

BIS1603.2 CONO

HAMILTON CITY COUNCIL

CONSENT NOTICE PURSUANT TO SECTION 221

OF RESOURCE MANAGEMENT ACT 1991

In the matter of Lots 1,2,3,4 and 5 DPS 65422
being a subdivision of Certificate of Title
11D/1169 (all)

and

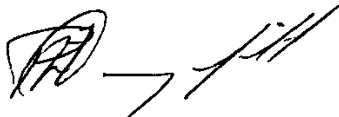
In the matter of a subdivision consent
pursuant to Sections 108, 220 and 221 of the
Resource Management Act 1991.

Pursuant to Section 220 (1) of the Resource Management Act 1991, the Hamilton City Council by resolution passed under delegated authority on 6 August 1992 imposed the following condition on the resource consent to subdivide Lot 2 DPS 14093:-

"A consent notice pursuant to Section 221 of the Resource Management Act 1991 being registered on the Certificate of Titles for Lots 1,2,3,4 and 5 to inform the owners and their successors in title that there are restrictions on the siting of buildings, stormwater disposal and effluent disposal and other stipulations noted in the soil report for the subdivision by Mr M T Mitchell and dated 23 July 1991."

A copy of the abovementioned report is appended to this consent notice.

Dated at Hamilton this 10th day of June 1993.

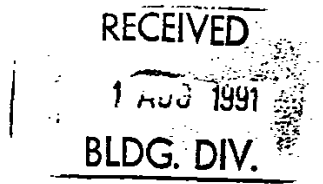


P E Dangerfield
CITY SECRETARY/ASSOCIATE TOWN CLERK

Mitchell

Geotechnical Engineer

1202/1 Victoria Street
P.O. Box 9123
Hamilton New Zealand
Facsimile 071 393-125
Telephone 071 383-119



Ref: W - 2777

23 July, 1991

McPherson & Goodwin
Registered Surveyors & Town Planners
P O Box 9379
Hamilton

Dear Sirs,

Re: Site Investigation and Geotechnical Appraisal
Proposed Subdivision of Lot 2. DPS 14093
C G & S Houghton Property, Hukanui Road, Hamilton

In accordance with a request from Mr Houghton, we have undertaken a Site Investigation and Geotechnical Engineering Appraisal of the above referenced property. The property is to be subdivided into four lots, designated Nos 1 to 4. The Lots are immediately adjacent to a steep sided gulley.

This report is directed towards reviewing the stability of the ground in the vicinity of these lots and establishing guidelines for residential development.

1. Field Investigation and Soil Conditions

The proposed lots typically consists of an upper flat area, overlooking a steeply sloping area, the base of which is a gulley arm of a tributary leading to the nearby Waikato River. In the bottom of the main gully is the Kirikiriroa Stream. The flatter ground at the top of the slope is currently covered in established grass, with light bush and scrub or gorse and blackberry covering the slopes. At the top of the southern slope adjacent to Lots 3 & 4 there is a row of large pine trees. The sloping ground is observed to be particularly steep in parts and this reflects the extent of the vegetative protection provided in the past.

The site was investigated by carrying out an inspection of the steeper slopes and by drilling a series of four hand auger borings at locations as shown on the Site Plan, Drawing No. 2777-01. The boring logs are presented on Figs. A-1 to A-2. Scala Penetrometer probes and insitu shear vanes were also carried out in association with the test borings and test results are shown on the Boring Logs. The purpose of the borings and probes was to provide guidance as to the general subsurface conditions and relative density of soils at the site.

The soils at the site within the upper flat areas, as revealed by the test borings and by an inspection of the slopes below, consist of up to 200mm of TOPSOIL overlying loose and soft to firm, silty LOAM to about 0.5 to 1.0 metres depth. Below this depth, are interbedded SILTS and SANDS. The soils exposed on the steeper slopes are similar to those encountered in the borings, with the soils in the upper part of the slopes being generally dry with little evidence of groundwater outflows.

The soils encountered in the borings and exposed on the steeper slopes are of the Hinuera Formation, an alluvial deposit put down about 20,000 years ago when the Waikato River consisted of a vast flood plain. In more recent times, the Waikato River has become entrenched and has cut down to its present level over the past several thousand years. At the same time, the tributaries of the Waikato River would have also rapidly cut down into its base. This rapid cutting down has lead to the development of the relatively steep slopes.

