Engineering Geology Ltd
CONSULTING GEOTECHNICAL, GEOLOGICAL AND EARTHQUAKE ENGINEERS

Unit 7C, Rosedale Office Park, 331 Rosedale Road
Albany, Auckland, New Zealand
PO Box 301054, Albany, North Shore 0752
Phone: 64 9 486 2546 Fax: 64 9 486 2556

Ref: 4597e

RESOURCE CONSENT R30581A
LOTS 1 TO 3, SUBDIVISION OF LOT 1, DP 117844, STAGE 1, MAKARAU ROAD, MAKARAU
EARTHWORKS COMPLETION REPORT

Prepared for:
SH 16 Limited
PO Box 65-191
MAIRANGI BAY, NORTH SHORE

9 July 2009

CONTENTS

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RESOURCE CONSENT R30581A
STAGE 1, LOTS 1 TO 3, SUBDIVISION OF LOT 1, DP 117844
MAKARAU ROAD, MAKARAU
EARTHWORKS COMPLETION REPORT

1.0 INTRODUCTION

This report presents the results of our observation and testing of earthworks for Stage 1 of the rural residential subdivision at the above site for SH 16 Limited. We carried out a geotechnical investigation of the property three years ago, reference our report 4597a dated 23 August 2006, which included Lots 1 to 3 and at that time we drilled a single hand auger borehole on each of the building sites. Hutchinson Consultants has carried out engineering design of the subdivision and have provided us with copies of the "as built" site plan, reference 11731 AB/05 and "as-built" cut/fill depth contour plan reference 11731 AB/04.

The subdivision comprises three residential lots and the development includes construction of building platforms on Lots 1 and 3 and a concrete drive from the existing bridge to the building sites.

Engineering Geology Ltd was engaged to undertake observations and control testing during construction of the earthworks. Following completion of the earthworks we also drilled two hand auger boreholes on the building platforms on Lots 1 and 3 to further test the compaction of the fill. Hutchinson Consultants carried out inspections during construction of the concrete drive and will provide separate certification for this aspect of the development.

2.0 SITE DESCRIPTION AND DEVELOPMENT OF THE SUBDIVISION

The property comprises a forestry block and is situated on the northern side of the Tahekeroa stream opposite the intersection of Makarau Road with Haruru Road. The land rises steeply from the stream to the north but reduces in slope to about 3H:1V in the vicinity of the Lots 1 and 3 building sites. The Lot 2 is on a near level terrace near the existing bridge.

Earthworks comprising a balanced cut to fill were carried to form level building platforms on Lots 1 and 3 and a new concrete drive has been formed from the end of the existing bridge along an existing farm track to provide access to these building sites. Minimal earthworks were carried out to form the drive and the depth of cut and fill on the Lots 1 and 3 building sites was no greater than 2m. The cut and fill batters on the building sites were shaped to an average gradient of 3H:1V.

The extent of the earthworks and location of the building platforms and the new drive is shown on the "As-Built" plans prepared by Hutchinson Consultants attached.

3.0 EARTHWORKS CONSTRUCTION AND TESTING

3.1 Observation & Testing of Fill Compaction

The earthworks were carried out in January/February 2008 and equipment used included excavators, trucks and a heavy sheep's foot compactor.

The standards adopted for the earthworks were NZS4431:1989 with testing in accordance with NZS4402:1986. The compaction standard adopted for the earth fills was an average undrained shear strength 140 kPa with no tests under 100 kPa.

During the earthworks construction we visited the site on a number of occasions to check stripping and benching of areas to be filled on the building platforms and to measure shear strengths of the compacted fill. Measured undrained shear strengths averaged 140 kPa with no tests under 100 kPa. Following completion of earthworks four hand auger boreholes, BH's 1a to 4a, were drilled through the fill on the Lots 1 and 3 building platforms with similar soil strengths recorded.

3.2 Borehole Investigation & Ground Conditions– Lots 1 to 3

A single hand auger borehole was drilled on the building sites as part of our original geotechnical investigation on the property, BH 9 (Lot 1), BH 10 (Lot 2) and BH 17 (Lot 3). Once the building platforms on Lots 1 and 3 had been completed we drilled an additional two hand auger boreholes on each platform, BH's 1a and 2a on the Lot 3 site and BH's 3a and 4a on the Lot 1 site to further test the compaction of the fill.

BH's 9, 10 & 17 extended to depths of between 4.8 and 5m and BH's 1a to 4a to depths 2.1 and 3m. The boreholes were 50mm in diameter and the in-situ, undrained shear strengths of the sub-soils were measured at 0.3m depths using a hand operated Pilcon shear vane. The approximate locations of the boreholes in relation to the recommended building sites are shown on Drawings 4597e-1 to 3 attached.

The natural subsoil's on the subdivision comprise residual silts and clays derived from the weathering of sandstone and siltstone of the Waitemata Group with the exception of BH 10 drilled on Lot 2 where the Waitemata Formation is overlain by alluvium. Based on our knowledge of the area and inspection of samples recovered from the boreholes we consider the natural and fill soils to be reactive and moderately susceptible to seasonal shrinkage and swelling (Class M, AS2870).

4.0 ASSESSMENT OF BUILDING SITES, LOTS 1 TO 3

The recommended building sites on Lots 1 and 3 have been centred on the building platforms created by the earthworks construction and set back between 10 and 12m from the steep slope on the eastern side of the sites. The Lot 2 site is centred on a near level terrace above the stream. Hutchinson Consultants have carried out a flood analysis of the site and confirm that it is above the potential stream flood level.

