REPORT NO: 9606

GEOTECHNICAL BORING RECORD

IGSL Ltd.

CONTRACT : O'Devaney Gardens

CLIENT :
ENGINEER : ARUP

CO-ORDINATES : E -
N -

GROUND LEVEL (mOD) -
BOREHOLE DIAMETER (mm) 200
BOREHOLE DEPTH (m) 6.00
CASING DEPTH (m) 6.00

BOREHOLE NO: BH11
Sheet 1 of 1

DATE STARTED: 29/03/2004
DATE COMPLETED: 29/03/2004

BORED BY: J.O'Hara

DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES REF. NUMBER	SAMPLE TYPE	DEPTH (m)	FIELD TEST RESULTS	STAND PIPE DETAILS
MADE GROUND containing concrete	▩							
MADE GROUND containing clay	▓		0.20					
				3956	B	1.00	N=5	
Stiff brown sandy gravelly CLAY with cobbles	▨		1.30					
				3957	B	2.00	N=28	
Hard black sandy gravelly CLAY with cobbles	▨		2.40					
				3958	B	3.00	N=71/ 285mm	
				3959	B	4.00	N=69	
				3960	B	5.00	N=83	
End of Borehole at 6.00 m			6.00	3961	B	6.00	N=R	

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
0.00	0.20	1.00	
5.80	6.00	2.00	

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
2.20	2.20	2.50	-	-	Slow

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Com
29/03/2004	6.00	0.00	-	BH dry, end of

Remarks:

Appendix II – Trial Pit Records

REPORT NO. 9606

TRIAL PIT RECORD

IGSL Ltd.

CONTRACT:	O'Devaney Gardens	Trial Pit No.:	TP1
		Sheet:	Sheet 1 of 1
CLIENT:		Excavation Method:	CAT
ENGINEER:	ARUP	Date Started:	26/03/2004
CO-ORDINATES:	E - N -	Date Completed:	26/03/2004
		Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples Ref. No.	Samples Type	Samples Depth (m)	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSOIL	▨	0.20							
	MADE GROUND containing clay, cutlery, sand, gravel and cobbles	▨	0.90			L8256	D	0.50		
1.0	Firm/stiff grey and brown mottled sandy gravelly CLAY with occasional cobbles	▨	2.70			L8257	B	1.00		
2.0						L8258	B	2.00		
	Hard black sandy gravelly CLAY with occasional cobbles	▨	2.75			L8259	B	2.75		
3.0	End of Trial Pit at 2.75 m									
4.0										

Groundwater Conditions: No groundwater encountered

Stability: Stable

Remarks:

REPORT NO. 9606	TRIAL PIT RECORD	IGSL Ltd.

CONTRACT:	O'Devaney Gardens	Trial Pit No.:	TP2
		Sheet:	Sheet 1 of 1
CLIENT:		Excavation Method:	CAT
ENGINEER:	ARUP	Date Started:	25/03/2004
		Date Completed:	25/03/2004
CO-ORDINATES:	E - N -	Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples Ref. No.	Samples Type	Samples Depth (m)	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	MADE GROUND containing tarmacadam		0.10							
	MADE GROUND containing hardcore		0.30							
	MADE GROUND containing clay, gravel, sand, cobbles, boulders, wire and cloth					L8201	D	0.50		
1.0	Firm/stiff brown sandy gravelly CLAY with occasional cobbles and boulders		1.00			L8202	D	1.00		
						L8203	B	1.50		
2.0						L8204	B	2.00		
	Very stiff/hard black sandy gravelly CLAY with occasional cobbles		2.30 2.40							
	End of Trial Pit at 2.40 m									
3.0										
4.0										

Groundwater Conditions: No groundwater encountered

Stability: Stable

Remarks:

REPORT NO. 9606	TRIAL PIT RECORD	IGSL Ltd.

CONTRACT:	O'Devaney Gardens	Trial Pit No.:	TP3
		Sheet:	Sheet 1 of 1
CLIENT:		Excavation Method:	CAT
ENGINEER:	ARUP	Date Started:	25/03/2004
CO-ORDINATES:	E - N -	Date Completed:	25/03/2004
		Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Ref. No.	Type	Depth (m)		
0.0	TOPSOIL	▨								
	MADE GROUND containing clay, china, plastic, cobbles, gravel and sand	▩	0.10							
	MADE GROUND containing clay, plastic, sand, gravel and cobbles	▓	0.40			L8205	D	0.50		
1.0	Firm brown very sandy, very gravelly CLAY with some cobbles	▒	1.00			L8206	D	1.00		
						L8207	B	1.50		
2.0										
	Medium dense brown clayey, gravelly SAND with occasional cobbles	▒	2.30			L8208	B	2.30		
	Stiff brown sandy gravelly CLAY with occasional cobbles	▒	2.50		▽ ▽	L8209	B	2.60		
3.0	Stiff/very stiff black very sandy, gravelly CLAY with occasional cobbles	▒	2.90			L8210	B	3.00		
	End of Trial Pit at 3.00 m		3.00							
4.0										

Groundwater Conditions:	Seepage at 2.5m and slow ingress at 2.6m
Stability:	Collapse of pit
Remarks:	

REPORT NO. 9606

TRIAL PIT RECORD

IGSL Ltd.

CONTRACT: O'Devaney Gardens

CLIENT:

ENGINEER: ARUP

CO-ORDINATES: E -
N -

Trial Pit No.: TP4

Sheet: Sheet 1 of 1

Excavation Method: CAT

Date Started: 25/03/2004

Date Completed: 25/03/2004

Ground Level (mOD): -

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples Ref.No.	Samples Type	Samples Depth (m)	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSOIL									
	MADE GROUND containing clay, china,sand, gravel and cobbles		0.15							
						L8228	D	0.50		
1.0	Stiff grey brown sandy gravelly CLAY with some cobbles.		0.90			L8229	B	1.00		
	Firm grey brown sandy gravelly CLAY with some cobbles.		1.80							
2.0						L8230	B	2.00		
	Medium dense grey brown clayey, gravelly SAND		2.50							
	Very stiff black sandy gravelly CLAY with occasional cobbles		2.55		▽	L8231	B	2.60		
	End of Trial Pit at 2.60 m		2.60							
3.0										
4.0										

Groundwater Conditions: Seepage at 2.6m

Stability: Stable

Remarks:

REPORT NO. 9606	TRIAL PIT RECORD	IGSL Ltd.

CONTRACT: O'Devaney Gardens

CLIENT:

ENGINEER: ARUP

CO-ORDINATES: E -
N -

Trial Pit No.: TP5

Sheet: Sheet 1 of 1

Excavation Method: CAT

Date Started: 25/03/2004

Date Completed: 25/03/2004

Ground Level (mOD): -

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Ref. No.	Type	Depth (m)		
0.0	MADE GROUND containing ash, clay, glass and cobbles	▨	0.90			L8216	D	0.50		
1.0	Firm brown very sandy, very gravelly CLAY with some cobbles	▒	1.90			L8217	B	1.00		
2.0	Stiff/very stiff brown sandy, very gravelly CLAY with occasional cobbles	▒	2.60			L8218 L8219	B B	2.00 2.50		
	Medium dense brown clayey, very sandy GRAVEL with some cobbles	▒	2.90							
3.0	Very stiff/hard black sandy gravelly CLAY	▒	3.00			L8220	B	3.00		
	End of Trial Pit at 3.00 m									
4.0										

Groundwater Conditions: No groundwater encountered

Stability: Stable

Remarks:

REPORT NO. **9606**

TRIAL PIT RECORD

IGSL Ltd.

CONTRACT: O'Devaney Gardens

CLIENT:

ENGINEER: ARUP

CO-ORDINATES: E -
N -

Trial Pit No.: TP6

Sheet: Sheet 1 of 1

Excavation Method: CAT

Date Started: 25/03/2004

Date Completed: 25/03/2004

Ground Level (mOD): -

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Ref. No.	Type	Depth (m)		
0.0	TOPSOIL	▩	0.10							
	MADE GROUND containing clay, china, cobbles and glass	▩	0.80			L8221	D	0.50		
1.0	Firm/stiff grey brown sandy gravelly CLAY with occasional cobbles	▒	2.00			L8222	B	1.00		
2.0	Very stiff/hard grey brown sandy gravelly CLAY with occasional cobbles	▒	2.40			L8223	B	2.10		
	End of Trial Pit at 2.40 m									
3.0										
4.0										

Groundwater Conditions: No groundwater encountered

Stability: Stable

Remarks:

REPORT NO. 9606	TRIAL PIT RECORD	IGSL Ltd.

CONTRACT:	O'Devaney Gardens	Trial Pit No.:	TP7
		Sheet:	Sheet 1 of 1
CLIENT:		Excavation Method:	CAT
ENGINEER:	ARUP	Date Started:	25/03/2004
		Date Completed:	25/03/2004
CO-ORDINATES:	E - N -	Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Ref. No.	Type	Depth (m)		
0.0	TOPSOIL	▩	0.10							
	MADE GROUND containing clay, pottery, china and cobbles	▨				L8224	D	0.60		
1.0	Firm/stiff grey brown sandy very gravelly CLAY with occasional cobbles	░	1.00			L8225	D	1.00		
						L8226	B	1.80		
2.0										
	Very stiff/hard black sandy gravelly CLAY with occasional cobbles	░	2.30							
	End of Trial Pit at 2.40 m		2.40			L8227	B	2.40		
3.0										
4.0										

Groundwater Conditions:	No groundwater encountered
Stability:	Stable
Remarks:	

REPORT NO. 9606	TRIAL PIT RECORD	IGSL Ltd.

CONTRACT:	O'Devaney Gardens	Trial Pit No.:	TP8
		Sheet:	Sheet 1 of 1
CLIENT:		Excavation Method:	CAT
ENGINEER:	ARUP -	Date Started:	25/03/2004
		Date Completed:	25/03/2004
CO-ORDINATES:	E - N -	Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Ref. No.	Type	Depth (m)		
0.0	TOPSOIL	▩	0.10							
	MADE GROUND containing clay, pottery, gravel, sand and plastic	▩				L8211	D	0.60		
1.0	Soft/firm light brown sandy gravelly CLAY	░	1.00			L8212	D	1.00		
		░				L8213	B	1.30		
	Soft/firm grey and brown mottled very sandy, very gravelly CLAY with occasional cobbles	░	1.40							
2.0		░			∇	L8214	B	2.00		
	Soft/firm brown very sandy, gravelly CLAY with some cobbles and occasional boulders	░	2.30		∇					
3.0	Very stiff/hard black sandy gravelly CLAY with occasional cobbles	░	3.00 3.10			L8215	B	3.00		
	End of Trial Pit at 3.10 m									
4.0										

Groundwater Conditions:	Slow ingress at 2.1 and 2.4m
Stability:	Collapse of pit from 2.1m
Remarks:	

REPORT NO. 9606	TRIAL PIT RECORD	IGSL Ltd.

CONTRACT:	O'Devaney Gardens	Trial Pit No.:	TP9
		Sheet:	Sheet 1 of 1
CLIENT:		Excavation Method:	CAT
ENGINEER:	ARUP	Date Started:	26/03/2004
CO-ORDINATES:	E - N -	Date Completed:	26/03/2004
		Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples Ref. No.	Samples Type	Samples Depth (m)	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSOIL		0.10							
	MADE GROUND containing clay, cobbles, gravel and plastic		0.70			L8244	D	0.50		
	Firm/stiff brown sandy gravelly CLAY with occasional cobbles									
1.0						L8246 L8245	B D	1.10		
2.0			2.50			L8248 L8247	B D	2.00		
	Very stiff/hard black sandy gravelly CLAY with occasional cobbles		2.60			L8249	B	2.50		
	End of Trial Pit at 2.60 m									
3.0										
4.0										

Groundwater Conditions:	No groundwater encountered
Stability:	Stable
Remarks:	

REPORT NO. 9606	TRIAL PIT RECORD	IGSL Ltd.

CONTRACT:	O'Devaney Gardens	Trial Pit No.:	TP10
		Sheet:	Sheet 1 of 1
CLIENT:		Excavation Method:	CAT
ENGINEER:	ARUP	Date Started:	26/03/2004
		Date Completed:	26/03/2004
CO-ORDINATES:	E - N -	Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Ref. No.	Type	Depth (m)		
0.0	TOPSOIL	▨								
	MADE GROUND containing clay, red brick, roots, tin, pottery and metal	▨	0.15			L8238	D	0.50		
1.0	Firm brown sandy, gravelly CLAY with some cobbles and boulders	▨	0.70			L8240 L8239	B D	1.00		
2.0	Firm brown sandy, gravelly CLAY with occasional cobbles and boulders	▨	1.40			L8242 L8241	B D	2.00		
	Hard black sandy gravelly CLAY with occasional cobbles and boulders	▨	2.40			L8243	B	2.40		
	End of Trial Pit at 2.45 m		2.45							
3.0										
4.0										

Groundwater Conditions:	No groundwater encountered
Stability:	Stable
Remarks:	

REPORT NO. 9606	TRIAL PIT RECORD	IGSL Ltd.

CONTRACT:	O'Devaney Gardens	Trial Pit No.:	TP11
		Sheet:	Sheet 1 of 1
CLIENT:		Excavation Method:	CAT
ENGINEER:	ARUP	Date Started:	26/03/2004
		Date Completed:	26/03/2004
CO-ORDINATES:	E - N -	Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Ref. No.	Type	Depth (m)		
0.0	MADE GROUND containing clay, fibreglass insulation, plastic, glass, gravel, cobbles and sand	▨								
	Firm grey brown sandy gravelly CLAY with occasional cobbles and boulders.	░	0.55			L8232	D	0.50		
1.0						L8233 L8234	B D	1.00		
2.0					▽	L8235 L8236	B D	2.10		
	Hard black sandy gravelly CLAY with occasional cobbles and boulders	░	2.40			L8237	B	2.50		
3.0	End of Trial Pit at 2.90 m		2.90							
4.0										

Groundwater Conditions:	Slow seepage from 2.2m
Stability:	Collapse of sidewalls
Remarks:	

REPORT NO. 9606	TRIAL PIT RECORD	IGSL Ltd.

CONTRACT:	O'Devaney Gardens	Trial Pit No.:	TP12
		Sheet:	Sheet 1 of 1
CLIENT:		Excavation Method:	CAT
ENGINEER:	ARUP	Date Started:	26/03/2004
		Date Completed:	26/03/2004
CO-ORDINATES:	E - N -	Ground Level (mOD):	-

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water Strike (m)	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Ref. No.	Type	Depth (m)		
0.0	TOPSOIL	▨	0.10							
	MADE GROUND containing clay, red brick, sand, gravel and cobbles	▨	0.90			L8250	D	0.50		
1.0	Firm/stiff brown sandy gravelly CLAY with some cobbles and occasional boulders	▒				L8252 L8251	B D	1.00		
2.0		▒	2.40		▽ ▽	L8254 L8253	B D	2.20		
	Hard black sandy gravelly CLAY with occasional cobbles	▒	2.50			L8255	B	2.50		
	End of Trial Pit at 2.50 m									
3.0										
4.0										

Groundwater Conditions: Slow ingress at 2.0m and seepage at 2.4m

Stability: Stable

Remarks:

Appendix III – Laboratory Test Records

Determination of Moisture Content

BS1377:Part 2:1990, clauses 3.2

BH/TP No.	Sample No.	Depth (m)	Sample Type	Moisture Content %	Description
TP 1	8256	0.50	D	28.2	Grey brown slightly sandy slightly gravelly SILT/CLAY with root hairs
TP 2	8201	0.50	D	13.8	Brown slightly sandy slightly gravelly SILT/CLAY with shell fragments
TP 2	8202	1.00	D	12.9	Grey brown slightly sandy slightly gravelly SILT/CLAY
TP 3	8205	0.50	D	27.3	Grey brown slightly sandy slightly gravelly SILT/CLAY with shell fragments
TP 3	8206	1.00	D	19.0	Brown slightly sandy slightly gravelly SILT/CLAY with shell fragments
TP 4	8228	0.50	D	23.7	Grey brown slightly sandy slightly gravelly SILT/CLAY with root hairs
TP 5	8216	0.50	D	23.1	Grey brown slightly sandy slightly gravelly SILT/CLAY
TP 6	8221	0.50	D	22.6	Brown slightly sandy slightly gravelly SILT/CLAY with red brick
TP 7	8224	0.50	D	16.5	Grey brown slightly sandy slightly gravelly SILT/CLAY
TP 7	8225	1.00	D	14.6	Mottled brown slightly sandy slightly gravelly SILT/CLAY
TP 8	8211	0.50	D	25.0	Grey brown slightly sandy slightly gravelly SILT/CLAY with red brick
TP 8	8712	1.00	D	30.2	Grey brown slightly sandy slightly gravelly SILT/CLAY with red brick
TP 9	8244	0.50	D	18.4	Grey brown slightly sandy slightly gravelly SILT/CLAY with root hairs
TP 9	8245	1.10	D	14.8	Grey brown slightly sandy slightly gravelly SILT/CLAY
TP 9	8247	2.00	D	13.5	Grey brown slightly sandy slightly gravelly SILT/CLAY
TP 10	8238	0.50	D	27.6	Grey brown slightly sandy slightly gravelly SILT/CLAY with root hairs
TP 10	8239	1.00	D	16.2	Grey brown slightly sandy slightly gravelly SILT/CLAY
TP 10	8241	2.00	D	15.1	Grey brown slightly sandy slightly gravelly SILT/CLAY with red brick
TP 11	8232	0.50	D	32.5	Grey black slightly sandy slightly gravelly SILT/CLAY with red brick
TP 11	8236	2.10	D	22.3	Grey brown slightly sandy slightly gravelly SILT/CLAY
TP 12	8250	0.50	D	22.5	Grey brown slightly sandy slightly gravelly SILT/CLAY with root hairs
TP 12	8251	1.00	D	11.1	Grey brown slightly sandy slightly gravelly SILT/CLAY
TP 12	8253	2.00	D	11.8	Grey brown slightly sandy slightly gravelly SILT/CLAY

IGSL

Contract: O'DEVANEY GARDENS

Contract No. 9606

Compiled By: D CONNOLLY

Date: 15/5/04

Page: 1 of 1

Summary of Classification Tests

BS1377:Part 2:1990, clauses 3.2, 4.3, 5.3 & 5.4

BH/TP No.	Sample No.	Depth (m)	Sample Type	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	<425µm %	Preparation	Description	Classification
BH 1	3965	4.00	B	9.4	29	17	12	33.1	WS	Brown slightly sandy slightl gravelly CLAY	C L
BH 7	3923	4.00	B	8.3	32	17	15	52.2	WS	Grey slightly sandy slightl gravelly CLAY	C L
BH 8	3927	2.00	B	9.2	28	16	12	49.1	WS	Brown slightly sandy slightl gravelly CLAY	C L
BH 9	3915	2.00	B	11.2	28	17	11	60	WS	Brown slightly sandy slightl gravelly CLAY	C L
TP 5	8217	1.00	B	17.3	42	25	17	61	WS	Brown slightly sandy slightl gravelly CLAY	C I
TP 8	8213	1.30	B	20.7	31	20	11	56.2	WS	Grey brown slightly sandy slightl gravelly CLAY	C L
TP 8	8214	2.00	B	14.9	25	17	8	53.2	WS	Mottled grey brown slightly sandy slightl gravelly CLAY	C L
TP 9	8246	1.10	B	22.1	40	22	18	50.5	WS	Mottled grey brown slightly sandy slightl gravelly CLAY	C I
TP 11	8237	2.50	B	8.8	32	18	14	53.8	WS	Grey slightly sandy slightl gravelly CLAY	C L

Notes: NAT - tested as received WS - Wet sieved (425µm) NP - Non Plastic

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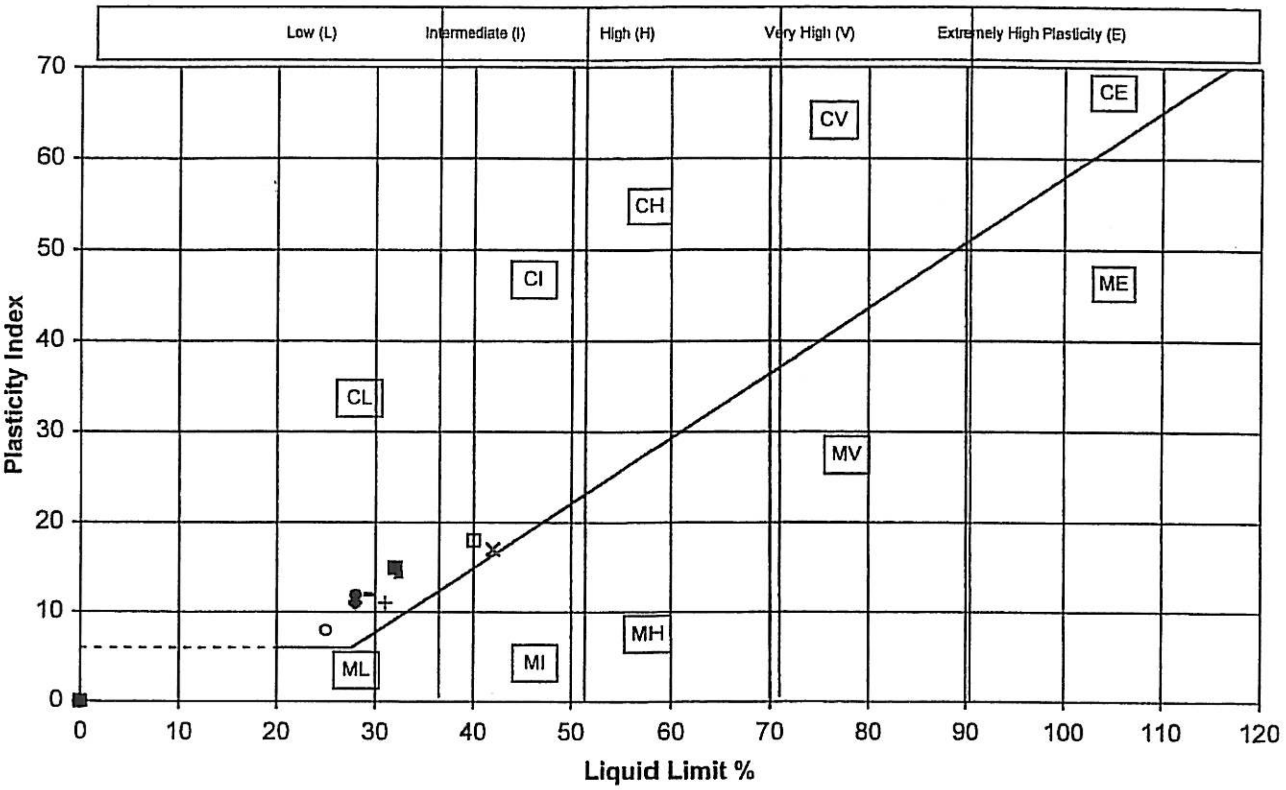
Plasticity Chart - Summary of Liquid & Plastic Limit Tests

BS1377:Part 2:1990, clauses 3.2, 4 & 5

Chart in accordance with BS5930:1999, fig.18

Contract No. 9606 Contract: O'DEVANEY GARDENS



Code	BH/TP	Sample	Depth (m)	MC%	LL%	PL%	PI%	%<425µm	Description
-	BH 1	3965	4.00	9.4	29	17	12	33.1	Brown slightly sandy slightl gravelly CLAY
■	BH 7	3923	4.00	8.3	32	17	15	52.2	Grey slightly sandy slightl gravelly CLAY
●	BH 8	3927	2.00	9.2	28	16	12	49.1	Brown slightly sandy slightl gravelly CLAY
◆	BH 9	3915	2.00	11.2	28	17	11	60	Brown slightly sandy slightl gravelly CLAY
x	TP 5	8217	1.00	17.3	42	25	17	61	Brown slightly sandy slightl gravelly CLAY
+	TP 8	8213	1.30	20.7	31	20	11	56.2	Grey brown slightly sandy slightl gravelly CLAY
o	TP 8	8214	2.00	14.9	25	17	8	53.2	Mottled grey brown slightly sandy slightl gravelly CLAY
□	TP 9	8246	1.10	22.1	40	22	18	50.5	Mottled grey brown slightly sandy slightl gravelly CLAY
-	TP 11	8237	2.50	8.8	32	18	14	53.8	Grey slightly sandy slightl gravelly CLAY
■									
●									
◆									
x									
+									
o									
□									

NP denotes specimen is non-plastic.