At a later date, it is probable that further headward erosion of the nearby minor tributary occurred to form the present gulley formation.

2. Slope Stability Review

The soils of the Hinuera Formation in the vicinity of the site are generally competent, as evidenced by the steepness of the escarpment, which lies at an angle of about 35 to 50 degrees to the horizontal and which is generally typical of the area. Ground Profiles D-D and E-E which have been measured in the area of steeper ground are presented on Drawing Nos. 2777-03 and -04.

In the tributary gully, off the main Kirikiriroa Stream gully, the ground slopes are slightly flatter, as shown on Ground Profiles A-A, B-B & C-C. These profiles are presented on Drawing Nos. 2777-02 and -03.

There is some minor evidence of ground surface creep on the outer faces of the steeper slopes. The scrub and tree roots have generally stabilized the surface soils on the slopes in the past, but it is to be expected that occasional near-surface slippages will occur from time to time as the surface of the slope undergoes further weathering. The extent of these anticipated minor slippages could be minimized by maintaining a close cover of vegetation over the slopes in the future.

Immediately after any gorse and blackberry has been cleared from a slope, a planting programme should be instigated.

However, where there is a reasonable setback distance provided between any residential structure and the top of slope, it is expected that the creep movements or minor slippages will have no affect upon the structure.

3. Stormwater Disposal

It is important that all concentrated stormwater from off roof and driveway areas, together with water tank overflows be carefully controlled and intercepted so that it does not flow over the slopes within the site. The stormwater should be piped to the the base of the slope or six metre deep soakholes may be used, provided they are located a minimum distance of thirty metres from the top of any slope.

We also advise that in spite of all precautions, there is always a risk of some unforeseen event, such as an earthquake/intense downpour which could result in rapid erosion of a portion of one of the steeper slopes. For this reason, and to ensure that there is an adequate factor of safety against instability of the soils upon which the structure may be built, an appropriate building line setback from the edge of the slope is recommended. In some circumstances, foundation deepening may also be required.

4. Recommendations for Development - Location of Residential Dwellings

As indicated above, because of the steepness of the slope and the possibility of some erosion of the steeper slope over the expected life of the proposed dwelling, a building line setback from the edge of the steeper slopes is recommended.

We advise that it would be preferable for all structures to be located a minimum of 7 metres from the edge of the steeper slope. At locations where the upper soil slope is relatively steep, such as along the southern boundary, this building setback should be increased to 10 metres from the edge of the slope. Under certain circumstances, it may be possible to build at closer to the edge of the slope than these distances. However such a proposal would require a Specific Design by a Registered Engineer.

Effluent from septic tanks may be disposed of through conventional drainfields. However such drainfields should be located at least 30 metres away from the edge of the slopes.

We further advise that no filling be placed over the steeper slope as this may initiate slippage within the underlying natural soils.

5. House Foundation Recommendations

The upper flat areas which would be used for building sites are expected to have variable soils layers in about the upper metre. The test borings show the soils in this zone are firm and loose and these soils should be compacted where they occur below building foundations or the foundations deepened accordingly.

Where a concrete slab-on-grade floor slab is planned for a development, the building site should be first stripped of all topsoil and then compacted with a self-propelled vibratory roller. Below any load bearing walls and exterior walls, some foundation deepening may be required if soft silts are located at close to the exposed ground surface. The replacement sand filling should be compacted in maximum 250mm lifts with the same vibratory roller.

6. Roadway Construction

The silt and loose sand deposit which occurs at close to ground surface is expected to have a low California Bearing Ratio (CBR) value. Undercuts in the order of 400mm below subgrade level, with the area backfilled with compacted sand, are likely to be required if the silt and sand layers were to remain in its present state. Under favourable weather conditions, compaction of the silt and sand deposits under controlled water content conditions may be possible, thereby enabling the depth of undercut to be reduced.

For the Right-of-Way Gulley Crossing, the immediate surface softer soils should be removed prior to the commencement of the general roadway filling operation. It is also recommended that preloading of this gulley crossing be carried out prior to the construction of the final formation. This would minimize future settlement of this filling.

7. Conclusion

Our investigation has revealed that Lot 1 to 4 of the proposed subdivision is suitable for residential development, subject to the recommendations as set out above.

An Appendix A; NZS 4404 Statement relating to Lot 1 to 4 of the proposed subdivision is enclosed.

