

SHRIMPTON & LIPINSKI

MAYFIELD

RESIDENTIAL SUBDIVISION STAGE 6

**REPORT ON SUBDIVISION EARTHWORKS
& RECOMMENDATIONS FOR BUILDING**

**HANSARD PLACE, HAWKRIDGE HEIGHTS
CHATER AVENUE, HYFORCE WAY
BETHLEHEM**

Our Ref: 17018
April 2005

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1.0 Introduction

The earthworks, roading construction and services installation were completed on 1 April 2005 for stage 6 of the Mayfield Subdivision in Bethlehem. 76 Residential Lots were created, with extensions to Chater Avenue and Hawkridge Heights and new cul de sacs of Hansard Place and Hyforce Way constructed in this stage.

The locations and sizes of the 76 lots are shown on DP 348781 (4 sheets). Copies of DP 348781 are contained in Appendix I of this report.

This report describes the earthworks undertaken in the formation of this stage of subdivision including the relevant standards adopted for the placement of filling to support residential buildings and recommendations for developing sites on sloping ground including building restrictions where relevant.

During the report reference is made to drawings 17018-31 and 32 which are included in Appendix I. These drawings show the road and lot locations, areas formed in cut and fill, compaction test positions and the sites of pre and post subdivision subsoil test bores.

2.0 Earthworks

The earthworks undertaken in the Stage 6 area were relatively minor and comprised:

- The reduction of elevated ground along the alignment of Chater Avenue to depths of up to 2.0 m. This excavation extended into lots 89 to 91 and around the cul de sac head of Hansard Place (as shown on 17018-31).
- The reduction of elevated ground along the alignment of Hawkridge Heights to depths of up to 1.5 m. This excavation in cut extended into lots 57 to 64 to the west, 68, 69, 72, 74 to 76 and 79 to the east and into lot 65 (as shown on 17018-32).
- The placement of filling derived from the areas of cut within slightly low lying areas within lots 102 to 110 inclusive and within lots 93 to 96 inclusive.
- The excavation of temporary silt runoff collection traps within lots 85 and 86 and 100 and 111 and their subsequent infilling to restore the original ground levels.

Areas of original ground were left undisturbed as shown on drawings 17018-31 and 32 away from areas of cut and fill. These areas are mostly on those lots above Mayfield Lane and State Highway 2 along the southern margins of the subdivision.

The depths of cut and filling shown on 17018-31 and 32 were derived from surveyed contours of the finished surface taken on completion of the earthworks compared with a topographical survey undertaken by S & L Consultants Ltd prior to the subdivision construction.

The earthworks for stage 6 were undertaken by A & R Partnership subcontracted to Higgins Contractors Bay of Plenty Ltd during the 2004-2005 earthworks season in compliance with consent 61698 issued by Environment Bay of Plenty.

3.0 Pre Subdivision Investigations

Prior to obtaining subdivision approval on 27 April 2004 for stage 6 of the Mayfield development a geotechnical assessment was undertaken by S & L Consultants Ltd and the report on that investigation was contained in the subdivision consent application document reference 16992 and dated February 2004.

That investigation involved the putting down of nine machine drilled boreholes numbered B1 to B6 and MB1 to MB3 at locations shown on appended plans 17018-31 and 32. The summary logs of the soils found in the boreholes are contained in Appendix IV.

The boreholes numbered B1 to B6 were located above the steep slopes that lead down through lots 67, 70 and 132 towards Mayfield Lane and lots 116 to 128 and 131 towards State Highway 2. From the previous stage 5 of Mayfield to the north boreholes MB1, MB3 and MB7 were also used as a reference in considering subsoil continuity.

Each borehole showed the presence of in situ ash derivative soils with no past filling or disturbed ground found. The soil types were typical of the Bethlehem area and are as described in Appendix A of Section 2 of the Tauranga City Council Code of Practice for Development.

The investigation concluded that:

- The soils to be obtained in areas of cut would be suitable for placement as filling to support future houses.
- Areas of ground not to be disturbed by construction earthworks would be suitable for the support of future houses in accordance with NZS 3604.
- As the volcanic ash stratigraphy varies in type and relative strength foundation bearing conditions may vary across building sites formed in areas of cut.
- Similar variations in soil type may be encountered in road subgrades and in situ testing would be required to determine pavement depths applicable to the subgrade conditions present.

4.0 Earthworks Standards

The performance specification required of the Contractor for the earthworks was based on the guidelines contained in NZS 4431:1989 "Code of Practice for Earthfill for Residential Development". Compliance with the compaction requirements listed below satisfies the standards listed in Section 7 of NZS 4431.

Air voids percentage (as defined in NZS 4402:Part 1: 1980)

- Structural Fill - average value less than 10% (any 10 tests)
- Maximum single value 12%

Undrained shear strength (measured by in situ vane)

- Structural Fill - average value not less than 150 kPa (any 10 tests)
- Minimum single value 100 kPa

The earthworks were observed by an engineering technician from this office and compaction and strength control testing was undertaken by local IANZ accredited soil testing laboratories in Tauranga both on site and in the laboratory.

8 compaction tests were undertaken within the areas of filling at locations shown on 17018-31 commensurate with the small volume of filling placed. Tests 5 to 8 were located in the filling to the two infilled silt runoff collection traps. For the minor depths of filling placed in lots 93 to 96 the post construction boreholes showed the presence of shallow filling of high strength (refer to Appendix IV). The compaction test results are summarized in the tabulation contained in Appendix III.

All test results fall within the acceptance criteria with most developed shear strengths being so high that the probe could not be pushed in or the readings exceeded the dial capacity.

5.0 Post Construction Testing

Post construction handaugered boreholes were put down on alternative lots that do not contain supervised filling, at locations shown on 17018-31 and 32. These boreholes were generally 1 metre deep and were intended to confirm ground bearings conditions for shallow building foundations that were identified in the pre-subdivision boreholes and during observations of services trench cuts and exposed soils prior to the placement of topsoil and grassing.

As the boreholes were being drilled undrained shear strengths were recorded with a hand held shear vane pushed in advance of the auger.

Summary logs of these boreholes and the shear strengths recorded are contained in Appendix IV.

6.0 Summary and Recommendations

6.1 Subdivision Construction Filling

Supervised structural filling as shown on drawing 17018-31 was placed in accordance with the methods and standards quoted in NZS 4431 under the supervision of S & L Consultants Ltd. Compaction testing on site confirmed that a high and uniform degree of compaction has been achieved suitable for the support of buildings.

A statement of professional opinion in support of the suitability of the filled areas for the erection of buildings in terms of NZS 3604 is appended in Appendix II of this report.

Within areas of structural filling on which buildings may be erected, however, the possibility of variation of soil type and strength may exist away from our observation or compaction tests locations. The normal inspection of foundation conditions during construction of buildings by competent tradesmen as described in NZS 3604 and by building certifiers should therefore be undertaken. If for any reason areas of low soil strength are found professional geotechnical advice should be sought.

6.2 Areas of Cut

In areas of cut as shown on 17018-31 and 32 the subsoils present on these lots will be ash derivative soils typical those found in the Tauranga area.

The varying depths of cut may have exposed a variety of different soil types immediately below the topsoil overlay. This is because the more recent ashes which extend the original ground level and which comprise a stiff upper mantle of light brown friable clayey silt overlying bands of yellow or light grey pumiceous sand have been partially removed. These differing soil types are described on the pre subdivision borehole logs contained in Appendix IV.

Each soil type identified in the boreholes and by visual observation during construction had varying undrained shear strengths or degrees of compaction. The tests undertaken showed that undrained shear strengths in the in situ soils are sufficient for the construction of shallow building foundations.

For all lots located in areas of cut the post construction boreholes indicated that ultimate ground bearing pressures for foundation design may be taken as 300 kPa in the limit state. This capacity meets the definition of "good ground" as defined in NZS 3604. In situ and as tested, the soils present in the cut areas are of adequate strength for bearing capacity of 300 kPa. However if they are disturbed or are found to be variable during construction, foundations detailed in accordance with NZS 3604 may have to be deepened or widened accordingly.

6.3 Areas of Undisturbed Ground

Areas of ground not altered by the subdivision earthworks are shown on 17018-31 and 32. Pre and post subdivision investigations indicate that in situ soils exist in the areas not modified during the subdivision construction. Tests taken during these investigations indicate that shallow building foundations can be constructed and that ultimate ground bearing pressures for foundation design may be taken as 300 kPa in the limit state. This capacity meets the definition of "good ground" as defined on NZS 3604.

The areas that have not been modified by subdivision earthworks had been developed in the past as orchards. The orchard trees and any ancillary structures have since been removed but it is possible that some areas, now grassed, may have been disturbed during clearing operations. If such disturbed ground or past filling is found in areas not shown on 17018-31 professional geotechnical advice may be required.

6.4 Land Stability and Building Restrictions

Land stability issues exist within lots **67, 70, 71, 118 to 128 and 131 and 132** because of the proximity of steep slopes that lead down to State Highway 2 or Mayfield Lane.

Typical profiles are shown on drawings 17018-G02 and 17018-G03 in Appendix I.

The slopes adjacent to State Highway 2 are cut batters that were formed during construction of Waihi Road. Our survey confirms that they vary to heights of 7.0 m and are 60 degrees to 65 degrees to the horizontal. The slopes adjacent to Mayfield Lane are not as steep but are higher. The upper parts of these slopes contain roll over areas or shoulders that vary between 20 degrees to 24 degrees. They then become steeper at between 40 degrees and 55 degrees. They are up to 15.0 m high from the base of the tops of the roll over areas.

There are no major forms of rotational slope instability presently affecting the slopes. However surface erosion is occurring within some of the steeper areas especially around old tree stumps. Currently there are exotic trees and stumps on the upper sections of the slopes above Mayfield Lane.

6.4.1 Investigations

The following investigations were undertaken to assess the slope stability.

- A topographical survey to confirm the slope details.
- The putting down of 6 machine drilled boreholes at the site. Their locations are shown on drawings 17018-31 and 32. Borehole logs are contained in Appendix IV.

The levels in the survey were determined in terms of Moturiki datum.

The boreholes were drilled to depths varying to 9.5 m. Standard Penetration Tests (SPT) were undertaken at regular intervals from the base of the boreholes. A hollow split sampler was utilised in the SPT so that the soils at the test depths could be identified. The test results are presented on the borehole logs. Groundwater levels were monitored at completion of the field work and at subsequent dates.

The subsoils were identified to comprise the normal sequence of Younger and Older ashes which are underlain by Matua Subgroup sediments and are typical of the Tauranga area.

The ash layers form a surface cover 5.0 m to 6.0 m thick. They comprise mostly cohesive clayey silts but include thin sandy strata. No perched ground water levels were identified. The cohesive materials are stiff to very stiff. The sandy layers are loose to medium dense to dense.

6.4.2 Slope Stability Analyses

Slope stability analyses have been undertaken for the cross sections shown on 17018-G02 and 17018-G03 in Appendix I.

The computer software X-Slope was used for the analyses. The following effective soil strength parameters were assigned to the subsoils.

Materials	SPT N Value	Effective Cohesion kPa	Internal Friction Angle	Density kN/m ³	Pore Water Pressure Coefficient
Cohesive Younger ashes	8	5.0	30	15	0.1
Non cohesive Younger ashes		0.0	30	14	0.4 to 0.5
Older ashes	3 to 14	5.0	30	16	0.6
Matua sediments	7 to 13	0.0	35	15	0.1 to 0.2

The soil strength parameters are based on data from the current investigations, and research by Oliver on behalf of the Tauranga City Council (1996). Calculations show that, based on the SPT data, friction angles of between 36 degrees to 40 degrees could be assigned to the Matua sediments with zero cohesion.

The pore water pressures taken in the analyses allow for perched groundwater levels to occur in the Younger and Older ashes, even though this was not apparent in the investigation boreholes.

The larger slopes are comprised mostly of Matua sediments. Although these subsoils are fully drained and are likely to remain so, they can be sensitive to fluctuations in groundwater levels. Accordingly the analyses allow for moderate increases in porewater pressures to occur in these strata.

Such increases in porewater pressures might occur in extreme storm events but they would only be temporary, and would quickly return to normal.

6.4.3 Building Restrictions

The critical potential failure surfaces corresponding to a generally accepted minimum slope stability factor of safety of 1.50 were identified. The point where they intersect the ground surface is taken as the position of the building restriction line, thereby satisfying the performance requirements of Section B1 of the New Zealand Building Code. The building restriction lines are shown on drawings 17018-31 and 32 and DP 348781.

Cross Section	Slope Heights	Overall Slope Angle	Building Restriction Set Back	Corresponding Slope Regression Angle
1	15.0 m	38°	18.0 m	29°
2	15.5 m	41°	15.5 m	28°
3	7.0 m	60°	14.5 m	27°
4	5.5 m	60°	9.0 m	29°

The above limitations will restrict buildings above the roll over slopes. The corresponding slope regression angles approximate the 1V:2H limit taken by Council in identifying unstable areas in their land instability hazard zone designations.

6.4.4 Construction in the Restricted Building Areas

Buildings that require a building consent in terms of the Building Act 2004 are to be excluded from the areas between the building restriction lines and the steep slopes above State Highway 2 or Mayfield Lane. The possibility exists that instability on these slopes may occur in the future but buildings up to the locations of the building restriction lines are highly unlikely to be at future risk from such instability.

