

Key to Exploratory Hole Records

SAMPLES

Undisturbed

U	Driven tube sample	} nominally 100 mm diameter and full recovery unless otherwise stated
TW	Pushed thin wall tube sample	
P	Pushed piston sample	
L	Liner sample (from Windowless or similar sampler), full recovery unless otherwise stated	
CBR	CBR mould sample	
BLK	Block sample	
CS	Core sample (from rotary core) taken for laboratory testing	
AMAL	Amalgamated sample	

Disturbed

D	Small sample
B	Bulk sample

Other

W	Water sample
G	Gas sample

ES	Environmental chemistry samples (in more than one container where appropriate)
EW	Soil sample
	Water sample

Comments Sample reference numbers are assigned to every sample taken. A sample reference of 'NR' indicates that attempt was made to take a tube sample, however, there was no recovery.

Monitoring samples taken after completion of hole construction are not shown on the exploratory hole logs.

TESTS

SPT S or SPT C Standard Penetration Test, open shoe (S) or solid cone (C)

The Standard Penetration Test is defined in BS EN ISO 22476-3 (2005). The incremental blow counts are given in the Field Records column; each increment is 75 mm unless stated otherwise and any penetration under self weight in mm (SW) is noted. Where the full 300 mm test drive is achieved the total number of blows for the test drive is presented as N = ** in the Test column. Where the test drive blows reach 50 (either in total or for a single increment) the total blow count beyond the seating drive is given (without the N = prefix).

IV	<i>in situ</i> Vane shear strength, peak (p) and remoulded (r)
HV	Hand vane shear strength, peak (p) and remoulded (r)
PP	Pocket penetrometer test, converted to shear strength
KFH, KRH, KPI	Variable head permeability tests (KFH = falling head test, KRH = rising head test, KPI = packer test), permeability value

Test results provided in Field Records column

DRILLING RECORDS

The mechanical indices (TCR/SCR/RQD & If) are defined in BS 5930 (1999)

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
If	Fracture spacing, mm. Minimum, typical and maximum spacings are presented. The term non-intact (NI) is used where the core is fragmented.

Flush returns, estimated percentage with colour where relevant, are given in the Records column

CRF	Core recovered (length in m) in the following run
AZCL	Assessed zone of core loss
NR	Not recovered

GROUNDWATER



Groundwater strike



Groundwater level after standing period

Notes:

Project 2U - Afan Advanced Digestion Scheme
Project No. H8118
Carried out for Morgan Est Plc.

Key

Sheet 1 of 3

Key to Exploratory Hole Records

INSTALLATION						
Standpipe/ piezometer	Details of standpipe/piezometer installations are given on the Record. Legend column shows installed instrument depths including slotted pipe section or tip depth, response zone filter material type and layers of backfill.					
SP SPIE PPIE EPIE	 The type of instrument installed is indicated by a code in the Legend column at the depth of the response zone: Standpipe Standpipe piezometer Pneumatic piezometer Electronic piezometer					
Inclinometer or Slip Indicator	The installation of vertical profiling instruments is indicated on the Record. The base of tubing is shown in the Legend column.					
ICE ICM SLIP	 The type of instrument installed is indicated by a code in the Legend column at the base of the tubing: Biaxial inclinometer Inclinometer tubing for use with probe Slip indicator					
Settlement Points or Pressure Cells	The installation of single point instruments is indicated on the Record. The location of the measuring device is shown in the Legend column.					
ESET ETM EPCE PPCE	 The type of instrument installed is indicated by a code in the Legend column: Electronic settlement cell/gauge Magnetic extensometer settlement point Electronic embedment pressure cell Electronic push in pressure cell					
INSTALLATION LEGENDS	A legend describing the installation is shown in the rightmost column. Legends additional to BS5930 are used to describe the backfill materials as indicated below.					
Arisings	Concrete	Grout	Bentonite	Sand	Gravel	Tarmac
						
NOTES						
1	Soils and rocks are described in accordance with BS EN ISO 14688-1 (2002), 14688-2 (2004), 14689-1 (2003) and BS 5930 (1999) as clarified by Baldwin et al (2007).					
2	Strata legends are in accordance with BS 5930 (1999).					
3	Water level observations of discernible entries during the advancing of the exploratory hole are given at the foot of the log and in the Legend column. The term "none observed" is used where no discrete entries are identified although this does not necessarily indicate that the hole has not been advanced below groundwater level. Under certain conditions groundwater cannot be observed, for instance, drilling with water flush or overwater, or boring at a rate much faster than water can make its way into the borehole (ref BS5930 : 1999, Clause 47.2.7). In addition, where appropriate, water levels in the hole at the time of recovering individual samples or carrying out in situ tests and at shift changes are given in the Records column.					
4	Evidence of the occurrence of very coarse particles (cobbles and boulders) is presented on the logs, however, because of their size in relation to the exploratory hole these records may not be fully representative of their size and frequency in the ground mass.					
5	The borehole logs present the results of Standard Penetration Tests recorded in the field without correction or interpretation. However, in certain ground conditions (eg high hydraulic head or where very coarse particles are present) some judgement may be necessary in considering whether the results are representative of in situ mass conditions.					
6	The declination of bedding and joints is given with respect to the normal to the core axis. Thus in a vertical borehole this will be the dip.					
7	The assessment of SCR, RQD and Fracture Spacing excludes artificial fractures					
Notes:	Project Project No. Carried out for	2U - Afan Advanced Digestion Scheme H8118 Morgan Est Plc.	Key Sheet 2 of 3			

Key to Exploratory Hole Records

REFERENCES

Baldwin M, Gosling R C and Brownlie N : 2007 : Soil and rock descriptions - a practical guide to the implementation of BS EN ISO 14688 and 14689. Ground Engineering, July.

BS EN ISO 14688-1 : 2002 : Geotechnical investigation and testing - Identification and classification of soil - Part 1 Identification and description. British Standards Institution.

BS EN ISO 14688-2 : 2004 : Geotechnical investigation and testing - Identification and classification of soil - Part 2 Principles for a classification. British Standards Institution.

BS EN ISO 14689-1 : 2003 : Geotechnical investigation and testing - Identification and classification of rock - Part 1 Identification and description. British Standards Institution.

BS EN ISO 22476-3 : 2005 : Geotechnical investigation and testing - Field testing - Part 3 Standard penetration test. British Standards Institution.

BS 5930 : 1999 : Code of Practice for site investigations. British Standards Institution

Updated July 2007

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled Logged Checked		RD / GJ GRP/ AH	Start 26/11/2008 End 17/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion boring 1.20 - 31.40m. Rotary coring (P size) 31.40 - 40.00m. Terminated on engineer's instruction.		Depth from 0.00m 10.00m 25.70m 31.40m	to 10.00m 25.70m 31.40m 40.00m	Diameter 250mm 200mm 150mm 120mm	Casing Depth 10.00m 25.70m 31.40m	Ground Level +8.08 mOD Coordinates E 276202.08 National Grid N 187342.54 Chainage	
Samples and Tests						Strata					
Depth	Type & No	Records	Date Casing	Time Water	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments			
0.20	ES 1		26/11/2008	1200	MADE GROUND: Dark brown silty slightly gravelly fine to coarse SAND. Gravel is subangular fine to coarse of brick, limestone, slag and clinker.	(1.00)					
0.50	ES 2										
1.00	ES 3										
1.20-1.53 1.20-1.50	SPT C B 4	50 (10,14/19,21,10 for 30mm)	26/11/2008 1.60	dry 1700 damp	MADE GROUND: Very dense dark grey silty slightly sandy angular to subangular fine to coarse GRAVEL of slag and clinker.	1.00 +7.08 (1.00)					
2.00-2.33 2.00 2.00-2.30	SPT C ES 5 B 6	50 (5,15/19,21,10 for 25mm)	27/11/2008 1.60	0800 dry		2.00 +6.08					
3.00-3.45 3.00-3.30 3.20	SPT C B 7 W 47	N=27 (10,10/8,11,4,4)	1.60	dry	MADE GROUND: Very dense and medium dense dark grey silty sandy angular to subangular fine to coarse GRAVEL of slag and clinker.	(1.70)					
4.00-4.45 4.00-4.45 4.00-4.30	SPT S D 8 B 9	* N=16 (2,2/3,4,4,5)	4.00		Medium dense light brown yellow slightly silty slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to medium of sandstone and shell fragments.	3.00-3.45 m Medium dense 4.00-10.00 m Blowing sand conditions	3.70 +4.38 (1.30)				
5.00-5.45 5.00-5.45 5.00-5.30	SPT S D 10 B 11	N=20 (2,3/5,5,5,5)	5.00		Medium dense dark grey slightly silty gravelly fine to medium SAND with low cobble content. Gravel is subrounded to rounded fine to coarse of sandstone. Cobbles are subrounded of sandstone.	5.00 +3.08					
6.00-6.45 6.00-6.45 6.00-6.30	SPT S D 12 B 13	N=19 (2,5/4,4,5,6)	6.00			(3.50)					
7.00-7.45 7.00-7.45 7.00-7.30	SPT S D 14 B 15	* N=19 (2,4/5,5,4,5)	27/11/2008 7.00 28/11/2008 7.00	1700 damp 0800 3.20							
8.00-8.45 8.00-8.45 8.00-8.30	SPT S D 16 B 17	N=22 (2,4/4,6,6,6)	8.00			8.50 -0.42					
9.00-9.45 9.00-9.45 9.00-9.30	SPT S D 18 B 19	N=23 (2,3/5,5,6,7)	9.00		Medium dense brown to light brown silty very gravelly fine to coarse SAND with low cobble content. Gravel is angular to subangular fine to coarse of shell fragments and sandstone. Cobbles are subangular of sandstone.						
28/11/2008 10.00			1700 3.40								
Depth	Type & No	Records	Date Casing	Time Water	Stratum continues to 13.70 m						
Groundwater Entries					Depth Related Remarks *					Chiselling Depths (m)	
No.	Struck (m)	Post strike behaviour	Depth sealed (m)		From	to (m)				Time	Tools used
1	3.60	Rose to 3.20 m after 20 minutes.	-		1.20	12.00	Water added to assist drilling			1.20 - 2.50	210 mins Chisel
					4.00	7.00	Sand blew up casing from 7.00 to 4.00m overnight 27/11 (2.5 hrs)				
					7.00	10.00	Slow progress due to blowing sand (7 hrs)				
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.					Project 2U - Afan Advanced Digestion Scheme					Borehole BH1	
Scale 1:50					Project No. H8118					Sheet 1 of 4	
(c) ESGL www.esgl.co.uk 408.24 19/02/2009 16:03:00					Carried out for Morgan Est Plc.						

