CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING,
CONTAMINATED LAND SURVEYS, DESK
STUDIES, RISK ASSESSMENT.

MRH GEOTECHNICAL

REPORT ON A GROUND INVESTIGATION AT

CROWN PLACE MEWS

LONDON NW5

Report No: 22180

Date: October 2002

60 Station Road, Chingford, London E4 7BE Tel: 020 8559 3134 Fax: 020 8559 3135
Email: mrh@cwcom.net Website: www.murrayrix.co.uk

Director: S.J. Hudson BSc
Consultants: E.J. Murray BSc, PhD, CEng, FICE, CGeol, FGS, MaPS D.W. Rix BSc, MSc, CEng, MICE A.W. Hutchings MIAT

QCA BS EN ISO 9001 REGISTERED FIRM

REPORT ON A GROUND INVESTIGATION AT CROWN PLACE MEWS, LONDON NW5

1 Introduction

1.1 This report has been prepared for the Ingealtoir, Chartered Structural Engineers, who are acting on behalf of Ashchurch Developments.

1.2 The purpose of the investigation was to obtain information with regard to the following:-

a) Foundation design.

b) Groundwater conditions.

c) Potential contamination hazards (see separate report).

2 Fieldwork

2.1 The fieldwork comprised the construction of a trial pit and two boreholes at the positions indicated in appendix A.

2.2 Soil samples and in situ tests were taken at regular intervals as the drilling progressed. The samples were sealed in airtight inert containers and transported to the laboratory for testing.

2.3 The fieldwork was carried out on the 24th October 2002.

3 General Geology and Revealed Strata

3.1 The 1:50,000 scale geological map indicates the site to be underlain by London Clay of the Eocene age.

3.2 Sections through the trial pit showing the exposed foundation profiles are given in appendix B.

3.3 Borehole 1 proved Made Ground to a depth of 1.90m over medium dense silty, Sand and Gravel, with stiff silty Clay being penetrated at 2.40m.

3.4 In the case of borehole 2, dense brick and concrete rubble prevented progress beyond a depth of 2.10m.

3.5 Details of the boreholes, sample depths and in situ test results are given in appendix C.

4 Groundwater

4.1 A water seepage was noted in borehole 1 at a depth of 1.90m.

5 Laboratory Testing

5.1 The following laboratory tests were carried out on the recovered soil samples:-

a) Moisture Content Determinations.

b) Sulphate and pH tests.

5.2 Unless otherwise stated, the tests were performed to B.S. 1377 'Methods of Tests for Civil Engineering Purposes'.

5.3 Atterberg Limits were determined for three samples. The results are tabulated in appendix D, categorising the London Clay to be of high plasticity (Plasticity Index 40% - 41%).

5.4 Although this is indicative of a high susceptibility to moisture related cyclic volume change, there were no indications of desiccation within the samples tested.

6 Conclusions

6.1 The findings of the boreholes indicate Made Ground to a depth of at least 2.10m.

6.2 Due to the variability and soft nature of this material, we would not recommend that it is considered as a suitable bearing stratum.

6.3 Consideration could be given to the use of deep trench fill or pad foundations, bearing on the underlying London Clay deposits, although this would be below the water table and cause undermining of the adjacent structures.

6.4 It may therefore prove more practical and economical to consider a piled foundation scheme, whereby the loadings could be transferred into the stiff Clay by means of shaft adhesion and end bearing.

6.5 The depth of piles would depend on their size, type, method of installation and load carrying requirements, together with the information contained in this report.

6.6 The Soluble Sulphate contents of the samples tested are tabulated below:

BH No.	Depth (m)	Sulphate Content (g/l)	pH	Class
1	1.00	0.67	7.4	1
1	2.00	1.02	7.6	1
1	3.00	1.29	7.6	2
2	1.00	0.31	7.3	1
2	2.00	1.16	7.4	1

6.7 The site should therefore be categorised as Class 2 in accordance with BRE recommendations, thus requiring any concrete in contact with the ground to contain sulphate resisting cement or its equivalent.