Any buildings located forward of the building restriction lines would be located on land that is more likely to be subject to future instability. Building Consents may therefore be refused under Section 71 of the Building Act because of future doubts about the stability of the land even though it is possible to deepen foundations to maintain support to the building if instability of the land does occur.

Minor buildings, that are exempt from building consents as listed in Schedule 1 of the Building Act, may be located within the restricted area. Such buildings may include retaining walls up to 1.5 m high. It is further recommended that such walls should not be located closer than 5 m from the fence that has been erected at the rear of each property. The fence is generally at the top of the slopes. While such retaining walls are exempt from requiring a building consent the walls should still be constructed by sound engineering principles and comply in all other respects with the Building Code. Advice should be sought about appropriate structures from the suppliers of the wall components or from a chartered professional civil engineer.

6.5 Topsoil Thickness

During the subdivision earthworks areas of cut or fill were initially stripped of topsoil and this was then replaced to target depths of up to 300mm. Outside of the earthworks areas where the ground was not disturbed and also close to road berms it is possible that topsoil depths may be deeper than 300mm where the topsoil depth was developed naturally or where it was deepened due to past farming activities or where slopes were eased down to the road berm levels. No guarantee is implied or given that the topsoil on any part of any lot is 300mm deep or less and it is recommended that future owners or builders check topsoil depths when preparing site development plans and cost schedules.

7.0 Professional Opinion

A statement in the format of Council's Code of Practice for Development (Form G2) that all lots are suitable for building is contained in Appendix II. This statement is accompanied by form G2A which summarizes the information and recommendations within this report.

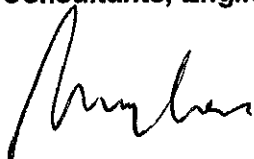
8.0 Applicability

Recommendations contained in this document are based on data from boreholes, observations of soil exposures, and test results. Inferences about the nature and continuity of subsoils away from these locations are made but cannot be guaranteed.

In all circumstances, if variations in the subsoils occur which differ from that described or assumed to exist the site should be inspected by an engineer suitably qualified to make an informed judgment and provide advice on appropriate improvement measures.

This report has been prepared specifically for the development at Stage 6 of the Mayfield Subdivision and no responsibility is accepted by S & L Consultants Ltd for the use of any part of this report for other development sites without their written approval.

S & L Consultants Ltd
Consultants, Engineers, Surveyors, Planners



M W Hughes
Geotechnical Engineer

15 April 2005

APPENDIX I

**Drawings - Earthworks Completion Plans 17018-31
17018-32**

Deposited Plan DP 348781 (4 sheets)

**Cross Sections 17018-G02
17018-G03**

KEY

- - - - - Cut / Fill Boundary
- - - - - Depth of Fill
- - - - - Depth of Cut
- ◆ Preconstruction Borehole
- ◆ Postconstruction Borehole
- Building Restriction Line (refer to DP 3487817)
- Compaction Test Position

NOTE
Sections 3 and 4 are shown on 17018-003



Checked By	DESCRIPTION	DATE
1	224 Application	
NAME	DATE	SPRINT
Designed	HW/H	4-05
Drawn	SD	4-05
Checked		
Approved		



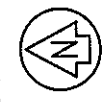
S & L CONSULTANTS LTD
SURVEYORS - ENGINEERS - PLANNERS
111 Commercial Road, Tauranga, New Zealand
P.O. Box 231, P.O. 070775-0089
T: 07 077-4005
F: 07 077-4005
Email: info@sandl.co.nz

TITLE
MAYFIELD SUBDIVISION
STAGE 6
CHATER AVENUE
HANSARD PLACE
COMPLETED EARTHWORKS
ASBUILT PLAN
SHEET 1 OF 2

Copyright in this drawing is reserved

ORIGINAL SCALE	DATE
1 : 500 (A1)	04/05

DRAWING No
17018-31



GRAPHIC SCALE

KEY

- - - - - Cut/Fill Boundary
- - - - - Depth of Fill
- - - - - Depth of Cut
- ⊕ Preconstruction Borehole
- ⊕ Postconstruction Borehole
- - - - - Building Restriction Line (refer to DP 348781)

NOTE

Sections 1 and 2 are shown on 17018-G02.

FORM No.	DATE	DESCRIPTION
1	22/4	Application

NAME	DATE	STATUS
Surveyed		
Designed	4/05	
Drawn	4/05	
Checked		
Approved		



S & L CONSULTANTS LTD
 SURVEYORS - CIVIL ENGINEERS - PLANNERS
 111 Commercial Road, Thornbury, New Zealand
 Phone: 09 477 4000
 Fax: 09 477 4005
 Email: sl@consultants.co.nz

TITLE	MAYFIELD SUBDIVISION
STAGE 6:	HAWKRIDGE HEIGHTS HYFORCE WAY
COMPLETED EARTHWORKS	ASBUILT PLAN
SHEET 2 OF 2	
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DATE	04/05
DRAWING No	17018-32



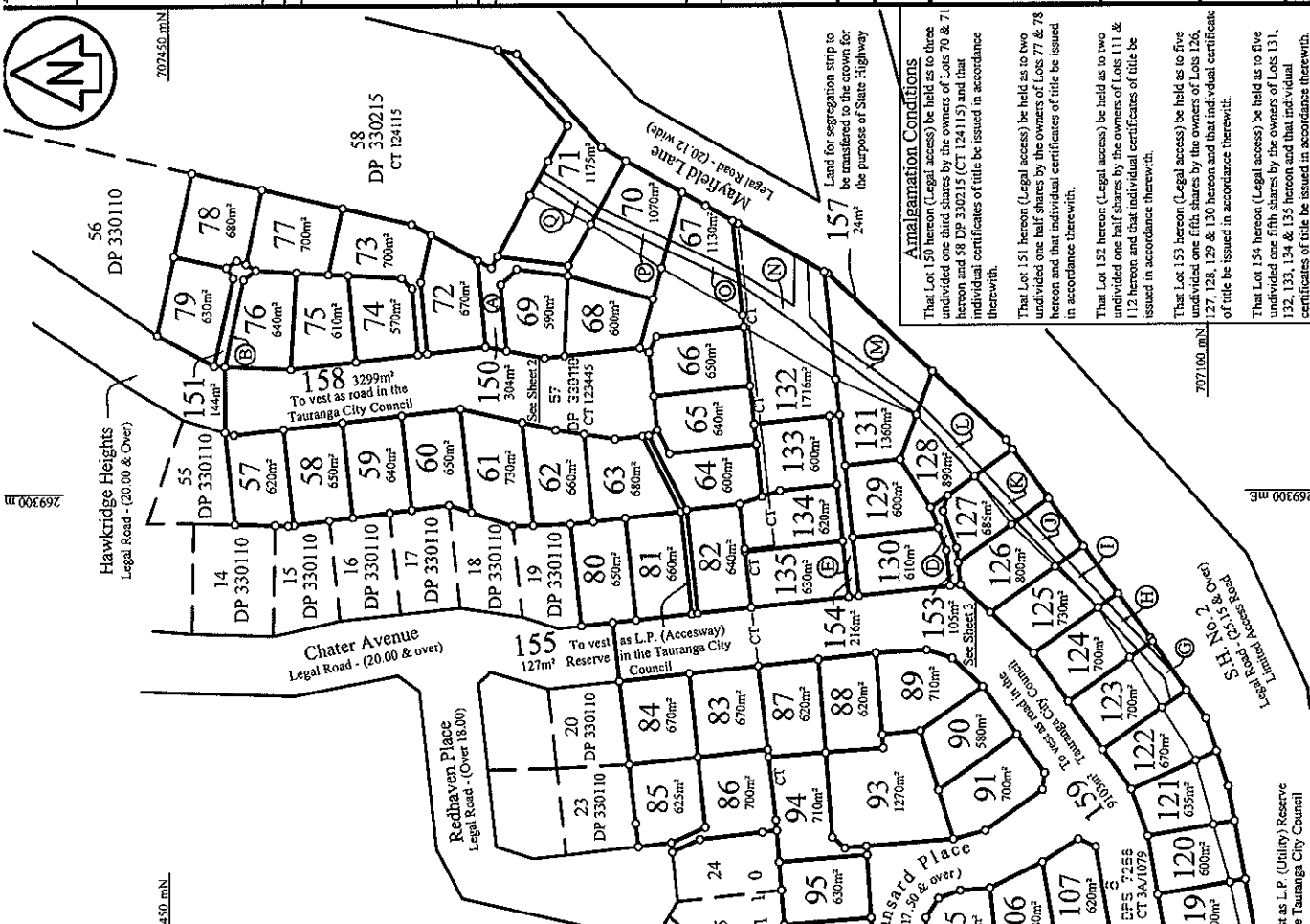
STATE HIGHWAY No 2

GRAPHIC SCALE 0 50 100 150 200 250 300 METERS

New CT's Allocated

Lot	CT	Lot	CT	Lot	CT	Lot	CT
57	200181	78 & 151	200202	100	200223	123	200244
58	200182	79	200203	102	200224	124	200245
59	200183	80	200204	103	200225	125	200246
60	200184	81	200205	104	200226	126 & 153	200247
61	200185	82	200206	105	200227	127 & 153	200248
62	200186	83	200207	106	200228	128 & 153	200249
63	200187	84	200208	107	200229	129 & 153	200250
64	200188	85	200209	108	200230	130 & 153	200251
65	200189	86	200210	110	200231	131 & 154	200252
66	200190	87	200211	111 & 152	200232	132 & 154	200253
67	200191	88	200212	112 & 152	200233	133 & 154	200254
68	200192	89	200213	113	200234	134 & 154	200255
69	200193	90	200214	114	200235	135 & 154	200256
70 & 150	200194	91	200215	115	200236	155	200257
71 & 150	200195	93	200216	116	200237	156	200258
72	200196	94	200217	117	200238	157	200259
73	200197	95	200218	118	200239	158	Road
74	200198	96	200219	119	200240	159	Road
75	200199	97	200220	120	200241		
76	200200	98	200221	121	200242		
77 & 151	200201	99	200222	122	200243		

Schedule of Proposed Easements in Gross	
Purpose	Shown / Serv. Ten. / Grantee
Right to Convey Telecommunications and Computer Media	A Lot 150 hereon B Lot 151 hereon C Lot 152 hereon D Lot 153 hereon E Lot 154 hereon
Right to Convey Electricity	A Lot 150 hereon B Lot 151 hereon C Lot 152 hereon D Lot 153 hereon E Lot 154 hereon



Registered Owner:
I hereby certify that this plan was approved by the Tauranga City Council pursuant to Section 223 of the Resource Management Act, 1991 on the _____ day of _____ 20____ subject to the granting or reserving of the easements set out in the memoranda hereon and subject to the amalgamation conditions set out hereon.

Authorised Officer:
Sub # 3876

Memorandum of Easements

Shown / Serv. Ten.	Dom. Ten.
A Lot 150 hereon & Lot 58 DP 330215 hereon	
B Lot 151 hereon	
C Lot 152 hereon	Lots 111 & 112 hereon
D Lot 153 hereon	Lots 126, 127, 128, 129 & 130 hereon
E Lot 154 hereon	Lots 131, 132, 133, 134 & 135 hereon

Memorandum of Easements in Gross

Shown / Serv. Ten.	Grantee
G Lot 123 hereon	
H Lot 124 hereon	
I Lot 125 hereon	
J Lot 126 hereon	
K Lot 127 hereon	
L Lot 128 hereon	
M Lot 131 hereon	
N Lot 132 hereon	
O Lot 87 hereon	
P Lot 70 hereon	
Q Lot 71 hereon	
R Lot 130 hereon	
S Lot 134 hereon	

Right to Drain Sewage & Water

Right to Convey Water

Notes:
1) Lots 57-91, 93-100, 102-108 & 110-135 & areas G-Z & AA- TT will be subject to a consent notice.

Class of Survey: 1
Total Area: 6.7507 ha

Comprised in CT SA3A/1079, CT123416 & CT123445

John David Barnes
being a person entitled to practice as a licensed cadastral surveyor certify that:
(a) The surveys to which this dossier relates are accurate, and were undertaken by me or under my direction in accordance with the Cadastral Survey Act 2002 and the Surveyor General's Rules for Cadastral Survey 2002/2;
(b) This dossier is accurate and has been created in accordance with that Act and those Rules.