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled RD / GJ Logged GRP/ AH Checked	Start 26/11/2008 End 17/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion boring 1.20 - 31.40m. Rotary coring (P size) 31.40 - 40.00m. Terminated on engineer's instruction.	Depth from 0.00m to 10.00m Diameter 250mm Casing Depth 10.00m 10.00m 25.70m 200mm 25.70m 25.70m 31.40m 150mm 31.40m 31.40m 40.00m 120mm	Ground Level +8.08 mOD Coordinates E 276202.08 National Grid N 187342.54 Chainage
Samples and Tests			Strata	
Depth 10.00-10.45 10.00-10.45 10.00-10.30	Type & No SPT S D 20 B 21	Records N=21 (2,2/4,5,5,7)	Date 10.00 01/12/2008 10.00	Time 3.40 0800 3.60
Medium dense brown to light brown silty very gravelly fine to coarse SAND with low cobble content. Gravel is angular to subangular fine to coarse of shell fragments and sandstone. Cobbles are subangular of sandstone.			(5.20)	
12.00-12.45	SPT C	N=16 (2,3/3,4,4,5)	12.00	
13.00-13.45 13.00-13.30	SPT C B 22	N=18 (4,4/4,4,5,5)	13.00	
13.70	D 23			
14.00-17.00 14.00-14.45 14.00-14.45	KFH SPT S D 24	k=1.1E-8 m/s N=20 (3,2/3,4,6,7)	14.00	
Firm dark grey sandy slightly organic CLAY.			13.70 -5.62 (0.30)	
Medium dense grey brown clayey slightly gravelly fine SAND. Gravel is subangular fine to medium of shell fragments.			14.00 -5.92	
15.00-15.45 15.00-15.45	SPT S D 25	N=15 (2,3/3,4,4,4)	15.00	
16.00-16.45 16.00-16.45	SPT S D 26	N=11 (2,2/2,3,3,3)	16.00	
(4.45)				
17.00-17.45 17.00-17.45	SPT S D 27	N=15 (2,3/3,4,4,4)	17.00	
18.00-18.45 18.00-18.45	SPT S D 28	N=11 (2,2/2,3,3,3)	18.00	
Firm grey slightly sandy silty CLAY.			18.45 -10.37 (0.55)	
19.00-19.45 19.00-19.45	SPT S D 29	N=12 (1,1/3,3,3,3)	19.00	
Soft to firm grey sandy slightly gravelly silty CLAY. Gravel is angular to subangular fine to medium of sandstone.			19.00 -10.92	
01/12/2008 20.00			1700 damp	
Depth	Type & No	Records	Date 01/12/2008 20.00	Time 1700 damp
Stratum continues to 24.20 m				
Groundwater Entries No. Struck Post strike behaviour			Depth sealed (m)	
Depth Related Remarks * From to (m)			Chiselling Depths (m) Time Tools used	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.			Project 2U - Afan Advanced Digestion Scheme Project No. H8118 Carried out for Morgan Est Plc.	
Scale 1:50 (c) ESGL www.esgl.co.uk 408.24 19/02/2009 16:03:01			Borehole BH1 Sheet 2 of 4	

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled RD / GJ Logged GRP/ AH Checked	Start26/11/2008 End17/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion boring 1.20 - 31.40m. Rotary coring (P size) 31.40 - 40.00m. Terminated on engineer's instruction.	Depth from0.00m to10.00m Diameter250mm Casing Depth10.00m 10.00m 25.70m 200mm 25.70m 31.40m 150mm 31.40m 40.00m 120mm	Ground Level+8.08 mOD CoordinatesE 276202.08 National GridN 187342.54 Chainage			
Samples and Tests			Strata				
Depth	Type & No	Records	DateCasingTimeWater	Description (Continued from Sheet 2)	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
20.00-20.45 20.00-20.45	SPT S D 30	N=2 (1,1/1,1,0,0)	20.00 02/12/2008 20.00	0800 4.70	Soft to firm grey sandy slightly gravelly silty CLAY. Gravel is angular to subangular fine to medium of sandstone.	20.00-20.45 m Very soft	
21.00-21.45 21.00-21.45	SPT S D 31	N=8 (1,1/2,2,2,2)	21.00		(5.20)		
22.00-22.45 22.00-22.45	SPT S D 32	N=8 (2,2/2,2,2,2)	22.00				
23.00-23.45 23.00-23.45	SPT S D 33	N=7 (1,1/2,1,2,2)	23.00				
24.00-24.45 24.00-24.75	SPT S D 34	N=17 (1,1/3,4,5,5)	24.00				
25.00-25.38 25.00-25.40 25.00-25.50	SPT S D 35 B 36	50 (10,12/12,13,17,8 for 5mm)	25.00		Stiff grey brown slightly sandy CLAY.	24.20 -16.12 (0.50)	
26.00-26.23 26.00-26.25 26.00-26.50	SPT S D 37 B 38	50 (16,9 for 5mm/18,32)	25.70 02/12/2008 25.70	1700 3.10	Very dense grey brown slightly clayey sandy subangular fine to coarse GRAVEL of sandstone.	24.70 -16.62 (1.30)	
26.00-26.23 26.00-26.25 26.00-26.50	SPT S D 37 B 38	50 (16,9 for 5mm/18,32)	25.70 03/12/2008 25.70	0800 5.70			
26.00-26.23 26.00-26.25 26.00-26.50	SPT S D 37 B 38	50 (16,9 for 5mm/18,32)	26.00	5.80	Very dense grey brown and orange brown silty very sandy subangular to rounded fine to coarse GRAVEL of sandstone with medium to high cobble content. Cobbles are subrounded of sandstone.	26.00 -17.92	
27.00-27.21 27.00-27.20 27.00-27.50	SPT S D 39 B 40	50 (25/22,28 for 55mm)	27.00	7.80		(2.80)	
28.00-28.22 28.00-28.50	SPT C B 41	50 (19,6 for 5mm/ 21,29 for 60mm)	28.00	9.30			
29.00-29.36 29.00-29.35	SPT S D 42	50 (12,13/20,16,14 for 60mm)	29.00	8.30	Very weak black COAL; recovered as angular to subangular fine to medium gravel.	28.80 -20.72 (0.70)	
29.50-30.00	B 43		03/12/2008 30.00	1700 7.10	Very weak grey to dark grey SILTSTONE; recovered as clayey slightly sandy	29.50 -21.42	
Depth	Type & No	Records	DateCasingTimeWater	Stratum continues to 31.40 m			
Groundwater Entries				Depth Related Remarks *		Chiselling	
No.	Struck (m)	Post strike behaviour	Depth sealed (m)	From	to (m)	Depths (m)	Time Tools used
						24.70 -25.40	90 mins Chisel
						26.40 -27.50	90 mins Chisel
						27.50 -28.30	120 mins Chisel
						28.30 -28.80	90 mins Chisel
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.				Project 2U - Afan Advanced Digestion Scheme		Borehole	
Project No. H8118				Morgan Est Plc.		BH1	
Scale 1:50						Sheet 3 of 4	

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled Logged Checked	RD / GJ GRP/ AH	Start 26/11/2008 End 17/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion boring 1.20 - 31.40m. Rotary coring (P size) 31.40 - 40.00m. Terminated on engineer's instruction.			Depth from 0.00m 10.00m 25.70m 31.40m	to 10.00m 25.70m 31.40m 40.00m	Diameter 250mm 200mm 150mm 120mm	Casing Depth 10.00m 25.70m 31.40m	Ground Level +8.08 mOD Coordinates E 276202.08 National Grid N 187342.54 Chainage
Samples and Tests						Strata				
Depth	Type & No	Records	Date Casing	Time Water	Description (Continued from Sheet 3)	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments		
30.00-30.13 30.00-30.15 30.00-30.50	SPT S D 44 B 45	50 (25 for 50mm/50)	30.00 04/12/2008 30.00	7.10 0800 4.20	subangular fine to coarse gravel.	(1.90)				
31.00-31.13 31.00-31.40	SPT C B 46	50 (30,5 for 5mm/50 for 50mm)	31.00 04/12/2008 31.40	4.30 1200 4.90						
31.40-31.52 31.40-33.00	SPT C C 48	50 (25 for 55mm/50 for 60mm)	31.40 16/12/2008 31.40	4.90 1300 1.00	Minimal recovery. Core loss presumed to be more weathered/ weaker material. Recovered material comprises dark grey very clayey angular fine to coarse gravel of weak SILTSTONE. (Driller notes clay)	31.40 -23.32				
31.40-33.00	13 0 0	NI NI NI				(1.60)				
33.00-34.50		C 49			Partial recovery. Core loss presumed to be more weathered/ weaker material. Recovered material comprises soft dark grey sandy slightly gravelly silty CLAY. Gravel is angular to subangular fine to medium of weak siltstone. No rock fabric evident - possible drilling disturbance. (Driller notes clay and mudstone)	33.00 -24.92				
33.00-34.50	43 5 0	N/A N/A N/A				(1.43)				
34.50-36.00		C 50			Weak to medium strong dark grey and grey thinly laminated SILTSTONE. Weathering: slight loss of strength along discontinuity surfaces. Discontinuities: 20 to 30 degree and randomly orientated very closely locally closely spaced planar smooth tight. Locally NI, recovered as angular fine to coarse gravel.	34.43 -26.35				
34.50-36.00	67 35 7	NI 50 100								
36.00-37.50		C 51	16/12/2008 31.40	1700						
36.00-37.50	27 13 0		17/12/2008 31.40	0800	36.00-37.50 m Minimal recovery, core loss presumed to be weaker/ more weathered material. (Driller notes fractured mudstone)	(5.57)				
37.50-39.00		C 52			37.50-40.00 m generally NI, some localised core loss, presumed to be weaker material.					
37.50-39.00	53 11 0	NI NI 50								
39.00-40.00		C 53								
39.00-40.00	90 13 0		17/12/2008 31.40	1700						
Depth	TCR RCR RCD	If	Records/Samples	Date Casing	Time Water	EXPLORATORY HOLE ENDS AT 40.00 m				
Groundwater Entries						Depth Related Remarks *				Chiselling Depths (m)
No.	Struck (m)	Post strike behaviour	Depth sealed (m)			From	to (m)	Time	Tools used	
								30.70 -31.00	45 mins Chisel	
								31.00 -31.00	60 mins Chisel	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.						Project 2U - Afan Advanced Digestion Scheme				Borehole
Project No. H8118						Sheet 4 of 4				
Carried out for Morgan Est Plc.										
Scale 1:50										
(c) ESGL www.esgl.co.uk 408.24 19/02/2009 16:03:03										

