Department of Finance and Personnel

Central Procurement Directorate

'helping maximise the benefits of effective procurement'

SI1305
York Street Interchange
Additional Fieldwork
Belfast

September 2013

Education & Library Boards | HEALTH ESTATES | Translink | northern ireland water | Housing Executive | ROADS Service | HSC Business Services Organisation

CONTENTS

S Donovan

5 September 2013

Professional Services Division
Geotechnical Engineering Branch
Clare House
303 Airport Road West
Belfast
BT3 9ED.

Borehole Log and Test Results

Central Procurement Directorate
Geotechnical Engineering Branch
Clare House
303 Airport Road West
Belfast
BT3 9ED

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Job Nr: SI1305	Job Title: York Street Interchange		
Client: DRD Roads Service			
BH Nr: 223	G.L. 10.49 mOD	Grid Ref: 333722 / 375199	Inv. Date: 15/02/2013
Drilling Method: Cable percussive with rotary follow on		Drilling Crew:	Logged By: S.Donovan

Stratum Depth	Reduced Level	Legend	Description	Water Strikes	Chiselling Depth from (m) Depth to (m)	Chiselling Time (mins)	SPT/Sample From	SPT/Sample To	Sample Type	SPT N	Cu kN/m²	Phi Deg	Bulk Den Mg/m³	Dry Den Mg/m³	W%	PL%	LL%	Core Indices TCR%	Core Indices SCR%	Core Indices RQD
0.15	10.34		Bitmac surfacing (FILL)																	
0.50	9.99		Quarry hardcore (FILL)				0.50	1.00	B	N=7 (1,1/1,2,2,2)										
1.00	9.49		Possibly firm reworked brown sandy clayey SILT (MADE GROUND)				1.00	3.00	B											
			Firm becoming stiff brown sandy clayey SILT (GLACIAL TILL)				1.50	1.95	U		53		1.82	1.36	34.3	29.3	55.70			
							1.95	2.05	D											
							2.05	2.50	S											
3.00	7.49		Reddish greyish brown fine and medium grained SANDSTONE completely weathered becoming highly weathered (SEDIMENTARY BEDROCK)				3.00	6.40	B											
							3.50	3.80	S	100 (18,7 for 25mm/40,60 for 60mm)										
							5.00	5.30	S	175 (25/30,40, 30 for 60mm)										
							6.20	6.35	S	100										
6.40	4.09						6.40	7.90	C	(25/100)								60.00	30.00	11.00
			Reddish greyish brown fine and medium grained																	

Continued next sheet

Sample type: B - Large disturbed sample. C - Rock core. D - Small disturbed sample. E - Environmental window sample.
S - SPT split spoon sample. U - Undisturbed sample. W - Water sample.

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Borehole Log and Test Results

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Job Nr:	SI1305	Job Title:	York Street Interchange		
Client:	DRD Roads Service				
BH Nr:	223	G.L. 10.49 mOD	Grid Ref: 333722 / 375199	Inv. Date:	15/02/2013
Drilling Method:	Cable percussive with rotary follow on	Drilling Crew:		Logged By:	S.Donovan

Stratum Depth	Reduced Level	Legend	Description	Water Strikes	Chiselling Depth from (m) Depth to (m)	Chiselling Time (mins)	SPT/Sample From	SPT/Sample To	Sample Type	SPT N	Cu kN/m²	Phi Deg	Bulk Den Mg/m³	Dry Den Mg/m³	W%	PL%	LL%	Core Indices TCR%	Core Indices SCR%	Core Indices RQD
			13. Point load tests carried out at 6.8m and 10.05m. No result obtained.				7.90	9.40	C									100.00	78.00	10.00
							9.40	10.90	C									60.00	58.00	8.00
10.90	-0.41		End of Borehole at 10.90 m																	

Sample type: B - Large disturbed sample. C - Rock core. D - Small disturbed sample. E - Environmental window sample.
S - SPT split spoon sample. U - Undisturbed sample. W - Water sample.

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Borehole Log and Test Results

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Job Nr:	SI1305	Job Title:	York Street Interchange		
Client:	DRD Roads Service				
BH Nr:	224	G.L. 13.50 mOD	Grid Ref: 333619 / 375183	Inv. Date:	12/02/2013
Drilling Method:	Cable percussive with rotary follow on		Drilling Crew:	Logged By:	S.Donovan

Stratum Depth	Reduced Level	Legend	Description	Water Strikes	Chiselling Depth from (m) Depth to (m)	Chiselling Time (mins)	SPT/Sample From	SPT/Sample To	Sample Type	SPT N	Cu kN/m²	Phi Deg	Bulk Den Mg/m³	Dry Den Mg/m³	W%	PL%	LL%	Core Indices TCR%	Core Indices SCR%	Core Indices RQD
0.15	13.35		Bitmac surfacing (FILL)																	
0.50	13.00		Quarry hardcore (FILL)				0.50	1.40	B											
			Probably firm reworked sandy clayey SILT (MADE GROUND)																	
1.40	12.10		Firm becoming stiff brown sandy clayey SILT (GLACIAL TILL)				1.40	3.70	B											
							1.60	2.05	U		81		2.07	1.66	24.7	27	51.10			
							2.05	2.15	D											
							2.15	2.60	S	N=14 (2,2/3,3,4 ,4)										
							3.10	3.55	U		42		1.93	1.58	22.1					
							3.55	3.65	D											
3.70	9.80		Yellowish grey fine and medium grained SANDSTONE completely weathered becoming highly weathered. (SEDIMENTARY BEDROCK)				3.65	4.10	S	50										
							3.70	5.00	B	(4,5/8,9,1 7,16 for 70mm)										
							4.80	4.95	S	100										
							5.00	6.00	B	(25/100)										
6.00	7.50		Yellowish grey fine and medium grained SANDSTONE moderately weathered (SEDIMENTARY BEDROCK)				6.00	7.50	C									13.00	0.00	0.00

Continued next sheet

Sample type: B - Large disturbed sample. C - Rock core. D - Small disturbed sample. E - Environmental window sample.
S - SPT split spoon sample. U - Undisturbed sample. W - Water sample.

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Job Nr:	SI1305	Job Title:	York Street Interchange		
Client:	DRD Roads Service				
BH Nr:	224	G.L. 13.50 mOD	Grid Ref: 333619 / 375183	Inv. Date:	12/02/2013
Drilling Method:	Cable percussive with rotary follow on	Drilling Crew:		Logged By:	S.Donovan

Stratum Depth	Reduced Level	Legend	Description	Water Strikes	Chiselling Depth from (m) Depth to (m)	Chiselling Time (mins)	SPT/Sample From	SPT/Sample To	Sample Type	SPT N	Cu kN/m²	Phi Deg	Bulk Den Mg/m³	Dry Den Mg/m³	W%	PL%	LL%	Core Indices TCR%	Core Indices SCR%	Core Indices RQD
			Yellowish grey fine and medium grained SANDSTONE moderately weathered (SEDIMENTARY BEDROCK)				7.50	9.00	C									66.00	47.00	8.00
9.00	4.50		End of Borehole at 9.00 m																	

Sample type: B - Large disturbed sample. C - Rock core. D - Small disturbed sample. E - Environmental window sample.
S - SPT split spoon sample. U - Undisturbed sample. W - Water sample.

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Job Nr: SI1305	Job Title: York Street Interchange
Client: DRD Roads Service	
T.P. Nr: TP201	G.L. 2.15 m OD
Grid Ref: 334203E - 375140N	
Excavation Method: Light mechanical excavator	Inv. Date: 01/05/2013
Log Scale: 1:50	Logged:

	Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
			0.30	1.85						Blinding and gravel (FILL)
			0.60	1.55						Stone in a reddish brown sandy matrix (MADE GROUND)
	B	0.70								Building rubble comprising brick, concrete, timber etc in a grey silty matrix. (MADE GROUND)
	ES	0.70								
			0.90	1.25						
1	B	1.00								Firm light grey sandy SILT (ESTUARINE ALLUVIUM)
	ES	1.00								
			1.20	0.95						Possibly medium dense grey fine and medium SAND. (ESTUARINE ALLUVIUM)
2	B	2.00								
	ES	2.00								
			2.30	-0.15						End of Trial Pit at 2.30 m
3										
4										

Remarks: No water

Checked : DB Date: 5/9/13

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Job Nr: SI1305	Job Title: York Street Interchange
Client: DRD Roads Service	
T.P. Nr: TP202	G.L. 1.89 m OD
Grid Ref: 334246E - 375106N	
Excavation Method: Light mechanical excavator	Inv. Date: 01/05/2013
Log Scale: 1:50	Logged: S.Donovan

Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
									Blinding and rubble (MADE GROUND)
ES	0.50	0.50	1.39						Soft dark brown sandy SILT (ESTUARINE ALLUVIUM)
		1.10	0.79						Probably loose grey silty fine and medium SAND containing shell fragments. (ESTUARINE ALLUVIUM)
ES	1.50								
ES	2.00								
B	2.00								
		2.20	-0.31						End of Trial Pit at 2.20 m

Remarks: No Water

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Job Nr: SI1305	Job Title: York Street Interchange
Client: DRD Roads Service	
T.P. Nr: TP203	G.L. 1.87 m OD
Grid Ref: 334271E - 375094N	
Excavation Method: Light mechanical excavator.	Inv. Date: 01/05/2013
Log Scale: 1:50	Logged: S.Donovan

Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
		0.10	1.77						Blinding (FILL)
									Building rubble containing brick, concrete, wire, timber, cobbles and boulders in a sandy matrix. (MADE GROUND)
ES	0.70	0.75	1.12						Concrete slab (FILL)
		0.90	0.97						Building rubble containing brick, concrete, wire, timber, cobbles and boulders in a sandy matrix. (MADE GROUND)
ES	1.00								
		1.30	0.57						Probably loose grey silty fine and medium SAND containing some brick fragments (MADE GROUND)
		1.60	0.27						End of Trial Pit at 1.60 m

1
2
3
4

Remarks: Slight groundwater flow @1.5m - Very strong smell of hydrocarbons at 1.6m

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TRIAL PIT LOG AND TEST RESULTS