Yours faithfully,



Mark T Mitchell
Consulting Geotechnical Engineer

Geotechnical Engineer

1202/1 Victoria Street
P.O. Box 9123
Hamilton New Zealand
Facsimile 071 393-125
Telephone 071 383-119

Ref: NZS 4404 : 1981

APPENDIX A

To: The Group Manager - Works Services
Hamilton City Council
Private Bag
Hamilton

Ref: W - 2777

STATEMENT OF PROFESSIONAL OPINION AS TO
SUITABILITY OF LAND FOR SUBDIVISION

Subdivision : Proposed Houghton Subdivision
Owner/Developer : C G & S Houghton
Location : Lot 2, DPS 14093, Hukanui Road, Hamilton

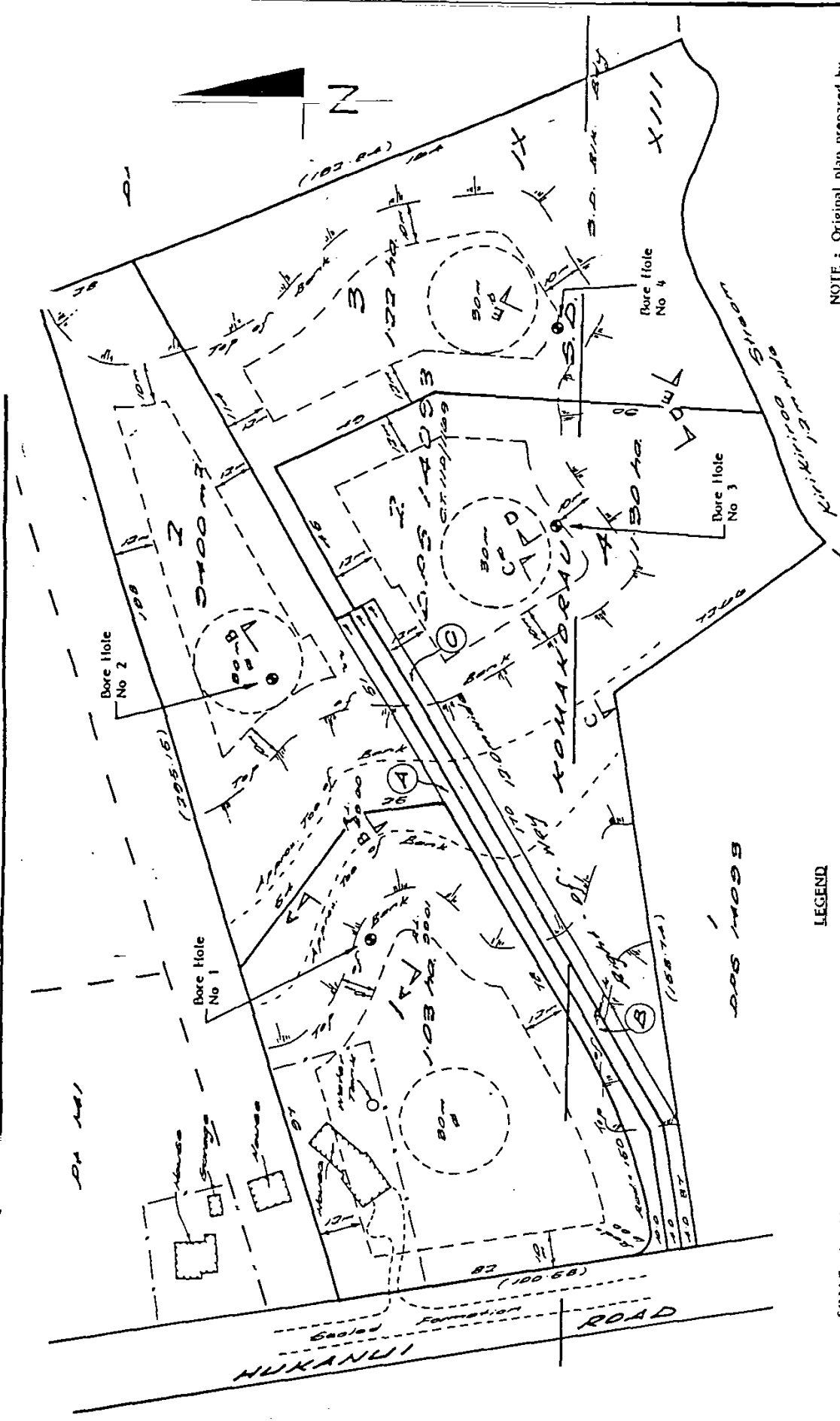
I, Mark Thomson Mitchell, Consulting Geotechnical Engineer of 1202/1 Victoria Street, Hamilton, hereby confirm that:

1. I am a Registered Engineer experienced in the field of soils engineering and more particularly land slope and foundations stability as applicable and was retained by the Mr & Mrs Houghton, Owners of the project to advise on the proposed development.
2. Site Investigations have been carried out under my direction and are described in my report dated 23 July, 1991
3. In my professional opinion, not to be construed as a guarantee, I consider that the proposed works give due regard to land slope and foundation stability considerations and that the land is suitable for the proposed subdivision, provided the recommendations as contained in my Geotechnical Report of 23 July, 1991 are followed.
4. This professional opinion is furnished to the Hamilton City Council and the Owner for their purposes alone, on the express condition that it will not be relied upon by any other person and does not remove the necessity for further inspection and investigations during the course of development of the site and associated structures and works.



Mark T Mitchell
Consulting Geotechnical Engineer

23 July, 1991



NOTE: Original plan prepared by
 M. Pierson and Goodwin
 Registered Surveyors
 5 Hardley St, Hamilton.

LEGEND

- denotes Bore Hole locations
- A-A " Ground Profile locations

SCALE 1 : 1000

DRAWING No. 2777-01
 DATE July 1991
 ISSUE One

SITE PLAN

C.G. & S. HOUGHTON

Proposed Subdivision of Lot 2 DPS 14093
 Hukanui Road, Hamilton.