Approved as to Survey by Land Information NZ on _____

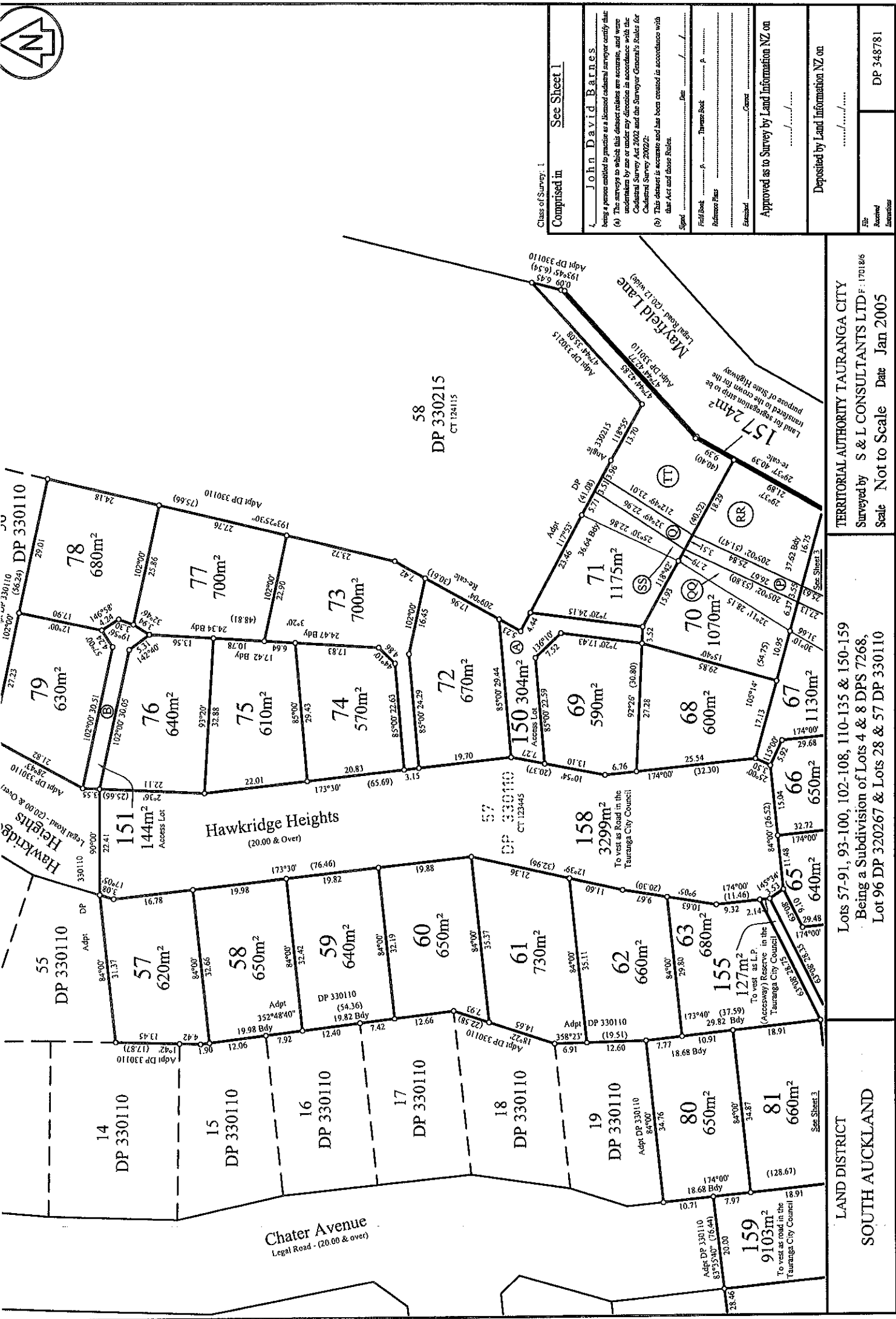
Deposited by Land Information NZ on _____

File No. _____
Revised _____
Date _____
DP 348781

TERRITORIAL AUTHORITY TAURANGA CITY
Surveyed by S & L CONSULTANTS LTD P: 70186
Scale 1 : 1250 Date Jan 2005

LAND DISTRICT SOUTH AUCKLAND
Lots 57-91, 93-100, 102-108, 110-135 & 150-159
Being a Subdivision of Lots 4 & 8 DPS 7268,
Lot 96 DP 320267 & Lots 28 & 57 DP 330110

Sheet 1 of 4 Sheets

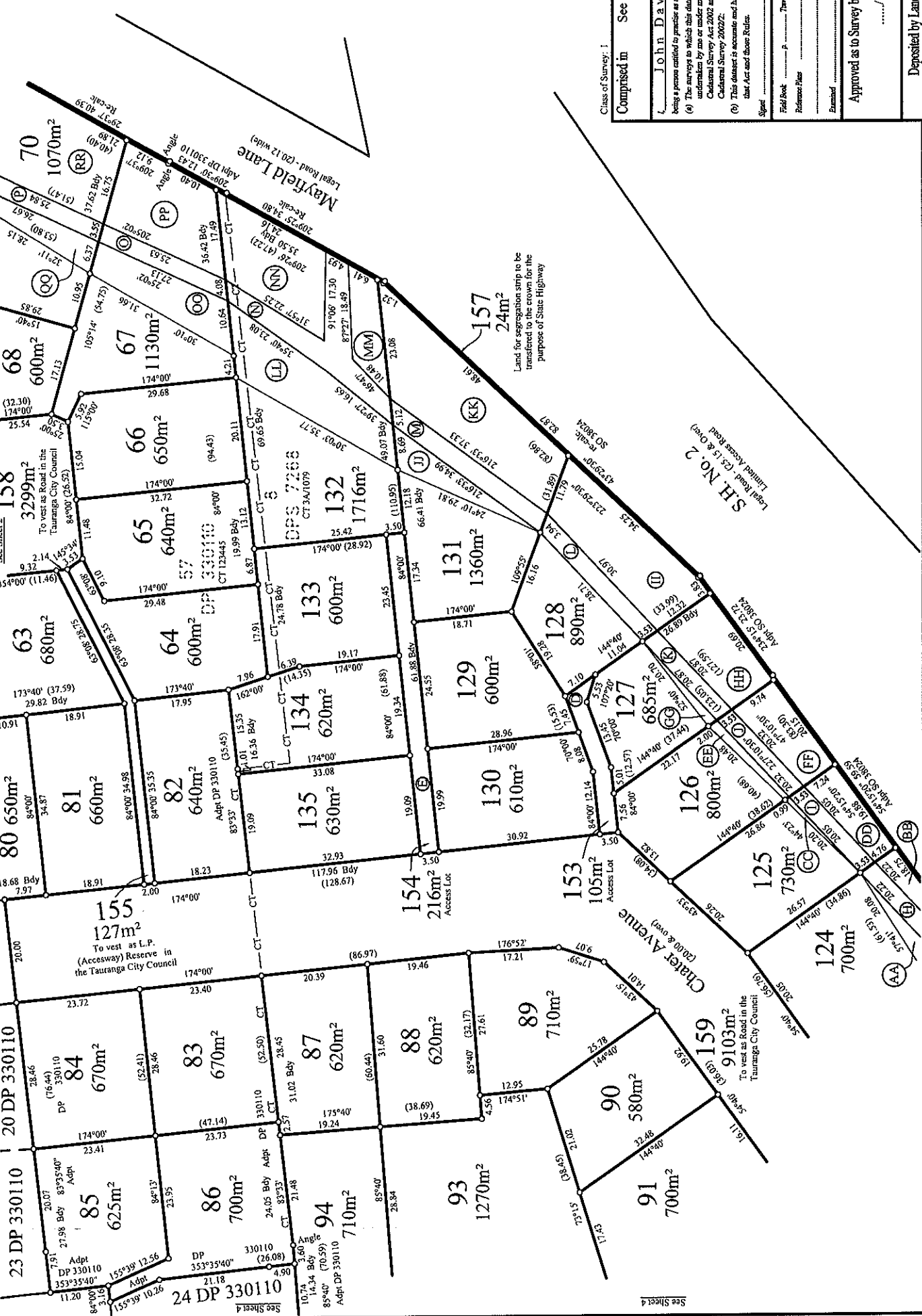


Class of Survey: 1	Comprised in	See Sheet 1
John David Barnes being a person entitled to practice as a licensed cadastral surveyor under (4) The surveys to which this document relates are accurate, and were conducted by me or under my direction in accordance with the Cadastral Survey Act 2002 and the Surveyor General's Rules for Cadastral Survey 2002; (5) This document is accurate and has been created in accordance with that Act and those Rules.		
Signd	Date	/ /
Field Book	Transit Book	P
Reference Plans	Control	
Approved as to Survey by Land Information NZ on		
Deposited by Land Information NZ on		
File	Accession	DP 348781

TERRITORIAL AUTHORITY TAURANGA CITY
 Surveyed by S & L CONSULTANTS LTD P: 1701816
 Scale Not to Scale Date Jan 2005

Lots 57-91, 93-100, 102-108, 110-135 & 150-159
 Being a Subdivision of Lots 4 & 8 DPS 7268,
 Lot 96 DP 320267 & Lots 28 & 57 DP 330110

LAND DISTRICT
 SOUTH AUCKLAND



Land for segregation strip to be transferred to the crown for the purpose of State Highway

Class of Survey: 1

Comprised in See Sheet 1

Class of Survey: 1	
Comprised in See Sheet 1	
John David Barnes	
being a person entitled to practice as a licensed cadastral surveyor certify that	
(a) The surveys to which this dossier relates are accurate, and were undertaken by me or under my direction in accordance with the	
Cadastral Survey Act 2002 and the Surveyor General's Rules for	
Cadastral Survey 2002;	
(b) This dossier is accurate and has been created in accordance with	
the Act and those Rules.	
Signed	Date
Field Book	Theme Book
Reference Plans	
Examined	Checked

Approved as to Survey by Land Information NZ on

Deposited by Land Information NZ on

TERRITORIAL AUTHORITY TAURANGA CITY	
Surveyed by S & L CONSULTANTS LTD F: 1701816	
Scale Not to Scale Date Jan 2005	
File	DP 348781
Received	
Amendment	

Sheet 3 of 4 Sheets

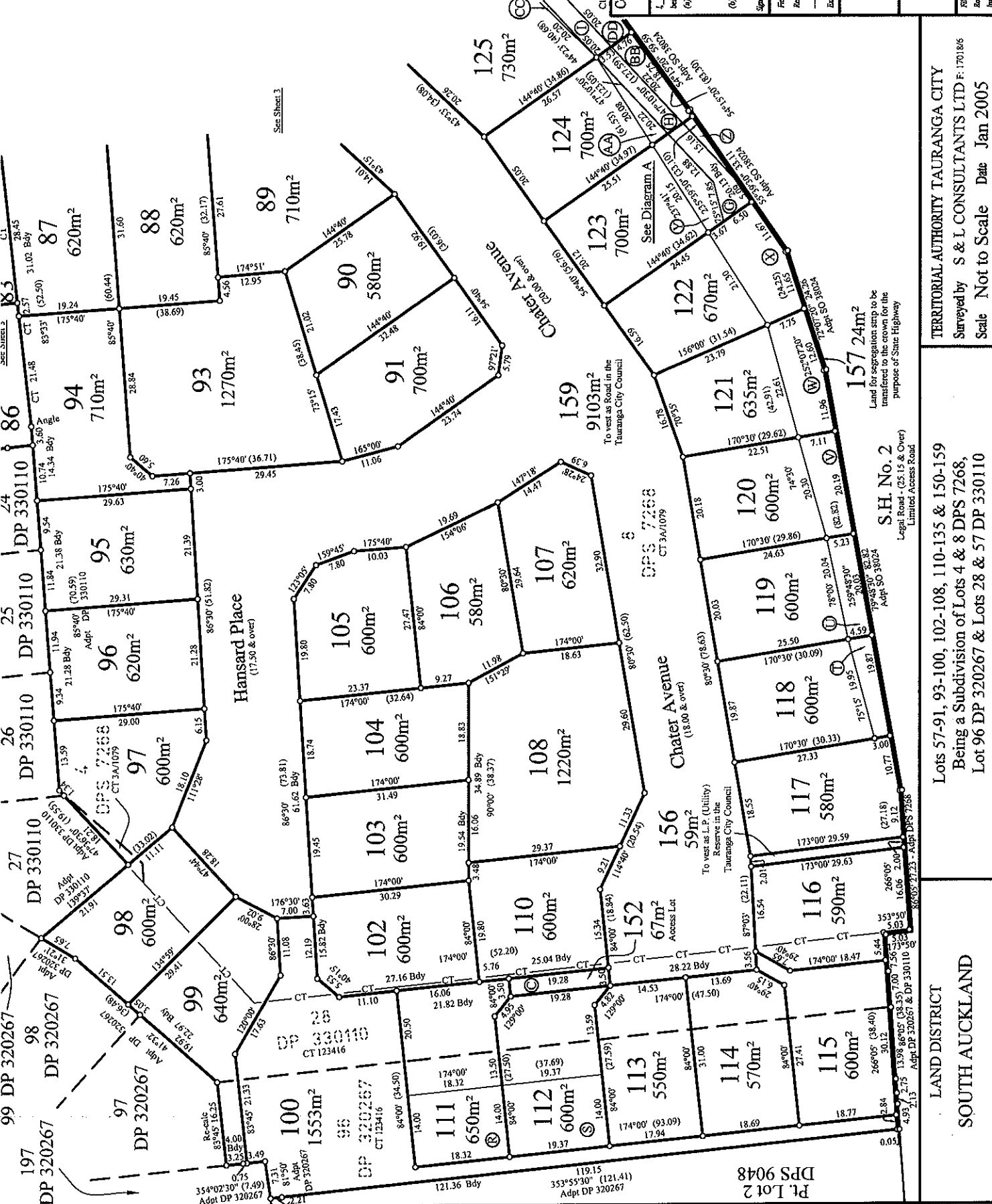
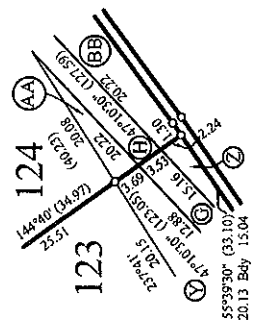
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 Surveyed by S & L CONSULTANTS LTD F: 1701816
 Scale Not to Scale Date Jan 2005