Job Nr: SI1305	Job Title: York Street Interchange
Client: DRD Roads Service	
T.P. Nr: TP204	G.L. 2.45 m OD
Grid Ref: 334078E - 375092N	
Excavation Method: Light mechanical excavator.	Inv. Date: 02/05/2013
Log Scale: 1:50	Logged: S.Donovan

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	Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
			0.20	2.25						Stone fill (FILL)
										Building rubble containing brick concrete etc in a brown silty matrix (MADE GROUND)
	ES	0.40	0.40	2.05						
	ES	0.50								Firm dark brown sandy SILT (ESTUARINE ALLUVIUM)
	B	0.50								
			0.80	1.65						Probably loose light brown silty fine SAND (ESTUARINE ALLUVIUM)
1										
2	ES	2.00								
	B	2.00								
			2.20	0.25						Probably medium dense grey fine and medium SAND containing shell fragments. (ESTUARINE ALLUVIUM)
			2.40	0.05						End of Trial Pit at 2.40 m
3										
4										

Remarks: No water

Checked : JB Date: 5/9/13

TRIAL PIT LOG AND TEST RESULTS

Job Nr: SI1305	Job Title: York Street Interchange
Client: DRD Roads Service	
T.P. Nr: TP205	G.L. 3.42 m OD
Grid Ref: 333959E - 375100N	
Excavation Method: Light mechanical excavator.	Inv. Date: 02/05/2013
Log Scale: 1:50	Logged: S.Donovan

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	Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
			0.10	3.32						Bitmac surfacing (FILL)
			0.30	3.12						Stone fill (FILL)
										Remainants of a brick wall and concrete foundation (MADE GROUND)
			0.90	2.52						
1	ES	1.00								Probably loose grey silty SAND containing brick and concre fragments (MADE GROUND)
	B	1.00								
			1.40	2.02						
	ES	1.50								Probably medium dense light brown mottled reddish brown silty SAND containing shell fragments (ESTUARINE ALLUVIUM)
	B	1.50	1.60	1.82						
										End of Trial Pit at 1.60 m
2										
3										
4										

Remarks: No water

Checked : DB Date: 5/9/13

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Job Nr: SI1305	Job Title: York Street Interchange
Client: DRD Roads Service	
T.P. Nr: TP206	G.L. 3.50 m OD
Grid Ref: 333947E - 375076N	
Excavation Method: Light mechanical excavator.	Inv. Date: 02/05/2013
Log Scale: 1:50	Logged: S.Donovan

	Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
			0.10	3.40						Bitmac surfacing (FILL)
	ES	0.20								Stone fill (FILL)
			0.30	3.20						Building rubble comprising brick, concrete, wire, timber etc. in a grey silty matrix (MADE GROUND)
	ES	0.50								
	B	0.50	0.60	2.90						Probably medium dense light grey fine and medium SAND containing shell fragments at 1.0m. (ESTUARINE ALLUVIU
1	ES	1.00								
	B	1.00								
			1.85	1.65						End of Trial Pit at 1.85 m
2										
3										
4										

Remarks: No water

Checked : DB Date: 5/9/13

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Job Nr: SI1305	Job Title: York Street Interchange
Client: DRD Roads Service	
T.P. Nr: TP207	G.L. 2.28 m OD
Grid Ref: 334341E - 375349N	
Excavation Method: Light mechanical excavator.	Inv. Date: 01/05/2013
Log Scale: 1:50	Logged: S.Donovan

Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
		0.30	1.98						Reinforced concrete slab (FILL)
ES	0.50								Stone fill on a terram mat. (FILL)
		0.70	1.58						
ES	0.80	0.80	1.48						Brick. probable demolished wall. (MADE GROUND)
		1.00	1.28						Firm dark brown sandy SILT (ESTUARINE ALLUVIUM)
		1.80	0.48						Probably medium dense grey mottled reddish brown fine and medium SAND (ESTUARINE ALLUVIUM)
									End of Trial Pit at 1.80 m

Remarks: No water

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Job Nr: SI1305	Job Title: York Street Interchange
Client: DRD Roads Service	
T.P. Nr: TP208	G.L. 2.11 m OD
Grid Ref: 334331E - 375285N	
Excavation Method: Light mechanical excavator.	Inv. Date: 01/05/2013
Log Scale: 1:50	Logged: S.Donovan

Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
									Reinforced concrete slab (FILL)
		0.40	1.71						
ES	0.50								Stone fill on a terram mat. (FILL)
		0.70	1.41						
ES	0.80								Soft dark brown sandy SILT (ESTUARINE ALLUVIUM)
B	0.80	0.90	1.21						
									Probably medium dense grey silty fine and medium SAND containing shell fragments. Shells appearing at 1.5m. (ESTUARINE ALLUVIUM)
B	1.50								
		2.00	0.11						End of Trial Pit at 2.00 m

1
2
3
4

Remarks: No Water

Checked : JB Date: 5/9/13

TRIAL PIT LOG AND TEST RESULTS

Job Nr:	SI1305	Job Title:	York Street Interchange
Client:	DRD Roads Service		
T.P. Nr:	TP209	G.L.	1.94 m OD
Grid Ref:	334328E - 375255N		
Excavation Method:	Light mechanical excavator.	Inv. Date:	02/05/2013
Log Scale:	1:50	Logged:	S.Donovan

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	Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
			0.10	1.84						Asphalt surfacing (FILL)
	ES	0.20								Blinding (FILL)
			0.35	1.59						Tile floor on a reddish brown sand bed. (FILL)
			0.50	1.44						Building rubble containing brick and concrete in a silty matrix (MADE GROUND)
	B	0.80	0.80	1.14						Firm dark brown sandy SILT (ESTUARINE ALLUVIUM)
1	ES	1.00	1.00	0.94						Probably medium dense reddish brown silty fine and mediu SAND. (ESTUARINE ALLUVIUM)
	ES	1.50								
	B	1.50	1.60	0.34						Probably medium dense grey fine and medium SAND containing shell fragments. (ESTUARINE ALLUVIUM)
2			2.00	-0.06						End of Trial Pit at 2.00 m
3										
4										

Remarks: No water

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Job Nr: SI1305	Job Title: York Street Interchange
Client: DRD Roads Service	
T.P. Nr: TP210	G.L. 1.92 m OD
Grid Ref: 334294E - 375206N	
Excavation Method: Light mechanical excavator	Inv. Date: 01/05/2013
Log Scale: 1:50	Logged: S.Donovan

Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
		0.10	1.82						Blinding (FILL)
									Cobble sized stone (MADE GROUND)
ES	0.70	0.70	1.22						Probably loose fine and medium SAND containing shell fragments occurring at 1.2m (ESTUARINE ALLUVIUM)
ES	1.00								
B	1.00								
		1.80	0.12						End of Trial Pit at 1.80 m

Remarks: Strong water flow at base of stone 0.7m. Flow stopped after 10 mins.

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Job Nr: SI1305	Job Title: York Street Interchange
Client: DRD Roads Service	
T.P. Nr: TP211	G.L. 1.91 m OD
Grid Ref: 334274E - 375179N	
Excavation Method: Light mechanical excavator.	Inv. Date: 01/05/2013
Log Scale: 1:50	Logged: S.Donovan

	Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
			0.25	1.66						Blinding (FILL)
	B	0.50								Stone fill in a greyish brown sandy silty matrix (MADE GROUND)
	ES	0.50								
	ES	0.50								
	ES	0.60	0.80	1.11						
1			1.00	0.91						Probably loose light brown fine and medium SAND (ESTAURINE ALLUVIUM)
	B	1.50								Probably loose grey fine and medium SAND containing shell fragments (ESTAURINE ALLUVIUM)
2			2.00	-0.09						End of Trial Pit at 2.00 m
3										
4										

Remarks: No water

Checked : DB Date: 5/9/13

TRIAL PIT LOG AND TEST RESULTS

Job Nr: SI1305	Job Title: York Street Interchange
Client: DRD Roads Service	
T.P. Nr: TP212	G.L. 2.40 m OD
Grid Ref: 334129E - 375155N	
Excavation Method: Light mechanical excavator.	Inv. Date: 30/04/2013
Log Scale: 1:50	Logged: S.Donovan

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	Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
			0.15	2.25						Layer of asphalt overlying bitmac and blinding (MADE GROUND)
										Building rubble comprising concrete, brick, timber etc in a clayey matrix (MADE GROUND)
	ES	0.50	0.50	1.90						Soft dark brown sandy SILT (ESTUARINE ALLUVIUM)
			0.80	1.60						Probably loose light grey mottled reddish brown silty fine and medium SAND (ESTUARINE ALLUVIUM)
1	ES	1.00								
	ES	1.50								
			1.80	0.60						End of Trial Pit at 1.80 m
2										
3										
4										

Remarks: No water flows observed. Strong smell of gas.

Checked : DS Date: 5/9/13

TRIAL PIT LOG AND TEST RESULTS

Job Nr:	SI1305	Job Title:	York Street Interchange
Client:	DRD Roads Service		
T.P. Nr:	TP213	G.L.	2.89 m OD
Grid Ref:	334065E - 375165N		
Excavation Method:	Light mechanical excavator.	Inv. Date:	30/04/2013
Log Scale:	1:50	Logged:	S.Donovan

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Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
		0.10	2.79						Bitmac surfacing (FILL)
		0.30	2.59						Sandstone blocks and concrete (MADE GROUND)
ES	0.50								Section of red brick wall (MADE GROUND)
		0.70	2.19						Soft dark grey sandy SILT (ESTAURINE ALLUVIUM)
ES	1.00	1.00	1.89						Probably loose grey mottled reddish brown fine and medium SAND (ESTUARINE ALLUVIUM)
ES	1.30	1.30	1.59						End of Trial Pit at 1.30 m

Remarks: No water

Checked : JS Date: 5/9/13

TRIAL PIT LOG AND TEST RESULTS

Job Nr:	SI1305	Job Title:	York Street Interchange
Client:	DRD Roads Service		
T.P. Nr:	TP214	G.L.	3.42 m OD
Grid Ref:	333978E - 375177N		
Excavation Method:	Light mechanical excavator.	Inv. Date:	01/05/2013
Log Scale:	1:50	Logged:	S.Donovan

Department of Finance and Personnel
www.dfpni.gov.uk

CENTRAL PROCUREMENT DIRECTORATE
Geotechnical Engineering Branch
Clare House
303 Airport Road West
Belfast BT3 9ED

Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
		0.25	3.17						100mm Asphalt overlying 2" stone (FILL)
		0.40	3.02						50mm bitmac overlying stone sub-base (FILL)
ES	0.50								Concrete slab (FILL)
B	0.50	0.60	2.82						
ES	0.70								Building rubble comprising concrete, brisk, timber, wire etc in a sandy silty matrix (MADE GROUND)
B	0.70								
		1.40	2.02						
ES	1.50								Soft dark grey slightly sandy SILT (ESTUARINE ALLUVIUM
B	1.50								
		1.90	1.52						
ES	2.00								Probably loose grey fine and medium SAND containing shel fragments (ESTUARINE ALLUVIUM)
B	2.00								
		2.20	1.22						End of Trial Pit at 2.20 m

Remarks: No Water

Checked : DB Date: 5/9/13

TRIAL PIT LOG AND TEST RESULTS

Job Nr:	SI1305	Job Title:	York Street Interchange
Client:	DRD Roads Service		
T.P. Nr:	TP215	G.L.	3.05 m OD
Grid Ref:	334028E - 375130N		
Excavation Method:	Light mechanical excavator.	Inv. Date:	30/04/2013
Log Scale:	1:50	Logged:	S.Donovan

Department of Finance and Personnel
www.dfpni.gov.uk

CENTRAL PROCUREMENT DIRECTORATE
Geotechnical Engineering Branch
Clare House
303 Airport Road West
Belfast BT3 9ED

	Sample/ Test Type	Sample Depth (m)	Stratum Depth (m)	Level m OD	Moisture Content %	Comp Type	Optimum M/C %	Maximum Dry Den Mg/m3	Legend	Description
			0.10	2.95						BITMAC surfacing (FILL)
										Building rubble comprising brick, mortar, concrete, cobbles etc (MADE GROUND)
	ES	0.50								
			0.60	2.45						Soft dark grey clayey SILT interbedded with probably loose light brown fine and medium SAND (ESTUARINE ALLUVIU
1	ES	1.00								
	ES	1.20								
			1.50	1.55						End of Trial Pit at 1.50 m
2										
3										
4										

Remarks: Strong groundwater flow at 1.2m

Checked : JB Date: 5/9/13

TP201

TP201

TP202

TP202

TP202

TP203

TP203

TP203

TP204

TP204

TP204

TP205

TP205

TP205

TP206

TP206

TP206

TP207

TP207

TP207

TP208

TP208

TP208

TP209

TP209

TP209

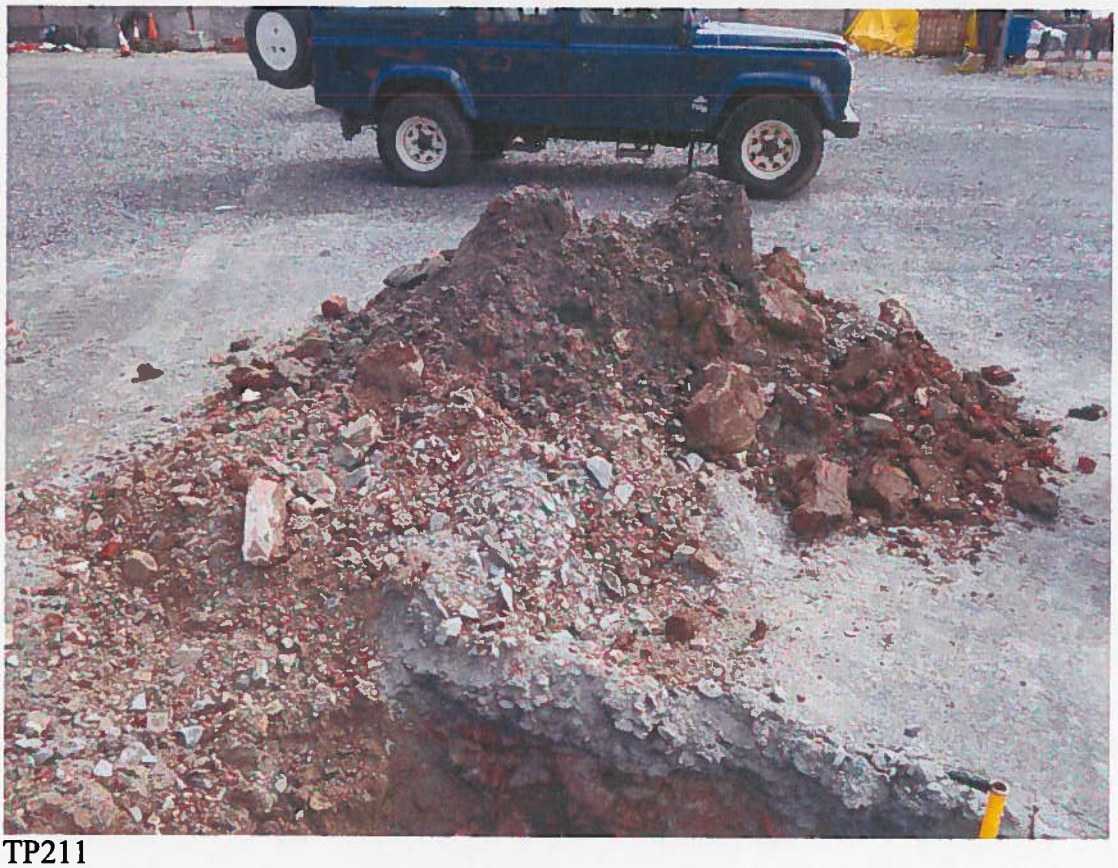
TP210

TP210

TP210

TP211

TP211



TP211

TP212

TP212

TP212

TP213

TP213

TP213

TP214

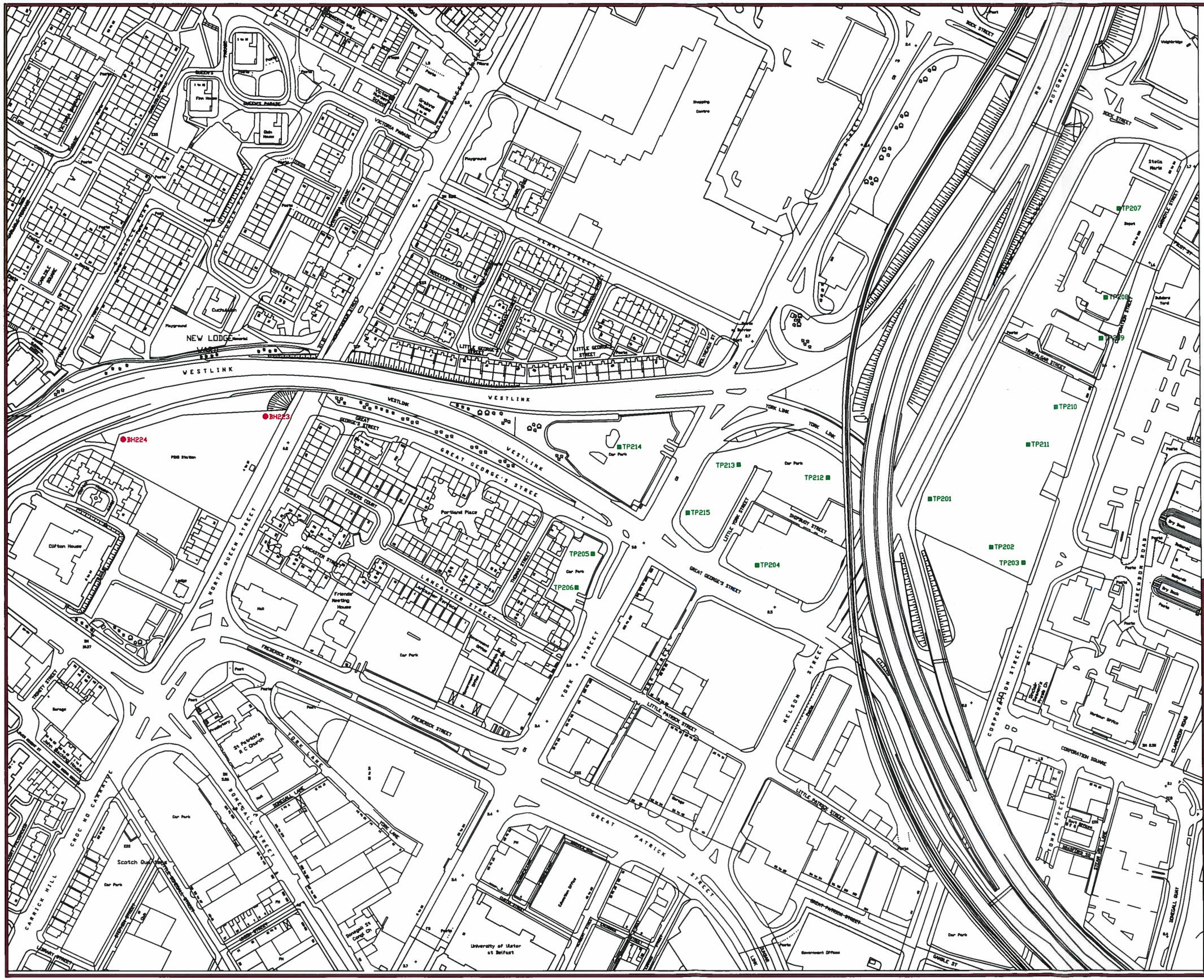
TP214

TP214

TP215

TP215

TP215



Department of Finance and Personnel
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CENTRAL PROCUREMENT DIRECTORATE
Works Procurement Division