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled RB Logged GRP Checked	Start 27/11/2008 End 28/11/2008	Equipment, Methods and Remarks Dando 2000 Hand dug inspection pit G.L. - 1.20m. Light cable percussion boring 1.20 - 8.45m. Unable to advance the borehole due to unknown obstruction. Terminated on client's instruction.		Depth from 0.00m to 8.45m Diameter 250mm Casing Depth 8.00m	Ground Level - Coordinates - National Grid - Chainage -			
Samples and Tests			Strata					
Depth	Type & No	Records	Date Casing	Time Water	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.00	KFH		27/11/2008	0800	MADE GROUND: Dark brown slightly silty gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of limestone, sandstone, concrete and shell fragments.	(0.50)		
0.20	ES 1							
0.50	ES 2					0.50		
0.50-1.20	B 3							
1.20-1.50	SPT C	* 50 (7,7/14,36)	1.20	dry	MADE GROUND: Brown slightly silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of slag, clinker, limestone and shell fragments.	(0.70)		
1.20-1.50	B 4					1.20		
2.00-2.45	SPT C	N=20 (3,5/5,4,5,6)	2.00	1.50	MADE GROUND: Very dense grey slightly sandy subangular fine to coarse GRAVEL of clinker, limestone and slag with medium cobble content. Cobbles are subangular of slag.	(0.80)		
2.00	ES 5					2.00		
2.00-2.30	B 6							
3.00-3.45	SPT S	N=6 (1,0/3,1,1,1)	3.00	2.50	MADE GROUND: Medium dense and loose dark brown grey slightly silty slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of slag brick sandstone and shell fragments.	(2.00)		
3.00-3.45	D 7							
3.00-3.30	B 8							
4.00-4.45	SPT S	N=18 (1,1/2,4,5,7)	4.00	3.50	Medium dense light brown slightly silty slightly gravelly fine to coarse SAND with low cobble content. Gravel is subrounded to rounded fine to coarse of sandstone. Cobbles are subrounded of sandstone.	4.00		
4.00-4.30	B 10							
4.00-4.45	D 9							
5.00-5.30	B 11					(2.00)		
6.00-6.45	SPT S	N=22 (1,1/3,4,7,8)	6.00	5.50	Medium dense becoming dense brown silty slightly gravelly fine to coarse of SAND. Gravel is angular to subangular fine to medium of shell fragments.	6.00		
6.00-6.45	D 12							
6.00-6.30	B 13							
7.00-7.45	SPT S	N=22 (1,1/3,5,7,7)	7.00	6.00		(2.45)		
7.00-7.45	D 14		27/11/2008	1700				
7.00-7.30	B 15		7.40	6.00				
8.00-8.45	SPT S	N=40 (1,4/6,10,11,13)	28/11/2008	0800				
8.00-8.45	D 16		7.40	4.30				
8.00-8.30	B 17		28/11/2008	1700				
			8.00	7.00				
			8.00	7.00				
EXPLORATORY HOLE ENDS AT 8.45 m					8.00-8.45 m Dense	8.45		
Groundwater Entries					Depth Related Remarks *		Chiselling	
No.	Struck (m)	Post strike behaviour	Depth sealed (m)		From	to (m)	Depths (m)	Time
None observed (see Key Sheet)					1.20	7.00	1.20 -1.65	60 mins
					4.20	7.40		Tools used
					7.40	8.45		60 mins Chisel
					Water added to assist drilling			
					Sand blew up casing to 4.20m overnight 27/11 (1hr re drill)			
					Slow progress due to blowing sand (2hrs)			
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.					Project		Borehole	
					2U - Afan Advanced Digestion Scheme		BH2	
					Project No. H8118		Sheet 1 of 1	
					Carried out for Morgan Est Plc.			

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled RB Logged GRP Checked	Start 01/12/2008 End 05/12/2008	Equipment, Methods and Remarks Dando 2000 Hand dug inspection pit G.L. - 1.20m. Light cable percussion boring 1.20 - 28.50m. Terminated on engineer's instruction.	Depth from 0.00m to 10.00m Diameter 250mm Casing Depth 10.00m	Ground Level +8.61 mOD Coordinates E 276164.42 National Grid N 187309.16 Chainage				
Samples and Tests			Strata					
Depth 0.20 0.50 0.50-1.00 1.00-1.20 1.00 1.20-1.65 1.20-1.50 2.00-2.45 2.00-2.30 2.00 3.00-3.45 3.00-3.45 3.00-3.30 4.00-4.45 4.00-4.45 4.00-4.30 4.30-5.45 5.00-5.45 5.00-5.30 6.00-6.45 6.00-6.45 6.00-6.30 7.00-7.45 7.00-7.45 7.00-7.30 7.50-12.00 8.00-8.45 8.00-8.45 8.00-8.30 9.00-9.45 9.00-9.45 9.00-9.30	Type & No ES 1 ES 2 B 3 B 4 ES 5 SPT C B 6 SPT C B 7 ES 8 SPT S D 10 B 9 SPT S D 11 B 12 D 13 SPT S B 14 SPT S D 15 B 16 SPT S D 17 B 18 KRH SPT S D 19 B 20 SPT S D 21 B 22	Records * N=39 (5,7/8,9,10,12) N=35 (6,6/9,8,9,9) N=5 (1,1/0,2,1,2) N=13 (1,0/1,3,4,5) * N=8 (1,1/2,2,1,3) * N=24 (1,1/3,5,7,9) N=30 (3,4/6,6,8,10) * k=8.7E-9 m/s N=13 (1,1/2,3,4,4) N=16 (1,1/2,2,5,7)	Date 01/12/2008 1.20 2.00 3.00 4.00 5.00 6.00 7.00 01/12/2008 7.50 02/12/2008 7.50 8.00 9.00 02/12/2008 10.00	Time 1300 dry 1.50 2.50 3.50 4.50 4.50 4.60 1700 4.60 0800 3.70 6.00 5.00 1700 6.00	Description MADE GROUND: Dark brown slightly silty gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of limestone, sandstone, concrete and shell fragments. MADE GROUND: (Dense) dark brown slightly silty gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of limestone sandstone concrete and shell fragments. MADE GROUND: (Dense) grey silty sandy subangular fine to coarse GRAVEL of slag and clinker with low cobble content. Cobbles are subangular of slag. 2.00-2.45 m Dense Loose and medium dense light brown slightly silty slightly gravelly fine to coarse SAND. Gravel is subrounded to rounded of sandstone. 4.00-10.00 m Blowing sand conditions Medium dense light brown to brown silty slightly gravelly medium to coarse SAND. Gravel is angular to subangular fine to coarse of shell fragments. Stratum continues to 11.00 m	Depth, Level/ (Thickness) (0.50) 0.50 +8.11 (1.00) 1.50 +7.11 (0.60) 2.10 +6.51 (4.90) 7.00 +1.61 (4.00)	Legend 	Backfill/ Instruments
Groundwater Entries No. 1 Struck 3.40 Post strike behaviour - Depth sealed (m) -			Depth Related Remarks * From 1.20 to 5.00 Water added to assist drilling 5.00 to 7.50 Sand blew up casing to 5.00m overnight 02/12 (0.5hr re drill) 6.00 to 7.50 Unable to move casing due to blowing sand 2.5hrs to free 7.40 to 10.00 Sand blew up casing to 7.40m overnight 01/12 (35min re drill) 7.50 to 10.00 Slow progress due to blowing sands (5hr)		Chiselling Depths (m) 1.20 - 1.70 Time 60 mins Tools used Chisel			
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.			Project 2U - Afan Advanced Digestion Scheme Project No. H8118 Carried out for Morgan Est Plc.		Borehole BH2A Sheet 1 of 3			



Borehole Log

PRELIMINARY



Soil Mechanics

Drilled RB Logged GRP Checked		Start 01/12/2008 End 05/12/2008	Equipment, Methods and Remarks Dando 2000 Hand dug inspection pit G.L. - 1.20m. Light cable percussion boring 1.20 - 28.50m. Terminated on engineer's instruction.		Depth from 0.00m 10.00m 27.00m	to 10.00m 27.00m 28.50m	Diameter 250mm 200mm 150mm	Casing Depth 10.00m 27.00m 28.50m	Ground Level +8.61 mOD Coordinates E 276164.42 National Grid N 187309.16 Chainage
Samples and Tests					Strata				
Depth	Type & No	Records	Date Casing	Time Water	Description (Continued from Sheet 1)	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments	
10.00 10.00-10.45 10.00-10.45 10.00-10.30	KFH SPT S D 23 B 24	k=6.0E-7 m/s N=18 (1,0/2,3,5,8)	10.00 03/12/2008 10.00	6.00 0800 2.00	Medium dense light brown to brown silty slightly gravelly medium to coarse SAND. Gravel is angular to subangular fine to coarse of shell fragments.				
11.00-11.45 11.00-11.45 11.00-11.30	SPT S D 25 B 26	N=10 (1,2/1,2,3,4)	11.00	4.20	Medium dense locally very loose to loose light brown silty slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone.	11.00 -2.39			
12.00-12.45 12.00-12.45 12.00-12.30	SPT S D 27 B 28	N=3 (1,0/1,0,1,1)	12.00	5.00	12.00-12.45 m Very loose	(3.00)		SP	
13.00-13.45 13.00-13.37 13.00-13.30	SPT S D 29 B 30	N=18 (2,2/3,4,5,6)	13.00	6.60					
14.00-14.45 14.00-14.45 14.00-14.30	SPT S D 31 B 32	N=9 (2,2/1,2,3,3)	14.00	6.60	Loose grey brown silty slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine to medium of shell fragments.	14.00 -5.39 (1.00)			
15.00-15.45 15.00-15.45 15.00-15.30	SPT S D 33 B 34	N=9 (2,2/1,2,3,3)	15.00	6.50	Loose to medium dense dark grey very silty gravelly fine SAND. Gravel is angular to subangular fine to medium of shell fragments.	15.00 -6.39			
16.00-16.45 16.00-16.45 16.00-16.30	SPT S D 35 B 36	N=12 (3,3/4,2,3,3)	16.00	6.50		(3.00)			
17.00-17.45 17.00-17.45 17.00-17.30	SPT S D 37 B 38	N=15 (2,3/4,4,3,4)	17.00	6.60					
18.00-18.45 18.00-18.45 18.00-18.30	SPT S D 39 B 40	N=3 (1,0/1,0,1,1)	18.00	6.60	Very soft to soft sandy clayey SILT.	18.00 -9.39 (1.00)			
19.00-19.45 19.00-19.45 19.00-19.30	SPT S D 41 B 42	N=3 (1,1/0,1,1,1)	19.00	6.60	Very soft dark grey slightly sandy silty CLAY.	19.00 -10.39 (1.00)			
			03/12/2008 19.70	1700 6.60					
			04/12/2008 19.70	0800 4.10					
Depth	Type & No	Records	Date Casing	Time Water					
Groundwater Entries					Depth Related Remarks *		Chiselling		
No.	Struck (m)	Post strike behaviour	Depth sealed (m)	From	to (m)	Depths (m)	Time	Tools used	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.					Project 2U - Afan Advanced Digestion Scheme		Borehole BH2A		
Project No. H8118					Carried out for Morgan Est Plc.		Sheet 2 of 3		

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled Logged Checked	RB GRP	Start 01/12/2008 End 05/12/2008	Equipment, Methods and Remarks Dando 2000 Hand dug inspection pit G.L. - 1.20m. Light cable percussion boring 1.20 - 28.50m. Terminated on engineer's instruction.		Depth from 0.00m 10.00m 27.00m	to 10.00m 27.00m 28.50m	Diameter 250mm 200mm 150mm	Casing Depth 10.00m 27.00m 28.50m	Ground Level +8.61 mOD Coordinates E 276164.42 National Grid N 187309.16 Chainage		
Samples and Tests					Strata						
Depth	Type & No	Records	Date Casing	Time Water	Description (Continued from Sheet 2)				Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
20.00-20.45 20.00-20.45 20.00-20.30	SPT S D 43 B 44	N=8 (2,2/2,1,2,3)	20.00	4.10	Loose very silty locally very clayey fine to medium SAND locally grading to very sandy SILT.				20.00 -11.39		
21.00-21.45 21.00-21.45 21.00-21.30	SPT S D 45 B 46	N=7 (2,1/2,2,1,2)	21.00	4.10					(3.00)		
22.00-22.45 22.00-22.45 22.00-22.30	SPT S D 46 B 47	N=7 (2,1/2,1,2,2)	22.00	4.00							
23.00-23.60 23.00-23.30	U 48 B 50	50 blows	23.00	4.10	Soft dark grey sandy SILT locally grading to sandy CLAY.				23.00 -14.39		
23.60	D 49										
24.00-24.45 24.00-24.45 24.00-24.30	SPT S D 51 B 52	N=6 (2,2/1,2,1,2)	24.00	4.20					(2.00)		
25.00-25.60 25.00-25.30	U 53 B 54	40 blows	25.00	4.20	Grey very silty fine to coarse SAND.				25.00 -16.39		
									(1.00)		
26.00-26.45 26.00-26.45	SPT S D 55	N=29 (5,10/8,10,7,4)	04/12/2008 1700 26.00 4.20 26.00 4.20 05/12/2008 0800 26.00 4.20		Stiff grey to dark grey slightly sandy gravelly CLAY. Gravel is subangular fine to coarse of sandstone and siltstone.				26.00 -17.39		
									(0.50)		
27.00-27.11 27.00-27.50	SPT C B 56	50 (25 for 45mm/50 for 65mm)	27.00	3.00	Very dense grey slightly silty sandy subangular to subrounded fine to coarse GRAVEL of siltstone and sandstone with low cobble content. Cobbles are subangular of sandstone.				26.50 -17.89		
28.00-28.25 28.00-28.50	SPT C B 57	50 (6,16/34,16 for 25mm)	28.00	4.00					(2.00)		
28.50-28.69	SPT C	50 (15,10 for 40mm/50 for 70mm)	05/12/2008 1700 28.50 4.10 28.50 4.00		EXPLORATORY HOLE ENDS AT 28.50 m				28.50 -19.89		
Depth	Type & No	Records	Date Casing	Time Water							
Groundwater Entries					Depth Related Remarks *				Chiselling		
No.	Struck (m)	Post strike behaviour	Depth sealed (m)		From to (m)				Depths (m)	Time	Tools used
									26.00 -26.40	60 mins	Chisel
									26.80 -27.00	30 mins	Chisel
									27.30 -27.80	60 mins	Chisel
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.					Project 2U - Afan Advanced Digestion Scheme				Borehole BH2A		
Project No. H8118					Carried out for Morgan Est Plc.				Sheet 3 of 3		
Scale 1:50					(c) ESGL www.esgl.co.uk 408.24 19/02/2009 16:03:14				AGS		