	Compiled by	Date	Checked by	Date	Page
IGSL	D CONNOLLY	5/1/04			

REPORT NO.

SULPHATE ANALYSIS

IGSL

CONTRACT: **O'DEVANEY GARDENS**

CONTRACT NO 9606

BH/TP NO.	DEPTH (M)	SAMPLE NO.	SAMPLE TYPE	TEST CODE	% Passing 2mm	SULPHUR TRIOXIDE		(so3 X 1.2)	pH
						WATER SO3 g/L	TOTAL SOIL so3 %	TOTAL SOIL so 4 %	VALUE
TP 5	3.00	8218	D	S	67.6		0.001	0.001	7.7
TP 7	1.80	8226	D	S	74.7		0.002	0.002	7.7
TP 9	2.00	8248	D	S	59.7		0.002	0.002	7.7
TP 12	1.00	8252	D	S	68.9		0.001	0.001	7.6

TEST CODE: W = WATER S = SOIL A = AQUEOUS SOIL EXTRACT(2:1)

REPORT NO.

SULPHATE ANALYSIS

IGSL

CONTRACT: **33-34 Sir John Rogersons Quay Dublin**

CONTRACT NO 9639

BH/TP NO.	DEPTH (M)	SAMPLE NO.	SAMPLE TYPE	TEST CODE	% Passing 2mm	SULPHUR TRIOXIDE		(so3 X 1.2)	pH
						WATER SO3 g/L	TOTAL SOIL so3 %	TOTAL SOIL so 4 %	VALUE
BH 1	2.00	6305	D	S	57.3		0.047	0.056	7.4
BH 2	2.00	6315	D	S	43.9		0.080	0.096	6.9

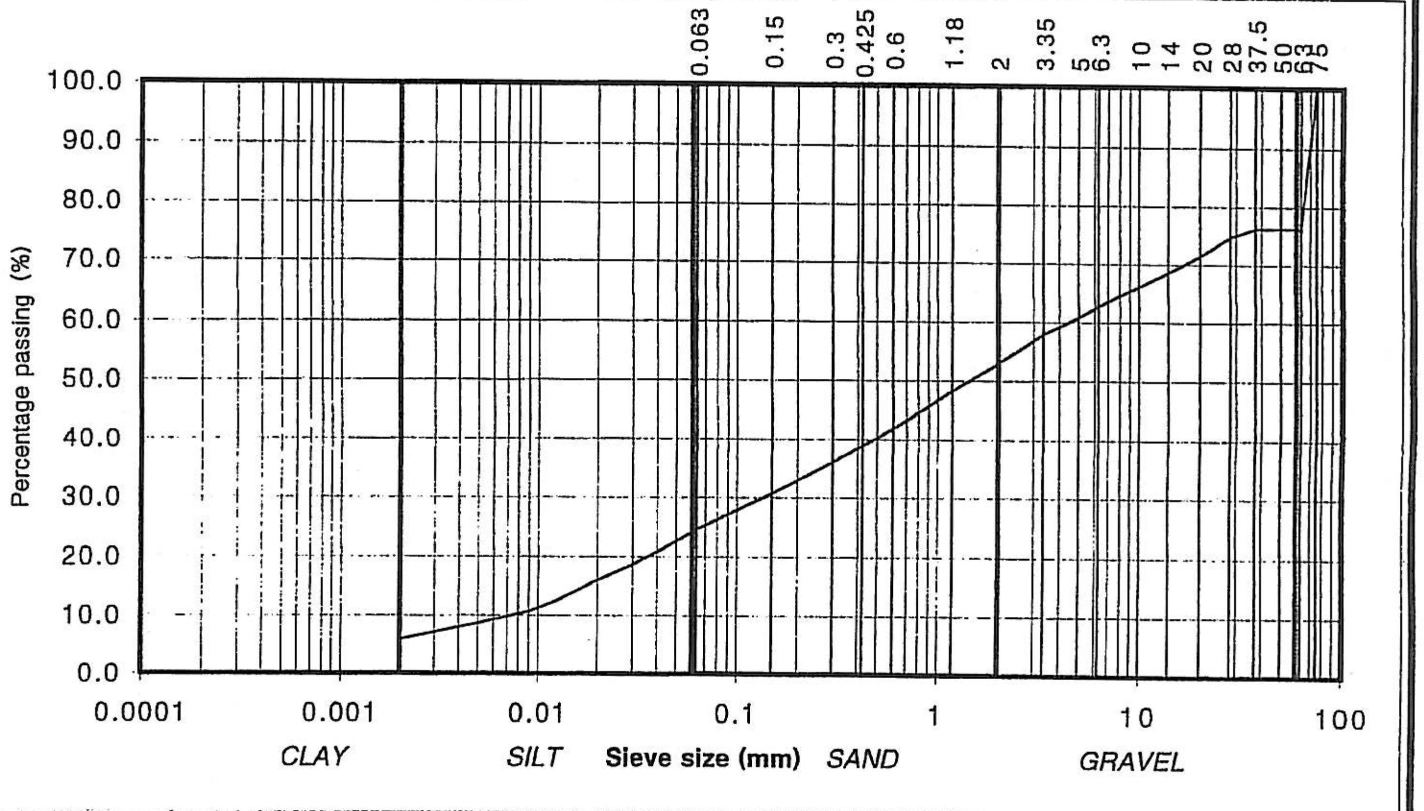
TEST CODE: W = WATER S = SOIL A = AQUEOUS SOIL EXTRACT(2:1)

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No: 9606
Contract: O'DEVANEY GARDENS
BH/TP No: TP 3
SAMPLE No.: 8208
DEPTH (m): 2.30
TEST METHOD: Wet sieve and hydrometer
DESCRIPTION: Grey brown slightly sandy, gravelly, SILT/CLAY with many cobbles

particle size	% passing	
75	100.0	COBBLES
63	76.2	GRAVEL
50	76.2	
37.5	76.2	
28	74.8	
20	71.3	
14	68.5	
10	66.0	
6.3	62.8	
5	60.7	
3.35	57.9	
2	52.9	SAND
1.18	48.3	
0.6	41.7	
0.425	38.8	
0.3	36.0	
0.15	30.7	
0.063	24.6	SILT/CLAY
0.04	20.8	
0.03	18.6	
0.02	16.1	
0.013	12.7	
0.009	10.6	
0.005	8.6	
0.002	5.8	



	Compiled by:	Date:	Checked by:	Date:	Page no:
IGSL	D CONNOLLY	5/1/04			

Irish Geotechnical Services Ltd., Industrial Estate, Newbridge, Co kildare

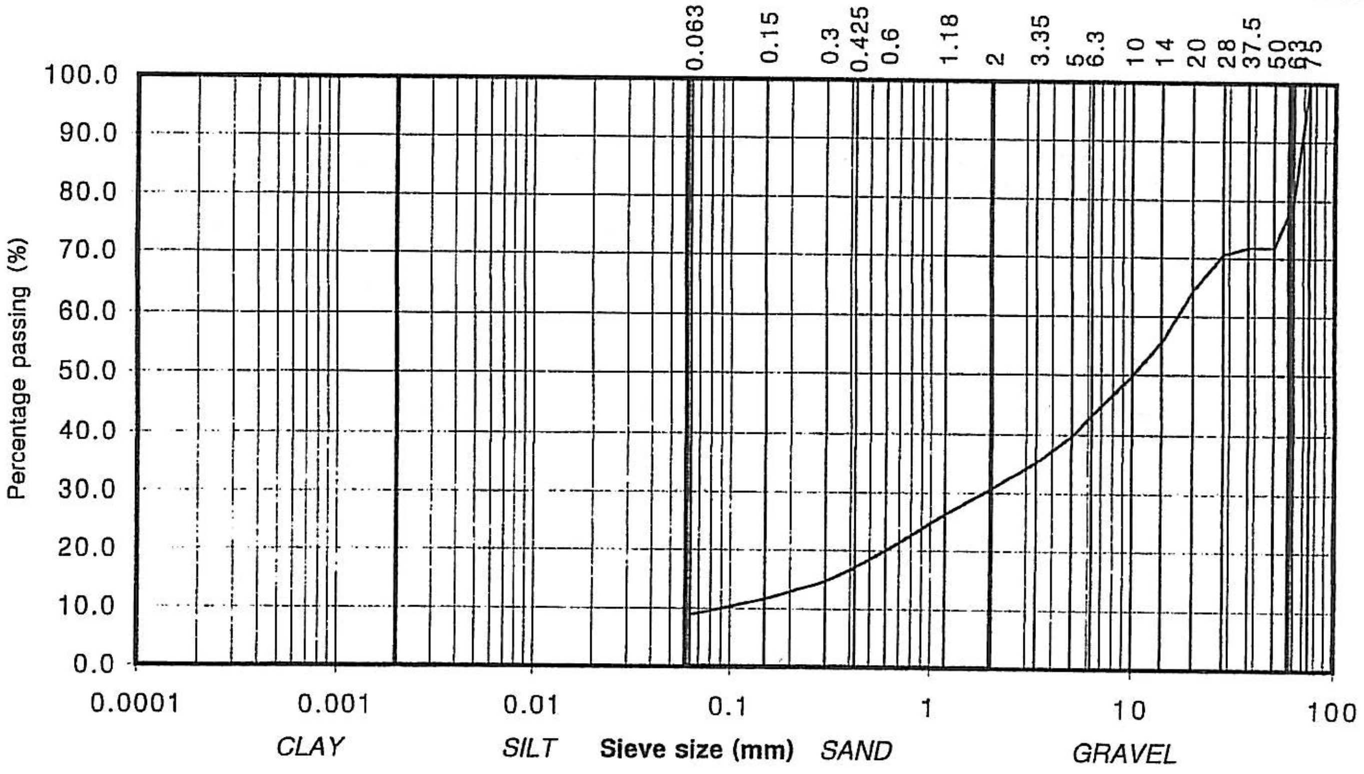
PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100.0	COBBLES
63	79.4	GRAVEL
50	71.8	
37.5	71.8	
28	70.5	
20	64.1	
14	55.5	
10	49.8	
6.3	43.2	
5	39.7	
3.35	35.1	
2	30.7	SAND
1.18	26.3	
0.6	20.1	
0.425	17.1	
0.3	14.7	
0.15	11.6	
0.063	8.8	SILT/CLAY
0.04	#N/A	
0.03	#N/A	
0.02	#N/A	
0.013	#N/A	
0.009	#N/A	
0.005	#N/A	
0.002	#N/A	

Contract No:	9606
Contract:	O'DEVANEY GARDENS
BH/TP No:	TP 5
SAMPLE No.:	8219
DEPTH (m):	2.50
TEST METHOD:	Wet sieve
DESCRIPTION:	Brown clayey/silty, very sandy, GRAVEL with many cobbles



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IGSL	D CONNOLLY	5/1/04			

Irish Geotechnical Services Ltd., Industrial Estate, Newbridge, Co kildare

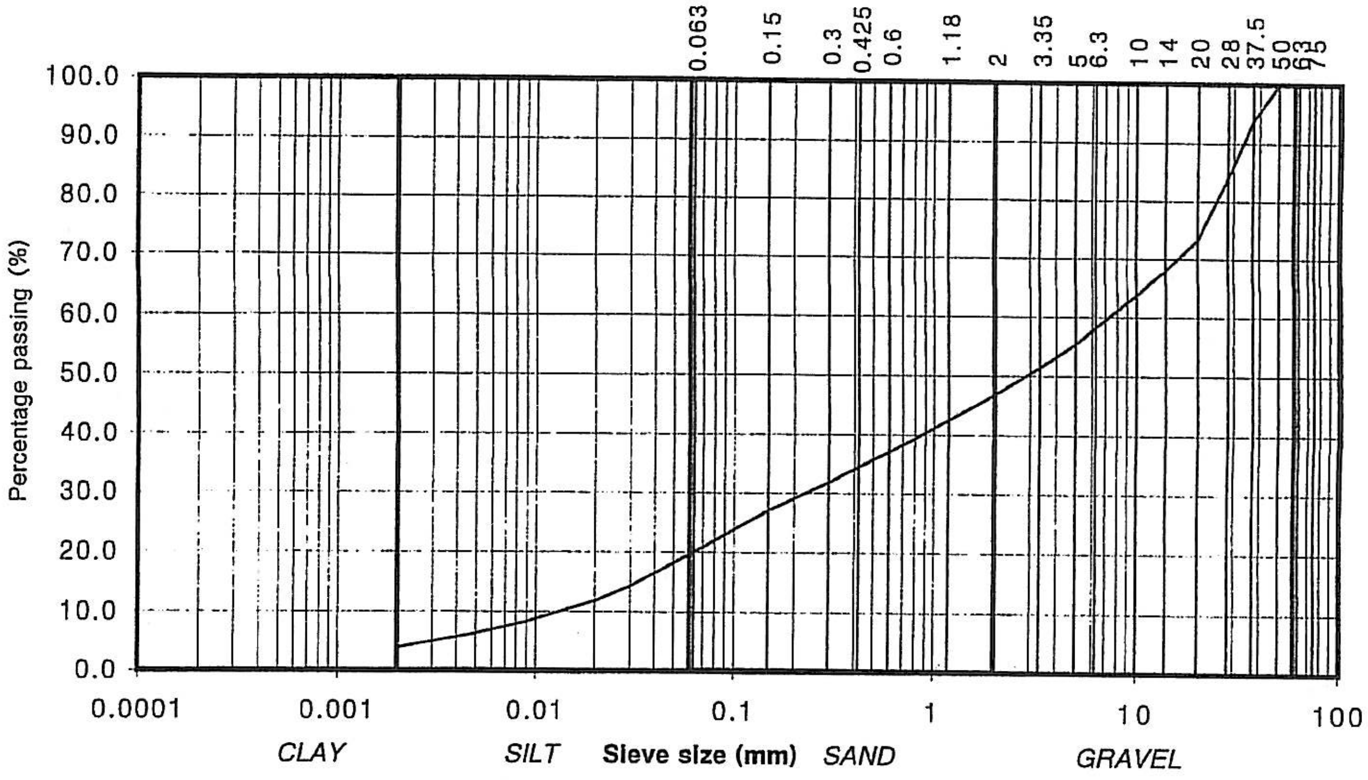
PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100.0	COBBLES
63	100.0	GRAVEL
50	100.0	
37.5	93.8	
28	84.0	
20	73.3	
14	67.9	
10	63.7	
6.3	58.2	
5	55.4	
3.35	51.4	
2	46.7	SAND
1.18	42.6	
0.6	37.0	
0.425	34.4	
0.3	31.8	
0.15	27.0	
0.063	20.0	SILT/CLAY
0.04	16.5	
0.03	14.2	
0.02	11.8	
0.013	9.9	
0.009	8.3	
0.005	6.2	
0.002	3.8	

Contract No: 9606
Contract: O'DEVANEY GARDENS
BH/TP No: TP 3
SAMPLE No.: 8207
DEPTH (m): 1.50
TEST METHOD: Wet sieve and hydrometer
DESCRIPTION: Brown slightly sandy, gravelly, SILT/CLAY



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D CONNOLLY	5/1/04			

Irish Geotechnical Services Ltd., Industrial Estate, Newbridge, Co kildare

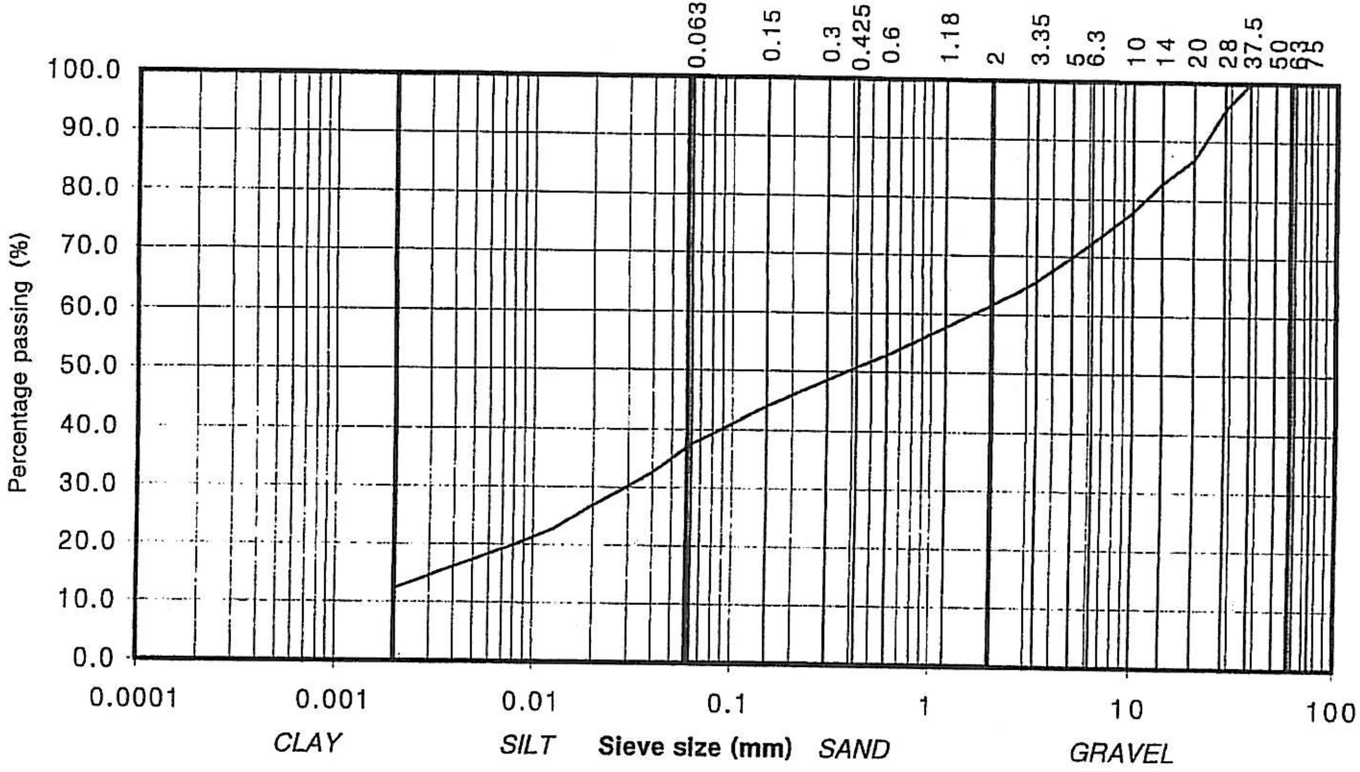
PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No: 9606
Contract: O'DEVANEY GARDENS
BH/TP No: TP 9
SAMPLE No.: 8247
DEPTH (m): 2.00
TEST METHOD: Wet sieve and hydrometer
DESCRIPTION: Grey brown slightly sandy, gravelly, SILT/CLAY

particle size	% passing	
75	100.0	COBBLES
63	100.0	GRAVEL
50	100.0	
37.5	100.0	
28	95.3	
20	86.8	
14	82.7	
10	77.7	
6.3	72.3	
5	69.8	
3.35	65.6	
2	61.6	SAND
1.18	57.8	
0.6	52.9	
0.425	50.8	
0.3	48.5	
0.15	44.1	
0.063	37.5	SILT/CLAY
0.04	32.6	
0.03	30.2	
0.02	26.8	
0.013	23.0	
0.009	20.6	
0.005	17.3	
0.002	12.2	



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D CONNOLLY	5/1/04			

Irish Geotechnical Services Ltd., Industrial Estate, Newbridge, Co kildare

PSD V3.1 12.01

REPORT NO.

