS 072*			
Aromatic C5-C7	mg/kg	DETS 072*			
Aromatic C7-C8	mg/kg	DETS 072*			
Aromatic C8-C10	mg/kg	DETS 072*			
Aromatic C10-C12	mg/kg	DETS 072#			
Aromatic C12-C16	mg/kg	DETS 072#			
Aromatic C16-C21	mg/kg	DETS 072#			
Aromatic C21-C35	mg/kg	DETS 072#			
Aliphatic C5-C35	mg/kg	DETS 072*			
Aromatic C5-C35	mg/kg	DETS 072*			
TPH Ali/Aro	mg/kg	DETS 072*			

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

Lab No.	321826	321827	321828
Sample ID	WS17	WS19	WS20
Depth	1.30	0.50	1.30
Sample Ref			
Sample Type			

Test	Units	DETSxx
Acenaphthene	mg/kg	DETS 050
Acenaphthylene	mg/kg	DETS 050
Anthracene	mg/kg	DETS 050
Benzo(a)anthracene	mg/kg	DETS 050
Benzo(a)pyrene	mg/kg	DETS 050
Benzo(b)fluoranthene	mg/kg	DETS 050
Benzo(k)fluoranthene	mg/kg	DETS 050
Benzo(g,h,i)perylene	mg/kg	DETS 050
Chrysene	mg/kg	DETS 050
Dibenzo(a,h)anthracene	mg/kg	DETS 050
Fluoranthene	mg/kg	DETS 050
Fluorene	mg/kg	DETS 050
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050
Naphthalene	mg/kg	DETS 050
Phenanthrene	mg/kg	DETS 050
Pyrene	mg/kg	DETS 050
PAH	mg/kg	DETS 050
EPH (C35-C40)	mg/kg	DETS 051
EPH (C6-C10)	mg/kg	DETS 051
EPH (C10-C35)	mg/kg	DETS 051
Phenol - Monohydric	mg/kg	DETS 067#

Summary of Asbestos Analysis

Soil Samples

Our Ref: 11-48141-1

Client Ref: 40822

Contract Title: WAST - Western Gateway Site

Lab No	Sample Ref	Depth	Material	Result
321751	BH01	0.50	SOIL	NAD
321757	BH02	0.50	SOIL	NAD
321765	TP01	0.30	SOIL	NAD
321767	TP02	0.20	SOIL	NAD
321771	TP04	0.20	SOIL	NAD
321773	TP06	0.20	SOIL	NAD
321777	TP09	0.40	SOIL	NAD
321778	TP09	0.80	SOIL	NAD
321783	TP13	0.50	SOIL	NAD
321784	TP13	1.10	SOIL	NAD
321785	TP14	1.00	SOIL	NAD
321786	TP15	0.50	SOIL	NAD
321787	TP16	0.50	SOIL	NAD
321789	TP17	1.00	SOIL	NAD
321791	TP18	0.30	SOIL	NAD
321793	TP19	0.30	SOIL	NAD
321794	TP20	0.30	SOIL	NAD
321795	TP20	0.80	SOIL	NAD
321796	TP21	0.30	SOIL	NAD
321798	TP22	0.30	SOIL	NAD
321799	TP23	0.30	SOIL	NAD
321801	TP24	0.40	SOIL	NAD
321802	TP25	0.30	SOIL	NAD
321804	TP26	0.50	SOIL	NAD
321807	TP27	0.50	SOIL	NAD
321808	TP27	1.00	SOIL	NAD
321810	TP28	0.50	SOIL	NAD
321811	TP28	1.00	SOIL	NAD
321813	TP29	0.50	SOIL	NAD

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos

NAD = No Asbestos Detected. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos

Samples are analysed by DETS 082 using polarised light microscopy in accordance with HSG248 and documented in-house methods. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Job Title: WAST - Western Gateway Site
Client Reference: 40822
Sample ID: SA03 / 0.80

Job Number: 11-48141
Sample Number: 321829
Date Analysed: 12/04/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	
003 Loss On Ignition	%	
062 BTEX	mg/kg	
052 PCB's (7 congeners)	mg/kg	
051 TPH (C10 - C40)	mg/kg	
050 PAH's	mg/kg	
008 pH	pH Units	
073 Acid Neutralisation Capacity (pH4)*	mol/kg	
073 Acid Neutralisation Capacity (pH7)*	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1	<1	<0.002	<0.01
042 Barium as Ba*	30	14	0.060	0.16
042 Cadmium as Cd	<2	<2	<0.004	<0.02
042 Chromium as Cr	<5	<5	<0.02	<0.1
042 Copper as Cu	<2	<2	<0.004	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4	<4	<0.01	<0.05
2328 Antimony as Sb	<1	<1	<0.01	<0.05
017 Selenium as Se	<3	<3	<0.006	<0.03
042 Zinc as Zn	<1	<1	<0.002	<0.01
055 Chloride as Cl	1900	470	<20	<100
055 Fluoride as F	210	110	0.42	1.2
055 Sulphate as SO4	7800	1200	<20	<100
035 Total Dissolved Solids *	46000	25000	92	275
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	10000	4900	20	55
Additional Information				
008 pH				
009 Conductivity uS/cm				
Temperature*				
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.113			
Stage 1				
Volume of Leachant L2	0.199			
Volume of Eluate VE1	0.135			
Stage 2				
Volume of Leachant L8	0.903			
Volume of Eluate VE2	0.830			

WAC Limit Values		
limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Job Title: WAST - Western Gateway Site
Client Reference: 40822
Sample ID: SA04 / 0.20

Job Number: 11-48141
Sample Number: 321831
Date Analysed: 12/04/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	
003 Loss On Ignition	%	
062 BTEX	mg/kg	
052 PCB's (7 congeners)	mg/kg	
051 TPH (C10 - C40)	mg/kg	
050 PAH's	mg/kg	
008 pH	pH Units	
073 Acid Neutralisation Capacity (pH4)*	mol/kg	
073 Acid Neutralisation Capacity (pH7)*	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1	<1	<0.002	<0.01
042 Barium as Ba*	19	4	0.038	0.058
042 Cadmium as Cd	<2	<2	<0.004	<0.02
042 Chromium as Cr	<5	<5	<0.02	<0.1
042 Copper as Cu	<2	<2	<0.004	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4	<4	<0.01	<0.05
2328 Antimony as Sb	<1	<1	<0.01	<0.05
017 Selenium as Se	<3	<3	<0.006	<0.03
042 Zinc as Zn	5	1	0.010	0.015
055 Chloride as Cl	2600	560	<20	<100
055 Fluoride as F	<100	<100	<0.02	<0.1
055 Sulphate as SO4	5300	1600	<20	<100
035 Total Dissolved Solids *	37000	7000	74	106
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	20000	9900	40	111
Additional Information				
008 pH				
009 Conductivity uS/cm				
Temperature*				
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.112			
Stage 1				
Volume of Leachant L2	0.196			
Volume of Eluate VE1	0.133			
Stage 2				
Volume of Leachant L8	0.896			
Volume of Eluate VE2	0.815			

WAC Limit Values		
limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Job Title: WAST - Western Gateway Site
Client Reference: 40822
Sample ID: TP04 / 0.20

