

on
GROUND INVESTIGATION
at
ENDEAVOUR WHARF
WHITBY
NORTH YORKSHIRE
DRAFT
NOVEMBER 2001
REPORT NO: 17202

STRUCTURAL SOILS

SCARBOROUGH BOROUGH COUNCIL

REPORT

on

GROUND INVESTIGATION

at

ENDEAVOUR WHARF

WHITBY

NORTH YORKSHIRE

NOVEMBER 2001

REPORT NO: 17202

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Revision	Date	Description	Prepared by

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2.0 SITE DESCRIPTION

The works were carried out in Whitby, North Yorkshire, at Endeavour Wharf, which is located on the west bank of the River Esk to the east of the junction of New Quay Road and Langbourne Road. The site is at approximate grid reference NZ 899109, see Site Location Plan in Appendix A.

The site comprises a level area of concrete / paved / tarmac deck and is used for loading and unloading ships. Two of the boreholes were carried out through the deck and a third was carried out from a cantilever platform off the side of the quay wall over the River Esk.

The Geological Survey of Great Britain and information provided by High-Point Rendel indicates the site to be underlain by shallow alluvial deposits underlain by interbedded weathered mudstones, siltstones and sandstones of the Scalby Formation of Middle Jurassic age. Made ground was also anticipated behind the quay wall.

3.0 FIELDWORK

Three cable percussion boreholes were completed between 10 and 17 December 2001 at the locations shown on the site plan in Appendix A. The borehole positions were selected by High-Point Rendel. Boreholes EW 01 and EW 03 were carried out on the quayside the deck having been previously broken out by others. Borehole EW 02 was carried out into the River Esk from a cantilever platform installed by Structural Soils Limited.

The boreholes were drilled using a cable percussion drilling rig with 200 and 150mm diameter tools and casing. The quay side holes, EW 01 and EW 03, extended to depths of 15.31 and 10.45m respectively. Borehole EW 02 extended to 9.35m below bed level.

Undisturbed samples, 100mm diameter, were recovered from the cohesive strata. Standard Penetration Tests were carried out at regular intervals in accordance with BS1377: Part 9: 1990: 3.3. Test results are given in detail in Appendix B and summarised on the borehole logs. Disturbed and bulk samples were also taken. The boreholes were backfilled with arisings.

The samples were logged by an engineer in general accordance with the recommendations of BS5930: 1999. Detailed descriptions, together with relevant comments, are given in the borehole logs included in Appendix B.

4.0 LABORATORY TESTING

The following laboratory tests were carried out on samples unless indicated otherwise generally in accordance with BS1377: 1990, *Methods of test for soils for civil engineering purposes*, parts 1 to 8. Where non-standard procedures have been undertaken, this will be recorded on the report sheet. The results are reported in tabular and/or graphical form included as Appendix C of this report. The laboratory tests were scheduled by High-Point Rendel.

4.1 Moisture Content

Five moisture contents were undertaken using the oven-drying method in accordance with BS1377: Part 2: 1990. The results are tabulated in the Summary of Classification Tests.

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4.2 Liquid Limit, Plastic Limit and Plasticity Index

Five liquid and plastic limit tests were performed in accordance with BS1377: Part 2: 1990. The results are tabulated in an A Line Plot (in accordance with BS5930: 1981) and the Summary of Classification Tests.

4. Consolidated - Undrained Triaxial Compression Tests (with the measurement of pore pressure)

A set of consolidated undrained triaxial compression tests with the measurement of pore pressure was undertaken on a sample from borehole EW02 (10.65m). The set comprised the saturation, consolidation and shearing with the measurement of pore pressure of three specimens, each nominally 38mm in diameter and 76mm in length at effective confining pressures ranging between 25 and 100 kPa. A further set was scheduled (EW02-9.00m) but the sample was found to be unsuitable.

The results are tabulated and represented graphically as saturation, consolidation and shearing (with measurement of pore pressure changing) curves, together with a plot of Mohr's circles defining effective cohesion (c') and effective angle of friction (ϕ').

STRUCTURAL SOILS LIMITED

A C Suckling BSc (Hons) CEng MICE

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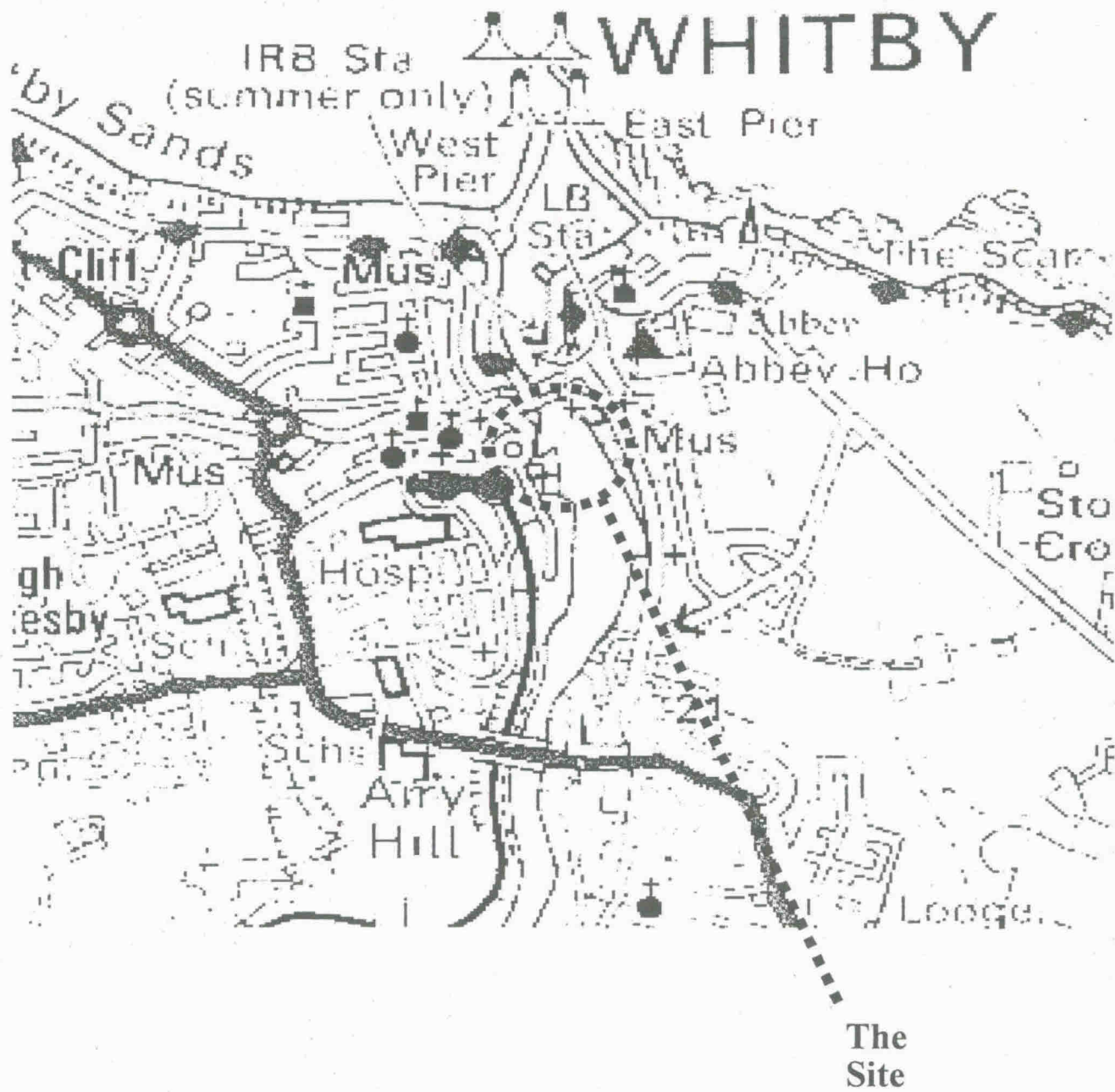
J McCarthy Bsc (Hons) FGS

