SOILS AND EARTH FILL REPORT
CHURCH HILLS RESIDENTIAL SUBDIVISION - STAGE III
CHURCH ROAD, HAMILTON

FOR

HAMILTON PROPERTIES LTD
c/o McPHERSON and GOODWIN
REGISTERED LAND AND ENGINEERING SURVEYORS
5 HARDLEY STREET - P O BOX 9397
HAMILTON

BY

MARK T MITCHELL
CONSULTING GEOTECHNICAL ENGINEER
1202/1 VICTORIA STREET - P O BOX 9123
HAMILTON

26 FEBRUARY, 1990

Mark T Mitchell

Consulting Geotechnical Engineer

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

Ref: W - 2272
26 February, 1990

McPherson & Goodwin
Registered Land & Engineering Surveyors
P O Box 9379
Hamilton

Attn: Mr Graeme Goodwin

Dear Sirs,

Re: Inspecting Engineer's Report - Subdivision Completion
Church Hills Residential Subdivision - Stage III

Please find enclosed four copies of our Soils and Earth Fill Report for the above referenced residential subdivision.

Shallow filling has been placed over a limited part of the subdivision during the past construction season. This will require minor deepening of foundations in some areas and reference should be made to this report at the time of house plan preparation.

It is considered that soils within the remaining portion of the present development would provide suitable bearing for conventional building foundations at normal depths.

A Certificate appropriate to this project is enclosed in Appendix B of this report.

Yours faithfully,

Mark T Mitchell
Consulting Geotechnical Engineer

SOILS AND EARTH FILL REPORT
CHURCH HILLS RESIDENTIAL SUBDIVISION - STAGE III
BALMERINO STREET, HAMILTON

I. INTRODUCTION

This Inspecting Engineer's Report presents a summary of existing soil conditions which are present in the Stage III Area (Lot Nos. 135, 137 to 151 and 91 to 105) of the Church Hills Residential Subdivision, which is located off Church Hills Road, Hamilton. The development is being undertaken by Hamilton Properties Ltd. Town Planners/Land Surveyors for the project are McPherson & Goodwin, Registered Surveyors and Town Planners. A Geotechnical appraisal of the subdivision has previously been undertaken by this office and the results of the investigation are presented in a report dated May 15, 1985.

II. FIELD INVESTIGATIONS AND SUBSURFACE CONDITIONS

Subsurface conditions at the site were investigated by drilling a series of five shallow borings at the locations shown on the Site Plan Drawing No 2272-01. The borings are designated Nos. 10 to 14 and their Logs are presented on Logs A-1 to A-3. Associated Scala Penetrometer probes were also carried out and these test results are presented on the Borehole Logs.

The site soils, as revealed by the borings, consist of TOPSOIL, overlying white to yellow-brown, firm to stiff CLAY, which tends to increase in shear strength with depth. These soils have generally been derived from the in-situ weathering of volcanic ash. Groundwater was not encountered at the time of test drilling.

III. FILL PLACEMENT

During the past year, earthworks were carried out at the subdivision. This work included cutting of soils within the roadway areas, and shallow fill placement within Lot Nos. 149, 150 and 151. The approximate extent of fill placement is shown on the enclosed Drawing Nos. 2272-01. The information contained on this plan is as provided by the Surveyors for the project.

Prior to placing this filling, the areas were stripped of all topsoil and other unsuitable or compressible soils. Fill was then placed in layers and subjected to occasional compaction. However because the soil was generally wetter than optimum water content and field drying conditions were poor, the fills were not able to be compacted to a standard which would enable them to be classified as an engineer-certified filling. Fill depths are typically less than 0.5 metres.

IV. RECOMMENDATIONS FOR RESIDENTIAL FOUNDATIONS

Soil type and shear strengths will often vary across a subdivisional development, and therefore it is not possible to provide specific recommendation for the construction of foundations for all residential dwellings to be constructed within this subdivision. However the following guidelines are provided for the design of foundations, but after foundations are actually excavated, inspection by Hamilton City Council Building Inspector or by a Consulting Engineer may require that foundations be varied according to soil conditions encountered.