7 References

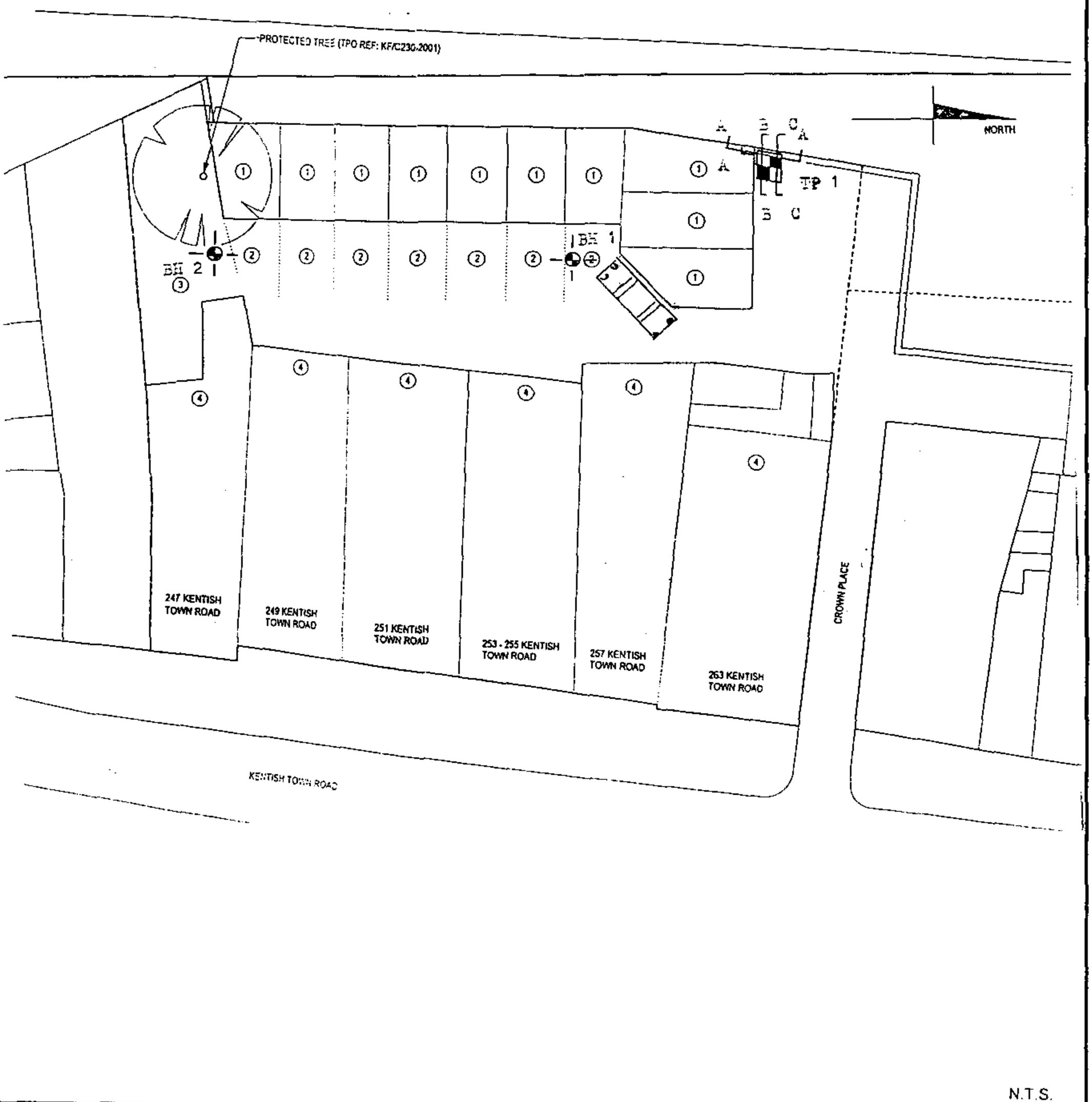
1) British Standard 5930: 1981
2) British Standard 1377: Parts 1-9
3) British Geological Survey Sheet 256 (1:50,000 scale), North London
4) BRE Special Digest 1 Concrete in aggressive ground (2001)
5) NHBC Standards, Chapter 4.2