5.0 REFERENCES

- 5.1 BS5930: 1999 *Code of Practice for Site Investigations*
- 5.2 BS1377: 1990 *Methods of Test for Soils for Civil Engineering Purposes*

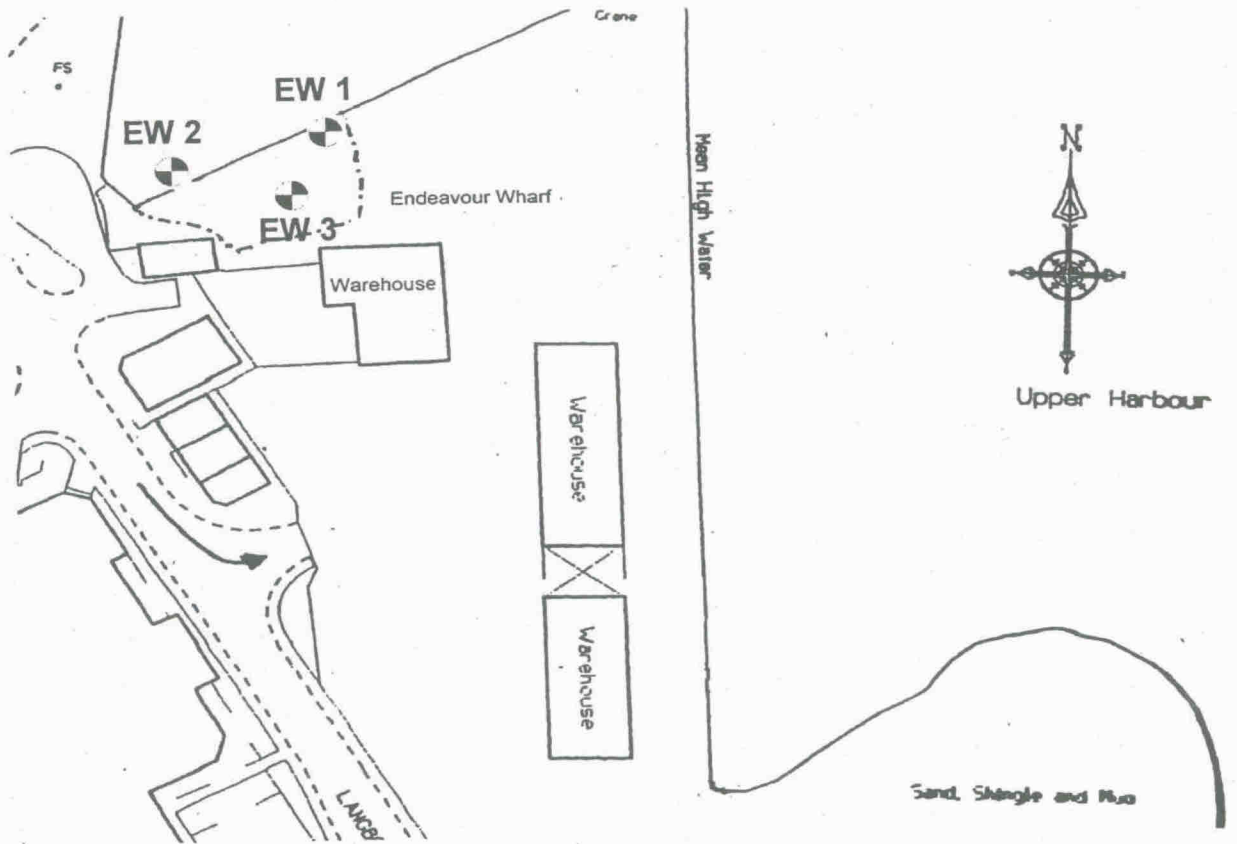
APPENDIX A

Site Location Plan
Site Plan




SITE LOCATION PLAN

	STRUCTURAL SOILS LIMITED	Location Endeavour Wharf, Whitby	Job No 17202
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SITE PLAN
Not To Scale

 <p>STRUCTURAL SOILS LIMITED</p>	<p>Location Endeavour Wharf, Whitby</p>	<p>Job No 17202</p>
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APPENDIX B

Borehole Logs
Standard Penetration Test Results



KEY TO BOREHOLE AND TRIAL PIT LOGS

SAMPLING

- U Undisturbed driven tube sample - 102mm diameter, 450 mm long
- P Undisturbed pushed piston sample - 102mm diameter, 1000mm long
- U+, P+ No recovery in undisturbed sample
- D Small disturbed sample
- B Bulk disturbed sample
- W Water Sample
- CS Core sample taken from rotary core for laboratory testing






IN-SITU TESTING

- SPT Standard Penetration Test using split spoon sampler.
- CPT Standard Penetration Test using a solid 60 degree cone.
The N value quoted is the number of blows required to complete a test drive of 300mm after a seating drive of 150mm. Where the full test drive was not completed, a linearly extrapolated N value (N*) is given and prefixed by *
- V Field Vane Test. Direct reading of shear strength, c_u , is quoted in kPa. N=Natural; R=Remoulded
- HP Hand Penetrometer Test. Value given as cohesive strength c_u , in kPa
- k Permeability Test. Permeability is quoted exponentially eg. $1.2E-07$ m/s.
- G Gas Test












DRILLING RECORDS

- W Water flush returns estimated percentage
- TCR Total Core Recovery, %
- SCR Solid Core Recovery, %
- RQD Rock Quality Designation, %
- If Fracture spacing, mm. Where variable, the minimum, average and maximum spacing may be quoted.
NI - non intact core.
NA - not applicable.