Lots 57-91, 93-100, 102-108, 110-135 & 150-159
 Being a Subdivision of Lots 4 & 8 DPS 7268,
 Lot 96 DP 320267 & Lots 28 & 57 DP 330110

LAND DISTRICT
 SOUTH AUCKLAND

See Sheet 4

See Sheet 4



TERRITORIAL AUTHORITY TAURANGA CITY
 Surveyed by S & L CONSULTANTS LTD F: 170186
 Scale Not to Scale Date Jan 2005

S.H. No. 2
 Legal Road - (25.15 & Over)
 Limited Access Road

LAND DISTRICT
 SOUTH AUCKLAND

Lot 99 DP 320267 & Lots 28 & 57 DP 330110

Class of Survey: 1	Comprised in: See Sheet 1
John David Barnes being a person entitled to practice as a licensed cadastral surveyor certify that: (a) The surveys to which this dataset relates are accurate, and were undertaken by me or under my direction in accordance with the Cadastral Survey Act 2002 and the Surveyor General's Rules for Cadastral Survey 2002; (b) This dataset is accurate and has been created in accordance with the Act and those Rules.	
Field Book: p. 1	Witness Book: p. 1
Addressed Plans: p. 1	Consent: p. 1
Approved as to Survey by Land Information NZ on: p. 1	
Deposited by Land Information NZ on: p. 1	
File Number: DP 348781	Instrument Number: DP 348781

KEY
 MB Machine Borehole 19-1-04
 N=9 SPT 'N' value

NOTES

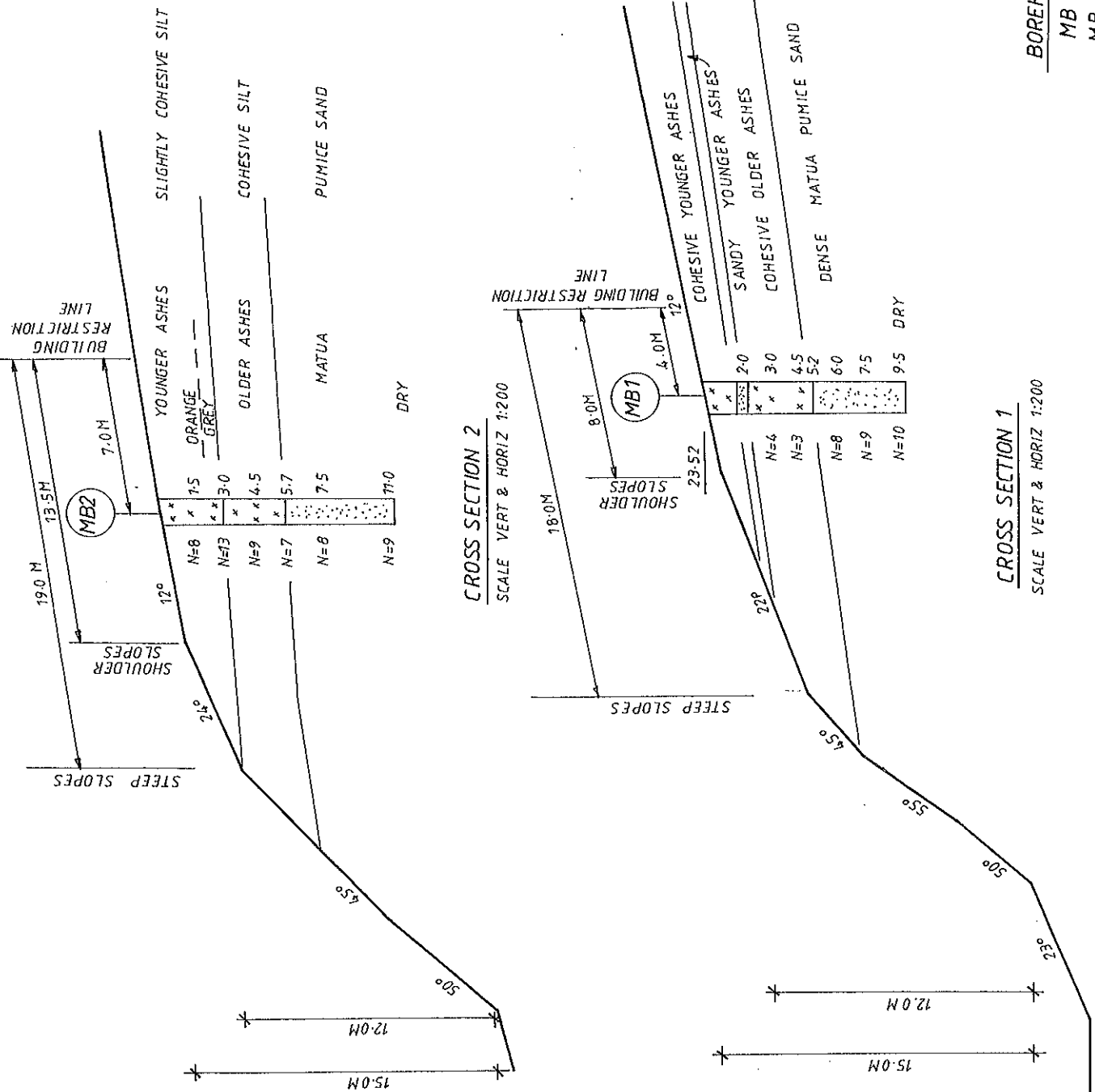
1. See Drawing 17018-3 for profile locations.
2. Levels are in terms of Moturiki Datum.

CD	KEY	NO	DESCRIPTION	DATE
0			SUBDIVISION CONSENT	2'04
			DATE	
			DATE	
			DATE	
			DATE	
			DATE	
			DATE	
			DATE	
			DATE	
			DATE	

S&I CONSULTANTS LTD
 SURVEYORS - ENGINEERS - PLANNERS
 111 Cameron Road, Tauranga
 New Zealand
 P.O. Box 231 Ph: (07) 577-6069
 Fax: (07) 577-6065
 Email: sl@digibridge.co.nz

TITLE MAYFIELD
 RESIDENTIAL SUBDIVISION
 STAGE 6
CROSS SECTION
PROFILES

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 ORIGINAL SCALE
 DATE
 AS SHOWN (A3) 2'04
 DRAWING NO
17018-G02
 REVISIONS



CROSS SECTION 1
 SCALE VERT & HORIZ 1:200

BOREHOLE	MOTURIKI
MB 1	23-52
MB 2	28-20

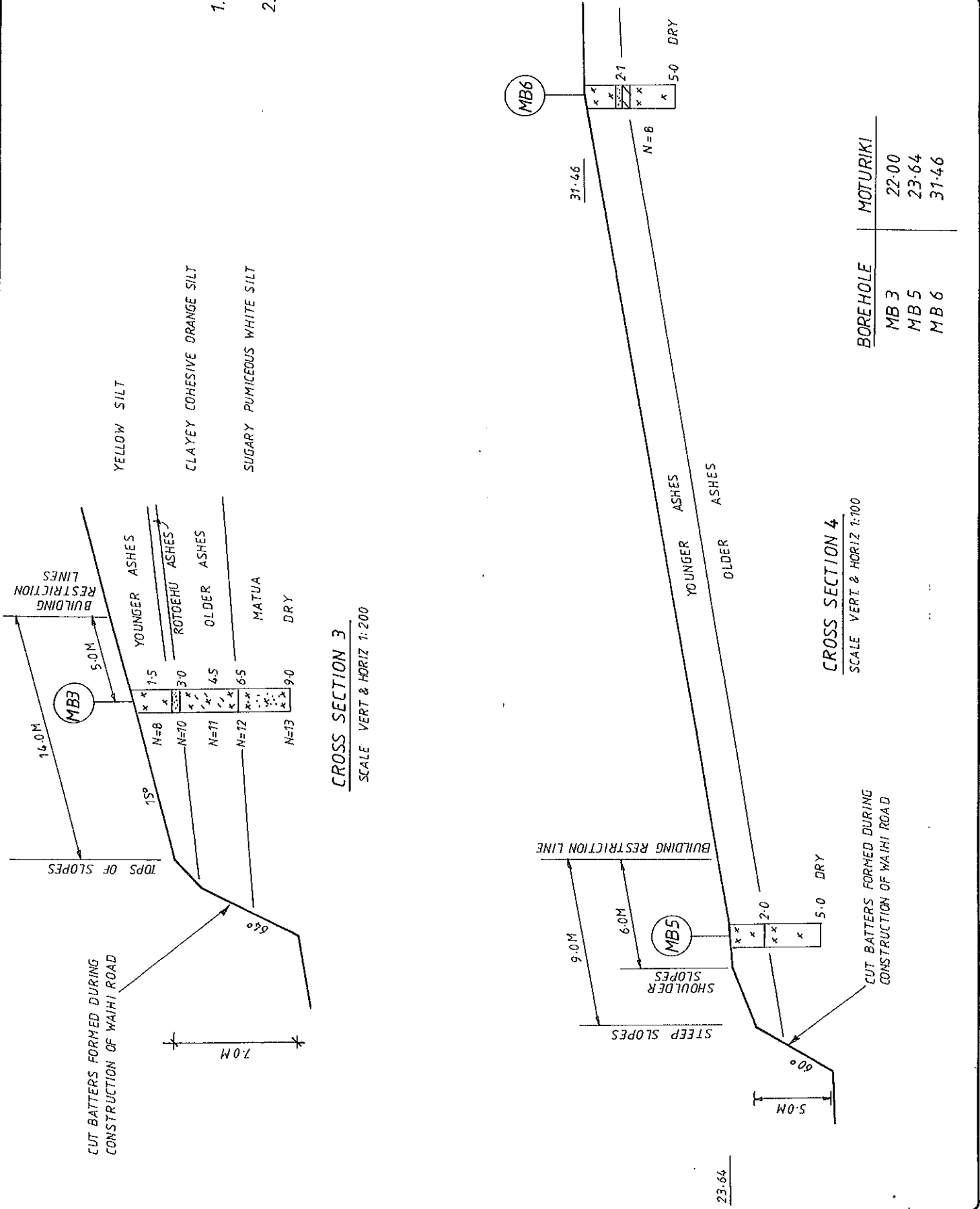
KEY
 MB Machine Borehole
 19-1-04
 N=9 SPT 'N' value

NOTES
 1. See Drawing 17018-31, 32 for profile locations.
 2. Levels are in terms of Maturiki Datum.

NO.	NAME	DATE	STATUS
1	AS SHOWN (A3)	2/04	
0	SUBDIVISION	2/04	CONSIST

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 Email: sl@sgs.co.nz

TITLE **MAYFIELD**
 RESIDENTIAL SUBDIVISION
 STAGE 6
 CROSS SECTION PROFILES
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 ORIGINAL HOLDER AS SHOWN (A3) 2/04
 DRAWING NO. 17018-G03



BOREHOLE	MOTURIKI
MB 3	22-00
MB 5	23-64
MB 6	31-46

APPENDIX II

**Statement of Professional Opinion as to the Suitability of
Land for Building Development**

Lot Summary Report

SECTION 2

To: The Director of Environmental Services

**STATEMENT OF PROFESSIONAL OPINION AS TO THE
GEOTECHNICAL SUITABILITY OF LAND FOR BUILDING**

DEVELOPMENT: Mayfield Subdivision Stage 6

OWNER: Mayfield Ltd

LOCATION: Hawkridge Heights, Chater Avenue, Hansard Place Hyforce Way, Bethlehem

I Michael William Hughes of S & L Consultants Ltd

(Full Name)

PO Box 231, Tauranga

(Name and Address of Firm)

Hereby confirm that;

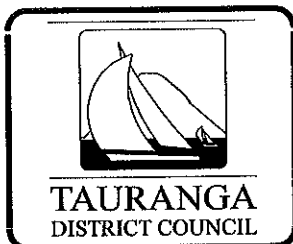
- 1) I am a professional person appropriately qualified with experience in geotechnical engineering to ascertain the suitability of the land for building development and was retained as the Soils Engineer to the above development.
- 2) An appropriate level of site investigation and construction supervision has been carried out under my direction and is described in my development evaluation dated 18 April 2005.
- 3) In my professional opinion, not to be construed as a guarantee, I consider that;
 - (a) The area shown in my report dated 18 April 2005 of each new allotment is suitable for the erection thereon of the building types appropriate to the zoning of the land, provided that;

Recommendations contained in my report are complied with.
 - (b) The structural earth fills shown on the attached Plan Nos. 17018-31 have been placed in accordance with the Code of Practice for Development of the Tauranga City Council.
 - (c) The completed works give due regard to all land slope and foundation stability considerations.
 - (d) The filled ground is suitable for the erection thereon of residential buildings not requiring specific design in terms of NZS 3604:1999 and related documents providing that;

Recommendations contained in my report, section 6 are complied with.
 - (e) The original ground not affected by filling is suitable for the erection thereon of residential buildings not requiring specific design in terms of NZS 3604:1999 and related documents, subject to the recommendations contained in my report including those relating to topsoil depths and soil variations away from test or observation positions.
4. This professional opinion is furnished to the Council and the owner for their purpose alone, on the express condition that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection for any dwelling.