Job Number: 11-48141
Sample Number: 321833
Date Analysed: 12/04/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	
003 Loss On Ignition	%	
062 BTEX	mg/kg	
052 PCB's (7 congeners)	mg/kg	
051 TPH (C10 - C40)	mg/kg	
050 PAH's	mg/kg	
008 pH	pH Units	
073 Acid Neutralisation Capacity (pH4)*	mol/kg	
073 Acid Neutralisation Capacity (pH7)*	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	1	<1	0.002	<0.01
042 Barium as Ba*	16	<1	0.032	<0.1
042 Cadmium as Cd	<2	<2	<0.004	<0.02
042 Chromium as Cr	<5	<5	<0.02	<0.1
042 Copper as Cu	8	3	0.016	0.037
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4	<4	<0.01	<0.05
2328 Antimony as Sb	<1	<1	<0.01	<0.05
017 Selenium as Se	<3	<3	<0.006	<0.03
042 Zinc as Zn	13	2	0.026	0.035
055 Chloride as Cl	1800	470	<20	<100
055 Fluoride as F	460	110	0.92	1.6
055 Sulphate as SO4	3600	930	<20	<100
035 Total Dissolved Solids *	34000	7000	68	107
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	8600	4400	17	<50
Additional Information				
008 pH				
009 Conductivity uS/cm				
Temperature*				
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.119			
Stage 1				
Volume of Leachant L2	0.218			
Volume of Eluate VE1	0.165			
Stage 2				
Volume of Leachant L8	0.954			
Volume of Eluate VE2	0.865			

WAC Limit Values		
limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Job Title: WAST - Western Gateway Site
Client Reference: 40822
Sample ID: TP13 / 1.80

Job Number: 11-48141
Sample Number: 321835
Date Analysed: 12/04/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	
003 Loss On Ignition	%	
062 BTEX	mg/kg	
052 PCB's (7 congeners)	mg/kg	
051 TPH (C10 - C40)	mg/kg	
050 PAH's	mg/kg	
008 pH	pH Units	
073 Acid Neutralisation Capacity (pH4)*	mol/kg	
073 Acid Neutralisation Capacity (pH7)*	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1	<1	<0.002	<0.01
042 Barium as Ba*	8	6	<0.02	<0.1
042 Cadmium as Cd	<2	<2	<0.004	<0.02
042 Chromium as Cr	<5	<5	<0.02	<0.1
042 Copper as Cu	<2	<2	<0.004	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4	<4	<0.01	<0.05
2328 Antimony as Sb	<1	<1	<0.01	<0.05
017 Selenium as Se	<3	<3	<0.006	<0.03
042 Zinc as Zn	1	2	0.002	0.019
055 Chloride as Cl	2000	640	<20	<100
055 Fluoride as F	<100	<100	<0.02	<0.1
055 Sulphate as SO4	14000	2500	28	<100
035 Total Dissolved Solids *	50000	7000	100	125
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	11000	6400	22	70
Additional Information				
008 pH				
009 Conductivity uS/cm				
Temperature*				
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.110			
Stage 1				
Volume of Leachant L2	0.190			
Volume of Eluate VE1	0.140			
Stage 2				
Volume of Leachant L8	0.879			
Volume of Eluate VE2	0.805			

WAC Limit Values		
limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Job Title: WAST - Western Gateway Site
Client Reference: 40822
Sample ID: TP14 / 1.60

Job Number: 11-48141
Sample Number: 321837
Date Analysed: 12/04/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	
003 Loss On Ignition	%	
062 BTEX	mg/kg	
052 PCB's (7 congeners)	mg/kg	
051 TPH (C10 - C40)	mg/kg	
050 PAH's	mg/kg	
008 pH	pH Units	
073 Acid Neutralisation Capacity (pH4)*	mol/kg	
073 Acid Neutralisation Capacity (pH7)*	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	1	1	0.002	0.010
042 Barium as Ba*	21	9	0.042	0.11
042 Cadmium as Cd	<2	<2	<0.004	<0.02
042 Chromium as Cr	<5	<5	<0.02	<0.1
042 Copper as Cu	3	<2	0.006	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4	<4	<0.01	<0.05
2328 Antimony as Sb	<1	<1	<0.01	<0.05
017 Selenium as Se	<3	<3	<0.006	<0.03
042 Zinc as Zn	<1	<1	<0.002	<0.01
055 Chloride as Cl	1700	410	<20	<100
055 Fluoride as F	310	<100	0.62	0.40
055 Sulphate as SO4	10000	1600	20	<100
035 Total Dissolved Solids *	100000	37000	200	451
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	7200	3600	14	<50
Additional Information				
008 pH				
009 Conductivity uS/cm				
Temperature*				
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.114			
Stage 1				
Volume of Leachant L2	0.203			
Volume of Eluate VE1	0.147			
Stage 2				
Volume of Leachant L8	0.916			
Volume of Eluate VE2	0.845			

WAC Limit Values		
limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Job Title: WAST - Western Gateway Site
Client Reference: 40822
Sample ID: TP15 / 1.00

Job Number: 11-48141
Sample Number: 321839
Date Analysed: 12/04/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	
003 Loss On Ignition	%	
062 BTEX	mg/kg	
052 PCB's (7 congeners)	mg/kg	
051 TPH (C10 - C40)	mg/kg	
050 PAH's	mg/kg	
008 pH	pH Units	
073 Acid Neutralisation Capacity (pH4)*	mol/kg	
073 Acid Neutralisation Capacity (pH7)*	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1	<1	<0.002	<0.01
042 Barium as Ba*	2	10	<0.02	<0.1
042 Cadmium as Cd	<2	<2	<0.004	<0.02
042 Chromium as Cr	<5	<5	<0.02	<0.1
042 Copper as Cu	<2	<2	<0.004	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4	<4	<0.01	<0.05
2328 Antimony as Sb	<1	<1	<0.01	<0.05
017 Selenium as Se	<3	<3	<0.006	<0.03
042 Zinc as Zn	<1	4	<0.002	0.035
055 Chloride as Cl	1500	480	<20	<100
055 Fluoride as F	10	<100	0.020	<0.1
055 Sulphate as SO4	1400	990	<20	<100
035 Total Dissolved Solids *	19000	<5	38	<50
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	8500	3900	17	<50
Additional Information				
008 pH				
009 Conductivity uS/cm				
Temperature*				
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.112			
Stage 1				
Volume of Leachant L2	0.195			
Volume of Eluate VE1	0.153			
Stage 2				
Volume of Leachant L8	0.892			
Volume of Eluate VE2	0.810			

WAC Limit Values		
limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Job Title: WAST - Western Gateway Site
Client Reference: 40822
Sample ID: TP17 / 2.00