Clare House
303 Airport Road West
Belfast BT3 9ED
Tel: 028 90 816200

Client
DRD Roads Service

Job

Drawing
York Street Interchange
Additional Fieldwork

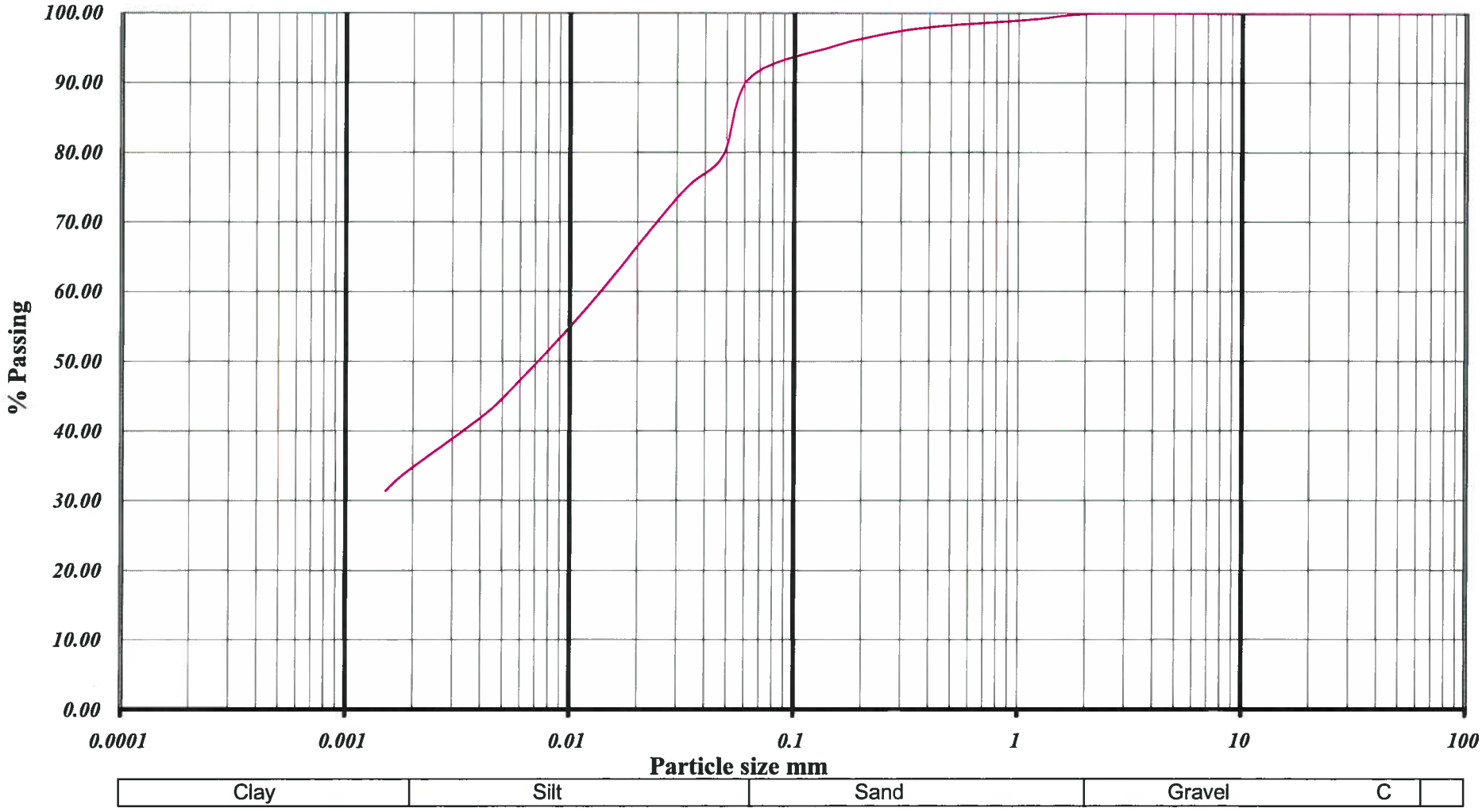
Scale
1:2500

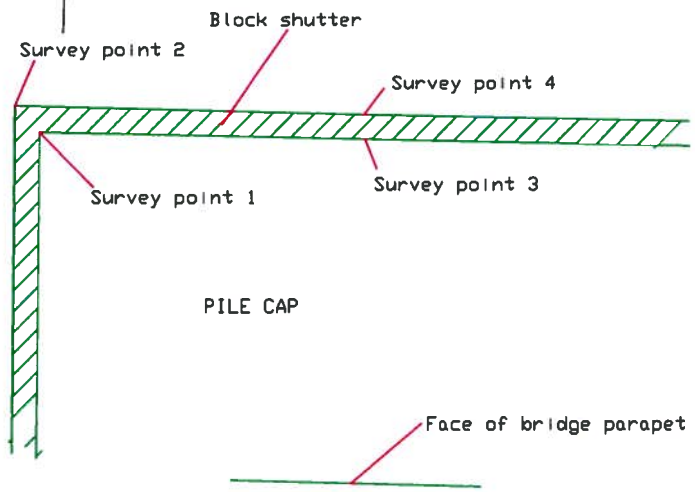
Branch:	Geotechnical Engineering Branch
Branch Manager:	E.Halliday BSc. C.Eng. MICE
Drawn by: SD	Date: July2013
Verified by:	Date:

Drawing No.
SI1305 / 01

Amendment:

SI 1305 York Street Interchange
Particle Size Analysis
BH 223 Sam 2 Depth 1.50m





Survey point 1	NW corner of pile cap	E 334155.567 / N 375143.062	GL 1.61 MoD
Survey point 2	NW corner of block shutter	E 334155.360 / N 375143.105	GL 1.64 MoD
Survey point 3	Approx mid point of pile cap	E 334158.322 / N 375143.003	GL 1.63 MoD
Survey point 4	Approx mid point north edge block shutter	E 334158.318 / N 375143.209	GL 1.60 MoD

Department of Finance and Personnel
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CENTRAL PROCUREMENT DIRECTORATE
Works Procurement Division
Clare House
303 Airport Road West
Belfast BT3 9ED
Tel 028 90 816200

Client: DRD Roads Service

Job: York Street Interchange

Drawing: Pile Cap Survey

Scale: NTS

Branch : Geotechnical Engineering Branch

Branch Manager: E.Halliday BSc. C.Eng. MICE

Drawn by: SD Date:

Verified by: Date:

Drawing No. SI1305/02

Amendment:

Causeway Geotech Ltd.
8 Drumahiskey Road
Balnamore, Ballymoney
Co. Antrim
BT53 7QL

FAO C Doherty/D O'Mahony/ P Dunlop

LABORATORY TEST REPORT
Asbestos in Soils

Results of analysis of 9 samples received 6 June 2013
York Street Interchange, Belfast

Chemtest

Report Date
13 June 2013

Login Batch No: 231735

Qualitative Results

				SOP 2190	
				ACM Type	Asbestos Identification
Chemtest ID	Sample ID	Sample Desc	Depth (m)		
AI78377	TP214		0.50	-	No Asbestos Detected
AI78378	TP201		0.70	-	No Asbestos Detected
AI78379	TP211		0.60	-	No Asbestos Detected
AI78380	TP203		0.50	-	No Asbestos Detected
AI78381	TP203		1.60	-	No Asbestos Detected
AI78382	TP202		0.50	-	No Asbestos Detected
AI78383	TP208		0.80	-	No Asbestos Detected
AI78384	TP204		0.40	-	No Asbestos Detected
AI78385	TP205		1.00	-	No Asbestos Detected

The detection limit for this method is 0.001%

Signed

Steve McGrath
Asbestos Analyst

All tests undertaken between 13-Jun-2013 and 13-Jun-2013

LIMS sample ID range AI78377 to AI78385

Causeway Geotech Ltd.
8 Drumahiskey Road
Balnamore, Ballymoney
Co. Antrim
BT53 7QL

LABORATORY TEST REPORT

Results of analysis of 3 samples
received 6 June 2013

York Street Interchange, Belfast

Chemtest
The right chemistry to deliver results

Report Date
13 June 2013

FAO C Doherty/D O'Mahony/ P Dunlop

Login Batch No					231735		
Chemtest LIMS ID					AI78386	AI78387	AI78388
Sample ID					TP214	TP203	TP205
Sample No							
Sampling Date					1/5/2013	1/5/2013	3/5/2013
Depth					0.50m	1.60m	1.00m
Matrix					*LEACHATE*	*LEACHATE*	*LEACHATE*
SOP↓	Determinand↓	CAS No↓	Units↓	*			
1220	Ammoniacal Nitrogen	AMM_NITROG	mg l-1	U	0.16		0.17
1270	Hardness	HARD_TOT	mg CaCO3 l-1	U	180		500
1450	Arsenic	7440382	µg l-1	U	6.8		11
	Cadmium	7440439	µg l-1	U	<0.080		<0.080
	Chromium	7440473	µg l-1	U	3.1		3.7
	Copper	7440508	µg l-1	U	1.5		3.7
	Mercury	7439976	µg l-1	U	<0.50		<0.50
	Nickel	7440020	µg l-1	U	<1.0		<1.0
	Lead	7439921	µg l-1	U	<1.0		7.3
	Selenium	7782492	µg l-1	U	<1.0		<1.0
	Zinc	7440666	µg l-1	U	<1.0		1.4
1700	Naphthalene	91203	µg l-1	U	<0.1	<0.1	<0.1
	Acenaphthylene	208968	µg l-1	U	<0.1	<0.1	<0.1
	Acenaphthene	83329	µg l-1	U	<0.1	<0.1	<0.1
	Fluorene	86737	µg l-1	U	<0.1	<0.1	<0.1
	Phenanthrene	85018	µg l-1	U	<0.1	<0.1	<0.1
	Anthracene	120127	µg l-1	U	<0.1	<0.1	<0.1
	Fluoranthene	206440	µg l-1	U	<0.1	<0.1	<0.1
	Pyrene	129000	µg l-1	U	<0.1	<0.1	<0.1
	Benzo[a]anthracene	56553	µg l-1	U	<0.1	<0.1	<0.1
	Chrysene	218019	µg l-1	U	<0.1	<0.1	<0.1
	Benzo[b]fluoranthene	205992	µg l-1	U	<0.1	<0.1	<0.1
	Benzo[k]fluoranthene	207089	µg l-1	U	<0.1	<0.1	<0.1
	Benzo[a]pyrene	50328	µg l-1	U	<0.1	<0.1	<0.1

All tests undertaken between 06/06/2013 and 13/06/2013

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

Causeway Geotech Ltd.
8 Drumahiskey Road
Balnamore, Ballymoney
Co. Antrim
BT53 7QL