The recommended building sites vary in area between 225m^2 (Lot 2) to about 675m^2 (Lot 3) and are on near level land set back from the steeper slopes. Thus we consider the designated building sites to be suitably stable for building construction. The Rodney District Council District Plan specifies that rural building sites should be 1000m^2 but

allows the Council to consider sites of smaller area subject to a favourable geotechnical report.

Based on the results of our observations and testing of fill compaction and the initial geotechnical investigation carried out by us we consider building foundations on the Lots 1 to 3 recommended building sites may generally comprise conventional shallow footings. However, on Lots 1 and 3 where buildings are positioned towards the eastern end of the designated building sites near the steep slope, piling of foundations may be required subject to review of the building plans by a Geotechnical Engineer.

Building development on the designated building sites on Lots 1 to 3 is subject to the following recommendations:

1. Building foundations may generally comprise conventional shallow strip and pad footings designed under Ultimate Limit State design for a dependable bearing pressure of 150 kPa (300 kPa ultimate). Footings should be taken down at least 0.6m below finished ground levels as a precaution against the settlement affects associated with seasonal soil shrinkage. Foundation excavations should be inspected by a Geotechnical Engineer and if weak ground is encountered the footings should be deepened or pile supported.

2. On Lots 1 and 3 foundation near the steep slope at the eastern end of the building platforms may have to be specifically engineer designed and supported on bored reinforced concrete piles or concrete encased timber piles subject to the review of building plans by a Geotechnical Engineer. Bored piles founded in very stiff soils ($Cu \geq 100$ kPa) soils a minimum of 3m below present ground levels may be designed for a dependable end bearing pressure of 450 kPa (900 kPa ultimate) and a dependable skin friction resistance of 18 kPa (35 kPa ultimate) ignoring friction over the top 0.6m of pile length to allow for loss of adhesion due to soil shrinkage.

3. Floor slabs on level cut ground or well compacted fill may be cast-on-grade subject to the inspection and approval of the sub-grade by a Geotechnical Engineer. Reinforced concrete raft foundations should be designed for Class M soils. The depth of hardfill under floor slabs should not exceed 1m above present ground levels unless reviewed and approved by a Geotechnical Engineer.

4. Any earthworks on the building sites that involves cuts and fill greater than 1m should be reviewed and approved by a Geotechnical Engineer. Cuts over 1m high and any fill placed on the building sites should be retained.

5. Building platforms should be shaped to shed stormwater evenly with no concentrated flows. Water tank over flow and any concentrated flows of stormwater from hard surfaces should be piped or channelled to an approved outlet away from the steeper slopes in a manner not to cause erosion. Any overland flow should be diverted around the building sites.

6. The subsoil's are considered too impermeable for disposal of sewerage effluent by means of conventional soakage trenches. Thus the sewerage systems should be engineer designed or comprise a proprietary home treatment plant which produces a high quality effluent suitable for drip irrigation. The sewerage tanks should be positioned back from the steeper slopes and the irrigation hoses placed down slope and well away from the building sites.

7. The residual and fill soils on the site are considered to be moderately reactive and susceptible to seasonal shrinkage and swelling. Thus trees (especially exotic varieties) hedges and plants having a high water demand should not be planted near buildings on shallow footings as they can withdraw moisture from the soils and cause the foundations to settle. As a guide to Class M soils trees and other plants should not be planted closer to a building than 0.75 times the mature height of the tree or plant.

8. Building plans on all lots should be reviewed and approved by a Geotechnical Engineer familiar with the contents of this report. Building outside the recommended building sites is not necessarily excluded but would be subject to review by a Geotechnical Engineer and additional borehole investigation to further assess subsoil conditions.

9. During building construction foundation excavations and floor slab sub-grades should be inspected and approved by a Geotechnical Engineer.

5.0 CONCLUSIONS

Based on our site observations and testing of fill compaction and boreholes holes drilled on the building platforms, we are satisfied that the earthworks on the subdivision have been carried out to a satisfactory engineering standard for the development, in general accordance with NZS4431:1989 'Code of Practice for Earthfills for Residential Development'. Building development is subject to the recommendations provided in Section 4.0 above.

Accordingly, we attach our 'Statement of Professional Opinion as to Suitability of Land for Building Development' for the earthworks, which is contained in Appendix A.

ENGINEERING GEOLOGY LTD

Report prepared by	Report Reviewed by
John E Power	JA Yeats, CP Eng.
(Senior Engineering Geologist)	(Director)

APPENDIX

Engineering Geology Ltd
Consulting Geotechnical, Geological and Earthquake Engineers

Unit 7C, Rosedale Office Park, 331 Rosedale Road
Albany, Auckland, New Zealand
PO Box 301054, Albany
Telephone 09 4862546 Facsimile 09 486 2556

Ref No.: 4597e

STATEMENT OF PROFESSIONAL OPINION AS TO SUITABILITY OF LAND FOR BUILDING DEVELOPMENT

Earthworks "As-Built" Plan No's.: ***Hutchinson Consultants 11731 AB/04 & 05***

Owner: ***SH 16 Limited***

Address: ***Marakau Road***

Locality: ***Makarau***

I ***JA Yeats*** on behalf of ***Engineering Geology Limited, Unit 7C, 331 Rosedale Road, Albany***

Hereby confirm that:

1. I am a Chartered Professional Engineer experienced in the field of soils engineering and was retained by the Developer as the Soils Engineer on the above development.

2. The extent of inspections carried out under my control during construction and the results of all tests carried out are described in my report Ref: ***4597e*** dated: ***9 July 2009***

3. In my professional opinion, I consider that:
   (a) The earthworks shown on the attached Plan No. ***11731 AB/04*** have been placed in general compliance with the Standards for Engineering Design and Construction and the provisions of the District Plan of the Rodney District Council.

