

ROTORUA DISTRICT COUNCIL

1061 Haupapa Street, Private Bag RO 3029, Rotorua, Telephone 07-348 4199 ext 8859, Fax 07-349 0993



Issue Document



Building Consent No: 12030 BC
Section 35, Building Act 1991
Issued: 22Mar02

Project Information Memorandum No: 10976

Owner

D C HEARD LTD
C/O ROTORUA BLDG CERTIFIERS
P O BOX 1373
ROTORUA 3215

CERTIFIED

Agent

ROTORUA BUILDING CERTIFIERS
P O BOX 1373
ROTORUA 3215

Site Information

PROPERTY ID: 00858
ASSESSMENT NO: 06500/729.00
STREET ADDRESS: 96 PUKUATUA STREET, ROTORUA CENTRAL, ROTORUA 3201
LEGAL DESCRIPTION: LOT 2 DPS 82612

Project Information

PROJECT IS FOR: New Work
INTENDED USE(S): 6X APARTMENTS
INTENDED LIFE: Indefinite but not less than 50 years
VALUE OF WORK: \$800,000.00
NUMBER OF STAGES: 1

Fees

COUNCIL'S TOTAL CHARGES FOR THIS BUILDING CONSENT ARE: \$3,408.00

PAYMENTS RECEIVED TO DATE:

Receipt number:	957027	Date:	05Mar02	Amount:	\$1,370.00
Receipt number:	963453	Date:	21Mar02	Amount:	\$38.00
Receipt number:	963453	Date:	22Mar02	Amount:	\$.00
Receipt number:	957028	Date:	05Mar02	Amount:	\$2,000.00

Building Consent: 12030

See attached page(s) for any other conditions.

Page : 1

1: Standard Conditions

This building consent is permission to undertake building work in accordance with the approved plans and specifications. All work must comply with the provisions of the Building Code. Any alterations from the original plans and specifications must have prior approval from the Building Control Manager.


2: Standard Statement

THIS BUILDING CONSENT IS ISSUED SUBJECT TO ALL OTHER OUTSTANDING CONSENTS HAVING BEEN APPROVED. WORK SHALL NOT COMMENCE AND INSPECTIONS WILL NOT BE UNDERTAKEN UNTIL THOSE OUTSTANDING CONSENTS HAVE BEEN COMPLIED WITH.

Signed for and behalf of the Council:

Name: P Lawrence Position: Building Control Manager

Signed:

 Date: 22/03/2002

CODE COMPLIANCE CERTIFICATE NO: 12030

Section 56, Building Act 1991

ISSUED BY **Bay Building Certifiers Ltd**

20 Park Street, P.O.Box 2230 Tauranga
Ph. 07 578-3427 Fax 07 578-5395

Building Certifier No.9, currently registered and approved as a building certifier for all clauses of the New Zealand building code, without limitation.

Consent Number 12030



PROJECT		PROJECT LOCATION	
All	<input checked="" type="checkbox"/>	Address	96 Pukuatua Street Rotorua
Stage No. of an intended stages		Lot	2
New or relocated building	<input checked="" type="checkbox"/>	D.P.	S 82612
Alteration	<input type="checkbox"/>		
Intended use(s) (in detail)			
Erect 6 dwellings			
Intended Life:		Owner	
Indefinite, but not less than 50 years	<input checked="" type="checkbox"/>	DC Heard Ltd	
Specified as ... years	<input type="checkbox"/>	28 Stanley Drive	
Demolition	<input type="checkbox"/>	Rotorua	

This is:

- ☒ A final code compliance certificate issued in respect of all of the building work under the above building consent excluding N.Z. Building Code clauses G9 (Electricity) and G11 (Gas as an energy source)
- ☐ An interim code compliance certificate in respect of part only, as specified in the attached particulars, of the building work under the above building consent
- ☐ This certificate is issued subject to the conditions specified in the attached page(s) headed 'Conditions of Code Compliance Certificate No. 12030' (being this certificate).

Signed

Name:

Position: **Roger Bruce**

OPERATIONS MANAGER

18/9/03
Compiled Resource
for OK

Date: Thursday, 21 August 2003

{Vixing \$1000.00} Refund Memo
{Diddo \$1000.00} 11373 23/9/03



O. Blad Cant Ltd ✓

Conditions of Code Compliance Certificate No: 12030

as at Monday, 15 September 2003

Owner		Site Location				
DC Heard Ltd 28 Stanley Drive Rotorua		96 Pukuatua Street Rotorua Lot 2 D.P. S 82612				
Job Description		Consent				
WorkType Dwelling - New IntendedUse Erect 6 dwellings		Number 12030 Date Tuesday, 2 April 2002 Process Time 0. Hrs				
Assesments Required						
	Required	Done	Passed	Failed	To Be Done	
Building	0	18	18	0	0	Extra Inspections 22
Plumbing/Drainage	0	4	4	0	0	
Structural	0	0	0	0	0	
Total	0	22	22	0	0	

Notes

The structural engineer is to supervise the sub excavation and replacement filling, and confirm that the site has been filled in accordance with BSK Ltd design criteria. BSK Engineers have supervised the excavation and compaction of the fill and the laying of the geotech matting. Producer Statement will be required prior to Code Compliance issue.
Producer statements received: As Built drainage, Insulclad from Colourtex coatings, BSK engineers re goundation excavations,, Electrical CCC.

Inspection Details

Date	Time	Inspector	InspectionType	Result	Note
02-Apr-02	08:30 AM	Mike Skelton	Footing	Pass	To West Blk. Footings have been excavated to sizes as shows on plans. All reinforcing in place as required. 2D12 bars with R6 stirrups at 300mm centres. D12 starters are to be hooked in after pouring . Siting to be confirmed by CanMap Surveyors when blockwork is complete.
10-Apr-02	10:30 AM	Mike Skelton	Slab	Pass	To West Blk. Hardfill well compacted to slab. 0.25mm polythene laid to slab. Top steel 147 laid to slab and tied to starters. All slab thickenings in place to load bearing walls, with all reinforcing cages tied in place. Sub Floor pipework in place to each unit. All plumbing is lagged and taped through the slab. Rebates in place for garage doors. Ok to pour.
01-May-02	08:30 AM	Mike Skelton	Drainage	Pass	To rear corner to enable backfilling and builder to establish a WC on site. All laid in PVC to fall to existing connection. Inspection points in place where required. Under water test. Ok to backfill.
08-May-02	01:00 PM	Mike Skelton	Footing	Pass	To East Blk. Footings have been excavated to sizes as shown on plans. All reinforcing in place as required. 2/D12 bars with R6 stirrups at 300mm centres. D12 starters are to be hooked in after pouring. CanMap Surveyors have placed the position of the building. BSK Consulting Engineers have carried out progressive inspections of excavations, geotech matting etc.
20-May-02	02:30 PM	Mike Skelton	Preline/Building	Pass	West Blk Unit 1. Moisure content to framing all complies. Fixings all in place to trusses, plates,braces etc where required. Batt insulation in place to wall cavities. Fire and sound rating systems have been constructed between units.Plumbing run in aquatherm under pressure test 300psi. Plumber has carried out testing methods for aquatherm. Discussed with builder regarding a Producer

				Statement for the Insulclad System. Ok to continue.
10-Jun-02	01:00 PM	Mike Skelton	Slab	Pass To East Blk. Hardfill well compacted to slab. 0.25mm polythene laid to slab. Top Steel 147 laid to slab and tied to starters. All slab thickenings in place to load bearing walls, with all reinforcing cages tied in place. Sub floor pipework in place to each unit. All plumbing is lagged and taped through the slab. Ok to pour.
10-Jun-02	03:30 PM	Mike Skelton	Preline/Building	Pass West Blk Unit 2. Moisture content to framing all complies. Fixings all in place to trusses, plates, braces etc where required. Batt insulation in place to wall cavities. Fire and sound rating systems have been constructed between units. Plumbing run in aquatherm under pressure test 300psi. Plumber has carried out testing methods for aquatherm.
10-Jun-02	04:30 PM	Mike Skelton	Slab	Pass To East Blk. Hardfill well compacted to slab. 0.25mm polythene laid to slab. Top Steel 147 laid to slab and tied to starters. All slab thickenings in place to load bearing wall, with all reinforcing cages tied in place. Sub Floor pipework in place to each unit. All plumbing is lagged and taped through the slab, ok to pour.
22-Jul-02	10:30 AM	Mike Skelton	Drainage	Pass To both blocks. All laid to good fall in uPVC. Under water test. All inspection points in place where required. OK to backfill. Lings to West Blk Unit 1 have been nailed/screwed off as per the manufacturers requirements. OK to continue.
26-Jul-02	11:00 AM	Mike Skelton	Preline/Building	Pass West Blk. Unit 3. Moisture content to framing all complied. Fixings all in place to trusses, plates, braces etc where required. Batt insulation in place to wall cavities. Fire and sound systems have been constructed between units. Plumbing run in aquatherm under pressure test 300psi. Plumber has carried out testing methods for aquatherm.
02-Aug-02	10:30 AM	Mike Skelton	Preline/Building	Pass West Blk Unit 1. All sheet linings have been nailed/screwed off as per the manufacturers requirements, Ok to continue.
06-Aug-02	10:30 AM	Mike Skelton	Preline/Building	Pass West Blk. Unit 2. All sheet linings have been nailed/screwed off as per the manufacturers requirements. Ok to continue.
23-Oct-02	11:00 AM	Mike Skelton	Preline/Building	Pass East Blk. Units 1,2,3 Moisture content to framing all complies. Fixings all in place to trusses, plates , braces etc where required. Batt insulation in place to wall cavities. Fire and sound rating systems have been constructed between units. Lings to West Blk Unit 2 have been nailed/screwed off as per the manufacturers requirements.
25-Oct-02	04:00 PM	Mike Skelton	Preline/Plumbing	Pass East Blk. Unit 3. Plumbing run in aquatherm under pressure test 300psi. Plumber has carried out testing methods for aquatherm. Fire and sound rated linings have been installed between units.
04-Nov-02	02:00 PM	Mike Skelton	Preline/Plumbing	Pass East Blk. Units 1 & 2. Plumbing run in aquatherm under pressure test 300psi. Plumber has carried out testing methods for aquatherm. Fire and sound rated linings have been installed between units.
14-Nov-02	10:30 AM	Mike Skelton	Preline/Building	Pass East Blk. Unit 3. All sheet linings have been nailed/screwed off as per the manufacturers requirements, Ok to continue.
03-Dec-02	10:30 AM	Mike Skelton	Preline/Building	Pass East Blk Unit 1 & 2. All sheet linings have been nailed/screwed off as oer the manufacturers requirements, OK to continue.
12-Dec-02	10:30 AM	Mike Skelton	Final/Building	Pass Final plumbing also. West Blk Unit 1, East Blk Unit 1. All work is complete. Wet area surfaces have been sealed. Safety glass is fitted to shower doors and bathroom windows when required. HWC restrained and tempering valve fitted and operating to correct temperature.
24-Dec-02	01:30 PM	Mike Skelton	Preline/Building	Pass West Blk. Unit 3. All sheet linings have been nailed/screwed off as per the manufacturers requirements. Ok to continue.
03-Mar-03	01:30 PM	Mike Skelton	Final/Building	Pass Final plumbing also. West Blk Unit 2, East Blk Unit 2 & 3. All work is complete. Wet area surfaces have been sealed. Safety glass is fitted to shower doors and bathroom windows where required. HWC restrained and tempering valve fitted and operating to correct temperature.
08-Jul-03	10:30 AM	Mike Skelton	Final/Building	Pass Final plumbing also. West Blk Unit 3. All work is complete. Wet area surfaces have been sealed. Safety glass is fitted to shower doors and bathroom windows where required. HWC restrained and tempering valve fitted and operating to correct temperature. Vehicle crossing and drive completed. OK to refund deposits held. Awaiting electrical certificate and producer statement for the exterior cladding system.
17-Jul-03	01:30 PM	Mike Skelton	Final/Building	Pass Final plumbing also. Producer statements and certificates have been received. Ok for Code Compliance Certificate to be issued.



22 Whitworth Road, Rotorua. Ph: 07 3479646 Mob: 025 2462006

Field Inspection Sheet - Building Certificate No: #HEARD

PIM No: 10976

Building Consent No: 12030

Owners Details

Name: DC Heard Ltd
Postal Address: 28 Stanley Drive
Rotorua
Phone: (07) 3455558 (027) 4950353
Fax: (07) 3455559

Builders Details

Name: Owner
Postal Address:

Phone:
Fax:

Site Details

Street Address: 96 Pukuatua Street, Rotorua
Legal Description: Lot 2 DPS 82612
Assessment No: 06500/729.00
Property ID: P00858

Project Details

Project: 6 x Apartments/garages
Intended Use: Residential
Intended Life: Indefinite
Stage(s): 1
Project Value: \$800,000.00

BSK Engineers have supervised the excavation and compaction of the fill and the laying of the geotech matting. Producer Statement will be required prior to Code Compliance Certificate issue.

2/4/2002: FOOTING - To West Blk. Footings have been excavated to sizes as shown on plans. All reinforcing in place as required. 2/D12 bars with R6 stirrups at 300mm centres. D12 starters are to be hooked in after pouring. Siting to be confirmed by CanMap Surveyors when blockwork is complete.

10/4/2002: PRESLAB - To West Blk. Hardfill well compacted to slab. 0.25mm polythene laid to slab. Top Steel 147 laid to slab and tied to starters. All slab thickenings in place to load bearing walls, with all reinforcing cages tied in place. Sub floor pipework in place to each unit. All plumbing is lagged and taped through the slab. Rebates in place for garage doors. OK to pour.

1/5/2002: DRAIN - To rear corner to enable backfilling and builder to establish an WC on site. All laid in uPVC to fall to existing connection. Inspection points in place where required. Under water test. OK to backfill.

8/5/2002: FOOTING - To East Blk. Footings have been excavated to sizes as shown on plans. All reinforcing in place as required. 2/D12 bars with R6 stirrups at 300mm centres. D12 starters are to be hooked in after pouring. CanMap Surveyors have checked the position of the building. BSK Consulting Engineers have carried out progressive inspections of excavations, geotech matting etc.

20/5/2002: PRELINE - West Blk Unit 1. Moisture content to framing all complies. Fixings all in place to trusses, plates, braces etc. where required. Batt insulation in place to wall cavities. Fire and sound rating systems have been constructed between units. Plumbing run in aquatherm under pressure test 300psi. Plumber has carried out testing methods for aquatherm. Discussed with builder regarding a Producer Statement for the Insulclad System. OK to continue.

10/6/2002: PRELINE - West Blk Unit 2. Moisture content to framing all complies. Fixings all in place to trusses, plates, braces etc. where required. Batt insulation in place to wall cavities. Fire and sound rating systems have been constructed between units. Plumbing run in aquatherm under pressure test 300psi. Plumber has carried out testing methods for aquatherm.

10/6/2002: PRESLAB - To East Blk. Hardfill well compacted to slab. 0.25mm polythene laid to slab. Top Steel 147 laid to slab and tied to starters. All slab thickenings in place to load bearing walls, with all reinforcing cages tied in place. Sub floor pipework in place to each unit. All plumbing is lagged and taped through the slab. OK to pour.

22/7/2002: DRAIN - To both blocks. All laid to good fall in uPVC. Under water test. All inspection points in place where required. OK to backfill. Linings to West Blk Unit 1 have been nailed/screwed off as per the manufacturers requirements. OK to continue.

26/7/2002: PRELINE - West Blk Unit 3. Moisture content to framing all complies. Fixings all in place to trusses, plates, braces etc. where required. Batt insulation in place to wall cavities. Fire and sound rating systems have been constructed between units. Plumbing run in aquatherm under pressure test 300psi. Plumber has carried out testing methods for aquatherm.



22 Whitworth Road, Rotorua. Ph: 07 3479646 Mob: 025 2462006

Field Inspection Sheet - Building Certificate No: #HEARD

PIM No:

10976

Building Consent No:

12030

2/8/2002: LININGS - West Blk Unit 1. All sheet linings have been nailed/screwed off as per the manufacturers requirements. OK to continue.
6/8/2002: LININGS - West Blk Unit 2. All sheet linings have been nailed/screwed off as per the manufacturers requirements. OK to continue.
23/10/2002: PRELINE - East Blk Units 1,2,3. Moisture content to framing all complies. Fixings all in place to trusses, plates, braces etc. where required. Batt insulation in place to wall cavities. Fire and sound rating systems have been constructed between units. Linings to West Blk Unit 2 have been nailed/screwed off as per the manufacturers requirements.
25/10/2002: PLUMBING - East Blk Unit 3. Plumbing run in aquatherm under pressure test 300psi. Plumber has carried out testing methods for aquatherm. Fire and sound rated linings have been installed between units.
4/11/2002: PLUMBING - East Blk Units 1 & 2. Plumbing run in aquatherm under pressure test 300psi. Plumber has carried out testing methods for aquatherm. Fire and sound rated linings have been installed between units.
12/11/2002: LININGS - East Blk Unit 3. All sheet linings have been nailed/screwed off as per the manufacturers requirements. OK to continue.
3/12/2002: LININGS - East Blk Unit 1 & 2. All sheet linings have been nailed/screwed off as per the manufacturers requirements. OK to continue.
12/12/2002: FINAL - West Blk Unit 1, East Blk Unit 1. All work is complete. Wet area surfaces have been sealed. Safety glass is fitted to shower doors and bathroom windows where required. HWC restrained and tempering valve fitted and operating to correct temperature.
24/12/2002: LININGS - West Blk Unit 3. All sheet linings have been nailed/screwed off as per the manufacturers requirements. OK to continue.
2002/2003: FINAL - West Blk Unit 2, East Blk Unit 2 & 3. All work is complete. Wet area surfaces have been sealed. Safety glass is fitted to shower doors and bathroom windows where required. HWC restrained and tempering valve fitted and operating to correct temperature.
8/7/2003: FINAL - West Blk Unit 3. All work is complete. Wet area surfaces have been sealed. Safety glass is fitted to shower doors and bathroom windows where required. HWC restrained and tempering valve fitted and operating to correct temperature. Vehicle crossing and drive completed. OK to refund deposits held. Awaiting electrical certificate and producer statement for the exterior cladding system.
17/7/2003: FINAL - Producer statements and certificates have been received. OK for Code Compliance Certificate to be issued.