Job Number: 11-48141
Sample Number: 321841
Date Analysed: 12/04/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	
003 Loss On Ignition	%	
062 BTEX	mg/kg	
052 PCB's (7 congeners)	mg/kg	
051 TPH (C10 - C40)	mg/kg	
050 PAH's	mg/kg	
008 pH	pH Units	
073 Acid Neutralisation Capacity (pH4)*	mol/kg	
073 Acid Neutralisation Capacity (pH7)*	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1	<1	<0.002	<0.01
042 Barium as Ba*	120	10	0.24	0.23
042 Cadmium as Cd	<2	<2	<0.004	<0.02
042 Chromium as Cr	<5	<5	<0.02	<0.1
042 Copper as Cu	5	<2	0.010	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4	<4	<0.01	<0.05
2328 Antimony as Sb	<1	<1	<0.01	<0.05
017 Selenium as Se	<3	<3	<0.006	<0.03
042 Zinc as Zn	4	<1	0.008	<0.01
055 Chloride as Cl	3600	730	<20	<100
055 Fluoride as F	390	290	0.78	3.0
055 Sulphate as SO4	72000	8200	144	158
035 Total Dissolved Solids *	230000	37000	460	601
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	7500	3600	15	<50
Additional Information				
008 pH				
009 Conductivity uS/cm				
Temperature*				
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.113			
Stage 1				
Volume of Leachant L2	0.200			
Volume of Eluate VE1	00136			
Stage 2				
Volume of Leachant L8	0.908			
Volume of Eluate VE2	0.850			

WAC Limit Values		
limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Job Title: WAST - Western Gateway Site
Client Reference: 40822
Sample ID: TP27 / 1.00

Job Number: 11-48141
Sample Number: 321843
Date Analysed: 12/04/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	
003 Loss On Ignition	%	
062 BTEX	mg/kg	
052 PCB's (7 congeners)	mg/kg	
051 TPH (C10 - C40)	mg/kg	
050 PAH's	mg/kg	
008 pH	pH Units	
073 Acid Neutralisation Capacity (pH4)*	mol/kg	
073 Acid Neutralisation Capacity (pH7)*	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1	<1	<0.002	<0.01
042 Barium as Ba*	20	6	0.040	<0.1
042 Cadmium as Cd	<2	<2	<0.004	<0.02
042 Chromium as Cr	<5	<5	<0.02	<0.1
042 Copper as Cu	<2	<2	<0.004	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4	<4	<0.01	<0.05
2328 Antimony as Sb	<1	<1	<0.01	<0.05
017 Selenium as Se	<3	<3	<0.006	<0.03
042 Zinc as Zn	<1	<1	<0.002	<0.01
055 Chloride as Cl	1600	660	<20	<100
055 Fluoride as F	380	230	0.76	2.5
055 Sulphate as SO4	33000	7300	66	109
035 Total Dissolved Solids *	100000	40000	200	484
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	9600	4600	19	53
Additional Information				
008 pH				
009 Conductivity uS/cm				
Temperature*				
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.116			
Stage 1				
Volume of Leachant L2	0.209			
Volume of Eluate VE1	0.162			
Stage 2				
Volume of Leachant L8	0.931			
Volume of Eluate VE2	0.860			

WAC Limit Values		
limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Job Title: WAST - Western Gateway Site
Client Reference: 40822
Sample ID: TP28 / 1.00

Job Number: 11-48141
Sample Number: 321845
Date Analysed: 12/04/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	
003 Loss On Ignition	%	
062 BTEX	mg/kg	
052 PCB's (7 congeners)	mg/kg	
051 TPH (C10 - C40)	mg/kg	
050 PAH's	mg/kg	
008 pH	pH Units	
073 Acid Neutralisation Capacity (pH4)*	mol/kg	
073 Acid Neutralisation Capacity (pH7)*	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1	<1	<0.002	<0.01
042 Barium as Ba*	<1	2	<0.02	<0.1
042 Cadmium as Cd	<2	<2	<0.004	<0.02
042 Chromium as Cr	<5	<5	<0.02	<0.1
042 Copper as Cu	<2	<2	<0.004	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4	<4	<0.01	<0.05
2328 Antimony as Sb	<1	<1	<0.01	<0.05
017 Selenium as Se	<3	<3	<0.006	<0.03
042 Zinc as Zn	<1	1	<0.002	<0.01
055 Chloride as Cl	1300	560	<20	<100
055 Fluoride as F	170	<100	0.34	0.24
055 Sulphate as SO4	1400	770	<20	<100
035 Total Dissolved Solids *	14000	<5000	28	<50
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	8600	4800	17	53
Additional Information				
008 pH				
009 Conductivity uS/cm				
Temperature*				
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.116			
Stage 1				
Volume of Leachant L2	0.208			
Volume of Eluate VE1	0.164			
Stage 2				
Volume of Leachant L8	0.929			
Volume of Eluate VE2	0.855			

WAC Limit Values		
limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Job Title: WAST - Western Gateway Site
Client Reference: 40822
Sample ID: TP29 / 0.50

Job Number: 11-48141
Sample Number: 321847
Date Analysed: 12/04/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	
003 Loss On Ignition	%	
062 BTEX	mg/kg	
052 PCB's (7 congeners)	mg/kg	
051 TPH (C10 - C40)	mg/kg	
050 PAH's	mg/kg	
008 pH	pH Units	
073 Acid Neutralisation Capacity (pH4)*	mol/kg	
073 Acid Neutralisation Capacity (pH7)*	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1	<1	<0.002	<0.01
042 Barium as Ba*	26	9	0.052	0.11
042 Cadmium as Cd	<2	<2	<0.004	<0.02
042 Chromium as Cr	<5	<5	<0.02	<0.1
042 Copper as Cu	<2	<2	<0.004	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4	<4	<0.01	<0.05
2328 Antimony as Sb	<1	<1	<0.01	<0.05
017 Selenium as Se	<3	<3	<0.006	<0.03
042 Zinc as Zn	<1	1	<0.002	<0.01
055 Chloride as Cl	2100	60	<20	<100
055 Fluoride as F	230	230	0.46	2.3
055 Sulphate as SO4	5800	4300	<20	<100
035 Total Dissolved Solids *	80000	21000	160	294
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	4800	<2000	<10	<50
Additional Information				
008 pH				
009 Conductivity uS/cm				
Temperature*				
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.116			
Stage 1				
Volume of Leachant L2	0.208			
Volume of Eluate VE1	0.165			
Stage 2				
Volume of Leachant L8	0.929			
Volume of Eluate VE2	0.870			

WAC Limit Values		
limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Job Title: WAST - Western Gateway Site
Client Reference: 40822
Sample ID: WS02 / 0.50

Job Number: 11-48141
Sample Number: 321867
Date Analysed: 12/04/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	
003 Loss On Ignition	%	
062 BTEX	mg/kg	
052 PCB's (7 congeners)	mg/kg	
051 TPH (C10 - C40)	mg/kg	
050 PAH's	mg/kg	
008 pH	pH Units	
073 Acid Neutralisation Capacity (pH4)*	mol/kg	
073 Acid Neutralisation Capacity (pH7)*	mol/kg	

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1	<1	<0.002	<0.01
042 Barium as Ba*	24	3	0.048	<0.1
042 Cadmium as Cd	<2	<2	<0.004	<0.02
042 Chromium as Cr	<5	<5	<0.02	<0.1
042 Copper as Cu	<2	<2	<0.004	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4	<4	<0.01	<0.05
2328 Antimony as Sb	<1	<1	<0.01	<0.05
017 Selenium as Se	<3	<3	<0.006	<0.03
042 Zinc as Zn	8	5	0.016	0.054
055 Chloride as Cl	1500	40	<20	<100
055 Fluoride as F	<100	<100	<0.02	<0.1
055 Sulphate as SO4	2700	70	<20	<100
035 Total Dissolved Solids *	13000	<5000	26	<50
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	5700	<2000	11	<50
Additional Information				
008 pH				
009 Conductivity uS/cm				
Temperature*				
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.116			
Stage 1				
Volume of Leachant L2	0.209			
Volume of Eluate VE1	0.166			
Stage 2				
Volume of Leachant L8	0.932			
Volume of Eluate VE2	0.835			