WATER COLUMN SYMBOLS

-   First water strike, second water strike etc.
-   Standing water level following first strike, standing water level following second strike etc.
-  Seepage

INSTRUMENTATION SYMBOLS

- | | | | |
|--|--|---|--|
|  Arisings |  Gravel filter |  Sand filter |  Bentonite seal |
|  Bentonite cement grout |  Concrete |  Solid pipe |  Slotted pipe |
|  Piezometer tip |  Stopcock cover |  Upstand cover | |

- NOTES:
1. All soil and rock descriptions and legends in general accordance with BS5930:1981.
 2. All lengths used to determine rock core mechanical properties taken along the centre line of the core. Obvious induced fractures have been ignored.
 3. The assessment of solid core is based on lengths that show a full diameter and not necessarily a full circumference.
 4. Material types divided by a broken line (---) indicates an unclear boundary.



STRUCTURAL SOILS

BOREHOLE LOG

Contract Endeavour Wharf, Whitby		Client High Point Rendel		Borehole No EW 01
Job No 17202	Start 11/12/01 End 12/12/01	Ground Level (m AOD)	Co-Ordinates	Sheet 1 of 2

Samples and In-situ Tests				Water	Instru- mentation	Description of Strata	Depth (Thick- ness)	Legend
Depth	No	Type	Blows					
0.00 -2.00	1	B				MADE GROUND: TARMAC	0.20	
						MADE GROUND: Loose grey brown slightly clayey fine to coarse SAND and angular to subangular fine to coarse GRAVEL of concrete, brick and sandstone.		
-2.00 -2.45	2	SPT	5					
2.00 -2.45	3	D					(3.80)	
2.00 -3.00	4	B						
-3.00 -3.45	5	SPT	31			Below 3.00 m, Medium dense to dense, locally sandy gravel.		
3.00 -3.45	6	B						
-4.00 -4.45	7	SPT	6				4.00	
4.00 -4.45	8	D				MADE GROUND: Loose becoming medium dense dark grey, grey and brown slightly sandy angular to subangular fine to coarse GRAVEL of brick, concrete and sandstone.		
4.00 -5.00	9	B				Occasional cobbles of sandstone.		
-5.00 -5.45	10	SPT	28			Below 5.00 m, Gravel of predominantly sandstone.	(1.80)	
5.00 -5.45	11	D						
5.00 -5.80	12	B						
5.80	13	D				Soft dark grey clayey to very clayey fine to medium SAND. Locally sandy silt/clay.	5.80	
							(0.90)	
6.50 -6.95	14	SPT	8					
6.50 -6.95	15	D					6.70	
6.50 -6.70	16	B				Loose small and medium GRAVEL. (Foreman's description)	(0.50)	
7.20	17	D				Soft to firm dark brown and dark grey slightly sandy CLAY. Some organic fibres.	7.20	
-8.00 -8.45	18	U	(7)					
8.45 -8.60	19	D						

Boring Progress and Water Observations						Chiselling			General Remarks
Date	Time	Borehole Depth	Casing Depth	Casing Diameter	Water Depth	From	To	Hours	
3.00		3.00	3.00	200	3.00				1. Borehole carried out through backfilled trial pit excavated by others. 2. Foreman notes water is tidal.
11/12/01	20 mins	3.00	3.00	200	2.80				
11/12/01		9.00	9.00	200	DRY				
12/12/01		9.00	9.00	200	DRY				
12/12/01		11.90	11.50	150	11.90	13.20	13.50	0.75hrs	
12/12/01	20 mins	11.90	11.50	150	3.80	13.60	14.00	1.0hrs	
12/12/01		15.31	14.00	150	1.30	14.80	15.00	1.0hrs	

All dimensions in metres		Method	Drilled By	Logged By	Checked By
Scale	1:50	Cable Percussion	JS	TC	

Contract Endeavour Wharf, Whitby		Client High Point Rendel		Borehole No EW 01
Job No 17202	Start 11/12/01 End 12/12/01	Ground Level (m AOD)	Co-Ordinates	Sheet 2 of 2

Samples and In-situ Tests				Water	Instrumentation	Description of Strata	Depth (Thickness)	Legend
Depth	No	Type	Blows					
9.00	20	D			CLAY (As Sheet 1) Below 9.00 m, Occasional fine organic fibres and slightly micaceous.			
9.50 - 9.95	21	U	(5)			(4.70)		
9.95 - 10.10	22	D						
10.50	23	D						
11.00 - 11.45	24	U	(5)					
11.00 - 11.45	25	D						
11.90	26	D				11.90		
12.00 - 12.50	27	B			Medium dense dark brown clayey slightly sandy subangular to subrounded fine to coarse GRAVEL of sandstone.			
12.50 - 12.95	28	CPT	24			(1.30)		
13.20 - 13.65	29	SPT	43			13.20		
13.20 - 13.65	30	D			BOULDER/COBBLES. (Foreman's description)	13.50		
13.20 - 13.60	31	B			Dense clayey SAND and GRAVEL. (Foreman's description)	13.60		
14.00	32	D			Stiff brown grey slightly sandy slightly gravelly to gravelly CLAY, gravel is subrounded fine to medium, rarely coarse, sandstone and mudstone.	(1.20)		
14.50 - 14.60	33	U	(50)					
14.60 - 15.05	34	D						
14.60 - 15.05	35	SPT	36			14.80		
14.60 - 15.31	36	D			Very weak light grey and grey fine grained SANDSTONE. Recovered angular fine to medium gravel sized fragments.	(0.51)		
14.90 - 15.31	37	D						
15.00	38	SPT	*94			15.31		
15.00	39	D			Borehole ends at 15.31 m.			