   (b) The completed works give due regard to land slope and foundation stability considerations.

   (c) The recommended building sites on Lots 1 to 3 as shown on Drawings 4597e-1 to 3 are suitable for the erection thereon of residential buildings providing that:

      1) ***Building foundations on Lots 1 to 3 may comprise conventional shallow footings taken down to a minimum depth of 0.6m.***
      2) ***Building development is subject to the recommendations contained in our Earthworks Completion Report reference 4597e dated 9 July 2009.***

Signed: ..... on behalf of Engineering Geology Ltd **9 July 2009**

BSc (Civ Eng), DIC, MSc (Soil Mech),CP Eng. CP Eng. No.: ***223636***

This form to be read in conjunction with Engineering Geology Ltd report Ref: ***4597e*** dated: ***9 July 2009***

Engineering Geology Ltd

BOREHOLE No. 9

Sheet 1 of 1

SITE: Lot 1 Makarau Road, MAKARAU

REF: 4597

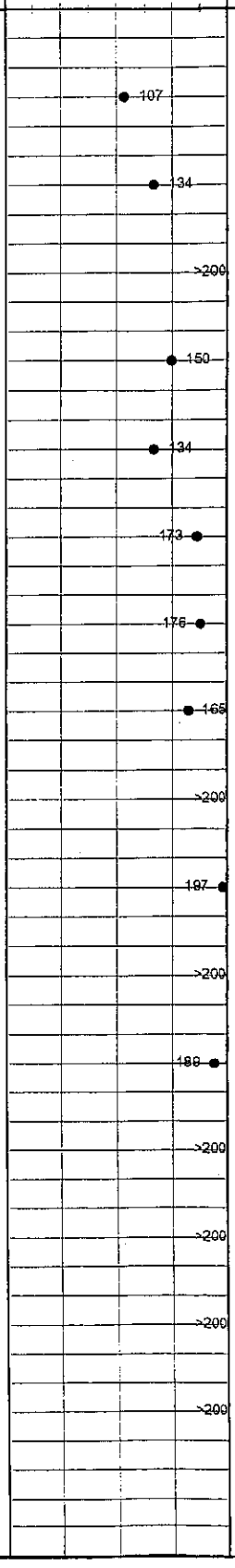
REDUCED LEVEL / STRATA INTERPRET.	DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	WATER CONTENT (%)	WATER LEVEL
Waitemata Group soils	TOPSOIL; silty, sl. sandy, stiff, wet, dark brown					
	SILT; sl. - mod. clayey, stiff, moist, orange brown with occ. limonitic inclusions					
	frequent black - dark orange brown limonitic inclusions					
	sl. sandy		1			
	no sand, sl. clayey					
	sl. sandy, occ. friable rounded silty inclusions					
	SILT; mod. sandy(c), stiff, moist - wet, dark orange brown with occ. white specks		2			
	SILT; stiff, moist, v. friable, lt. grey, occ. small CW rounded gravels(f)					
	SILT; sandy(m-c), stiff, moist - wet, dark orange brown		3			
	SILT; stiff, moist, friable, lt. grey white					Dry: 15/8/01
	mod. sandy(c), brownish grey					
	occ. black mottles		4			
	occ. limonitic staining					
	sl. - mod. clayey, sl. plastic horizon					
	E.O.B @ 4.8 m (Too hard to auger)		5			

CORRECTED VANE SHEAR STRENGTH (kPa)

● Field vane (BS 1377)

○ Remoulded Field vane

50 100 150



NOTES

LOGGED BY: PC

DATE DRILLED: 15-Aug-01

DRILL METHOD: 50 mm Hand Auger

Engineering Geology Ltd

BOREHOLE No. 10

Sheet 1 of 1

SITE: Lot 2 Makauau Road, MAKARAU

REF: 4597

REDUCED LEVEL / STRATA	DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	WATER CONTENT (%)	WATER LEVEL	CORRECTED VANE SHEAR STRENGTH (kPa) ● Field vane (BS 1377) ○ Remoulded Field vane 50 100 150
Alluvium	TOPSOIL; tr.clay, silty, moist, brown, organic						
	SILT; sl.clayey, tr.sand, v.stiff, moist, silt inclusion (f), orange/brown, tr.organics, (black flecks), lt.grey/orange						112
	lt.grey, orange/brown, red/brown, limonite, staining						129
	sl.sandy						154
	reddish/brown, lt.grey, limonite nodules		1				
	orange, lt.grey, red/brown & black streaks, limonite & MngO staining						154
							162
	sandy						158
	wet, (g/water encountered at 2.0m)		2		2.0m		151
	clayey, sl.sandy, m/plastic						
	h/plastic, lt.grey, orange streaks						139
	CLAY; silty, sl.sandy, stiff, moist, h/plastic, grey/, blue, silt inclusions (f), organics (rotted wood)						63
	wet, no rotted wood						50
	saturated, (g/water encountered at 3.1m)		3		3.1m	3.3m 15/06/2006	
	firm						47
	dark grey						71
	stiff						
	tr.sand, lt.grey/blue						90
	SILT; clayey, sandy, stiff, wet, h/plastic, dark grey		4		4.1m		
	tr.clay						63
	saturated, (g/water encountered at 4.1m)						
	SAND; silty, stiff, saturated, loose, weathered, siltstone fragments (m), dark grey						63
	hard						>200
	E.O.B. at 4.8m (Too Hard to Auger)		5				