FAO C Doherty/D O'Mahony/ P Dunlop

LABORATORY TEST REPORT

Results of analysis of 3 samples received 6 June 2013

York Street Interchange, Belfast

Chemtest
The right chemistry to deliver results

Report Date
13 June 2013

					231735		
					AI78386	AI78387	AI78388
					TP214	TP203	TP205
					1/5/2013	1/5/2013	3/5/2013
					0.50m	1.60m	1.00m
					LEACHATE	*LEACHATE*	*LEACHATE*
1700	Dibenzo[a,h]anthracene	53703	µg l-1	U	<0.1	<0.1	<0.1
	Indeno[1,2,3-cd]pyrene	193395	µg l-1	U	<0.1	<0.1	<0.1
	Benzo[g,h,i]perylene	191242	µg l-1	U	<0.1	<0.1	<0.1
	Total (of 16) PAHs		µg l-1	U	<2	<2	<2

All tests undertaken between 06/06/2013 and 13/06/2013

* Accreditation status

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Causeway Geotech Ltd.
8 Drumahiskey Road
Balnamore, Ballymoney
Co. Antrim
BT53 7QL

FAO C Doherty/D O'Mahony/ P Dunlop

LABORATORY TEST REPORT

Results of analysis of 11 samples received 6 June 2013

York Street Interchange, Belfast

Chemtest
The right chemistry to deliver results

Report Date
13 June 2013

Login Batch No					231735					
Chemtest LIMS ID					AI78377	AI78378	AI78379	AI78380	AI78381	AI78382
Sample ID					TP214	TP201	TP211	TP203	TP203	TP202
Sample No										
Sampling Date					1/5/2013	1/5/2013	1/5/2013	1/5/2013	1/5/2013	1/5/2013
Depth					0.50m	0.70m	0.60m	0.50m	1.60m	0.50m
Matrix					*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
2010	pH			M	10.1	7.9	7.6			
2300	Cyanide (free)	57125	mg kg-1	M	< 0.5					
	Cyanide (total)	57125	mg kg-1	M	< 0.5					
2625	Organic matter		%	M	2.4				1.7	
2425	Ammoniacal Nitrogen (extractable)	7664417	mg kg-1	M	< 2.0					
2450	Arsenic	7440382	mg kg-1	M	13	11	10			
	Cadmium	7440439	mg kg-1	M	<0.10	<0.10	<0.10			
	Chromium	7440473	mg kg-1	M	28	27	44			
	Copper	7440508	mg kg-1	M	42	38	21			
	Mercury	7439976	mg kg-1	M	0.73	0.42	0.12			
	Nickel	7440020	mg kg-1	M	67	31	46			
	Lead	7439921	mg kg-1	M	140	140	89			
	Selenium	7782492	mg kg-1	M	<0.20	<0.20	<0.20			
	Zinc	7440666	mg kg-1	M	48	53	55			
2675	TPH aliphatic >C5-C6		mg kg-1	N	< 0.1 [1]	< 0.1 [1]		< 0.1 [1]	< 0.1 [1]	< 0.1 [1]
	TPH aliphatic >C6-C8		mg kg-1	N	< 0.1 [1]	< 0.1 [1]		< 0.1 [1]	44 [1]	< 0.1 [1]
	TPH aliphatic >C8-C10		mg kg-1	N	< 0.1 [1]	< 0.1 [1]		< 0.1 [1]	460 [1]	< 0.1 [1]
	TPH aliphatic >C10-C12		mg kg-1	M	< 1 [1]	< 1 [1]		< 1 [1]	1200 [1]	< 1 [1]
	TPH aliphatic >C12-C16		mg kg-1	M	< 1 [1]	< 1 [1]		< 1 [1]	3000 [1]	< 1 [1]
	TPH aliphatic >C16-C21		mg kg-1	M	< 1 [1]	< 1 [1]		< 1 [1]	2100 [1]	< 1 [1]
	TPH aliphatic >C21-C35		mg kg-1	M	< 1 [1]	< 1 [1]		< 1 [1]	590 [1]	< 1 [1]
	TPH aliphatic >C35-C44		mg kg-1	N	< 1 [1]	< 1 [1]		< 1 [1]	< 1 [1]	< 1 [1]
	TPH aromatic >C5-C7		mg kg-1	N	< 0.1 [1]	< 0.1 [1]		< 0.1 [1]	< 0.1 [1]	< 0.1 [1]
	TPH aromatic >C7-C8		mg kg-1	N	< 0.1 [1]	< 0.1 [1]		< 0.1 [1]	0.29 [1]	< 0.1 [1]

[1]The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 06/06/2013 and 13/06/2013

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

Causeway Geotech Ltd.
8 Drumahiskey Road
Balnamore, Ballymoney
Co. Antrim
BT53 7QL

LABORATORY TEST REPORT

Results of analysis of 11 samples received 6 June 2013

York Street Interchange, Belfast

Chemtest
The right chemistry to deliver results

Report Date
13 June 2013

FAO C Doherty/D O'Mahony/ P Dunlop

Login Batch No				231735	
Chemtest LIMS ID				AI78383	AI78385
Sample ID				TP208	TP205
Sample No					
Sampling Date				2/5/2013	3/5/2013
Depth				0.80m	1.00m
Matrix				*SOIL*	*SOIL*
SOP↓	Determinand↓	CAS No↓	Units↓	*	
2010	pH			M	8.9
2300	Cyanide (free)	57125	mg kg-1	M	< 0.5
	Cyanide (total)	57125	mg kg-1	M	< 0.5
2625	Organic matter		%	M	3.3
2425	Ammoniacal Nitrogen (extractable)	7664417	mg kg-1	M	< 2.0
2450	Arsenic	7440382	mg kg-1	M	13
	Cadmium	7440439	mg kg-1	M	<0.10
	Chromium	7440473	mg kg-1	M	33
	Copper	7440508	mg kg-1	M	53
	Mercury	7439976	mg kg-1	M	1.1
	Nickel	7440020	mg kg-1	M	58
	Lead	7439921	mg kg-1	M	370
	Selenium	7782492	mg kg-1	M	<0.20
	Zinc	7440666	mg kg-1	M	97
2675	TPH aliphatic >C5-C6		mg kg-1	N	< 0.1 [1]
	TPH aliphatic >C6-C8		mg kg-1	N	< 0.1 [1]
	TPH aliphatic >C8-C10		mg kg-1	N	< 0.1 [1]
	TPH aliphatic >C10-C12		mg kg-1	M	< 1 [1]
	TPH aliphatic >C12-C16		mg kg-1	M	< 1 [1]
	TPH aliphatic >C16-C21		mg kg-1	M	< 1 [1]
	TPH aliphatic >C21-C35		mg kg-1	M	< 1 [1]
	TPH aliphatic >C35-C44		mg kg-1	N	< 1 [1]
	TPH aromatic >C5-C7		mg kg-1	N	< 0.1 [1]
	TPH aromatic >C7-C8		mg kg-1	N	< 0.1 [1]

[1]The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

* Accreditation status

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Causeway Geotech Ltd.
8 Drumahiskey Road
Balnamore, Ballymoney
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LABORATORY TEST REPORT

Results of analysis of 11 samples received 6 June 2013

York Street Interchange, Belfast

Chemtest
The right chemistry to deliver results

Report Date
13 June 2013

					231735					
					AI78377	AI78378	AI78379	AI78380	AI78381	AI78382
					TP214	TP201	TP211	TP203	TP203	TP202
					1/5/2013	1/5/2013	1/5/2013	1/5/2013	1/5/2013	1/5/2013
					0.50m	0.70m	0.60m	0.50m	1.60m	0.50m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2675	TPH aromatic >C8-C10		mg kg-1	N	< 0.1 [1]	< 0.1 [1]		< 0.1 [1]	24 [1]	< 0.1 [1]
	TPH aromatic >C10-C12		mg kg-1	M	< 1 [1]	< 1 [1]		< 1 [1]	120 [1]	< 1 [1]
	TPH aromatic >C12-C16		mg kg-1	M	< 1 [1]	< 1 [1]		< 1 [1]	610 [1]	< 1 [1]
	TPH aromatic >C16-C21		mg kg-1	M	< 1 [1]	< 1 [1]		< 1 [1]	710 [1]	< 1 [1]
	TPH aromatic >C21-C35		mg kg-1	M	< 1 [1]	< 1 [1]		< 1 [1]	200 [1]	< 1 [1]
	TPH aromatic >C35-C44		mg kg-1	N	< 1 [1]	< 1 [1]		< 1 [1]	< 1 [1]	< 1 [1]
	Total Petroleum Hydrocarbons		mg kg-1	N	< 10 [1]	< 10 [1]		< 10 [1]	9100 [1]	< 10 [1]
2700	Naphthalene	91203	mg kg-1	M	< 0.1	0.14		< 0.1	7.2	< 0.1
	Acenaphthylene	208968	mg kg-1	M	0.21	< 0.1		< 0.1	< 0.1	< 0.1
	Acenaphthene	83329	mg kg-1	M	0.19	0.29		< 0.1	3.3	< 0.1
	Fluorene	86737	mg kg-1	M	0.12	0.24		0.13	1.2	< 0.1
	Phenanthrene	85018	mg kg-1	M	1.4	1		1	< 0.1	0.5
	Anthracene	120127	mg kg-1	M	0.37	0.41		0.33	< 0.1	0.1
	Fluoranthene	206440	mg kg-1	M	1.4	0.79		1.2	< 0.1	0.58
	Pyrene	129000	mg kg-1	M	1.6	0.76		1.1	< 0.1	0.66
	Benzo[a]anthracene	56553	mg kg-1	M	1.3	0.73		0.73	< 0.1	< 0.1
	Chrysene	218019	mg kg-1	M	< 0.1	0.85		0.92	< 0.1	< 0.1
	Benzo[b]fluoranthene	205992	mg kg-1	M	0.92	< 0.1		0.57	< 0.1	< 0.1
	Benzo[k]fluoranthene	207089	mg kg-1	M	0.62	< 0.1		0.4	< 0.1	< 0.1
	Benzo[a]pyrene	50328	mg kg-1	M	0.55	< 0.1		0.44	< 0.1	< 0.1
	Dibenzo[a,h]anthracene	53703	mg kg-1	M	< 0.1	< 0.1		< 0.1	< 0.1	< 0.1
	Indeno[1,2,3-cd]pyrene	193395	mg kg-1	M	< 0.1	< 0.1		< 0.1	< 0.1	< 0.1
	Benzo[g,h,i]perylene	191242	mg kg-1	M	< 0.1	< 0.1		< 0.1	< 0.1	< 0.1
	Total (of 16) PAHs		mg kg-1	M	8.7	5.2		6.8	12	< 2
2760	Methyl tert-butylether	1634044	µg kg-1	N	< 1.0 [1]	< 1.0 [1]		< 1.0 [1]	< 1.0 [1]	< 1.0 [1]