WAC Limit Values		
limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

APPENDIX 5
MONITORING

Gas and Groundwater Monitoring Results

Contract Number:		W11/40822				Gas Monitor:		GA2000	
Contract Name:		WAST - Western Gateway Site				Readings Taken By:		CR	
Date:		17th March 2011				Checked By:		MHW	
Background Readings:		Weather Conditions:				Cloudy			
		Ground Conditions (dry / wet etc):				Dry			
		Atmospheric Pressure (Start):				1007mb			
		Atmospheric Pressure (Finish):				1007mb			
O ₂ % v/v	20.5	CO ₂ % v/v	0.0	CH ₄ % v/v	0.0	CO ppm	0.0	H ₂ S ppm	0.0
Hole No:	O ₂ % v/v	CO ₂ % v/v	CH ₄ % v/v	LEL %	H ₂ S ppm	CO ppm	Gas flow Rate (l/hr)		Diff. Pressure
BH01	Steady	Steady	Steady	Steady	Steady	Steady	Mins	Steady	-0.03
SHALLOW	20.6	0.2	0.0	0.0	0.0	0.0	0	0.1	
5 secs									
30 secs									
1 min	20.8	0.3	0.1	0.2	0.0	0.0	1	0.1	
1 min	20.9	0.2	0.2	0.3	0.0	0.0	2	0.2	
DEEP	20.9	0.2	0.2	0.3	0.0	0.0	3	0.1	
5 secs									
30 secs									
30 secs	17.2	3.9	0.1	0.2	1.1	0.0	4	0.1	
1 min	14.2	3.7	0.1	0.2	0.1	0.0	5	0.2	
CIRCULATE	14.1	3.8	0.1	0.2	0.1	0.0	6	0.2	
1 min									
2 mins									
2 mins	14.3	3.7	0.1	0.2	0.1	0.0	7	0.2	
3 mins	14.2	3.7	0.1	0.2	0.1	0.0	8	0.2	
4 mins	16.0	2.8	0.1	0.2	0.1	0.0	9		
5 mins	18.1	1.7	0.1	0.2	0.1	0.0	10		
6 mins	18.6	1.4	0.1	0.2	0.0	0.0			
7 mins	19.3	1.1	0.1	0.2	0.0	0.0			
8 mins	19.4	1.0	0.1	0.2	0.0	0.0			
9 mins	19.5	1.0	0.1	0.2	0.0	0.0			
10 mins	19.5	1.0	0.1	0.2	0.0	0.0			
SHALLOW	19.6	0.9	0.1	0.2	0.1	0.0			
5 secs									
30 secs									
1 min	20.3	0.3	0.1	0.2	0.1	0.0			
1 min	20.9	0.2	0.1	0.2	0.1	0.0			
DEEP	21.0	0.2	0.1	0.2	0.1	0.0			
5 secs									
30 secs									
30 secs	14.2	4.1	0.1	0.2	0.1	0.0			
1 min	13.6	4.2	0.1	0.2	0.1	0.0			
VOC ppm	0.0	Depth to base of well	12.74	SWL	11.65	LNAPL or DNAPL	0.0	Temp	7.6
	Steady		mBGL		mBGL		mBGL		°C
>>>> = Flow above detection limit of 30 l/hr, <<< = Negative flow greater than -10 l/hr. >Max = In excess of lower explosive limit. NR = Not Recorded									
Remarks:									

Remarks:

Remarks:

Remarks:

Gas and Groundwater Monitoring Results

Contract Number:		W11/40822				Gas Monitor:		GA2000	
Contract Name:		WAST - Western Gateway Site				Readings Taken By:		CR	
Date:		16th March 2011				Checked By:		MHW	
Background Readings:		Weather Conditions:				Cloudy			
		Ground Conditions (dry / wet etc):				Dry			
		Atmospheric Pressure (Start):				1007mb			
		Atmospheric Pressure (Finish):				1007mb			
O ₂ % v/v	20.7	CO ₂ % v/v	0.0	CH ₄ % v/v	0.0	CO ppm	0.0	H ₂ S ppm	0.0
Hole No:	O ₂ % v/v	CO ₂ % v/v	CH ₄ % v/v	LEL %	H ₂ S ppm	CO ppm	Gas flow Rate (l/hr)		Diff. Pressure
WS01	Steady	Steady	Steady	Steady	Steady	Steady	Mins	Steady	-0.27
SHALLOW 5 secs	20.3	0.4	0.1	0.1	0.0	0.0	0	0.1	
30 secs	20.2	0.4	0.1	0.1	0.0	0.0	1	0.1	
1 min	20.2	0.4	0.1	0.1	0.0	0.0	2	0.1	
DEEP 5 secs	20.2	0.3	0.2	0.3	0.0	0.0	3	0.1	
30 secs	26.5	0.0	0.1	0.2	0.0	0.0	4		
1 min	20.6	0.0	0.1	0.2	0.0	0.0	5		
CIRCULATE 1 min	20.8	0.0	0.1	0.2	0.0	0.0	6		
2 mins	20.5	0.3	0.3	0.5	0.0	0.0	7		
3 mins	20.4	0.4	0.3	0.5	0.0	0.0	8		
4 mins	20.3	0.4	0.2	0.4	0.0	0.0	9		
5 mins	20.4	0.4	0.2	0.4	0.0	0.0	10		
6 mins	20.7	0.1	0.2	0.4	0.0	0.0			
7 mins	20.7	0.2	0.2	0.3	0.0	0.0			
8 mins	20.6	0.3	0.2	0.4	0.0	0.0			
9 mins	20.5	0.3	0.2	0.4	0.0	0.0			
10 mins	20.5	0.3	0.2	0.4	0.0	0.0			
SHALLOW 5 secs	20.9	0.0	0.1	0.2	0.0	0.0			
30 secs	21.0	0.0	0.1	0.2	0.0	0.0			
1 min	21.0	0.0	0.1	0.2	0.0	0.0			
DEEP 5 secs	20.6	0.0	0.2	0.4	0.0	0.0			
30 secs	20.9	0.0	0.1	0.2	0.0	0.0			
1 min	21.0	0.0	0.1	0.2	0.0	0.0			
VOC ppm	0.0	Depth to base of well	4.63	SWL	3.26	LNAPL or DNAPL	None	Temp	8.1
	Steady		mBGL		mBGL		mBGL		°C
>>>> = Flow above detection limit of 30 l/hr, <<< = Negative flow greater than -10 l/hr. >Max = In excess of lower explosive limit. NR = Not Recorded									
Remarks:									