Boring Progress and Water Observations						Chiselling			General Remarks
Date	Time	Borehole Depth	Casing Depth	Casing Diameter	Water Depth	From	To	Hours	
3.00	20 mins	3.00	3.00	200	3.00				
11/12/01		3.00	3.00	200	2.80				
11/12/01		9.00	9.00	200	DRY				
12/12/01		9.00	9.00	200	DRY				
12/12/01	20 mins	11.90	11.50	150	11.90	13.20	13.50	0.75hrs	
12/12/01		11.90	11.50	150	3.80	13.60	14.00	1.0hrs	
12/12/01		15.31	14.00	150	1.30	14.80	15.00	1.0hrs	
12/12/01									

All dimensions in metres Scale 1:50	Method Cable Percussion	Drilled By JS	Logged By TC	Checked By
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Contract Endeavour Wharf, Whitby		Client High Point Rendel		Borehole No EW 02
Job No 17202	Start 13/12/01	Ground Level (m AOD)	Co-Ordinates	Sheet 1 of 2
	End 17/12/01			

Samples and In-situ Tests				Water	Instru- mentation	Description of Strata	Depth (Thick- ness)	Legend
Depth	No	Type	Blows					
						0.00 to 5.70 m. Platform level to bed of river/harbour.		
							(5.70)	
							5.70	
6.00 - 7.00	1	B				Loose waste. (Foreman's description)	6.00	
						Dark grey sandy subangular to subrounded fine to coarse GRAVEL of predominantly sandstone. Occasional cobbles. Foreman notes dense. Below 6.50 m, Foreman notes loose.	(1.10)	
7.00 - 7.45	2	CPT	0				7.10	
7.10	3	D				Very soft black slightly sandy slightly gravelly CLAY, gravel is fine to coarse sandstone and rarely fine shell fragments. Occasional organic fibres.	(0.70)	
							7.80	
7.80	4	D				Soft to firm brown and grey slightly sandy micaceous CLAY. Occasional yellow and black organic fibres. Locally silt/clay.		
8.00 - 8.45	5	SPT	2					
8.00 - 8.45	6	D						
8.00 - 9.00	7	B						

Boring Progress and Water Observations						Chiselling			General Remarks
Date	Time	Borehole Depth	Casing Depth	Casing Diameter	Water Depth	From	To	Hours	
13/12/01		5.70	6.00	200	1.90				1. Borehole carried out from cantilever platform over water. 2. All depth taken from platform deck. 3. Foreman notes water is tidal.
13/12/01		7.80	7.80	200	1.90				
14/12/01		12.00	12.00	150	12.00				
14/12/01	20 mins	12.00	12.00	150	3.00				
14/12/01		14.93	14.93	150	Tidal				
17/12/01		13.30	13.30	150	2.20				
17/12/01		15.05	15.00	150	5.20	14.90	15.00	1.0hrs	

All dimensions in metres Scale 1:50		Method Cable Percussion	Drilled By JS	Logged By TC	Checked By
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Contract Endeavour Wharf, Whitby		Client High Point Rendel		Borehole No EW 02
Job No 17202	Start 13/12/01	Ground Level (m AOD)	Co-Ordinates	Sheet 2 of 2
	End 17/12/01			

Samples and In-situ Tests				Water	Instru- mentation	Description of Strata	Depth (Thick- ness)	Legend
Depth	No	Type	Blows					
9.00 -9.45	8	U	(6)			CLAY (As Sheet 1)		
9.45 -9.60	9	D					(3.40)	
10.00	10	D						
10.50 -10.95	11	U	(6)			10.50 m, Brown slightly sandy subangular to subrounded fine to coarse GRAVEL of sandstone.		
10.95 -11.10	12	D						
11.20	13	D					11.20	
						Firm to stiff brown locally mottled light grey slightly sandy CLAY. Rare fine to medium gravel of sandstone. Occasional fine organic fibres.		
12.00 -12.45	14	SPT	22					
12.00 -12.45	15	D					12.20	
12.00 -13.00	16	B				Medium dense grey and brown slightly gravelly to gravelly fine to coarse SAND, gravel is subrounded fine to medium sandstone.		
13.00 -13.45	17	CPT	22					
13.00 -13.60	18	B						
13.60 -14.05	19	SPT	26					
13.60 -14.05	20	D					(2.70)	
13.60 -14.90	21	B						
14.90 -14.93	22	SPT	*1000			Very weak light grey and grey fine grained SANDSTONE. Recovered as angular fine to medium gravel size fragments.		
14.90 -14.93	23	D					14.90	
15.00 -15.05	24	SPT	*750				15.05	
14.90 -15.05	25	D				Borehole ends at 15.05 m.		

Boring Progress and Water Observations						Chiselling			General Remarks
Date	Time	Borehole Depth	Casing Depth	Casing Diameter	Water Depth	From	To	Hours	
13/12/01		5.70	6.00	200	1.90				1. Borehole carried out from cantilever platform over water. 2. All depth taken from platform deck. 3. Foreman notes water is tidal.
13/12/01		7.80	7.80	200	1.90				
14/12/01	20 mins	12.00	12.00	150	12.00				
14/12/01		12.00	12.00	150	3.00				
14/12/01		14.93	14.93	150	Tidal				
17/12/01		13.30	13.30	150	2.20				
17/12/01		15.05	15.00	150	5.20	14.90	15.00	1.0hrs	
17/12/01									

All dimensions in metres		Method	Drilled By	Logged By	Checked By
Scale	1:50	Cable Percussion	JS	TC	

Contract Endeavour Wharf, Whitby		Client High Point Rendel		Borehole No EW 03
Job No 17202	Start 10/12/01	Ground Level (m AOD)	Co-Ordinates	Sheet 1 of 2
	End 10/12/01			