Mark T Mitchell
 Consulting Geotechnical Engineer

1202 Victoria St, P.O. Box 9123, Hamilton.

Bore Hole
No 1

Horizon 4
? Silty loam
? ?
? Fine-med. sand
? ?
? Gorse
? Soft to firm silt

Gorse and Blackberries

GROUND PROFILE A - A

Horizontal

Bore Hole
No 2

Horizon 4
? Silty loam
? ?
? Fine silt
? ?
? Loose fine-med. sand

Hedge

Gorse and Blackberries

GROUND PROFILE B - B

Horizontal

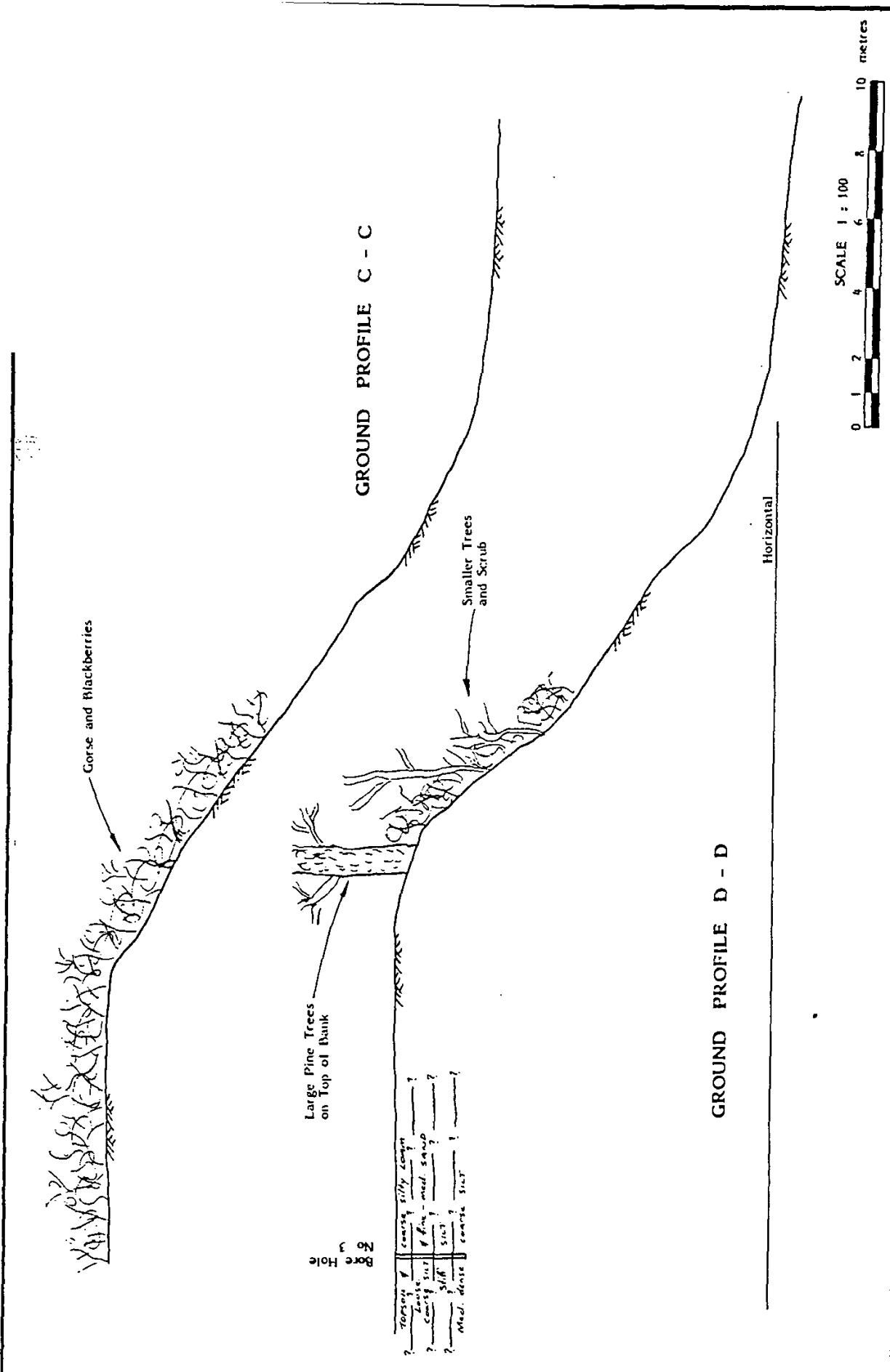


Mark T Mitchell
Consulting Geotechnical Engineer
1202 Victoria St, P.O. Box 9123, Hamilton.

C.G. & S. HOUGHTON
Proposed Subdivision of Lot 2 DPS 14093
Hukarui Road, Hamilton.