☒ Code Compliance Certificate Authorised for Issue

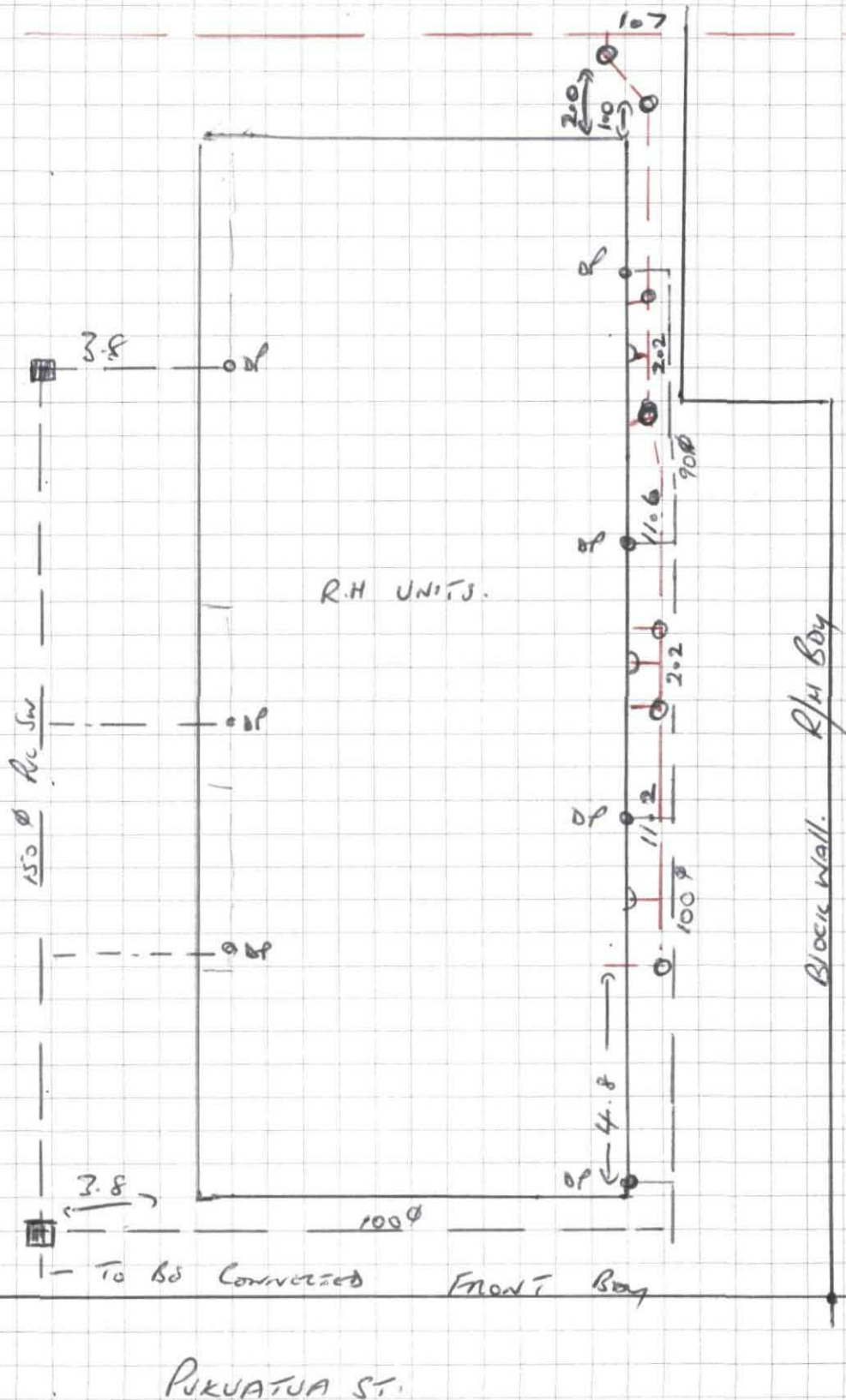
Signed by the Building Certifier.

Name: Michael J Skelton

Date: 17/07/03

DRAINAGE PLAN AS BUILTS

B/Cert No:	11976	Consent No:	12030	Property No:	P00858
Owner:	HEARD				
Address:	PUKIATUA ST				
Drainlayer:	CHGATER BROS			Date:	30/7/02
Sign:	S.A. Burt.				

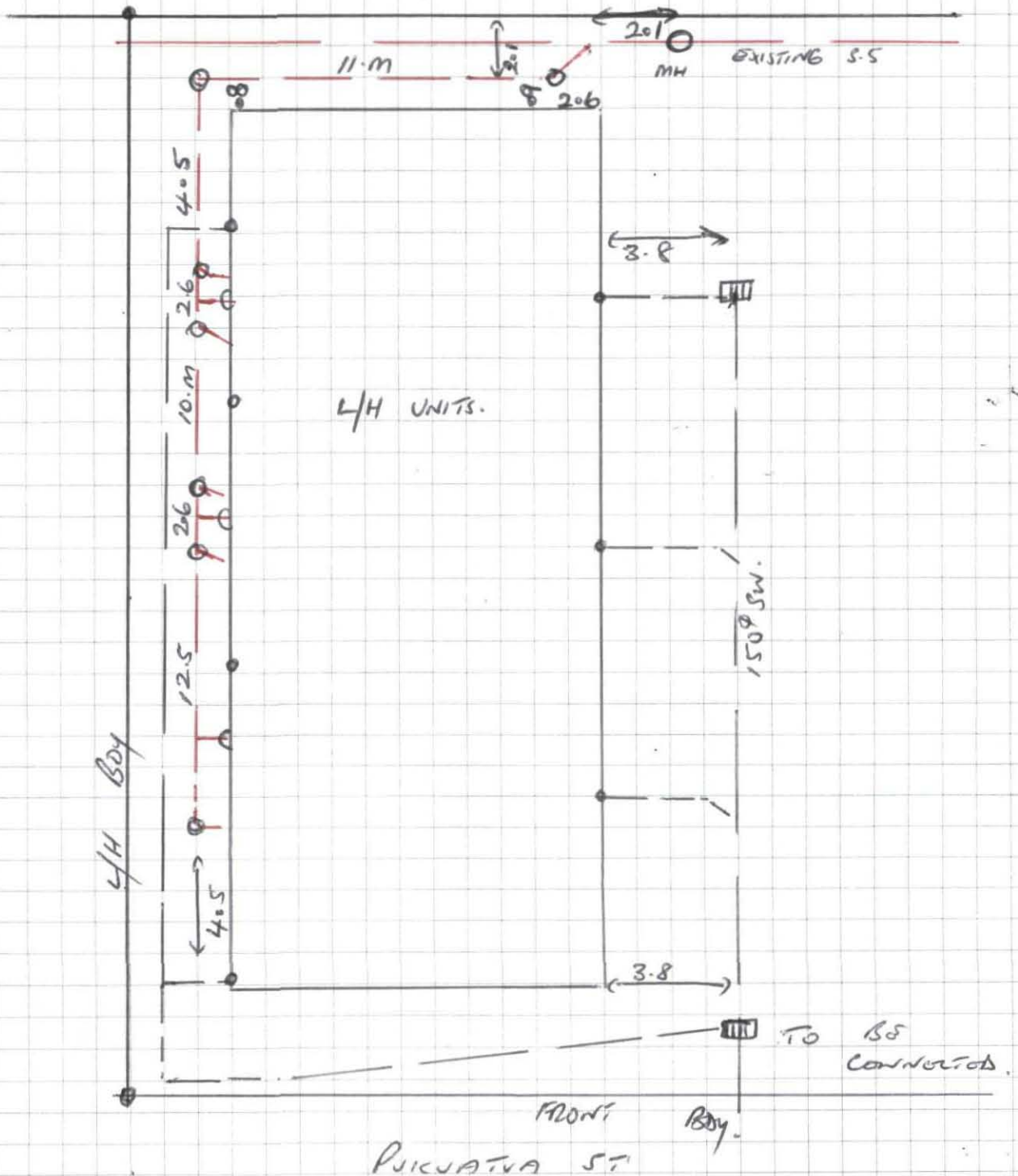


RBC**ROTORUA BUILDING***Certifiers*

Ph/Fax: (07)3479676 or (025)2761575

DRAINAGE PLAN AS BUILTS

B/Cert No:	11076	Consent No:	12030	Property No:	P00850
Owner:	HEARD				
Address:	Pukiaua St				
Drainlayer:	CHCATER	BROS.	Date:	30/7/02	
Sign:	SILB				





plaster
SYSTEMS LTD

A NUPLEX GROUP COMPANY

1205

PRODUCER STATEMENT

WORK COMPLETED BY: Colour-Tex Coatings LTD (056)
(Licensed Plaster Systems Contractor Name & Licence No.)

TO: D.C Heard LTD
(Owner)

TO BE SUPPLIED TO: Rotorua District Council
(Territory Authority)

IN RESPECT OF: Insulated 40mm polystyrene System
(Description of cladding system installed)

CLADDING SYSTEM BRANZ APPRAISAL No.: 257 B
(Appraisal Certificate No.)

AT: 96 Pukutua Street Rotorua
(Address of site)

DATE OF COMPLETION OF WORK: 26 November 2002

The Plaster Systems Licensed Contractor certifies that this project has been completed with materials that meet Plaster Systems Limited specifications and that all the work has been carried out in accordance with Plaster Systems Limited installation instructions and current BRANZ Appraisal Certificate.

The 40mm Insulated System is used and installed in accordance with the statements and conditions of the 40mm Insulated Systems Appraisal Certificate the following NZBC Clauses will be met: B1 Structure; B2 Durability; E2 External Moisture; E3 Internal Moisture; F2 Hazardous Building Materials; and H1 Energy Efficiency.

This Producer Statement does not cover the suitability or stability of the site or the products or systems applied by trades other than those of the Licensed Plaster Systems Contractor.

NAME: B Harrison Colour-Tex Coatings LTD

SIGNED: B Harrison DATE: 26-11-02

TECHNOLOGY TRANSFORMING TRADITION

11 July 2003

Building Control Manager
Rotorua District Council
Private Bag RO 3029
ROTORUA

Dear Sir,

**RE: DEVELOPMENT FOR D C HEARD
PUKUATUA STREET, ROTORUA**

OUR REF: 12848

We confirm that BSK Consulting Engineers Ltd., were engaged by D C Heard to carry out construction observation services to completion of the floor slabs for this multi-unit development.

Inspections were carried out at completion of excavation for the foundations and periodically during the laying of the geotextile layers and hardfilling.

Based on the above, we believe on reasonable grounds, that the works described on BSK Consulting Engineers Ltd., drawings, Ref: 12848, Sheets 1 and 2, have been completed to the extent required by the Building Consent.

Yours faithfully



J W Kronast B.E. MIPENZ Reg. Engineer
BSK CONSULTING ENGINEERS LTD

DIRECTORS
E. Don Stotter
C.Eng., M.I.C.E.,
M.I.P.E.N.Z
Reg. Engineer
John W Kronast
B.E., M.I.P.E.N.Z

Electrical Certificate of Compliance

for prescribed electrical work that is carried out on electrical installations and involves the placing or positioning or the replacing or repositioning of conductors (including fittings attached to those conductors).

To be completed whether or not an inspection is required.

No. 1341874

No. of attachments

CUSTOMER INFORMATION - PLEASE PRINT CLEARLY

Name of customer David Harold Bitchler

Phone: 627 495035

Address of installation 96 Pukekete St Rotorua

Postal address of customer (if not as above)

WORK DETAILS

6 No. of lighting outlets

No. of ranges

2 No. of socket outlets

No. of water heaters

Please tick (✓) as appropriate where work includes:

☒ Mains☒ Main earthing system

Was any installation work carried out by the homeowner?

Yes

No

☒ Switchboard☒ 45 Electric linesDescription ~~BS~~ & Body corp supply
MEN CENTRAL METER ISD

It is recommended that test results be recorded here:

Visual Examination



Earth Continuity



Bonding



Polarity



Insulation Resistance 500+ Mohm

Other

If necessary attach any pages with sketches of work done

CERTIFICATION OF WORK

I certify that the above electrical work has been carried out in accordance with the requirements of the Electricity Act 1992 and Electricity Regulations 1997.

ELECTRICAL WORKER DETAILS

Name

Pat Edhouse

Registration no.

EL628

Company

Pat Edhouse Elect

Signature

P. Edhouse

Date

17-10-02

Contact Ph No.

025 962 365

CERTIFICATION OF ELECTRIC LINES

(to be completed where a separate electrical worker has installed the electric line portion of the mains)

Name

Registration no.

Company

Signature

Date

Contact Ph No.

INSPECTION DETAILS Electrical work requiring inspection by a registered electrical inspector

☒ New mains☒ Switchboard☒ Earthing system☐ Installation work in hazardous areas

I certify that the inspection has been carried out in accordance with the requirements of regulation 41 of the Electricity Regulations 1997.

Name

D. JENSEN

Registration no.

19723

Signature

Daniel Jensen

Date

17.10.2002

Contact Ph No.

025 800170

CUSTOMER COPY - THIS IS AN IMPORTANT DOCUMENT AND SHOULD BE RETAINED

Electrical Certificate of Compliance

for prescribed electrical work that is carried out on electrical installations and involves the placing or positioning or the replacing or repositioning of conductors (including fittings attached to those conductors).

To be completed whether or not an inspection is required.

No. 1341876

No. of attachments

CUSTOMER INFORMATION - PLEASE PRINT CLEARLY

Name of customer Peter Shea

Phone:

Address of installation

1/96 Pukuanua St Roturua

Postal address of customer (if not as above)

WORK DETAILS

29 No. of lighting outlets

1

No. of ranges

20 No. of socket outlets

1

No. of water heaters

Was any installation work carried out by the homeowner?

Yes

No

Please tick (✓) as appropriate where work includes:

✓

Mains

✓

Main earthing system

✓

Switchboard

UG

Electric lines

Description New house

1 towel rail

2 Fan

It is recommended that test results be recorded here:

Visual Examination

✓

Earth Continuity

✓

Bonding

✓

Polarity

✓

Insulation Resistance 100M Ohm

Other

If necessary attach any pages with sketches of work done

CERTIFICATION OF WORK

I certify that the above electrical work has been carried out in accordance with the requirements of the Electricity Act 1992 and Electricity Regulations 1997.

ELECTRICAL WORKER DETAILS

Name

Pat Edhouse

Registration no.

E6624

Company

Pat Edhouse Elect

Signature

P. Edhouse

Date

18-12-02

Contact Ph No.

025 962 365

CERTIFICATION OF ELECTRIC LINES

(to be completed where a separate electrical worker has installed the electric line portion of the mains)

Name

Registration no.

Company

Signature

Date

Contact Ph No.

INSPECTION DETAILS

 Electrical work requiring inspection by a registered electrical inspector

✓

New mains

✓

Switchboard

✓

Earthing system

Installation work in hazardous areas

I certify that the inspection has been carried out in accordance with the requirements of regulation 41 of the Electricity Regulations 1997.

Name

D. JENSEN

Registration no.

19723

Signature

David Jensen

Date

19.12.2002

Contact Ph No.

025 800 170

CUSTOMER COPY - THIS IS AN IMPORTANT DOCUMENT AND SHOULD BE RETAINED

Electrical Certificate of Compliance

for prescribed electrical work that is carried out on electrical installations and involves the placing or positioning or the replacing or repositioning of conductors (including fittings attached to those conductors).
To be completed whether or not an inspection is required.

No. 1341882

No. of attachments

CUSTOMER INFORMATION - PLEASE PRINT CLEARLY

Name of customer Ross Swenson

Phone: _____

Address of installation 2/96 Pukutua stRobur

Postal address of customer (if not as above) _____

WORK DETAILS

46 No. of lighting outlets1 No. of ranges

Please tick (✓) as appropriate where work includes:

25 No. of socket outlets1 No. of water heaters☒ Mains☒ Main earthing system

Was any installation work carried out by the homeowner?

☐ Yes☐ No☒ Switchboard☐ Electric linesDescription New inst2 Towel rails2 Fans.1 100w PumpMEN DIST. BOARD.

It is recommended that test results be recorded here:

Visual Examination



Earth Continuity



Bonding



Polarity

Insulation Resistance 100Mg + Mohm

Other _____

If necessary attach any pages with sketches of work done

CERTIFICATION OF WORK

I certify that the above electrical work has been carried out in accordance with the requirements of the Electricity Act 1992 and Electricity Regulations 1997.

ELECTRICAL WORKER DETAILS

Name

Pat Edhurn

Registration no.

ECG 28

Company

Pat Edhurn Elect

Signature

P. Edhurn

Date

12-12-02

Contact Ph No.