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled Logged Checked	RB / GJ GRP/ AH	Start 10/12/2008 End 17/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion borehole 1.20 - 31.00m. Rotary open holed 31.00 - 33.00m, rotary coring (P size) 33.00 - 41.00m. Terminated on engineer's instruction		Depth from 0.00m 10.00m 27.00m 31.00m	to 10.00m 27.00m 31.00m 41.00m	Diameter 250mm 200mm 150mm 120mm	Casing Depth 10.00m 27.00m 31.00m	Ground Level Coordinates National Grid Chainage	+8.03 mOD E 276134.25 N 187291.97	
Samples and Tests					Strata						
Depth	Type & No	Records	Date Casing	Time Water	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments			
0.00 0.20 0.20-0.50 0.50	ES 1 B 2 ES 3		10/12/2008	0800	MADE GROUND: Brown slightly silty gravelly fine SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of brick, sandstone and clinker. Cobbles are subangular of sandstone and clinker.	(0.50) 0.50 +7.53					
1.00-1.20 1.20-1.65 1.20-1.50 1.50-2.00	B 4 SPT C B 5 B 6	* N=13 (3,2/3,3,4,3)	1.20	1.20	MADE GROUND: Medium dense grey silty sandy subangular fine to coarse GRAVEL of clinker, brick and limestone with medium cobble content. Cobbles are subangular of sandstone and concrete.	(1.00) 1.50 +6.53					
2.00-2.45 2.00 2.00-2.30	SPT C ES 7 B 8	N=13 (3,3/2,3,4,4)	2.00	1.00	MADE GROUND: Medium dense black to dark grey slightly clayey sandy angular to subangular fine to coarse GRAVEL of clinker brick and limestone (strong hydrocarbon odour).	(1.50)					
3.00-3.45 3.00 3.00-3.30	SPT C ES 10 B 9	N=5 (1,0/1,1,1,2)	3.00	1.55	MADE GROUND: Loose black slightly clayey fine to coarse SAND (strong hydrocarbon odour).	3.00 +5.03 (1.50)					
4.00-4.45 4.00-4.45 4.00-4.30 4.50	SPT S D 11 B 12 W 58	N=5 (1,1/0,1,2,2)	4.00	1.70		4.50 +3.53					
5.00-5.45 5.00-5.45 5.00-5.30	SPT S D 13 B 14	N=10 (1,2/1,2,3,4)	5.00	2.00	Medium dense becoming loose light brown slightly silty slightly gravelly fine to coarse SAND. Gravel is subangular fine to coarse of sandstone and shell fragments.						
6.00-6.45 6.00-6.45 6.00-6.30	SPT S D 15 B 16	N=5 (1,1/0,2,1,2)	6.00	2.50		(3.50)					
7.00-7.45 7.00-7.45 7.00-7.30	SPT S D 17 B 18	N=4 (1,0/1,0,1,2)	7.00	2.50							
8.00-8.45 8.00-8.45 8.00-8.30	SPT S D 19 B 20	N=7 (1,2/2,2,1,2)	8.00 10/12/2008 8.30	3.00 1700 3.00	Loose becoming medium dense light brown slightly silty slightly gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone.	8.00 +0.03					
9.00-9.45 9.00-9.45 9.00-9.30	SPT S D 21 B 22	* N=6 (1,2/1,2,1,2)	9.00 11/12/2008 8.30	4.50 0800 3.40		(3.00)					
					Stratum continues to 11.00 m						
Groundwater Entries					Depth Related Remarks *					Chiselling	
No.	Struck (m)	Post strike behaviour	Depth sealed (m)		From to (m)	Time				Tools used	
1	4.50	-	-		1.20 6.20 7.25 9.00	10.00 8.30 8.30 10.00				Water added to assist drilling Sand blew up casing 8.30 to 6.20m overnight 10/12 (2.5hr re drill Pull back casing to free, 2.5hr slow progress to 8.30m Slow progress due to blowing sands (3hr)	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.					Project 2U - Afan Advanced Digestion Scheme					Borehole BH3	
Scale 1:50					Project No. H8118					Sheet 1 of 5	
(c) ESGL www.esgl.co.uk 408.24 19/02/2009 16:03:18					Carried out for Morgan Est Plc.						

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled RB / GJ Logged GRP/ AH Checked	Start 10/12/2008 End 17/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion borehole 1.20 - 31.00m. Rotary open holed 31.00 - 33.00m, rotary coring (P size) 33.00 - 41.00m. Terminated on engineer's instruction	Depth from 0.00m to 10.00m Diameter 250mm Casing Depth 10.00m 10.00m 27.00m 200mm 27.00m 27.00m 31.00m 150mm 31.00m 31.00m 41.00m 120mm	Ground Level +8.03 mOD Coordinates E 276134.25 National Grid N 187291.97 Chainage				
Samples and Tests			Strata					
Depth 10.00-10.45 10.00-10.45 10.00-10.30	Type & No SPT S D 23 B 24	Records N=15 (2,3/4,4,5,2)	Date 10.00 12/12/2008	Time 4.50 0800 6.30	Description (Continued from Sheet 1) Loose becoming medium dense light brown slightly silty slightly gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone. Loose and medium dense grey slightly very silty slightly gravelly fine to coarse SAND. Gravel is subangular fine to coarse of sandstone and shell fragments.	Depth, Level/ (Thickness) 10.00-11.00 m Medium dense 11.00 -2.97	Legend	Backfill/ Instruments
13.00-13.45 13.00-13.45 13.00-13.30	SPT S D 25 B 26	N=18 (2,2/3,4,5,6)	13.00	6.30				
14.00-14.45 14.00-14.45 14.00-14.30	SPT S D 27 B 28	N=7 (2,2/2,1,2,2)	14.00	6.30				
15.00-15.45 15.00-15.45 15.00-15.30	SPT S D 29 B 30	N=25 (2,3/6,6,6,7)	15.00	6.00				
16.00-16.60 16.00-16.30	U 31 B 32	30 blows	16.00	6.00				
17.00-17.45 17.00-17.45 17.00-17.30	SPT S D 33 B 34	N=9 (2,1/2,2,2,3)	17.00	6.30				
18.00-18.60 18.00-18.30	U 35 B 36	31 blows	18.00	6.30	Soft to firm very low to low strength dark grey slightly sandy SILT.	18.00 -9.97		
19.00-19.45 19.00-19.45 19.00-19.30	SPT S D 37 B 38	N=7 (2,1/2,1,2,2)	19.00	6.00		(2.00)		
Depth	Type & No	Records	Date	Time				
Groundwater Entries No. Struck Post strike behaviour Depth sealed (m)					Depth Related Remarks * From to (m) 11.00 13.00 Unable to sample due to casing dropping under it's own weight		Chiselling Depths (m) Time Tools used	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.					Project 2U - Afan Advanced Digestion Scheme Project No. H8118 Carried out for Morgan Est Plc.		Borehole BH3 Sheet 2 of 5	

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled Logged Checked	RB / GJ GRP/ AH	Start 10/12/2008 End 17/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion borehole 1.20 - 31.00m. Rotary open holed 31.00 - 33.00m, rotary coring (P size) 33.00 - 41.00m. Terminated on engineer's instruction		Depth from 0.00m 10.00m 27.00m 31.00m	to 10.00m 27.00m 31.00m 41.00m	Diameter 250mm 200mm 150mm 120mm	Casing Depth 10.00m 27.00m 31.00m	Ground Level +8.03 mOD Coordinates E 276134.25 National Grid N 187291.97 Chainage
Samples and Tests					Strata				
Depth	Type & No	Records	Date Casing	Time Water	Description (Continued from Sheet 2)	Depth, Level (Thickness)	Legend	Backfill/ Instruments	
20.00-20.60 20.00-20.30	U 39 B 40	30 blows	20.00 12/12/2008 20.30	6.00 1700 6.00	Soft low strength grey slightly sandy silty organic CLAY.	20.00 -11.97			
21.00-21.45 21.00-21.45 21.00-21.30	SPT S D 41 B 42	N=7 (2,1/2,1,2,2)	21.00	6.30		(2.00)			
22.00-22.45 22.00-22.45 22.00-22.30 22.00-22.60	SPT S D 43 B 44 U NR	N=9 (2,1/2,2,2,3) 50 blows No recovery NR	22.00 22.00	6.30 6.30		22.00 -13.97 (1.00)			
23.00-23.45 23.00-23.45 23.00-23.45	SPT S D 45 B 46	N=9 (2,2/2,2,2,3)	23.00	6.30	Loose dark grey very silty fine SAND.	23.00 -14.97			
24.00-24.60 24.00-24.30	U 47 B 48	40 blows	24.00	6.30	Soft extremely low to very low strength grey slightly sandy clayey SILT.	(3.00)			
25.00-26.45 25.00-25.45 25.00-25.30	SPT S D 49 B 50	N=15 (2,2/3,4,4,4)	25.00	6.00	Very dense grey slightly clayey sandy angular to subangular fine to medium GRAVEL of sandstone with high cobble content. Cobbles are subangular of sandstone.	26.00 -17.97			
26.00-29.00 26.00-26.34 26.00-26.30 26.00-26.30	KFH SPT S D 51 B 52	k=1.1E-8 m/s 50 (4,6/8,20,22 for 40mm)	26.00 13/12/2008 26.30 14/12/2008 26.30	6.00 1700 6.00 0800 5.70		(3.00)			
27.00-27.10 27.00-28.00	SPT C B 53	50 (18,8 for 15mm/50 for 10mm)	27.00	3.70					
28.00-28.25 28.00-29.00	SPT C B 54	50 (5,10/29,21 for 25mm)	28.00	4.90					
29.00-29.06 29.00-29.50	SPT C B 55	50 (25 for 45mm/50 for 15mm)	29.00 14/12/2008 29.30	5.30 1700 5.70	Very stiff grey to dark grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and siltstone.	29.00 -20.97 (0.45)			
			15/12/2008 29.30	0800 5.30	Very dense dark grey very silty very	29.45 -21.42			
Depth	Type & No	Records	Date Casing	Time Water	Stratum continues to 31.00 m				
Groundwater Entries No. Struck Post strike behaviour Depth sealed (m)					Depth Related Remarks * From to (m)				
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.					Project 2U - Afan Advanced Digestion Scheme Project No. H8118 Carried out for Morgan Est Plc.				
Scale 1:50 (c) ESGL www.esgl.co.uk 408.24 19/02/2009 16:03:21					Borehole BH3 Sheet 3 of 5				