LOSS ON IGNITION ANALYSIS

IGSL

CONTRACT: **O'DEVANEY GARDENS**

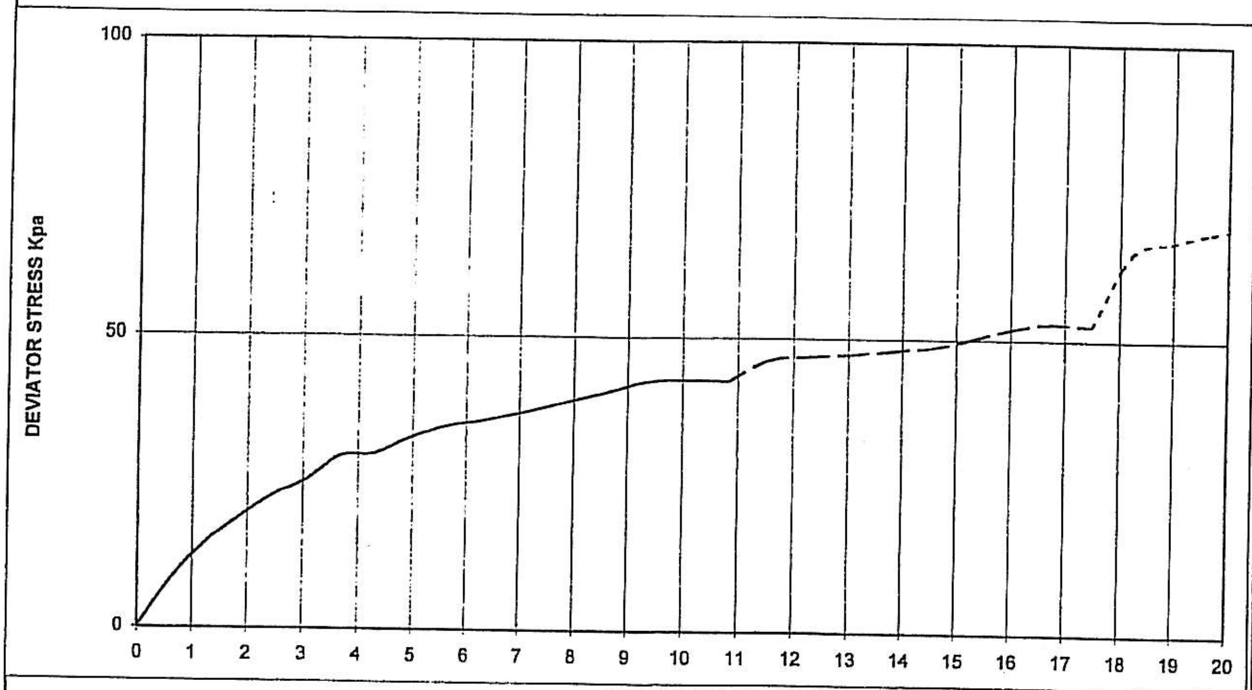
CONTRACT NO 9606

BOREHOLE NO.	SAMPLE NO.	DEPTH (METRES)	SAMPLE TYPE	% PASSING 2mm	L .O .I %	REMARKS
BH 8	3927	2.00	D	59.7	2.26	
TP 8	8214	2.00	D	68.6	2.34	

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITH MULTISTAGE LOADING WITHOUT PWP - SINGLE SPECIMEN

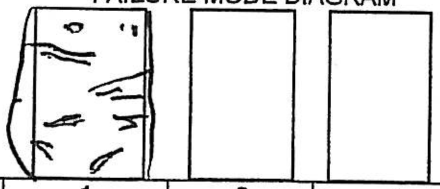
BS1377:Part 7:1990, clause 9

Contract No.	**9606**		Contract:	**O'DEVANEY GARDENS**	
BH/TP No.	**BH 11**	Sample No.	**3957**	Depth (M)	**2.00**



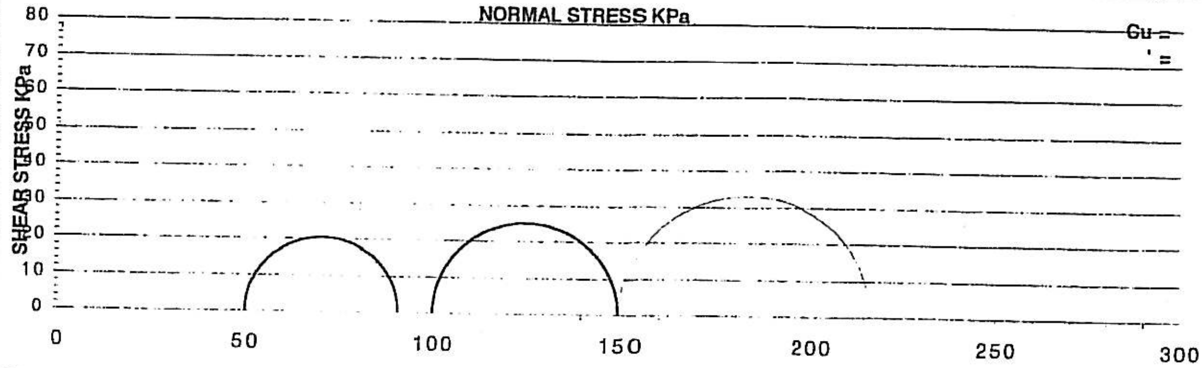
Description:
Brown slightly sandy slightly gravelly SILT/CLAY

FAILURE MODE DIAGRAM



Menbrane thickness(mm) 0.3
~~Undisturbed~~ Recompacted 2.5kg
Rate of strain %/min 2%

	1	2	3	
CELL PRESSURE KPa	50	100	150	
DEVIATOR STRESS KPa	42.8	52.8	69.0	
DEVIATOR STRESS CORRECTED KPa	**40.6**	**50.0**	**66.0**	
MEMBRANE CORRECTION KPa	2.2	2.8	3.0	
MOISTURE CONTENT %	14.3			
BULK DENSITY Mg/m3	2.22			
DRY DENSITY Mg/m3	1.94			
DIAMETER mm	102			
LENGTH mm	203			
STRAIN AT FAILURE %	**10.1**	**16.7**	**20.0**	
Cu KPa	20.3	25.0	33.0	



IGSL	Compiled By	Date	Checked By	Date	Page No.
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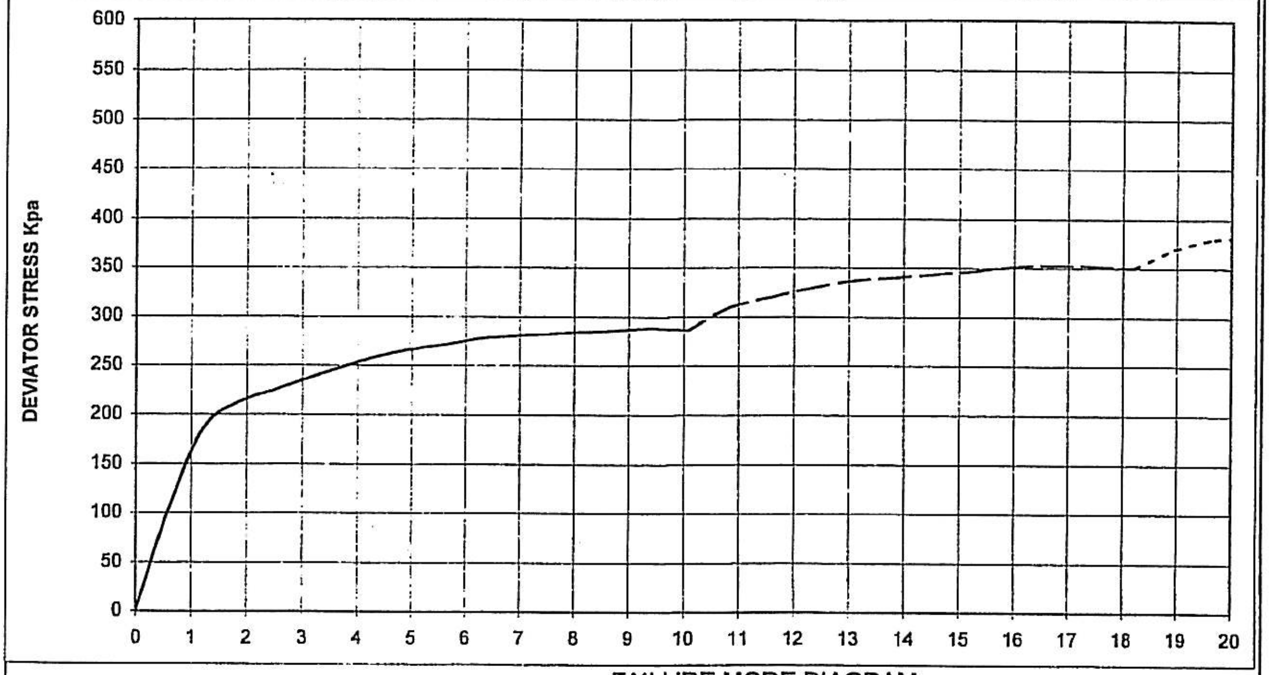
UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITH MULTISTAGE LOADING WITHOUT PWP - SINGLE SPECIMEN

BS1377:Part 7:1990, clause 9

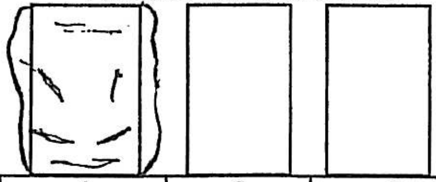
Contract No. **9606** Contract: **O'DEVANEY GARDENS**

BH/TP No. **BH 4** Sample No. **3952** Depth (M) **3.00**



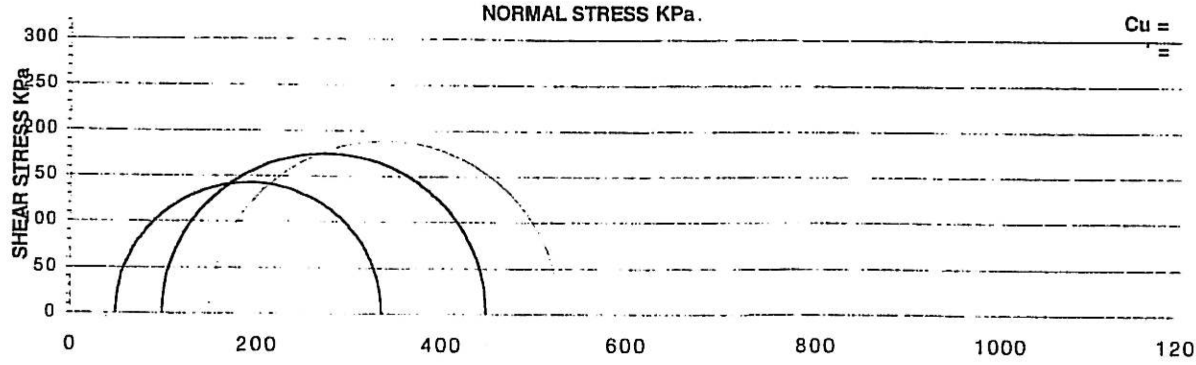
FAILURE MODE DIAGRAM

Description:
Dark grey slightly sandy slightly gravelly SILT/CLAY



Menbrane thickness(mm)	0.3
~~Undisturbed~~ Recompacted	2.5kg
Rate of strain %/min	2%

	1	2	3	
CELL PRESSURE KPa	50	100	150	
DEVIATOR STRESS KPa	287.5	352.3	381.2	
DEVIATOR STRESS CORRECTED KPa	**285.3**	**349.5**	**378.2**	
MEMBRANE CORRECTION KPa	2.2	2.8	3.0	
MOISTURE CONTENT %	9.9			
BULK DENSITY Mg/m3	2.18			
DRY DENSITY Mg/m3	1.98			
DIAMETER mm	102			
LENGTH mm	203			
STRAIN AT FAILURE %	**9.4**	**16.7**	**20.0**	
Cu KPa	142.6	174.8	189.1	



IGSL	Compiled By	Date	Checked By	Date	Page No.
	D CONNOLLY	15/5/04			

Report No.

CALIFORNIA BEARING RATIO

I.G.S.L.

Contract: **O'DEVANEY GARDENS**

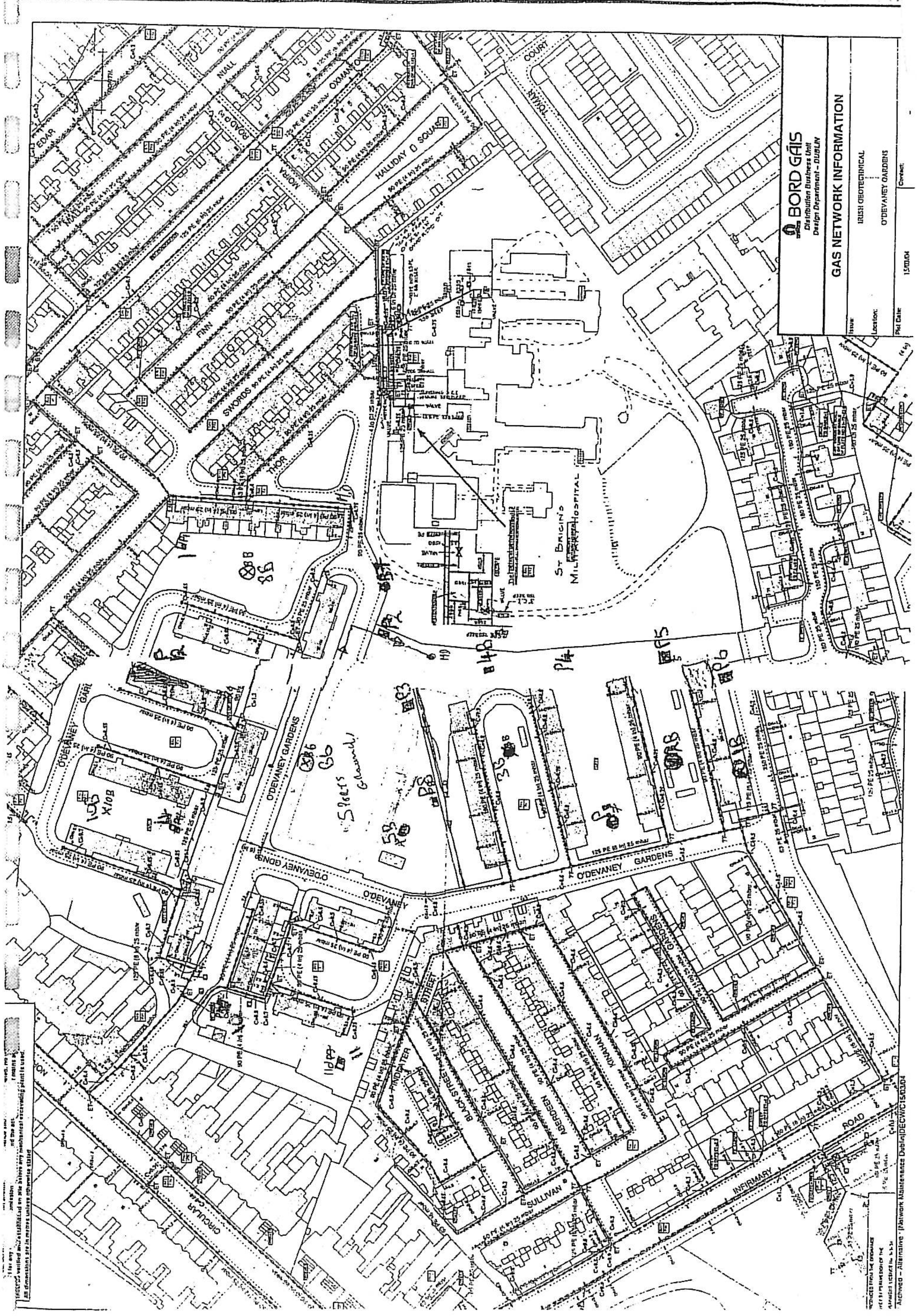
DATE: 15/5/04

CONTRACT No 9606

Location	Sample No.	Depth of Sample	Sample Description	Water Content %	Test Code	Water Content		Bulk Density Mg/M3	% Passing 20mm	C.B.R.		
						Top %	Bottom %			Top %	Base %	Average %
BH 1	3963	2.00	Light brown slightly sandy very gravelly SILT/CLAY	16.7	L/St	17.5	15.9	2.20	75.3	0.7	0.7	0.7
BH 7	3921	2.00	Brown black slightly sandy gravelly SILT/CLAY	12.8	L/St	11.9	13.7	2.19	83.5	4.7	4.3	4.5
TP 10	8240	1.00	Brown black slightly sandy gravelly SILT/CLAY	16.7	L/St	16.4	17.0	2.08	88.2	5.3	5.0	5.1

Test Code:
U.-Undisturbed Sample
D.-Dynamic Compaction
St.-Static compaction
L.-2.5Kg. Rammer
H.-4.5Kg. Rammer
A/5.-5% Air Voids Ratio
A10.-10% Air Voids Ratio
RN29.- Road Note 29 (St. 95% H.)
V.- Vibrating Hammer
M.- Method Number

Appendix IV – Site Plan

BORD GÁIS
Distribution Business Unit
Design Department - DUBLIN
GAS NETWORK INFORMATION
Issue: IRISH GEOTECHNICAL
Location: O'DEVANEY GARDENS
Plot Date: 15/03/04
Contact:
Archived – Alternative · (Network Maintenance Dublin)DECW/C15/03/04
all dimensions are in metres unless otherwise stated
verified and established on site before any mechanical excavating plant is used
EDAR
NIALL
ROAD
OXMANTOWN
MORIA
HALLIDAY SQUARE
FINN
SWORDS
THOR
COURT
ST BRICIN'S MILITARY HOSPITAL
VALVE
O'DEVANEY GARDENS
O'DEVANEY GDNS
O'DEVANEY
GARDENS
PINDGATER
STREET
BLACK STREET
ABERDEEN
KINAHAN
SULLIVAN
INFIRMARY ROAD
CIRCULAR
125 PE 25 mbar
90 PE (4 in) 25 mbar
63 PE 25 mbar
180 PE 25 mbar
Sleets
Ground
B4B
P4
P5
P6
P8
P2
P3
B5
B6
B8
1B
X10B
X5B
X3B
X1B
11
ET
CaLS

IGSL Limited
Ground Investigation
O'Devaney Gardens Dublin (Phase 2)
Project No. 10009
On Behalf Of
Arup
Consulting Engineers

FOREWORD

Notes on Site Investigation Procedure

The following notes should be read in conjunction with the report. Any modifications to the procedures outlined below are indicated in the main text.

GENERAL

The recommendations made and opinions expressed in the Report are based on the "Boring Records, an examination of samples and results of the site and laboratory tests. No responsibility can be held for conditions which have not been revealed by the boreholes, for example, between borehole positions. Whilst the report may express an opinion on a possible configuration of strata both between borehole positions and below the maximum depth of the investigation, this is for guidance only and no liability can be accepted for its accuracy.

BORING TECHNIQUE

Unless otherwise stated the 'Shell and Auger' technique of soft ground boring has been employed. Whilst this technique allows the maximum data to be obtained on strata conditions, a degree of mixing of some layered soils, (e.g. thin layers of coarse and fine granular material) is inevitable. Specific attention is drawn to this factor where evidence of such a condition is available.

GROUND WATER

The ground water conditions entered on the Boring Records are those appertaining at the time of the investigation. The normal rate of boring does not usually permit the recording of an equilibrium water level for any one water strike. Moreover, ground water levels are subject to variations caused by seasonal effects or changes in local drainage conditions. The table of each Boring Record shows the ground water level at the quoted borehole and casing depths, usually at the start of the day's work. The word "none" indicates that ground water was sealed off by the borehole casing.

GAS MONITORING

Unless otherwise stated gas monitoring is carried out using a GA2000 infra red gas detector. The gases monitored for and levels noted are recorded and plotted on the relevant test data sheets. Unless stated otherwise no monitoring is carried out for gas pressure or to calculate gas flow rates.

ROUTINE SAMPLING

Undisturbed samples of predominantly cohesive soils are obtained in a 102mm diameter open-drive sampler, complying with the requirements of the British Standard Code of Practice B.S. 5930. Large disturbed samples of granular soils, or of soils in which undisturbed sampling is not possible or appropriate, are taken from the boring tools and sealed into polythene bags. Small disturbed samples are taken at frequent intervals and sealed into 0.5 kg glass jars or polythene bags for subsequent visual classification. Where encountered in sufficient quantity, samples of groundwater are taken.

Unless otherwise stated in the main text, disturbed soil samples may not be at their natural water content.

REPORT ON A GROUND INVESTIGATION
FOR
PROPOSED RESIDENTIAL RE-DEVELOPMENT WORKS
AT
O'DEVANEY GARDENS / ST. BRICINS HOSPITAL , DUBLIN
ON BEHALF OF
ARUP,
CONSULTING ENGINEERS

REPORT NO. 10009 **OCTOBER 2004**

1.INTRODUCTION

The proposed development site is located in the O'Devaney Gardens and St. Bricins Hospital areas which are situated off the North Circular Road in Dublin.

It is proposed to redevelop this site and construct new multi storey residential developments along with associated commercial and community areas.

An investigation of sub-soil conditions was ordered by the projects consulting engineers, Arup Ireland, on behalf of their clients, Dublin City Council. The ground investigation was completed over two phases of works with phase 1 completed in April 2004 and reported on in IGSL report no. 9606 (May 2004).

The programme of the investigation completed in Phase 2 included,

- ✓ The construction of five exploratory boreholes to establish stratification. During the course of boring in-situ tests were performed at regular intervals and representative soil samples were recovered for visual examination and laboratory analysis.
- ✓ The drilling of seven rotary coreholes to establish the depth to, type of and quality of the underlying bedrock.
- ✓ The installation of groundwater monitoring standpipes at selected borehole and corehole locations.
- ✓ The carrying out of laboratory soils testing (Geotechnical) as specified by the projects engineers.

This report has contains the factual information pertaining to the works completed during the Phase 2 works.

II.FIELDWORK

The site is referred to as the O'Devaney Gardens development and the locations of all of the investigation points are shown on the detailed site plan enclosed in Appendix V to this report.

Site works were supervised by a representative of the consulting engineers and by an IGSL geotechnical engineer. The methods utilised during the course of the field investigations are outlined in the following sections.

Cable Tool Boreholes.

Conventional cable tool techniques (shell and auger) were employed at five locations across the site . All field work was carried out in accordance with BS5930.

Sampling and in - situ testing were performed to BS1377. Disturbed and undisturbed soil samples were taken at regular intervals or at changes in stratification while standard penetration tests (SPT's) were also carried out to establish relative in - situ soil strength.

Full details of stratification, testing, sampling, comments on groundwater and notes on any obstructions to normal boring encountered are given in the detailed borehole records enclosed in Appendix I to this report.

Groundwater monitoring standpipes were installed at each of the cable tool boreholes in accordance with the specifications of the projects engineers. Installations comprised a 50mm standpipe slotted in its lower section with a filter sock and gravel pack installed around the slotted section. The installation was completed with a 50mm riser pipe attached to the slotted section around which an impermeable bentonite seal was placed to prevent surface water migration into the standpipe. Each installation was then capped with a protective steel lockable cover which was then concreted into place.

Rotary Coring

A total of seven rotary coreholes were constructed at six locations across the site. The results of these are enclosed in the detailed coring records enclosed in Appendix II to this report.

Rotary core drilling was undertaken using a top drive lorry mounted Casagrande rotary coring rig

The coring operation utilised HQ coring techniques which open a 90mm hole and recover a 75mm core of rock. Air mist flush was used in the drillhole and the cores were packed in 3m core boxes and returned to I.G.S.L.'s laboratory in Newbridge, County Kildare.

The rock cores were then logged by I.G.S.L.'s engineering geologist and detailed core logs are presented in the relevant appendix. These logs include descriptions and the standard mechanical indices (TCR, SCR and RQD). In addition, a graphic fracture spacing log has been prepared, and this is incorporated as part of the engineering geological core records.