Signed 

Date 18 April 2005



**SUITABILITY OF LAND
FOR BUILDING DEVELOPMENT**

TAURANGA CITY COUNCIL

MAY 98

G 2 Δ

**MAYFIELD SUBDIVISION STAGE 6
CHATER AVENUE, HAWKRIDGE HEIGHTS, BETHLEHEM**

T.C.C Sub 5876

File Ref: 17018

The comments and notations included on this summary sheet are outlined in the support documents. These shall be read in conjunction with this summary.

Lot#	Area(m ²)	Shear Strength kPa	Subdivision Filling		Subsurface Data		Natural topography earthworked		Natural topography unworked		Foundations		Building line restriction?	Recommendations/restrictions
			Y/N	Depth (m)	Y/N	Depth (m)	Y/N	Depth (m)	Conventional shallow Foundations to NZS 3604:1999	Specific Design	Y/N/NA	Y/N/NA		
57	620		N		N	0-0.5	Y	0-0.5	N	Y	Y	N	N	
58	650	172	N		N	0-1.0	Y	0-1.0	N	Y	Y	N	N	
59	640		Y	0.5	N	0-1.0	Y	0-1.0	N	Y	Y	N	N	
60	650	127	N		N	0-1.0	Y	0-1.0	N	Y	Y	N	N	
61	730		N		N	0-1.0	Y	0-1.0	N	Y	Y	N	N	
62	660	131	N		N	0-0.5	Y	0-0.5	N	Y	Y	N	N	
63	680	197	N		N	0-0.5	Y	0-0.5	N	Y	Y	N	N	
64	600		N		N	0-1.0	Y	0-1.0	N	Y	Y	N	N	
65	640	191	N		N	0-1.0	Y	0-1.0	N	Y	Y	N	N	
66	650		N		N	0-0.5	Y	0-0.5	N	Y	Y	N	N	
67	1130	161	N		N		Y		Y	Y	Y	N	Y	
68	600		N		N	0-0.5	Y	0-0.5	N	Y	Y	N	N	
69	590	216	N		N	0-1.0	Y	0-1.0	N	Y	Y	N	N	
70	1070	117	N		N		Y		Y	Y	Y	N	Y	
71	1175		N		N		Y		Y	Y	Y	N	Y	
72	670		N		N	0-1.5	Y	0-1.5	N	Y	Y	N	N	
73	700	197	N		N		Y		Y	Y	Y	N	N	
74	570	197	N		N	0-1.5	Y	0-1.5	N	Y	Y	N	N	
75	610		N		N	1-1.5	Y	1-1.5	N	Y	Y	N	N	
76	640	194	N		N	0-1.0	Y	0-1.0	N	Y	Y	N	N	
77	700	216	N		N		Y		Y	Y	Y	N	N	
78	680	204	N		N		Y		Y	Y	Y	N	N	
79	630		N		N	1-0.5	Y	1-0.5	N	Y	Y	N	N	
80	650	162	N		N		Y		Y	Y	Y	N	N	
81	660		N		N		Y		Y	Y	Y	N	N	

Comments

Refer to S & L Consultants Ltd report reference 17018 dated 18 April 2004. Lots shown on DP 348781.

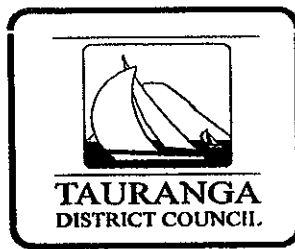


LOT SUMMARY REPORT

TAURANGA CITY COUNCIL

MAY 98

G 2a Δ



LOT SUMMARY REPORT

TAURANGA CITY COUNCIL

MAY 98

G 2a Δ

MAYFIELD SUBDIVISION STAGE 6 CHATER AVENUE, HAWKRIDGE HEIGHTS, BETHLEHEM

T.C.C Sub 5876
File Ref: 17018

The comments and notations included on this summary sheet are outlined in the support documents. These shall be read in conjunction with this summary.

Lot#	Area(m ²)	Shear Strength kPa	Subsurface Data				Natural topography unworked		Natural topography earthworked		Foundations		Building line restriction?	Recommendations/restrictions
			Subdivision Filling		Natural topography unworked	Natural topography earthworked	Conventional shallow Foundations to NZS 3604:1999	Specific Design	Conventional shallow Foundations to NZS 3604:1999	Specific Design				
			Y/N	Depth (m)							Y/N	Depth(m)		
82	640	189	N		Y	N				Y	N	N		
83	670	189	N		Y	N				Y	N	N		
84	670		N		Y	N				Y	N	N		
85	625	189	Y	0-1.0	Y	N				Y	N	N		
86	700	150	Y	0-1.0	Y	N				Y	N	N		
87	620		N		N	Y	0-0.3			Y	N	N		
88	620		N		N	Y	0-0.5			Y	N	N		
89	710	189	N		N	Y	0-1.5			Y	N	N		
90	580		N		N	Y	0-1.5			Y	N	N		
91	700	189	N		N	Y	0-1.0			Y	N	N		
93	1270	150	Y	0-0.5	Y	N				Y	N	N		
94	710	150	Y	0.5	Y	N				Y	N	N		
95	630	150	Y	0-1.0	Y	N				Y	N	N		
96	620	150	Y	0-1.0	Y	N				Y	N	N		
97	600	150	N		N	Y	0-0.5			Y	N	N		
98	600	117	N		N	Y	0-0.5			Y	N	N		
99	640		N		N	Y	0-0.5			Y	N	N		
100	1553	150	N		Y	N				Y	N	N		
102	600	150	Y	0-0.5	Y	N				Y	N	N		
103	600	150	Y	0-0.5	Y	N				Y	N	N		
104	600	150	Y	0-0.5	Y	N				Y	N	N		
105	600	150	Y	0-0.5	Y	N				Y	N	N		
106	580	150	Y	0-0.5	Y	N				Y	N	N		
107	620	150	Y	0-0.3	Y	N				Y	N	N		

Comments

Refer to S & L Consultants Ltd report reference 17018 dated 18 April 2005. Lots shown on DP 348781.

**MAYFIELD SUBDIVISION STAGE 6
CHATER AVENUE, HAWKRIDGE HEIGHTS, BETHLEHEM**

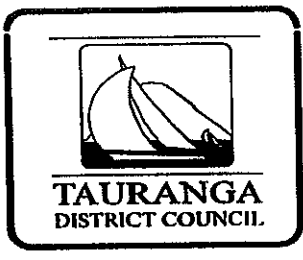
T.C.C Sub 5876
File Ref: 17018

The comments and notations included on this summary sheet are outlined in the support documents. These shall be read in conjunction with this summary.

Lot#	Area(m ²)	Shear Strength kPa	Subsurface Data				Natural topography earthworked		Conventional shallow Foundations to NZS 3604:1999 Y/N/NA	Specific Design Y/N/NA	Building line restriction? Y/N	Recommendations/restrictions
			Subdivision Filling		Natural topography unworked Y/N	Natural topography earthworked Y/N	Depth(m)					
			Y/N	Depth (m)								
108	1220	150	Y	0-1.5	N	Y	0-0.3	Y	N	N		
110	600	150	Y	0-0.3	N	Y	0-0.5	Y	N	N		
111	650		Y	0-1.0	Y	N		Y	N	N		
112	600	120	N		Y	N		Y	N	N		
113	550		N		Y	N		Y	N	N		
114	570	194	N		Y	N		Y	N	N		
115	600		N		Y	N		Y	N	N		
116	590	158	N		Y	N		Y	N	N		
117	580		N		Y	N		Y	N	N		
118	600	211	N		Y	N		Y	N	Y		
119	600		N		Y	N		Y	N	Y		
120	600	131	N		Y	N		Y	N	Y		
121	635		N		Y	N		Y	N	Y		
122	670	119	N		Y	N		Y	N	Y		
123	700		N		Y	N		Y	N	Y		
124	700	204	N		Y	N		Y	N	Y		
125	730		N		Y	N		Y	N	Y		
126	800	191	N		Y	N		Y	N	Y		
127	685		N		Y	N		Y	N	Y		
128	890	189	N		Y	N		Y	N	Y		
129	600		N		Y	N		Y	N	N		
130	610	130	N		Y	N		Y	N	N		
131	1360		N		Y	N		Y	N	Y		
132	1716	122	N		Y	N		Y	N	Y		
133	600		N		N	Y	0-0.5	Y	N	N		

Comments

Refer to S & L Consultants Ltd report reference 17018 dated 18 April 2005. Lots shown on DP 348781.



**LOT SUMMARY
REPORT**

TAURANGA CITY COUNCIL

MAY 98

G 2a Δ

APPENDIX III

Compaction Test Results

Our Ref: 17018

**MAYFIELD SUBDIVISION STAGE 6
SUMMARY OF COMPACTION TEST RESULTS**

Sheet 1 of 1

Test No	Location	Air Voids Percentage	Undrained Shear Strength kPa
T1	Lot	0	163
T2	Lot	4.5	170
T3	Lot	4.2	165
T4		4.4	155
T5	Lot 36	6.6	180
T6	Lot 36	5.1	160
T7		6.1	188
T8		6	188

Refer to 17018-31 for test locations

APPENDIX IV

Post Construction Borehole Logs

Pre Construction Borehole Logs



Borehole 58
on Lots 60

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 58					
TOPSOIL 150 deep	X				
SILT clayey v. stiff friable sl. moist brown	X	0.5			
SILT clayey sl. sandy stiff moist friable brown (younger ash)	X	1.0			
End of bore					
LOT NO 60					
TOPSOIL 200 deep	X				
SILT clayey sl. sandy stiff sl. moist friable brown (younger ash)	X	0.5			
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 62
on Lots 63

Sheet: 1 Of: 1

Site: MAYFIELD SUBDIVISION STAGE 6

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 62					
TOPSOIL 200 deep	SS				
Silt clayen sl. sandy stiff dry friable brown bec. moist	X X X X	0.5			
Silt clayen stiff sl. moist friable light brown	X X X X	1.0			
End of bore					
LOT NO 63					
TOPSOIL 300 deep	SS				
Silt stiff sl. moist friable brown	X X X	0.5			
Silt sl. sandy stiff - hard sl. moist light brown	X X X X	1.0			
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 65
on Lots 67

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 65					
TOPSOIL 200 deep	X ₁				
SILT clayey stiff sil. moist friable light brown	X ₁	0.5			
sec. sil. sandy moist	X ₁	1.0			
End of bore					
LOT NO 67					
TOPSOIL 200 deep	X ₁				
SILT clayey sil. sandy v. stiff dry friable brown	X ₁	0.5			
remains stiff	X ₁				
becomes moist	X ₁	1.0			
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 69
on Lots 70

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: Of:

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 69					
TOPSOIL 300 deep	3333	0.0 - 0.1			
SILT sl. sandy (st) stiff clay friable brown	X X X	0.1 - 0.5			
SILT clayey stiff clay light brown	X X	0.5 - 1.0			
End of bore					
LOT NO 70					
TOPSOIL 300 deep	3333	0.0 - 0.1			
SILT v. stiff clay friable light brown	XX XX XX	0.1 - 0.5			
SILT sl. sandy v. stiff friable sl. moist brown	X X X	0.5 - 1.0			
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole on Lots 74
76

Sheet: 1 Of: 1

Site: MAYFIELD SUBDIVISION STAGE 6

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 74					
TOPSOIL 100 deep	X	0.0			
SILT SL-sand (t) stiff dry friable brown	X	0.1			
	X	0.2			
	X	0.3			
SILT clayey stiff SL-plastic moist light brown	X	0.4			
	X	0.5			
	X	0.6			
	X	0.7			
	X	0.8			
	X	0.9			
	X	1.0			
End of bore					
LOT NO 76					
TOPSOIL 100 deep	X	0.0			
SILT clayey stiff SL-moist friable light brown	X	0.1			
	X	0.2			
	X	0.3			
	X	0.4			
	X	0.5			
	X	0.6			
	X	0.7			
	X	0.8			
	X	0.9			
	X	1.0			
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole on Lots 77
78

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 77					
TOPSOIL 100 deep	X	0.0			
SILT clayey stiff dry friable pumice incl. light brown	X	0.1			
SILT clayey sl-sandy stiff moist sl plastic brown	X	0.2			
SILT clayey sl-sandy v-stiff sl moist friable dk brown	X	0.3			
End of bore		1.0			
LOT NO 78					
TOPSOIL 100 deep	X	0.0			
SILT stiff dry friable light brown	X	0.1			
SILT clayey v-stiff dry friable brown	X	0.2			
End of bore		1.0			