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled Logged Checked	RB / GJ GRP/ AH	Start 10/12/2008 End 17/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion borehole 1.20 - 31.00m. Rotary open holed 31.00 - 33.00m, rotary coring (P size) 33.00 - 41.00m. Terminated on engineer's instruction			Depth from 0.00m 10.00m 27.00m 31.00m	to 10.00m 27.00m 31.00m 41.00m	Diameter 250mm 200mm 150mm 120mm	Casing Depth 10.00m 27.00m 31.00m	Ground Level Coordinates National Grid Chainage	+8.03 mOD E 276134.25 N 187291.97
Samples and Tests						Strata					
Depth	Type & No	Records	Date Casing	Time Water	Description (Continued from Sheet 3)	Depth, Level (Thickness)	Legend	Backfill/ Instruments			
30.00-30.32 30.00-31.00	SPT S B 56	50 (12,13/11,22,17 for 15mm)	30.00	5.30	sandy subangular fine to coarse GRAVEL of sandstone with occasional pockets of very stiff clay and medium cobble content. Cobbles are subangular of sandstone.	(1.55)					
31.00-31.42 31.00	SPT S D 57	50 (4,5/9,12,13,16 for 40mm)	15/12/2008 31.00 18/12/2008 31.00	1700 5.30 0800 7.00	(Clay and weathered Mudstone) Driller's description	31.00 -22.97					
33.00-34.50	C 59				Weak to medium strong dark grey thinly laminated SILTSTONE. Weathering: slight loss of strength along discontinuity surfaces, localised weaking and increase in fracture spacing. Discontinuities: 15 to 25 degree very closely locally extremely closely spaced planar smooth tight. Locally NI, recovered as angular fine to coarse gravel. Partial recovery; core loss presumed to be weaker/ more weathered material.	33.00 -24.97					
33.00-34.50	53 12 0										
34.50-36.00	NI 30 50	C 60				(3.00)					
34.50-36.00	53 19 0										
36.00-37.00		Flush: 31.00-41.00 Air, 100 % If NI/NI/NI	C 61		Very weak to weak dark grey black carbonaceous MUDSTONE. NI; recovered as angular fine to coarse gravel.	36.00 -27.97 (0.30)					
36.00-37.00	91 62 16	40 60 160			Weak to medium strong dark grey thinly laminated SILTSTONE. Weathering: slight loss of strength along discontinuity surfaces. Discontinuities: 15 to 25 degree very closely to closely spaced planar smooth tight.	36.30 -28.27 (0.70)					
37.00-38.00		If NI/NI/NI If NI/<20/20	C 62		Very weak to weak dark grey black carbonaceous MUDSTONE and COAL. NI; recovered as angular fine to coarse gravel.	37.00 -28.97 37.10 -29.07 37.22 -29.19 (0.58)					
37.00-38.00	90 15 0	NI <20 20									
38.00-39.50	NI NI 25	C 63				37.80 -29.77 (0.40)					
38.00-39.50	89 73 51				Very weak to weak dark grey fossiliferous MUDSTONE. Weathering: slight loss of strength throughout core. Discontinuities: subhorizontal extremely closely to very closely spaced planar rough tight and incipient. Locally NI, recovered as angular fine to coarse gravel.	38.20 -30.17					
39.50-41.00	NI 100 200	C 64			Very weak black COAL. Discontinuities: subhorizontal extremely	(2.80)					
Depth	TCR RCD	If	Records/Samples	Date Casing	Time Water	Stratum continues to 41.00 m					
Groundwater Entries						Depth Related Remarks *			Chiselling		
No.	Struck (m)	Post strike behaviour	Depth sealed (m)			From	to (m)	Time	Tools used		
						31.00	33.00	120 mins	Chisel		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.						Project 2U - Afan Advanced Digestion Scheme			Borehole BH3		
Project No. H8118						Carried out for Morgan Est Plc.			Sheet 4 of 5		
Scale 1:50						(c) ESGL www.esgl.co.uk 408.24 19/02/2009 16:03:22					

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled RB / GJ Logged GRP/ AH Checked		Start 10/12/2008 End 17/12/2008		Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion borehole 1.20 - 31.00m. Rotary open holed 31.00 - 33.00m, rotary coring (P size) 33.00 - 41.00m. Terminated on engineer's instruction		Depth from 0.00m to 10.00m 10.00m to 27.00m 27.00m to 31.00m 31.00m to 41.00m		Diameter 250mm 200mm 150mm 120mm		Casing Depth 10.00m 27.00m 31.00m		Ground Level +8.03 mOD Coordinates E 276134.25 National Grid N 187291.97 Chainage		
Samples and Tests						Strata								
Depth		TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Description (Continued from Sheet 4)					Depth, Level/ (Thickness)	Legend	Backfill/ Instrument
39.50-41.00		90 52 18			18/12/2008 31.00	1700	37.22m - 37.80m : closely spaced planar smooth tight and incipient. Locally NI, recovered as angular fine to coarse gravel. 37.80m - 38.20m : Very weak to weak grey fossiliferous MUDSTONE. Weathering: slight loss of strength throughout core. Discontinuities: subhorizontal extremely closely to very closely spaced planar rough tight and incipient. Generally NI, recovered as angular fine to coarse gravel. 38.20m - 41.00m : Weak to medium strong dark grey thinly laminated SILTSTONE. Weathering: slight loss of strength along discontinuity surfaces. Discontinuities: 15 to 25 degree and randomly orientated closely locally very closely spaced planar smooth tight. Locally NI, recovered as angular fine to coarse gravel (Drilling disturbance). EXPLORATORY HOLE ENDS AT 41.00 m					41.00 - 32.97		
Depth		TCR SCR RQD	If	Records/Samples	Date Casing	Time Water								
Groundwater Entries						Depth Related Remarks *						Chiselling		
No.	Struck (m)	Post strike behaviour			Depth sealed (m)		From to (m)					Depths (m)	Time	Tools used
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.						Project 2U - Afan Advanced Digestion Scheme						Borehole		
(c) ESGL www.esgl.co.uk 408.24 19/02/2009 16:03:24						Project No. H8118						BH3		
Scale 1:50						Carried out for Morgan Est Plc.						Sheet 5 of 5		

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled Logged Checked	RD / GJ GRP	Start 04/12/2008 End 19/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. 1.20m. Light cable percussion boring 1.20 - 35.45m. Rotary open holed 35.45 - 36.00m, rotary coring (P size) 36.00 - 43.00m. Borehole terminated on engineer's instruction.		Depth from 0.00m 11.00m 28.00m 35.45m	to 11.00m 28.00m 35.45m 43.00m	Diameter 250mm 200mm 150mm 120mm	Casing Depth 11.00m 28.00m 35.45m	Ground Level +9.04 mOD Coordinates E 276100.12 N 187263.88 Chainage
Samples and Tests					Strata				
Depth	Type & No	Records	Date Casing	Time Water	Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments	
0.20	ES 1		04/12/2008	1400	MADE GROUND: Brown to light brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone and clinker.	(0.50)			
0.50	ES 2					0.50 +8.54			
1.00	ES 3				MADE GROUND: Dark brown slightly clayey gravelly coarse SAND. Gravel is subangular fine to coarse of sandstone and slag.	(0.50) 1.00 +8.04 (0.30) 1.30 +7.74			
1.50-1.70	B 4	*	04/12/2008 05/12/2008	1700 0800 dry	MADE GROUND: Dark brown slightly clayey sandy subangular GRAVEL of clinker, brick and slag with low cobble content. Cobbles are subangular of brick.				
2.00-2.45 2.00 2.00-2.45 2.00-2.20	SPT C ES 5 D 6 B 7	N=21 (2,3/4,5,5,7)	2.00		Medium dense light brown silty very gravelly fine to coarse SAND with low cobble content. Gravel is subrounded to rounded fine to coarse of sandstone. Cobbles are subrounded of sandstone.				
3.00-3.45 3.00-3.20	SPT C B 8	N=16 (2,2/3,3,4,6)	3.00			(4.20)			
4.00-4.45 4.00-4.20	SPT C B 9	N=19 (3,2/4,4,4,7)	4.00						
4.50	W 67	*							
5.00-5.45 5.00-5.20	SPT C B 10	N=22 (3,4/5,5,6,6)	5.00						
6.00-6.45 6.00-6.45 6.00-6.20	SPT S D 11 B 12	N=23 (2,4/4,6,6,7)	6.00		Medium dense brown slightly silty slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone and shell fragments.	5.50 +3.54			
7.00-7.45 7.00-7.45 7.00-7.20	SPT S D 13 B 14	N=24 (3,5/5,5,7,7)	7.00						
8.00-8.45 8.00-8.45 8.00-8.20	SPT S D 15 B 16	N=29 (2,4/6,6,7,10)	8.00			(4.50)			
9.00-9.45 9.00-9.45 9.00-9.20	SPT S D 17 B 18	N=25 (3,3/4,7,7,7)	9.00						
Depth	Type & No	Records	Date Casing	Time Water					
Groundwater Entries					Depth Related Remarks *		Chiselling		
No.	Struck (m)	Post strike behaviour	Depth sealed (m)		From	to (m)	Depths (m)	Time	
1	4.50	Water Strike	-		1.50	11.00			
					4.50	13.30			
					Water added to assist drilling process Blowing sands		Tools used		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.					Project 2U - Afan Advanced Digestion Scheme		Borehole		
					Project No. H8118		BH4		
					Carried out for Morgan Est Plc.		Sheet 1 of 5		