A. Non-Filled Areas

Concrete Slab-on-Grade

Concrete slab-on-grade construction should be carried out by firstly excavating and removing all topsoil, together with any fill which may be present on account of old farm drains, etc, from below the proposed foundation area. The exposed surface should then be proof-rolled with self-propelled vibratory roller and any soft areas encountered compacted

further or removed. The sand fill below the concrete slabs should be placed in layers not exceeding 250 mm in thickness, with each layer thoroughly compacted with the vibratory roller, adding water to assist compaction as required.

Timber Floor

The near-surface original soils are generally capable of supporting timber floor structures. The footings for these structures may be designed in accordance with requirements of NZS 3604, the NZ Code of Practice for Light Timber Framed Buildings. All footing excavations should be inspected by a Hamilton City Council Building Inspector prior to footing construction.

B. Filled Areas

The filling placed on Lot Nos. 149, 150 and 151 has not been compacted to an adequate standard to provide support for residential structures. However the depth of filling is relatively shallow over these lots and it would be feasible to deepen the foundations by excavating or drilling piers through to the original ground. Cast-in-place concrete foundation pads and concrete/timber piers could then be used for support of the structures. ie. the foundations can generally be constructed as per New Zealand Standard Code of Practice for Light Timber Frame Buildings; NZS 3604:1981.

V. SUPPLEMENTARY SOILS INVESTIGATIONS

In each of the lots within this development, supplementary soils investigations may be required at the time of Building Permit Applications in order to determine the founding depth of footings which are appropriate to the proposed structure and the actual ground conditions.

If loose, soft, unusual, or unexpected soils are found to be present at the time of foundation excavations, further soil investigations should also be carried out to determine the extent of the problem soils.

VI. LIMITATIONS

The geotechnical opinions and recommendations which are contained in this report are based on site conditions as they presently exist and further assume that the exploratory holes and probings are representative of subsurface conditions throughout the site. It is assumed that subsurface conditions everywhere are not significantly different from those disclosed by the investigation.

We should be notified of any subsurface conditions which appear to be different those as disclosed by this investigation so that these conditions may be reviewed and our recommendations reconsidered where necessary.

VII. CONCLUSION

It is considered that soils within the major portion of the present development would provide suitable bearing for conventional building foundations at normal depths. Filling is present on three lots and minor deepening of foundations will be required in these areas.

This report and certification does not preclude routine foundation inspections by the Builder or the Hamilton City Council Building Inspectors. Where such inspections reveal the presence of localized soft areas, or local areas which have been filled at some time in the past, further soils investigations should be carried out in order to determine the extent of the problem.

An Appendix B Certificate for the Stage III Portion of the project is enclosed.

Mark T Mitchell
Consulting Geotechnical Engineer

26 February, 1990

Mark T Mitchell

Consulting Geotechnical Engineer

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Hamilton New Zealand
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APPENDIX B (Ref: NZS 4404 : 1981)

Ref: W - 2272

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

STATEMENT OF PROFESSIONAL OPINION AS TO

SUITABILITY OF LAND FOR RESIDENTIAL BUILDING DEVELOPMENT

Subdivision	:	Church Hills Residential Subdivision - Stage III
Owner/Developer	:	Hamilton Properties Ltd
Location	:	Lot Nos 91 to 105, 135, 137 to 151 Balmerino Drive,, 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 was retained by McPherson and Goodwin, Registered Surveyors and Town Planners for the project as Soils Engineer on the above subdivision.

2. The extent of my inspections during construction are described in my report dated 26 February, 1990.

3. In my professional opinion, not to be construed as a guarantee, I consider that:

   a. The shallow fill which have been placed over Lot Nos. 149, 150 and 151, as indicated in our 26 February, 1990 report, have not been placed in compliance with the Code of Practice of the Hamilton City Council.

   b. Were residential development is proposed on lots which contain the recently placed shallow fill, it is important that all house foundations are appropriately designed and deepened as required, and in the manner as described in our report.