025 902 765

CERTIFICATION OF ELECTRIC LINES

(to be completed where a separate electrical worker has installed the electric line portion of the mains)

Name

Registration no.

Company

Signature

Date

Contact Ph No.

INSPECTION DETAILS Electrical work requiring inspection by a registered electrical inspector

☒ New mains☒ Switchboard☒ Earthing system☐ Installation work in hazardous areas

I certify that the inspection has been carried out in accordance with the requirements of regulation 41 of the Electricity Regulations 1997.

Name

D. Jensen

Registration no.

19723

Signature

D. Jensen

Date

12-12-2002

Contact Ph No.

025 800 170

CUSTOMER COPY - THIS IS AN IMPORTANT DOCUMENT AND SHOULD BE RETAINED

Electrical Certificate of Compliance

for prescribed electrical work that is carried out on electrical installations and involves the placing or positioning or the replacing or repositioning of conductors (including fittings attached to those conductors).

To be completed whether or not an inspection is required.

No. 1341880

No. of attachments

CUSTOMER INFORMATION - PLEASE PRINT CLEARLY

Name of customer David Heard / D C Heard Ltd Phone: 0274950355

Address of installation 3/96 Pukunatua St Rotorua

Postal address of customer (if not as above) 25 Stanley Dr Rotorua

WORK DETAILS

49 No. of lighting outlets

1 No. of ranges

Please tick (✓) as appropriate where work includes:

25 No. of socket outlets

1 No. of water heaters

Mains

Main earthing system

Was any installation work carried out by the homeowner?

Yes No

Switchboard

19 Electric lines

Description New Unit

2 towel Radios

2 Fans

MEN in main meter base

It is recommended that test results be recorded here:

Visual Examination

Earth Continuity

Bonding

Polarity

Insulation Resistance 500 Mohm

Other

If necessary attach any pages with sketches of work done

CERTIFICATION OF WORK

I certify that the above electrical work has been carried out in accordance with the requirements of the Electricity Act 1992 and Electricity Regulations 1997.

ELECTRICAL WORKER DETAILS

Name Pat Edhouse

Registration no. E6626

Company Pat Edhouse Elect

Signature P. Edhouse

Date 19-12-02

Contact Ph No. 025 962 365

CERTIFICATION OF ELECTRIC LINES

(to be completed where a separate electrical worker has installed the electric line portion of the mains)

Name

Registration no.

Company

Signature

Date

Contact Ph No.

INSPECTION DETAILS Electrical work requiring inspection by a registered electrical inspector

New mains

Switchboard

Earthing system

Installation work in hazardous areas

I certify that the inspection has been carried out in accordance with the requirements of regulation 41 of the Electricity Regulations 1997.

Name

Registration no.

Signature

Date

Contact Ph No.

CUSTOMER COPY - THIS IS AN IMPORTANT DOCUMENT AND SHOULD BE RETAINED

Electrical Certificate of Compliance

for prescribed electrical work that is carried out on electrical installations and involves the placing or positioning or the replacing or repositioning of conductors (including fittings attached to those conductors).

To be completed whether or not an inspection is required.

No. 1341878

No. of attachments

CUSTOMER INFORMATION - PLEASE PRINT CLEARLY

Name of customer Ivan Deedman

Phone:

Address of installation 5/96 Pukuatua St Rotorua

Postal address of customer (if not as above)

WORK DETAILS

50 No. of lighting outlets

1

No. of ranges

29 No. of socket outlets

1

No. of water heaters

Was any installation work carried out by the homeowner?

Yes

No

Please tick (✓) as appropriate where work includes:

☐ Mains☐ Main earthing system☐ Switchboard☐ Electric lines

Description New unit (unit 5 of 6)

2 towel racks

2 Fans

It is recommended that test results be recorded here:

Visual Examination



Earth Continuity



Bonding



Polarity



Insulation Resistance 500mg + Mohm

Other

If necessary attach any pages with sketches of work done

CERTIFICATION OF WORK

I certify that the above electrical work has been carried out in accordance with the requirements of the Electricity Act 1992 and Electricity Regulations 1997.

ELECTRICAL WORKER DETAILS

Name

Pat Edhouse Elect

Registration no.

ECC28

Company

Pat Edhouse Elect

Signature

P. S. Edhouse

Date

6-12-02

Contact Ph No.

025 962 365

CERTIFICATION OF ELECTRIC LINES

(to be completed where a separate electrical worker has installed the electric line portion of the mains)

Name

Registration no.

Company

Signature

Date

Contact Ph No.

INSPECTION DETAILS Electrical work requiring inspection by a registered electrical inspector

☐ New mains☐ Switchboard☐ Earthing system☐ Installation work in hazardous areas

I certify that the inspection has been carried out in accordance with the requirements of regulation 41 of the Electricity Regulations 1997.

Name

Registration no.

Signature

Date

Contact Ph No.

CUSTOMER COPY - THIS IS AN IMPORTANT DOCUMENT AND SHOULD BE RETAINED

Electrical Certificate of Compliance

for prescribed electrical work that is carried out on electrical installations and involves the plating or positioning or the replacing or repositioning of conductors (including fittings attached to those conductors).

To be completed whether or not an inspection is required.

No. 1412455

No. of attachments

Copy of
1341875

CUSTOMER INFORMATION - PLEASE PRINT CLEARLY

Name of customer C. Spitz

Phone:

Address of installation 3/96 Pukunatua St Rotorua

Postal address of customer (if not as above)

WORK DETAILS

29 No. of lighting outlets

1 No. of ranges

20 No. of socket outlets

1 No. of water heaters

Was any installation work carried out by the homeowner?

Yes

No

Please tick (✓) as appropriate where work includes:

✓ Mains

✓ Main earthing system

✓ Switchboard

49 Electric lines

Description New unit

1 towel Rail

2 Fans

MEIV in main meter box

It is recommended that test results be recorded here:

Visual Examination

Earth Continuity

Bonding

Polarity

Insulation Resistance 500MΩ Mohm

Other

If necessary attach any pages with sketches of work done

CERTIFICATION OF WORK

I certify that the above electrical work has been carried out in accordance with the requirements of the Electricity Act 1992 and Electricity Regulations 1997.

ELECTRICAL WORKER DETAILS

Name

Pat Edhouse

Registration no.

E6624

Company

Pat Edhouse Elect

Signature

P. Edhouse

Date

15-12-02

Contact Ph No.

025 962 365

CERTIFICATION OF ELECTRIC LINES

(to be completed where a separate electrical worker has installed the electric line portion of the mains)

Name

Registration no.

Company

Signature

Date

Contact Ph No.

INSPECTION DETAILS Electrical work requiring inspection by a registered electrical inspector

New mains

Switchboard

Earthing system

Installation work in hazardous areas

I certify that the inspection has been carried out in accordance with the requirements of regulation 41 of the Electricity Regulations 1997.

Name

Registration no.

Signature

Date

Contact Ph No.

CUSTOMER COPY - THIS IS AN IMPORTANT DOCUMENT AND SHOULD BE RETAINED

23 September 2003

FILE

Please Quote: P00858

DC Heard Ltd
28 Stanley Drive
ROTORUA

Dear Sir/Madam

DAMAGE DEPOSIT AND/OR VEHICLE CROSSING DEPOSIT

Please find attached cheque for the sum of \$2000.00 being a refund for the Damage Deposit and/or Vehicle Crossing Deposit.

The Deposit was paid on permit No. 12030.

Ref: RETIREMENT UNITS – Cnr HALL & SCHOOL ROAD

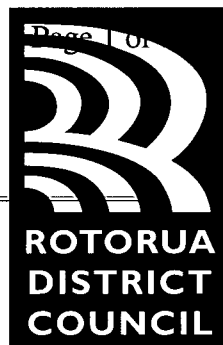
If you have any queries regarding this matter, please do not hesitate to contact me.

Yours faithfully



Diane MacLeod
Administration Assistant Building

Encl.



MacLeod,Diane

From: Kidd, Brendon
Sent: Friday, 19 September 2003 15:10
To: MacLeod,Diane
Subject: RE: mike skeltons refunds

Private Bag RO 3029
Rotorua
New Zealand
Telephone 07-348 4199
Fax 07-346 3143
E-mail mail@rdc.govt.nz

Address all
communications to:
Chief Executive
Rotorua District Council

(Hi Diane you may refund all of these, ta B

-----Original Message-----

From: MacLeod,Diane
Sent: Tuesday, 16 September 2003 2:41 p.m.
To: Kidd, Brendon
Subject: mike skeltons refunds

hi there
heres the last from Bay Certifiers ex Mike Skeltons jobs
please let me know when I can refund.

B/c 11621
Chr Hall Rd / Schools Rds - Anglican Care Waiapu Ltd - D/dep \$1000.00 & v/xing \$1000.00.

B/c 12030
96 Pukuatua Str - DC Heard Ltd - V/xing \$1000.00 & d/dep \$1000.00

B/c 14000
16-18 School Bld - X St Barnabus Church - D/dep \$600.00.

Diane MacLeod
Building Administration
Environmental Services
Rotorua District Council
Ph: 07-3484199 Ext: 8190
email: dmacl@rdc.govt.nz

Revision Letter	Amendment Changes	Date of Rev.	Changed by Initials

P00858

Council Stormwater line.
Application to RDC Resource engineers to
be made for street opening and new connection.

Pukuatua Street

12030
District Council has granted
consent in reliance on building certificate
issued by an approved
inspector under section 56 of the Building Act 1991.
Date: 22.03.02
Consent Number: 12030

PLANS APPROVED SUBJECT TO ALL
REQUIREMENTS OF THE BUILDING ACT
1991 BEING FULLY COMPLIED WITH

Date: 22.03.02 Consent Number: 12030

KENTON COX DESIGN

Document Set ID: 640105
Version: 1, Version Date: 22/06/2010

© THIS DESIGN IS THE PROPERTY OF 'KENTON COX DESIGN' AND MAY NOT BE COPIED OR REPRODUCED WITHOUT PERMISSION.

NOTE:-
ALL CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS
OF THE RELEVANT NZ STANDARDS AND THE NZ BUILDING CODE.
CHECK ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION.

Floor Area
Units 1 to 3 = 364.13 sqm
Units 4 to 6 = 366.13 sqm
Total Site Cover = 730.26 sqm.

Existing Manhole approx 1500mm Deep and
800mm from cl of pipe to boundary.
(Distances to be confirmed on site at time of
excavation.

New connection to existing
sewer to be in accordance with
RDC standard details.
Permission to be sought from
RDC prior to connection.

Note:
Drainage lines are schematic
only.
Ensure all pipes are installed
in compliance to relevant
codes of practice.

Note: Protect other occupancy from the
effect of accidental spillage &
over flow in wet areas as prescribed
in NZBC clause E3.3.2.

Check.

APPROVED

These plans are approved in accordance with
The NZ Building Code.
These plans must remain on site.
BAY BUILDING CERTIFIERS K.M.Cox

Project Title

Unit Development for
D C Heard

Site Plan

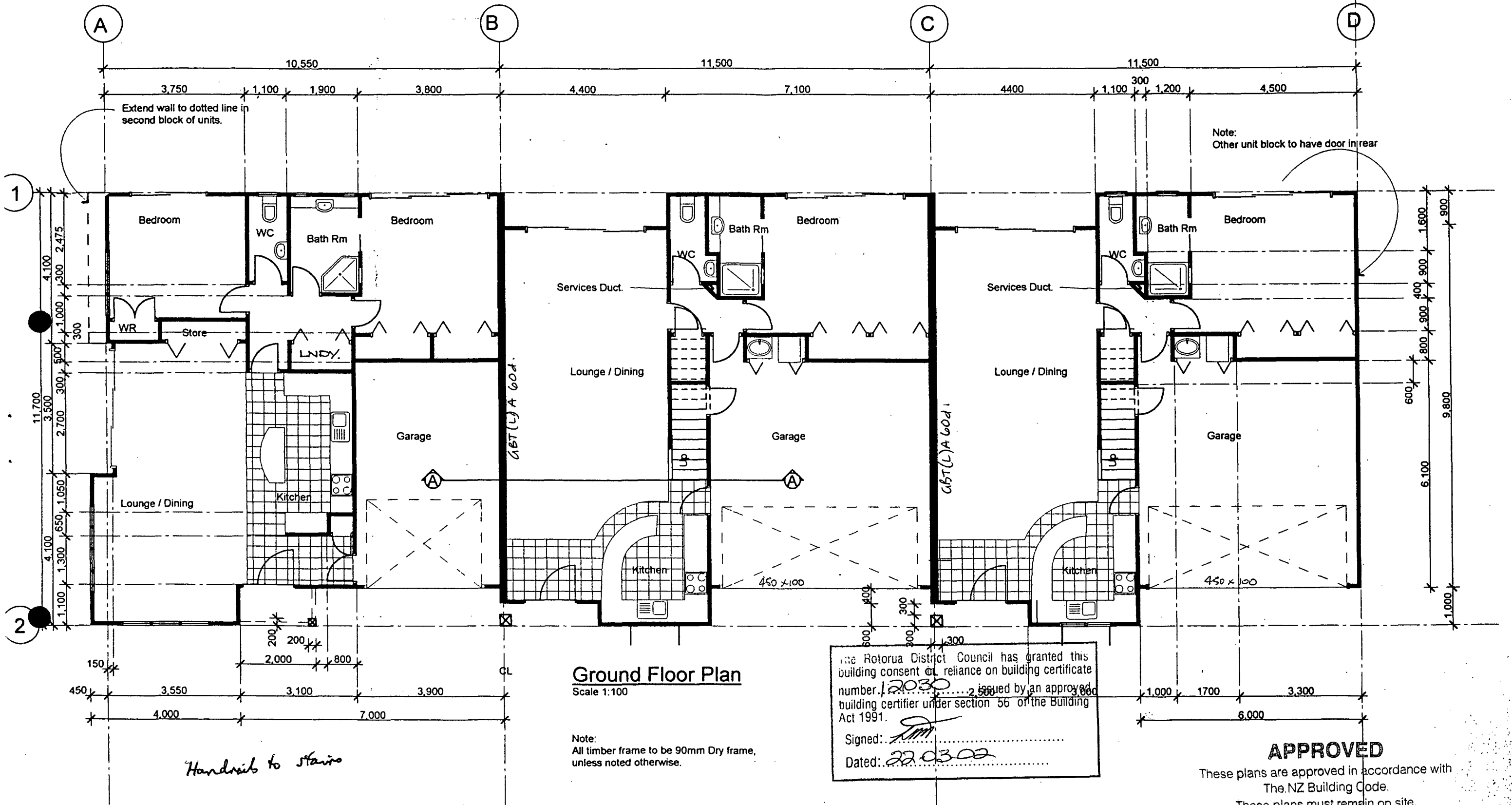
Date of Issue
(Stamped)

Project No.
3021

Drawing No.
A01

KENTON COX DESIGN

RESIDENTIAL • COMMERCIAL • INDUSTRIAL ARCHITECTURE
75 MARGUERITA ST. P.O. BOX 6271 ROTORUA PH (07) 349 4892 FAX (07) 349 4842



The Rotorua District Council has granted this building consent on reliance on building certificate number 12030 issued by an approved building certifier under section 56 of the Building Act 1991.