It should be noted that considerable difficulty was encountered while completing the drilling works in the O'Devaney Gardens section of the site. During the drilling of RC5 the drill crew were attacked by the residents of the adjoining developments and were forced to abandon the drillhole for health & safety reasons. Following consultation with the client the drill rig was demobilized while the local authority carried out discussions with the residents of the area. The drill rig was then remobilised to site but was restricted to working from 8.00am to 2.30 pm daily at which time the rig was stood down for the remainder of the day and moved off site to a secure area. Considerable delays and standing time were incurred by IGSL as a results of the above working conditions.

Groundwater monitoring standpipes were installed at selected rotary coreholes locations. As with the cable tool boreholes all standpipes were installed in accordance with the specifications of the projects engineers.

III. TESTING

During the course of the investigation samples of the sub soils were taken from the boreholes and samples of the rock cores were recovered from the coreholes. The disturbed soil samples were returned to IGSL's laboratory where a programme of testing was scheduled by the projects engineers.

In Situ Tests – SPT Tests

The relative in-situ strength of the sub-soils was established at intervals in both the boreholes and coreholes by cone penetration test.

A solid conical point is hammered into the soil and the blow count for 300mm of penetration is recorded in four 75mm increments. Results are presented in the right - hand column of the boring records and in the central section of the relevant coring records.

Geotechnical Testing – Soils

All of the geotechnical test data is included in Appendix III to this report.

Tests carried out included

- ✓ Moisture Content Tests
- ✓ Atterburg Limits (Classification tests).
- ✓ Moisture Condition Value (MCV) Tests
- ✓ Particle Size Distribution Tests (Wet Sieve)
- ✓ Sedimentation Analysis (by Hydrometer).
- ✓ pH and Sulphate Tests
- ✓ CBR Tests

Environmental Testing – Soils

At the request of the projects engineers, Arup Ireland, selected samples were dispatched to an environmental analytical laboratory for specialist testing.

The carrying out of the environmental laboratory soils testing was completed at the STL testing facilities in Dublin in accordance with the test schedules and specifications issued by Arup.

Appendix I

Cable Tool Borehole Records

REPORT NO: 10009	GEOTECHNICAL BORING RECORD	IGSL Ltd.

CONTRACT : O'Devaney Gardens Phase 2		BOREHOLE NO: 12 Sheet 1 of 1
CLIENT :	GROUND LEVEL (mOD) 12.93	DATE STARTED: 24/08/2004
ENGINEER : Arup	BOREHOLE DIAMETER (mm) 200	DATE COMPLETED: 24/08/2004
CO-ORDINATES : E 234758.52 N 313730.13	BOREHOLE DEPTH (m) 7.50 CASING DEPTH (m) 7.50	BORED BY: J. McDonnell

DEPTH (M)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES			FIELD TEST RESULTS	STAND PIPE DETAILS
					REF. NUMBER	SAMPLE TYPE	DEPTH (m)		
0	MADE GROUND (consisting of firm, black, sandy, gravelly, CLAY, with red brick, ash, and glass).								
1					3222	B D	1.00	N=14	
			11.43	1.50					
	Firm, brown, sandy, gravelly, CLAY, with cobbles.								
2					3223	B D	2.10	N=17	
3			9.93	3.00	3224	B D	3.10	N=38	
	Stiff, black, sandy, gravelly, CLAY, with cobbles.								
			9.43	3.50					
	Very stiff, black, sandy, gravelly, CLAY, with cobbles.								
4					3225	B D	4.00	N=51	
5					3226	B D	5.00	N=51	
6					3227	B D	6.00	N=54/ 215mm	
7					3228	B D	7.00	N=56	
			5.53	7.40					
	OBSTRUCTION.		5.43	7.50				N=R	
	End of Borehole at 7.50 m								
8									
9									
10									

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
3.70	4.00	1.00	
6.30	6.60	1.00	
7.40	7.50	2.00	

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
3.00	3.00	3.50	2.60	-	Medium

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type
24/08/2004	7.50	1.00	7.50	SP

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
24/08/2004	7.50	0.00	-	Dry at end of boring

Remarks: Samples - B = Geotechnical bulk sample, D = Chemical Sample

REPORT NO: **10009**	**GEOTECHNICAL BORING RECORD**	**IGSL Ltd.**

CONTRACT : O'Devaney Gardens Phase 2		BOREHOLE NO: 13 Sheet 1 of 1
CLIENT : ENGINEER : Arup	GROUND LEVEL (mOD) 15.18 BOREHOLE DIAMETER (mm) 200	DATE STARTED: 25/08/2004 DATE COMPLETED: 25/08/2004
CO-ORDINATES : E 234782.91 N 313757.45	BOREHOLE DEPTH (m) 7.10 CASING DEPTH (m) 7.10	BORED BY: J. McDonnell

DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES REF. NUMBER	SAMPLE TYPE	DEPTH (m)	FIELD TEST RESULTS	STAND PIPE DETAILS
MADE GROUND (consisting of brown, sandy, CLAY, with red brick,and ash).								
Firm, brown, sandy, gravelly, CLAY, with cobbles.		14.68	0.50					
				3229	B D	1.00	N=11	
				3230	B D	2.00	N=12	
Grey/ brown, coarse, sandy, GRAVEL.		12.88	2.30	3231	B D	2.50		
Very stiff, black, sandy, gravelly, CLAY, with cobbles and boulders.		12.38	2.80	3232	B D	3.00	N=49	
				3233	B D	4.00	N=51	
				3234	B D	5.00	N=36/ 140mm	
Very stiff to hard, black, sandy, very gravelly, CLAY, with cobbles.		9.88	5.30					
				3235	B D	6.00	N=54	
OBSTRUCTION.		8.18	7.00	3236	B D	7.00	N=R	
End of Borehole at 7.10 m		8.08	7.10					

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
5.30	5.40	0.50	
7.00	7.10	2.00	

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
2.30	2.30	2.80	1.40	-	Fast
5.30	5.30	-	4.90	-	Medium

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type
25/08/2004	7.10	1.00	7.10	SP

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
25/08/2004	7.10	0.00	5.00	At end of boring

Remarks: Samples - B = Geotechnical bulk sample, D = Chemical Sample

REPORT NO: **10009** | **GEOTECHNICAL BORING RECORD** | **IGSL Ltd.**

CONTRACT : O'Devaney Gardens Phase 2

BOREHOLE NO: 14
Sheet 1 of 1

CLIENT :
ENGINEER : Arup

CO-ORDINATES : E 234824.06
N 313736.58

GROUND LEVEL (mOD) 17.20
BOREHOLE DIAMETER (mm) 200
BOREHOLE DEPTH (m) 7.00
CASING DEPTH (m) 7.00

DATE STARTED: 27/08/2004
DATE COMPLETED: 27/08/2004

BORED BY: J. McDonnell

DEPTH (M)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES REF. NUMBER	SAMPLES SAMPLE TYPE	SAMPLES DEPTH (m)	FIELD TEST RESULTS	STAND PIPE DETAILS
0	MADE GROUND (consisting of brown, sandy, CLAY, with red brick).								
	Firm, brown, sandy, gravelly, CLAY, with cobbles.		16.60	0.60					
1					3237	B D	1.00	N=20	
2					3238	B D	2.00	N=17	
3								N=40	
	Very stiff, black, sandy, gravelly, CLAY, with cobbles.		14.00	3.20	3239 3240 3241	B D	3.30		
4					·3240	B	4.00	N=52	
	Dense black clayey fine to coarse GRAVEL.		12.40	4.80					
5					3241	B	5.00	N=43	
	Very stiff to hard, black, sandy, very gravelly, CLAY, with cobbles and boulders.		12.10	5.10					
6					3242	B D	6.00	N=66	
	OBSTRUCTION.		10.50	6.70					
7	End of Borehole at 7.00 m		10.20	7.00	3243	B D	7.00	N=R	
8									
9									
10									

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
3.40	3.60	0.75	
5.40	5.70	0.50	
6.70	7.00	2.00	

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
2.50	2.50	-	2.50	-	Seepage
4.50	4.50	-	4.20	-	Slow
4.80	4.80	-	4.50	-	Slow

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type
27/08/2004	7.00	1.00	7.00	SP

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
27/08/2004	7.00	0.00	6.00	At end of boring

Remarks: Samples - B = Geotechnical bulk sample, D = Chemical Sample

REPORT NO: **10009**	**GEOTECHNICAL BORING RECORD**	**IGSL Ltd.**

CONTRACT : O'Devaney Gardens Phase 2

BOREHOLE NO: 15
Sheet 1 of 1

CLIENT :
ENGINEER : Arup

CO-ORDINATES : E 234865.11
N 313754.96

GROUND LEVEL (mOD)	17.72
BOREHOLE DIAMETER (mm)	200
BOREHOLE DEPTH (m)	5.50
CASING DEPTH (m)	5.50

DATE STARTED: 30/08/2004
DATE COMPLETED: 30/08/2004

BORED BY: J. McDonnell

DEPTH (M)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES REF. NUMBER	SAMPLE TYPE	DEPTH (m)	FIELD TEST RESULTS	STAND PIPE DETAILS
0	MADE GROUND (consisting of brown, sandy, CLAY, with red brick).		17.22	0.50					
	Firm, brown, sandy, gravelly, CLAY, with cobbles.								
1					3244	B D	1.00	N=11	
2					3245	B D	2.00	N=17	
	Hard, black, sandy, gravelly, CLAY, with cobbles and boulders.		15.22	2.50					
3					3246	B D	3.00	N=83	
4					3247	B D	4.00	N=61/ 210mm	
5					3248	B D	5.00	N=66/ 215mm	
	OBSTRUCTION.		12.42	5.30					
	End of Borehole at 5.50 m		12.22	5.50				N=R	
6									
7									
8									
9									
10									

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
2.60	2.90	1.00	
4.30	4.40	1.25	
5.30	5.50	2.00	

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type
30/08/2004	5.50	1.00	5.50	SP

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
30/08/2004	5.50	0.00	-	Dry at end of boring

Remarks: Samples - B = Geotechnical bulk sample, D = Chemical Sample

REPORT NO: **10009**	**GEOTECHNICAL BORING RECORD**	**IGSL Ltd.**

CONTRACT : O'Devaney Gardens Phase 2		BOREHOLE NO: 16 Sheet 1 of 1
CLIENT : ENGINEER : Arup	GROUND LEVEL (mOD) 18.49 BOREHOLE DIAMETER (mm) 200	DATE STARTED: 31/08/2004 DATE COMPLETED: 31/08/2004
CO-ORDINATES : E 234872.54 N 313723.49	BOREHOLE DEPTH (m) 6.00 CASING DEPTH (m) 6.00	BORED BY: J. McDonnell

DEPTH (M)	DESCRIPTION	LEGEND	ELEVATION (mOD)	DEPTH (m)	SAMPLES REF. NUMBER	SAMPLES SAMPLE TYPE	SAMPLES DEPTH (m)	FIELD TEST RESULTS	STAND PIPE DETAILS
0	MADE GROUND (consisting of brown, sandy, CLAY, with red brick).								
	Firm, brown, sandy, gravelly, CLAY, with cobbles.		17.99	0.50					
1					3249	B D	1.00	N=17	
2					3250	B D	2.00	N=19	
3	Very stiff to hard black sandy gravelly CLAY with cobbles and boulders		15.49	3.00	3251	B D	3.10	N=50	
4					3252	B D	4.00	N=38	
5					3253	B D	5.00	N=63	
	OBSTRUCTION.		12.69	5.80					
6	End of Borehole at 6.00 m		12.49	6.00	3254	B D	6.00	N=27/ 25mm	
7									
8									
9									
10									

Hard Strata Boring / Chiselling

From (m)	To (m)	Hours	Comments
4.60	4.80	1.25	.
5.80	6.00	2.00	.

Water Strike Details

Water Strike	Casing Depth	Sealed At	Rise To	Time	Comments
2.50	2.50	-	2.50	-	Seepage
3.80	3.80	-	3.80	-	Seepage

Standpipe Installation Details

Date	Tip Depth	RZ Top	RZ Base	Type
31/08/2004	6.00	1.00	6.00	SP

Groundwater Observations

Date	Hole Depth	Casing Depth	Depth to Water	Comments
31/08/2004	6.00	0.00	5.00	At end of boring

Remarks: Samples - B = Geotechnical bulk sample, D = Chemical Sample

Appendix II

Rotary Corehole Records

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	*IGSL Ltd.*

CONTRACT: O' Devaneys Gardens

DRILLHOLE NO : RC1

SHEET: Sheet 1 of 2

CLIENT:

ENGINEER: Arup

CORE DIAMETER (mm): 74

GROUND LEVEL (mOD): 15.26

DATE STARTED: 30/09/2004

DATE COMPLETED:30/09/2004

CO-ORDINATES: 234757.19 313756.69

INCLINATION (Degrees): 90

FLUSH: AIR/MIST

DRILLED BY: Millennium

LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
		0	0	0									SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of clay and gravel
									11.06	4.20			SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of stiff black sandy gravelly SILT/CLAY
	5.50								9.76	5.50			Stiff black/brown sandy very gravelly SILT/CLAY with many sub-angular cobbles

Continued next sheet

REMARKS: Second standpipe installed at 10.0m, gravel 10.0-1.0m, seal 1.0-0.0m, headworks.

INSTALLATION DETAILS

Installation Type : SP

Depth to Response Zone top (m) : 1.00

Depth to Response Zone bottom (m) : 10.00

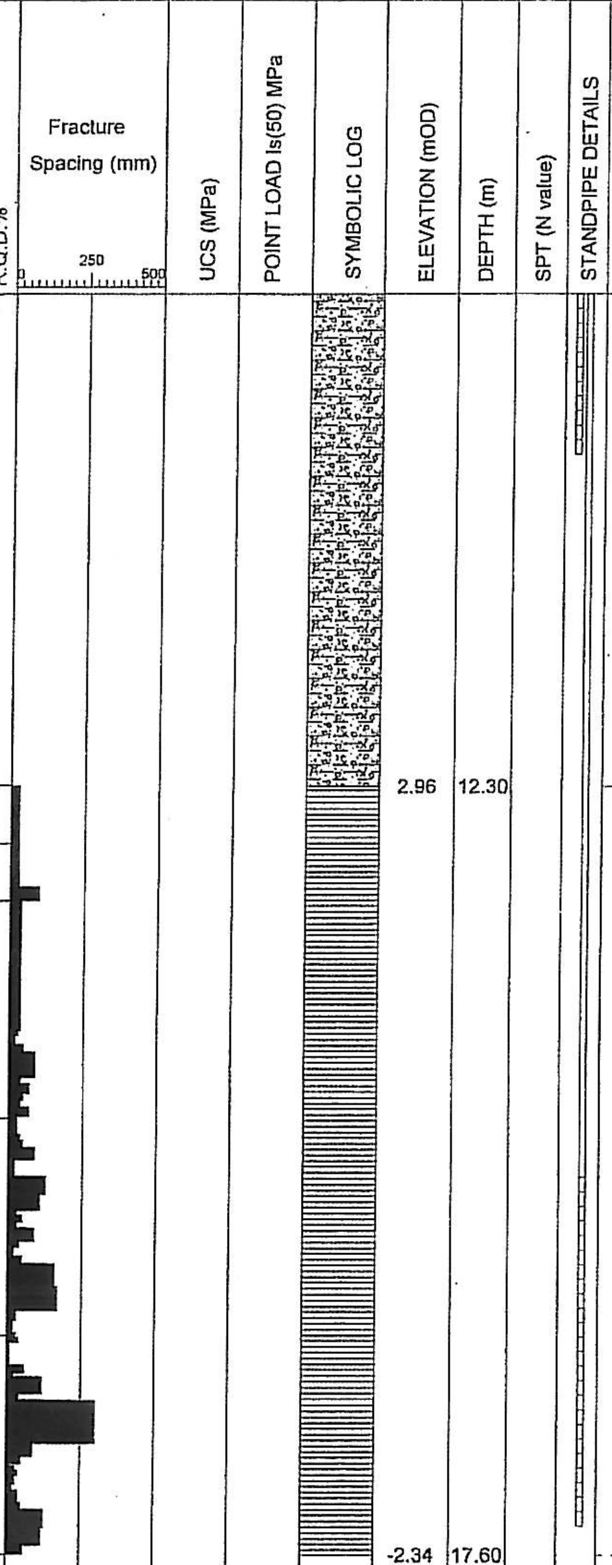
Comments : Gravel 17.6-15.0m, seal 15.0-10.0m, headworks.

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	*IGSL Ltd.*

CONTRACT: O' Devaneys Gardens
DRILLHOLE NO : RC1
SHEET: Sheet 2 of 2

CLIENT:
ENGINEER: Arup
CORE DIAMETER (mm): 74
GROUND LEVEL (mOD): 15.26
DATE STARTED: 30/09/2004
DATE COMPLETED:30/09/2004

CO-ORDINATES: 234757.19
313756.69
INCLINATION (Degrees): 90
FLUSH: AIR/MIST
DRILLED BY: Millennium
LOGGED BY: Sean/Dan



DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	ELEVATION (mOD)	DEPTH (m)	GEOTECHNICAL DESCRIPTION
9		100	0	0			Stiff black/brown sandy very gravelly SILT/CLAY with many sub-angular cobbles
10							
11							
12	12.30				2.96	12.30	
		100	0	0			Moderately weak, thin to medium bedded, grey/black fine grained MUDSTONE, fresh to locally slightly weathered, intersected by smooth to locally rough, planar to undulose, tight to locally open, possible clay infilled(at 12.55m-12.65m, 13.1m-13.15m, 16.18m-16.2m) fractures dipping sub-45°
	12.70	100	25	25			
13	13.10						
		100	26	0			
14							
	14.60						
15		100	45	22			
16	16.10						
		100	63	29			
	17.60				-2.34	17.60	End of Borehole at 17.60 m

REMARKS: Second standpipe installed at 10.0m, gravel 10.0-1.0m, seal 1.0-0.0m, headworks.

INSTALLATION DETAILS
Installation Type : SP
Depth to Response Zone top (m) : 1.00
Depth to Response Zone bottom (m) : 10.00
Comments : Gravel 17.6-15.0m, seal 15.0-10.0m, headworks.

REPORT NO. 10009

GEOTECHNICAL CORE LOG RECORD

IGSL Ltd.

CONTRACT: O' Devaneys Gardens

DRILLHOLE NO : RC2
SHEET: Sheet 1 of 3

CLIENT:
ENGINEER: Arup

CORE DIAMETER (mm): 74
GROUND LEVEL (mOD): 17.95

DATE STARTED: 01/10/2004
DATE COMPLETED:01/10/2004

CO-ORDINATES: 234889.57
313752.00

INCLINATION (Degrees): 90
FLUSH: AIR/MIST

DRILLED BY: Millennium
LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%.	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
													SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of clay and gravel
1													
2													
3													
4													
5											N=38		
6													
		0	0	0									
7									10.75	7.20	N=41		SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of stiff black sandy gravelly silt/clay
8													
									9.25	8.70	N=53		Continued next sheet

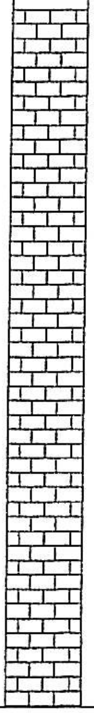
REMARKS: Standpipe slotted 22.0-16.0, solid 16.0-14.5m, fill 13.0-0.0m.

INSTALLATION DETAILS
Installation Type : SP
Depth to Response Zone top (m) : 16.00
Depth to Response Zone bottom (m) : 22.00
Comments : Gravel 14.5m-22.0m, seal 22.0m-23.5m & 14.5-13.0m, headworks.

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	IGSL Ltd.

CONTRACT: O' Devaneys Gardens		DRILLHOLE NO : RC2 SHEET: Sheet 2 of 3
CLIENT: ENGINEER: Arup	CORE DIAMETER (mm): 74 GROUND LEVEL (mOD): 17.95	DATE STARTED: 01/10/2004 DATE COMPLETED:01/10/2004
CO-ORDINATES: 234889.57 313752.00	INCLINATION (Degrees): 90 FLUSH: AIR/MIST	DRILLED BY: Millennium LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
9													SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of clay and gravel
10											N=43		
11											N=58		
12													
13	13.00	20	15	15					4.95	13.00	N=66		Strong, thin to medium bedded, dark grey/black, fine grained mud-rich LIMESTONE, fresh to locally slightly weathered, intersected by smooth to locally rough, planar to undulose, locally tight to open, possible clay infilled(at 13.31m-14.5m, 14.57m-18.0m) fractures dipping sub-45°
14	14.50	20	6	0									
15													
16	16.00	10	0	0									
	17.00	10	0	0									



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REMARKS: Standpipe slotted 22.0-16.0, solid 16.0-14.5m, fill 13.0-0.0m.

INSTALLATION DETAILS

Installation Type : SP

Depth to Response Zone top (m) : 16.00

Depth to Response Zone bottom (m) : 22.00

Comments : Gravel 14.5m-22.0m, seal 22.0m-23.5m & 14.5-13.0m, headworks.

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	*IGSL Ltd.*

CONTRACT: O' Devaneys Gardens

DRILLHOLE NO : RC2
SHEET: Sheet 3 of 3

CLIENT:
ENGINEER: Arup

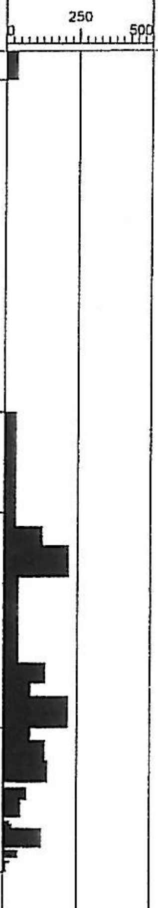
CORE DIAMETER (mm): 74
GROUND LEVEL (mOD): 17.95

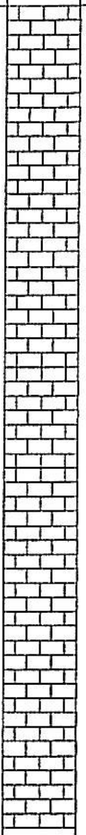
DATE STARTED: 01/10/2004
DATE COMPLETED:01/10/2004

CO-ORDINATES: 234889.57
313752.00

INCLINATION (Degrees): 90
FLUSH: AIR/MIST

DRILLED BY: Millennium
LOGGED BY: Sean/Dan





DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
18	18.00								-0.05	18.00	N=66		Strong, thin to medium bedded, dark grey/black, fine grained mud-rich LIMESTONE, fresh to locally slightly weathered, intersected by smooth to locally rough, planar to undulose, locally tight to open, possible clay infilled(at 13.31m-14.5m, 14.57m-18.0m) fractures dipping sub-45°
19		0	0	0							N=64		Dark grey/black clays and mud-rich angular, fine grained, LIMESTONE gravels, moderately to highly weathered
20	20.30								-2.35	20.30			Strong, thin to medium bedded, dark grey/black, fine grained mud-rich LIMESTONE, fresh to locally slightly weathered, intersected by smooth to locally rough, planar to undulose, locally tight to open, clay infilled(at 18.0m-21.0m) fractures dipping sub-45°
		100	0	0									
21	21.00								-3.05	21.00			
		100	59	49									Strong, thin to medium bedded, dark grey/black, fine grained mud-rich LIMESTONE, fresh to locally slightly weathered, intersected by smooth to locally rough, planar to undulose, locally tight to open, possible clay infilled(at 21.45m-22.0m) fractures dipping sub-45° to locally horizontal
22	22.50												
23		100	57	44									
	23.50								-5.55	23.50			End of Borehole at 23.50 m
24													
25													

REMARKS: Standpipe slotted 22.0-16.0, solid 16.0-14.5m, fill 13.0-0.0m.