GROUND PROFILES

DRAWING No. 2777-02
DATE July 1991
ISSUE One



GROUND PROFILE C - C

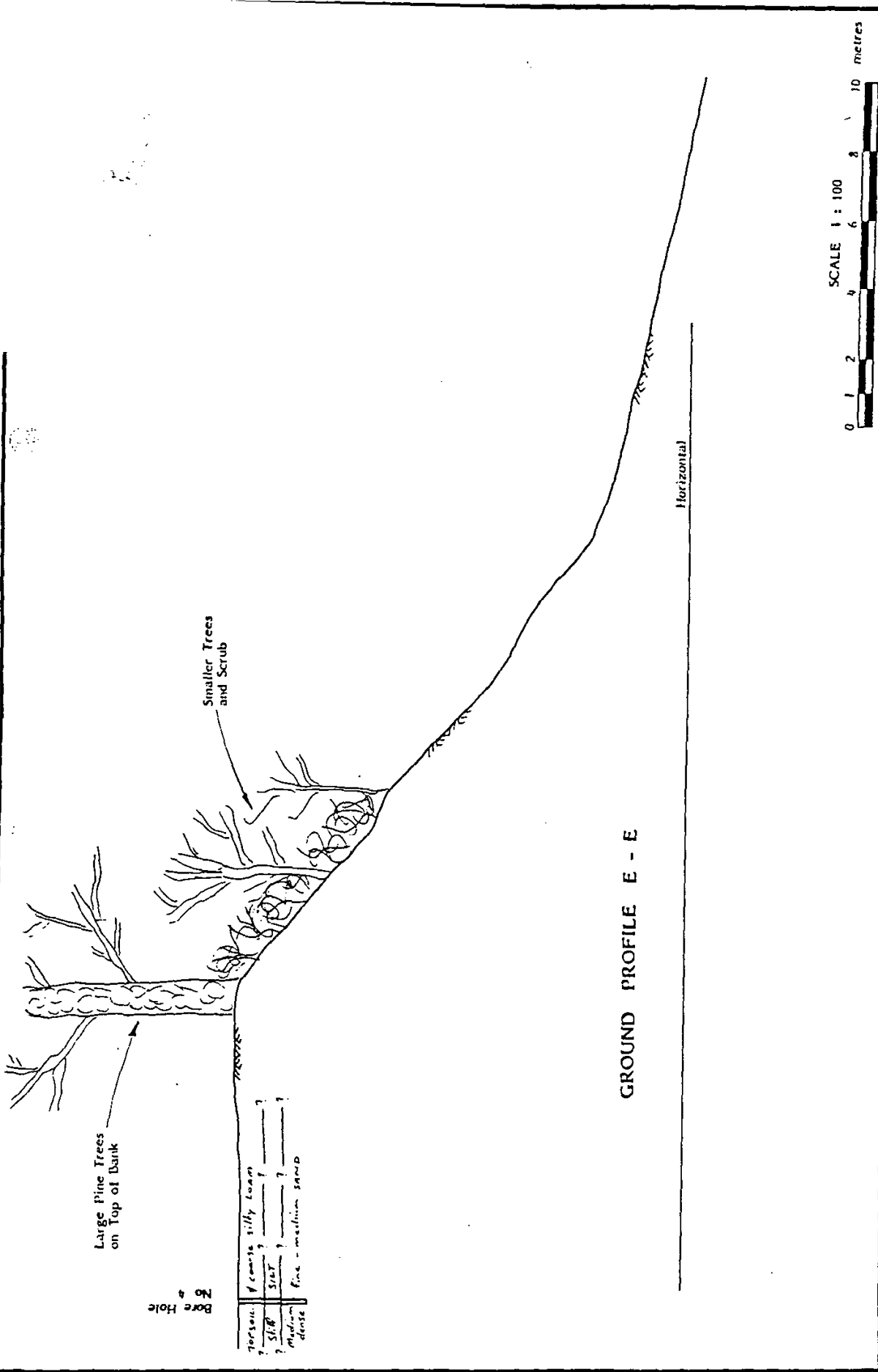
GROUND PROFILE D - D



38
Hole

Topsoil	10cm	?
Loose silt	15cm	?
Loose silt & fine med sand	15cm	?
Med. dense coarse silt	15cm	?

Mark T Mitchell Consulting Geotechnical Engineer 1202 Victoria St, P.O. Box 9123, Hamilton.	C.G. & S. HOUGHTON Proposed Subdivision of Lot 2 DPS 14093 Hukahui Road, Hamilton.	GROUND PROFILES	DRAWING No. 2777-03 DATE July 1991 ISSUE Chr
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Bore Hole No. 4

Person.	1	2	3
Soil	1	2	3
Medium	1	2	3
dense	1	2	3
	fine - medium sand		



Mark T Mitchell Consulting Geotechnical Engineer 1202 Victoria St, P.O. Box 9123, Hamilton.	C.G. & S. HOUGHTON Proposed Subdivision of Lot 2 DPS 14093 Hukunui Road, Hamilton.	GROUND PROFILES DRAWING No. 2777-04 DATE July 1991 ISSUE One

SOIL DESCRIPTION	FIELD TEST DATA		
	Depth in Metres	Vane Shear Strength (kPa)	Scala Penetrometer (blows per 100mm. drop)
BORE HOLE LOG No. 1			0 2 4 6 8
Dark brown, TOPSOIL.	0		
Firm, brownish yellow, fine sandy, slightly clayey SILT. (LOAM) Becoming light brownish yellow @ 0.6m.		93 68 48	
Loose, light orangy brown, slightly silty fine - med. SAND. Medium dense, reddish brown, IRON stained lense 0.85 - 1.0m.	1		
Loose, pale brown, v. slightly silty fine pumice SAND.			
V. loose, pale greyish brown, silty medium pumice SAND.		39	
Soft to firm pale brown, SILT. Becoming light grey @ 1.8m.	2	41	
Bottom of bore hole completed 17/7/91	3		

BORE HOLE LOG No. 2			0 2 4 6 8
Dark brown, TOPSOIL.	0		
Firm, brownish yellow, fine sandy, slightly clayey SILT. (LOAM) Becoming soft to firm @ 0.5m. Becoming pale brownish yellow @ 0.7m.		66 51 40 42	
Firm, light grey, pumice SILT.	1	60 53	
Loose, pale brown, sl. silty very fine pumice SAND.			
Loose, pale brown, medium pumice SAND.	2		
Bottom of bore hole completed 17/7/91	3		

NOTE: The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

BORE HOLE LOG No. 1 & 2

GEOCON SOIL TESTING LTD
Civil Engineering Laboratory
1202 Victoria St, P.O. Box 9123, Hamilton.