Gas and Groundwater Monitoring Results

Contract Number:		W11/40822				Gas Monitor:		GA2000	
Contract Name:		WAST - Western Gateway Site				Readings Taken By:		CR	
Date:		16th March 2011				Checked By:		MHW	
Background Readings:		Weather Conditions:				Cloudy			
		Ground Conditions (dry / wet etc):				Dry			
		Atmospheric Pressure (Start):				1007mb			
		Atmospheric Pressure (Finish):				1007mb			
O ₂ % v/v	20.7	CO ₂ % v/v	0.0	CH ₄ % v/v	0.0	CO ppm	0.0	H ₂ S ppm	0.0
Hole No:	O ₂ % v/v	CO ₂ % v/v	CH ₄ % v/v	LEL %	H ₂ S ppm	CO ppm	Gas flow Rate (l/hr)		Diff. Pressure
WS02	Steady	Steady	Steady	Steady	Steady	Steady	Mins	Steady	-0.18
SHALLOW 5 secs	20.8	0.0	0.0	0.0	0.0	0.0	0	0.1	
30 secs	20.3	0.6	0.2	0.4	0.0	0.0	1	0.2	
1 min	19.8	1.0	0.1	0.2	0.0	0.0	2	0.1	
DEEP 5 secs	19.6	1.0	0.1	0.2	0.0	0.0	3	0.1	
30 secs	19.7	1.0	0.1	0.2	0.0	0.0	4	0.2	
1 min	19.8	1.0	0.1	0.2	0.0	0.0	5	0.1	
CIRCULATE 1 min	19.8	1.0	0.1	0.2	0.0	0.0	6	0.2	
2 mins	19.8	1.0	0.1	0.2	0.0	0.0	7	0.1	
3 mins	19.9	1.0	0.1	0.2	0.0	0.0	8	0.1	
4 mins	19.9	1.0	0.1	0.2	0.0	0.0	9	0.1	
5 mins	19.9	0.9	0.1	0.2	0.0	0.0	10	0.1	
6 mins	19.9	0.9	0.1	0.2	0.0	0.0			
7 mins	19.9	0.9	0.1	0.2	0.0	0.0			
8 mins	19.9	0.9	0.1	0.2	0.0	0.0			
9 mins									
10 mins									
SHALLOW 5 secs	19.9	0.9	0.1	0.2	0.0	0.0			
30 secs	19.9	0.9	0.2	0.3	0.0	0.0			
1 min	19.8	1.0	0.1	0.2	0.0	0.0			
DEEP 5 secs	19.8	0.9	0.1	0.2	0.0	0.0			
30 secs	19.8	1.0	0.1	0.2	0.0	0.0			
1 min	19.8	1.0	0.1	0.2	0.0	0.0			
VOC ppm	0.3	Depth to base of well	3.74	SWL	3.28	LNAPL or DNAPL	None	Temp	8.0
	Steady		mBGL		mBGL		mBGL		°C
>>>> = Flow above detection limit of 30 l/hr, <<< = Negative flow greater than -10 l/hr. >Max = In excess of lower explosive limit. NR = Not Recorded									
Remarks:									

Gas and Groundwater Monitoring Results

Contract Number:		W11/40822				Gas Monitor:		GA2000	
Contract Name:		WAST - Western Gateway Site				Readings Taken By:		CR	
Date:		16th March 2011				Checked By:		MHW	
Background Readings:		Weather Conditions:				Cloudy			
		Ground Conditions (dry / wet etc):				Dry			
		Atmospheric Pressure (Start):				1007mb			
		Atmospheric Pressure (Finish):				1007mb			
O ₂ % v/v	20.7	CO ₂ % v/v	0.0	CH ₄ % v/v	0.0	CO ppm	0.0	H ₂ S ppm	0.0
Hole No:	O ₂ % v/v	CO ₂ % v/v	CH ₄ % v/v	LEL %	H ₂ S ppm	CO ppm	Gas flow Rate (l/hr)		Diff. Pressure
WS03	Steady	Steady	Steady	Steady	Steady	Steady	Mins	Steady	0.08
SHALLOW 5 secs	20.0	0.1	0.4	0.7	0.0	0.0	0	0.2	
30 secs	20.8	0.0	0.3	0.5	0.0	0.0	1	0.2	
1 min	20.9	0.0	0.2	0.3	0.0	0.0	2	0.2	
DEEP 5 secs	20.9	0.0	0.2	0.3	0.0	0.0	3	0.2	
30 secs	20.9	0.1	0.2	0.3	0.0	0.0	4	0.2	
1 min	20.9	0.0	0.2	0.3	0.0	0.0	5		
CIRCULATE 1 min	20.8	0.2	0.3	0.6	0.0	0.0	6		
2 mins	20.9	0.1	0.3	0.5	0.0	0.0	7		
3 mins	20.9	0.1	0.3	0.5	0.0	0.0	8		
4 mins	20.9	0.1	0.3	0.5	0.0	0.0	9		
5 mins	20.9	0.1	0.3	0.4	0.0	0.0	10		
6 mins	20.9	0.1	0.3	0.4	0.0	0.0			
7 mins	20.9	0.1	0.3	0.4	0.0	0.0			
8 mins	20.9	0.1	0.2	0.4	0.0	0.0			
9 mins	20.9	0.1	0.2	0.4	0.0	0.0			
10 mins	29.9	0.1	0.2	0.4	0.0	0.0			
SHALLOW 5 secs	29.9	0.1	0.2	0.4	0.0	0.0			
30 secs	29.9	0.1	0.2	0.4	0.0	0.0			
1 min	21.0	0.1	0.2	0.3	0.0	0.0			
DEEP 5 secs	20.9	0.1	0.2	0.3	0.0	0.0			
30 secs	21.0	0.0	0.2	0.3	0.0	0.0			
1 min	21.0	0.1	0.2	0.3	0.0	0.0			
VOC ppm	0.5	Depth to base of well	5.64	SWL	3.12	LNAPL or DNAPL	None	Temp	8.6
	Steady		mBGL		mBGL		mBGL		°C
>>>> = Flow above detection limit of 30 l/hr, <<< = Negative flow greater than -10 l/hr. >Max = In excess of lower explosive limit. NR = Not Recorded									
Remarks:									