NOTES

LOGGED BY: RB

DATE DRILLED: 15-Jun-06

DRILL METHOD: 50mm Hand Auger

Engineering Geology Ltd

BOREHOLE No. 17

SITE: I Lot 3 Makarau Road, MAKARAU

REF: 4597

Sheet 1 of 1

REDUCED LEVEL / STRATA	DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	WATER CONTENT (%)	WATER LEVEL
Waitemata Group	TOPSOIL; silt, moist, sl. friable, grey brown					
	SILT; mod. topsoil, moist, stiff, grey brown, grey orange brown					
	tr. clay, no topsoil, light grey, orange					
	v. stiff					
	clayey, tr. sand (f), sl. plastic		1			
	CLAY; silty, moist, plastic, v. stiff, orange, light grey					
	limonite stains, dark orange brown streaks		2			
	SILT; clayey, moist, mod. plastic, v. stiff, light grey, orange					
	tr. clay, MnO nodules, non plastic, black mottles		3			
	tr. sand (f)					
	tr. grit (f-m)		4			4.5m 28/07/2006
	sl. sandy (f-m), no clay			4.5m		
	saturated, seepage encountered @ 4.5m					
	sandy (f), orange brown, light grey					
	E.O.B. @ 5.0m		5			

CORRECTED VANE SHEAR STRENGTH (kPa)

● Field vane (BS 1377)

o Remoulded Field vane

50 100 150

63 141 159 168 190 186 167 156 132 129 144 127 181 159 119 103

NOTES

LOGGED BY: DM

DATE DRILLED: 28-Jul-06

DRILL METHOD: 50 mm Hand Auger

Engineering Geology Ltd

BOREHOLE No. 1A

SITE: Lot 3 , Makarau Road, MAKARAU

REF: 4597

Sheet 1 of 1

REDUCED LEVEL / STRATA	DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	WATER CONTENT (%)	WATER LEVEL
Fill	SILT; tr. clay, tr. sand (f), dry-moist, friable, v. stiff					
	sl. clayey, sl. friable					
	tr. clay, stiff					
Waitemata Group	SILT; clayey, moist, sl.plastic, stiff, orange brown					
	tr. clay, stiff, tr. sand (f), sl. friable, v. stiff					
	sandy (f-m), no clay, mod. friable					
	hard		1			
	SAND (f-m), silty, moist, med. dense, light yellow grey, orange					
	SILT; sandy (f-m), moist, mod. friable, hard, light yellow grey, orange					
	tr. clay, tr. sand (f), light grey, orange		2			Dry 11/03/2008
	E.O.B. @ 2.1m					
			3			
			4			
			5			

CORRECTED VANE SHEAR STRENGTH (kPa)

● Field vane (BS 1377)

○ Remoulded Field vane

50 100 150

156 144 139 91 144 >202 166 >202 UTP >202 UTP >202 UTP

NOTES

LOGGED BY: DM

DATE DRILLED: 11-Mar-08

DRILL METHOD: 50 mm Hand Auger

Engineering Geology Ltd

BOREHOLE No. 2A

SITE: Lot 3 , Makarau Road, MAKARAU

REF: 4597

Sheet 1 of 1

REDUCED LEVEL / STRATA	DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	WATER CONTENT (%)	WATER LEVEL
Fill	SILT; tr. clay, tr. sand (f), dry-moist, mod. friable, v. stiff		0			
	sl. clayey, sl. friable					
	tr. clay, mod. friable					
	sl. clayey, moist, sl. friable					
	hard					
	clayey, no sand		1			
	sl. clayey					
	v. stiff					
	hard					
	v. stiff					
Waitemata Group	SILT; tr. clay, moist, sl. friable, hard, light grey, orange, orange brown		2			
	sl. clayey, sl. plastic					
	tr. clay, non plastic, sl. friable					
	clayey, sl. plastic					
	CLAY; silty, moist, plastic, v. stiff, light grey, orange, orange brown		3			
	E.O.B. @ 3.0m					
			4			
			5			

Dry 11/08/2008

CORRECTED VANE SHEAR STRENGTH (kPa)

● Field vane (BS 1377)

○ Remoulded Field vane

50 100 150

193, 126, 150, 134, >202, >202 UTP, 144, 147, >202, 144, 144, >202, >202, >202 UTP, 178

NOTES

LOGGED BY: DM

DATE DRILLED: 11-Mar-08

DRILL METHOD: 50 mm Hand Auger

Engineering Geology Ltd

BOREHOLE No. 3A

SITE: Lot 1, Makarau Road, MAKARAU

REF: 4597

Sheet 1 of 1

REDUCED LEVEL / STRATA	DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	WATER CONTENT (%)	WATER LEVEL	CORRECTED VANE SHEAR STRENGTH (kPa) ● Field vane (BS 1377) ○ Remoulded Field vane 50 100 150
Fill	SILT; tr. clay, moist, stiff						87
	tr. sand (f)						58
	dry-moist, sl. friable, v. stiff						91
	clayey, no sand, non friable						159
	tr. clay, tr. sand (f), sl. friable, hard						>202 UTP
	tr. gravel (f), dry, friable						>202 UTP
	no gravel		1				>202 UTP
	tr. gravel (f)						>202 UTP
	no gravel, no sand, moist, non friable						>202 UTP
	tr. gravel (f), dry, sl. friable						>202 UTP
	no gravel						>202 UTP
Waitemata Group	CLAY; silty, dry-moist, sl. plastic, v. stiff, orange brown, orange, light grey		2				191
	SILT; clayey, sl.sandy (f), moist, sl.plastic, v.stiff sl. clayey, tr. sand (f), orange, light grey					Dry 11/03/2008	118
	tr. clay, non plastic						176
	clayey, no sand, sl. plastic						
	tr. clay, non plastic		3				196
	E.O.B. @ 3.0m						
			4				
			5				