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 80
on Lots 82

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 80					
TOPSOIL 200 deep	111				
SILT clayey stiff dry friable light brown bec. sl. sandy moist brown (Younger ash)	X- X- X- X- X- X-	0.5 1.0			
End of bore					
LOT NO 82					
TOPSOIL 150 deep	111				
SILT clayey sl. sandy stiff sl. moist friable light brown (Younger ash)	X- X- X- X- X- X- X-	0.5 1.0			
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 83
on Lots 85

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 83					
TOPSOIL 200 deep	X				
SILT clayey stiff friable mixed brown (disturbed)	X	0.5			
SILT clayey silty-sandy stiff silty moist friable light brown	X				
	X				
	X				
SILT stiff silty moist friable brown	XX	1.0			
	XX				
End of bore					
LOT NO 85					
TOPSOIL 150. deep	X				
SILT clayey silty-sandy stiff silty moist friable light brown	X	0.5			
	X				
	X				
	X				
(Younger ash)	X	1.0			
	X				
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 89
on Lots 91

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 89					
TOPSOIL 300 deep	333				
SILT STiff sl-moist friable dark brown	XV XX	0.5			
SILT clayey sl-sandy v. stiff sl-moist brown	XI XI XI	1.0			
End of bore					
LOT NO 91					
TOPSOIL 50 deep	X				
SILT sl-clayey sl-sandy sl. stiff sl-moist friable light brown (Younger ash)	X X X X X X X	0.5 1.0			
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 94
on Lots 95

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 94					
TOPSOIL 150 deep					
SILT stiff dry friable light yellow - light brown sec. brown incl (filling) Some small kindling roots	xy	0.5			
SILT stiff sl. moist friable brown (natural ground)	xy	1.0			
End of bore					
LOT NO 95					
TOPSOIL 300 deep					
SILT sl. sandy (Y) stiff dry friable light brown - yellow and brown inclusions (mixed fill) Traces of original topsoil layer	xy	0.5			
SILT stiff sl. moist yellow-brown	xy	1.0			
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole on Lot 96

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 96					
TOPSOIL 300 deep	SS	0.0 - 0.3			
Silt st. clayey v. stiff st. most friable mixed light brown - yellow - brown (filling)	XX	0.3 - 1.0			
Silt st. st. st. most friable brown (natural ground)	XX	1.0 - 1.5			
End of bore		1.5 - 2.0			

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 98
on Lots 100

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 98					
TOPSOIL 200 deep	1 S				
SILT sl. clayey stiff moist friable light brown (younger ash)	X X X X X X X	0.5 1.0			
End of bore					
LOT NO 100					
TOPSOIL 150 deep	1 S				
SILT sl. clayey stiff clay friable light brown bec. sl. moist bec. sl. sandy	X X X X X X	0.5 1.0			
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 112
on Lots 114

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 112					
TOPSOIL 100 deep	3				
Silt clayey stiff silty & friable light brown	X				
	X				
	X	0.5			
	X				
bec. silty sandy light brown	X				
	X				
	X	1.0			
	X				
End of bore					
LOT NO 114					
TOPSOIL 200 deep	3				
Silt silty clayey stiff clay friable light brown	X				
	X				
	X	0.5			
	X				
(Younger ash)	X				
	X				
	X	1.0			
	X				
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 116
on Lots 118

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 116					
TOPSOIL 150 deep	X	0.0			
SILT sl. clayey stiff sl. moist friable light brown	X	0.1			
	X	0.2			
	X	0.3			
	X	0.4			
	X	0.5			
	X	0.6			
	X	0.7			
	X	0.8			
	X	0.9			
	X	1.0			
End of bore					
LOT NO 118					
TOPSOIL 100 deep	X	0.0			
SILT sl. sandy stiff dry friable light brown	X	0.1			
	X	0.2			
	X	0.3			
	X	0.4			
	X	0.5			
	X	0.6			
	X	0.7			
	X	0.8			
	X	0.9			
	X	1.0			
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 120
 on Lots 122
 Sheet: 1 Of: 1

Site: **MAYFIELD SUBDIVISION STAGE 6**

Job No. **17018** Date Excavated: **April 2005** RL Ground: **—**

Logged By: **J Lloyd**

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 120					
TOPSOIL 100 deep	X				
SILT clayey sl. sandy stiff sl. moist & friable light brown (younger ash)	X X X X X X X X X	0.5 1.0			
End of bore					
LOT NO 122					
TOPSOIL 50 deep	X				
SILT clayey stiff dry friable light brown bec. sl. moist sl. plastic stiff light brown	X X X X X X X X	0.5 1.0			
End of bore					

EXCAVATION METHOD: **Handauger and shear vane or Scala Penetrometer**



Borehole 124
on Lots 126

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 124					
TOPSOIL 100 deep	X				
SILT sl. clayey stiff sl. moist friable light brown (Younger all.)	X X X X X X X	0.5 1.0			
End of bore					
LOT NO 126					
TOPSOIL 200 deep	X				
SILT sl. sandy stiff sl. moist friable brown	X X X	0.5			
SILT clayey stiff sl. moist friable light brown	X X X	1.0			
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 128
on Lots 130

Sheet: 1 Of: 1

Site: MAYFIELD SUBDIVISION STAGE 6

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 128					
TOPSOIL 300 deep	351				
SILT clayey st. sandy stiff st. moist friable light brown (younger all.)	X X X X X X	0.5 1.0			
End of bore					
LOT NO 130					
TOPSOIL 200 deep	221				
SILT clayey stiff dry friable light brown bec. st. moist (younger all.)	X X X X X X	0.5 1.0			
End of bore					

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole 132
on Lots 134

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: April 2005

RL Ground: —

Logged By: J Lloyd

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
LOT NO 132					
TOPSOIL 200 deep	X ₁	0.0 - 0.1			
SILT clayey st. sandy stiff st. moist friable light brown (younger ash)	X ₂	0.1 - 0.2			
	X ₃	0.2 - 0.3			
	X ₄	0.3 - 0.4			
	X ₅	0.4 - 0.5			
	X ₆	0.5 - 0.6			
End of bore	X ₇	0.6 - 0.7			
	X ₈	0.7 - 0.8			
	X ₉	0.8 - 0.9			
	X ₁₀	0.9 - 1.0			
	X ₁₁	1.0 - 1.1			
LOT NO 134					
TOPSOIL 150 deep	X ₁₂	0.0 - 0.1			
SILT clayey st. sandy stiff st. moist friable light brown (younger ash)	X ₁₃	0.1 - 0.2			
	X ₁₄	0.2 - 0.3			
	X ₁₅	0.3 - 0.4			
	X ₁₆	0.4 - 0.5			
	X ₁₇	0.5 - 0.6			
End of bore	X ₁₈	0.6 - 0.7			
	X ₁₉	0.7 - 0.8			
	X ₂₀	0.8 - 0.9			
	X ₂₁	0.9 - 1.0			
	X ₂₂	1.0 - 1.1			

EXCAVATION METHOD: Handauger and shear vane or Scala Penetrometer



Borehole No. MB 1

Site: MAYFIELD SUBDIVISION-STAGE 5 SIMMONS AND TACKER PROPERTIES

Sheet: 1 Of: 2

Job No. 16992

Date Excavated: M. 16/6/03

RL Ground: 29.4

Logged By: MH

Description of Soil	Soil Symbol	Depth (m)	SPT	GROUNDWATER	CORE RECOVERY	Undrained Shear Strength (kPa)		
						50	100	150
TOPSOIL		0.0 - 0.5						
SILT: Very clayey, moderately cohesive brown yellow, stiff, moist	X X	0.5 - 1.5						
SPT 450 RECOVERY Very clayey, cohesive Dark brown yellow silt, stiff moist	X X	1.5 - 2.0	1 2 2 N=4	BOREHOLE DRY	100%			
brown yellow silt	X	2.0 - 2.5						
Some sand, cream	X X	2.5 - 3.0						
Very sandy, cream, loose	X X	3.0 - 3.5						
SPT 450 RECOVERY pumice sand, cream, loose Dry	X X	3.5 - 4.0	1.5 1.5 2 N=3.5		100%			
pumiceous silt, cream	X X	4.0 - 4.5						
CLAY: cohesive, Dark brown, very stiff, moist		4.5 - 5.0						
		5.0 - 5.5						

EXCAVATION METHOD: 75 mm Ø MACHINE ANGER Et hollow SPT



Borehole No. MB 3

Site: MAYFIELD SUBDIVISION STAGE 5

SIMMONS AND TACKER PROPERTIES

Sheet: 1 of 2

Job No. 16992

Date Excavated: Mr 16/6/03

RL Ground: 29.1

Logged By: MH

Description of Soil	Soil Symbol	Depth (m)	SPT	GROUNDWATER CORE RECOVERY	Undrained Shear Strength (kPa)		
					50	100	150
TOPSOIL	UU	0.0 - 0.5					
SILT: Very clayey, moderately cohesive Dark brown yellow, very stiff slightly moist.	'x'x'	0.5 - 1.0		BOREHOLE DRY			
SPT 450 RECOVERY SILT: Very clayey, cohesive Dark brown orange, very stiff, sensitive, slightly moist	'x'x'	1.0 - 1.5	0	100%			
SILT: very clayey, cohesive, Dark brown orange, stiff, moist	'x'x'	1.5 - 2.0	1	100%			
Very sandy, cream, loose	x	2.0 - 2.5	2	100%			
SPT 450 RECOVERY SILT: Very sandy, pale yellow medium dense, Dry pumice SAND: medium grained pale yellow, Dry, loose pumice sand pale grey, loose slightly moist	'x'x'	2.5 - 3.0	3	100%			
CLAY: cohesive, Dark brown, stiff, sticky, moist	///	3.0 - 4.0	2	100%			
	///	4.0 - 4.5	1	100%			

EXCAVATION METHOD: 75 mm ϕ MACHINE AUGER + Hollow SPT



Borehole No. MB 1

Site: MAYFIELD SUBDIVISION STAGE 5

SIMMONS AND TUCKER PROPERTIES

Sheet: 2 of 2

Job No. 16992

Date Excavated: M-16/6/03

RL Ground: 29.4

Logged By: MBT

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
SPT 450 RECOVERY Very clayey cohesive silt Dark brown orange, Very stiff Slightly moist	X	6 10 12			
		5.0			
		5.5			
		6.0			
SPT 450 : RECOVERY Very clayey moderately cohesive, yellow orange silt stiff, sensitive, moist	X	1 1 1			
		6.5			
EOR @ 6.5m: TARGET DEPTH					

EXCAVATION METHOD: 75mm Ø MACHINE AUGER ET HOLLOW SPT



Borehole No. MB3

Site: MAYFIELD SUBDIVISION STAGE 5

SIMMONS AND TUCKER PROPERTIES

Sheet: 2 of 2

Job No. 16992

Date Excavated: M. 16/6/03

RL Ground: 29.1

Logged By: MBH

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
SPT 450 : SILT, very clayey, cohesive RECOVERY Dark brown orange, hard slightly moist	XX	3			
		3			
Very clayey cohesive brown orange silt, very stiff, moist	X	3.0			
		5.5			
		6.0			
SPT 450 : SILT: Very clayey, cohesive RECOVERY Dark brown orange, very stiff slightly moist	X	6.5			
		6.5			
EUB @ 6.5m: TARGET DEPTH					

100%

N=11

N=3

EXCAVATION METHOD: 75mm Ø MACHINE AUGER & HOLLOW SPT



Borehole No. MB 7

Site: MAYFIELD SUBDIVISION

SIMMONS AND TUCKER PROPERTIES

Sheet: | Of: |

Job No. 16992

Date Excavated: M. 16/6/03

RL Ground: 27.9

Logged By: MA

Description of Soil	Soil Symbol	Depth (m)	SPT	GROUNDWATER	CORE RECOVERY	Undrained Shear Strength (kPa)		
						50	100	150
TOPSOIL	UU	0.0						
SILT: very clayey, moderately cohesive Dark orange, stiff, moist	XX	0.5						
	XX	1.0			100%			
	XX	1.5						
SPT 450 : Very sandy non cohesive RECOVERY brown yellow silt, Dense Dry	XX	2.0	2					
	XX	2.5	3					
	XX	3.0	6	N=9				
SILT: clayey, pale brown, yellow stiff	XX	3.5			100%			
Very sandy, non cohesive cream, loose, Dry	XX	4.0						
	XX	4.5						
SPT 450 : Very clayey, cohesive, Dark RECOVERY brown orange silt, Very stiff, slightly moist	XX	5.0	2					
	XX	5.5	4					
	XX	6.0	8	N=12				
EOB @ 3.5m: TARGET DEPTH		3.5						
				BOREHOLE DRY				

EXCAVATION METHOD: 75mm ϕ MACHINE AUGER Et Hollow SPT.