[1]The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 06/06/2013 and 13/06/2013

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

Causeway Geotech Ltd.
8 Drumahiskey Road
Balnamore, Ballymoney
Co. Antrim
BT53 7QL

FAO C Doherty/D O'Mahony/ P Dunlop

LABORATORY TEST REPORT

Results of analysis of 11 samples received 6 June 2013

York Street Interchange, Belfast

Chemtest
The right chemistry to deliver results

Report Date
13 June 2013

					231735	
					AI78383	AI78385
					TP208	TP205
					2/5/2013	3/5/2013
					0.80m	1.00m
					SOIL	*SOIL*
2675	TPH aromatic >C8-C10		mg kg-1	N	< 0.1 [1]	< 0.1 [1]
	TPH aromatic >C10-C12		mg kg-1	M	< 1 [1]	< 1 [1]
	TPH aromatic >C12-C16		mg kg-1	M	< 1 [1]	< 1 [1]
	TPH aromatic >C16-C21		mg kg-1	M	< 1 [1]	< 1 [1]
	TPH aromatic >C21-C35		mg kg-1	M	< 1 [1]	< 1 [1]
	TPH aromatic >C35-C44		mg kg-1	N	< 1 [1]	< 1 [1]
	Total Petroleum Hydrocarbons		mg kg-1	N	< 10 [1]	< 10 [1]
2700	Naphthalene	91203	mg kg-1	M	< 0.1	< 0.1
	Acenaphthylene	208968	mg kg-1	M	< 0.1	< 0.1
	Acenaphthene	83329	mg kg-1	M	< 0.1	< 0.1
	Fluorene	86737	mg kg-1	M	< 0.1	< 0.1
	Phenanthrene	85018	mg kg-1	M	< 0.1	< 0.1
	Anthracene	120127	mg kg-1	M	< 0.1	< 0.1
	Fluoranthene	206440	mg kg-1	M	< 0.1	< 0.1
	Pyrene	129000	mg kg-1	M	< 0.1	< 0.1
	Benzo[a]anthracene	56553	mg kg-1	M	< 0.1	< 0.1
	Chrysene	218019	mg kg-1	M	< 0.1	< 0.1
	Benzo[b]fluoranthene	205992	mg kg-1	M	< 0.1	< 0.1
	Benzo[k]fluoranthene	207089	mg kg-1	M	< 0.1	< 0.1
	Benzo[a]pyrene	50328	mg kg-1	M	< 0.1	< 0.1
	Dibenzo[a,h]anthracene	53703	mg kg-1	M	< 0.1	< 0.1
	Indeno[1,2,3-cd]pyrene	193395	mg kg-1	M	< 0.1	< 0.1
	Benzo[g,h,i]perylene	191242	mg kg-1	M	< 0.1	< 0.1
	Total (of 16) PAHs		mg kg-1	M	< 2	< 2
2760	Methyl tert-butylether	1634044	µg kg-1	N	< 1.0 [1]	< 1.0 [1]

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Co. Antrim
BT53 7QL

FAO C Doherty/D O'Mahony/ P Dunlop

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Chemtest
The right chemistry to deliver results

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13 June 2013

					231735					
					AI78377	AI78378	AI78379	AI78380	AI78381	AI78382
					TP214	TP201	TP211	TP203	TP203	TP202
					1/5/2013	1/5/2013	1/5/2013	1/5/2013	1/5/2013	1/5/2013
					0.50m	0.70m	0.60m	0.50m	1.60m	0.50m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2760	Dichlorodifluoromethane	75718	µg kg-1	U					< 1.0 [1]	
	Chloromethane	74873	µg kg-1	M					< 1.0 [1]	
	Vinyl chloride	75014	µg kg-1	M					< 1.0 [1]	
	Bromomethane	74839	µg kg-1	U					< 20 [1]	
	Chloroethane	75003	µg kg-1	U					< 2.0 [1]	
	Trichlorofluoromethane	75694	µg kg-1	U					< 1.0 [1]	
	1,1-Dichloroethene	75354	µg kg-1	U					< 1.0 [1]	
	Dichloromethane	75092	µg kg-1	N					ne [1]	
	trans-1,2-Dichloroethene	156605	µg kg-1	U					< 1.0 [1]	
	1,1-Dichloroethane	75343	µg kg-1	M					< 1.0 [1]	
	cis-1,2-Dichloroethene	156592	µg kg-1	M					< 1.0 [1]	
	Bromochloromethane	74975	µg kg-1	U					< 1.0 [1]	
	Trichloromethane	67663	µg kg-1	M					< 1.0 [1]	
	1,1,1-Trichloroethane	71556	µg kg-1	M					< 1.0 [1]	
	Tetrachloromethane	56235	µg kg-1	M					< 1.0 [1]	
	1,1-Dichloropropene	563586	µg kg-1	U					< 1.0 [1]	
	Benzene	71432	µg kg-1	M	< 1.0 [1]	< 1.0 [1]		< 1.0 [1]	< 1.0 [1]	< 1.0 [1]
	1,2-Dichloroethane	107062	µg kg-1	U					< 2.0 [1]	
	Trichloroethene	79016	µg kg-1	U					< 1.0 [1]	
	1,2-Dichloropropane	78875	µg kg-1	U					< 1.0 [1]	
	Dibromomethane	74953	µg kg-1	U					< 10 [1]	
	Bromodichloromethane	75274	µg kg-1	U					< 5.0 [1]	
	cis-1,3-Dichloropropene	10061015	µg kg-1	N					< 10 [1]	
	Toluene	108883	µg kg-1	M	< 1.0 [1]	< 1.0 [1]		< 1.0 [1]	< 1.0 [1]	< 1.0 [1]
	trans-1,3-Dichloropropene	10061026	µg kg-1	N					< 10 [1]	

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					AI78383	AI78385
					TP208	TP205
					2/5/2013	3/5/2013
					0.80m	1.00m
					SOIL	*SOIL*
2760	Dichlorodifluoromethane	75718	µg kg-1	U		
	Chloromethane	74873	µg kg-1	M		
	Vinyl chloride	75014	µg kg-1	M		
	Bromomethane	74839	µg kg-1	U		
	Chloroethane	75003	µg kg-1	U		
	Trichlorofluoromethane	75694	µg kg-1	U		
	1,1-Dichloroethene	75354	µg kg-1	U		
	Dichloromethane	75092	µg kg-1	N		
	trans-1,2-Dichloroethene	156605	µg kg-1	U		
	1,1-Dichloroethane	75343	µg kg-1	M		
	cis-1,2-Dichloroethene	156592	µg kg-1	M		
	Bromochloromethane	74975	µg kg-1	U		
	Trichloromethane	67663	µg kg-1	M		
	1,1,1-Trichloroethane	71556	µg kg-1	M		
	Tetrachloromethane	56235	µg kg-1	M		
	1,1-Dichloropropene	563586	µg kg-1	U		
	Benzene	71432	µg kg-1	M	< 1.0 [1]	< 1.0 [1]
	1,2-Dichloroethane	107062	µg kg-1	U		
	Trichloroethene	79016	µg kg-1	U		
	1,2-Dichloropropane	78875	µg kg-1	U		
	Dibromomethane	74953	µg kg-1	U		
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	cis-1,3-Dichloropropene	10061015	µg kg-1	N		
	Toluene	108883	µg kg-1	M	< 1.0 [1]	< 1.0 [1]
	trans-1,3-Dichloropropene	10061026	µg kg-1	N		

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					TP214	TP201	TP211	TP203	TP203	TP202
					1/5/2013	1/5/2013	1/5/2013	1/5/2013	1/5/2013	1/5/2013
					0.50m	0.70m	0.60m	0.50m	1.60m	0.50m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2760	1,1,2-Trichloroethane	79005	µg kg-1	U					< 10 [1]	
	Tetrachloroethene	127184	µg kg-1	M					< 1.0 [1]	
	1,3-Dichloropropane	142289	µg kg-1	U					< 2.0 [1]	
	Dibromochloromethane	124481	µg kg-1	U					< 10 [1]	
	1,2-Dibromoethane	106934	µg kg-1	U					< 5.0 [1]	
	Chlorobenzene	108907	µg kg-1	M					< 1.0 [1]	
	1,1,1,2-Tetrachloroethane	630206	µg kg-1	M					< 2.0 [1]	
	Ethylbenzene	100414	µg kg-1	M	< 1.0 [1]	< 1.0 [1]		< 1.0 [1]	< 1.0 [1]	< 1.0 [1]
	m- & p-Xylene	1330207	µg kg-1	U	< 1.0 [1]	< 1.0 [1]		< 1.0 [1]	< 1.0 [1]	< 1.0 [1]
	o-Xylene	95476	µg kg-1	U	< 1.0 [1]	< 1.0 [1]		< 1.0 [1]	< 1.0 [1]	< 1.0 [1]
	Styrene	100425	µg kg-1	U					< 1.0 [1]	
	Tribromomethane	75252	µg kg-1	U					< 10 [1]	
	Isopropylbenzene	98828	µg kg-1	U					< 1.0 [1]	
	Bromobenzene	108861	µg kg-1	U					< 1.0 [1]	
	1,2,3-Trichloropropane	96184	µg kg-1	N					< 50 [1]	
	n-Propylbenzene	103651	µg kg-1	U					< 1.0 [1]	
	2-Chlorotoluene	95498	µg kg-1	M					< 1.0 [1]	
	1,2,4-Trimethylbenzene	95636	µg kg-1	U					< 1.0 [1]	
	4-Chlorotoluene	106434	µg kg-1	U					< 1.0 [1]	
	tert-Butylbenzene	98066	µg kg-1	U					< 1.0 [1]	
	1,3,5-Trimethylbenzene	108678	µg kg-1	U					< 1.0 [1]	
	sec-Butylbenzene	135988	µg kg-1	U					< 1.0 [1]	
	1,3-Dichlorobenzene	541731	µg kg-1	U					< 1.0 [1]	
	4-Isopropyltoluene	99876	µg kg-1	U					< 1.0 [1]	
	1,4-Dichlorobenzene	106467	µg kg-1	U					< 1.0 [1]	