Samples and In-situ Tests				Water	Instru- mentation	Description of Strata	Depth (Thick- ness)	Legend
Depth	No	Type	Blows					
0.50 -1.00	1	B			MADE GROUND: CONCRETE	(0.50)	[Cross-hatch pattern]	
						0.50		
1.00 -1.45	2	SPT	6		MADE GROUND: Loose grey and brown slightly clayey, locally clayey, slightly gravelly fine to coarse SAND, gravel is angular to subangular fine to coarse brick and sandstone. Locally sandy clay.	(1.90)	[Cross-hatch pattern]	
1.00 -1.45	3	D						
1.00 -2.00	4	B						
2.00 -2.45	5	SPT	4		Loose yellow and grey clayey, locally very clayey, slightly gravelly to gravelly fine to medium SAND, gravel is subangular fine to coarse sandstone.	2.40	[Cross-hatch pattern]	
2.00 -2.45	6	D						
2.00 -3.00	7	B						
3.00 -3.45	8	SPT	5		Loose dark grey/black slightly clayey to clayey slightly gravelly fine to medium SAND, gravel is subangular to subrounded fine to medium sandstone. Locally very clayey. Organic odour.	(1.80)	[Cross-hatch pattern]	
3.00 -3.45	9	D						
3.00 -4.00	10	B						
4.00 -4.45	11	SPT	3		Loose dark grey/black slightly clayey to clayey slightly gravelly fine to medium SAND, gravel is subangular to subrounded fine to medium sandstone. Locally very clayey. Organic odour.	4.20	[Cross-hatch pattern]	
4.00 -4.45	12	D						
4.20 -5.00	13	D						
4.20	14	B						
5.00 -5.45	15	SPT	6		Loose dark grey/black slightly clayey to clayey slightly gravelly fine to medium SAND, gravel is subangular to subrounded fine to medium sandstone. Locally very clayey. Organic odour.	(2.70)	[Cross-hatch pattern]	
5.00 -5.45	16	D						
5.00 -6.50	17	B						
6.50 -6.95	18	SPT	9		Loose grey sandy subrounded fine to coarse GRAVEL of sandstone. Locally sand and gravel.	6.90	[Cross-hatch pattern]	
6.50 -6.95	19	D						
7.00 -8.00	20	B			Loose grey sandy subrounded fine to coarse GRAVEL of sandstone. Locally sand and gravel.	(1.20)	[Cross-hatch pattern]	
8.00 -8.45	21	CPT	3		Very soft dark brown and dark grey, locally black, slightly sandy CLAY. Locally silt/clay. Occasional fine organic fibres.	8.10	[Cross-hatch pattern]	
8.10	22	D						

Boring Progress and Water Observations						Chiselling			General Remarks
Date	Time	Borehole Depth	Casing Depth	Casing Diameter	Water Depth	From	To	Hours	
10/12/01		2.80	2.00	150	2.80				Concrete broken out - 1 hr.
10/12/01	20 mins	2.80	2.00	150	2.10				
10/12/01		6.50	6.50	150	2.10				
10/12/01		10.45	9.00	150	6.50				

All dimensions in metres Scale 1:50		Method Cable Percussion	Drilled By JS	Logged By TC	Checked By
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Contract Endeavour Wharf, Whitby		Client High Point Rendel		Borehole No EW 03
Job No 17202	Start 10/12/01	Ground Level (m AOD)	Co-Ordinates	Sheet 2 of 2
	End 10/12/01			

Samples and In-situ Tests				Water	Instru- mentation	Description of Strata	Depth (Thick- ness)	Legend
Depth	No	Type	Blows					
						CLAY (As Sheet 1)	(2.35)	
10.00 - 10.45	23	SPT	2					
10.00 - 10.45	24	D						
						Borehole ends at 10.45 m.	10.45	

Boring Progress and Water Observations						Chiselling			General Remarks
Date	Time	Borehole Depth	Casing Depth	Casing Diameter	Water Depth	From	To	Hours	
10/12/01		2.80	2.00	150	2.80				Concrete broken out - 1 hr.
10/12/01	20 mins	2.80	2.00	150	2.10				
10/12/01		6.50	6.50	150	2.10				
10/12/01		10.45	9.00	150	6.50				

All dimensions in metres		Method	Drilled By	Logged By	Checked By
Scale	1:50	Cable Percussion	JS	TC	



STRUCTURAL SOILS

STANDARD PENETRATION TESTS

Contract				Client						Job No	
Endeavour Wharf, Whitby				High Point Rendel						17202	
Borehole	Depth (m)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive	R (mm)	N	N*	Comments	
				Blows	Pen (mm)	Blows					
EW 01	2.00	1.50	Dry	1,3	150	2,1,1,1	450	5			
EW 01	3.00	3.00	Dry	4,3	150	1,6,12,12	450	31			
EW 01	4.00	4.00	2.80	1,3	150	2,0,1,3	450	6			
EW 01	5.00	5.00	2.80	1,1	150	1,13,9,5	450	28			
EW 01	6.50	6.00	2.80	1,1	150	2,2,2,2	450	8			
EW 01	12.50	12.50	3.80	3,6	150	8,6,4,6	450	24			
EW 01	13.20	13.00	9.20	16,9	125	20,9,8,6	425	43			
EW 01	14.60	14.00	1.30	1,6	150	9,9,9,9	300	36			
EW 01	15.00	14.00	1.30	9,13	150	23,23,4,	310		94		
EW 02	7.00	7.00	1.90	1,1	150	0,0,0,0	450	0			
EW 02	8.00	8.00	Tidal	0,0	150	0,1,0,1	450	2			
EW 02	12.00	12.00	Tidal	3,3	150	2,5,7,8	450	22			
EW 02	13.00	13.00	Tidal	8,7	150	5,4,5,8	450	22			
EW 02	13.60	13.60	Tidal	20,9	150	6,8,6,6	450	6			
EW 02	14.90	14.90	Tidal	25,	10	50,,,	15		1000		
EW 02	15.00	15.00	5.20	25,	30	20,,,	20		750		
EW 03	1.00	None	Dry	2,1	150	1,1,2,2	450	6			
EW 03	2.00	2.00	Dry	2,2	150	1,1,1,1	450	4			
EW 03	3.00	3.00	2.10	1,2	150	2,1,1,1	450	5			
EW 03	4.00	4.00	2.10	2,1	150	1,1,0,1	450	3			
EW 03	5.00	5.00	2.10	1,0	150	1,1,2,2	450	6			
EW 03	6.50	6.50	2.10	4,3	150	3,3,2,1	450	9			
EW 03	8.00	8.00	2.10	1,0	150	1,0,1,1	450	3			
EW 03	10.00	9.00	6.50	0,0	150	1,0,1,0	450	2			

Notes:

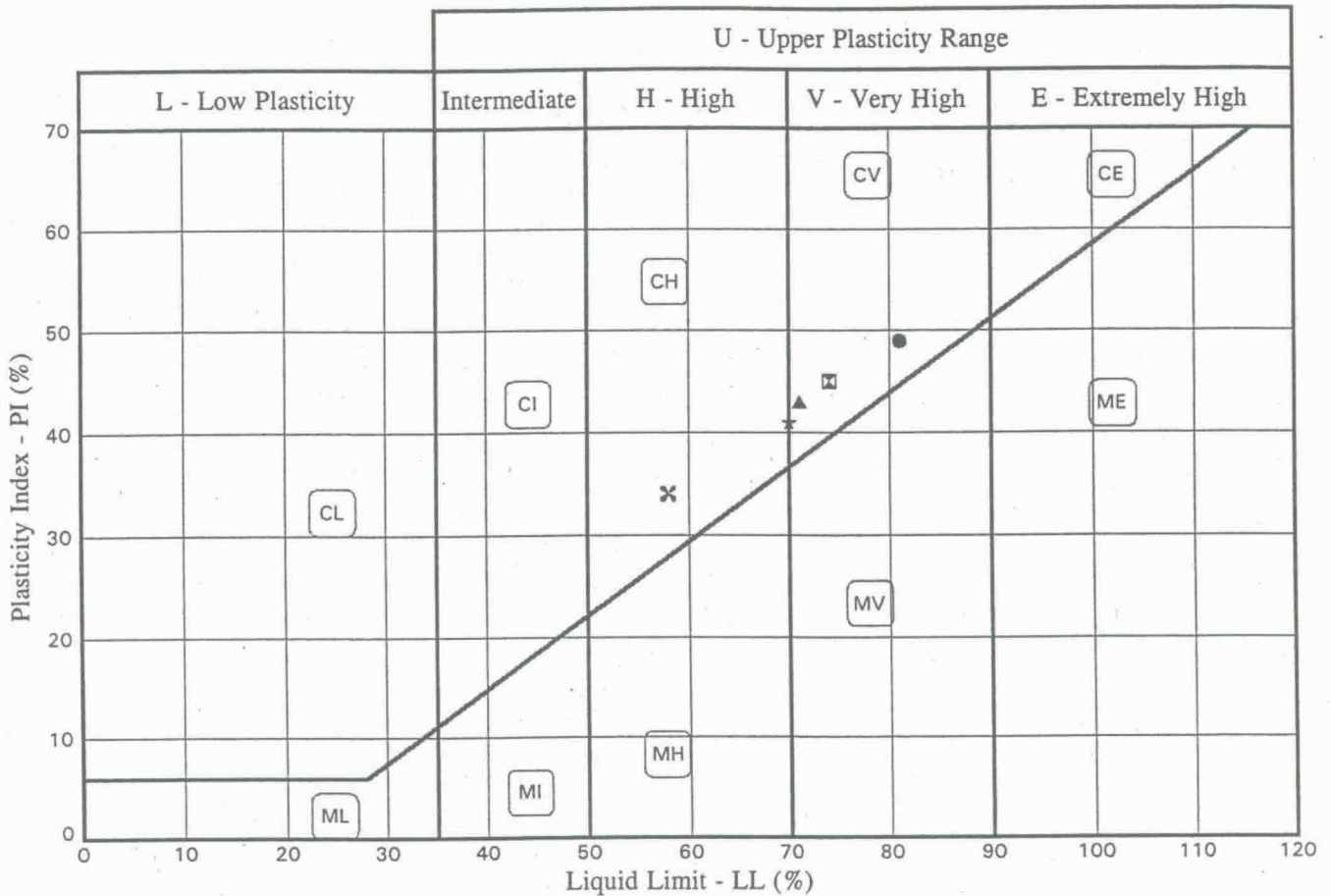
- 1. Tests carried out in accordance with BS1377:Part 9:1990:3.3
- 2. Reported blows are for 75mm penetration unless indicated " + "
- 3. Where full test drive was not achieved, actual penetration (R) and extrapolated N value (N*) reported
- 4. Tests carried out using a split spoon sampler unless noted as CPT in comments column

APPENDIX C

Geotechnical Laboratory Test Results

PLASTICITY CHART - PI Vs LL

In accordance with clause 42.3 of BS5930:1981
Testing in accordance with clauses 3.2,4.3,4.4,5.3,5.4 of BS1377:Part 2:1990



Sample Identification		MC	LL	PL	PI	<425um	Specimen Description	
BH	Sample Depth	%	%	%	%	%		
●	EW02 .	8.00	95	81	32	49	100	Dark grey CLAY
⊠	EW02 .	9.45	56	74	29	45	100	Dark grey CLAY and some wood
▲	EW02 .	10.00	55	71	28	43	100	Dark grey CLAY and some wood
★	EW02 .	10.95	62	70	29	41	100	Dark grey CLAY and PEAT
✕	EW02 .	11.20	30	58	24	34	100	Dark grey/brown CLAY

* Combined sample

<p>STRUCTURAL SOILS Chevet House A1 Great North Road Knottingley WF11 0BS</p>	Compiled By	Date	Checked By	Date
	Contract Whitby		Job No 17202	
	Page 1 of 1			

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 8:1990

Borehole : **EW2** Sample : Depth (m) : **10.65**
 Sample Diameter (mm) : **38.00** Sample Height (mm) : **77.00**
 Drainage : **Radial + 1 end** Sample Type : **Undisturbed**
 Description : **Grey mottled black organic SILT**

SPECIMEN NUMBER		1	2	3
PROPERTIES	Initial Moisture Content (%)	54	55	55
	Initial Bulk Density (Mg/m ³)	1.68	1.68	1.68
	Initial Dry Density (Mg/m ³)	1.09	1.08	1.08
	Final Moisture Content (%)	48	46	41
	Final Bulk Density (Mg/m ³)	1.68	1.70	1.73
	Final Dry Density (Mg/m ³)	1.13	1.16	1.23
SATURATION	Final Back Pressure (kPa)	290	290	290
	Cell Pressure Increment (kPa)	50	50	100
	Pore Pressure Increment (kPa)	49.5	50.0	100.0
	Final Pore Pressure Ratio - B Value	0.99	1.00	1.00
CONSOLIDATION	Cell Pressure (kPa)	325	350	400
	Back Pressure (kPa)	300	300	300
	Effective Cell Pressure (kPa)	25	50	100
	Initial Volume (cm ³)	85.26	86.09	86.57
	Final Volume (cm ³)	82.34	80.17	76.44
	Change in Volume (cm ³)	2.92	5.92	10.13
COMPRESSION	Cell Pressure (kPa)	325	350	400
	Initial Pore Water Pressure (kPa)	300	299	305
	Strain Rate (mm/min)	0.010	0.009	0.009
	Axial Strain at Failure (%)	16.2	13.3	12.8
	Time to Failure (hrs)	21.1	17.9	18.3
	Deviator Stress at Failure (kPa)	37	41	80
	Pore Pressure at Failure (kPa)	313	326	367
	Effective Major Principle Stress (kPa)	49	65	113
	Effective Minor Principle Stress (kPa)	12	24	33
	Effective Principle Stress Ratio	4.1	2.7	3.4
Pore Pressure Coefficient - A _v	0.35	0.65	0.77	
Effective Cohesion (c') (kPa)	4	Angle of Shear Resistance (φ') 31 (deg)		