4. Furthermore, in my professional opinion, not to be construed as a guarantee, I consider that:

   a. The original ground which is free of filling is suitable for the erection thereon of residential buildings not requiring specific design in terms of NZS 1900 and related documents providing that:

   (i) Footings are founded below the level of any soft, organic or compressible soils present at the site, and are designed to support the design structural loading with reference to the capacity of the supporting soil to sustain such loadings.

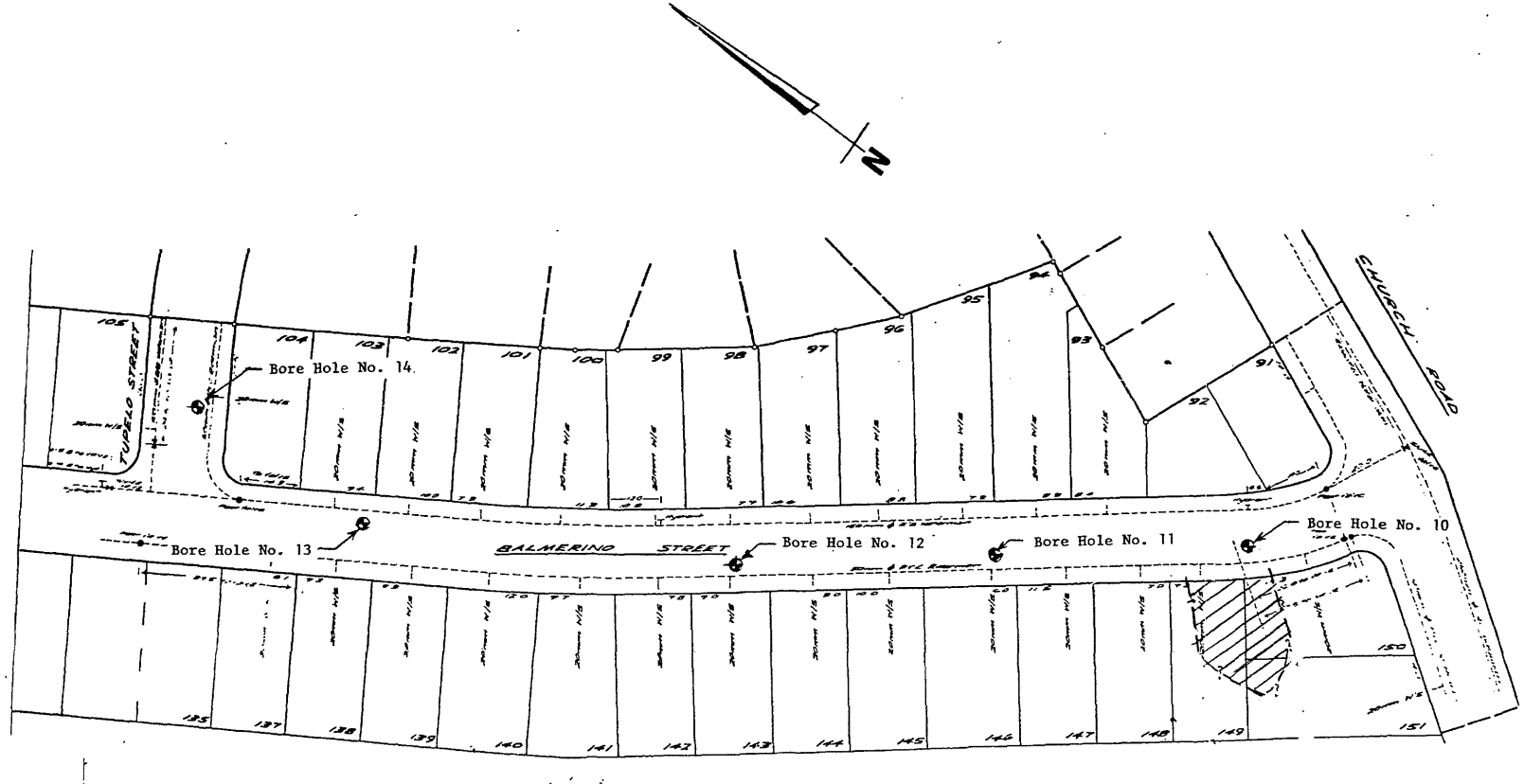
(ii) Normal footing inspections are carried out prior to pouring of foundations. The inspections to be carried out by the Hamilton City Council Building Inspectors or by a Registered Engineer. Such inspections should include probings to ensure that no undetected fill soils underlie the footings.