Stephen Hudson
MRH Geotechnical Limited

APPENDIX A

TRIAL PIT / BOREHOLE LOCATION PLAN

TRIAL PIT / BOREHOLE LOCATION PLAN



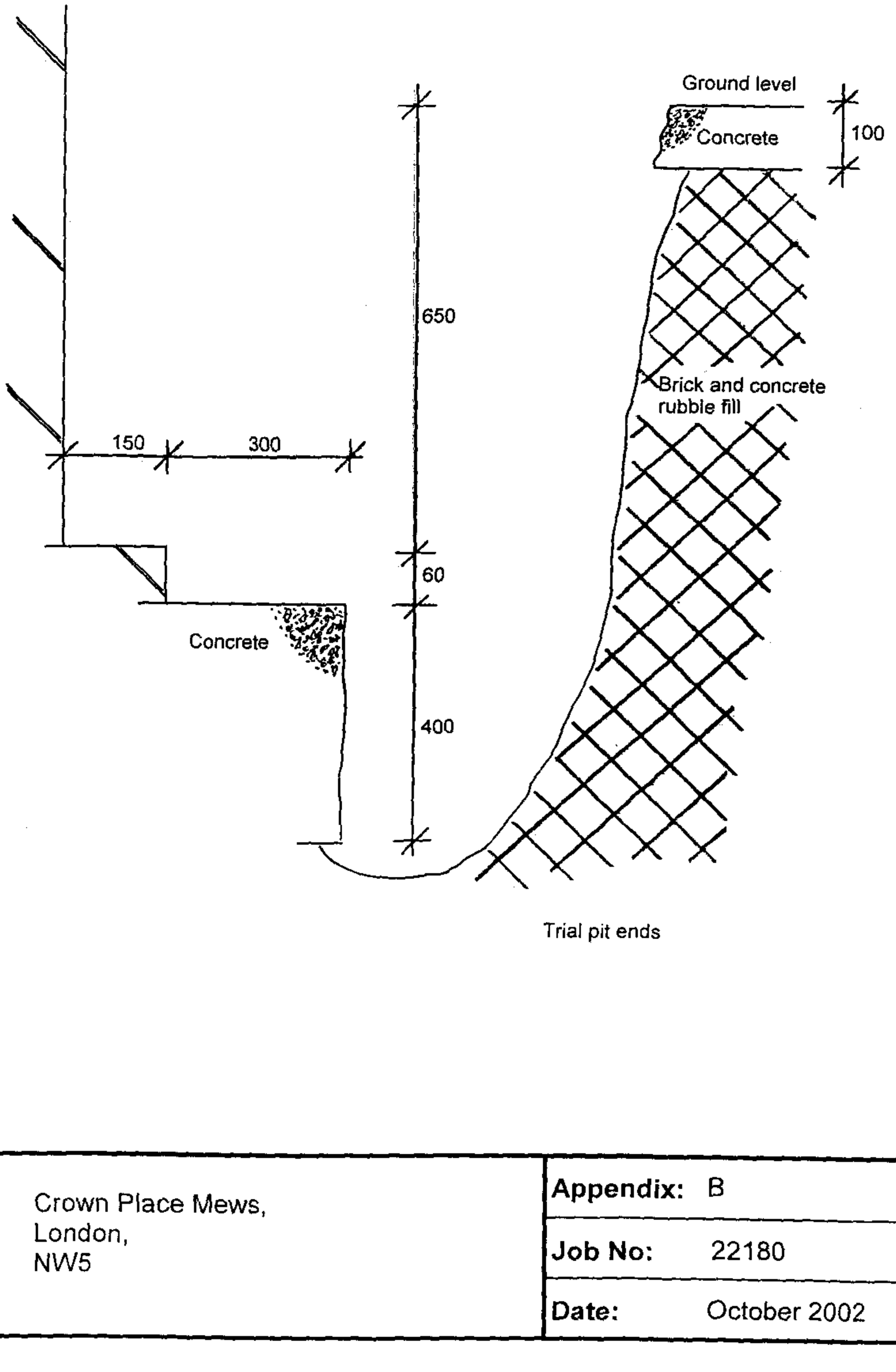
N.T.S.