B1

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of 1

Job No. 17018

Date Excavated: M. 19/1/04

RL Ground: 23.50 ^{MOTARRIKI}

Logged By: MA

Description of Soil	Soil Symbol	Depth (m)	SPT.	GWL	CORE RECOVERY %	Undrained Shear Strength (kPa)		
						50	100	150
FIELD LOG								
SILT: clayey, cohesion, brown orange	X X							
	YOUNGER ASHES	100						
pumiceous silt, sandy, cream, stiff, moist	X X	100						
	YOUNGER ASHES	100						
SILT: clayey, cohesion, brown orange stiff, moist	X X							
	OLDER ASHES	500						
Very clayey dark brown orange silt, stiff, moist - very moist	X	500	2					
	OLDER ASHES	500	2					
coarse grained, slightly cohesive Dark orange, stiff, very moist	X X	500	N=4	100				
	OLDER ASHES	500	N=4	100				
coarse grained with flecks manganese,	X	500	1					
	TRANSITION ZONE	500	12					
	TRANSITION ZONE	500	N=3	100				
	TRANSITION ZONE	500	N=3	100				
pumice sand, cream grey, non cohesive Dense, Dry	X X	600						
	MATUA	600						
Damp pumice sand fine grained, Dense.	X X	600	2					
	MATUA	600	4					
cream grey pumice sand, Dense Dry	X X	700	4					
	MATUA	700	N=8	100				
	MATUA	700	N=8	100				
cream grey pumice sand, Dense slightly moist	X X	800	3					
	MATUA	800	4					
uniform, cream grey pumice sand Dense, Dry	X X	800	5					
	MATUA	800	N=9	100				
	MATUA	800	N=9	100				
cream grey pumice sand Dense, Dry	X X	900	3					
	MATUA	900	5					
	MATUA	900	N=10	100				

EXCAVATION METHOD: 75mm Ø ANGER + HOLLOW SPT. FOR @ 9-USOM.



B2

Site: MAYFIELD SWS DIVISION STAGE 6

Sheet: 1 of 2

Job No. 17018

Date Excavated: 11/19/04

RL Ground: 22.8

Logged By: MTT

RC IS IN TERMS OF MOTARIKI DATUM.

Description of Soil

FIELD LOG

Soil Symbol

Depth (m)

SPT

SWL

CORRECTION

Undrained Shear Strength (kPa)

50 100 150

SILT: non cohesive, yellow, dry, stiff

Very stiff - Hard

YOUNGER ASHES

DRY

N=8

100g

becomes cream grey

SILT: clayey, Dark brown, dry, hard

becomes moist

HAMILTON

SPT: Dark brown orange clayey silt
very stiff - hard, moist

Brown orange silt mixed
with cream pumice sand

N=9

100g

pumice sand: fine grained, cream grey
Base, Dry

NATURAL

N=7

100g

N=0

100g

100g

Backfill Dry End of Drilling
Backfill Dry End of Day

EXCAVATION METHOD: 75mm Ø AUGER + HOLLOW SPOT



B2

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 2 Of: 2

Job No. 17018

Date Excavated: 11-19-04

RL Ground:

Logged By: MAA

Description of Soil	Soil Symbol	Depth (m)	Undrained Shear Strength (kPa)		
			50	100	150
FIELD LOG.					
pumice sand cream gray, dense, slightly moist ~ uniform.	⋯⋯⋯	0.00 - 1.00			
cream gray pumice sand, dense, slightly moist	⋯⋯⋯	1.00 - 1.40			
End @ 11.0m					

EXCAVATION METHOD:



B3

Site: MAYFIELD SUBDIVISION STAGE 1

Sheet: 1 Of 1

Job No. 17018

Date Excavated: 11/19/04

RL Ground: 20.2

Logged By: MAA

RL IN TERMS OF MUTUKI DATUM.

Description of Soil

FIELD LOG

Soil Symbol

Depth (m)

SPT

ORCE
REMARKS

Undrained Shear Strength (kPa)

50 100 150

SILT: yellow, ^{fls} very stiff, Dry.

x x

100

3

100

large roots @ 2.0m

YOUNGER ASHES

x

100

3

100

pumice sand, silty, cream, medium dense

x x

100

3

100

SILT very clayey, cohesive, dark brown, dark brown orange, hard

x

200

4

100

large roots @ 4.0m

OLDER ASHES

x

400

4

60-80

brown orange, hard, slightly moist.

x x

500

4

100

coarse grained with some flecks of manganese

x x

600

5

100

pumiceous silt. Silty white, dark dry: non cohesive.

x x

700

5

100

becoming too hard to auger

MATUA

x x

800

6

800

FOR @ 9.0m: TOO HARD TO AUGER

x x

900

4

100

EXCAVATION METHOD: 75mm ϕ MACHINE AUGER + HOLLOW SPT



134

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: M. 19/1/04

RL Ground: 22.1

Logged By: MA

Description of Soil	Soil Symbol	Depth (m)	SPT	GWL	Cone Resistance	Undrained Shear Strength (kPa)		
						50	100	150
FIELD LOG								
SILT: slightly cohesive, yellow, very stiff, Dry. T/S	YOUNGER ASHES	0-1.0						
pumice sand, fine grained, cream, medium Dense Dry	YOUNGER ASHES	1.0-1.5						
SILT: very clayey, cohesive, Dark brown very stiff-hard, slightly moist Dark brown orange	YOUNGER ASHES	1.5-2.0						
pale brown orange, very stiff, moist; Big tree root @ 5.0m.	OLDER ASHES	2.0-3.0						
mixed pale cream pumiceous silt and manganese, very stiff	OLDER ASHES	3.0-4.0						
pumice sand, fine grained, white, Dense Dry	MATUA	4.0-5.0						
Very uniform sand	MATUA	5.0-6.0						
FOB @ 0.0m								
Borehole Dry End of Drilling								
Borehole Dry End of Day								

EXCAVATION METHOD: 75mm ϕ MACHINE AUGER \rightarrow HOLLOW SPT



85

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of: 1

Job No. 17018

Date Excavated: M. 19/1/04

RL Ground: 23.6

Logged By: MAA

RL IN TERMS OF METRICK DATUM

Description of Soil

Soil Symbol

Depth (m)

SPT

CWL

Undrained Shear Strength (kPa)

50 100 150

FIELD LOG

Topsoil

SILT: Very clayey, cohesive, brown yellow, very stiff, slightly moist

YOUNGER ASHES

CLAY: Dark brown, very stiff, moist

SILT: Very clayey, cohesive, Dark brown orange, stiff, moist.

coarse grained, cohesive, bright orange, moist, stiff.

OLDER ASHES

pluck yellow orange mottled cream grey purplish silt and some manganese patches

TRANSITION ZONE

EOB @ 5.0m : TARGET DEPTH

TRANSITION ZONE BETWEEN OLDER ASHES AND MATAU

Borehole Dry END OF DRILLING
Borehole Dry END OF DAY.

EXCAVATION METHOD: 75mm Ø MACHINE AUGER + HOLLOW SPT



B6

Site: MAYFIELD SUBDIVISION STAGE 6

Sheet: 1 Of 1

Job No. 17018

Date Excavated: 11/11/04

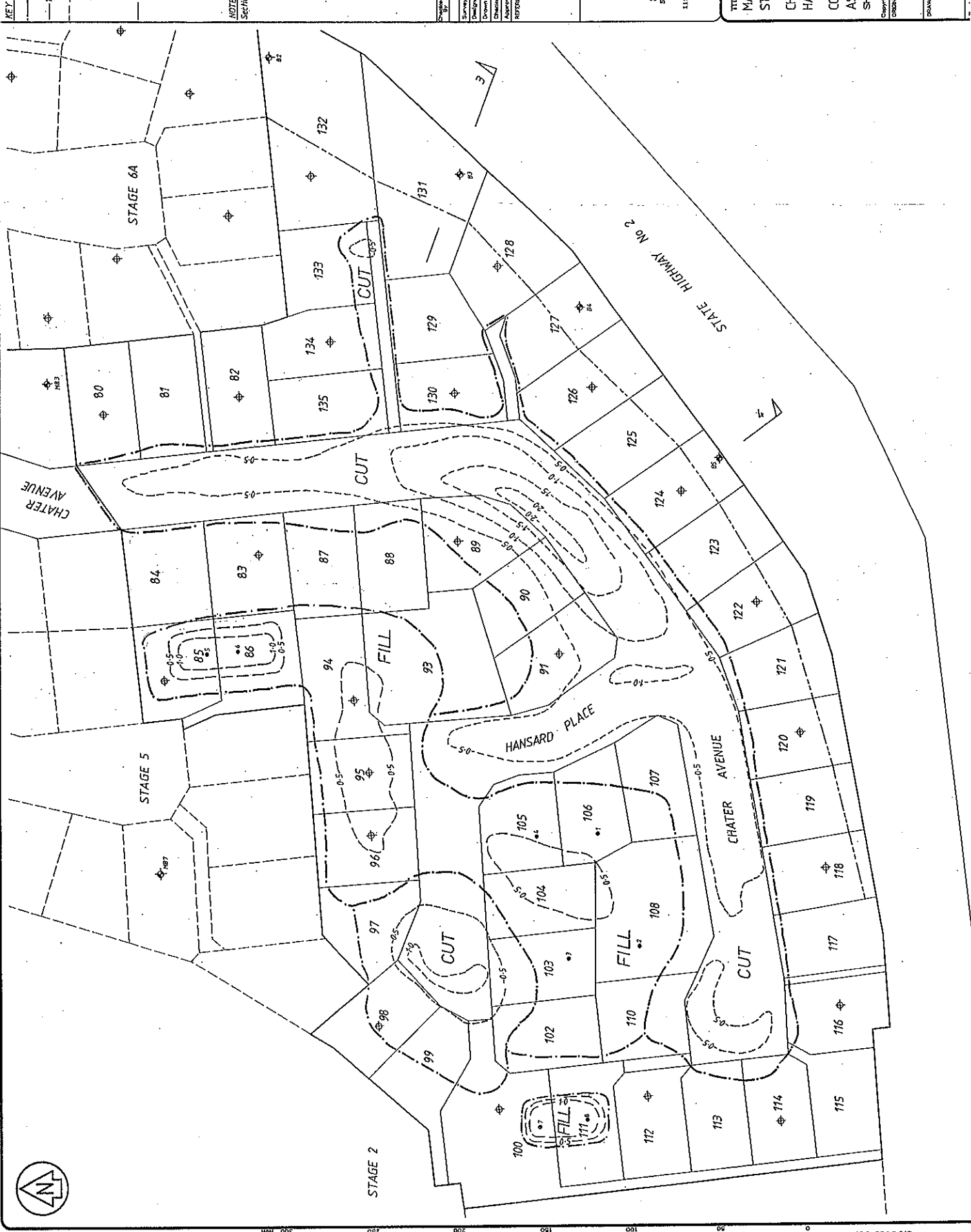
RL Ground: 31.5

Logged By: MAA

R.L. IN TERMS OF MOTURIKI DATUM

Description of Soil	Soil Symbol	Depth (m)	SPT	CORRECTION	Undrained Shear Strength (kPa)		
					50	100	150
FIELD LOG							
T/S	UU						
SILT: Vv clayey, cohesive, Dark brown orange, moist	XX						
	X			100			
pale brown yellow	XX						
	X			100			
Pumice sands, cream, moist							
Clay: Dark brown, stiff, moist			2				
SILT Dark brown orange	XY		4	NO			
	X			100			
	XX						
End @ 5.0m: TARGET DEPTH							
Borehole Dry End of Drilling and End of Day							

EXCAVATION METHOD: 75mm Ø MACHINE'S AUGER + HOLLOW SPT.



KEY

- - - - - Cut / Fill Boundary
- - - - - Depth of Fill
- - - - - Depth of Cut
- ◆ Preconstruction Borehole
- ◆ Postconstruction Borehole
- - - - - Building Restriction Line (refer to DP 343781)
- Compaction Test Position

NOTE
Sections 3 and 4 are shown on T7098-023

APP. NO.	NAME	DATE	DATE	DATE
1	224 Application			
Drawn	MMH	4.05		
Checked	SD	4.05		
Approved				

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TITLE
MAYFIELD SUBDIVISION
STAGE 6.

CHATER AVENUE
HANSARD PLACE
COMPLETED EARTHWORKS
ASBUILT PLAN
SHEET 1 OF 2

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ORIGINAL SCALE
1 : 500 (A1)

DATE
04/05

DRAWING NO.
17018-31



KEY

- - - - - Cut/Fill Boundary
- - - - - Depth of Fill
- - - - - Depth of Cut
- ⊕ Preconstruction Borehole
- ⊕ Postconstruction Borehole
- - - - - Building Restriction Line
(refer to DP 348781)

NOTE

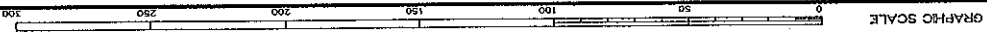
Sections 1 and 2 are shown on 77018-002.

Checked By	DATE	DESCRIPTION	DATE
1	22/4	Application	
NAME	DATE	DATE	SIGNED
Surveyed			
Designed	MWH	4-05	
Drawn	SD	4-05	
Checked			
Approved			



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TITLE	MAYFIELD SUBDIVISION
STAGE	STAGE 6:
	HAWKRIDGE HEIGHTS
	HYFORCE WAY
	COMPLETED EARTHWORKS
	ASBUILT PLAN
	SHEET 2 OF 2
Copyright in this drawing is reserved.	
ORIGINAL SCALES	DATE
1 : 500 (A1)	04/05
DRAWING No	
17018-32	
Revised	



GRAPHIC SCALE

KEY

MB Machine Borehole
19.1.04
N=9 SPT 'N' value

NOTES

- See Drawing 17018-3.1, 3.2 for profile locations.
- Levels are in terms of Moturiki Datum.