(iii) All other recommendations as contained in our Soils Report dated 26 February, 1990 are adopted and followed.

4. This professional opinion is furnished to the Hamilton City Council and to the Initial Purchaser of each section 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 the normal inspection of foundation conditions at the time of erection of any dwelling or building or structure.

Mark T Mitchell
Consulting Geotechnical Engineer

26 February, 1990



SITE PLAN

1 : 1000

0 10 20 40 60 80 100 metres

/LEGEND:

denotes bore Hole location.

denotes shallow FILL area.

Drawing Reference: Plan prepared from McPherson & Goodwin, Registered Surveyors plan reference No. 6097.

Mark T Mitchell Consulting Geotechnical Engineer 1202 Victoria St, P.O. Box 9123, Hamilton.	HAMILTON CITY COUNCIL - CHURCH HILLS STAGE III Residential Subdivision At Balmerino Street, Hamilton.	**SITE PLAN**	DRAWING No. 2272-01 DATE February, 1990 ISSUE One

SOIL DESCRIPTION

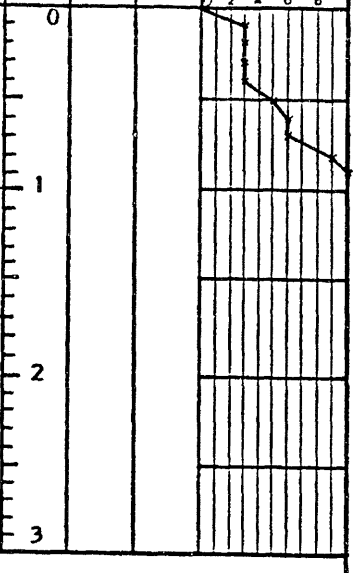
FIELD TEST DATA

Depth in Metres | Vane Shear Strength (kPa) | Scala Penetrometer (blows per 100mm. drop)

BORE HOLE LOG No. 10

Firm, yellowish brown, CLAY.
Becoming stiff @ 0.5m.

Bottom of bore hole completed 20/7/89



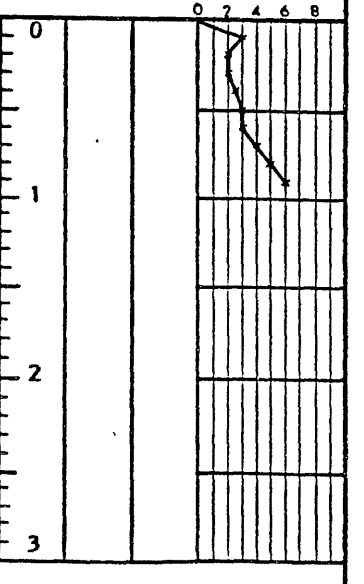
BORE HOLE LOG No. 11

Firm, yellowish brown, CLAY.

Firm, light yellowish brown, CLAY.

Stiff, yellowish brown, CLAY.