Location: Crown Place Mews, London, NW5	**Appendix:** A
	Job No: 22180
	Date: October 2002

APPENDIX B

TRIAL PIT SECTIONS

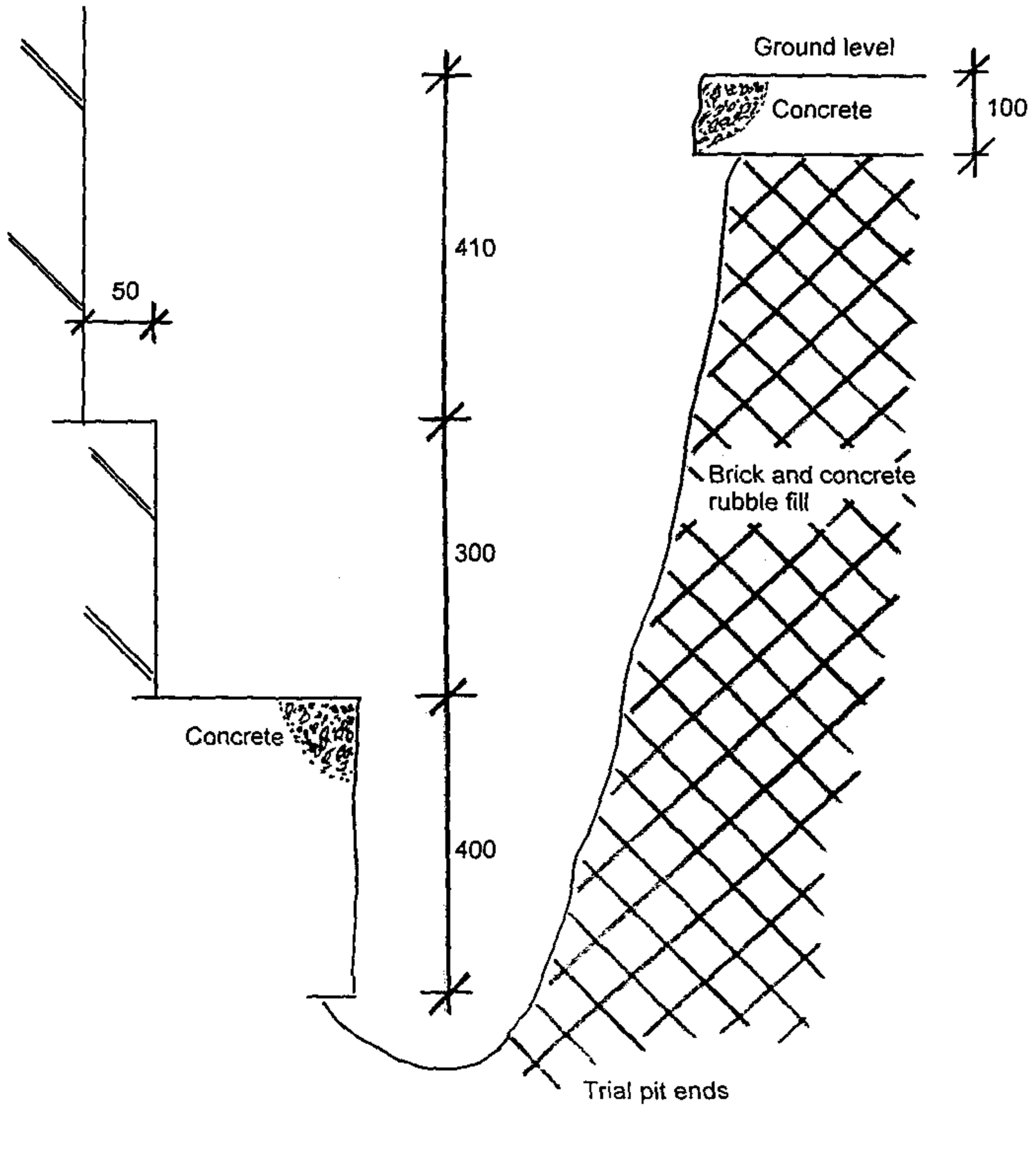
TRIAL PIT 1
(Section A - A)