Borehole Log

PRELIMINARY



Soil Mechanics

Drilled RD / GJ Logged GRP Checked		Start 04/12/2008 End 19/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. 1.20m. Light cable percussion boring 1.20 - 35.45m. Rotary open holed 35.45 - 36.00m, rotary coring (P size) 36.00 - 43.00m. Borehole terminated on engineer's instruction.		Depth from 0.00m 11.00m 28.00m 35.45m	to 11.00m 28.00m 35.45m 43.00m	Diameter 250mm 200mm 150mm 120mm	Casing Depth 11.00m 28.00m 35.45m	Ground Level +9.04 mOD Coordinates E 276100.12 National Grid N 187263.88 Chainage					
Samples and Tests					Strata									
Depth	Type & No	Records	Date Casing	Time Water	Description (Continued from Sheet 1)				Depth, Level/ (Thickness)	Legend	Backfill/ Instruments			
10.00 10.00-10.45 10.00-10.45 10.00-10.20 10.00-16.30	KFH SPT S D 19 B 20 B 31	k=3.7E-5 m/s N=22 (2,4/5,6,7)	10.00		Medium dense light brown slightly silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone.				10.00 -0.96					
11.00-11.45 11.00-11.45 11.00-11.20	SPT S D 21 B 22	* N=21 (2,2/3,4,7,7)	11.00											
			05/12/2008 11.00	1700 damp										
			08/12/2008 11.00	0800 3.10					(3.30)					
12.00-12.45 12.00-12.30	SPT C B 23	N=20 (2,3/4,5,5,6)	12.00	3.60										
13.00-16.00 13.00-13.45 13.00-13.45 13.00-13.30	KFH SPT S D 24 B 25	k=1.1E-8 m/s N=18 (2,2/5,5,4,4)	13.00	3.60	Medium dense grey very silty slightly gravelly fine to coarse SAND. Gravel is subrounded fine to coarse of sandstone.				13.30 -4.26					
14.00-14.45 14.00-14.45 14.00-14.30	SPT S D 26 B 27	N=18 (2,3/5,5,4,4)	14.00	4.10										
15.00-15.45 15.00-15.45 15.00-15.30	SPT S D 28 B 29	N=19 (2,3/4,5,5,5)	15.00	4.20										
16.00-16.45 16.00-16.45	SPT S D 30	N=8 (1,2/2,2,2,2)	16.00	4.80	Soft to firm very low to medium strength light grey brown slightly sandy silty CLAY.				16.00 -6.96					
16.50-17.00	U 32	12 blows	16.00	6.70										
17.00	D 33													
17.50-18.00	U 34	12 blows	17.50	6.80					(2.00)					
18.00-18.45 18.00	SPT S D 35	N=16 (2,2/3,3,4,6)	18.00	9.10	Medium dense and loose dark grey very silty fine to medium SAND.				18.00 -8.96					
18.50-18.95 18.50-18.80	D 36 B 37		08/12/2008 18.50	1700 9.10										
			09/12/2008 18.50	0800 9.60										
19.50-19.95 19.50-19.95 19.50-19.80	SPT S D 38 B 39	N=7 (1,1/2,1,2,2)	19.50	10.20					(2.50)					
					19.50-19.95 m Loose									
Depth	Type & No	Records	Date Casing	Time Water	Stratum continues to 20.50 m									
Groundwater Entries No. Struck Post strike behaviour (m)					Depth sealed (m) 11.00					Depth Related Remarks * From to (m) 11.00 Bentonite plug forced up borehole (1.5 hrs re drill)		Chiselling Depths (m)	Time	Tools used
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.					Project 2U - Afan Advanced Digestion Scheme Project No. H8118 Carried out for Morgan Est Plc.					Borehole BH4 Sheet 2 of 5				

Borehole Log

PRELIMINARY



Soil Mechanics

Drilled RD / GJ Logged GRP Checked	Start 04/12/2008 End 19/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. 1.20m. Light cable percussion boring 1.20 - 35.45m. Rotary open holed 35.45 - 36.00m, rotary coring (P size) 36.00 - 43.00m. Borehole terminated on engineer's instruction.	Depth from 0.00m to 11.00m Diameter 250mm Casing Depth 11.00m 11.00m 28.00m 200mm 28.00m 28.00m 35.45m 150mm 35.45m 35.45m 43.00m 120mm	Ground Level +9.04 mOD Coordinates E 276100.12 National Grid N 187263.88 Chainage				
Samples and Tests			Strata					
Depth	Type & No	Records	Date Casing	Time Water	Description (Continued from Sheet 2)	Depth, Level (Thickness)	Legend	Backfill/ Instruments
20.50-20.95 20.50-20.95 20.50-20.80	SPT S D 40 B 41	N=9 (1,2/2,2,2,3)	20.50	10.40	Medium dense and loose dark grey very silty fine to medium SAND.	20.50 -11.46		
					Firm dark grey slightly sandy silty CLAY.	(1.00)		
21.50-21.95 21.50-21.95 21.50-21.80	SPT S D 42 B 43	N=8 (1,1/2,2,2,2)	21.50	11.10	Loose dark grey very silty fine SAND.	21.50 -12.46		
						(1.00)		
22.50-22.95 22.50-22.95 22.50-22.80	SPT S D 44 B 45	N=9 (1,3/2,2,2,3)	22.50	11.90	Firm dark grey sandy SILT locally grading to slightly organic silty CLAY.	22.50 -13.46		
						(1.00)		
23.50-23.95 23.50-23.95 23.50-23.80	SPT S D 46 B 47	N=8 (1,2/2,2,2,2)	23.50	12.90	Loose grey very silty fine to medium SAND.	23.50 -14.46		
24.50-24.95 24.50-24.95 24.50-24.80	SPT S D 48 B 49	N=7 (1,2/1,2,1,3)	24.50	14.60	24.50-25.50 m Slightly organic	(2.00)		
25.50-25.95 25.50-25.95 25.50-25.80	SPT S D 50 B 51	N=10 (1,2/2,2,3,3)	25.50	15.40	Firm grey silty CLAY grading to clayey SILT.	25.50 -16.46		
						(1.70)		
26.50-26.95 26.50-26.95 26.50-26.80	SPT S D 52 B 53	N=12 (2,2/3,3,3,3)	26.50	16.10				
27.20	D 54					27.20 -18.16		
27.50-27.88 27.50-27.80	SPT S B 55	50 (5,10/12,15,19,4 for 5mm)	27.50	15.80	Firm grey to dark grey slightly sandy silty organic CLAY.	27.40 -18.36		
			09/12/2008 28.00	1700 15.80	Very dense grey silty very sandy subrounded to rounded fine to coarse GRAVEL of sandstone with occasional pockets of firm sandy clay and low cobble content. Cobbles are subrounded of sandstone.			
			10/11/2008 0800 10/12/2008 28.00	6.00 6.00				
28.50-28.77 28.50-29.00	SPT C B 56	50 (7,18/31,19 for 40mm)	28.50	4.60				
29.50-29.65 29.50-30.00	SPT C B 57	50 (20,5 for 5mm/50 for 70mm)	29.50	4.50				
Depth	Type & No	Records	Date Casing	Time Water	Stratum continues to 33.10 m			
Groundwater Entries No. Struck Post strike behaviour Depth sealed (m)					Depth Related Remarks * From to (m)		Chiselling Depths (m) Time Tools used 27.70 -27.70 45 mins Chisel 28.60 -29.40 120 mins Chisel 29.40 -29.40 240 mins Chisel	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.					Project 2U - Afan Advanced Digestion Scheme Project No. H8118 Carried out for Morgan Est Plc.		Borehole BH4 Sheet 3 of 5	

Scale 1:50

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Borehole Log

PRELIMINARY



Soil Mechanics

Drilled RD / GJ Logged GRP Checked	Start 04/12/2008 End 19/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. 1.20m. Light cable percussion boring 1.20 - 35.45m. Rotary open holed 35.45 - 36.00m, rotary coring (P size) 36.00 - 43.00m. Borehole terminated on engineer's instruction.		Depth from 0.00m to 11.00m Diameter 250mm Casing Depth 11.00m 11.00m 28.00m 200mm 28.00m 28.00m 35.45m 150mm 35.45m 35.45m 43.00m 120mm	Ground Level +9.04 mOD Coordinates E 276100.12 National Grid N 187263.88 Chainage			
Samples and Tests			Strata					
Depth	Type & No	Records	Date Casing	Time Water	Description (Continued from Sheet 3)	Depth, Level (Thickness)	Legend	Backfill/ Instruments
30.50-30.82 30.50-31.00	SPT C B 58	50 (15,10 for 20mm/17,20,13)	30.50	4.50	Very dense grey silty very sandy subrounded to rounded fine to coarse GRAVEL of sandstone with occasional pockets of firm sandy clay and low cobble content. Cobbles are subrounded of sandstone.	(5.70)		
31.50-31.82 31.50-31.80	SPT C B 59	50 (9,11/17,23,10 for 15mm)	10/11/2008 1700 10/12/2008 4.50 31.30 11/12/2008 0800 31.50 6.30 31.30 5.50					
32.50-32.63 32.50-32.65 32.50-33.00	SPT S D 60 B 61	50 (25 for 65mm/50 for 65mm)	32.50	7.10	Very dense dark grey silty sandy subangular to rounded fine to coarse GRAVEL of sandstone with low cobble content. Cobbles are subrounded of sandstone.	33.10 -24.06		
33.50-33.92 33.50-34.00	SPT C B 62	50 (8,13/12,14,16,8 for 40mm)	33.50	4.10		(1.00)		
34.50-34.83 34.50-34.80 34.50-34.60 34.80-35.30	SPT S D 63 B 64 B 65	50 (12,13 for 60mm/ 20,18,12 for 40mm)	34.50	8.90	Very dense grey brown clayey slightly sandy subrounded fine to coarse GRAVEL of sandstone.	34.10 -25.06		
35.45-35.56 35.45	SPT S D 66	50 (25 for 25mm/42,8 for 5mm)	34.45 9.20 18/12/2008 1200 35.45	Very weak grey brown SILTSTONE; recovered as clayey slightly sandy fine to coarse gravel.	34.80 -25.76			
36.00-37.00	C 68	C 69	11/12/2008 1700 35.45 9.20 18/12/2008 1200 35.45	Clay and siltstone (Driller's description).	35.45 -26.41			
36.00-37.00	60 14 0		18/12/2008 1700 35.45		Weak to medium strong dark grey thinly laminated SILTSTONE. Weathering: slight loss of strength along discontinuity surfaces. Discontinuities: 10 to 25 degree becoming subhorizontal closely spaced planar smooth tight. Locally NI; recovered as angular to subangular fine to coarse gravel.			36.00 -26.96
37.00-38.50	NI 65 70	C 70	19/12/2008 0800 35.45	37.90-38.10 m Subvertical discontinuity 38.25-42.40 m Subhorizontal discontinuities 38.50-38.90 m NI, recovered as gravel 39.20-39.35 m Subvertical discontinuity	(6.40)			
37.00-38.50	93 73 7		38.50-40.00					38.50-40.00
38.50-40.00	100 88 21							
Depth	TCR RCD	If	Records/Samples	Date Casing	Time Water	Stratum continues to 42.40 m		
Groundwater Entries No. Struck (m) Post strike behaviour Depth sealed (m) 2 33.10 Rose to 4.10 m after 20 minutes. Increase from 7.10m -						Depth Related Remarks * From to (m)		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.						Chiselling Depths (m) Time Tools used 31.30 -33.10 270 mins Chisel 34.80 -35.45 90 mins Chisel		
Project 2U - Afan Advanced Digestion Scheme Project No. H8118 Carried out for Morgan Est Plc.						Borehole BH4 Sheet 4 of 5		