NOTES

LOGGED BY: DM

DATE DRILLED: 11-Mar-08

DRILL METHOD: 50 mm Hand Auger

Engineering Geology Ltd

BOREHOLE No. 4A

SITE: Lot 1, Makarau Road, MAKARAU

REF: 4597

Sheet 1 of 1

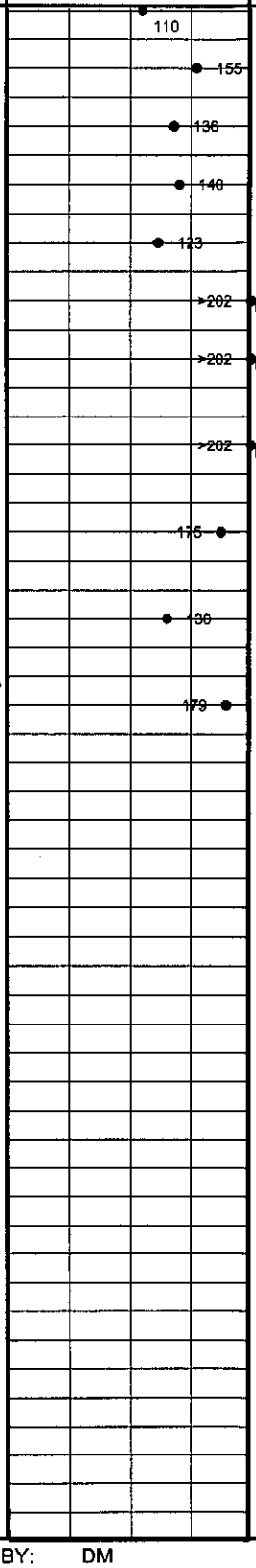
REDUCED LEVEL / STRATA	DESCRIPTION OF SOIL	SOIL SYMBOL	DEPTH (m)	SAMPLE TYPE	WATER CONTENT (%)	WATER LEVEL
Fill	SILT; tr. clay, moist, v. stiff					
	sl. clayey, sl. plastic					
	tr. clay, dry-moist, non plastic tr. sand (f)					
	dry, friable, hard		1			
Waitemata Group	SILT; clayey, dry-moist, hard, orange, orange brown					
	CLAY; silty, dry-moist, sl. plastic, v. stiff, orange, light grey moist, plastic		2			Dry 11/03/2008
	SILT; clayey, moist, sl. plastic, orange, light grey tr. clay, tr. sand (f), non plastic, light grey, orange					
	E.O.B. @ 2.5m		3			
			4			
			5			

CORRECTED VANE SHEAR STRENGTH (kPa)

● Field vane (BS 1377)