Gas and Groundwater Monitoring Results

Contract Number:		W11/40822				Gas Monitor:		GA2000	
Contract Name:		WAST - Western Gateway Site				Readings Taken By:		CR	
Date:		16th March 2011				Checked By:		MHW	
Background Readings:		Weather Conditions:				Cloudy			
		Ground Conditions (dry / wet etc):				Dry			
		Atmospheric Pressure (Start):				1007mb			
		Atmospheric Pressure (Finish):				1007mb			
O ₂ % v/v	20.7	CO ₂ % v/v	0.0	CH ₄ % v/v	0.0	CO ppm	0.0	H ₂ S ppm	0.0
Hole No:	O ₂ % v/v	CO ₂ % v/v	CH ₄ % v/v	LEL %	H ₂ S ppm	CO ppm	Gas flow Rate (l/hr)		Diff. Pressure
WS04	Steady	Steady	Steady	Steady	Steady	Steady	Mins	Steady	-0.04
SHALLOW 5 secs	20.6	0.3	0.0	0.0	0.0	0.0	0	0.2	
30 secs	20.1	0.8	0.3	0.6	0.0	0.0	1	0.1	
1 min	20.9	1.0	0.3	0.6	0.0	0.0	2	0.1	
DEEP 5 secs	19.5	0.7	0.2	0.4	0.0	0.0	3	0.2	
30 secs	20.9	0.0	0.2	0.3	0.0	0.0	4	0.2	
1 min	21.0	0.0	0.2	0.3	0.0	0.0	5	0.2	
CIRCULATE 1 min	21.0	0.0	0.2	0.3	0.0	0.0	6	0.2	
2 mins	21.0	0.0	0.2	0.3	0.0	0.0	7	0.2	
3 mins	21.0	0.0	0.2	0.3	0.0	0.0	8		
4 mins	21.0	0.0	0.2	0.3	0.0	0.0	9		
5 mins	21.0	0.0	0.2	0.3	0.0	0.0	10		
6 mins									
7 mins									
8 mins									
9 mins									
10 mins									
SHALLOW 5 secs	21.0	0.0	0.2	0.3	0.0	0.0			
30 secs	21.0	0.0	0.2	0.3	0.0	0.0			
1 min	21.0	0.0	0.2	0.3	0.0	0.0			
DEEP 5 secs	21.0	0.0	0.2	0.3	0.0	0.0			
30 secs	21.0	0.0	0.2	0.3	0.0	0.0			
1 min	21.0	0.0	0.2	0.3	0.0	0.0			
VOC ppm	0.0	Depth to base of well	4.06	SWL	2.97	LNAPL or DNAPL	None	Temp	8.0
	Steady		mBGL		mBGL		mBGL		°C
>>>> = Flow above detection limit of 30 l/hr, <<< = Negative flow greater than -10 l/hr. >Max = In excess of lower explosive limit. NR = Not Recorded									
Remarks:									

Remarks:

Remarks:

Remarks:

Gas and Groundwater Monitoring Results

Contract Number:		W11/40822				Gas Monitor:		GA2000	
Contract Name:		WAST - Western Gateway Site				Readings Taken By:		CR	
Date:		17th March 2011				Checked By:		MHW	
Background Readings:		Weather Conditions:				Cloudy			
		Ground Conditions (dry / wet etc):				Dry			
		Atmospheric Pressure (Start):				1007mb			
		Atmospheric Pressure (Finish):				1007mb			
O ₂ % v/v	20.4	CO ₂ % v/v	0.0	CH ₄ % v/v	0.0	CO ppm	0.0	H ₂ S ppm	0.0
Hole No:	O ₂ % v/v	CO ₂ % v/v	CH ₄ % v/v	LEL %	H ₂ S ppm	CO ppm	Gas flow Rate (l/hr)		Diff. Pressure
WS11	Steady	Steady	Steady	Steady	Steady	Steady	Mins	Steady	-0.06
SHALLOW 5 secs	20.8	0.1	0.2	0.3	0.0	0.0	0	0.1	
30 secs	21.1	0.2	0.2	0.3	0.0	0.0	1	0.2	
1 min	21.1	0.2	0.2	0.3	0.0	0.0	2	0.1	
DEEP 5 secs	20.9	0.4	0.2	0.3	0.0	0.0	3	0.1	
30 secs	20.3	1.4	0.2	0.3	0.0	0.0	4	0.2	
1 min	20.3	1.4	0.1	0.2	0.0	0.0	5	0.2	
CIRCULATE 1 min	20.3	1.4	0.1	0.2	0.0	0.0	6	0.2	
2 mins	20.3	1.5	0.1	0.2	0.0	0.0	7	0.2	
3 mins	20.5	1.4	0.1	0.2	0.0	0.0	8	0.2	
4 mins	20.4	1.5	0.1	0.2	0.0	0.0	9		
5 mins	20.5	1.3	0.1	0.2	0.0	0.0	10		
6 mins	20.5	1.3	0.1	0.2	0.0	0.0			
7 mins	20.5	1.3	0.1	0.2	0.0	0.0			
8 mins	20.5	1.5	0.1	0.2	0.0	0.0			
9 mins	20.4	1.6	0.1	0.2	0.0	0.0			
10 mins	20.4	1.6	0.1	0.2	0.0	0.0			
SHALLOW 5 secs	20.4	1.6	0.1	0.2	0.0	0.0			
30 secs	20.4	1.6	0.1	0.2	0.0	0.0			
1 min	20.5	1.5	0.1	0.2	0.0	0.0			
DEEP 5 secs	20.5	1.4	0.1	0.2	0.0	0.0			
30 secs	20.4	1.7	0.1	0.2	0.0	0.0			
1 min	20.4	1.6	0.1	0.2	0.0	0.0			
VOC ppm	0.0	Depth to base of well	3.00	SWL	DRY	LNAPL or DNAPL	NR	Temp	7.6
	Steady		mBGL		mBGL		mBGL		°C
>>>> = Flow above detection limit of 30 l/hr, <<< = Negative flow greater than -10 l/hr. >Max = In excess of lower explosive limit. NR = Not Recorded									
Remarks:									

Remarks:

Gas and Groundwater Monitoring Results

Contract Number:		W11/40822				Gas Monitor:		GA2000	
Contract Name:		WAST - Western Gateway Site				Readings Taken By:		CR	
Date:		17th March 2011				Checked By:		MHW	
Background Readings:		Weather Conditions:				Cloudy			
		Ground Conditions (dry / wet etc):				Dry			
		Atmospheric Pressure (Start):				1007mb			
		Atmospheric Pressure (Finish):				1007mb			
O ₂ % v/v	20.4	CO ₂ % v/v	0.0	CH ₄ % v/v	0.0	CO ppm	0.0	H ₂ S ppm	0.0
Hole No:	O ₂ % v/v	CO ₂ % v/v	CH ₄ % v/v	LEL %	H ₂ S ppm	CO ppm	Gas flow Rate (l/hr)		Diff. Pressure
WS13	Steady	Steady	Steady	Steady	Steady	Steady	Mins	Steady	-0.04
SHALLOW									
5 secs	20.7	0.4	0.2	0.4	0.0	0.0	0	0.1	
30 secs	20.6	0.3	0.3	0.5	0.0	0.0	1	0.2	
1 min	20.6	0.3	0.3	0.5	0.0	0.0	2	0.2	
DEEP									
5 secs	20.5	0.3	0.3	0.5	0.0	0.0	3	0.2	
30 secs	20.9	0.0	0.2	0.3	0.0	0.0	4	0.2	
1 min	21.0	0.0	0.2	0.3	0.0	0.0	5		
CIRCULATE									
1 min	21.0	0.0	0.2	0.3	0.0	0.0	6		
2 mins	21.0	0.0	0.2	0.3	0.0	0.0	7		
3 mins	21.0	0.0	0.2	0.3	0.0	0.0	8		
4 mins	21.0	0.0	0.2	0.3	0.0	0.0	9		
5 mins	21.0	0.0	0.2	0.3	0.0	0.0	10		
6 mins									
7 mins									
8 mins									
9 mins									
10 mins									
SHALLOW									
5 secs	21.0	0.0	0.2	0.3	0.0	0.0			
30 secs	21.0	0.1	0.2	0.3	0.0	0.0			
1 min	21.0	0.0	0.2	0.3	0.0	0.0			
DEEP									
5 secs	21.0	0.0	0.2	0.4	0.0	0.0			
30 secs	21.0	0.0	0.2	0.3	0.0	0.0			
1 min	21.0	0.0	0.2	0.3	0.0	0.0			
VOC ppm	0.0	Depth to base of well	6.04	SWL	5.98	LNAPL or DNAPL	0.0	Temp	7.9
	Steady		mBGL		mBGL		mBGL		°C
>>>> = Flow above detection limit of 30 l/hr, <<< = Negative flow greater than -10 l/hr. >Max = In excess of lower explosive limit. NR = Not Recorded									
Remarks:									