N.T.S.

Location: Crown Place Mews, London, NW5	**Appendix:** B
	Job No: 22180
	Date: October 2002

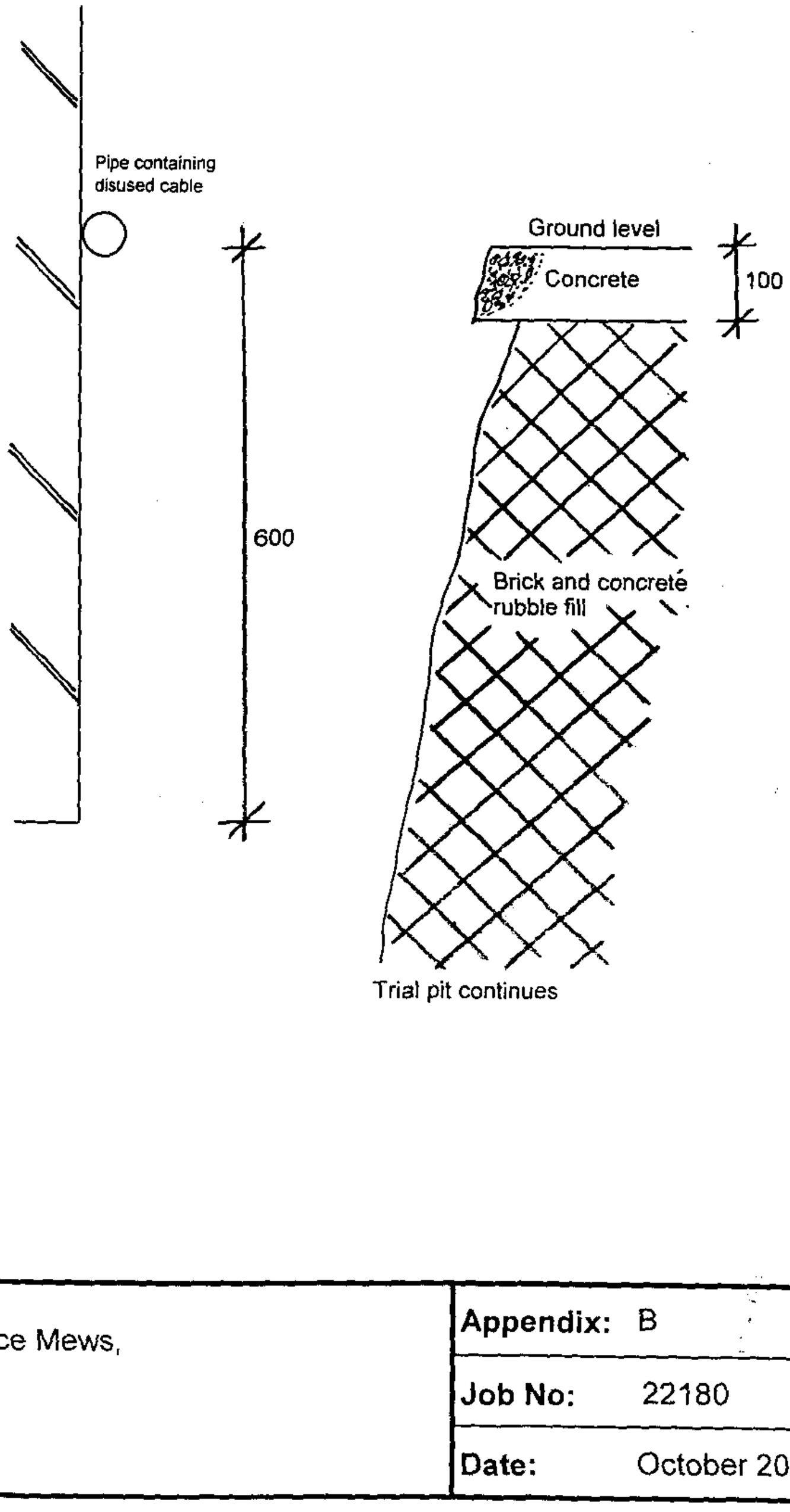
TRIAL PIT 1
(Section B - B)