Signed: *[Signature]*
Dated: 22.03.02

APPROVED

These plans are approved in accordance with The NZ Building Code.
These plans must remain on site.
BAY BUILDING CERTIFIERS

PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH

Date 22.03.02 Consent Number 12030

Officer: *[Signature]*

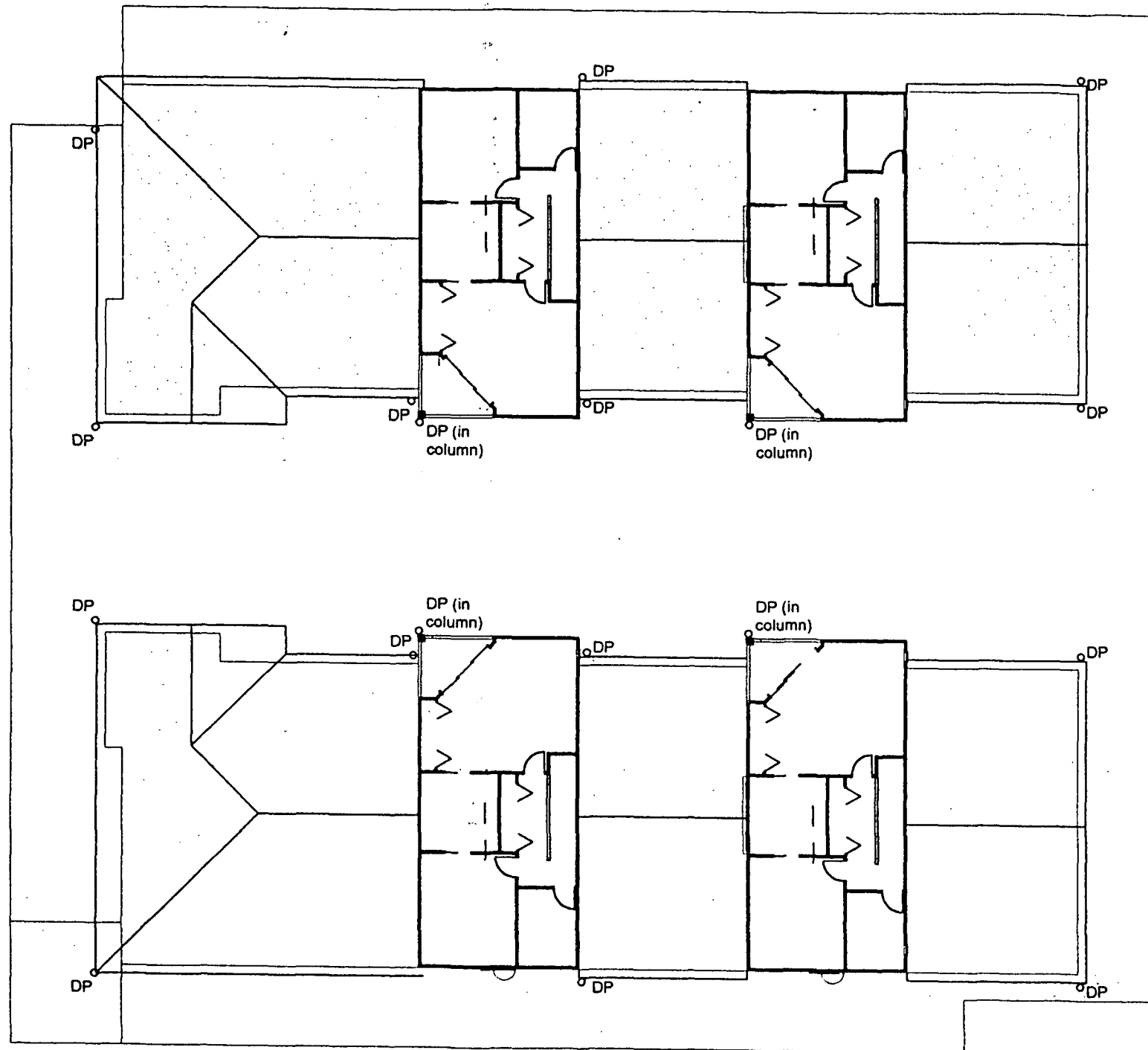
KENTON COX DESIGN

RESIDENTIAL • COMMERCIAL • INDUSTRIAL ARCHITECTURE

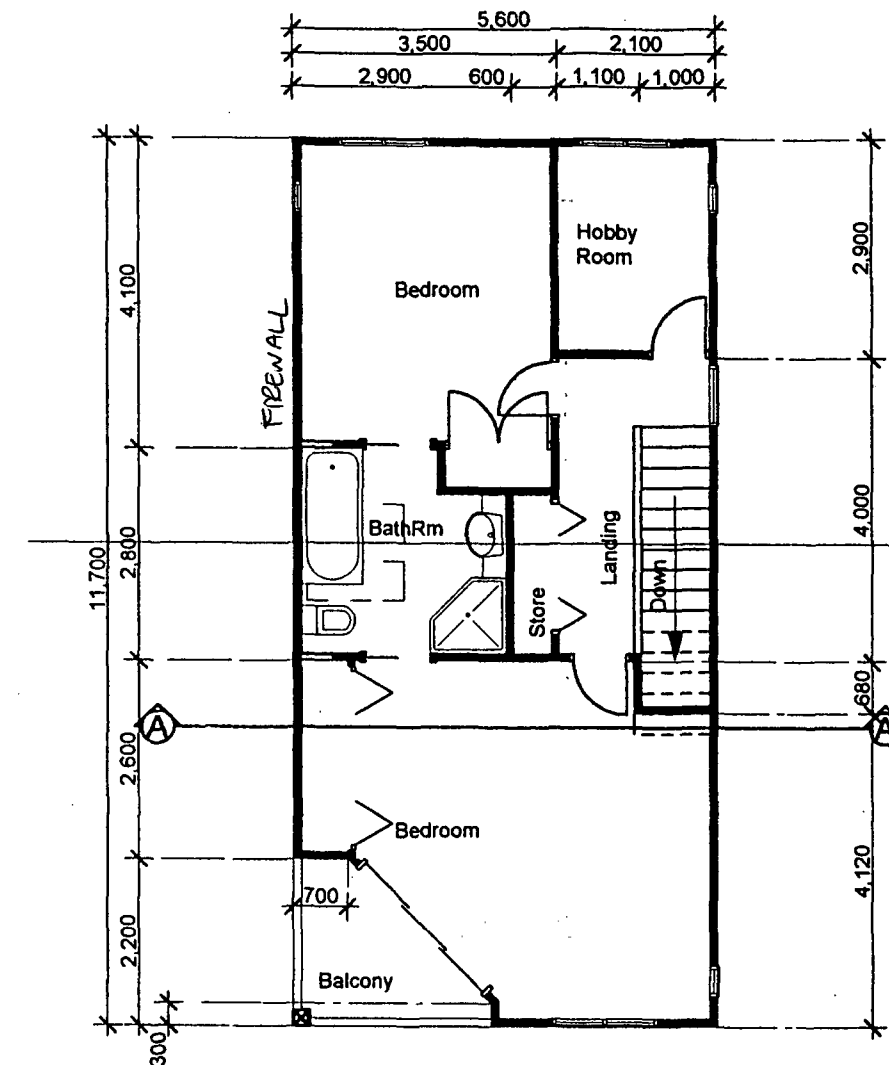
75 MARGUERITA ST. P.O. BOX 6271 ROTORUA PH (07) 349 4882 FAX (07) 349 4842

Project No.	3021
Drawing No.	A02
Rev.	()

Revision Letter	Amendment Changes	Date of Rev.	Changed by initials



First Floor Plan / Ground Floor Roofing Plan
Scale 1:200



First Floor Plan
Scale 1:100

The Rotorua District Council has granted this building consent in reliance on building certificate number. 12030 issued by an approved building certifier under section 56 of the Building Act 1991.

Signed: *[Signature]*
Dated: 22.03.02

PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH

Date 22.03.02 Consent Number 12030

Officer: *[Signature]*

NOTE:
ALL CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF THE RELEVANT NZ STANDARDS AND THE NZ BUILDING CODE.
CHECK ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION.

APPROVED

These plans are approved in accordance with The NZ Building Code.
These plans must be used in accordance with the BAY BUILDING CERTIFICATE.

First Floor & Roofing Plan

Date of issue (Stamped)

Project No. 3021

Drawing No. A03

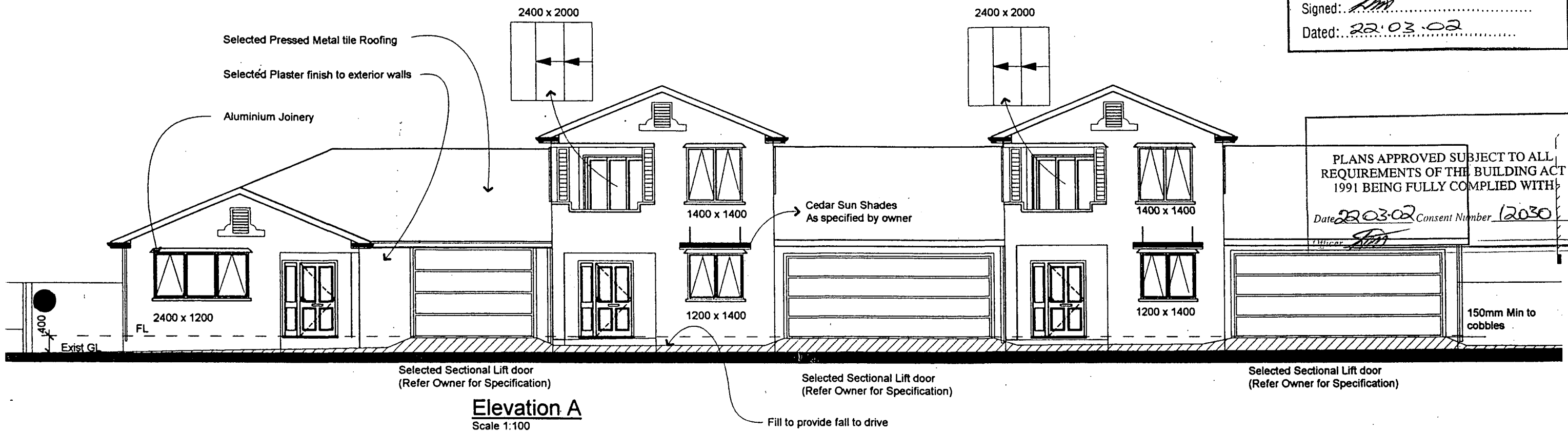
Rev. Letter ()



RESIDENTIAL • COMMERCIAL • INDUSTRIAL ARCHITECTURE
75 MARGHERITA ST. P.O. BOX 6271 ROTORUA PH (07) 349 4892 FAX (07) 349 4842

The Rotorua District Council has granted this building consent in reliance on building certificate number. 12030..... issued by an approved building certifier under section 56 of the Building Act 1991.

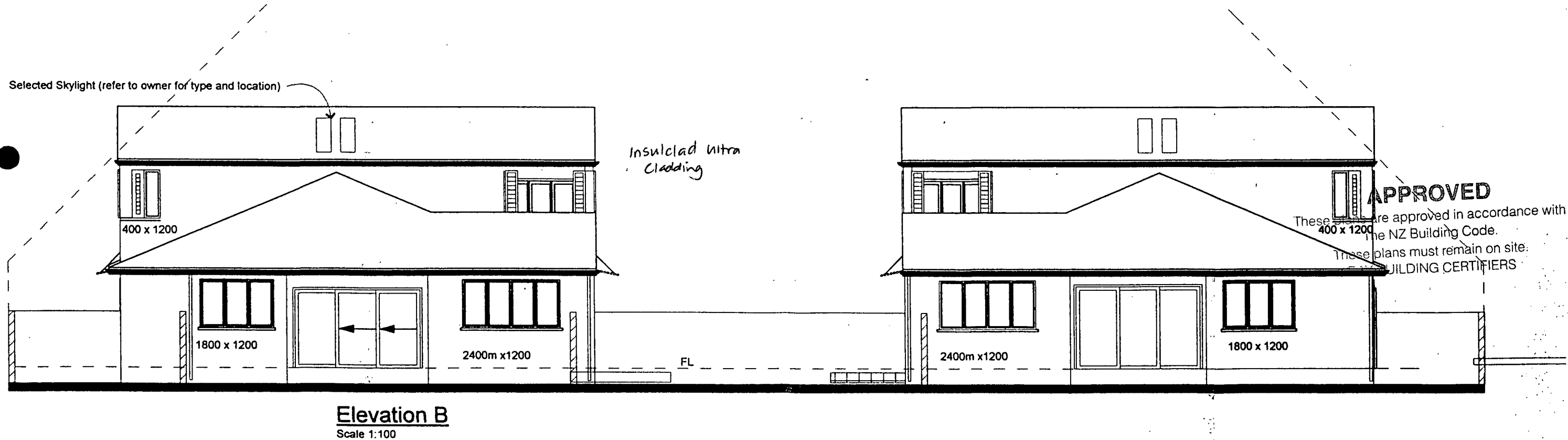
Signed: *[Signature]*
Dated: 22.03.02

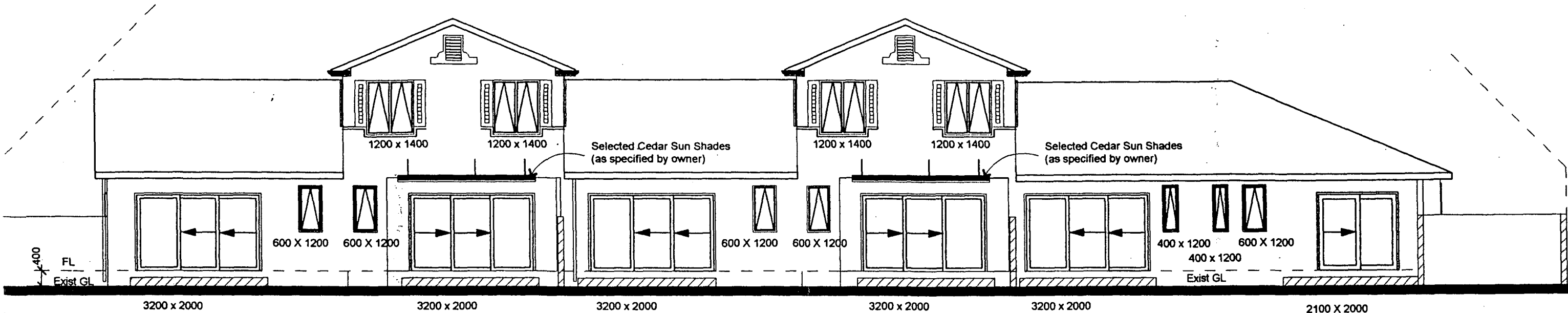


PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH

Date 22.03.02 Consent Number 12030

[Signature]





Elevation C

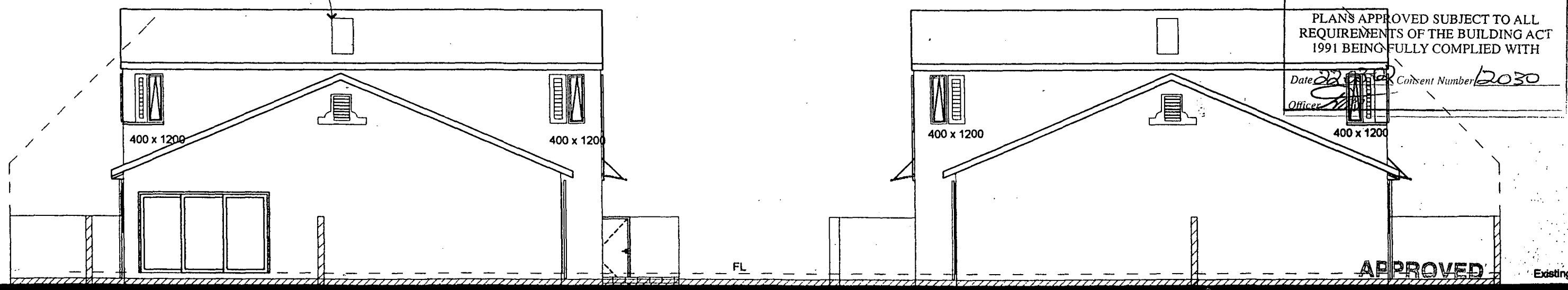
Scale 1:100

The Rotorua District Council has granted this building consent in reliance on building certificate number... 12030 ... issued by an approved building certifier under section 56 of the Building Act 1991.

Signed: *[Signature]*

Dated: 22-03-02

Selected Skylight (Refer to owner for specification)



Elevation D

Scale 1:100

PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH

Date: 22-03-02 Consent Number: 12030

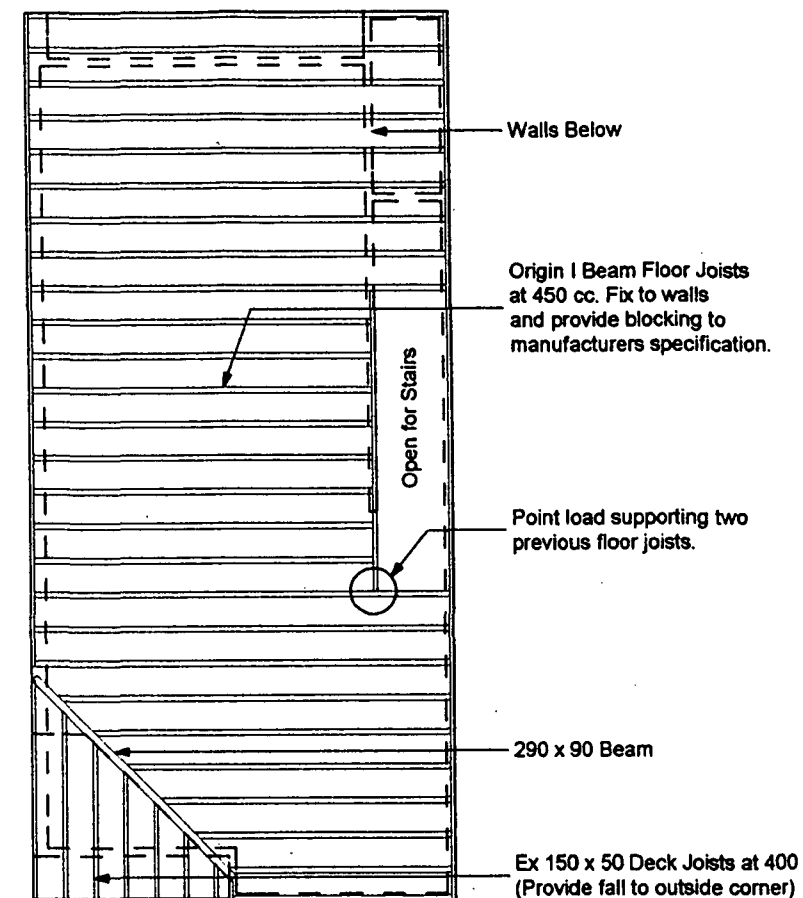
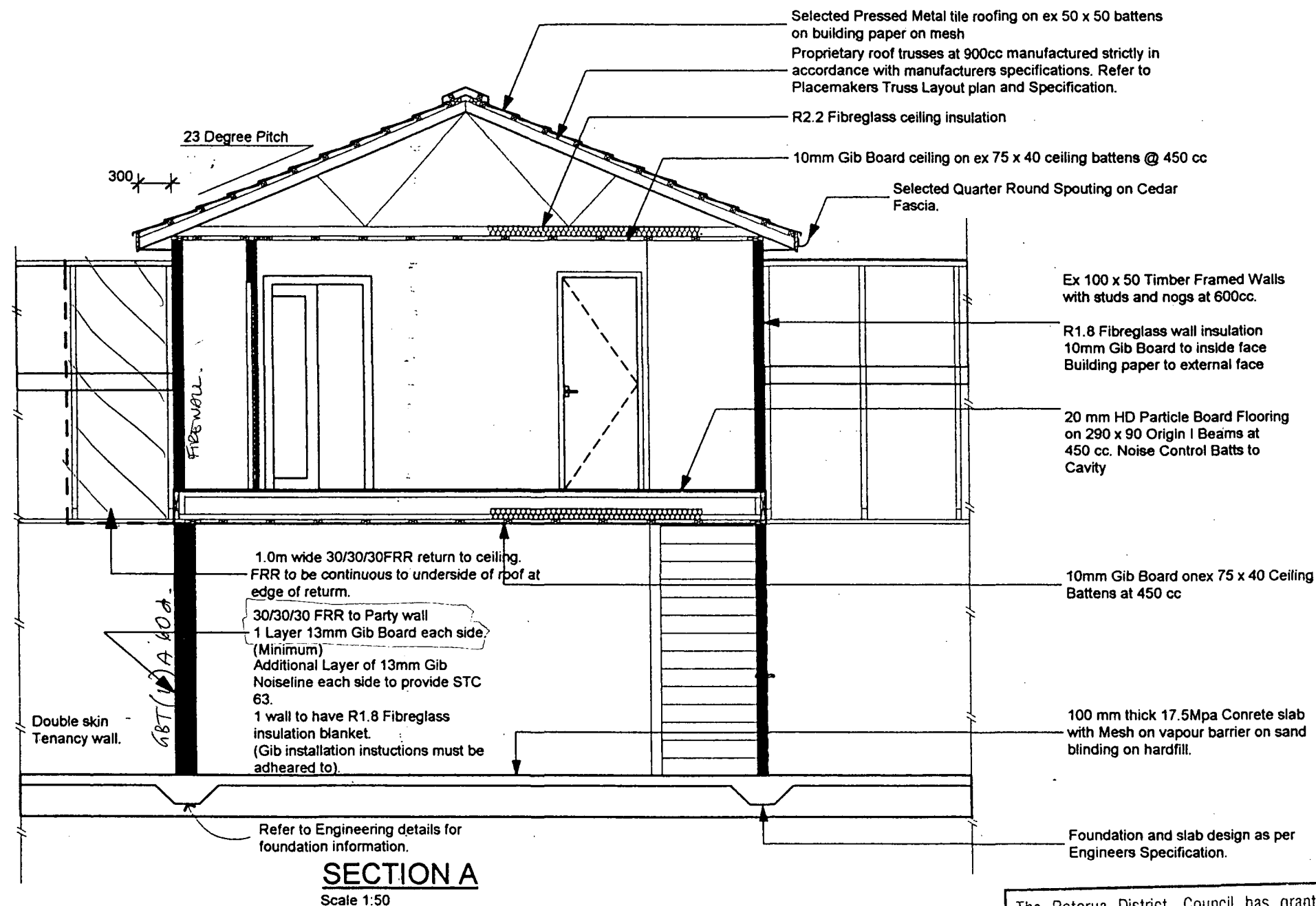
Officer: *[Signature]*