Gas and Groundwater Monitoring Results

Contract Number:		W11/40822				Gas Monitor:		GA2000	
Contract Name:		WAST - Western Gateway Site				Readings Taken By:		CR	
Date:		17th March 2011				Checked By:		MHW	
Background Readings:		Weather Conditions:				Cloudy			
		Ground Conditions (dry / wet etc):				Dry			
		Atmospheric Pressure (Start):				1007mb			
		Atmospheric Pressure (Finish):				1007mb			
O ₂ % v/v	20.6	CO ₂ % v/v	0.0	CH ₄ % v/v	0.0	CO ppm	0.0	H ₂ S ppm	0.0
Hole No:	O ₂ % v/v	CO ₂ % v/v	CH ₄ % v/v	LEL %	H ₂ S ppm	CO ppm	Gas flow Rate (l/hr)		Diff. Pressure
WS14	Steady	Steady	Steady	Steady	Steady	Steady	Mins	Steady	-0.05
SHALLOW									
5 secs	20.6	0.7	0.0	0.0	0.0	0.0	0	0.0	
30 secs	19.9	1.3	0.0	0.0	0.0	0.0	1	0.0	
1 min	19.8	1.3	0.0	0.0	0.0	0.0	2	0.1	
DEEP									
5 secs	19.9	1.2	0.0	0.0	0.0	0.0	3	0.1	
30 secs	19.3	3.4	0.0	0.0	0.0	0.0	4	0.2	
1 min	19.2	3.4	0.1	0.2	0.0	0.0	5	0.2	
CIRCULATE									
1 min	19.2	3.3	0.2	0.3	0.0	0.0	6	0.2	
2 mins	19.2	3.3	0.2	0.3	0.0	0.0	7	0.2	
3 mins	19.2	3.3	0.2	0.3	0.0	0.0	8	0.2	
4 mins	19.2	3.3	0.2	0.3	0.0	0.0	9		
5 mins	19.2	3.3	0.2	0.3	0.0	0.0	10		
6 mins									
7 mins									
8 mins									
9 mins									
10 mins									
SHALLOW									
5 secs	19.2	3.2	0.2	0.3	0.0	0.0			
30 secs	19.6	2.6	0.2	0.3	0.0	0.0			
1 min	19.5	2.9	0.2	0.3	0.0	0.0			
DEEP									
5 secs	19.4	3.0	0.2	0.3	0.0	0.0			
30 secs	19.2	3.3	0.2	0.3	0.0	0.0			
1 min	19.2	3.3	0.2	0.3	0.0	0.0			
VOC ppm	0.0	Depth to base of well	5.90	SWL	DRY	LNAPL or DNAPL	NR	Temp	7.6
	Steady		mBGL		mBGL		mBGL		°C
>>>> = Flow above detection limit of 30 l/hr, <<< = Negative flow greater than -10 l/hr. >Max = In excess of lower explosive limit. NR = Not Recorded									
Remarks:									

Remarks:

Remarks:

Gas and Groundwater Monitoring Results

Contract Number:		W11/40822				Gas Monitor:		GA2000	
Contract Name:		WAST - Western Gateway Site				Readings Taken By:		CR	
Date:		17th March 2011				Checked By:		MHW	
Background Readings:		Weather Conditions:				Cloudy			
		Ground Conditions (dry / wet etc):				Dry			
		Atmospheric Pressure (Start):				1007mb			
		Atmospheric Pressure (Finish):				1007mb			
O ₂ % v/v	20.6	CO ₂ % v/v	0.0	CH ₄ % v/v	0.0	CO ppm	0.0	H ₂ S ppm	0.0
Hole No:	O ₂ % v/v	CO ₂ % v/v	CH ₄ % v/v	LEL %	H ₂ S ppm	CO ppm	Gas flow Rate (l/hr)		Diff. Pressure
WS17	Steady	Steady	Steady	Steady	Steady	Steady	Mins	Steady	-0.08
SHALLOW 5 secs	20.8	0.0	0.2	0.3	0.2	0.0	0	0.2	
30 secs	20.8	0.0	0.2	0.3	0.2	0.0	1	0.2	
1 min	20.8	0.0	0.2	0.3	0.2	0.0	2	0.2	
DEEP 5 secs	20.7	0.0	0.2	0.3	0.2	0.0	3	0.2	
30 secs	20.8	0.0	0.2	0.3	0.2	0.0	4	0.2	
1 min	20.8	0.0	0.1	0.3	0.2	0.0	5		
CIRCULATE 1 min	20.8	0.0	0.2	0.3	0.2	0.0	6		
2 mins	20.8	0.0	0.2	0.3	0.2	0.0	7		
3 mins	20.8	0.0	0.2	0.3	0.1	0.0	8		
4 mins	20.9	0.0	0.2	0.3	0.1	0.0	9		
5 mins	20.9	0.0	0.2	0.3	0.1	0.0	10		
6 mins	20.9	0.0	0.2	0.3	0.1	0.0			
7 mins	20.9	0.0	0.2	0.3	0.1	0.0			
8 mins	20.9	0.0	0.2	0.3	0.1	0.0			
9 mins									
10 mins									
SHALLOW 5 secs	20.9	0.0	0.2	0.3	0.1	0.0			
30 secs	20.9	0.0	0.2	0.3	0.1	0.0			
1 min	20.8	0.1	0.2	0.3	0.1	0.0			
DEEP 5 secs	20.7	0.3	0.2	0.3	0.1	0.0			
30 secs	20.5	0.7	0.2	0.3	0.1	0.0			
1 min	20.5	0.9	0.2	0.3	0.1	0.0			
VOC ppm	0.0	Depth to base of well	5.66	SWL	5.18	LNAPL or DNAPL	None	Temp	8.0
	Steady		mBGL		mBGL	mBGL	°C		
>>>> = Flow above detection limit of 30 l/hr, <<< = Negative flow greater than -10 l/hr. >Max = In excess of lower explosive limit. NR = Not Recorded									
Remarks:									