N.T.S.

Location: Crown Place Mews, London, NW5	**Appendix:** B
	Job No: 22180
	Date: October 2002

TRIAL PIT 1
(Section C - C)



N.T.S.

Location: Crown Place Mews, London, NW5	**Appendix:** B
	Job No: 22180
	Date: October 2002

APPENDIX C

BOREHOLE LOGS

BOREHOLE LOG - M R H GEOTECHNICAL

HOLE NO. BH 1
Sheet 1 of 1

CLIENT	SITE
Ashchurch Developments	Crown Place Mews, London NW5

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
24/10/02 - 24/10/02	1:50	GROUND / AS APPENDIX A	SC/PA	SH	22180

SAMPLE DEPTH	RECORD TYPE	SPT N (Cu-kN/m²)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	LEGEND
				Concrete (0.15)	0.15	
0.50	D1			Soft greyish brown silty, sandy clay with some gravel, brick and concrete. MADE GROUND (1.75)		
1.00	D2					
1.50	D3					
2.00 - 2.30	D4	N=19		Medium dense orange brown silty, clayey SAND and GRAVEL (0.50) Water seepage at 1.90m	1.90	
2.50	D5			Very stiff brown with traces of bluish grey silty CLAY, occasional partings of orange silt (4.80)	2.40	
3.00	D6	(156)				
3.50	D7	(144)				
4.00	D8	(136)				
4.50	D9					
5.00	D10	(144)				
5.50	D11					
6.00	D12	(150)				
6.50	D13					
7.00	D14	(164)				
				Very stiff greyish brown silty CLAY (2.80)	7.20	
8.00	D15	(162)				
9.00	D16	(170)				
				Borehole ends		
10.00	D17	(166)			10.00	

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
1.90	-	-	-	-	Water seepage at 1.90m

BORING METHOD AND REMARKS

Mechanical auger

KEY: D = Disturbed Sample B = Bulk Sample
U = Undisturbed Sample W = Water Sample
All dimensions are in metres unless otherwise stated

BOREHOLE LOG - M R H GEOTECHNICAL

HOLE NO. BH 2
Sheet 1 of 1

CLIENT	SITE
Ashchurch Developments	Crown Place Mews, London NW5

DATE OF FIELDWORK	SCALE	LEVEL/POSITION	OPERATOR	LOGGED BY	JOB NO.
24/10/02 - 24/10/02	1:50	GROUND / AS APPENDIX A	SC/PA	SH	22180

SAMPLE DEPTH	RECORD TYPE	SPT N (Cu-kN/m²)	Standp/ Piezo	DESCRIPTION OF STRATUM (thickness)	DEPTH	LEGEND
				Asphalt (0.10)	0.10	
0.50	D1			Very dense black silty brick and concrete rubble with some topsoil. MADE GROUND (2.00)		
1.00	D2					
1.50	D3					
2.00	D4			Borehole ends, unable to penetrate dense FILL, 1.5 hours to drill 2.00m	2.10	