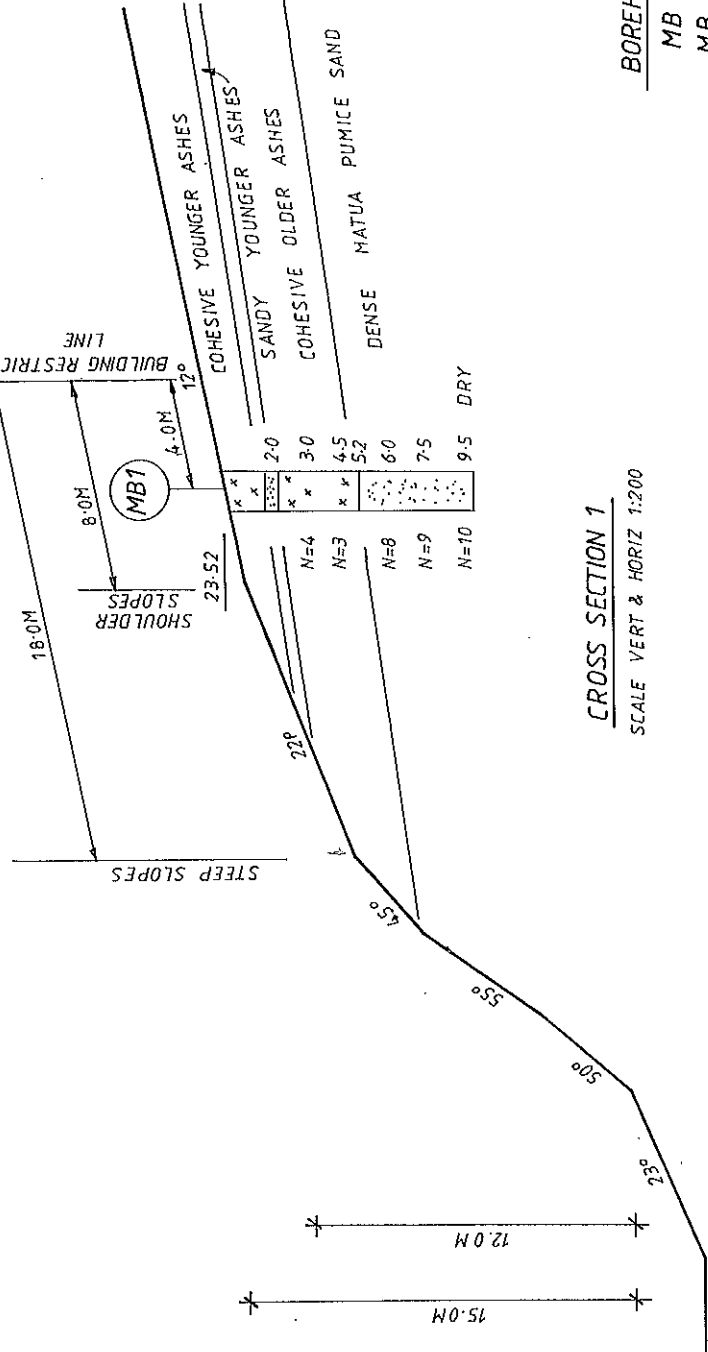
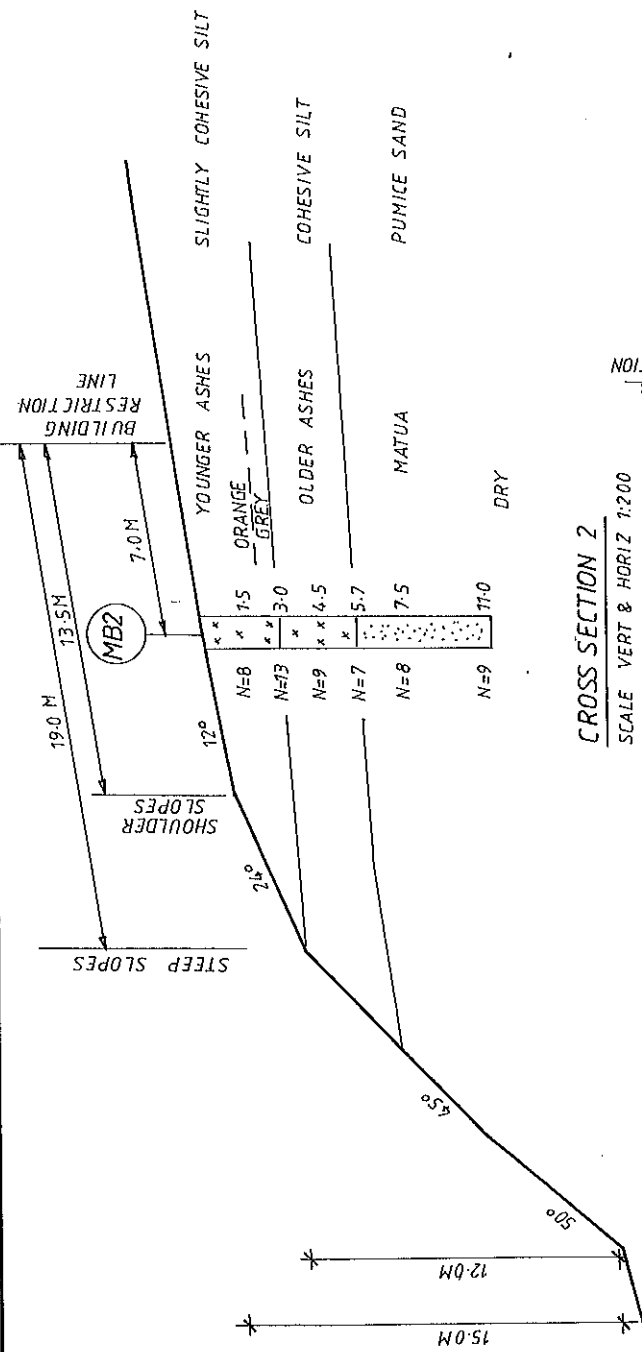
NO	DATE	DESCRIPTION	DATE	BY	CHECKED
1	22.4	AMALGAMATION	4/08		
0		SUBDIVISION CONSENT	2'04		



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TITLE MAYFIELD
RESIDENTIAL SUBDIVISION
STAGE 6
CROSS SECTION PROFILES

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DRAWING NO: AS SHOWN (A3) 2'04
DRAWING No: 17018-G02



BOREHOLE	MOTURIKI
MB 1	23.52
MB 2	28.20

KEY
 MB Machine
 Borehole
 19.1.04
 N=9 SPT 'N' value

NOTES
 1. See Drawing 17018-3, 32 for profile locations.
 2. Levels are in terms of Moturiki Datum.

224
 1 AP [unclear] 2/05
 0 SUBDIVISION 2'04
 0 CONSENT

NO	DATE	DESCRIPTION	DATE	SIGNED
1	27/11	REVISED		
2	2/04	REVISED		

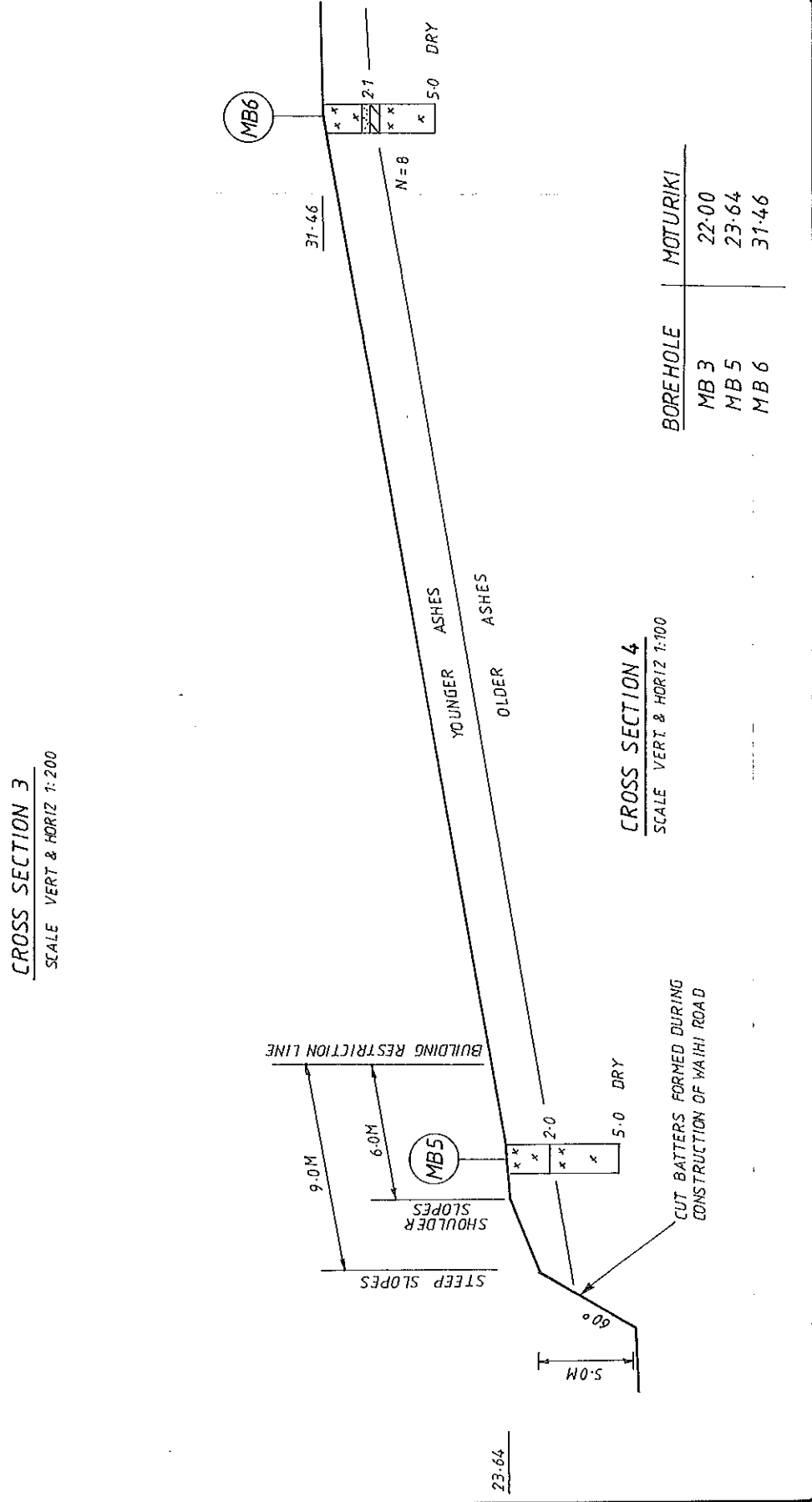
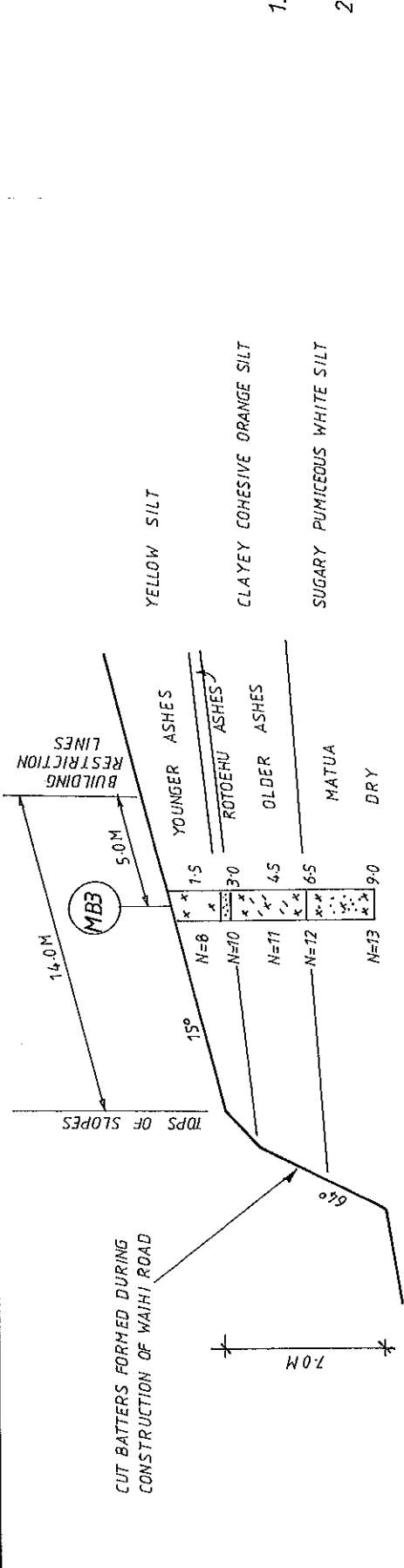
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TITLE MAYFIELD
 RESIDENTIAL
 SUBDIVISION
 STAGE 6
 CROSS SECTION
 PROFILES

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 ORIGINAL SCALE DATE
 AS SHOWN (A3) 2'04

DRAWING No
17018-G03

REVISION: 011



BOREHOLE	MOTURIKI
MB 3	22.00
MB 5	23.64
MB 6	31.46