APPROVED

Existing

The NZ Building Code.
These plans must remain on site.
BAY BUILDING CERTIFIERS

Revision Letter	Amendment Changes	Date of Rev.	Changed by Initials



First Floor Framing Plan

Scale 1:100.

Refer to design calculations from Fletcher Challenge Forests.

The Rotorua District Council has granted this building consent in reliance on building certificate number 22030 issued by an approved building certifier under section 56 of the Building Act 1991.

Signed: *[Signature]*Dated: 22.03.02

PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH

Date 22.03.02 Consent Number 12030Officer *[Signature]*

NOTE:
ALL CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF THE RELEVANT NZ STANDARDS AND THE NZ BUILDING CODE.
CHECK ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION.

A3

Designed by

K.M. Cox

Draughted by

K.M. Cox

Project Title

Unit Development for DC Heard

APPROVED

These plans are approved in reliance with the NZ Building Code. These plans must remain on site. BAY BUILDING CERTIFIERS

Date of Issue (Stamped)

Project No.

3020

Drawing No.

A06

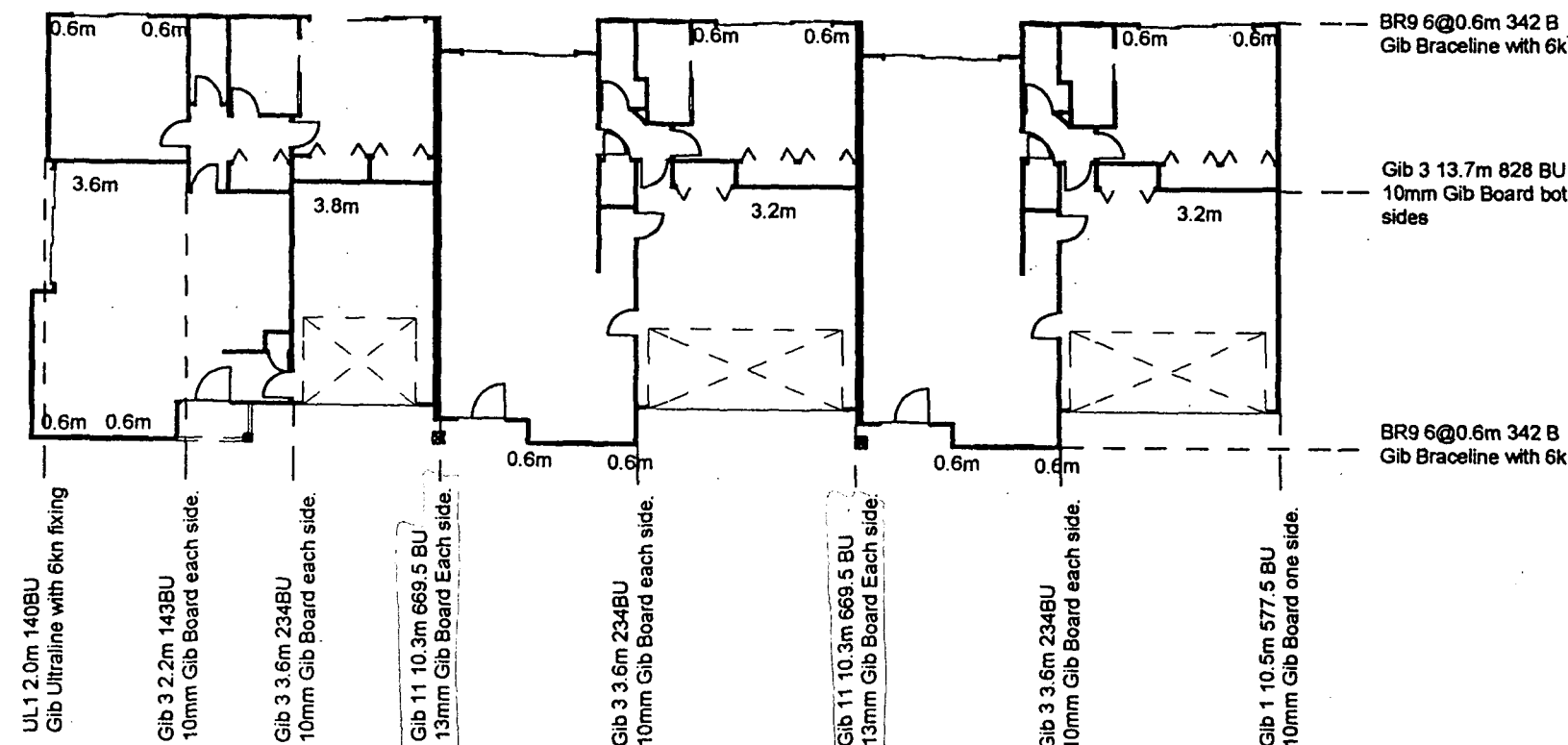
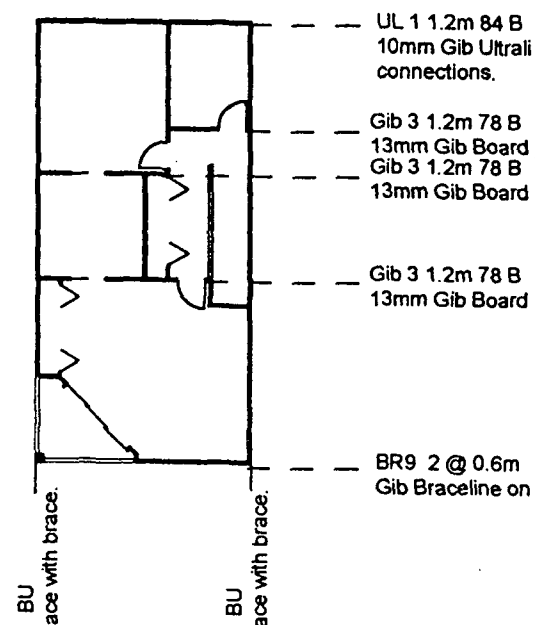
Rev. Letter

()

KENTON COX DESIGN

RESIDENTIAL • COMMERCIAL • INDUSTRIAL ARCHITECTURE
75 MARGUERITA ST. P.O. BOX 6271 ROTORUA PH (07) 349 4862 FAX (07) 349 4842

Revision Letter	Amendment Changes	Date of R



The Rotorua District Council has granted this building consent in reliance on building certificate number 12030 issued by an approved building certifier under section 56 of the Building Act 1991.

Signed: [Signature]

Dated: 22.03.02

PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH

Date 22.03.02 Consent Number 12030

Officer [Signature]

Do
K.M
Draughted by
K.M.C
Project Title

Unit Developemnt for
DC Heard

APPROVED

These plans are approved in accordance with The NZ Building Code.
These plans must remain on site.
BAY BUILDING CERTIFIERS

KENTON COX DESIGN

3020

A07

The Rotorua District Council has granted this building consent in reliance on building certificate number. 12030 issued by an approved building certifier under section 56 of the Building Act 1991.

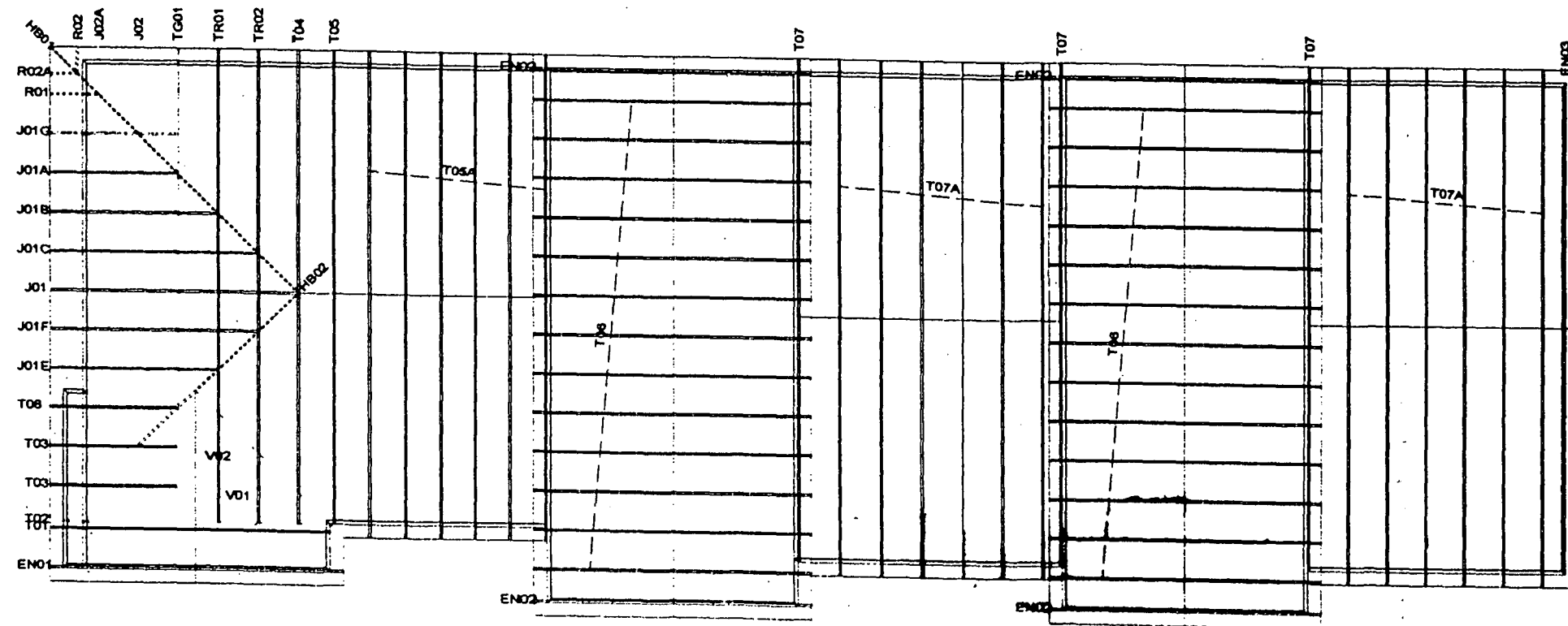
Signed: [Signature]

Dated: 22.03.02

PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH

22.03.02 Consent Number 12030

[Signature]



Placemakers Rotorua		
Te Ngae Rd Rotorua	Name: David Heard Address: Pukuta St	Town House Development
Telephone: 3456892 07 345 6892 Fax	Telephone:	Job: 0111018
Scale: 1 : 141		Date: 13/12/01
		Drawn By: John C

APPROVED

These plans are approved in accordance with The NZ Building Code.

These plans must remain on site.

BY BUILDING CERTIFIERS

Origin I Beam Quantity Sheet

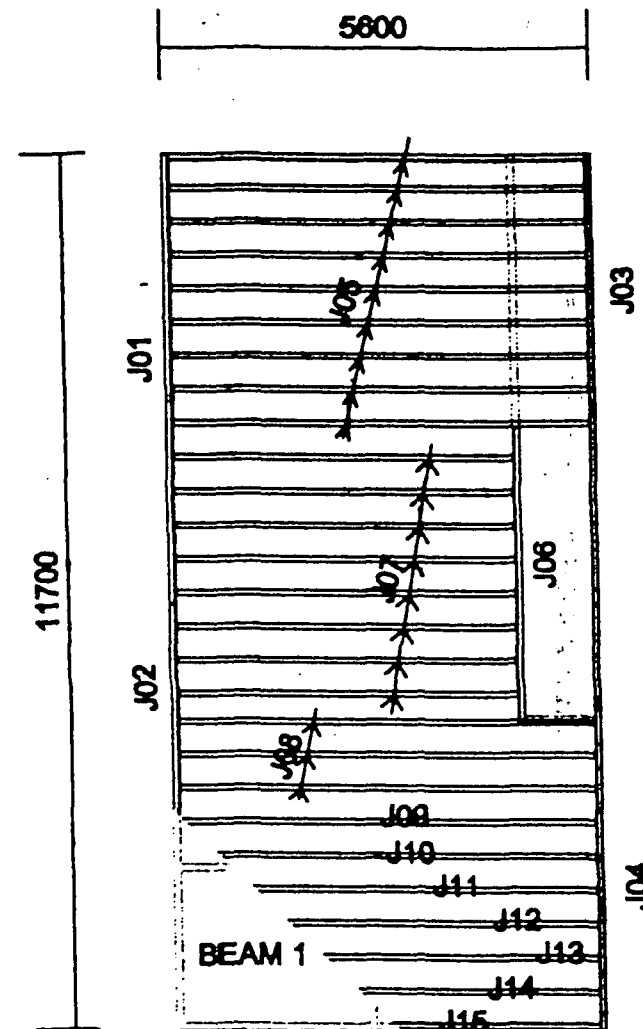
Date 12/12/01
 Job Name David Heard
 Rep Steve Hall
 Job No FCF012
 Address Pukuatua St
 Branch Rotorua

at the source
 of great ideas
 in wood solutions

Chris Burbridge
 Manager Technical Services

FLETCHER CHALLENGE
 FORESTS

Fletcher Challenge Forests
 3 Rockridge Avenue, Perrose
 Private Bag 92036, AMC
 Auckland, New Zealand
 Telephone 0800-ORIGIN
 0800-674-446
 Facsimile 0800-500-323
 E-mail origin@fcl.co.nz



Summary of Joist Lengths

Name	Size	Quantity	Length (m)	Totals (m)
BEAM 1	290x90	1	4.15	

Name	Size	Quantity	Length (m)	Totals (m)
J01	290 I-Beam	1	6.00	
J02		1	2.83	
J03		1	6.00	
J04		1	5.70	
J05		9	5.46	
J06		1	3.91	
J07		8	4.42	
J08		3	5.46	
J09		1	5.40	
J10		1	4.95	
J11		1	4.50	
J12		1	4.05	
J13		1	3.60	
J14		1	3.15	
J15		1	2.70	

Selected Length

1/4.2

Selected Length

1/6.0
 1/5.7
 1/5.7
 1/4.2
 8/4.5
 3/3.9
 1/5.4
 1/5.1
 1/4.5
 1/4.2
 1/3.6
 1/2.7

The Rotorua District Council has granted this building consent in reliance on building certificate number 12030 issued by an approved building certifier under section 56 of the Building Act 1991.