GROUNDWATER AND CASING INFORMATION

DEPTH STRUCK	DEPTH CASED	ELAPSED TIME	WATER LEVEL	DEPTH SEALED	REMARKS ON GROUNDWATER AND CASING
-	-	-	-	-	Borehole dry on completion

BORING METHOD AND REMARKS

Mechanical auger

KEY: D = Disturbed Sample B = Bulk Sample
U = Undisturbed Sample W = Water Sample
All dimensions are in metres unless otherwise stated

APPENDIX D

MOISTURE CONTENT
AND
ATTERBERG LIMIT TEST RESULTS

TEST REPORT.

ISSUED BY : M R H GEOTECHNICAL LTD

Appendix D PAGE 1

Contract Job No.
Crown Place Mews, London NW5 22180

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)	Description (BS 5930:1981:41)
BH 1	0.50	D1	27	-	-	-		Very soft greyish brown silty, sandy clay with some gravel, brick and concrete. MADE GROUND
BH 1	1.00	D2	23	-	-	-		Soft greyish brown silty, sandy clay with some gravel, brick, clinker and concrete. MADE GROUND
BH 1	1.50	D3	28	-	-	-		Soft greyish brown silty, sandy clay with some gravel, brick and concrete. MADE GROUND
BH 1	2.00 -2.30	D4	13	-	-	-		Medium dense orange brown silty, clayey SAND and GRAVEL
BH 1	2.50	D5	26	-	-	-		Very stiff brown with traces of bluish grey silty CLAY, occasional partings of orange silt
BH 1	3.00	D6	26	63	23	40	0.08	Very stiff brown with traces of bluish grey silty CLAY, occasional partings of orange silt. CH: CLAY of high plasticity
BH 1	3.50	D7	29	-	-	-		Very stiff brown silty CLAY
BH 1	4.00	D8	32	69	28	41	0.10	Very stiff brown with traces of bluish grey silty CLAY, occasional partings of orange silt. CH: CLAY of high plasticity
BH 1	4.50	D9	29	-	-	-		Very stiff brown with traces of bluish grey silty CLAY, occasional partings of orange silt
BH 1	5.00	D10	29	-	-	-		Very stiff greyish brown with traces of bluish grey silty CLAY
BH 1	5.50	D11	27	65	24	41	0.07	Very stiff brown with traces of bluish grey silty CLAY, occasional partings of orange silt. CH: CLAY of high plasticity
BH 1	6.00	D12	27	-	-	-		Very stiff brown with traces of bluish grey silty CLAY, occasional partings of orange silt
BH 1	6.50	D13	27	-	-	-		Very stiff brown with traces of bluish grey silty CLAY, occasional partings of orange silt
BH 1	7.00	D14	28	-	-	-		Very stiff brown with traces of bluish grey silty CLAY, occasional partings of orange silt
BH 1	8.00	D15	27	-	-	-		Very stiff greyish brown silty CLAY

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

MRR2CT

TEST REPORT.

ISSUED BY : M R H GEOTECHNICAL LTD

Appendix D PAGE 2

Contract Job No.
Crown Place Mews, London NW5 22180

SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)	Description (BS 5930:1981:41)
BH 1	9.00	D16	27	-	-	-		Very stiff greyish brown silty CLAY
BH 1	10.00	D17	26	-	-	-		Very stiff greyish brown silty CLAY
BH 2	0.50	D1	12	-	-	-		Very dense black silty brick and concrete rubble with some topsoil. MADE GROUND
BH 2	1.00	D2	11	-	-	-		Very dense black silty brick and concrete rubble with some topsoil. MADE GROUND
BH 2	1.50	D3	12	-	-	-		Very dense black silty brick and concrete rubble with some topsoil. MADE GROUND
BH 2	2.00	D4	14	-	-	-		Very dense black silty, clayey brick and concrete rubble with some topsoil. MADE GROUND

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.

MRR2CT