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					2/5/2013	3/5/2013
					0.80m	1.00m
					SOIL	*SOIL*
2760	1,1,2-Trichloroethane	79005	µg kg-1	U		
	Tetrachloroethene	127184	µg kg-1	M		
	1,3-Dichloropropane	142289	µg kg-1	U		
	Dibromochloromethane	124481	µg kg-1	U		
	1,2-Dibromoethane	106934	µg kg-1	U		
	Chlorobenzene	108907	µg kg-1	M		
	1,1,1,2-Tetrachloroethane	630206	µg kg-1	M		
	Ethylbenzene	100414	µg kg-1	M	< 1.0 [1]	< 1.0 [1]
	m- & p-Xylene	1330207	µg kg-1	U	< 1.0 [1]	< 1.0 [1]
	o-Xylene	95476	µg kg-1	U	< 1.0 [1]	< 1.0 [1]
	Styrene	100425	µg kg-1	U		
	Tribromomethane	75252	µg kg-1	U		
	Isopropylbenzene	98828	µg kg-1	U		
	Bromobenzene	108861	µg kg-1	U		
	1,2,3-Trichloropropane	96184	µg kg-1	N		
	n-Propylbenzene	103651	µg kg-1	U		
	2-Chlorotoluene	95498	µg kg-1	M		
	1,2,4-Trimethylbenzene	95636	µg kg-1	U		
	4-Chlorotoluene	106434	µg kg-1	U		
	tert-Butylbenzene	98066	µg kg-1	U		
	1,3,5-Trimethylbenzene	108678	µg kg-1	U		
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	1,3-Dichlorobenzene	541731	µg kg-1	U		
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					TP214	TP201	TP211	TP203	TP203	TP202
					1/5/2013	1/5/2013	1/5/2013	1/5/2013	1/5/2013	1/5/2013
					0.50m	0.70m	0.60m	0.50m	1.60m	0.50m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2760	n-Butylbenzene	104518	µg kg-1	U					< 1.0 [1]	
	1,2-Dichlorobenzene	95501	µg kg-1	U					< 1.0 [1]	
	1,2-Dibromo-3-chloropropane	96128	µg kg-1	U					< 50 [1]	
	1,2,4-Trichlorobenzene	120821	µg kg-1	U					< 1.0 [1]	
	Hexachlorobutadiene	87683	µg kg-1	U					< 1.0 [1]	
2762	CAS591-21-9		µg kg-1						170 [1]	
	cyclopentane,1,2,3,trimethyl		µg kg-1						52 [1]	
	Cyclopentane,1,2,4-trimethyl		µg kg-1						51 [1]	
	Dichloroacetic acid,nonyl ester		µg kg-1						100 [1]	
	Tentatively Identified Compounds		µg kg-1						Detected [1]	
2790	Phenol	108952	mg kg-1	N					< 0.5 [1]	
	bis(2-Chloroethyl)ether	111444	mg kg-1	N					< 0.5 [1]	
	2-Chlorophenol	95578	mg kg-1	N					< 0.5 [1]	
	1,3-Dichlorobenzene	541731	mg kg-1	N					< 0.5 [1]	
	1,4-Dichlorobenzene	106467	mg kg-1	N					< 0.5 [1]	
	1,2-Dichlorobenzene	95501	mg kg-1	N					< 0.5 [1]	
	2-Methylphenol	95487	mg kg-1	N					< 0.5 [1]	
	bis(2-Chloroisopropyl)ether	108601	mg kg-1	N					< 0.5 [1]	
	4-Methylphenol	106445	mg kg-1	N					< 0.5 [1]	
	N-Nitrosodi-n-propylamine	621647	mg kg-1	N					< 0.5 [1]	
	Hexachloroethane	67721	mg kg-1	N					< 0.5 [1]	
	Nitrobenzene	98953	mg kg-1	N					< 0.5 [1]	
	Isophorone	78591	mg kg-1	N					< 0.5 [1]	
	2-Nitrophenol	88755	mg kg-1	N					< 0.5 [1]	
	2,4-Dimethylphenol	105679	mg kg-1	N					< 0.5 [1]	

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					0.80m	1.00m
					SOIL	*SOIL*
2760	n-Butylbenzene	104518	µg kg-1	U		
	1,2-Dichlorobenzene	95501	µg kg-1	U		
	1,2-Dibromo-3-chloropropane	96128	µg kg-1	U		
	1,2,4-Trichlorobenzene	120821	µg kg-1	U		
	Hexachlorobutadiene	87683	µg kg-1	U		
2762	CAS591-21-9		µg kg-1			
	cyclopentane,1,2,3,trimethyl		µg kg-1			
	Cyclopentane,1,2,4-trimethyl		µg kg-1			
	Dichloroacetic acid,nonyl ester		µg kg-1			
	Tentatively Identified Compounds		µg kg-1			
2790	Phenol	108952	mg kg-1	N		
	bis(2-Chloroethyl)ether	111444	mg kg-1	N		
	2-Chlorophenol	95578	mg kg-1	N		
	1,3-Dichlorobenzene	541731	mg kg-1	N		
	1,4-Dichlorobenzene	106467	mg kg-1	N		
	1,2-Dichlorobenzene	95501	mg kg-1	N		
	2-Methylphenol	95487	mg kg-1	N		
	bis(2-Chloroisopropyl)ether	108601	mg kg-1	N		
	4-Methylphenol	106445	mg kg-1	N		
	N-Nitrosodi-n-propylamine	621647	mg kg-1	N		
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					0.50m	0.70m	0.60m	0.50m	1.60m	0.50m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2790	bis(2-Chloroethoxy)methane	111911	mg kg-1	N					< 0.5 [1]	
	2,4-Dichlorophenol	120832	mg kg-1	N					< 0.5 [1]	
	1,2,4-Trichlorobenzene	120821	mg kg-1	N					< 0.5 [1]	
	Naphthalene	91203	mg kg-1	N					< 0.5 [1]	
	4-Chloroaniline	106478	mg kg-1	N					< 0.5 [1]	
	Hexachlorobutadiene	87683	mg kg-1	N					< 0.5 [1]	
	4-Chloro-3-methylphenol	59507	mg kg-1	N					< 0.5 [1]	
	2-Methylnaphthalene	91576	mg kg-1	N					< 0.5 [1]	
	Hexachlorocyclopentadiene	77474	mg kg-1	N					< 0.5 [1]	
	2,4,6-Trichlorophenol	88062	mg kg-1	N					< 0.5 [1]	
	2,4,5-Trichlorophenol	95954	mg kg-1	N					< 0.5 [1]	
	2-Chloronaphthalene	91587	mg kg-1	N					< 0.5 [1]	
	2-Nitroaniline	88744	mg kg-1	N					< 0.5 [1]	
	Dimethylphthalate	131113	mg kg-1	N					< 0.5 [1]	
	2,6-Dinitrotoluene	606202	mg kg-1	N					< 0.5 [1]	
	Acenaphthylene	208968	mg kg-1	N					< 0.5 [1]	
	3-Nitroaniline	99092	mg kg-1	N					< 0.5 [1]	
	Acenaphthene	83329	mg kg-1	N					< 0.5 [1]	
	Dibenzofuran	132649	mg kg-1	N					< 0.5 [1]	
	2,4-Dinitrotoluene	121142	mg kg-1	N					< 0.5 [1]	
	Diethylphthalate	84662	mg kg-1	N					< 0.5 [1]	
	Fluorene	86737	mg kg-1	N					< 0.5 [1]	
	4-Chlorophenylphenylether	7005723	mg kg-1	N					< 0.5 [1]	
	4-Nitroaniline	100016	mg kg-1	N					< 0.5 [1]	
	2-Methyl-4,6-dinitrophenol	534521	mg kg-1	N					< 0.5 [1]	

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					SOIL	*SOIL*
2790	bis(2-Chloroethoxy)methane	111911	mg kg-1	N		
	2,4-Dichlorophenol	120832	mg kg-1	N		
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	Naphthalene	91203	mg kg-1	N		
	4-Chloroaniline	106478	mg kg-1	N		
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	4-Chloro-3-methylphenol	59507	mg kg-1	N		
	2-Methylnaphthalene	91576	mg kg-1	N		
	Hexachlorocyclopentadiene	77474	mg kg-1	N		
	2,4,6-Trichlorophenol	88062	mg kg-1	N		
	2,4,5-Trichlorophenol	95954	mg kg-1	N		
	2-Chloronaphthalene	91587	mg kg-1	N		
	2-Nitroaniline	88744	mg kg-1	N		
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	4-Chlorophenylphenylether	7005723	mg kg-1	N		
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The right chemistry to deliver results