STRUCTURAL SOILS
 The Old School House
 Stillhouse Lane
 Bedminster
 Bristol BS3 4EB

Contract **Endeavour Wharf, Whitby**

Job No **13221**
 Page **of**

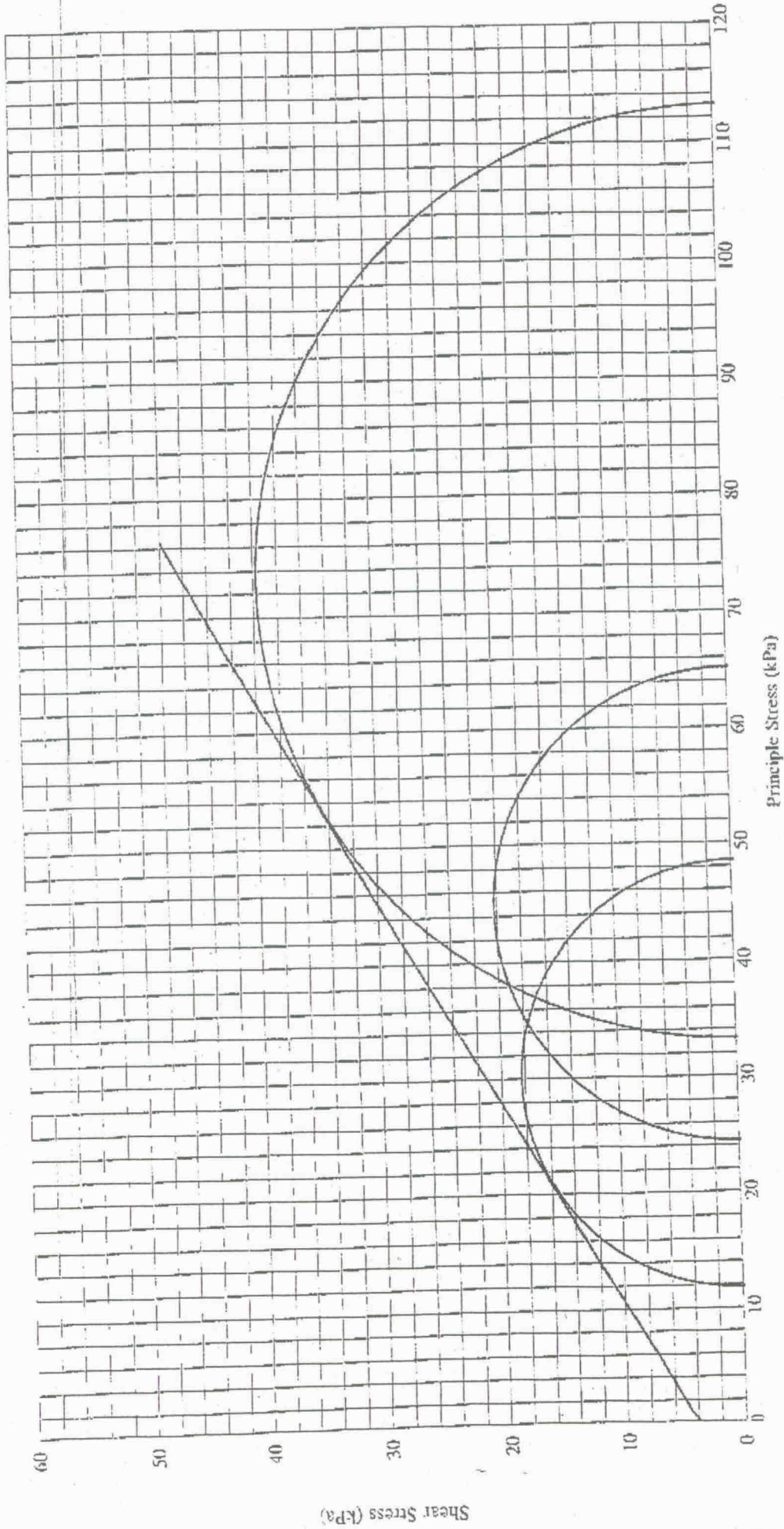
CONSOLIDATED UNDRAINED TRIAXIAL TEST - MOHR CIRCLES

In accordance with BS1377: Part 8:1990

Depth (m) : 10.65

Sample Number : EW2

Borehole No :