C.G. & S. HOUGHTON
Proposed Subdivision of Lot 2 DPS 14093
Hukanui Road, Hamilton.
July 1991

W.2777

Fig A-1

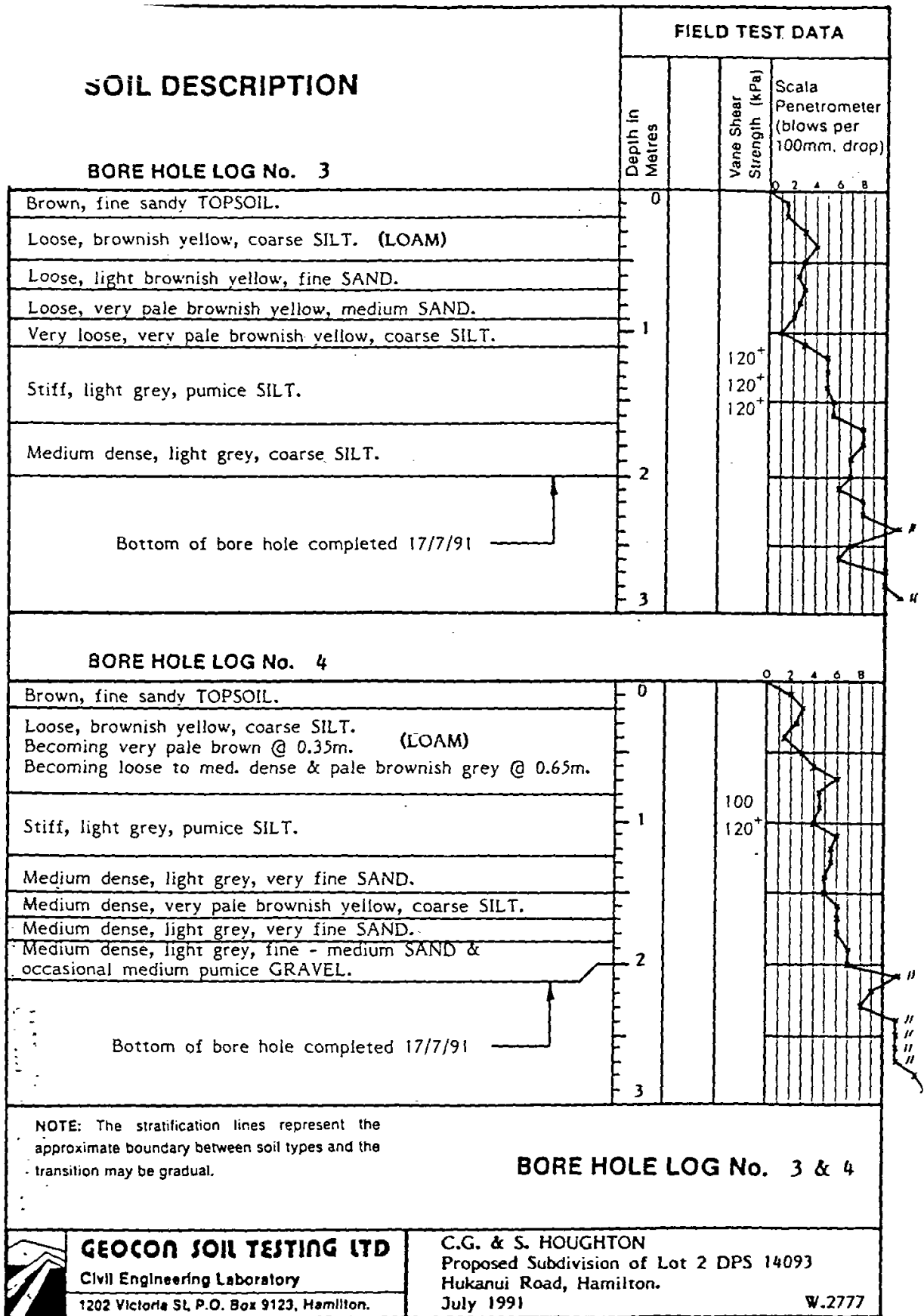


Fig A-2