Signed: *[Signature]*

Dated: 22.03.02

PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH

Date 22.03.02 Consent Number 12030

Officer: *[Signature]*

SUMMARY OF SELECTED LENGTHS

Item	Length	Quantity	Total (m)
I Beam 290x69	3.6		0
	3.9	3	11.7
	4.2	2	8.4
	4.5	9	40.5
	4.8	0	0
	5.1	1	5.1
	5.4	1	5.4
	5.7	10	57
	6.0	3	18
	6.3	1	6.3
	6.6	0	0
	7.2	0	0
TOTAL		30	152.4

SUMMARY OF MISCELLANEOUS QUANTITIES

IUT 2.68/11.4 Hanger	40
SULI 2.68/10 Hanger	6
2400x1200 Origin Flooring	21 sheets

These plans are approved in accordance with The NZ Building Code.
 These plans must remain on site.
 BY BUILDING CERTIFIERS

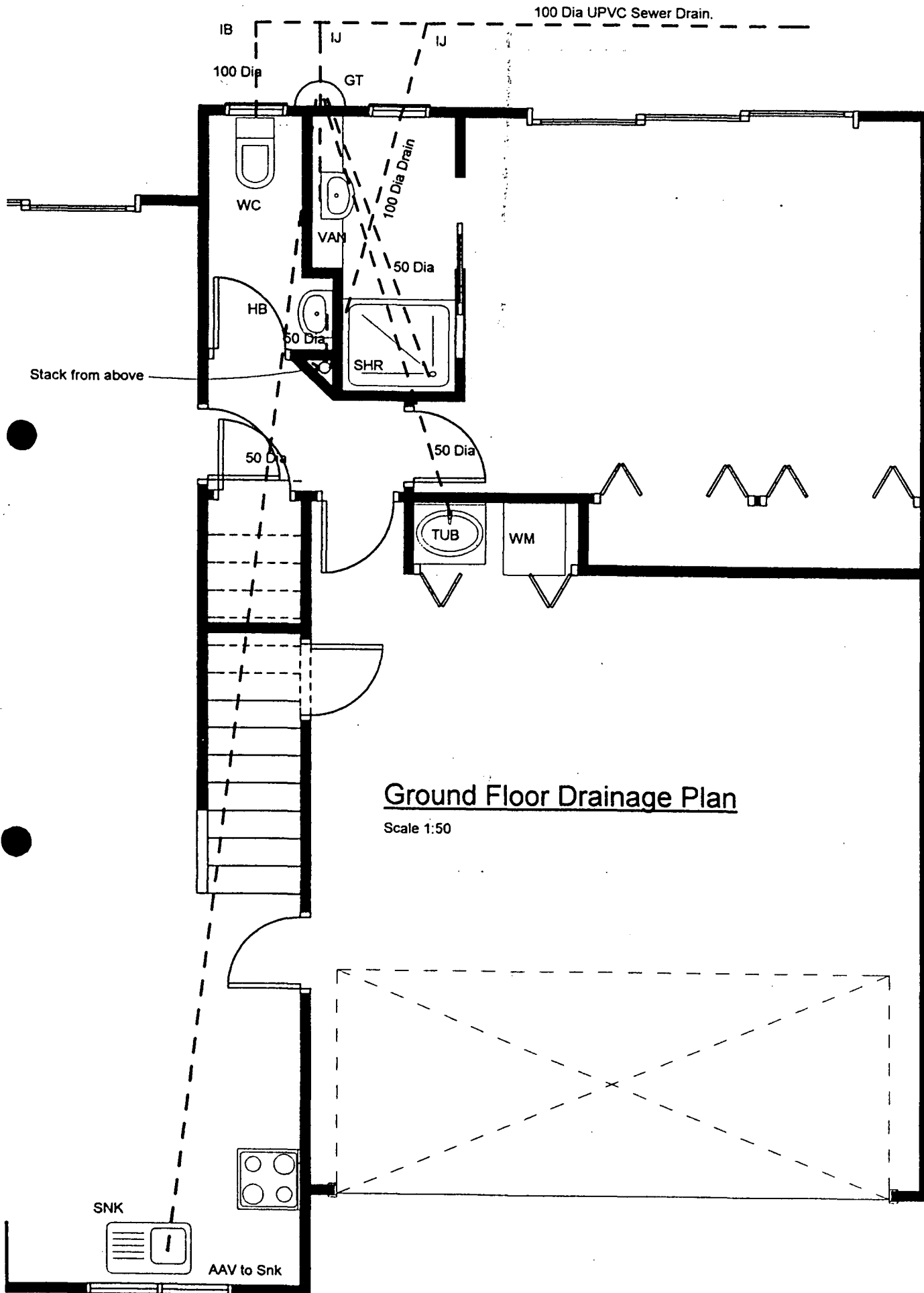
FLETCHER CHALLENGE FORESTS

DAVID HEARD BUILDERS PUKUATA ST TOWN HOUSES

DESIGN BY JOHN CHITTENDEN
 70 LOOP RD LAKE OKAREKA
 PH 3628 420

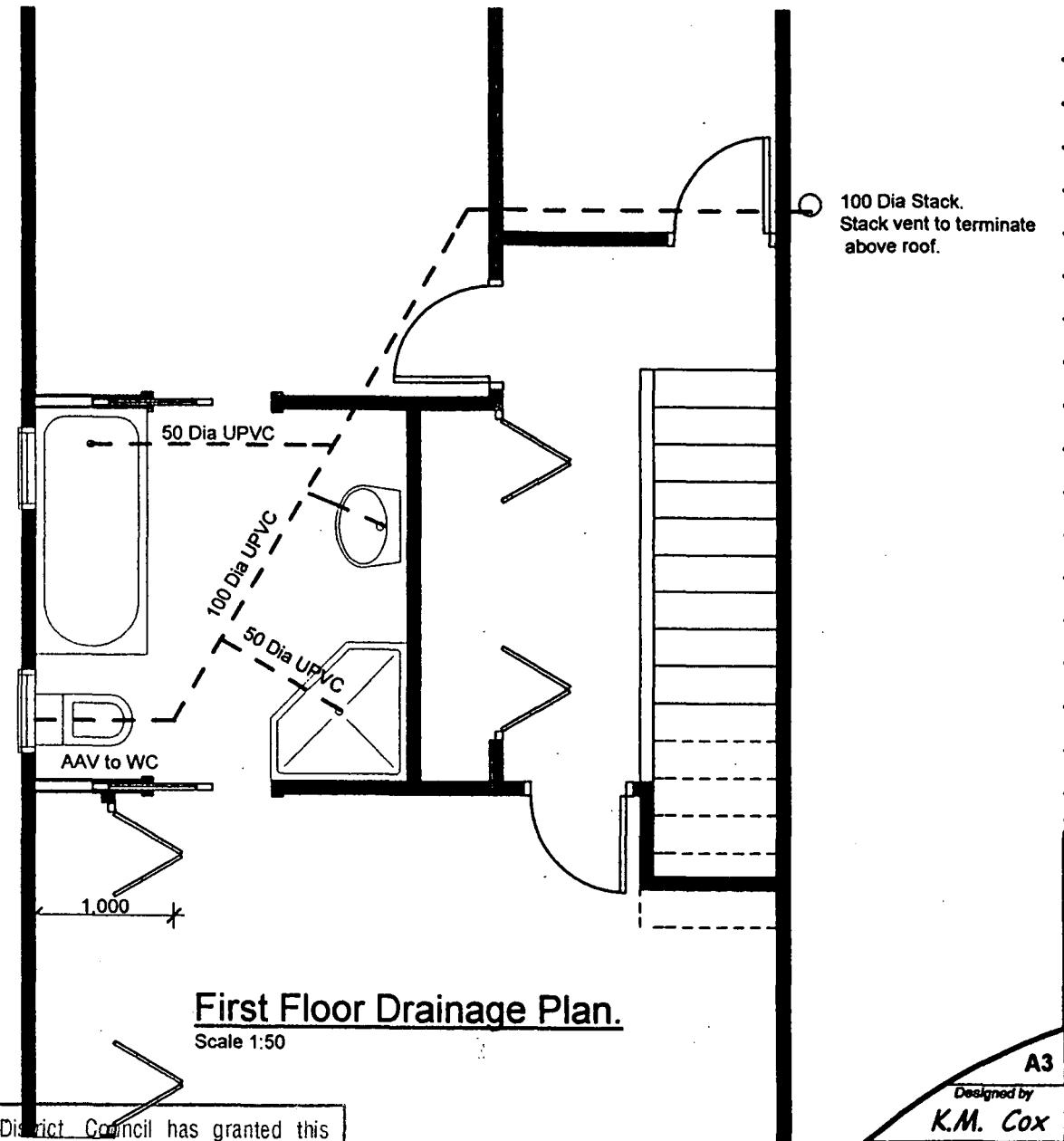
DRAWN BY JC
 CHECKED JC
 DATE 12/12/01
 PLEN/FCF012
 SCALE 1:100

Revision Letter	Amendment Changes	Date of Rev.	Changed by Initials



Ground Floor Drainage Plan

Scale 1:50



First Floor Drainage Plan.

Scale 1:50

Note:
Ensure all penetrations in Origin I Beams are in compliance with manufacturers instruction.

100 Dia Hole to be cut no closer than 1.0m from support.

Drawings are Schematic only.
All plumbing and drainage to be installed strictly in accordance with NZBC.

The Rotorua District Council has granted this building consent in reliance on building certificate number 2030..... Issued by an approved building certifier under section 56 of the Building Act 1991.

Signed: *[Signature]*

Dated: 22-03-02

PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH

22-03-02 Consent Number 12030

NOTE:
ALL CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF THE RELEVANT NZ STANDARDS AND THE NZ BUILDING CODE.
CHECK ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION.

APPROVED

These plans are approved in accordance with The NZ Building Code.

These plans must remain on site.

BAY BUILDING CERTIFIERS

Date of Issue (Stamped)

Unit Development for DC Heard

A3

Designed by

K.M. Cox

Drafted by

K.M. Cox

Project Title

Unit Development for DC Heard

Project No.

3020

Drawing No.

A09

Rev. Letter

()

KENTON COX DESIGN

RESIDENTIAL • COMMERCIAL • INDUSTRIAL ARCHITECTURE
75 MARGUERITA ST. P.O. BOX 6271 ROTORUA PH (07) 349 4892 FAX (07) 349 4842

Revision Letter	Amendment Changes	Date of Rev.	Changed by Initials

Bracing Calculations

Job No: 3021

Street Address:

Legal Description:

Building Height to Apex: 7.0
 Roof Height above Eaves: 1.5m
 Stud Height: 2.4m
 Roof Pitch: >30 Deg

Roof Weight: Light
 Cladding Weight: Light
 Roof Type: Trussed

Bracing Required for Earthquake

Ground Floor

BU Required

264 Single Storey 2.7 X Floor Area 264 = 712.8
 108 Two Storey 7.4 X Floor Area 108 = 799.2

Total = 1512

Bracing Required for Wind

Wind Zone: Medium



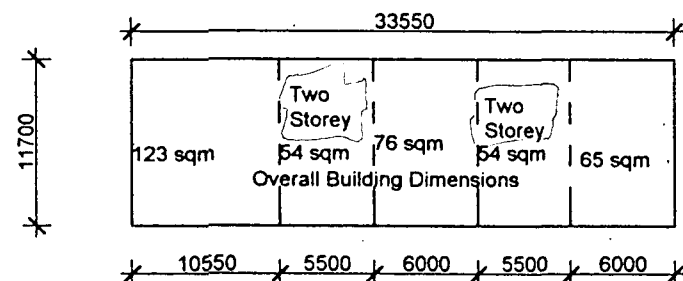
Lower of two

Ground Floor

BU Along
Required

Ground Floor 11.7 x 89 =
 1041.3 Bu

Provided
 Ground Floor 1578 for EQ



10.55 x 37 = 388.5
 5.5 x 96 = 528
 6.0 x 37 = 222
 5.5 x 96 = 528
 6.0 x 37 = 222

Required

Ground Floor 1888.5

Provided

Ground Floor 2901.5 for wind

Refer to Floor Plan for Bracing Distribution.

Refer to Manufacturers specification for fixing of all products.

Bracing Calculations

Job No: 3021

Street Address:

Legal Description:

Building Height to Apex: 7.0
 Roof Height above Eaves: 1.5m
 Stud Height: 2.4m
 Roof Pitch: >30 Deg

Roof Weight: Light
 Cladding Weight: Light
 Roof Type: Trussed

Bracing Required for Earthquake

Ground Floor

BU Required 4.2 X Floor Area 66 = 277.2

Bracing Required for Wind

Wind Zone: Medium

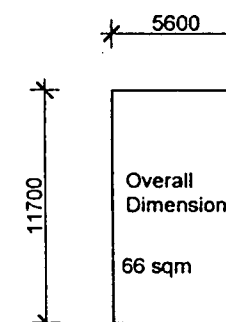


Upper Floor

BU Along
Required

Ground Floor 11.7 x 37 =
 432.9 BU

Provided
 Ground Floor 450 for wind



Required
 Ground Floor 5.6 x 44
Provided
 Ground Floor = 246.4 Bu
 Ground Floor 320 for EQ

Refer to Floor Plan for Bracing Distribution.

Refer to Manufacturers specification for fixing of all products.

The Rotorua District Council has granted this building consent in reliance on building certificate number 12030 issued by an approved building certifier under section 56 of the Building Act 1991.
 Signed: *[Signature]*
 Dated: 22.03.02

PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH
 Date 22.03.02 Consent Number 12030
 Officer: *[Signature]*

A3
 Designed by
K.M. Cox
 Drafted by
K.M. Cox

Unit Development for
 DC Heard

APPROVED

These plans are approved in accordance with
 The NZ Building Code
 These plans must remain on site.
 BAY BUILDING CERTIFIERS

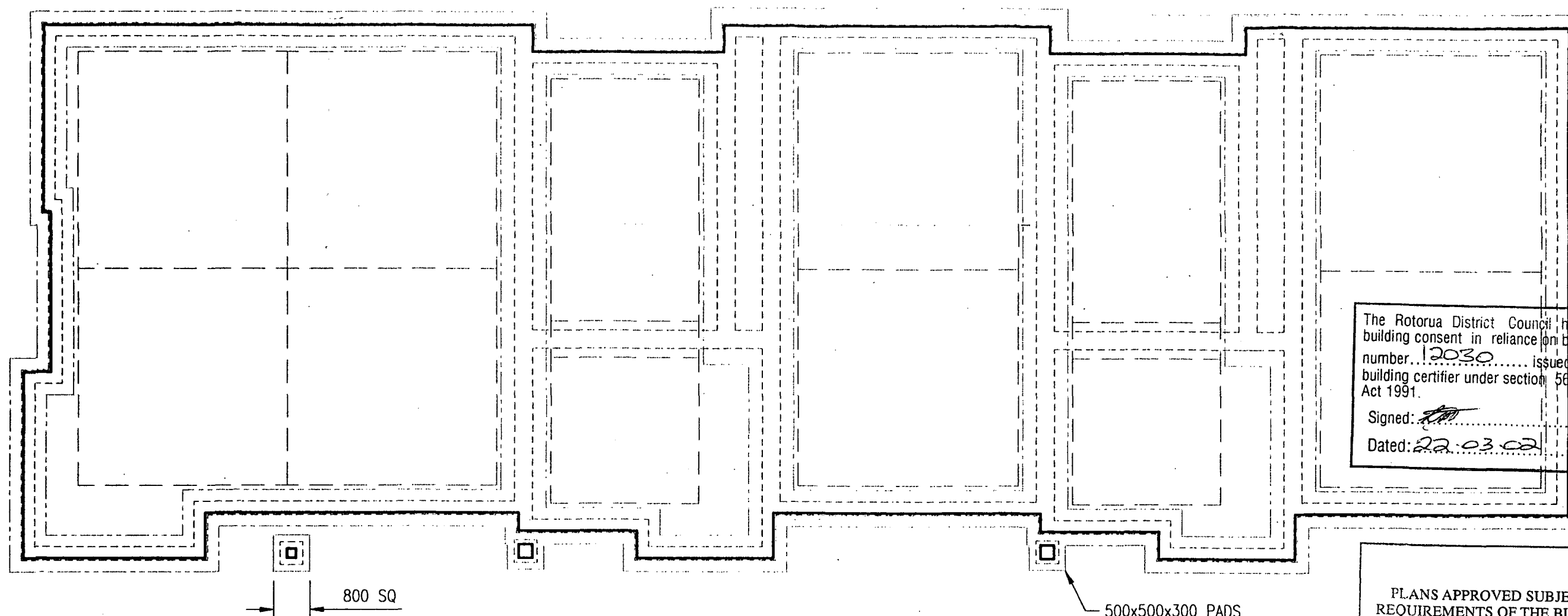
Date of Issue
 (Stamped)

KENTON COX DESIGN

Project No. 3020
 Drawing No. A08
 Rev. Letter ()

RESIDENTIAL • COMMERCIAL • INDUSTRIAL ARCHITECTURE
 75 MARGUERITA ST. P.O. BOX 6271 ROTORUA PH (07) 349 4882 FAX (07) 349 4842

NOTE:
 ALL CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF THE RELEVANT NZ STANDARDS AND THE NZ BUILDING CODE.
 CHECK ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION.



The Rotorua District Council has granted this building consent in reliance on building certificate number 12030 issued by an approved building certifier under section 56 of the Building Act 1991.

Signed: *[Signature]*

Dated: 22.03.02

PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH

Date 22.03.02 Consent Number 12030

Officer: *[Signature]*

GENERAL NOTES:

- 1, REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS ETC.
- 2, REFER ALSO TO TONKIN & TAYLOR GEOTECHNICAL REPORTS REF: 11722 & 15549.