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Borehole Log

PRELIMINARY



Soil Mechanics

Drilled Logged Checked	RD / GJ GRP / AH	Start 13/12/2008 End 22/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion borehole 1.20 - 31.50m. Rotary open holed 31.50 - 32.00m, rotary coring (P size) 32.00 - 39.50m. Terminated on engineer's instruction		Depth from 0.00m 11.30m 29.20m 31.50m	to 11.30m 29.20m 31.50m 39.50m	Diameter 250mm 200mm 150mm 120mm	Casing Depth 11.30m 29.20m 31.50m	Ground Level Coordinates National Grid Chainage	+7.93 mOD E 276105.43 N 187358.55		
Samples and Tests					Strata							
Depth	Type & No	Records	Date Casing	Time Water	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments				
0.20	ES 1		13/12/2008	0800	MADE GROUND: Grey silty slightly sandy subangular fine to coarse GRAVEL of limestone.	(0.40)						
0.50	ES 2				MADE GROUND: (Very dense) slightly silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone and shell fragments.	0.40 +7.53						
1.00	ES 3					(0.80)						
1.20-1.58 1.20-1.40	SPT C B 4	50 (2,4/7,18,25)			MADE GROUND: Very dense brown grey SAND and GRAVEL with high cobble content. Gravel is angular to subangular fine to coarse of slag and sandstone. Cobbles are angular of sandstone and slag.	1.20 +6.73 1.40 +6.53 (0.30)						
2.00-2.45 2.00 2.00-2.20	SPT S ES 5 B 6	N=18 (2,3/4,4,5,5)	2.00		MADE GROUND: (Very dense) dark grey slightly silty slightly sandy angular to subangular fine to coarse GRAVEL of slag and clinker with medium subangular cobbles of slag and clinker.	1.70 +6.23						
3.00-3.45 3.00-3.45 3.00-3.20	SPT S D 7 B 8	N=21 (2,2/4,5,6,6)	3.00		Medium dense light brown slightly silty slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone and shell fragments.							
4.00-4.45 4.00-4.20 4.00-4.45	SPT S B 10 D 11	N=16 (1,1/3,4,4,5)	4.00									
4.60	W 12											
5.00-5.45 5.00-5.20 5.00-5.45	SPT S B 14 D 15	N=17 (1,2/3,3,5,6)	13/12/2008 5.00 14/12/2008 5.00	1700 5.00 0800 3.10		(6.30)						
6.00-6.45 6.00-6.45 6.00-6.20	SPT S D 15 B 16	N=19 (1,1/3,4,5,7)	6.00									
7.00-7.45 7.00-7.45 7.00-7.20	SPT S D 17 B 18	N=22 (1,2/5,5,5,7)	7.00									
8.00-8.45 8.00-8.45 8.00-8.20	SPT S D 19 B 20	N=18 (2,1/3,4,5,6)	8.00	4.00	Medium dense brown grey silty slightly gravelly fine to coarse SAND. Gravel is subangular fine to coarse of sandstone, coal and shell fragments.	8.00 -0.07						
9.00-9.45 9.00-9.45 9.00-9.20	SPT S D 21 B 22	N=18 (2,2/4,4,4,6)	9.00	4.20		(3.30)						
Depth	Type & No	Records	Date Casing	Time Water	Stratum continues to 11.30 m							
Groundwater Entries					Depth Related Remarks *					Chiselling		
No.	Struck (m)	Post strike behaviour	Depth sealed (m)		From 1.50 3.80	to (m) 7.00 5.00	Water added to assist drilling process Sand blew up casing 5.00m to 3.80m overnight 13/12 (2.5hr re drill)			Depths (m) 1.40 -1.70	Time 45 mins	Tools used Chisel
1	4.60	-	-									
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.					Project 2U - Afan Advanced Digestion Scheme					Borehole BH5		
Scale 1:50					Project No. H8118					Sheet 1 of 4		
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Borehole Log

PRELIMINARY



Soil Mechanics

Drilled RD / GJ Logged GRP / AH Checked	Start 13/12/2008 End 22/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion borehole 1.20 - 31.50m. Rotary open holed 31.50 - 32.00m, rotary coring (P size) 32.00 - 39.50m. Terminated on engineer's instruction	Depth from 0.00m to 11.30m Diameter 250mm Casing Depth 11.30m 11.30m 29.20m 200mm 29.20m 29.20m 31.50m 150mm 31.50m 31.50m 39.50m 120mm	Ground Level +7.93 mOD Coordinates E 276105.43 National Grid N 187358.55 Chainage																																				
Samples and Tests			Strata																																					
Depth 10.00-10.45 10.00-10.45 10.00-10.20	Type & No SPT S D 23 B 24	Records N=23 (2,3/4,6,6,7)	Date 10.00	Time 4.20	Description (Continued from Sheet 1) Medium dense brown grey silty slightly gravelly fine to coarse SAND. Gravel is subangular fine to coarse of sandstone, coal and shell fragments.	Depth, Level/ (Thickness) 11.30 -3.37 (1.60)	Legend 	Backfill/ Instruments 																																
11.00-11.45 11.00-11.45 11.00-11.20	SPT S D 25 B 26	N=24 (2,2/5,5,7,7)	11.00 14/12/2008 11.30	4.30 1700 4.30	Medium dense dark brown grey silty gravelly coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone.	12.00 12.00-12.45 12.00-12.45 12.00-12.30	KFH SPT S D 27 B 28	k=1.1E-8 m/s N=25 (2,4/5,6,6,8)	12.00 4.50	Loose dark grey silty fine to coarse SAND with occasional pockets of soft clay.	12.90 -4.97 (1.10)	14.00-14.45 14.00-14.45 14.00-14.30	SPT S D 31 B 32	N=11 (2,2/2,3,3,3)	14.00 4.50	Medium dense dark grey slightly silty slightly gravelly fine SAND. Gravel is angular to subangular fine to coarse of sandstone.	15.00-15.45 15.00-15.45 15.00-15.30	SPT S D 33 B 34	N=20 (1,1/2,4,6,8)	15.00 4.50	16.00-16.45 16.00-16.45 16.00-16.30	SPT S D 35 B 36	N=19 (1,2/2,4,5,8)	16.00 4.50	17.00-17.45 17.00-17.45 17.00-17.30	SPT S D 37 B 38	N=11 (1,2/2,2,3,4)	17.00 4.50	Firm low strength dark grey slightly sandy silty CLAY.	18.00-18.50 18.50	U 39 D 40	9 blows No recovery NR	18.00 5.40 15/12/2008 1700 19.00 5.60 19.00 5.40 16/12/2008 0800 19.00 4.20	17.10 -9.17 (2.40)	19.00-19.50 19.50-19.95 19.50-19.80	SPT S D 42 B 43	N=13 (3,4/3,3,3,4)	19.50 5.60	Medium dense dark grey silty fine SAND.	19.50 -11.57
Depth 10.00-10.45 10.00-10.45 10.00-10.20	Type & No SPT S D 23 B 24	Records N=23 (2,3/4,6,6,7)	Date 10.00	Time 4.20	Stratum continues to 20.50 m	Groundwater Entries No. Struck Post strike behaviour (m)	Depth sealed (m)	Depth Related Remarks * From to (m)	Chiselling Depths (m)	Time	Tools used																													
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.																																								
Project 2U - Afan Advanced Digestion Scheme Project No. H8118 Carried out for Morgan Est Plc.																																								
Borehole BH5 Sheet 2 of 4																																								



Borehole Log

PRELIMINARY



Soil Mechanics

Drilled RD / GJ Logged GRP / AH Checked		Start 13/12/2008 End 22/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion borehole 1.20 - 31.50m. Rotary open holed 31.50 - 32.00m, rotary coring (P size) 32.00 - 39.50m. Terminated on engineer's instruction		Depth from 0.00m 11.30m 29.20m 31.50m	to 11.30m 29.20m 31.50m 39.50m	Diameter 250mm 200mm 150mm 120mm	Casing Depth 11.30m 29.20m 31.50m	Ground Level +7.93 mOD Coordinates E 276105.43 National Grid N 187358.55 Chainage
Samples and Tests					Strata				
Depth	Type & No	Records	Date Casing	Time Water	Description (Continued from Sheet 2)	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments	
20.50-20.95 20.50-20.95 20.50-20.80	SPT S D 44 B 45	N=17 (3,3/3,4,4,6)	20.50	4.50	Medium dense dark grey silty fine SAND.	(1.00)			
					Stiff sandy SILT.	20.50 -12.57			
						(0.80)			
21.30	D 46					21.30 -13.37			
21.50-22.00	U NR	No recovery NR	21.50	4.50	Firm dark grey slightly sandy silty organic CLAY.	(0.30)			
						21.60 -13.67			
22.00-22.45 22.00-22.45 22.00-22.30	SPT S D 48 B 49	N=28 (6,7/6,7,6,9)	22.00	4.50	Medium dense dark grey very silty slightly gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone.				
23.00-23.45 23.00-23.45 23.00-23.30	SPT S D 50 B 51	* N=11 (2,3/2,3,3,3)	23.00	4.50		(3.60)			
24.00-24.45 24.00-24.45 24.00-24.30	SPT S D 52 B 53	N=14 (2,3/3,3,4,4)	24.00	4.50					
25.00-25.45 25.00-25.45 25.00-25.30	SPT S D 54 B 55	N=14 (1,2/3,4,3,4)	25.00	4.50					
25.50-25.80	U 56	200 mm rec	25.50	4.50	Firm dark grey slightly sandy slightly organic silty CLAY.	25.20 -17.27			
25.80	D 57					(1.00)			
25.80-26.20	B 58								
26.20-26.40	B 59		16/12/2008 26.40	1700 3.10	Very dense grey brown silty sandy subangular to subrounded fine to coarse GRAVEL of sandstone.	26.20 -18.27			
			17/12/2008 26.40	0800 8.20					
27.00-27.45 27.00-27.30	SPT C B 60	N=50 (8,12/11,12,12,15)	27.00	5.30		(1.80)			
28.00-28.45 28.00	SPT C B 61	N=43 (6,8/10,10,11,12)	28.00	4.70	Dense grey brown clayey sandy subrounded to rounded fine to coarse GRAVEL of sandstone with medium cobble content. Cobbles are subrounded of sandstone.	28.00 -20.07			
						(1.20)			
29.00-29.37 29.00-29.20	SPT C B 62	50 (3,9/14,18,18 for 65mm)	29.00 17/12/2008 29.20 18/12/2008 29.20	5.60 1700 5.60 0800 7.20	Very stiff grey slightly sandy gravelly CLAY with medium cobble content. Gravels are subangular to subrounded fine to coarse of sandstone. Cobbles are	29.20 -21.27			
Depth	Type & No	Records	Date Casing	Time Water	Stratum continues to 30.80 m				
Groundwater Entries					Depth Related Remarks *		Chiselling		
No.	Struck (m)	Post strike behaviour	Depth sealed (m)	From to (m)		Depths (m)	Time	Tools used	
				23.00 26.40 26.40 28.90		28.90 -29.20 29.20 -30.00 30.00 -30.40	60 mins Chisel 145 mins Chisel 120 mins Chisel		
					Gravel blew up casing 26.40 to 23.00m overnight 16/12 (1hr re drill) Slow progress due to blowing gravels (5.5hr)				
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.					Project 2U - Afan Advanced Digestion Scheme		Borehole BH5		
Scale 1:50					Project No. H8118		Sheet 3 of 4		
(c) ESGL www.esgl.co.uk 408.24 19/02/2009 16:03:42					Carried out for Morgan Est Plc.				