Report Date
13 June 2013

FAO C Doherty/D O'Mahony/ P Dunlop

					231735					
					AI78377	AI78378	AI78379	AI78380	AI78381	AI78382
					TP214	TP201	TP211	TP203	TP203	TP202
					1/5/2013	1/5/2013	1/5/2013	1/5/2013	1/5/2013	1/5/2013
					0.50m	0.70m	0.60m	0.50m	1.60m	0.50m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2790	Azobenzene	103333	mg kg-1	N					< 0.5 [1]	
	4-Bromophenylphenylether	101553	mg kg-1	N					< 0.5 [1]	
	Hexachlorobenzene	118741	mg kg-1	N					< 0.5 [1]	
	Pentachlorophenol	87865	mg kg-1	N					< 0.5 [1]	
	Phenanthrene	85018	mg kg-1	N					< 0.5 [1]	
	Anthracene	120127	mg kg-1	N					< 0.5 [1]	
	Carbazole	86748	mg kg-1	N					< 0.5 [1]	
	Di-n-butylphthalate	84742	mg kg-1	N					< 0.5 [1]	
	Fluoranthene	206440	mg kg-1	N					< 0.5 [1]	
	Pyrene	129000	mg kg-1	N					< 0.5 [1]	
	Butylbenzylphthalate	85687	mg kg-1	N					< 0.5 [1]	
	Benzo[a]anthracene	56553	mg kg-1	N					< 0.5 [1]	
	Chrysene	218019	mg kg-1	N					< 0.5 [1]	
	bis(2-Ethylhexyl)phthalate	117817	mg kg-1	N					< 0.5 [1]	
	Di-n-octylphthalate	117840	mg kg-1	N					< 0.5 [1]	
	Benzo[b]fluoranthene	205992	mg kg-1	N					< 0.5 [1]	
	Benzo[k]fluoranthene	207089	mg kg-1	N					< 0.5 [1]	
	Benzo[a]pyrene	50328	mg kg-1	N					< 0.5 [1]	
	Indeno[1,2,3-cd]pyrene	193395	mg kg-1	N					< 0.5 [1]	
	Dibenzo[a,h]anthracene	53703	mg kg-1	N					< 0.5 [1]	
	Benzo[g,h,i]perylene	191242	mg kg-1	N					< 0.5 [1]	
	2,4-Dinitrophenol	51285	mg kg-1	N					< 0.5 [1]	
	4-Nitrophenol	100027	mg kg-1	N					< 0.5 [1]	
2792	Tentatively Identified Compounds		mg kg-1						Not detected	
2920	Phenols (total)		mg kg-1	N	<0.3					

[1]The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

All tests undertaken between 06/06/2013 and 13/06/2013

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

Causeway Geotech Ltd.
8 Drumahiskey Road
Balnamore, Ballymoney
Co. Antrim
BT53 7QL

LABORATORY TEST REPORT

Results of analysis of 11 samples received 6 June 2013

York Street Interchange, Belfast

Chemtest
The right chemistry to deliver results

Report Date
13 June 2013

FAO C Doherty/D O'Mahony/ P Dunlop

					231735	
					AI78383	AI78385
					TP208	TP205
					2/5/2013	3/5/2013
					0.80m	1.00m
					SOIL	*SOIL*
2790	Azobenzene	103333	mg kg-1	N		
	4-Bromophenylphenylether	101553	mg kg-1	N		
	Hexachlorobenzene	118741	mg kg-1	N		
	Pentachlorophenol	87865	mg kg-1	N		
	Phenanthrene	85018	mg kg-1	N		
	Anthracene	120127	mg kg-1	N		
	Carbazole	86748	mg kg-1	N		
	Di-n-butylphthalate	84742	mg kg-1	N		
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	Pyrene	129000	mg kg-1	N		
	Butylbenzylphthalate	85687	mg kg-1	N		
	Benzo[a]anthracene	56553	mg kg-1	N		
	Chrysene	218019	mg kg-1	N		
	bis(2-Ethylhexyl)phthalate	117817	mg kg-1	N		
	Di-n-octylphthalate	117840	mg kg-1	N		
	Benzo[b]fluoranthene	205992	mg kg-1	N		
	Benzo[k]fluoranthene	207089	mg kg-1	N		
	Benzo[a]pyrene	50328	mg kg-1	N		
	Indeno[1,2,3-cd]pyrene	193395	mg kg-1	N		
	Dibenzo[a,h]anthracene	53703	mg kg-1	N		
	Benzo[g,h,i]perylene	191242	mg kg-1	N		
	2,4-Dinitrophenol	51285	mg kg-1	N		
	4-Nitrophenol	100027	mg kg-1	N		
2792	Tentatively Identified Compounds		mg kg-1			
2920	Phenols (total)		mg kg-1	N		

[1]The stability time for this analyte has been exceeded - these results may be compromised. The accreditation for these results remains unaffected.

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

ALcontrol Laboratories

Validated

CERTIFICATE OF ANALYSIS

SDG:	130301-152	**Location:**	Seapark	**Order Number:**	444978
Job:	D_DFP_BFT-8	**Customer:**	Department of Finance & Personnel	**Report Number:**	216863
Client Reference:		**Attention:**	Stephen Donovan	**Superseded Report:**	

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			7008042	BH223/1		0.50	400g Tub (ALE214)
			7008045	BH223/5		1.00	400g Tub (ALE214)
			7008046	BH223/9		3.00	400g Tub (ALE214)
			7008047	BH224/1		0.50	400g Tub (ALE214)
			7008049	BH224/4		2.15	400g Tub (ALE214)
			7008050	BH224/10		3.70	400g Tub (ALE214)
Ammoniacal N as NH4 in 2:1 extract	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Anions by Kone (soil)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Asbestos Identification (Soil)	All	NDPs: 0 Tests: 1						X
Magnesium (BRE)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
NO3, NO2 and TON by KONE (s)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
pH	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Total Sulphate	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Total Sulphur	All	NDPs: 0 Tests: 6	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	130301-152	**Location:**	Seapark	**Order Number:**	444978
Job:	D_DFP_BFT-8	**Customer:**	Department of Finance & Personnel	**Report Number:**	216863
Client Reference:		**Attention:**	Stephen Donovan	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
7008042	BH223/1	0.50	Light Brown	Sandy Silt Loam	0.1 - 2 mm	Stones	None
7008045	BH223/5	1.00	Light Brown	Silty Clay	0.063 - 0.1 mm	Stones	None
7008046	BH223/9	3.00	Light Brown	Sand	0.1 - 2 mm	Stones	None
7008047	BH224/1	0.50	Light Brown	Silty Clay Loam	0.063 - 0.1 mm	Stones	None
7008049	BH224/4	2.15	Dark Brown	Clay	<0.063 mm	None	None
7008050	BH224/10	3.70	Light Brown	Silt Loam	0.063 - 0.1 mm	Stones	Fibres

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

ALcontrol Laboratories

Validated

CERTIFICATE OF ANALYSIS

SDG:	130301-152	**Location:**	Seapark	**Order Number:**	444978
Job:	D_DFP_BFT-8	**Customer:**	Department of Finance & Personnel	**Report Number:**	216863
Client Reference:		**Attention:**	Stephen Donovan	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH223/1	BH223/5	BH223/9	BH224/1	BH224/4	BH224/10
			Depth (m)	0.50	1.00	3.00	0.50	2.15	3.70
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	15/02/2013	15/02/2013	15/02/2013	12/02/2013	12/02/2013	12/02/2013
			Sample Time						
			Date Received	28/02/2013	28/02/2013	28/02/2013	28/02/2013	28/02/2013	28/02/2013
			SDG Ref	130301-152	130301-152	130301-152	130301-152	130301-152	130301-152
			Lab Sample No.(s)	7008042	7008045	7008046	7008047	7008049	7008050
			AGS Reference						
Sulphur, Total	<0.02 %	TM132		0.0296 #	<0.02 #	<0.02 #	0.0444 #	<0.02 #	0.0258 @ #
pH	1 pH Units	TM133		8.52 M	7.82 M	9.01 M	8.27 M	8.35 M	8.76 M
Sulphate, acid soluble (total)	<0.02 %	TM221		<0.02	<0.02	<0.02	0.0251	<0.02	<0.02
Total Sulphur (ASB)	<0.0016 %	TM221							0.00386
Soluble Sulphate 2:1 extract as SO4 BRE	<0.003 g/l	TM243		0.0225 M	0.0188 M	0.0075 M	0.0467 M	0.0199 M	0.0181 M
Chloride 2:1 water/soil extract BRE	<0.001 g/l	TM243		0.0496 M	0.0512 M	0.0194 M	0.0767 M	0.0178 M	0.0089 M
Nitrate as NO3, 2:1 water soluble (BRE)	<0.0003 g/l	TM243		0.000626	0.00536	0.00168	0.0335	0.00432	0.0026
Ammoniacal N as NH4 in 2:1 extract BRE	<0.0003 g/l	TM248		<0.0003	<0.0003	<0.0003	0.000357	<0.0003	<0.0003
Magnesium (BRE)	<0.008 g/l	TM282		<0.008	<0.008	<0.008	<0.008	<0.008	<0.008

ALcontrol Laboratories

Validated

CERTIFICATE OF ANALYSIS

SDG:	130301-152	**Location:**	Seapark	**Order Number:**	444978
Job:	D_DFP_BFT-8	**Customer:**	Department of Finance & Personnel	**Report Number:**	216863
Client Reference:		**Attention:**	Stephen Donovan	**Superseded Report:**	

Asbestos Identification - Soil

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH224/10 3.70 SOLID 12/02/2013 00:00:00 130301-152 7008050 TM048	21/03/13	Chris Swindells	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG:	130301-152	**Location:**	Seapark	**Order Number:**	444978
Job:	D_DFP_BFT-8	**Customer:**	Department of Finance & Personnel	**Report Number:**	216863
Client Reference:		**Attention:**	Stephen Donovan	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
ASB_PREP				
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer		
TM243		Mixed Anions In Soils By Kone		
TM248	In-House Method	Determination of Ammonium BRE (2:1 Extract) on solids		
TM282		Extraction of Magnesium by BRE Method		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	130301-152	**Location:**	Seapark	**Order Number:**	444978
Job:	D_DFP_BFT-8	**Customer:**	Department of Finance & Personnel	**Report Number:**	216863
Client Reference:		**Attention:**	Stephen Donovan	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	7008042	7008045	7008046	7008047	7008049	7008050
Customer Sample Ref.	BH223/1	BH223/5	BH223/9	BH224/1	BH224/4	BH224/10
AGS Ref.						
Depth	0.50	1.00	3.00	0.50	2.15	3.70
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Ammoniacal N as NH4 in 2 1 extract	09-Mar-2013	09-Mar-2013	09-Mar-2013	09-Mar-2013	09-Mar-2013	09-Mar-2013
Anions by Kone (soil)	12-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013
Asbestos Identification						21-Mar-2013
Magnesium (BRE)	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013
NO3, NO2 and TON by KONE (s)	12-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013
pH	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013	09-Mar-2013
Sample description	06-Mar-2013	06-Mar-2013	06-Mar-2013	06-Mar-2013	06-Mar-2013	06-Mar-2013
Total Sulphate	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013	11-Mar-2013
Total Sulphur	12-Mar-2013	12-Mar-2013	12-Mar-2013	12-Mar-2013	12-Mar-2013	21-Mar-2013

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5 -C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
•	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.