INSTALLATION DETAILS
Installation Type : SP
Depth to Response Zone top (m) : 16.00
Depth to Response Zone bottom (m) : 22.00
Comments : Gravel 14.5m-22.0m, seal 22.0m-23.5m & 14.5-13.0m, headworks.

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	*IGSL Ltd.*

CONTRACT: O' Devaneys Gardens

DRILLHOLE NO : RC3
SHEET: Sheet 1 of 3

CLIENT:
ENGINEER: Arup

CORE DIAMETER (mm): 74
GROUND LEVEL (mOD): 27.35

DATE STARTED: 12/10/2004
DATE COMPLETED:12/10/2004

CO-ORDINATES: 234747.41
313631.24

INCLINATION (Degrees): 90
FLUSH: AIR/MIST

DRILLED BY: Millennium
LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
													SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of black sandy gravelly clay
1													
2													
3													
4													
5													
6													
7													
		0	0	0							N=55		
8													
											N=55		

Continued next sheet

REMARKS: Standpipe slotted 16m-18.9m, solid 10m-16mm, gravel fill 11m-14m, gravel 15.5m-18.9m, seal at 10m-11m & 14m-15.5m.

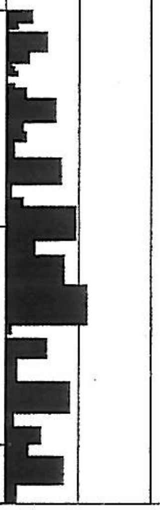
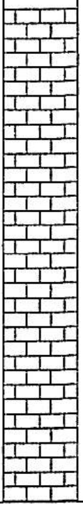
INSTALLATION DETAILS
Installation Type : SP
Depth to Response Zone top (m) : 10.00
Depth to Response Zone bottom (m) : 18.90
Comments : 7m-8.5m seal, 8.5m-10m gravel

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	*IGSL Ltd.*

CONTRACT: O' Devaneys Gardens
DRILLHOLE NO : RC3
SHEET: Sheet 2 of 3

CLIENT:
ENGINEER: Arup
CORE DIAMETER (mm): 74
GROUND LEVEL (mOD): 27.35
DATE STARTED: 12/10/2004
DATE COMPLETED: 12/10/2004

CO-ORDINATES: 234747.41
313631.24
INCLINATION (Degrees): 90
FLUSH: AIR/MIST
DRILLED BY: Millennium
LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
9													SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of black sandy gravelly clay
10											N=68		
11											N=76		
12													
									14.45	12.90			SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of angular fragments of moderately weathered limestone, possible rockhead
13													
14													
	14.40								12.95	14.40			Strong very strong, medium to thickly bedded, grey/dark grey, fine grained mud-rich LIMESTONE, fresh to slightly to locally moderately weathered, intersected by smooth to rough, planar to undulose to locally irregular, tight to open, clay infilled(at 5.31m-5.42m, 16.64m-16.67m), locally Fe oxide stained fractures dipping 45° to locally sub-horizontal
15		100	69	41									
	15.90												
16		100	64	49									
	17.40												

Continued next sheet

REMARKS: Standpipe slotted 16m-18.9m, solid 10m-16mm, gravel fill 11m-14m, gravel 15.5m-18.9m, seal at 10m-11m & 14m-15.5m.

INSTALLATION DETAILS
Installation Type : SP
Depth to Response Zone top (m) : 10.00
Depth to Response Zone bottom (m) : 18.90
Comments : 7m-8.5m seal, 8.5m-10m gravel

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	*IGSL Ltd.*

CONTRACT: O' Devaneys Gardens

DRILLHOLE NO : RC3

SHEET: Sheet 3 of 3

CLIENT:

ENGINEER: Arup

CORE DIAMETER (mm): 74

GROUND LEVEL (mOD): 27.35

DATE STARTED: 12/10/2004

DATE COMPLETED:12/10/2004

CO-ORDINATES: 234747.41

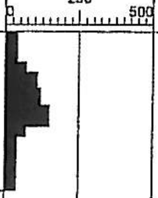
313631.24

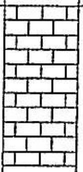
INCLINATION (Degrees): 90

FLUSH: AIR/MIST

DRILLED BY: Millennium

LOGGED BY: Sean/Dan





DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.% .	Fracture Spacing (mm)	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
18		100	35	18									Strong very strong, medium to thickly bedded, grey/dark grey, fine grained mud-rich LIMESTONE, fresh to slightly to locally moderately weathered, intersected by smooth to rough, planar to undulose to locally irregular, tight to open, clay infilled(at 5.31m-5.42m, 16.64m-16.67m), locally Fe oxide stained fractures dipping 45° to locally sub-horizontal
19	18.90								8.45	18.90			End of Borehole at 18.90 m
20													
21													
22													
23													
24													
25													

REMARKS: Standpipe slotted 16m-18.9m, solid 10m-16mm, gravel fill 11m-14m, gravel 15.5m-18.9m, seal at 10m-11m & 14m-15.5m.

INSTALLATION DETAILS

Installation Type : SP

Depth to Response Zone top (m) : 10.00

Depth to Response Zone bottom (m) : 18.90

Comments : 7m-8.5m seal, 8.5m-10m gravel

REPORT NO. 10009

GEOTECHNICAL CORE LOG RECORD

IGSL Ltd.

CONTRACT: O' Devaneys Gardens

DRILLHOLE NO : RC4
SHEET: Sheet 1 of 3

CLIENT:
ENGINEER: Arup

CORE DIAMETER (mm): 74
GROUND LEVEL (mOD): 27.07

DATE STARTED: 07/10/2004
DATE COMPLETED:08/10/2004

CO-ORDINATES: 234893.83
313554.05

INCLINATION (Degrees): 90
FLUSH: AIR/MIST

DRILLED BY: Millennium
LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
													SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of black sandy gravelly clay with occasional cobbles
1													
2													
3													
4													
5													
6													
7		0	0	0							N=51		
8											N=59		Continued next sheet

REMARKS: Seal-0.0m-1m, Fill-1m-9.5,
Seal-9.5m-10.5m

INSTALLATION DETAILS
Installation Type : SPIE
Depth to Response Zone top (m) : 10.50
Depth to Response Zone bottom (m) : 12.00
Comments : Fill Seal 12m-14m

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	IGSL Ltd.

CONTRACT: O' Devaneys Gardens

DRILLHOLE NO : RC4
SHEET: Sheet 2 of 3

CLIENT:
ENGINEER: Arup

CORE DIAMETER (mm): 74
GROUND LEVEL (mOD): 27.07

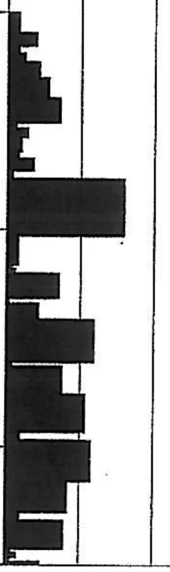
DATE STARTED: 07/10/2004
DATE COMPLETED:08/10/2004

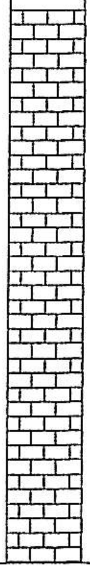
CO-ORDINATES: 234893.83
313554.05

INCLINATION (Degrees): 90
FLUSH: AIR/MIST

DRILLED BY: Millennium
LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
9													SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of black sandy gravelly clay with occasional cobbles
10											N=68		
11											N=74		
12													
13									14.27	12.80			SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of angular fragments of moderately weathered limestone, possible rockhead
14	14.00								13.07	14.00			Strong to very strong, medium to thickly bedded, grey/dark grey, fine grained mud-rich LIMESTONE, fresh to locally slightly weathered, intersected by smooth to rough, planar to undulose to localy irregular, tight to open, locally calcite filled (3mm-to 10mm) fractures dipping 45°
		100	70	45									
15	15.50												
16		100	67	61									
	17.00												





Continued next sheet

REMARKS: Seal-0.0m-1m, Fill-1m-9.5,
Seal-9.5m-10.5m

INSTALLATION DETAILS
Installation Type : SPIE
Depth to Response Zone top (m) : 10.50
Depth to Response Zone bottom (m) : 12.00
Comments : Fill Seal 12m-14m

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	*IGSL Ltd.*

CONTRACT: O' Devaneys Gardens

DRILLHOLE NO : RC4
SHEET: Sheet 3 of 3

CLIENT:
ENGINEER: Arup

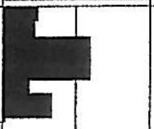
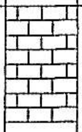
CORE DIAMETER (mm): 74
GROUND LEVEL (mOD): 27.07

DATE STARTED: 07/10/2004
DATE COMPLETED:08/10/2004

CO-ORDINATES: 234893.83
313554.05

INCLINATION (Degrees): 90
FLUSH: AIR/MIST

DRILLED BY: Millennium
LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%.	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
18 19 20 21 22 23 24 25	18.60	100	82	66					8.47	18.60			Strong to very strong, medium to thickly bedded, grey/dark grey, fine grained mud-rich LIMESTONE, fresh to locally slightly weathered, intersected by smooth to rough, planar to undulose to localy irregular, tight to open, locally calcite filled (3mm-to 10mm) fractures dipping 45° End of Borehole at 18.60 m

REMARKS: Seal-0.0m-1m, Fill-1m-9.5, Seal-9.5m-10.5m

INSTALLATION DETAILS
Installation Type : SPIE
Depth to Response Zone top (m) : 10.50
Depth to Response Zone bottom (m) : 12.00
Comments : Fill Seal 12m-14m

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	*IGSL Ltd.*

CONTRACT: O' Devaneys Gardens		DRILLHOLE NO : RC5 SHEET: Sheet 1 of 2
CLIENT: ENGINEER: Arup	CORE DIAMETER (mm): GROUND LEVEL (mOD): 26.81	DATE STARTED: 22/09/2004 DATE COMPLETED:22/09/2004
CO-ORDINATES: 235010.56 313631.03	INCLINATION (Degrees): 90 FLUSH: AIR/MIST	DRILLED BY: Millennium LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%.	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
													SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of clay and gravel & black sandy gravelly clay
											N=33		
											N=54		
											N=61		

Continued next sheet

REMARKS: Relocated borehole to 5A due to unsafe site conditions

INSTALLATION DETAILS
Installation Type :
Depth to Response Zone top (m) :
Depth to Response Zone bottom (m) :
Comments :

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	*IGSL Ltd.*

CONTRACT: O' Devaneys Gardens		DRILLHOLE NO : RC5 SHEET: Sheet 2 of 2
CLIENT: ENGINEER: Arup	CORE DIAMETER (mm): GROUND LEVEL (mOD): 26.81	DATE STARTED: 22/09/2004 DATE COMPLETED:22/09/2004
CO-ORDINATES: 235010.56 313631.03	INCLINATION (Degrees): 90 FLUSH: AIR/MIST	DRILLED BY: Millennium LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
9													SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of clay and gravel & black sandy gravelly clay
10											N=58		
11											N=69		
12									14.81	12.00			End of Borehole at 12.00 m
13													
14													
15													
16													

REMARKS: Relocated borehole to 5A due to unsafe site conditions

INSTALLATION DETAILS

Installation Type :

Depth to Response Zone top (m) :

Depth to Response Zone bottom (m) :

Comments :

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	IGSL Ltd.

CONTRACT: O' Devaneys Gardens
DRILLHOLE NO : RC5A
SHEET: Sheet 1 of 3

CLIENT:
ENGINEER: Arup
CORE DIAMETER (mm): 74
GROUND LEVEL (mOD): 26.83
DATE STARTED: 06/10/2004
DATE COMPLETED:06/10/2004

CO-ORDINATES: 235012.19
313632.76
INCLINATION (Degrees): 90
FLUSH: AIR/MIST
DRILLED BY: Millennium
LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
													SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of black sandy gravelly clay
1													
2													
3													
4													
5													
6													
7													
											N=66		
		0	0	0									
8													
											N=60		Continued next sheet

REMARKS: Standpipe slotted 15m-20m, solid 0.0m-15m, fill cover 0.0m-12mm, gravel 15m-20m

INSTALLATION DETAILS
Installation Type :
Depth to Response Zone top (m) :
Depth to Response Zone bottom (m) :
Comments :

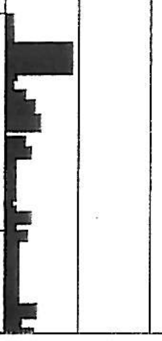
REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	IGSL Ltd.

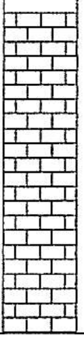
CONTRACT: O' Devaneys Gardens
DRILLHOLE NO : RC5A
SHEET: Sheet 2 of 3

CLIENT:
ENGINEER: Arup
CORE DIAMETER (mm): 74
GROUND LEVEL (mOD): 26.83
DATE STARTED: 06/10/2004
DATE COMPLETED:06/10/2004

CO-ORDINATES: 235012.19
313632.76
INCLINATION (Degrees): 90
FLUSH: AIR/MIST
DRILLED BY: Millennium
LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%.	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
9													SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of black sandy gravelly clay
10											N=70		
11											N=68		
12													
13											N=67		
14													
15									11.73	15.10			SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of angular fragments of moderately weathered limestone, possible rockhead
	15.60								11.23	15.60			Strong to very strong, medium to thickly bedded, grey/dark grey, fine grained mud-rich LIMESTONE, fresh to slightly to locally moderately weathered, intersected by smooth to rough, planar to undulose to localy irregular, tight to open, locally clay infilled (at 15.6m-15.8m, 18.62m-18.74m, 18.82m-18.87m) fractures dipping sub-45° to sub-vertical
16		100	35	13									
	17.10												
		100	46	14									





Continued next sheet

REMARKS: Standpipe slotted 15m-20m, solid 0.0m-15m, fill cover 0.0m-12mm, gravel 15m-20m

INSTALLATION DETAILS
Installation Type :
Depth to Response Zone top (m) :
Depth to Response Zone bottom (m) :
Comments :

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	*IGSL Ltd.*

CONTRACT: O' Devaneys Gardens

DRILLHOLE NO : RC5A

SHEET: Sheet 3 of 3

CLIENT:

ENGINEER: Arup

CORE DIAMETER (mm): 74

GROUND LEVEL (mOD): 26.83

DATE STARTED: 06/10/2004

DATE COMPLETED:06/10/2004

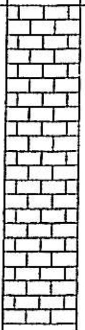
CO-ORDINATES: 235012.19
313632.76

INCLINATION (Degrees): 90

FLUSH: AIR/MIST

DRILLED BY: Millennium

LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
18													Strong to very strong, medium to thickly bedded, grey/dark grey, fine grained mud-rich LIMESTONE, fresh to slightly to locally moderately weathered, intersected by smooth to rough, planar to undulose to localy irregular, tight to open, locally clay infilled (at 15.6m-15.8m, 18.62m-18.74m, 18.82m-18.87m) fractures dipping sub-45° to sub-vertical
	18.20												
19		100	37	27									
	19.70	100	13	0									
20	20.00								6.83	20.00			End of Borehole at 20.00 m
21													
22													
23													
24													
25													

REMARKS: Standpipe slotted 15m-20m, solid 0.0m-15m, fill cover 0.0m-12mm, gravel 15m-20m

INSTALLATION DETAILS

Installation Type :

Depth to Response Zone top (m) :

Depth to Response Zone bottom (m) :

Comments :

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	IGSL Ltd.

CONTRACT: O' Devaneys Gardens		DRILLHOLE NO : RC6 SHEET: Sheet 1 of 2
CLIENT: ENGINEER: Arup	CORE DIAMETER (mm): 74 GROUND LEVEL (mOD): 23.64	DATE STARTED: 14/10/2004 DATE COMPLETED:14/10/2004
CO-ORDINATES: 234875.49 313655.77	INCLINATION (Degrees): 90 FLUSH: AIR/MIST	DRILLED BY: Millennium LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm) 0 250 500	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
													SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of black sandy gravelly clay
1													
2													
3													
4													
5													
6													
7		0	0	0							N=55		
8													
											N=64		Continued next sheet

REMARKS: Standpipe slotted 14m-17m, solid 0.0m-14m, fill 1m-11.5m, seal 0.0m-1m, 11.5m-13m, gravel 13m-17.4m.

INSTALLATION DETAILS

Installation Type : SP

Depth to Response Zone top (m) : 0.00

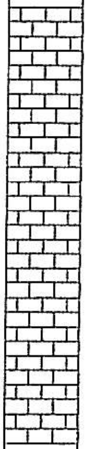
Depth to Response Zone bottom (m) : 20.00

Comments : Standpipe slotted 15m- 20m

REPORT NO.	10009	GEOTECHNICAL CORE LOG RECORD	IGSL Ltd.

CONTRACT: O' Devaneys Gardens		DRILLHOLE NO : RC6 SHEET: Sheet 2 of 2
CLIENT: ENGINEER: Arup	CORE DIAMETER (mm): 74 GROUND LEVEL (mOD): 23.64	DATE STARTED: 14/10/2004 DATE COMPLETED:14/10/2004
CO-ORDINATES: 234875.49 313655.77	INCLINATION (Degrees): 90 FLUSH: AIR/MIST	DRILLED BY: Millennium LOGGED BY: Sean/Dan

DOWNHOLE DEPTH (m)	CORE RUN DEPTH (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing (mm)	UCS (MPa)	POINT LOAD Is(50) MPa	SYMBOLIC LOG	ELEVATION (mOD)	DEPTH (m)	SPT (N value)	STANDPIPE DETAILS	GEOTECHNICAL DESCRIPTION
9													SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of black sandy gravelly clay
10											N=58		
11											N=71		
12													
13									10.64	13.00			SYMETREX: OPEN HOLE DRILLING - observed by driller as returns of angular fragments of moderately weathered limestone, possible rockhead
14													
	14.40								9.24	14.40			Strong to very strong, medium to thickly bedded, grey/dark grey, fine to medium grained mud-rich LIMESTONE and MUDSTONE(at 15m-15.4, 16.55m-17.4m), slightly to locally moderately weathered, intersected by smooth to rough, planar to undulose to localy irregular, tight to open, clay infilled (at 14.4m-14.51m, 14.8m-15m, 15.6m-15.7m, 16.21m-16.56m), locally calcite filled, locally Fe oxide stained fractures dipping sub-45° to sub-vertical
15		100	21	9									
	15.80												
16													
		100	48	44									
	17.40								6.24	17.40			End of Borehole at 17.40 m



REMARKS: Standpipe slotted 14m-17m, solid 0.0m-14m, fill 1m-11.5m, seal 0.0m-1m, 11.5m-13m, gravel 13m-17.4m.