Job No

13221

Date

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Date

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Figure

Page

of

Endeavour Wharf, Whitby

Contract

STRUCTURAL SOILS

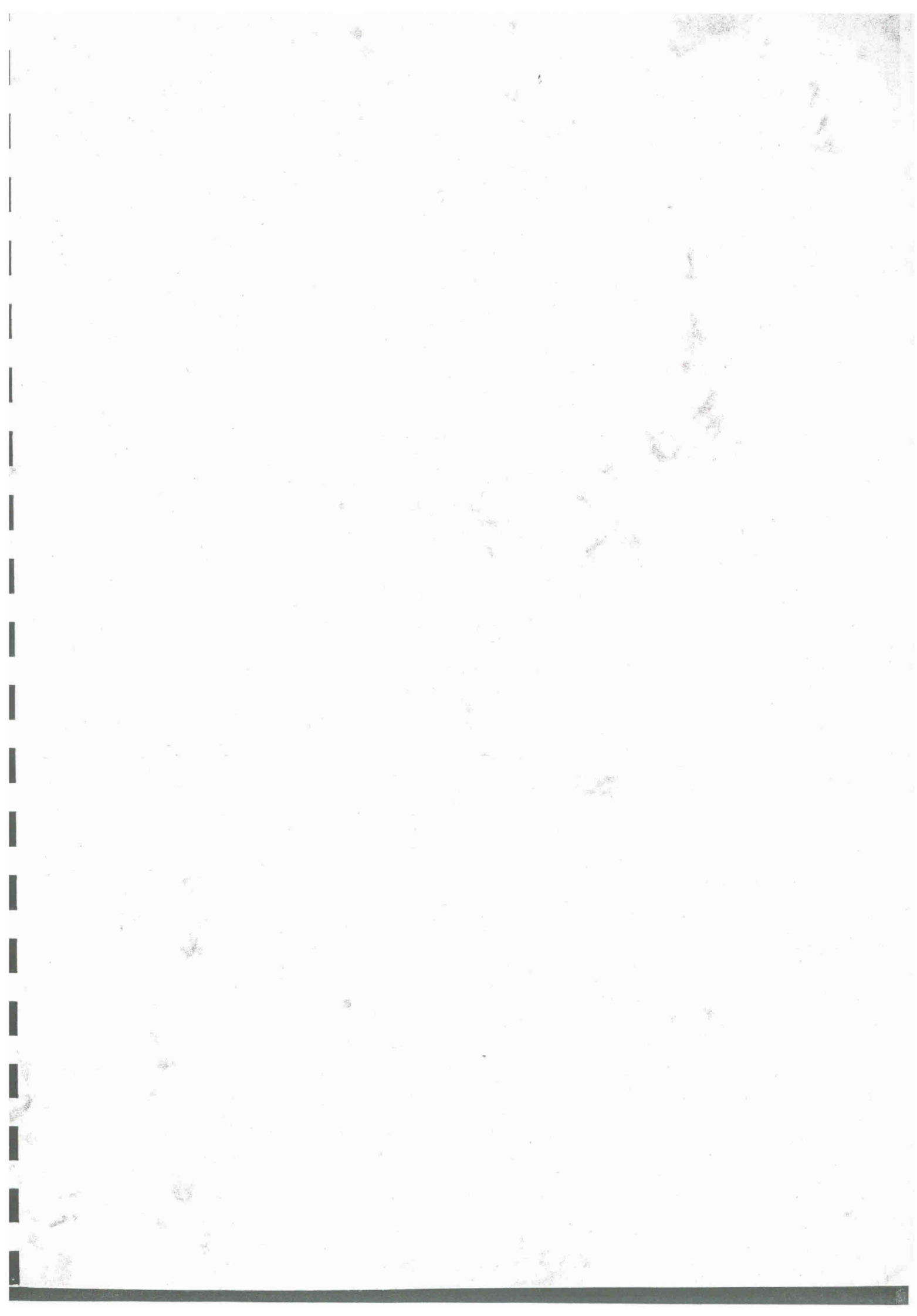
The Old School House

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Bedminster

Bristol BS3 4EB







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Director of Technical Services
Scarborough Borough Council
Town Hall
St Nicholas Street
SCARBOROUGH YO11 2HG

Our Ref: GAT/AT/BAILES

Your Ref:

Date: 17 January 2002

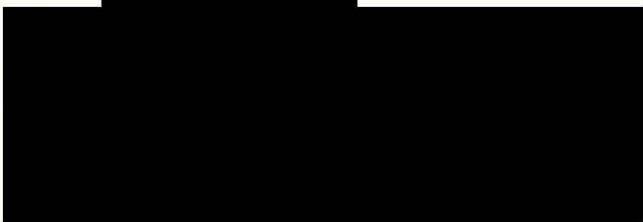
Dear Sirs

**RE BILLAM TO BAILES
BEACHOLME ROBIN HOOD'S BAY**

We are acting for a prospective Purchaser of the above property and amongst the material furnished to us by the Vendors Solicitors was a letter which the Council wrote to the Solicitors acting for the previous owner on 2nd August 1989 (copy attached). Would you please confirm that the points made in this letter still hold good and also let me know if there have been any changes in the position. If on checking your files you locate a copy of the Wilson & Wilson letter to you of 24th July 1989 then we should be grateful if you could copy it to us as it would help us understand fully the points made in your letter.

Your assistance would be appreciated.

Yours faithfully



TECHNICAL SERVICES DEPARTMENT	
18 JAN 2002	
..... DTS	1.
..... ADMIN	2.
✓ HAZARDING	3.
..... PLANNING	4.
..... PROPERTY	5.
..... WKS.MAN	6.
REG No	19093
FILE No
REPLY DATE

Partners: C. H. Atterton, G. A. Turnbull, M. D. Clarke, J. K. Campbell*, D. Smark*, C. A. Middleton, A. Clough

Associate Solicitors: C. Whiston, D. M. Williams*, J. Woodland, J. Bayles Probate Manager: D. Williams†

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and 11-12 Whitworth Terrace, Spennymoor, Co. Durham DL16 7LD Tel: (01388) 814389 Fax: (01388) 817871 DX 60451 Spennymoor

*Member of the Law Society's Personal Injuries Panel †Member of the Society of Trust and Estate Practitioners

*Member of the Law Society's Family Law Panel

Scarborough Borough Council

Department of Technical Services

Town Hall
St. Nicholas Street
Scarborough
YO11 2HG

Director of Technical Services:
M.D. Clements, B. Eng., F.I.C.E.
Chartered Engineer



Telephone: (0723) 372351 Fax: (0723) 354979

If calling, please ask for Mr. N. Corrie
All correspondence to be addressed to the Director
2nd August, 1989

Your Ref: *176*
Our Ref: NC/RMF 19/7/1B

Dear Sirs,

Mr. and Mrs. B.H. Potter - Purchase of Beacholme,
Covets Hill, Robin Hood's Bay

I refer to your letter dated 24th July, 1989, regarding the above matter and I wish to make the following comments:-

- (a) The owners of the property known as Beacholme are not responsible for any contribution to the cost of sea wall repairs. In this context the term sea wall refers to that section of masonry, blockwork and concrete below the level of the private properties (i.e. the walls of the property which is a continuation of the sea wall is not the responsibility of this Council).
- (b) The sea wall at this location is inspected at least twice per year and repair works are carried out as and when required.
- (c) This sea wall is maintained as per other similar sea defence structures with no special considerations being given to the fact that private properties have been built on the top of it.
- (d) This Council does not hold insurance cover for its sea defences but, as stated previously, it does undertake regular inspections and carry out maintenance works when required.
- (e) If the sea wall was to be damaged, by say an exceptionally high sea, I am of the opinion that this Council would not be liable for damage to property built on top of the sea wall.

Considering the above information I would suggest that the prospective purchasers of "Beacholme" arrange sufficient insurance cover to allow for the possibility of damage to the property by whatsoever causes.

I hope this answers all your queries but if not please do not hesitate to contact my assistant, Mr. Corrie.

Yours faithfully,

Director of Technical Services.

Wilson & Wilson,
Solicitors and Commissioners for Oats,
P.O. Box No. 8
Meadow Road, Kettering,
Northamptonshire. NN16 8TN