○ Remoulded Field vane

50 100 150



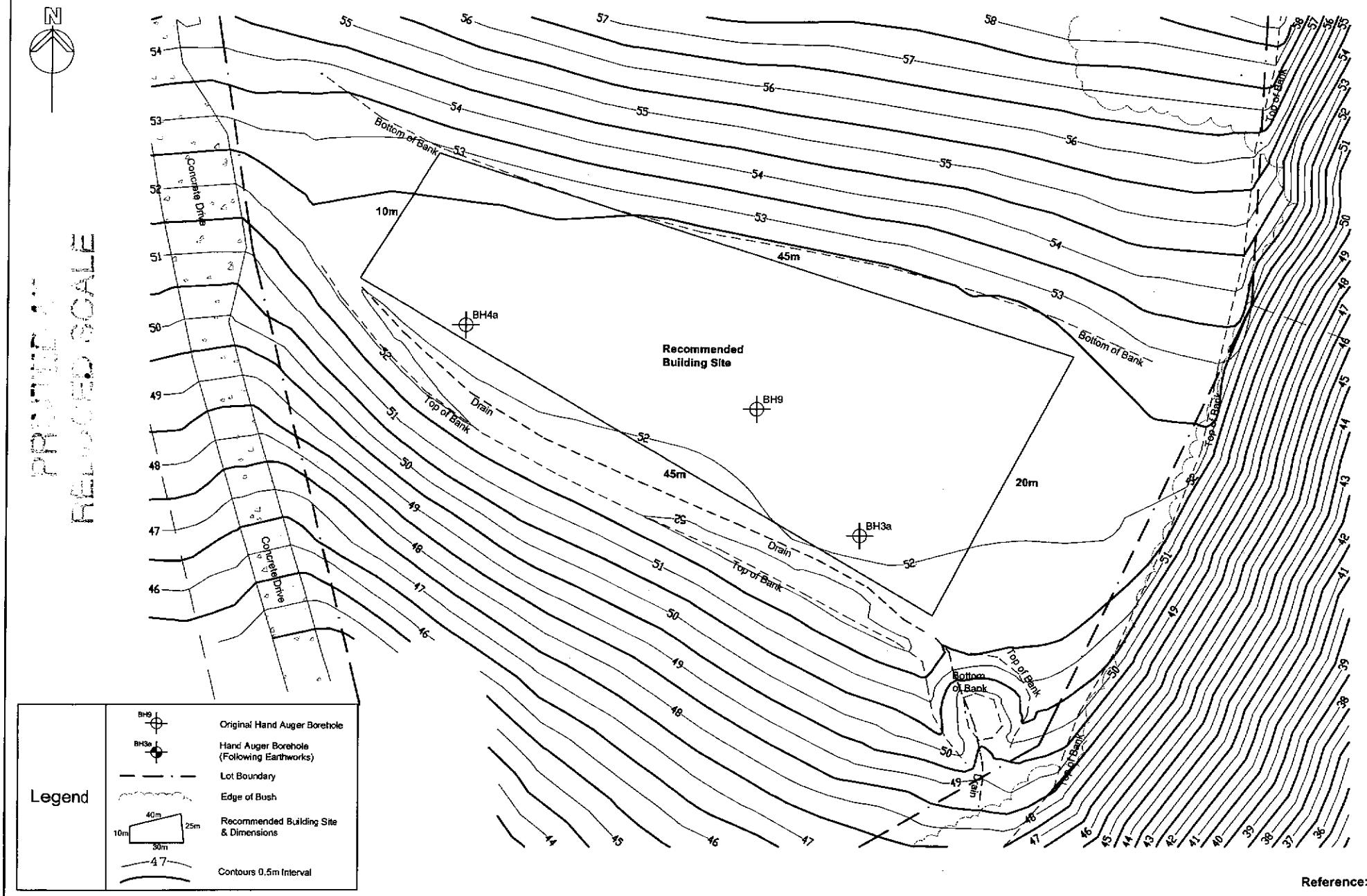
NOTES

LOGGED BY: DM

DATE DRILLED: 11-Mar-08

DRILL METHOD: 50 mm Hand Auger

DRAWINGS



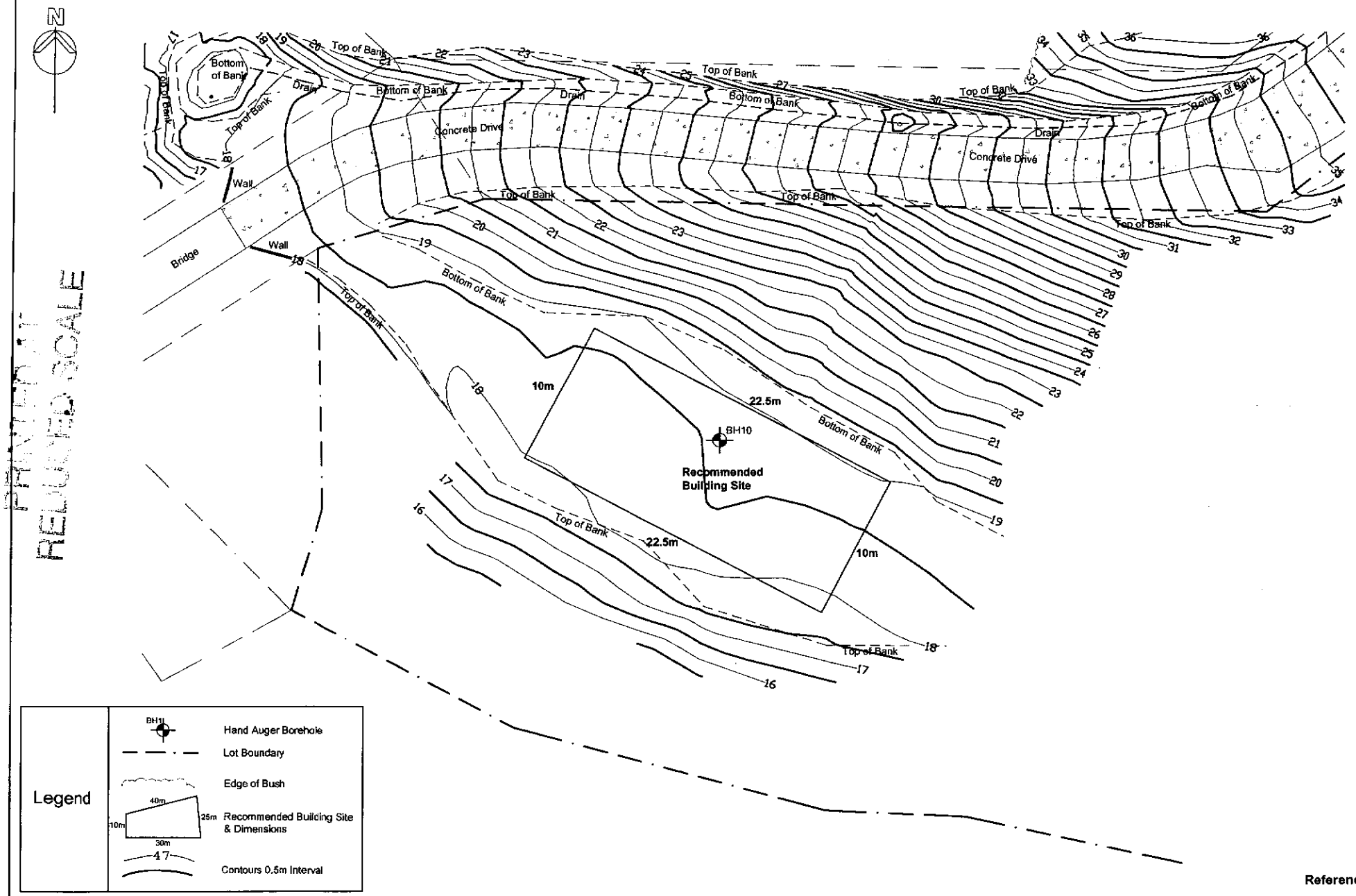
Reference: C&R Surveyors

ENGINEERING GEOLOGY LTD
Unit 7C, 331 Rosedale Rd, PO Box 301054, Albany
Ph (09)486-2546, Fax (09)486-2556