Bottom of bore hole completed 20/7/89



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

BORE HOLE LOG No. 10 & 11

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

CHURCH HILLS RESIDENTIAL SUBDIVISION
Balmerino Street, Hamilton.
February 1990 W.2272

Fig A-1

SOIL DESCRIPTION

FIELD TEST DATA

Depth in Metres | Vane Shear Strength (kPa) | Scala Penetrometer (blows per 100mm. drop)

BORE HOLE LOG No. 12

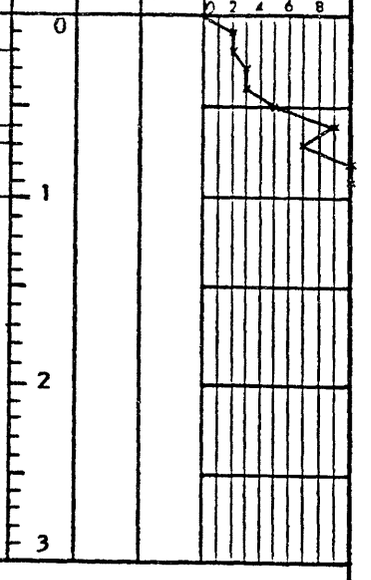
Firm, yellowish brown, CLAY.

Firm to stiff, white, CLAY.
Contains mica flecks.

Medium dense, brown, clayey silty coarse SAND.

Stiff, reddish brown, CLAY.

Bottom of bore hole completed 20/7/89

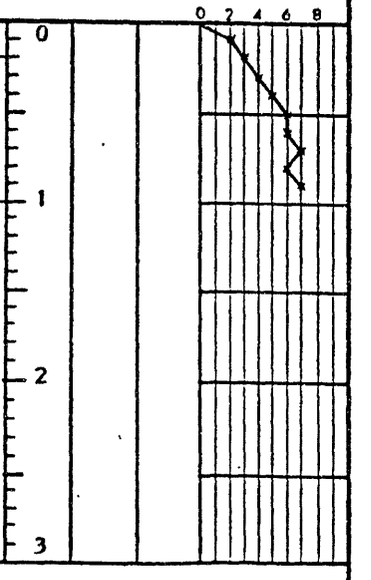


BORE HOLE LOG No. 13

Firm, yellowish brown, CLAY.

Firm becoming stiff, light yellowish brown, CLAY.

Bottom of bore hole completed 20/7/89



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

BORE HOLE LOG No. 12 & 13

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Fig A-2

SOIL DESCRIPTION

BORE HOLE LOG No. 14

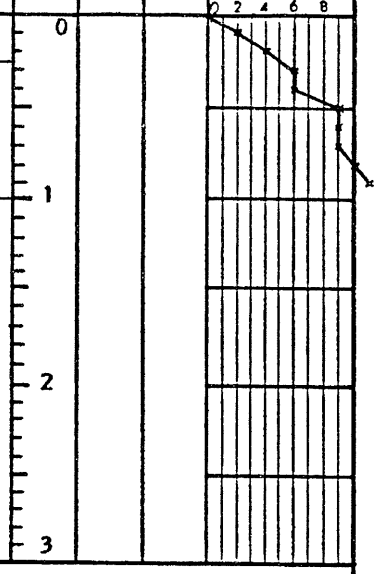
FIELD TEST DATA

Depth in Metres | Vane Shear Strength (kPa) | Scala Penetrometer (blows per 100mm drop)

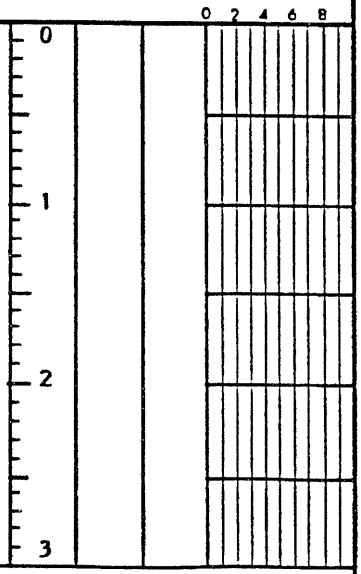
Firm to stiff, yellowish brown, CLAY.

Stiff, light yellowish brown, CLAY.
Becoming very stiff @ 0.8m.

Bottom of bore hole completed 20/7/89



BORE HOLE LOG No.



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

BORE HOLE LOG No. 14

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Fig A-3