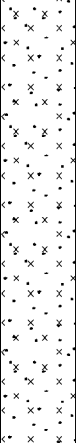
Borehole Log

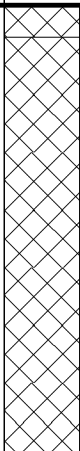
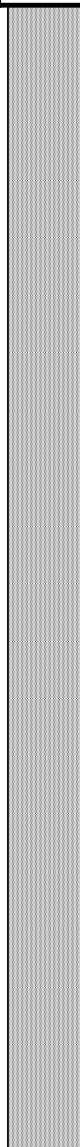
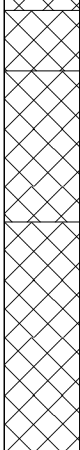
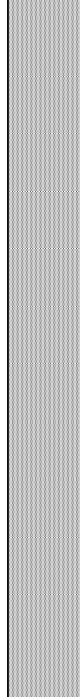
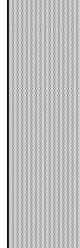
PRELIMINARY



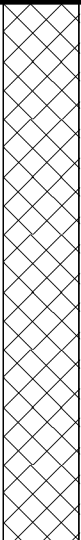
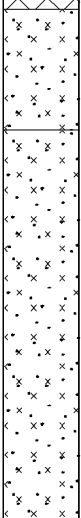
Soil Mechanics

Drilled Logged Checked		RD / GJ GRP / AH	Start 13/12/2008 End 22/12/2008	Equipment, Methods and Remarks Dando 2000 / Tractor Mounted Gryphon Hand dug inspection pit G.L. - 1.20m. Light cable percussion borehole 1.20 - 31.50m. Rotary open holed 31.50 - 32.00m, rotary coring (P size) 32.00 - 39.50m. Terminated on engineer's instruction		Depth from 0.00m 11.30m 29.20m 31.50m	to 11.30m 29.20m 31.50m 39.50m	Diameter 250mm 200mm 150mm 120mm	Casing Depth 11.30m 29.20m 31.50m	Ground Level +7.93 mOD Coordinates E 276105.43 National Grid N 187358.55 Chainage
Samples and Tests						Strata				
Depth	Type & No	Records	Date Casing	Time Water	Description (Continued from Sheet 3)	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments		
30.00-30.30 30.00-30.50	SPT C B 63	50 (5,15/21,29 for 70mm)	30.00	7.90	subangular of cobbles.	(1.60)				
30.80	D 64					30.80 -22.87				
31.00-31.15 31.00-31.30 31.00-31.40	SPT S D 65 B 66	50 (25/50 for 70mm)	31.00	8.10	Very dense very clayey sandy angular to subangular fine to medium GRAVEL of mudstone and siltstone.	(0.60)				
31.50-31.60 31.50	SPT C D 67	50 (25 for 55mm/50 for 40mm)	18/12/2008 31.50 22/12/2008 31.50	1700 5.30 0800 8.10	31.00 m Dark grey slightly sandy slightly gravelly SILT. Gravel is angular to subangular fine to coarse of sandstone.	31.40 -23.47 31.50 -23.57				
32.00-33.00	C 68				Very dense clayey sandy angular to subangular fine to coarse GRAVEL of sandstone with medium cobble content. Cobbles are subangular of sandstone.	(0.50)				
32.00-33.00	60 2 0				Clay and weathered mudstone (Driller's description).	32.00 -24.07				
33.00-34.50	NI	C 69			Weak locally medium strong dark grey thinly laminated SILTSTONE. Weathering: slight loss of strength throughout core. NI; recovered as angular to subangular medium to coarse gravel. Possible very closely spaced discontinuities. Partial recovery. Core loss presumed to be more weathered / weaker material.	(2.50)				
33.00-34.50	40 2 0									
34.50-35.50	0 0 0	Flush: 30.50-39.50 Air, 100 %			Fractured mudstone (Driller's description).	34.50 -26.57				
35.50-36.50	NR					(2.00)				
36.50-37.50	30 0 0	C 70			Weak locally medium strong dark grey thinly laminated SILTSTONE. Weathering: slight loss of strength throughout core. NI; recovered as angular to subangular medium to coarse gravel. Possible very closely spaced discontinuities. Partial recovery. Core loss presumed to be more weathered / weaker material.	36.50 -28.57				
37.50-38.50	50 4 0	C 71				(1.00)				
38.50-39.50	NI 30 40	C 72			Weak dark grey to black carbonaceous MUDSTONE. Weathering: slight loss of strength throughout core. Discontinuities: subhorizontal very closely spaced planar smooth tight. Locally NI; recovered as angular to subangular fine to coarse gravel. Partial recovery. Core loss presumed to be more weathered / weaker material.	37.50 -29.57				
38.50-39.50	60 5 0					(2.00)				
			22/12/2009 31.50	1700						
EXPLORATORY HOLE ENDS AT 39.50 m						39.50 -31.57				
Depth	TCR RCR ROR	If	Records/Samples	Date Casing	Time Water					
Groundwater Entries						Depth Related Remarks *				
No.	Struck (m)	Post strike behaviour	Depth sealed (m)			From	to (m)			
						Chiselling Depths (m)	Time	Tools used		
						30.00 -30.40	120 mins	Chisel		
						31.40 -31.50	45 mins	Chisel		
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.						Borehole				
Project						2U - Afan Advanced Digestion Scheme				
Project No.						H8118				
Carried out for						Morgan Est Plc.				
Scale 1:50						BH5				
(c) ESGL www.esgl.co.uk 408.24 19/02/2009 16:03:44						Sheet 4 of 4				

Logged GRP Checked		Start 24/11/2008 End 24/11/2008	Equipment, Methods and Remarks Tracked excavator Machine excavated pit G.L. - 3.50m. Terminated on client's instruction.		Dimensions and Orientation Width 1.60 m Length 3.50 m A B C D 075 (Deg)		Ground Level +7.92 mOD Coordinates E 276194.37 National Grid N 187351.13 Chainage	
Samples and Tests			Strata					
Depth	Type & No.	Date Records	Description			Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.00-0.30	B 1	1530	1 MADE GROUND: Dark brown and grey slightly silty sandy subangular to subrounded fine to coarse GRAVEL of slag, limestone and sandstone with medium cobble content. Cobbles are subangular of limestone and slag.			0.20 +7.72		
0.20	ES 2							
0.50 0.50-1.00	ES 3 B 4		2 MADE GROUND: Light brown silty slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone.			(1.30)		
1.00	ES 5							
1.50-2.00	B 6					3 MADE GROUND: Light grey silty sandy ashy angular to subangular fine to coarse GRAVEL of clinker and slag with medium cobble content. Cobbles are subangular of slag and clinker.		
2.00 2.00-2.50	ES 7 B 8	4 Light brown silty slightly gravelly SAND. Gravel is subrounded fine to coarse of sandstone and shell fragments.			2.00 +5.92			
3.00 3.00-3.50	ES 10 B 9							(1.50)
		24/11/2008 1700 dry				3.50 +4.42		
			EXPLORATORY HOLE ENDS AT 3.50 m					

Logged GRP Checked		Start 24/11/2008 End 24/11/2008	Equipment, Methods and Remarks Tracked excavator Machine excavated pit G.L. - 3.80m. Terminated on client's instruction.		Dimensions and Orientation Width 2.50 m Length 2.50 m A B C D 164 (Deg)			Ground Level +8.19 mOD Coordinates E 276160.65 National Grid N 187317.74 Chainage			
Samples and Tests				Strata							
Depth	Type & No.	Date Records		Description				Depth, Level/ (Thickness)		Legend	Backfill/ Instruments
0.00-0.30	B 1	1200		1 MADE GROUND: Brown silty slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone and shell fragments. 2 MADE GROUND: Brown to light brown silty slightly gravelly fine SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. Cobbles are subrounded of mudstone and sandstone.				0.10	+8.09		
0.20	ES 2							(1.40)			
0.50-1.00	B 3										
0.50	ES 4										
1.00	ES 5										
1.30-1.80	B 6			3 MADE GROUND: Grey angular to subangular COBBLES of brick clinker and slag with some silty sandy gravel. Gravel is subangular fine to coarse of sandstone and clinker. 4 MADE GROUND: Grey brown silty sandy subangular fine to coarse GRAVEL of clinker and slag with low to medium cobble content. Cobbles are subangular of slag and clinker. 5 MADE GROUND: Orange brown silty slightly gravelly fine to coarse SAND. Gravel is subangular fine to coarse of clinker and slag. 1.60-1.65 m [Black 'coal tar' type material, strong hydrocarbon odour.				1.50	+6.69		
1.65	ES 7							1.70	+6.49		
								(0.50)			
2.00-2.30	B 9							2.20	+5.99		
2.15	ES 8							(1.60)			
3.10-3.60	B 10										
		24/11/2008 1330 dry		EXPLORATORY HOLE ENDS AT 3.80 m				3.80	+4.39		
Depth	Type & No.	Records Date									
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)				Depth Related Remarks * From to (m)				Stability Sides unstable throughout Shoring None Weather Dry			
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.				Project 2U - Afan Advanced Digestion Scheme Project No. H8118 Carried out for Morgan Est Plc.				Trial Pit TP2 Sheet 1 of 1			
Scale 1:25				(c) ESGL www.esgl.co.uk 408.24 19/02/2009 16:03:54							

Logged GRP Checked	Start 24/11/2008 End 24/11/2008	Equipment, Methods and Remarks Tracked excavator Machine excavated pit G.L. -2.20m. Terminated due to presence of services.	Dimensions and Orientation Width 1.50 m Length 3.10 m A B C D B → 075 (Deg)	Ground Level Coordinates National Grid Chainage	+8.30 mOD E 276143.87 N 187288.20	
Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level/ (Thickness)	Legend	Backfill/ Instruments
0.00-0.30	B 1	1330	1 MADE GROUND: Soft brown organic 'sludge' (by-product of the water treatment works).	(0.50)		
0.20	ES 2					
0.50 0.50-1.00	ES 3 B 4		2 MADE GROUND: Light brown silty slightly gravelly fine to medium SAND with occasional rootlets. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone.	0.50 +7.80		
1.00 1.00-1.50	ES 5 B 6		1.10 m Earthing mat.	(1.00)		
2.00	ES 7	24/11/2008 1430 dry	3 MADE GROUND: Dark brown slightly clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone.	1.50 +6.80	(0.70)	
			EXPLORATORY HOLE ENDS AT 2.20 m	2.20 +6.10		
Depth	Type & No.	Records Date				
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)		Stability Sides unstable throughout Shoring None Weather Dry	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25			Project 2U - Afan Advanced Digestion Scheme Project No. H8118 Carried out for Morgan Est Plc.		Trial Pit TP3 Sheet 1 of 1	

Logged GRP Checked	Start 25/11/2008 End 25/11/2008	Equipment, Methods and Remarks Tracked excavator Machine excavated pit G.L. - 3.50m. Terminated on client's instruction.	Dimensions and Orientation Width 1.40 m Length 3.10 m A B C 155 (Deg)	Ground Level Coordinates National Grid Chainage	+9.55 mOD E 276097.19 N 187267.41	
Samples and Tests			Strata			
Depth	Type & No.	Date Records	Description	Depth, Level (Thickness)	Legend	Backfill/ Instruments
0.00-0.30	B 1	1330	1 MADE GROUND: Brown to light brown slightly silty slightly gravelly fine SAND with medium cobble content. Gravel is subangular to subrounded fine to coarse of brick, concrete and limestone. Cobbles are subangular of concrete and brick.	(1.80)		
0.20	ES 2					
0.50 0.50-1.00	ES 3 B 4					
1.00 1.00-1.50	ES 5 B 6					
2.00 2.00-2.50	ES 7 B 8	25/11/2008	2 Dark brown silty slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone.	1.80 +7.75 (0.40)		
3.00-3.50	B 9		3 Light brown silty slightly gravelly fine to coarse SAND. Gravel is subrounded to to rounded of sandstone.	2.20 +7.35 (1.30)		
			EXPLORATORY HOLE ENDS AT 3.50 m	3.50 +6.05		
Depth	Type & No.	Records Date				
Groundwater Entries No. Struck Post Strike Behaviour (m) None observed (see Key Sheet)			Depth Related Remarks * From to (m)		Stability Sides unstable throughout Shoring None Weather Dry	
Notes: For explanation of symbols and abbreviations see key sheet. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 (c) ESGL www.esgl.co.uk 408.24 19/02/2009 16:04:05 			Project 2U - Afan Advanced Digestion Scheme Project No. H8118 Carried out for Morgan Est Plc.		Trial Pit TP4 Sheet 1 of 1	