SPECIFICATION:

- 1, FOR COMPACTION OF THE PUMICE SAND BACKFILL THE FOLLOWING CLAUSES ARE APPLICABLE.

AFTER PLACING THE GEOTEXTILE, THE FIRST LAYER OF BACKFILL MATERIAL, CONSISTING OF CLEAN WELL GRADED PUMICE SAND, SHALL BE PLACED IN A LAYER NOT EXCEEDING 300mm THICKNESS (LOOSE), AND THEN COMPACTED USING A LIGHTWEIGHT STATIC ROLLER. PROVISION SHALL BE MADE FOR THE GEOGRID IN THE LOWER PART OF THIS LAYER, IN ACCORDANCE WITH THE DRAWINGS.

ROLLING SHALL CONTINUE UNTIL THE FOLLOWING COMPACTION CRITERIA ARE ACHIEVED.

FLOOR SLAB & FOUNDATION PLAN 1:100

- (a) CLEGG IMPACT VALUE (CIV) OF NOT LESS THAN 6.
 - (b) A RELATIVE DENSITY OF NOT LESS THAN 40%.
- 2, SUBSEQUENT FILL LAYERS SHALL BE PLACED IN LAYERS NOT EXCEEDING 150mm THICKNESS (LOOSE).

ROLLING OF A LIGHTWEIGHT STATIC ROLLER SHALL CONTINUE UNTIL THE FOLLOWING COMPACTION CRITERIA HAVE BEEN ACHIEVED.

(a) A (CIV) OF NOT LESS THAN 9.
(b) A RELATIVE DENSITY OF NOT LESS THAN 70%.

LINE LEGEND

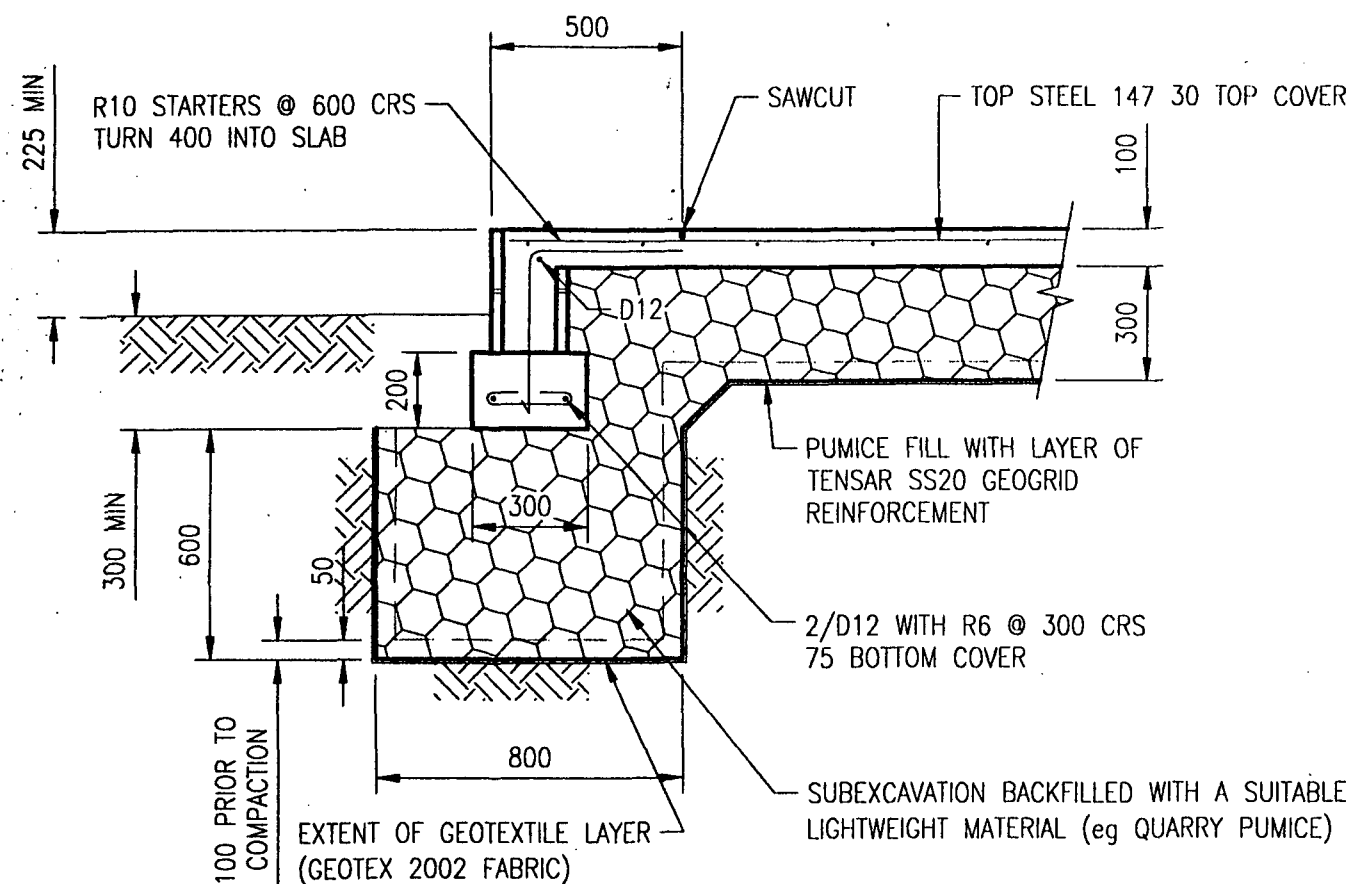
- SLAB OUTLINE
 - - - - SAWCUT
 - - - - EXCAVATION OUTLINE
- APPROVED**
- These plans are approved in accordance with the NZ FOUNDATION Code.
- These plans must remain on site.
- BY BUILDING CERTIFIERS

bsk
CONSULTING ENGINEERS LTD
P.O. BOX 23, 144 HINEMOA STREET, ROTORUA
NEW ZEALAND
PHONE (07) 348 5394 FAX (07) 348 2311
EMAIL: bsk.144@clear.net.nz

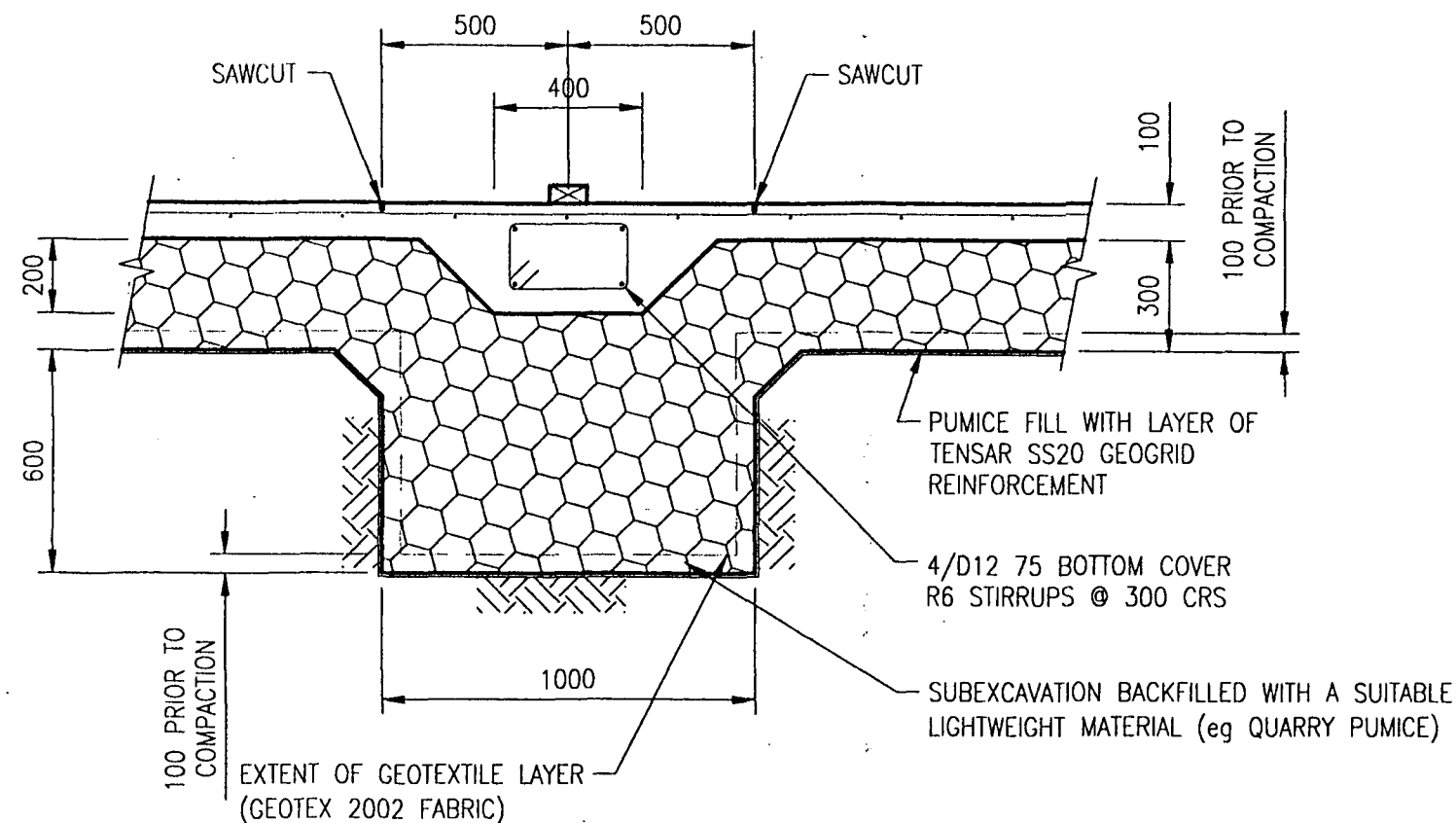
PROJECT:

UNIT DEVELOPMENT FOR D.C. HEARD
PUKUATUA STREET
ROTORUA

DRAWN: CN	DATE: DECEMBER 2001
CHECKED: JWK	JOB REF No: 12848
SCALES: 1:100	SHEET No: 1 OF 2



TYPICAL PERIMETER FOOTING 1:20



TYPICAL INTERNAL FOUNDATION 1:20

The Rotorua District Council has granted this building consent in reliance on building certificate number 12030 issued by an approved building certifier under section 56 of the Building Act 1991.

Signed: *[Signature]*

Dated: 22.03.02

PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH

Date 22.03.02 Consent Number 12030

Officer *[Signature]*

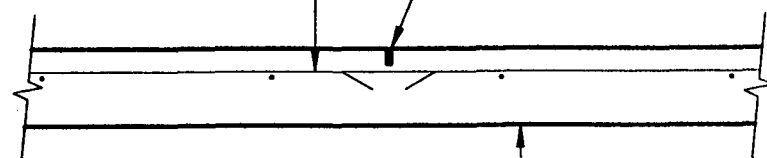
APPROVED

these plans are approved in accordance with
The NZ Building Code.

These plans must remain on site.
BY BUILDING CERTIFIERS

TOPSTEEL 147 30 TOP COVER
CUT ALTERNATE STRANDS AT
LINE OF SAWCUT

3mm x 20mm SAWCUT TO
BE MADE WITHIN 36 HOURS
OF POURING CONCRETE



100 THICK SLAB

SAWCUT DETAIL 1:10

bsk
CONSULTING ENGINEERS LTD
P.O. BOX 23, 144 HINEMOA STREET, ROTORUA
NEW ZEALAND
PHONE (07) 348 6394 FAX (07) 348 2311
EMAIL: bsk.144@clear.net.nz

PROJECT:

UNIT DEVELOPMENT FOR D.C. HEARD
PUKUATUA STREET
ROTORUA

DRAWN: CN

DATE: DECEMBER 2001

CHECKED: JWK

JOB REF No: 12848

SCALES: 1:20 1:10

SHEET No: 2 OF 2



TONKIN & TAYLOR LTD. CONSULTING ENGINEERS
19 MORGAN STREET NEWMARKET AUCKLAND NEW ZEALAND
P.O. BOX 5271 AUCKLAND 1 NEW ZEALAND
PH: 64-9-377 1865 FAX 64-9-307 0265

P 0 0 8 5 8

SITE INVESTIGATION

PUKUATUA ST DEVELOPMENT

ROTORUA

The Rotorua District Council has granted this building consent in reliance on building certificate number 12030 issued by an approved building certifier under section 56 of the Building Act 1991.

Signed: [Signature]

Dated: 22-03-02

Ref: 11722
December 1992

PREPARED FOR:

Pukuatua Street Partnership
C/- Neville Rykers
127 Mountain Road
EPSOM

DISTRIBUTION:

Pukuatua Street Partnership
Tonkin & Taylor Ltd (File)

PLANS APPROVED SUBJECT TO ALL
REQUIREMENTS OF THE BUILDING ACT
1991 BEING FULLY COMPLIED WITH

Date 22-03-02 Consent Number 12030

For [Signature]

- 2 copies
- 2 copies



SITE INVESTIGATION
PUKUATUA STREET DEVELOPMENT
ROTORUA
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1.0 INTRODUCTION

1.1 General

This report presents the results of a site investigation carried out for potential development at the corner of Pukuatua Street and Ranolf Street, Rotorua site. The work was carried out for the Pukuatua Street Partnership at the direction of Mr Neville Rykers. The work is in general accordance with our proposal of 18 November 1992.

The results of the investigation show that the near-surface soils present at the site are generally poor and it is recommended that the proposed development be supported on driven piles.

1.2 Scope of Work

The work comprised the following:

- Two machine augered boreholes with in situ testing to a depth of approximately 10 m.
- Nine cone penetrometer tests (CPT) to a depth of approximately 10 m.
- Laboratory testing of undisturbed soil samples to characterise the nature and performance of the materials.
- Investigation of available subsurface information from published geological data and previous Tonkin & Taylor investigations in the vicinity of the proposed site.
- Office evaluation of the investigation and subsequent compilation of a report.

1.3 Fieldwork

The fieldwork was carried out on 27 November 1992 by Geotech Drilling of Wairakei. The work was supervised by a senior technician from Tonkin & Taylor who also logged the boreholes. Disturbed samples of the materials obtained from the augered boreholes were retained and inspected by a geotechnical engineer to confirm the nature of the soils encountered.

Nine cone penetrometer tests (CPT) were carried out over the site. Also, standard penetration tests (SPT) were carried out in both boreholes at regular intervals of depth. The augered boreholes allow the CPT results to be rationalised against the SPT results and the disturbed samples recovered from the site. The locations of the augered boreholes and cone penetration tests are shown on the site plan, see Drawing No. 11722-1. Detailed geological logs of the augered boreholes are presented in Appendix A with core penetration test results in Appendix B.

1.4 Laboratory Testing

Laboratory testing has been undertaken to characterise the recovered soil samples and to investigate their physical response to applied loads. To achieve this, the cohesive soil specimens have been subjected to shear vane tests and one dimensional consolidation tests. Results from these tests have been used in the analysis of the expected bearing capacity and settlement for the various materials. The non-cohesive specimens have been subjected to a particle size analysis to assess the potential for liquefaction under earthquake induced ground motions.

Results of all laboratory tests are presented in Appendix C. The undrained shear strengths obtained for the undisturbed silt samples are summarised in Table 1.

Table 1
Undrained Shear Strengths From Laboratory Tests

Borehole	Depth (m)	Cu (kPa)
1	1.3	67
2	2.3	3
2	5.2	0

The silt samples recovered from borehole 2 show exceptionally low strength. Consolidation tests on the material from borehole 2 also confirm high compressibility with a coefficient of volume compressibility (M_v) of $0.87 \text{ m}^2/\text{MN}$ for the loading range of 26.8 kPa to 53.6 kPa. The specimen from borehole 1 displayed a lower coefficient of compressibility of $0.25 \text{ m}^2/\text{MN}$ for the same loading range.

Particle size analyses have been carried out using sample of non-cohesive soil from boreholes 1 and 2. Both samples contain grain sizes ranging from fine sand to fine gravel which when deposited in a saturated, loose state has the potential to liquefy during earthquake induced ground shaking.

2.0 SITE CONDITIONS

2.1 Surface Conditions

The proposed site comprises five existing sections situated at the corner of Pukuatua Street and Ranolf Street, Rotorua. The length of the Pukuatua Street boundary is approximately 125 m while the length of the Ranolf Street boundary is approximately 40 m. Numbering the sections one to five from west to east, sections Three and Four include old weatherboard houses with section Three also containing a garage. A hot water bore is located on the north side of section Three and the lawns are described as "soft". Section Five contains single level flats with block end walls and timber frames and cladding. Section Two contains a preload of relatively low density fill with depths ranging from 1.0 m to 1.8 m at the south-east corner. The fill has been in place for a period of approximately 5 years. Section One is clear of any structures or features.

2.2 Subsurface Conditions

The New Zealand Geological Survey Map 1:250,000 Rotorua, Sheet 5, 1st Edition describes the geological conditions in the region of the site as being sedimentary alluvium and terrace and fan deposits. These materials are part of the Hawera Series and are of Pleistocene to Holocene age.

Our experience with soils in the Rotorua area reveals that in several locations there are deposits of silt with low shear strength and high sensitivity. This material is difficult to work with since its low shear strength is further reduced when disturbed.