INSTALLATION DETAILS

Installation Type : SP

Depth to Response Zone top (m) : 0.00

Depth to Response Zone bottom (m) : 20.00

Comments : Standpipe slotted 15m- 20m

Appendix III

Laboratory Test Records
(Geotechnical)

Determination of Moisture Content

BS1377:Part 2:1990, clauses 3.2

BH/TP No.	Sample No.	Depth (m)	Sample Type	Moisture Content %	Description
BH 12	3222	1.00	D	21.1	Brown slightly organic slightly sandy slightly gravelly SILT/CLAY
BH 12	3224	3.10	D	12.1	Mottled grey brown slightly sandy slightly gravelly SILT/CLAY
BH 12	3226	5.00	D	7.0	Black slightly sandy gravelly SILT/CLAY
BH 12	3227	6.00	D	8.7	Black slightly sandy slightly gravelly SILT/CLAY
BH 12	3228	7.00	D	13.9	Grey slightly sandy slightly gravelly SILT/CLAY
BH 13	3230	2.00	D	10.7	Brown slightly sandy slightly gravelly SILT/CLAY
BH 13	3231	2.50	D	9.4	Brown clayey/silty sandy GRAVEL
BH 13	3232	3.00	D	12.5	Grey slightly sandy slightly gravelly SILT/CLAY
BH 13	3234	5.00	D	5.2	Black grey slightly sandy slightly gravelly SILT/CLAY
BH 13	3235	6.00	D	10.9	Grey slightly sandy slightly gravelly SILT/CLAY
BH 13	3236	7.00	D	17.1	Grey slightly sandy slightly gravelly SILT/CLAY
BH 14	3237	1.00	D	6.8	Mottled grey brown slightly sandy gravelly SILT/CLAY with some cobbles
BH 14	3239	3.30	D	9.8	Black brown slightly sandy slightly gravelly SILT/CLAY
BH 14	3240	4.00	D	7.0	Black slightly sandy slightly gravelly SILT/CLAY
BH 14	3241	5.00	D	8.5	Black grey clayey/silty sandy GRAVEL with some cobbles
BH 14	3243	7.00	D	6.8	Black slightly sandy slightly gravelly SILT/CLAY

IGSL	Contract	O'Devaney Gardens Phase 2	Contract No. 10009
	Compiled By D CONNOLLY	Date 30/9/04	Page 1 of 2

Determination of Moisture Content

BS1377:Part 2:1990, clauses 3.2

BH/TP No.	Sample No.	Depth (m)	Sample Type	Moisture Content %	Description
BH 15	3244	1.00	D	9.2	Brown slightly sandy slightly gravelly SILT/CLAY
BH 15	3246	3.00	D	8.7	Black grey slightly sandy slightly gravelly SILT/CLAY
BH 15	3248	5.00	D	15.4	Black slightly sandy slightly gravelly SILT/CLAY
BH 16	3250	2.00	D	9.2	Brown slightly sandy slightly gravelly SILT/CLAY
BH 16	3251	3.10	D	9.2	Black grey slightly sandy slightly gravelly SILT/CLAY
BH 16	3252	3.00	D	11.0	Grey slightly sandy gravelly SILT/CLAY
BH 16	3253	4.00	D	7.8	Black slightly sandy slightly gravelly SILT/CLAY

IGSL

Contract: O'Devaney Gardens Phase 2

Contract No. 10009

Compiled By: D CONNOLLY

Date: 30/9/04

Page: 2 of 2

Summary of Classification Tests

BS1377:Part 2:1990, clauses 3.2, 4.3, 5.3 & 5.4

BH/TP No.	Sample No.	Depth (m)	Sample Type	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	<425µm %	Preparation	Description	Classification
BH 12	3223	2.10	D	14.7	32	19	13	59.1	WS	Mottled grey brown slightly sandy slightly gravelly CLAY	C L
BH 12	3225	4.00	D	8.1	32	14	18	42.9	WS	Grey slightly sandy slightly gravelly CLAY	C L
BH 13	3229	1.00	D	12.7	28	18	10	54.5	WS	Brown slightly sandy slightly gravelly CLAY	C L
BH 13	3233	4.00	D	9.2	27	14	13	52.3	WS	Grey black slightly sandy slightly gravelly CLAY	C L
BH 14	3238	2.00	D	10.4	32	16	16	47.2	WS	Brown slightly sandy slightly gravelly CLAY	C L
BH 14	3242	6.00	D	9.1	33	15	18	60.1	WS	Black slightly sandy slightly gravelly CLAY	C L
BH 15	3245	2.00	D	10.2	34	18	16	45.3	WS	Mottled grey brown slightly sandy slightly gravelly CLAY	C L
BH 15	3247	4.00	D	6.8	28	14	14	51.1	WS	Black slightly sandy slightly gravelly CLAY	C L
BH 16	3249	1.00	D	17.4	35	19	16	51.2	WS	Brown slightly sandy slightly gravelly CLAY	C L
BH 16	3254	5.00	D	19.7	31	16	15	43	WS	Grey slightly sandy slightly gravelly CLAY	C L

Notes: NAT - tested as received WS - Wet sieved (425µm) NP - Non Plastic

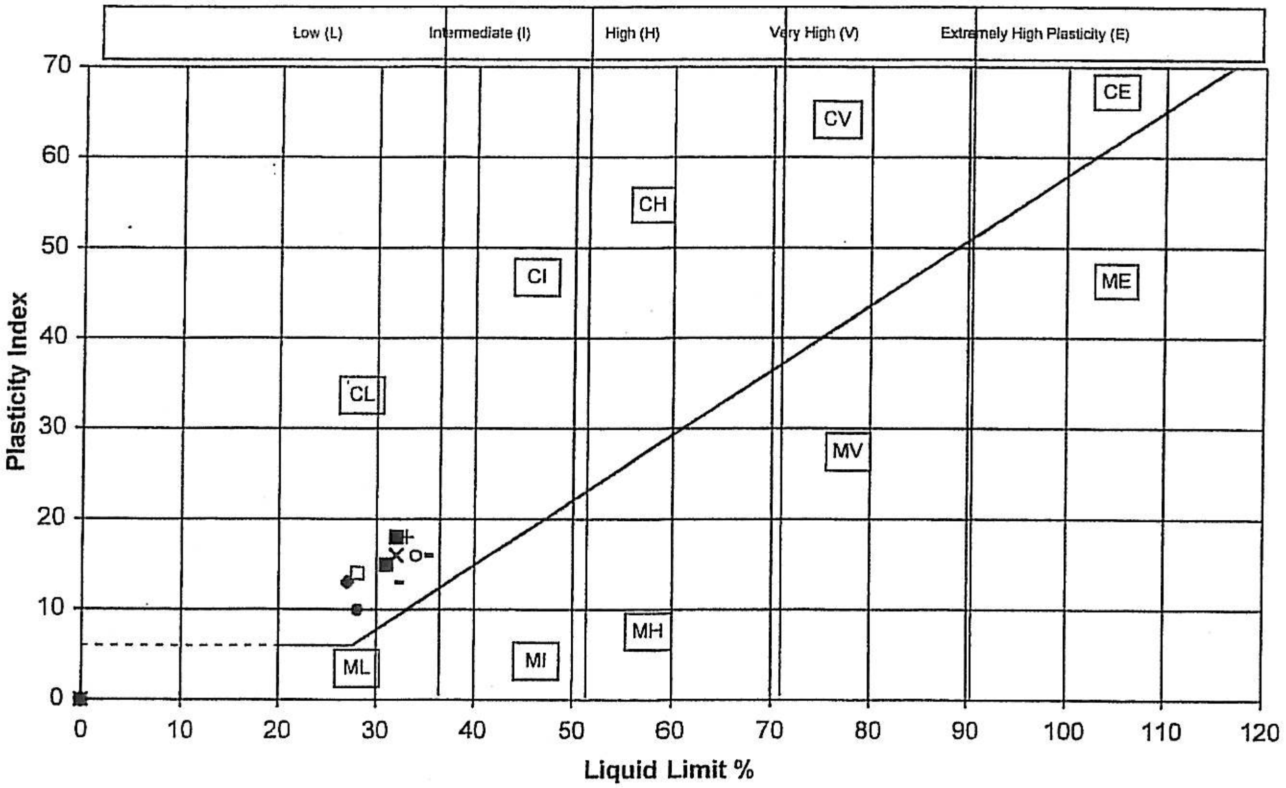
IGSL	Contract O'Devaney Gardens Phase 2				Contract No. 10009
	Compiled By	Date	Checked By	Date	Page
	D CONNOLLY	30/9/04			of

Plasticity Chart - Summary of Liquid & Plastic Limit Tests

BS1377:Part 2:1990, clauses 3.2, 4 & 5

Chart in accordance with BS5930:1999, fig.18

Contract No. 10009 Contract: O'Devaney Gardens Phase 2



Code	BH/TP	Sample	Depth (m)	MC%	LL%	PL%	PI%	%<425μm	Description
-	BH 12	3223	2.10	14.7	32	19	13	59.1	Mottled grey brown slightly sandy slightly gravelly CLAY
■	BH 12	3225	4.00	8.1	32	14	18	42.9	Grey slightly sandy slightly gravelly CLAY
●	BH 13	3229	1.00	12.7	28	18	10	54.5	Brown slightly sandy slightly gravelly CLAY
◆	BH 13	3233	4.00	9.2	27	14	13	52.3	Grey black slightly sandy slightly gravelly CLAY
x	BH 14	3238	2.00	10.4	32	16	16	47.2	Brown slightly sandy slightly gravelly CLAY
+	BH 14	3242	6.00	9.1	33	15	18	60.1	Black slightly sandy slightly gravelly CLAY
o	BH 15	3245	2.00	10.2	34	18	16	45.3	Mottled grey brown slightly sandy slightly gravelly CLAY
☐	BH 15	3247	4.00	6.8	28	14	14	51.1	Black slightly sandy slightly gravelly CLAY
-	BH 16	3249	1.00	17.4	35	19	16	51.2	Brown slightly sandy slightly gravelly CLAY
■	BH 16	3254	5.00	19.7	31	16	15	43	Grey slightly sandy slightly gravelly CLAY
●									
◆									
x									
+									
o									
☐									

NP denotes specimen is non-plastic.

	Compiled by	Date	Checked by	Date	Page
IGSL	D CONNOLLY	30/9/04			

Moisture Condition Value Test Report Sheet

I.G.S.L.

Contract Details

Contract Name: O'Devanev Gardens Phase 2
Contract No.: 10009
Client Name:
Engineer:

Sample Details

BH/TP No.: BH 16
Depth (m): 2
Sample Type: D
Sample Reference: 3250

Test Summary

Description:
Brown slightly sandy slightly gravelly SILT/CLAY

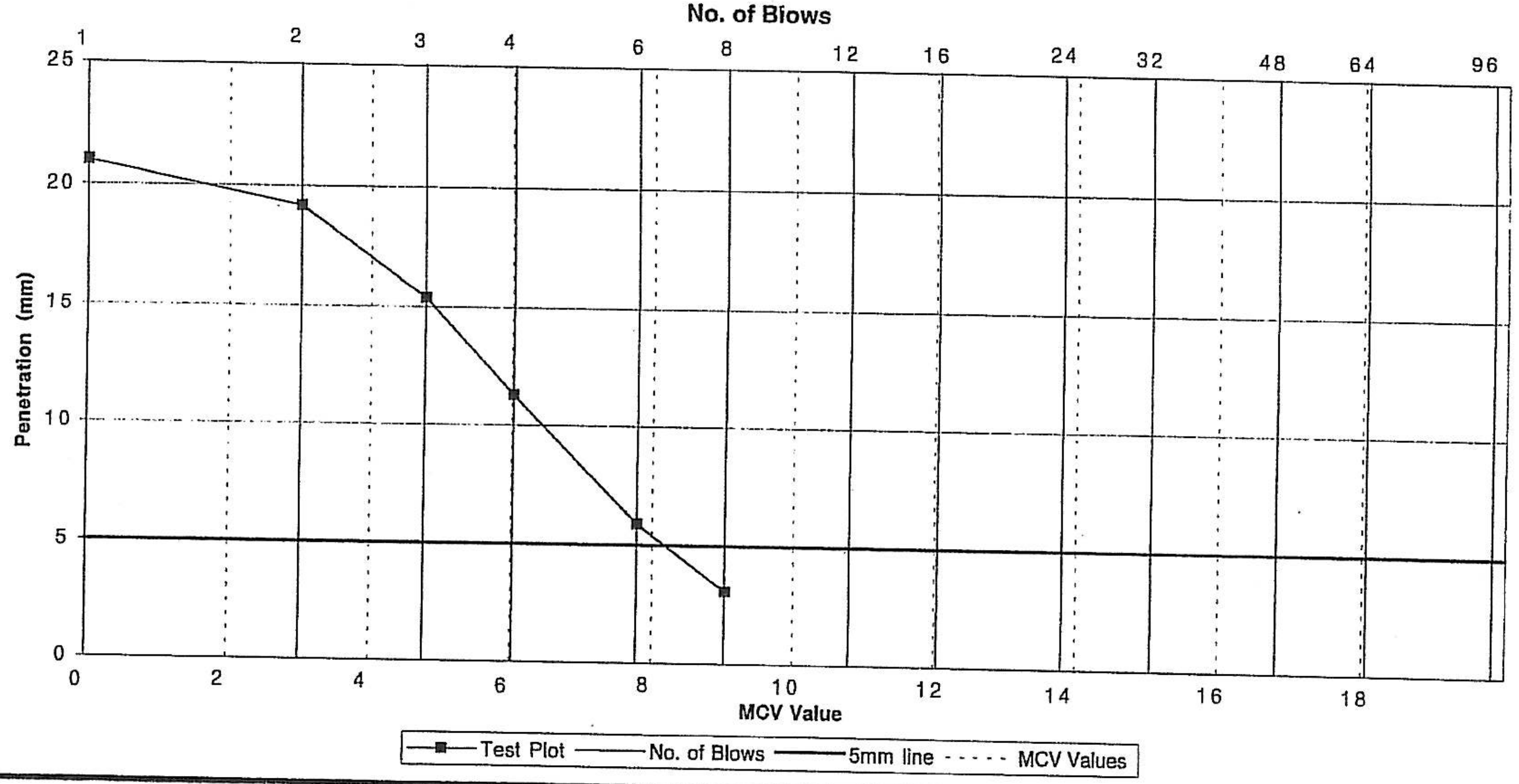
Moisture Content (%): 11.7

% Passing 20mm Sieve: 95.5

Moisture Condition Value: 8.2

Comments

No. Blows	Penetration (mm)
1	21
2	19.2
3	15.4
4	11.3
6	5.9
8	3.1
12	
16	
24	
32	
48	
64	
100	



Moisture Condition Value Test Report Sheet

I.G.S.L.

Contract Details

Contract Name: O'Devaney Gardens Phase 2
Contract No.: 10009
Client Name:
Engineer:

Sample Details

BH/TP No.: BH 15
Depth (m): 3
Sample Type: D
Sample Reference: 3246

Test Summary

Description:
Black grey slightly sandy slightly gravelly SILT/CLAY

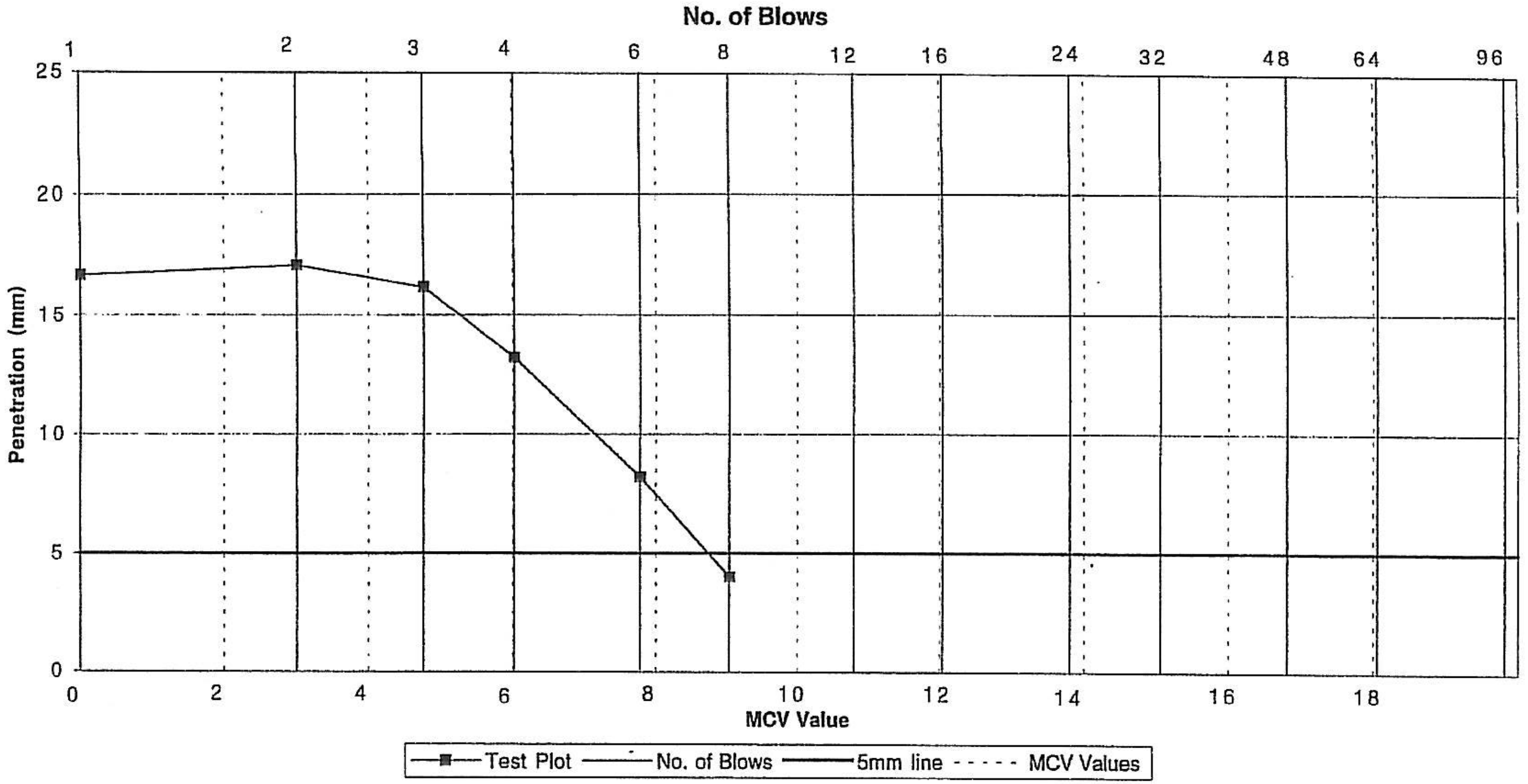
Moisture Content (%): 9.1

% Passing 20mm Sieve: 88.5

Moisture Condition Value: 8.8

Comments

No. Blows	Penetration (mm)
1	16.7
2	17.1
3	16.2
4	13.2
6	8.2
8	4
12	
16	
24	
32	
48	
64	
100	



Moisture Condition Value Test Report Sheet

I.G.S.L.

Contract Details

Contract Name	O'Devaney Gardens Phase 2
Contract No.	10009
Client Name	
Engineer	

Sample Details

BH/TP No.	BH 14
Depth (m)	2
Sample Type	D
Sample Reference	3238

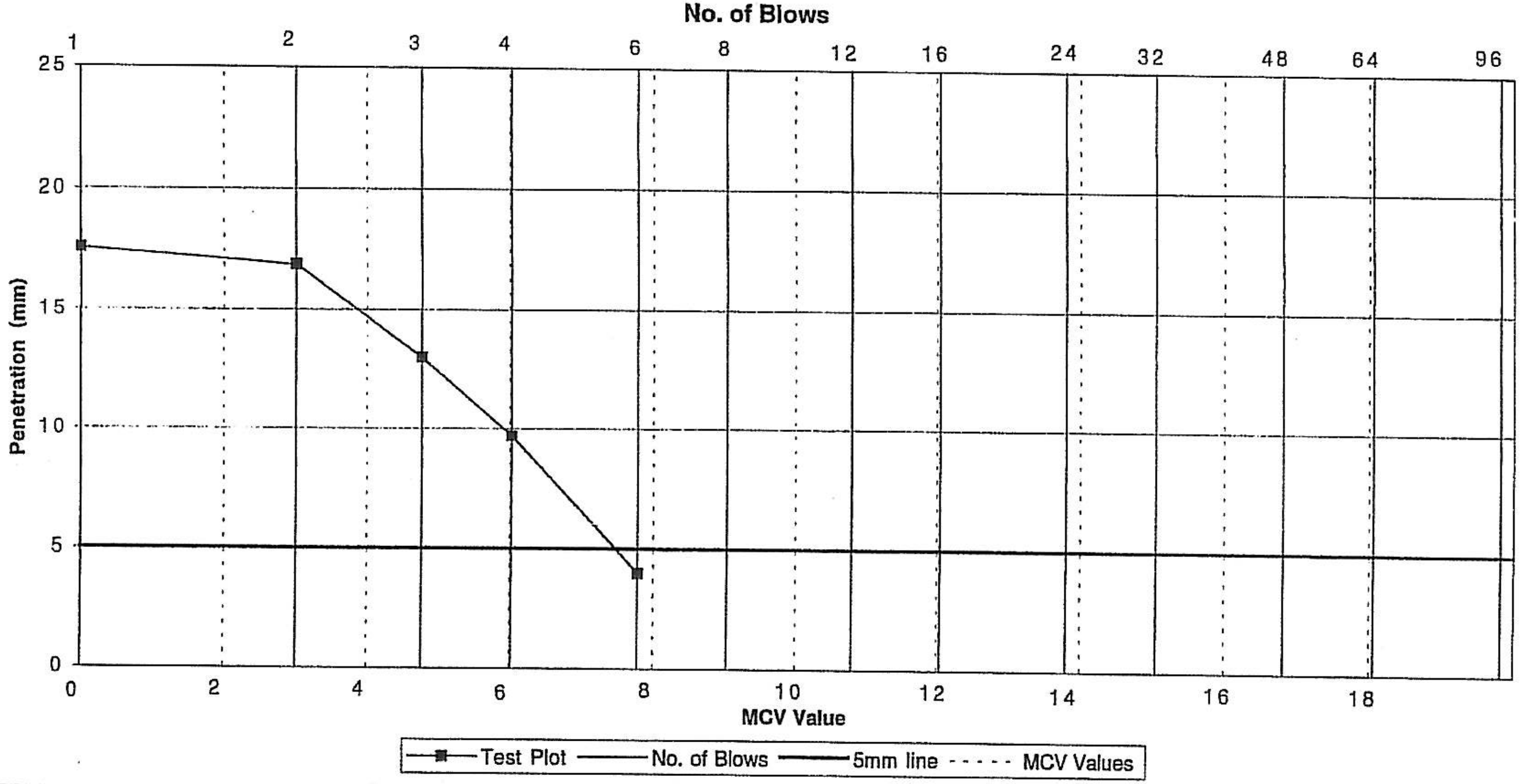
Test Summary

Description:
Brown slightly sandy slightly gravelly CLAY

Moisture Content (%)	12.8
% Passing 20mm Sieve	64.7
Moisture Condition Value	7.5

Comments

No. Blows	Penetration (mm)
1	17.6
2	16.9
3	13
4	9.7
6	4
8	
12	
16	
24	
32	
48	
64	
100	



Moisture Condition Value Test Report Sheet

I.G.S.L.

Contract Details

Contract Name	O'Devaney Gardens Phase 2
Contract No.	10009
Client Name	
Engineer	

Sample Details

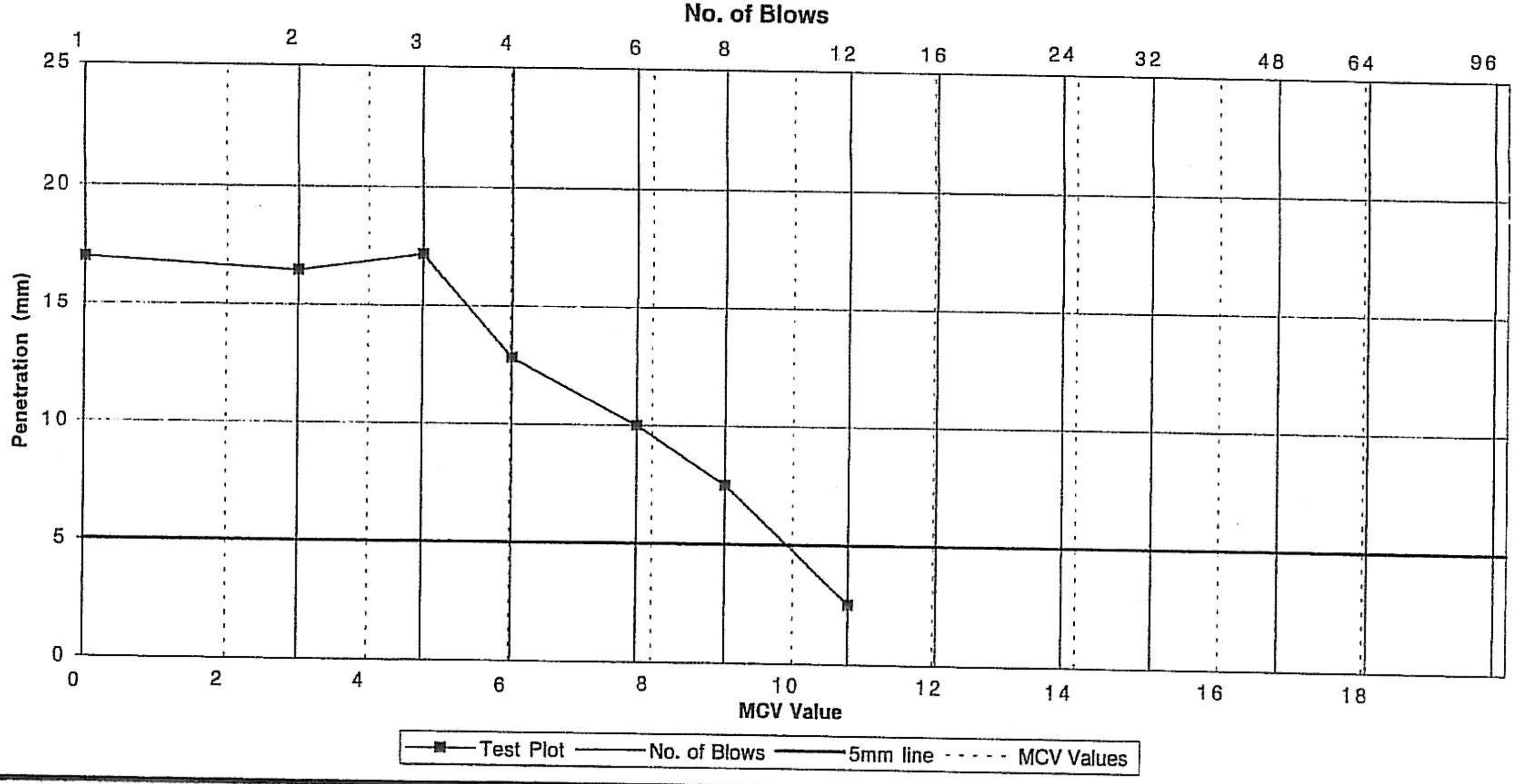
BH/TP No.	BH 13
Depth (m)	2
Sample Type	D
Sample Reference	3230

Test Summary

Description:
Brown slightly sandy gravelly SILT/CLAY

Moisture Content (%)	10.7
% Passing 20mm Sieve	84.4
Moisture Condition Value	10.0
Comments	

No. Blows	Penetration (mm)
1	17
2	16.5
3	17.2
4	12.8
6	10
8	7.5
12	2.5
16	
24	
32	
48	
64	
100	



Moisture Condition Value Test Report Sheet

I.G.S.L.