Lot 1 Building Site, Makarau Road, MAKARAU

Borehole Location Plan

Drawing No.	4597e-1
Date:	January 2009
Drawn:	MH
Scale:	1:250 (@A3)
Filename:	4597e-1.dwg



PRELIMINARY

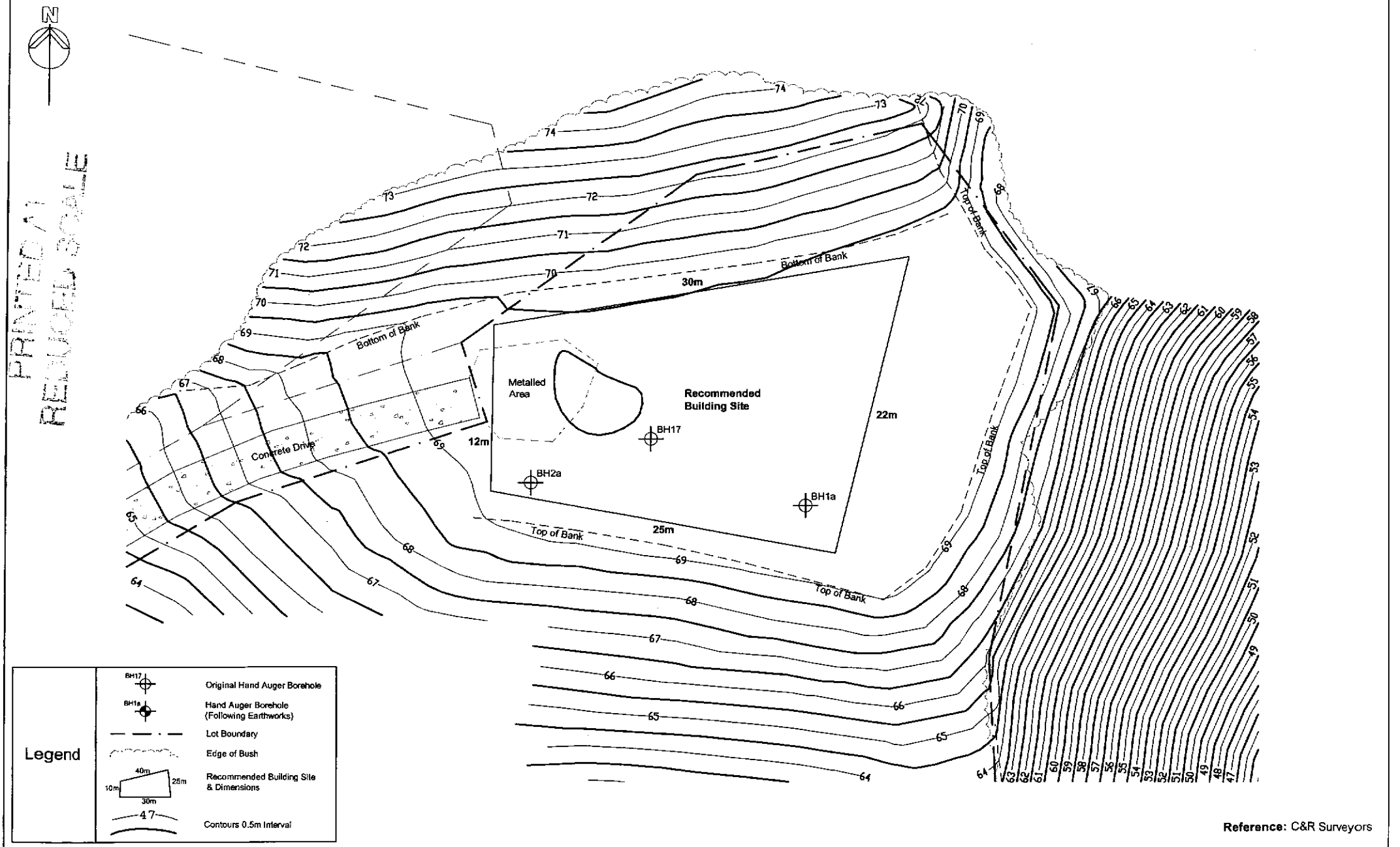
Reference: C&R Surveyors

ENGINEERING GEOLOGY LTD
Unit 7C, 331 Rosedale Rd, PO Box 301054, Albany
Ph (09)486-2546, Fax (09)486-2556

Lot 2 Building Site, Makarau Road, MAKARAU

Borehole Location Plan

Drawing No.	4597e-2
Date:	June 2009
Drawn:	MH
Scale:	1:250 (@A3)
Filename:	4597e-2.dwg



Legend

- BH17 — Original Hand Auger Borehole
- BH1a — Hand Auger Borehole (Following Earthworks)
- Lot Boundary
- Edge of Bush
- Recommended Building Site & Dimensions (40m, 25m, 10m, 30m)
- 47 — Contours 0.5m Interval

Reference: C&R Surveyors

ENGINEERING GEOLOGY LTD
Unit 7C, 331 Rosedale Rd, PO Box 301054, Albany
Ph (09)486-2546, Fax (09)486-2556

Lot 3 Building Site, Makarau Road, MAKARAU

Borehole Location Plan

Drawing No.	4597e-3
Date:	June 2009
Drawn:	MH
Scale:	1:250 (@A3)
Filename:	4597e-3.dwg

LEGEND:

CUT
VOLUME 3347m³
AREA 4024m²

FILL
VOLUME 3457m³
AREA 4962m²

NOTE:

ALL LEVELS RELATE TO L & S DATUM.
ALL AREAS SUBJECT TO FINAL SURVEY

REV.	DATE	ITEM

DO NOT SCALE IF IN DOUBT -- ASK

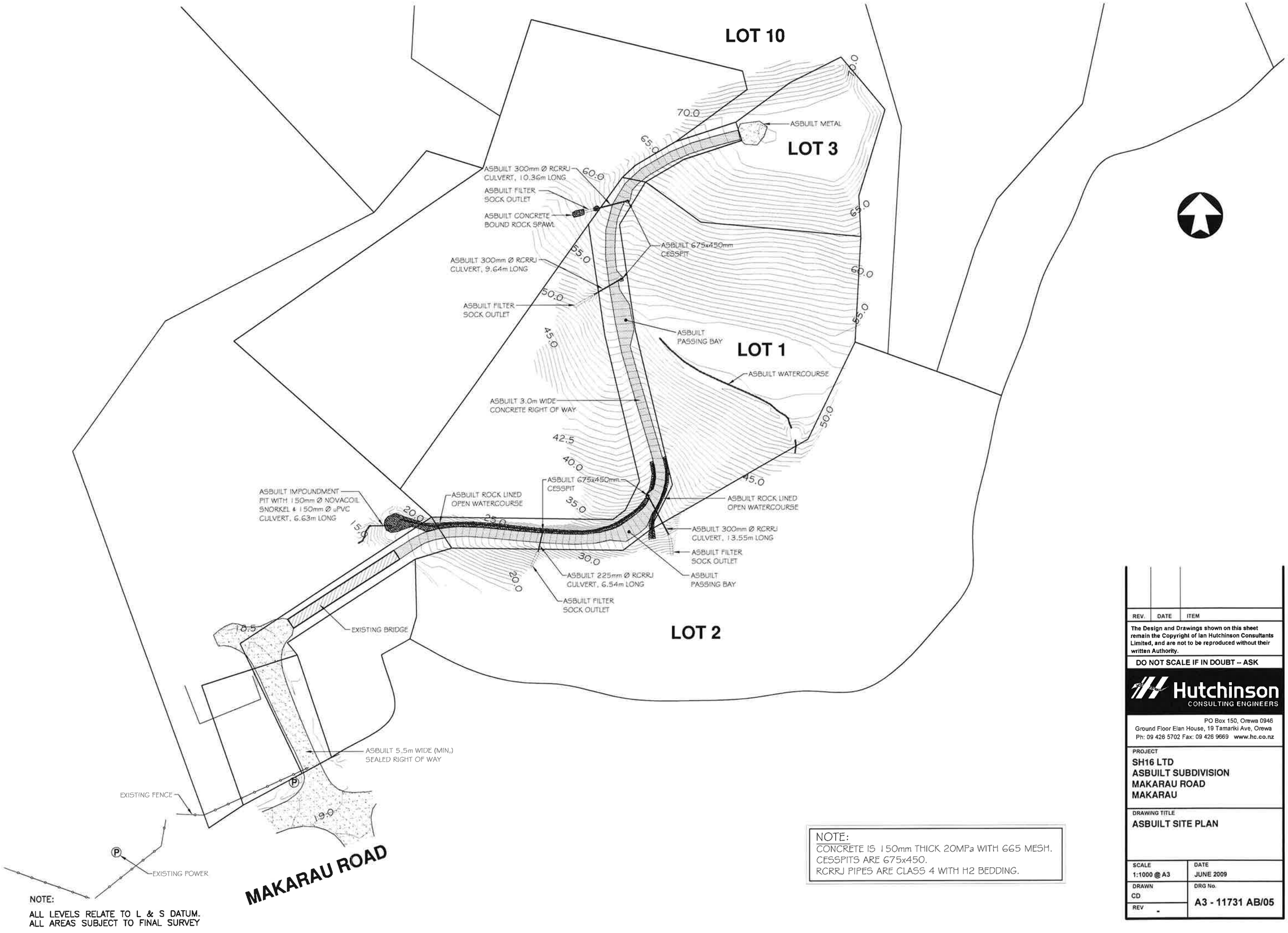
Hutchinson
CONSULTING ENGINEERS

PO Box 150, Orewa 0946
Ground Floor Elan House, 19 Tamariki Ave, Orewa
Ph: 09 426 5702 Fax: 09 426 9669 www.hc.co.nz

PROJECT
SH16 LTD
ASBUILT SUBDIVISION
MAKARAU ROAD
MAKARAU

DRAWING TITLE
ASBUILT CUT / FILL DEPTH CONTOUR PLAN

SCALE	DATE
1:1000 @ A3	JUNE 2009
DRAWN: CD	DRG No. A3 - 11731 AB/04
REV -	



NOTE:
ALL LEVELS RELATE TO L & S DATUM.
ALL AREAS SUBJECT TO FINAL SURVEY

NOTE:
CONCRETE IS 150mm THICK 20MPa WITH G65 MESH.
CESSPITS ARE 675x450.
RCRRJ PIPES ARE CLASS 4 WITH H2 BEDDING.

REV.	DATE	ITEM

DO NOT SCALE IF IN DOUBT -- ASK

Hutchinson
CONSULTING ENGINEERS
PO Box 150, Orewa 0946
Ground Floor Elan House, 19 Tamariki Ave, Orewa
Ph: 09 426 5702 Fax: 09 426 9669 www.hc.co.nz

PROJECT
SH16 LTD
ASBUILT SUBDIVISION
MAKARAU ROAD
MAKARAU

DRAWING TITLE
ASBUILT SITE PLAN

SCALE	DATE
1:1000 @ A3	JUNE 2009
DRAWN CD	DRG No. A3 - 11731 AB/05
REV -	