Gas and Groundwater Monitoring Results

Contract Number:		W11/40822				Gas Monitor:		GA2000	
Contract Name:		WAST - Western Gateway Site				Readings Taken By:		CR	
Date:		17th March 2011				Checked By:		MHW	
Background Readings:		Weather Conditions:				Cloudy			
		Ground Conditions (dry / wet etc):				Dry			
		Atmospheric Pressure (Start):				1008mb			
		Atmospheric Pressure (Finish):				1008mb			
O ₂ % v/v	20.5	CO ₂ % v/v	0.0	CH ₄ % v/v	0.0	CO ppm	0.0	H ₂ S ppm	0.0
Hole No:	O ₂ % v/v	CO ₂ % v/v	CH ₄ % v/v	LEL %	H ₂ S ppm	CO ppm	Gas flow Rate (l/hr)		Diff. Pressure
WS18	Steady	Steady	Steady	Steady	Steady	Steady	Mins	Steady	0.16
SHALLOW 5 secs	20.2	0.0	0.0	0.0	0.0	0.0	0	0.1	
30 secs	20.0	0.2	0.6	0.1	0.0	0.0	1	0.1	
1 min	20.2	0.1	0.3	0.5	0.0	0.0	2	0.1	
DEEP 5 secs	20.4	0.0	0.2	0.3	0.0	0.0	3	0.1	
30 secs	20.4	0.0	0.2	0.3	0.0	0.0	4	0.1	
1 min	20.4	0.0	0.2	0.3	0.0	0.0	5		
CIRCULATE 1 min	20.4	0.0	0.2	0.3	0.0	0.0	6		
2 mins	20.5	0.0	0.2	0.3	0.0	0.0	7		
3 mins	20.5	0.0	0.2	0.3	0.0	0.0	8		
4 mins	20.6	0.0	0.1	0.2	0.0	0.0	9		
5 mins	20.6	0.0	0.1	0.2	0.0	0.0	10		
6 mins	20.6	0.0	0.1	0.2	0.0	0.0			
7 mins	20.6	0.0	0.1	0.2	0.0	0.0			
8 mins	20.6	0.0	0.1	0.2	0.0	0.0			
9 mins	20.6	0.0	0.1	0.2	0.0	0.0			
10 mins	20.6	0.0	0.1	0.2	0.0	0.0			
SHALLOW 5 secs	20.6	0.0	0.1	0.2	0.0	0.0			
30 secs	20.5	0.1	0.2	0.3	0.0	0.0			
1 min	20.6	0.0	0.2	0.3	0.0	0.0			
DEEP 5 secs	20.6	0.0	0.2	0.3	0.0	0.0			
30 secs	20.6	0.0	0.2	0.3	0.0	0.0			
1 min	20.6	0.0	0.2	0.3	0.0	0.0			
VOC ppm	0.0	Depth to base of well	6.10	SWL	4.26	LNAPL or DNAPL	None	Temp	8.4
	Steady		mBGL		mBGL		mBGL		°C
>>>> = Flow above detection limit of 30 l/hr, <<< = Negative flow greater than -10 l/hr. >Max = In excess of lower explosive limit. NR = Not Recorded									
Remarks:									

Gas and Groundwater Monitoring Results

Contract Number:		W11/40822				Gas Monitor:		GA2000	
Contract Name:		WAST - Western Gateway Site				Readings Taken By:		CR	
Date:		17th March 2011				Checked By:		MHW	
Background Readings:		Weather Conditions:				Cloudy			
		Ground Conditions (dry / wet etc):				Dry			
		Atmospheric Pressure (Start):				1008mb			
		Atmospheric Pressure (Finish):				1008mb			
O ₂ % v/v	20.5	CO ₂ % v/v	0.0	CH ₄ % v/v	0.0	CO ppm	0.0	H ₂ S ppm	0.0
Hole No:	O ₂ % v/v	CO ₂ % v/v	CH ₄ % v/v	LEL %	H ₂ S ppm	CO ppm	Gas flow Rate (l/hr)		Diff. Pressure
WS19	Steady	Steady	Steady	Steady	Steady	Steady	Mins	Steady	0.25
SHALLOW									
5 secs	20.4	0.0	0.0	0.0	0.0	0.0	0	-0.0	
30 secs	20.5	0.0	0.2	0.3	0.0	0.0	1	-0.0	
1 min	20.5	0.0	0.1	0.2	0.0	0.0	2	-0.0	
DEEP									
5 secs	20.5	0.0	0.1	0.2	0.0	0.0	3	-0.0	
30 secs	20.6	0.0	0.1	0.2	0.0	0.0	4		
1 min	20.5	0.0	0.1	0.2	0.0	0.0	5		
CIRCULATE									
1 min	20.4	0.1	0.2	0.3	0.0	0.0	6		
2 mins	20.4	0.1	0.2	0.3	0.0	0.0	7		
3 mins	20.4	0.1	0.2	0.3	0.0	0.0	8		
4 mins	20.4	0.1	0.2	0.3	0.0	0.0	9		
5 mins	20.4	0.1	0.2	0.3	0.0	0.0	10		
6 mins									
7 mins									
8 mins									
9 mins									
10 mins									
SHALLOW									
5 secs	20.4	0.1	0.2	0.3	0.0	0.0			
30 secs	20.5	0.0	0.2	0.3	0.0	0.0			
1 min	20.6	0.0	0.1	0.2	0.0	0.0			
DEEP									
5 secs	20.5	0.0	0.1	0.2	0.0	0.0			
30 secs	20.6	0.0	0.1	0.2	0.0	0.0			
1 min	20.6	0.0	0.1	0.2	0.0	0.0			
VOC ppm	0.0	Depth to base of well	3.68	SWL	2.06	LNAPL or DNAPL	None	Temp	7.8
	Steady		mBGL		mBGL		mBGL		°C
>>>> = Flow above detection limit of 30 l/hr, <<< = Negative flow greater than -10 l/hr. >Max = In excess of lower explosive limit. NR = Not Recorded									
Remarks:									

APPENDIX 6
PHOTOGRAPHS

Trial Pit Photographs TP01



Trial Pit Photographs TP01



Trial Pit Photographs TP02



Trial Pit Photographs TP02



Trial Pit Photographs TP03



Trial Pit Photographs TP03



Trial Pit Photographs TP04



Trial Pit Photographs TP04



Trial Pit Photographs TP05



Trial Pit Photographs TP05



Trial Pit Photographs TP06



Trial Pit Photographs TP06



Trial Pit Photographs TP07



Trial Pit Photographs TP07



Trial Pit Photographs TP09



Trial Pit Photographs TP09



Trial Pit Photographs TP10



Trial Pit Photographs TP10



Trial Pit Photographs TP11



Trial Pit Photographs TP11



Trial Pit Photographs TP12



Trial Pit Photographs TP12



Trial Pit Photographs TP13



Trial Pit Photographs TP13



Trial Pit Photographs TP14



Trial Pit Photographs TP14



Trial Pit Photographs TP15



Trial Pit Photographs TP15



Trial Pit Photographs TP16



Trial Pit Photographs TP16



Trial Pit Photographs TP17



Trial Pit Photographs TP17



Trial Pit Photographs TP18



Trial Pit Photographs TP18



Trial Pit Photographs TP19



Trial Pit Photographs TP19



Trial Pit Photographs TP20



Trial Pit Photographs TP20



Trial Pit Photographs TP21



Trial Pit Photographs TP21



Trial Pit Photographs TP22



Trial Pit Photographs TP22



Trial Pit Photographs TP23



Trial Pit Photographs TP23



Trial Pit Photographs TP24



Trial Pit Photographs TP24



Trial Pit Photographs TP25



Trial Pit Photographs TP25



Trial Pit Photographs TP26



Trial Pit Photographs TP26



Trial Pit Photographs TP27



Trial Pit Photographs TP27



Trial Pit Photographs TP28



Trial Pit Photographs TP28