Contract Details

Contract Name	O'Devaney Gardens Phase 2
Contract No.	10009
Client Name	
Engineer	

Sample Details

BH/TP No.	BH 12
Depth (m)	4
Sample Type	D
Sample Reference	3225

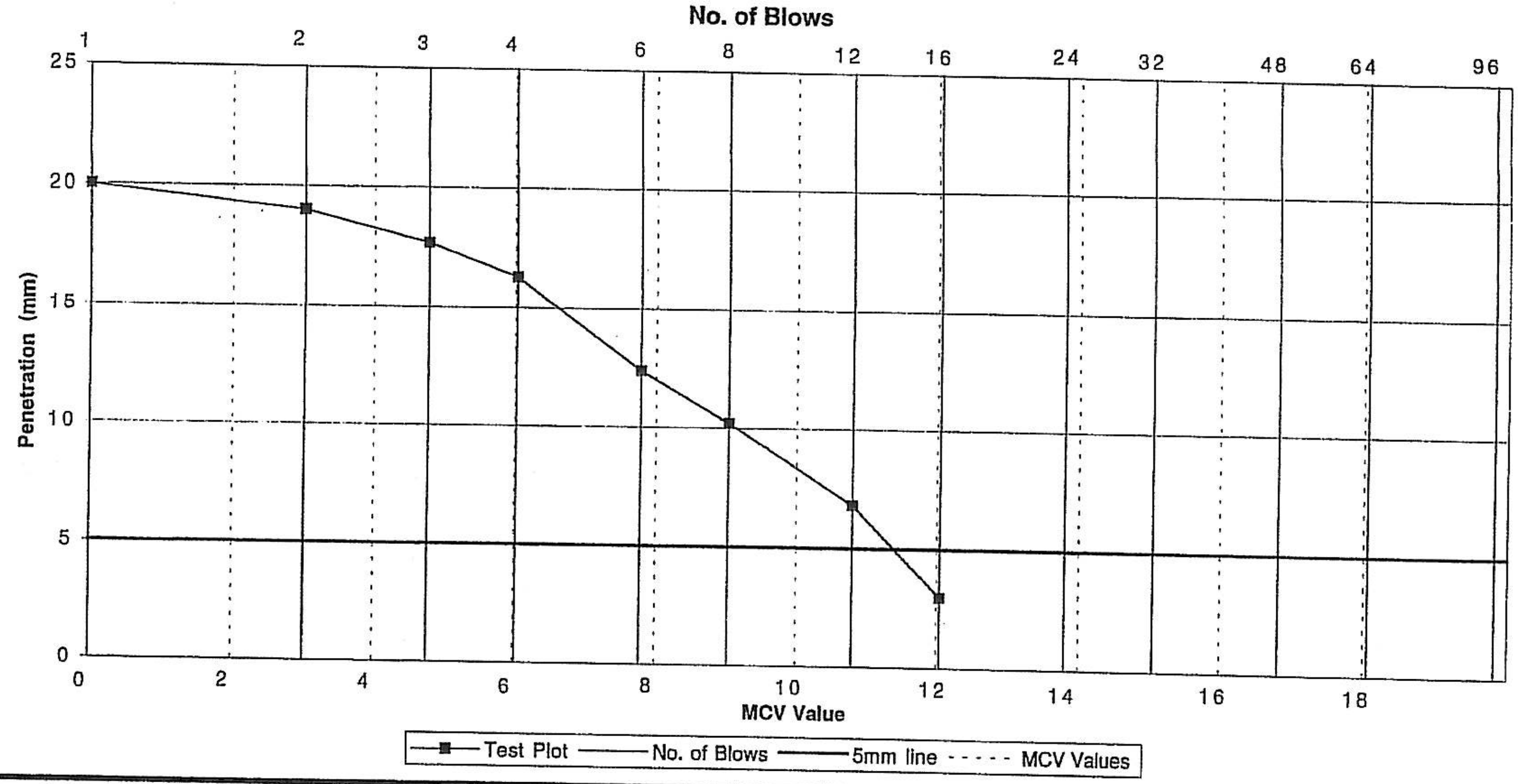
Test Summary

Description:
Grey slightly sandy slightly gravelly CLAY

Moisture Content (%)	8.1
% Passing 20mm Sieve	84
Moisture Condition Value	11.4

Comments

No. Blows	Penetration (mm)
1	20
2	19
3	17.7
4	16.3
6	12.4
8	10.2
12	6.8
16	3
24	
32	
48	
64	
100	



REPORT NO.

SULPHATE ANALYSIS

IGSL

CONTRACT: **O'Devaney Gardens Phase 2**

CONTRACT NO 10009

BH/TP NO.	DEPTH (M)	SAMPLE NO.	SAMPLE TYPE	TEST CODE	% Passing 2mm	SULPHUR TRIOXIDE		(so3 X 1.2)	pH
						WATER SO3 g/L	TOTAL SOIL so3 %	TOTAL SOIL so 4 %	VALUE
BH 12	2.10	3224	D	S	37.7		0.037	0.044	8.2
BH 14	4.00	3240	D	S	55.3		0.209	0.251	7.5
BH 15	3.00	3247	D	S	60.1		0.218	0.262	7.7

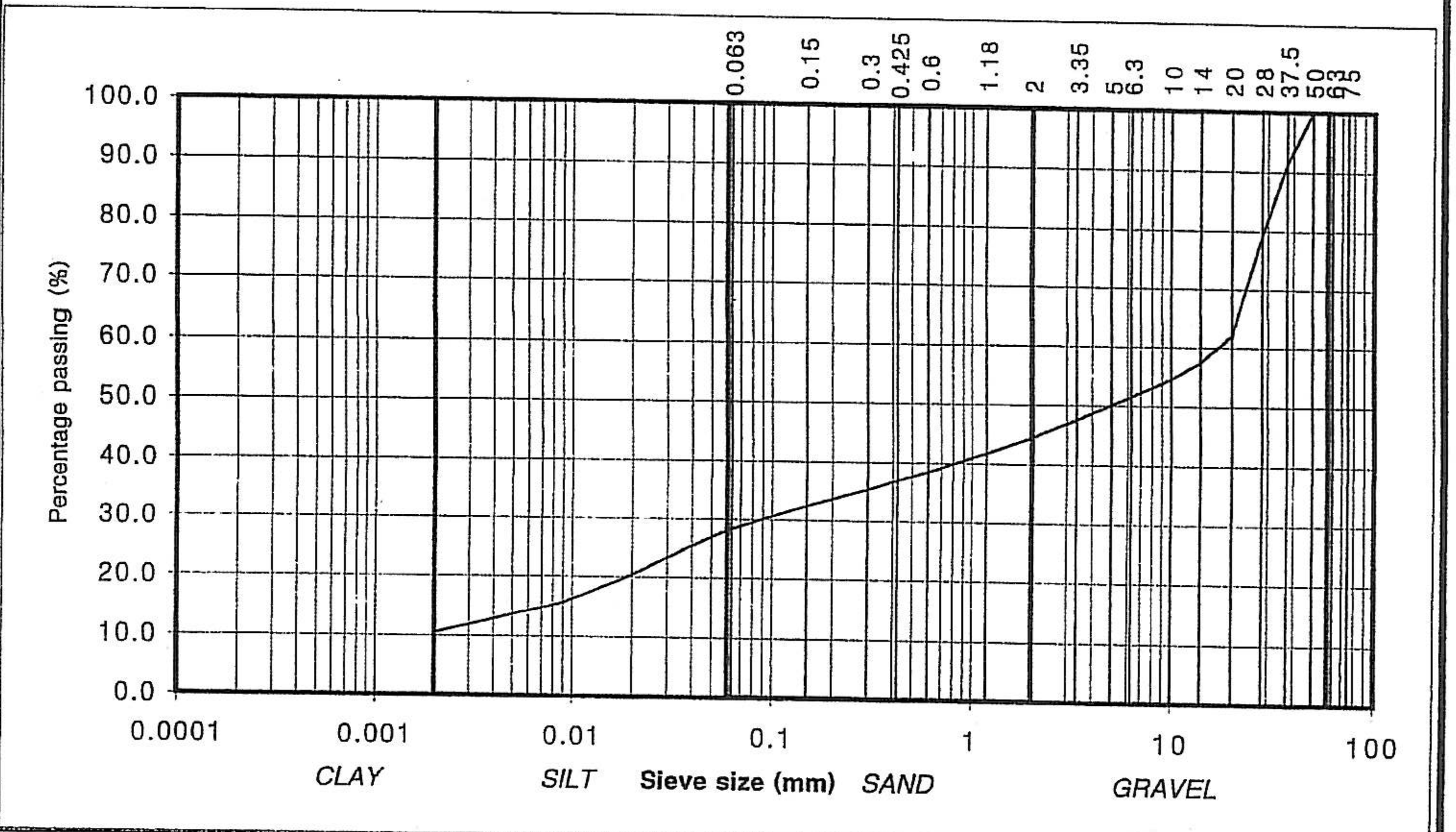
TEST CODE: W = WATER S = SOIL A = AQUEOUS SOIL EXTRACT(2:1)

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100.0	COBBLES
63	100.0	GRAVEL
50	100.0	
37.5	91.4	
28	79.0	
20	62.1	
14	57.5	
10	54.7	
6.3	51.7	
5	50.2	
3.35	47.6	
2	44.6	SAND
1.18	41.8	
0.6	38.3	
0.425	36.9	
0.3	35.3	
0.15	32.4	
0.063	28.4	SILT/CLAY
0.04	25.4	
0.03	23.4	
0.02	20.4	
0.013	17.7	
0.009	15.6	
0.005	13.6	
0.002	10.4	

Contract No:	10009
Contract:	O'Devaney Gardens Phase 2
BH/TP No:	BH 12
SAMPLE No.:	3226
DEPTH (m):	5.00
TEST METHOD:	Wet sieve and hydrometer
DESCRIPTION:	Black slightly sandy, gravelly, SILT/CLAY



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IGSL LIMITED, UNIT F, M7 BUSINESS PARK, NAAS, CO.KILDARE.

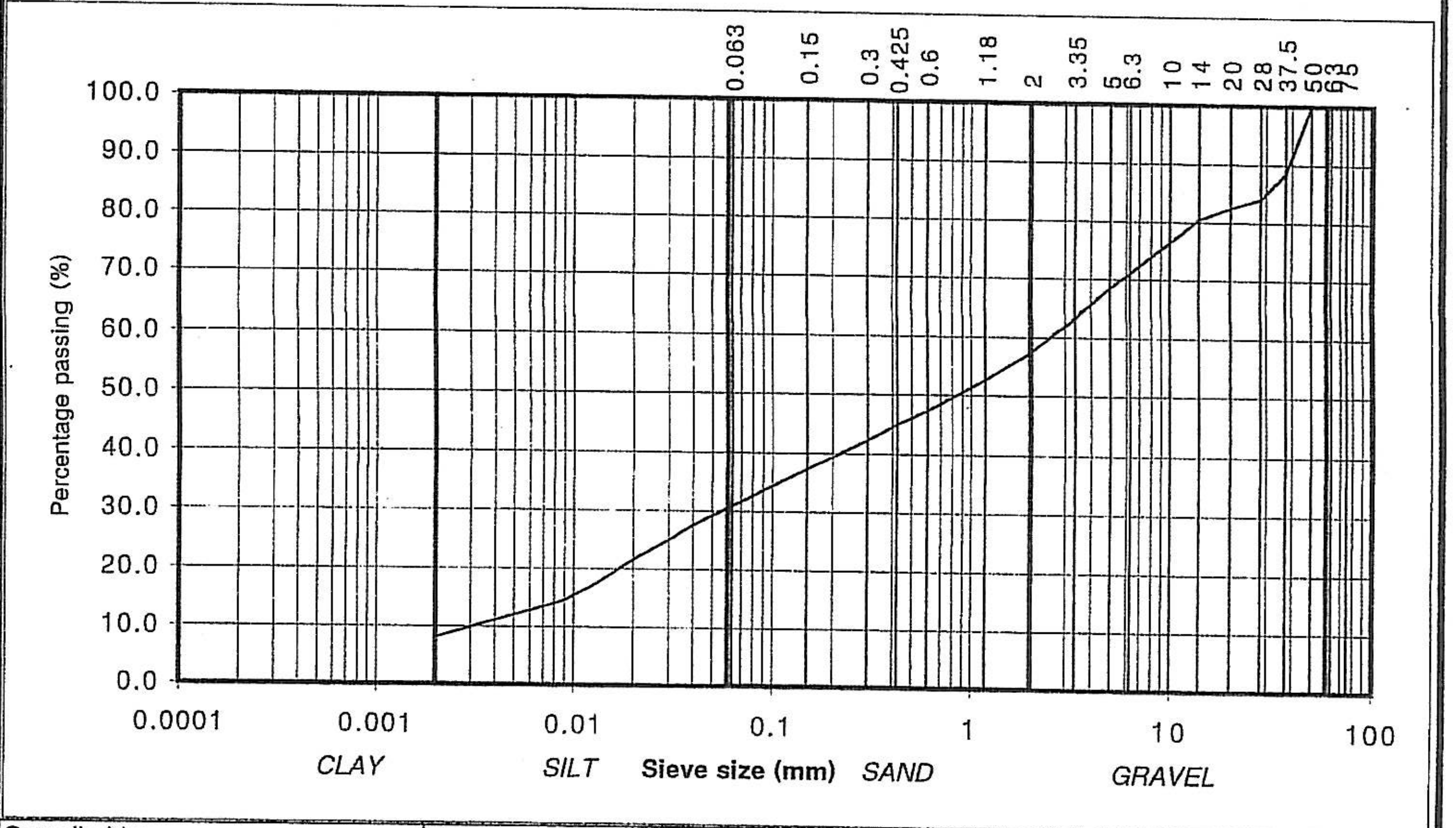
PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	100.0	COBBLES
63	100.0	GRAVEL
50	100.0	
37.5	88.4	
28	84.0	
20	82.4	
14	80.4	
10	76.4	
6.3	71.1	
5	68.4	
3.35	63.2	
2	57.4	SAND
1.18	52.7	
0.6	47.2	
0.425	44.9	
0.3	42.2	
0.15	37.3	
0.063	30.8	SILT/CLAY
0.04	27.5	
0.03	25.1	
0.02	21.6	
0.013	17.4	
0.009	14.5	
0.005	12.0	
0.002	8.1	

Contract No:	10009
Contract:	O'Devaney Gardens Phase 2
BH/TP No:	BH 13
SAMPLE No.:	3230
DEPTH (m):	2.00
TEST METHOD:	Wet sieve and hydrometer
DESCRIPTION:	Brown slightly sandy, gravelly, SILT/CLAY



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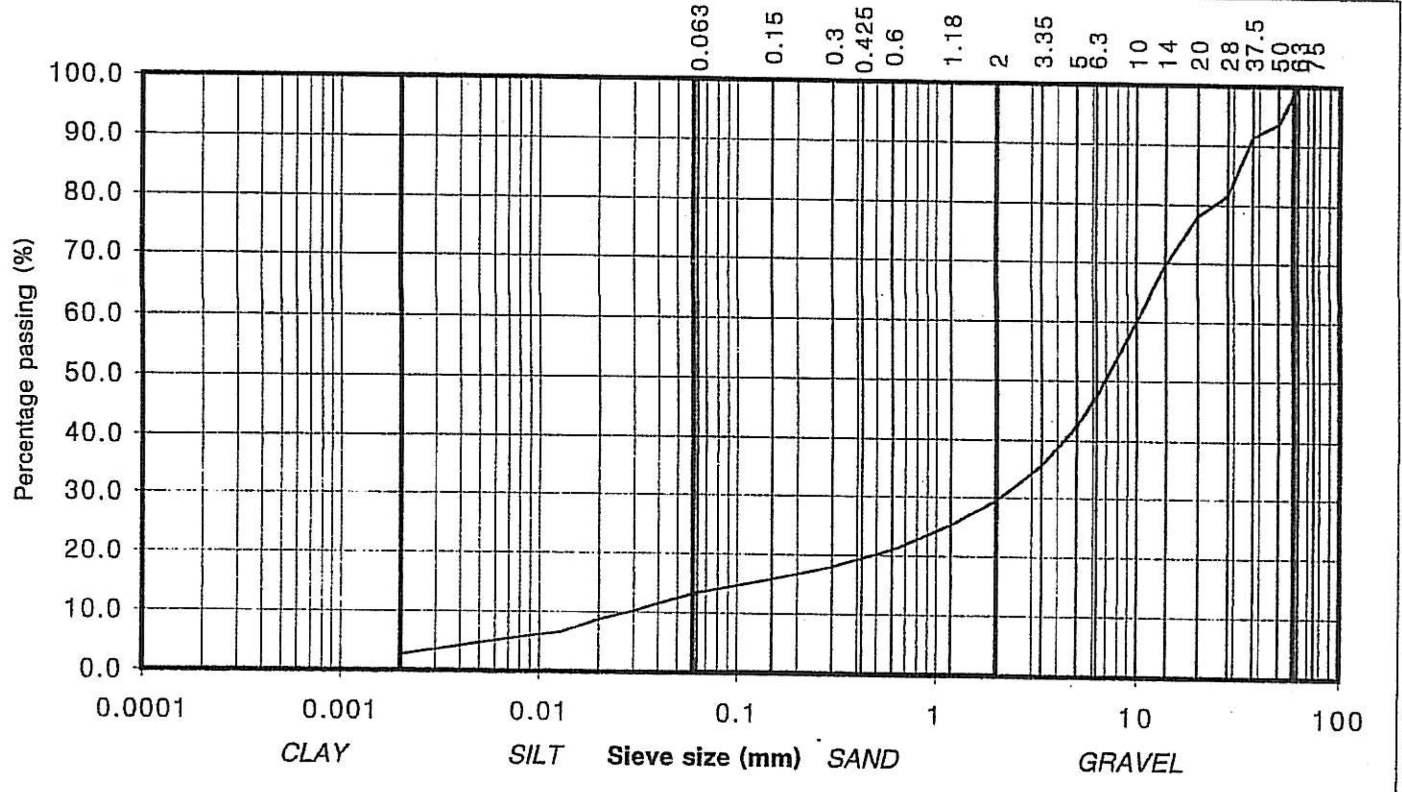
PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No:	10009
Contract:	O'Devaney Gardens Phase 2
BH/TP No:	BH 13
SAMPLE No.:	3231
DEPTH (m):	2.50
TEST METHOD:	Wet sieve and hydrometer
DESCRIPTION:	Brown clayey/silty, sandy, GRAVEL

particle size	% passing	
75	100.0	COBBLES
63	100.0	GRAVEL
50	93.7	
37.5	91.4	
28	81.6	
20	78.0	
14	69.6	
10	60.0	
6.3	47.4	
5	42.4	
3.35	35.5	
2	29.5	SAND
1.18	25.2	
0.6	21.0	
0.425	19.5	
0.3	18.0	
0.15	15.8	
0.063	13.3	SILT/CLAY
0.04	11.5	
0.03	10.2	
0.02	8.7	
0.013	6.6	
0.009	6.0	
0.005	4.7	
0.002	2.6	



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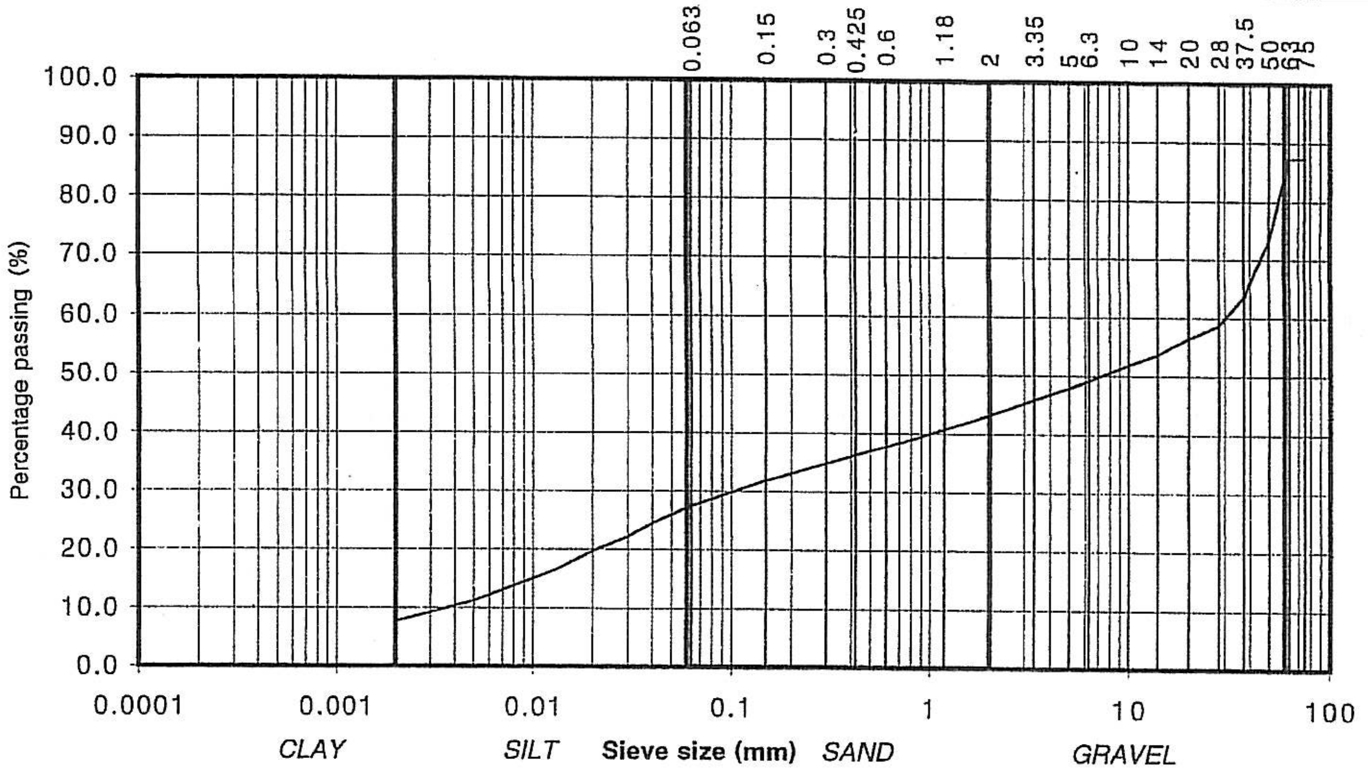
Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No: 10009
Contract: O'Devaney Gardens Phase 2
BH/TP No: BH 14
SAMPLE No.: 3237
DEPTH (m): 1.00
TEST METHOD: Wet sieve and hydrometer
DESCRIPTION: Mottled grey brown slightly sandy, gravelly, SILT/CLAY with some cobbles

particle size	% passing	
75	87.3	COBBLES
63	87.3	GRAVEL
50	73.0	
37.5	63.7	
28	58.7	
20	56.6	
14	53.7	
10	52.0	
6.3	49.2	
5	48.0	
3.35	45.9	
2	43.2	SAND
1.18	40.7	
0.6	37.6	
0.425	36.3	
0.3	34.7	
0.15	31.8	
0.063	27.4	SILT/CLAY
0.04	24.5	
0.03	22.1	
0.02	19.7	
0.013	16.4	
0.009	14.4	
0.005	11.1	
0.002	7.6	



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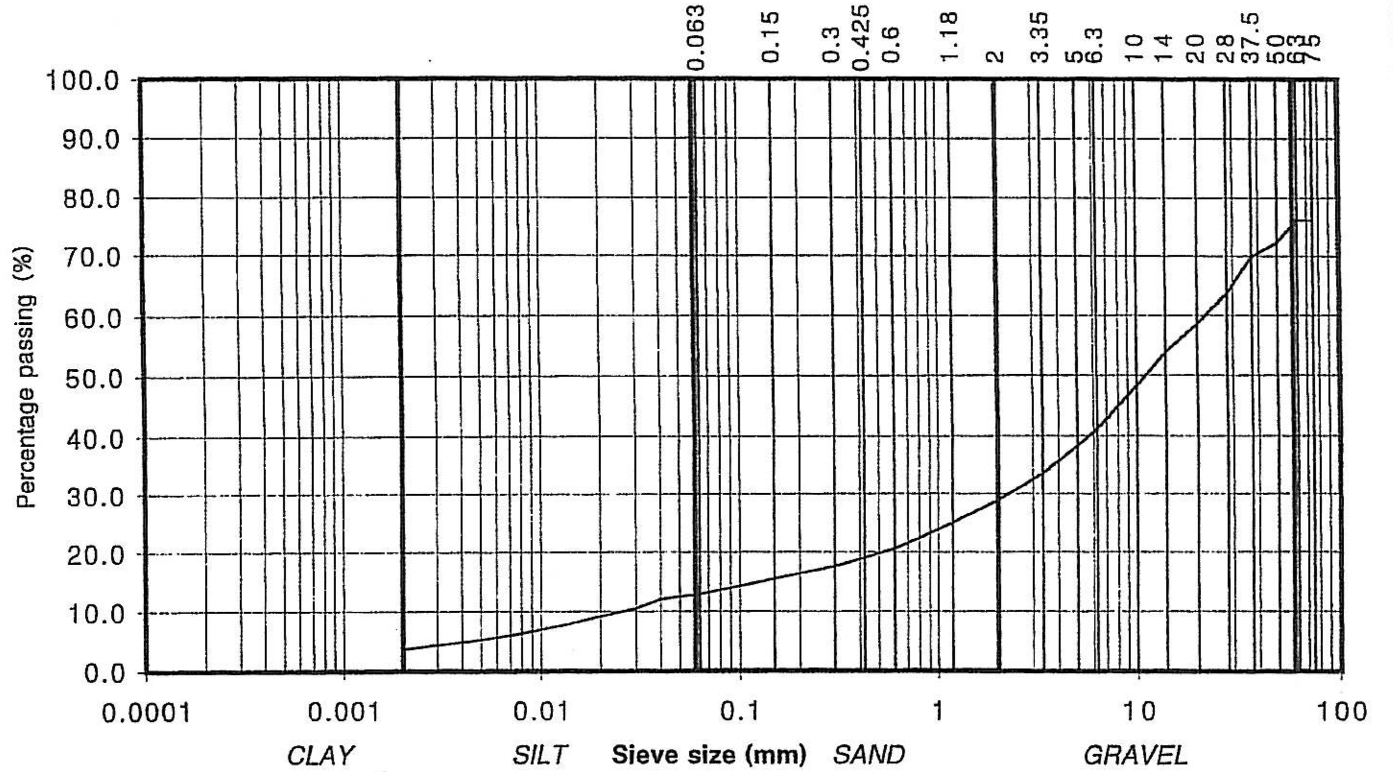
PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

particle size	% passing	
75	76.1	COBBLES
63	76.0	GRAVEL
50	72.2	
37.5	69.8	
28	63.7	
20	58.6	
14	53.9	
10	48.2	
6.3	41.1	
5	38.2	
3.35	33.5	
2	28.8	SAND
1.18	25.0	
0.6	20.6	
0.425	19.1	
0.3	17.7	
0.15	15.5	
0.063	12.9	SILT/CLAY
0.04	12.0	
0.03	10.4	
0.02	9.1	
0.013	7.6	
0.009	6.6	
0.005	5.2	
0.002	3.6	

Contract No: 10009
Contract: O'Devaney Gardens Phase 2
BH/TP No: BH 14
SAMPLE No.: 3241
DEPTH (m): 5.00
TEST METHOD: Wet sieve and hydrometer
DESCRIPTION: Black grey clayey/silty, sandy, GRAVEL with many cobbles



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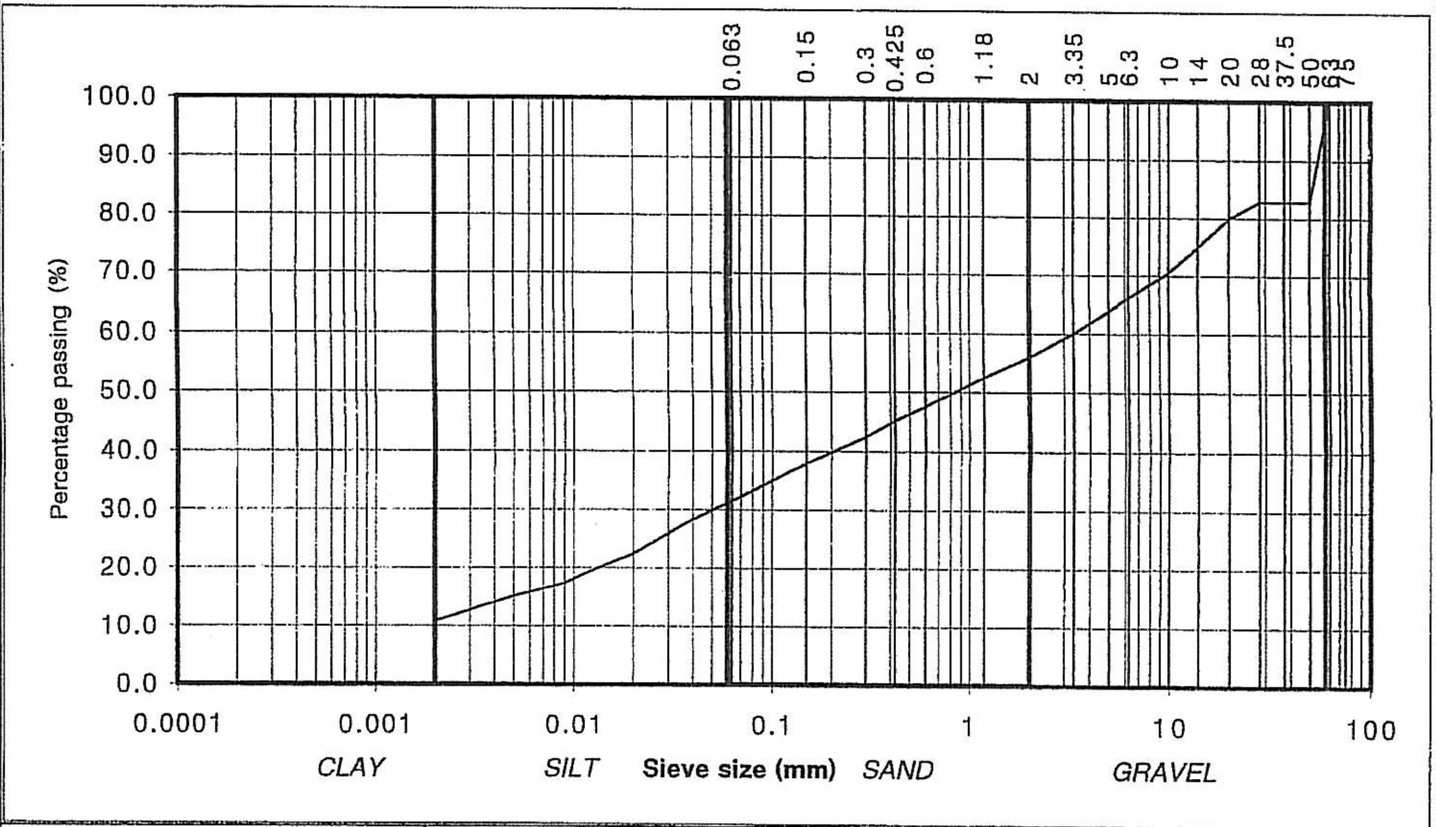
PSD V3.1 12.01

Determination of Particle Size Distribution

BS1377:Part2:1990 , clauses 9.2

Contract No: 10009
Contract: O'Devaney Gardens Phase 2
BH/TP No: BH 16
SAMPLE No.: 3252
DEPTH (m): 3.00
TEST METHOD: Wet sieve and hydrometer
DESCRIPTION: Grey slightly sandy, gravelly, SILT/CLAY

particle size	% passing	
75	100.0	COBBLES
63	100.0	GRAVEL
50	82.8	
37.5	82.8	
28	82.8	
20	79.9	
14	74.9	
10	70.4	
6.3	66.1	
5	63.9	
3.35	60.1	
2	56.0	SAND
1.18	52.5	
0.6	47.5	
0.425	45.1	
0.3	42.4	
0.15	37.9	
0.063	31.5	SILT/CLAY
0.04	28.4	
0.03	25.8	
0.02	22.3	
0.013	19.8	
0.009	17.3	
0.005	15.0	
0.002	10.8	



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PSD V3.1 12.01

Report No.

CALIFORNIA BEARING RATIO

I.G.S.L.

Contract: **O'Devaney Gardens Phase 2**

DATE: 30/9/04

CONTRACT No 10009

Location	Sample No.	Depth of Sample	Sample Description	Water Content %	Test Code	Water Content				C.B.R.		
						Top %	Bottom %	Bulk Density. Mg/M3	% Passing 20mm	Top %	Base %	Average %
BH 13	3229	1.00	Brown slightly sandy slightly gravelly CLAY	8.8	L/St	8.7	8.9	2.07	91.1	33.4	23.5	28.5
BH 14	3237	1.00	Mottled grey brown slightly sandy gravelly SILT/CLAY with some cobbles	11.5	L/St	11.5	11.6	2.18	56.6	17.0	10.7	13.8
BH 15	3244	1.00	Brown slightly sandy slightly gravelly SILT/CLAY	10.7	L/St	11.5	9.7	2.21	81.8	13.7	12.3	13.0

Test Code:
U.-Undisturbed Sample
D.-Dynamic Compaction
St.-Static compaction
L.-2.5Kg. Rammer
H.-4.5Kg. Rammer
A/5.-5% Air Voids Ratio
A10.-10% Air Voids Ratio
RN29.- Road Note 29 (St. 95% H.)
V.- Vibrating Hammer
M.- Method Number

Appendix IV

Laboratory Test Records
(Environmental)

SEVERN TRENT
ENVIRONMENTAL LEADERSHIP
STL
Leaders in Environmental Testing

Mr Keogh
IRISH GEOTECHNICAL SURVEYS
Unit F
M7 Business Park
Naas
Co Kildare
Ireland

11 November 2004

Test Report : TH/248933/2004

Dear Mr Keogh,

Analysis of your sample(s) submitted on 29/09/2004 is now complete and we have pleasure in enclosing the appropriate test report(s).

Should you have any query on the report(s) or any part of our service we will be happy to discuss your requirements.

An invoice for the analysis carried out will be sent under separate cover.

Thank you for using STL and we look forward to receiving your next samples.

To arrange a container delivery or sample collection please ring the direct line to **COURIERS on 024 7685 6562.**

Yours Sincerely,

Signed :

Name : J. Fell

Title : Section Manager

STL Coventry
STL Business Centre, Torrington Avenue,
Coventry, CV4 9GU, United Kingdom

Tel: +44 (0)24 7642 1213
Fax: +44 (0)24 7685 6575
www.stl-analytical.co.uk

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Registered in England & Wales Registration No. 2148934 Registered Office: 2297 Coventry Road, Birmingham B26 3PU

SGS UKAS 005
Cert. No. 10269
Environmental Management Systems
UKAS TESTING
1314
0897
1229
1510
INVESTOR IN PEOPLE

Report Summary

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SEVERN
TRENT
ENVIRONMENTAL LEADERSHIP

STL

Mr Darren Keogh
IRISH GEOTECHNICAL SURVEYS LTD
Unit F
M7 Business Park
Naas
Co Kildare
Ireland

Report Number : TH/248933/2004 Issue 1

Job Description : Irish Geotechnical Surveys Ltd

Job Location : O Devant Gardens St Brcins Hosp.

Number of Samples included in report	1	Job Received :	**29 September 2004**
Number of test results included in report	24	Analysis Commenced :	**30 September 2004**

Signed : HQuick

Name : **H. Quick** Date : 11 November 2004

Title : **Senior Coordinator**

STL was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.
Information on the methods of analysis and performance characteristics are available on request
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory

Certificate of Analysis

UKAS
1314
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SEVERN
TRENT
ENVIRONMENTAL LEADERSHIP

STL

Sample **1** Laboratory Number : **424210**
of **1** Report Number : **TH /248933/2004** **Issue** **1**

Sample Source : **IRISH GEOTECHNICAL SURVEYS LTD**
Sample Point Description : **Irish Geotechnical Surveys**
Sample Description : **BH 12 3222**

Sample Date : **28 September 2004** Sample Received : **29 September 2004** Analysis Complete : **10 November 2004**

Test Description	Result	Units	Accreditation	Method
Antimony, Total as Sb	<0.001	mg/l	C	WAS016
Arsenic , Total as As	0.009	mg/l	C	WAS014
Barium, Total as Ba	0.009	mg/l	C	WAS049
Cadmium , Total as Cd	<0.0005	mg/l	C	WAS049
Chromium , Total as Cr	<0.005	mg/l	C	WAS049
Copper, Total as Cu	<0.005	mg/l	C	WAS049
Lead , Total as Pb	<0.005	mg/l	C	WAS049
Mercury , Total as Hg	<0.1	ug/l	C	WAS013
Molybdenum , Total as Mo	<0.005	mg/l	C	WAS049
Nickel , Total as Ni	<0.005	mg/l	C	WAS049
Selenium , Total as Se	<0.001	mg/l	C	WAS015
Zinc, Total as Zn	0.006	mg/l	C	WAS049
Fluoride as F	0.3	mg/l	C	WAS029
NRA Leachate	Analyst Comment		* C	PREP
Chloride as Cl	3	mg/l	C	WAS036
Sulphate as SO4	<5	mg/l	C	WAS036
Solids, Total diss.at 180c	142	mg/l	* C	WAS010
TOC (Filtered)	6.7	mg/l	C	WAS005
Naphthols BG 2.6/3.0	<0.1	mg/l	* L	PHOHBGW2
Phenol BG 2.6/3.0	< 0.50	ug/l	* L	PHOHBG2.4
Cresols BG 2.6/3.0	< 0.50	ug/l	* L	PHOHBG2.4
Total Phenols BG 2.6/3.0	< 2.5	ug/l	* L	PHOHBG2.4
Trimethylphenol BG 2.6/3.0	< 0.50	ug/l	* L	PHOHBG2.4
Xylenols&EthylphenolsBG2.6/3.0	0.67	ug/l	* L	PHOHBG2.4

Analyst Comment for 424210 : NRA Leachate performed on this sample.

Accreditation Codes : * = Not UKAS accredited B = Analysed at Bridgend C = Analysed at STL Coventry R = Analysed at Runcorn S = Sub-contracted
L = Analysed at STL CAS For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Signed : H Quick

Name : **H. Quick** Date : 11 November 2004
Title : **Senior Coordinator**

Report Summary

UKAS TESTING
1314
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SEVERN TRENT
ENVIRONMENTAL LEADERSHIP
STL

Mr Darren Keogh
IRISH GEOTECHNICAL SURVEYS LTD
Unit F
M7 Business Park
Naas
Co Kildare
Ireland

Report Number : TH/248936/2004 *Issue 1*

Job Description : Irish Geotechnical Surveys Ltd

Job Location : O Devant Gardens St Bricins Hosp.

Number of Samples included in report	**1**	Job Received :	**29 September 2004**
Number of test results included in report	**44**	Analysis Commenced :	**30 September 2004**

Signed : JFell

Name : **J. Fell** Date : 15 October 2004
Title : **Production Manager**

STL was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.
Information on the methods of analysis and performance characteristics are available on request
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory

Certificate of Analysis

1314
0897
1229
1510

SEVERN TRENT
ENVIRONMENTAL LEADERSHIP

STL

Sample 1 Laboratory Number : 424220
of 1 Report Number : TH /248936/2004 Issue 1

Sample Source : **IRISH GEOTECHNICAL SURVEYS LTD**
Sample Point Description : **Irish Geotechnical Surveys**
Sample Description : **BH12 3222**

Sample Date : **28 September 2004** Sample Received : **29 September 2004** Analysis Complete : **13 October 2004**

Test Description	Result	Units	Accreditation	Method
Antimony as Sb, dry weight	2.5	mg/kg	L	30C
Arsenic as As, dry weight	13	mg/kg	L	30/30C
Barium as Ba, dry wt.	60	mg/kg	L	52
Cadmium as Cd, dry weight	2.4	mg/kg	L	30
Chromium as Cr, dry weight	14	mg/kg	L	30
Copper as Cu, dry weight	43	mg/kg	L	30
Lead as Pb, dry weight	47	mg/kg	L	30
Mercury as Hg, dry weight	< 0.20	mg/kg	L	30C
Molybdenum as Mo, dry weight	3.5	mg/kg	L	52
Nickel as Ni, dry weight	44	mg/kg	L	30
Selenium as Se, dry weight	0.75	mg/kg	L	30C
Zinc as Zn, dry weight	120	mg/kg	L	30
Sulphate as SO4, water sol dw	< 120	mg/kg	L	46
Total organic carbon	17000	mg/kg	L	36
PCB28	< 1.0	ug/kg	C	312
PCB52	< 1.0	ug/kg	C	312
PCB101	< 1.0	ug/kg	C	312
PCB118	< 1.0	ug/kg	C	312
PCB138	< 1.0	ug/kg	C	312
PCB153	< 1.0	ug/kg	C	312
PCB180	< 1.0	ug/kg	C	312
TPH >C6-C8	< 5.0	mg/kg	C	314
TPH >C8-C10	< 5.0	mg/kg	C	314
TPH >C10-C16	< 10	mg/kg	C	314
TPH >C16-C24	26	mg/kg	C	314
TPH >C24-C40	69	mg/kg	C	314
TPH >C6-C40	95	mg/kg	C	314
Naphthalene	< 0.50	mg/kg	C	313
Acenaphthylene	< 0.50	mg/kg	C	313
Acenaphthene	< 0.50	mg/kg	C	313
Fluorene	< 0.50	mg/kg	C	313
Phenanthrene	< 0.50	mg/kg	C	313
Anthracene	< 0.50	mg/kg	C	313
Fluoranthene	1.4	mg/kg	C	313
Pyrene	1.2	mg/kg	C	313
Benzo(a)anthracene	0.60	mg/kg	C	313
Chrysene	0.73	mg/kg	C	313
Benzo(b)fluoranthene	0.75	mg/kg	C	313
Benzo(k)fluoranthene	0.71	mg/kg	C	313
Benzo(a)pyrene	0.61	mg/kg	C	313

Certificate of Analysis

1314
0897
1229
1510

SEVERN TRENT
ENVIRONMENTAL LEADERSHIP

STL

Sample 1 Laboratory Number : **424220**
of 1 Report Number : **TH /248936/2004** **Issue 1**

Sample Source : **IRISH GEOTECHNICAL SURVEYS LTD**
Sample Point Description : **Irish Geotechnical Surveys**
Sample Description : **BH12 3222**

Sample Date : **28 September 2004** Sample Received : **29 September 2004** Analysis Complete : **13 October 2004**

Test Description	Result	Units	Accreditation	Method
Indeno(123cd)pyrene	< 0.50	mg/kg	C	313
Dibenzo(ah)anthracene	< 0.50	mg/kg	C	313
Benzo(ghi)perylene	< 0.50	mg/kg	C	313
PAH total	5.9	mg/kg	C	313

Accreditation Codes : * = Not UKAS accredited B = Analysed at Bridgend C = Analysed at STL Coventry R = Analysed at Runcorn S = Sub-contracted
L = Analysed at STL CAS For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Signed : Name : **J. Fell** Date : 15 October 2004
Title : **Production Manager**

Appendix V – Site Plan

St. Bricins Hospital, Dublin

Scale: 1:1250