The geological logs of the boreholes undertaken in this study are presented in Appendix A. They indicate that there is a significant variation of subsurface conditions across the site in an east-west direction. Borehole 2, to the east identifies alternating silt and sand layers to approximately 3.2 m depth where medium dense to dense gravels are located. The gravels are underlain by alternating layers of sand and silt to the end of the borehole at a depth of 10.55 m. Other features to note on the log of borehole 1 are the presence of organic silts at depths of 0.1 m and 2.6 m, both with a

thickness of 0.2 m. The latter is logged as "soft" and hence is expected to be highly compressible. There are loose sand deposits identified at depths of 2.8 m and 7.9 m which may have the potential to liquefy during earthquake events. Groundwater has been identified at a depth of 1.3 m below the ground surface. Liquefaction potential will be addressed in a later section of this report.

The geological log for borehole 2 identifies the presence of a significant deposit of sensitive silt which is interrupted by a 0.7 m thick layer of loose sand at 6.4 m depth. There are also relatively thin alternating layers of sand and silt from 9.9 m depth. The majority of the silt is described as "soft" with traces of peat at approximately 0.4 m depth and 9.2 m depth. Tubular roots are also found in the silt over most of the borehole depth. Elevated soil temperatures were detected from approximately 6 m on. This raises the possibility of hydrothermal alteration which further complicates the properties of the soil. The groundwater level in borehole 2 has been identified at a depth of 1.0 m below the ground surface.

The cone penetrometer test (CPT) results are shown plotted against depth in Appendix B. Tests 1 and 2 correspond with the location of boreholes 1 and 2 respectively and the various material layers discussed above are clearly identifiable. In the plot of CPT 1 the gravels at 3.2 m depth show significant cone resistance while the sand layers show moderate cone resistance. The plot for CPT 2 indicates the presence of very low penetration resistance silts apart from thin sand layers at approximately 6.5 m. The materials below the maximum borehole depth (10.70 m) show somewhat greater penetration resistance with friction ratios suggesting the presence of loose to medium dense sands and gravels.

Analysis of the CPT data indicates that the apparent competency of the soils deteriorates from east to west across the site. The variation of soil type across each section in the north-south direction is, however, relatively small. The gravels at the 3 m depth are evident over the two eastern sections but not over the remainder of the site. The remaining CPT plots are dominated by the presence of low penetration resistance silts and occasional sand layers. Signs of increased material competence are apparent at greater depth, i.e. 7 m to 12 m with friction ratios suggesting the presence of sands and gravels.

3.0 GEOTECHNICAL ENGINEERING

3.1 Introduction

Recommendations and opinions in this report are based on data from the two boreholes and nine cone penetration tests. The nature and continuity of the soils away from the test locations is inferred but it must be appreciated that the actual conditions could vary from the assumed model.

3.2 Foundations

The borehole and CPT results obtained for the western side of the site are dominated by low strength, compressible silts. These observations are confirmed by shear vane and consolidation tests obtained from the laboratory investigation.

For a period of approximately 5 years, section number 2 has been subjected to a fill preload of 1.0 to 1.8 m depth. The preload has had the effect of improving the soil conditions, however, the effective improvement has been restricted to the upper 2 m. Considering the time scale and the limited success of the preload, further use of preloading is not recommended, and isolated shallow foundations are not expected to be suitable for the site.

We recommend the use of driven timber or similar piles for founding the proposed structure(s). The use of piles minimises the effect of the variable soil conditions and reduces the probability of differential settlements. The piles would develop the majority of their capacity from end bearing in the gravels found at depths varying from approximately 4 m on the eastern side to approximately 12 m on the western side. The ultimate bearing capacity of such piles should be taken as 5 MPa. Applying a factor of safety of 3.0 results in an allowable bearing capacity of 1.7 MPa. Note that side friction has not been considered due to the low shear strength and high sensitivity of the silts. Piled foundations carrying the allowable stress specified above are expected to experience very small settlements (less than 5 mm under the working stress loads).

The piles should be driven with careful control on both set and depth. Special care should be taken to drive the piles to the appropriate depth and not to over-drive them. A suitable pile driving formula should be used (e.g. Hiley) to confirm the pile capacity at the time of installation. Table 2 identifies the expected pile lengths for each of the CPT locations.

Table 2
Approximate Pile Founding Depths

CPT Location	Pile Founding Depth (m)
1	3.5
2	10.5
3	11.0
4	11.0
5	12.5
6	8.0
7	3.5
8	4.0
9	4.0

An alternative foundation option is to use a concrete raft foundation. This would reduce the applied pressures to a low level, but the structure would be subject to considerable total and differential settlements. The raft foundation would also be susceptible to further settlements caused by seismic events.

3.3 Liquefaction Potential

The borehole logs presented in Appendix A indicate the presence of various layers of loose, saturated sands beneath the site. In addition, the laboratory analysis has shown that these materials are contained within a grading envelope which is susceptible to liquefaction.

The consequence of liquefaction at the site is dependant on the type of foundation employed. It is considered that driven pile foundations would not be significantly affected by earthquake ground motions; as the area is relatively flat, but a raft foundation would be likely to experience increased total and differential settlements. Note that the pile driving operation has the effect of compacting the loose sand deposits, hence reducing the potential for liquefaction and providing increased side frictional stresses during seismically induced settlements.

The lateral load capacity of the pile foundations should be considered carefully at the time of detailed design.

5.0 APPLICABILITY

This report has been prepared for the particular brief given to us and data or opinions contained in it may not be used in other contexts or for any other purpose without our prior review and agreement.

During excavation and construction, the site should be examined by an engineer competent to judge whether the exposed subsoils are compatible with the inferred conditions on which the report has been based. We would be pleased to provide this service to you and believe your project would benefit from the continuity. However, it is important that we be contacted if there is any variation in subsoil conditions from those described in the report.

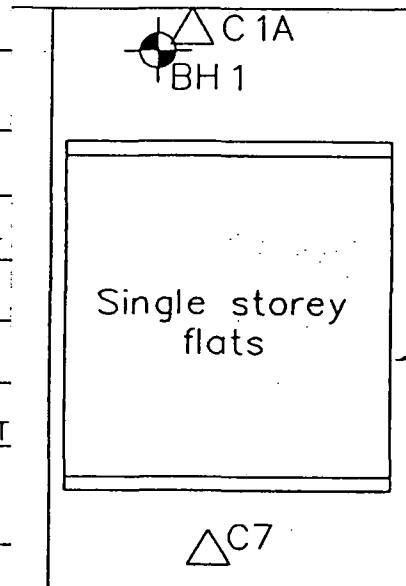
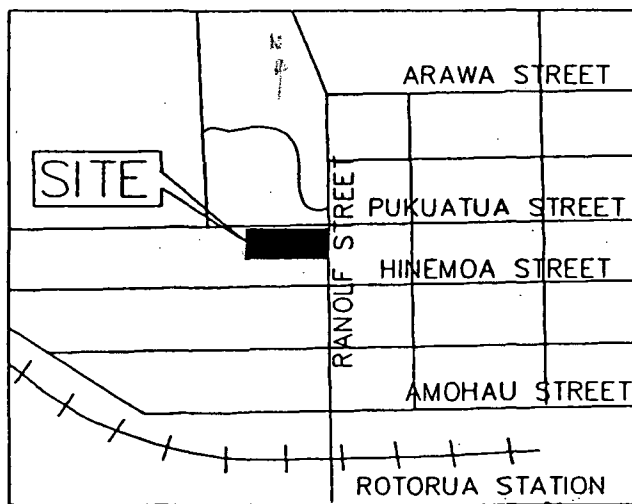
TONKIN & TAYLOR LTD
Consulting Engineers



P.J. Millar
GEOTECHNICAL GROUP MANAGER

Report prepared by: R.J. Peploe

RJP:MP
1172\2RJP1412.REP

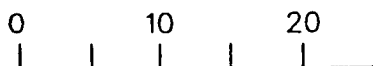


RANOLF STREET

LOCALITY PLAN (NOT TO SCALE)

er test 1992

SCALE



TONKIN & TAYLOR
CONSULTING ENGINEERS

Drawing No.	Rev.
11722-1	
Date	DECEMBER 1992
Drawn	RAF
Checked	RJP



ENGINEERING LOG TERMINOLOGY

DRILLING OR EXCAVATION

FLUID LOSS	WATER	CORE RECOVERY	METHOD/CASING	PENETRATION
		Core recovered expressed as percentage of the length of the core run.	Shows drilling method and depth of casing.	

SAMPLES AND TESTS

SAMPLE TYPE	TESTS	GRAPHIC LOG	TYPICAL SYMBOLS
OPEN BARREL	N = 22 SPT. UNCORRECTED BLOW COUNT FOR 300MM	The Graphic Log shows soil and rock substances, significant defects, and core loss. Soil and rock substances represented by clear contrasting symbols consistent for each project.	CLAY
DOUBLE OR TRIPLE TUBE	● 75kPa UNDRAINED SHEAR STRENGTH AS MEASURED BY FIELD VANE		SILT
STANDARD PENETRATION TEST	☒ PRESSUREMETER TEST		SAND
LARGE DIAMETER THIN WALLED TUBE	* LABORATORY TEST(S) CARRIED OUT — UNSPECIFIED OR SPECIFIED AS BELOW		GRAVEL
SMALL DIAMETER THIN WALLED TUBE			ORGANIC MATERIAL
BULK SAMPLE	LV - LABORATORY VANE AL - ATTERBERG LIMITS		MUDSTONE
	UU - UNDRAINED TRIAXIAL PSD - PARTICLE SIZE		SANDSTONE
	C σ' - EFFECTIVE STRESS CONS - CONSOLIDATION		BASALT
	DS - DIRECT SHEAR COMP - COMPACTION		NO CORE
	UC - UNCONFINED COMPRESSION IS - POINT LOAD		

SOIL DESCRIPTION

CLASSIFICATION SYMBOL	MOISTURE CONTENT	UNDRAINED SHEAR STRENGTH	RELATIVE DENSITY
Based on USBR Unified Soil Classification System Visual Method for field identification. Classification symbols based on Laboratory Method may differ.	D - DRY, LOOKS AND FEEL DRY	Cu (kPa)	SPT-UNCORRECTED
	M - MOIST, NO FREE WATER ON HAND WHEN REMOULDING	VS - VERY SOFT < 10	N VALUE
	W - WET, FREE WATER ON HAND WHEN REMOULDING	S - SOFT 10 to 25	VL - VERY LOOSE 0 to 4
		F - FIRM 25 to 50	L - LOOSE 4 to 10
		St - STIFF 50 to 100	MD - MEDIUM DENSE 10 to 30
	Moisture content may be compared to the plastic limit (PL) eg M > PL = moist, moisture content greater than the plastic limit	VSt - VERY STIFF 100 to 200	D - DENSE 30 to 50
		H - HARD > 200	VD - VERY DENSE > 50
		Fb - FRIABLE	

ROCK DESCRIPTION

WEATHERING	ROCK STRENGTH	SIGNIFICANT DEFECTS
Fr - FRESH	UCS (MPa)	
SW - SLIGHTLY WEATHERED	EXTREMELY LOW < 2	
HW - HIGHLY WEATHERED	VERY LOW 2 to 6	
EW - EXTREMELY WEATHERED	LOW 6 to 20	
	MODERATE 20 to 60	
	HIGH 60 to 200	
	VERY HIGH > 200	

BOREHOLE LOG

BOREHOLE No: 1

SHEET 1 OF 1

PROJECT: SITE INVESTIGATION		LOCATION: PUKUATUA ST ROTORUA		JOB No: 11722													
CO-ORDINATES N/A		DRILL TYPE: MOBILE		HOLE STARTED: 27.11.92													
R.L.		DRILL METHOD: 180mm HOLLOW AUGER		HOLE FINISHED: 27.11.92													
DATUM N/A		DRILL FLUID: N/A		DRILLED BY: GEOTECH DRILLING													
				LOGGED BY: LPA CHECKED: RJP													
GEOLOGICAL			ENGINEERING DESCRIPTION														
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (kPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
SEAL & FILL																	GRAVEL: Seal, sand, coarse, grey
TOPSOIL			500	SPT	N/A	N = 2	1				OL	M	F				SILT: organic, dark brown
ALLUVIUM			450	SPT			2			X							- light grey & brown, thin organic layers, becomes dark yellow
			750	TUBE			3	1.0	X				Vst				- white, pumiceous
			450	SPT			4	2.0	X				F				- brown, slightly organic
			450	SPT			5						MD				SAND: medium, lt grey
			450	SPT			6						L				- fine, silty, brown, slightly organic
			600	SPT			7	3.0									SILT: organic, dark brown
			500	TUBE			8										SAND: medium, grey
			400	AUGER			9	4.0									GRAVELS: pumiceous, white, up to 6mmφ, sand matrix, grey
			450	SPT			10	5.0						MD			
			1050	AUGER			11	6.0									- grades to sand
			450	SPT			12	7.0						Vst			SAND: medium to coarse, grey
			1050	AUGER			13	8.0									SILT: pumiceous, grey, warm
			450	SPT			14	9.0						L			- grades to sand
			450	SPT			15	10.0									SAND: medium, grey, some fine pumiceous gravels
		1250	AUGER														SILT: sandy, green, some rounded gravels up to 5mmφ
		450	SPT										MD				END OF BORE AT 10.55m

BOREHOLE LOG

GEOTECH DRILLING CONE PENETROMETER

CLIENT: PUKUATUA ST PARTNERS

CPT No: CPT1A
1 of 1

PROJECT: CPT SURVEY

LOCATION: PUKUATUA ST

JOBNO: 11722

Date: 11-27-1992

Cone Range: 100kN

Client Ref: -

R.L.: -

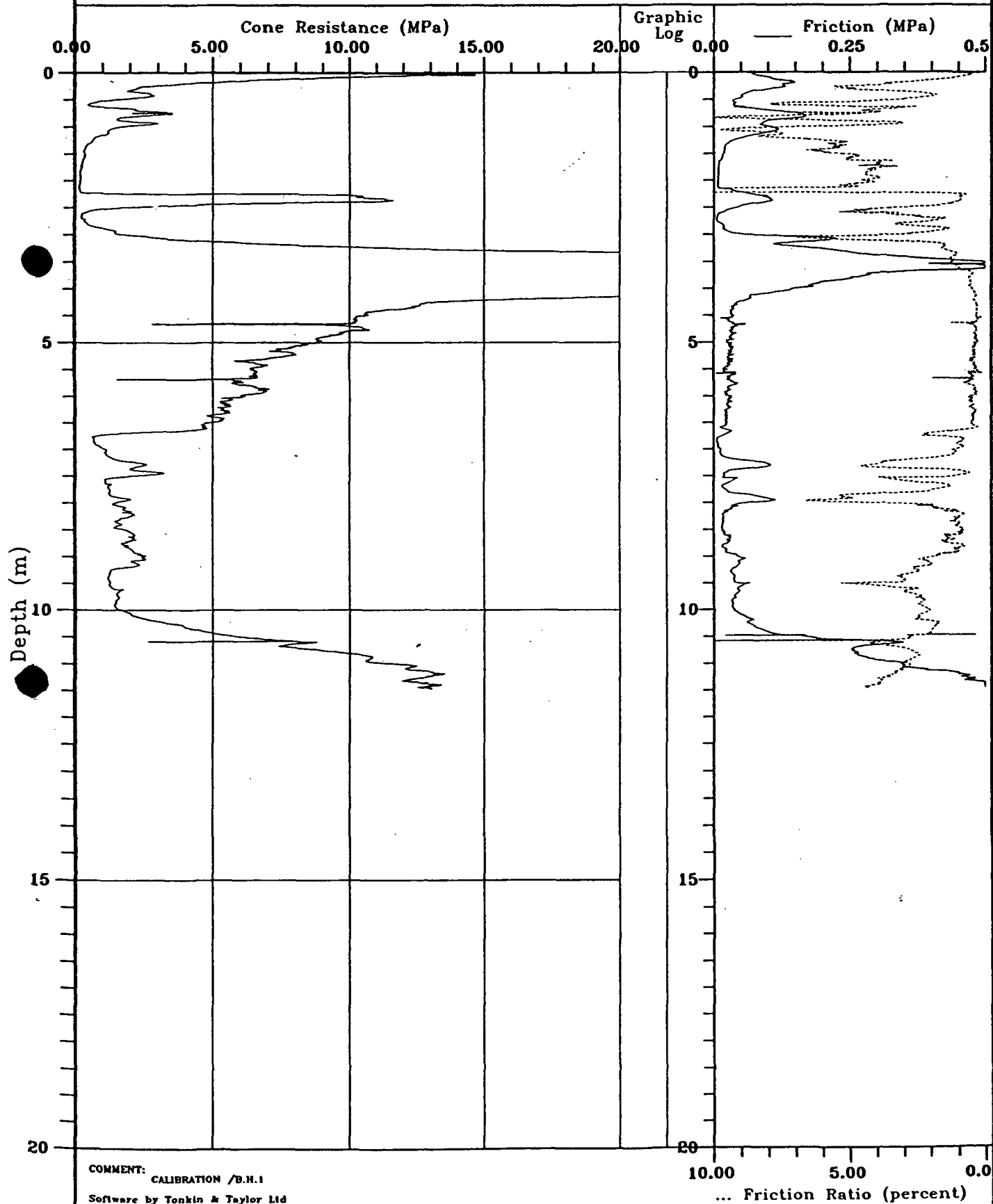
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East: -

Datum: -

Grid Ref: -

North: -



GEOTECH DRILLING CONE PENETROMETER

CLIENT: PUKUATUA ST PARTNERS

CPT No: cpt2
1 of 1

PROJECT: CPT SURVEY

LOCATION: PUKUATUA ST

JOBNO: 11722

Date: 11-27-1992

Cone Range: 100kN

Client Ref: -

R.L.: -

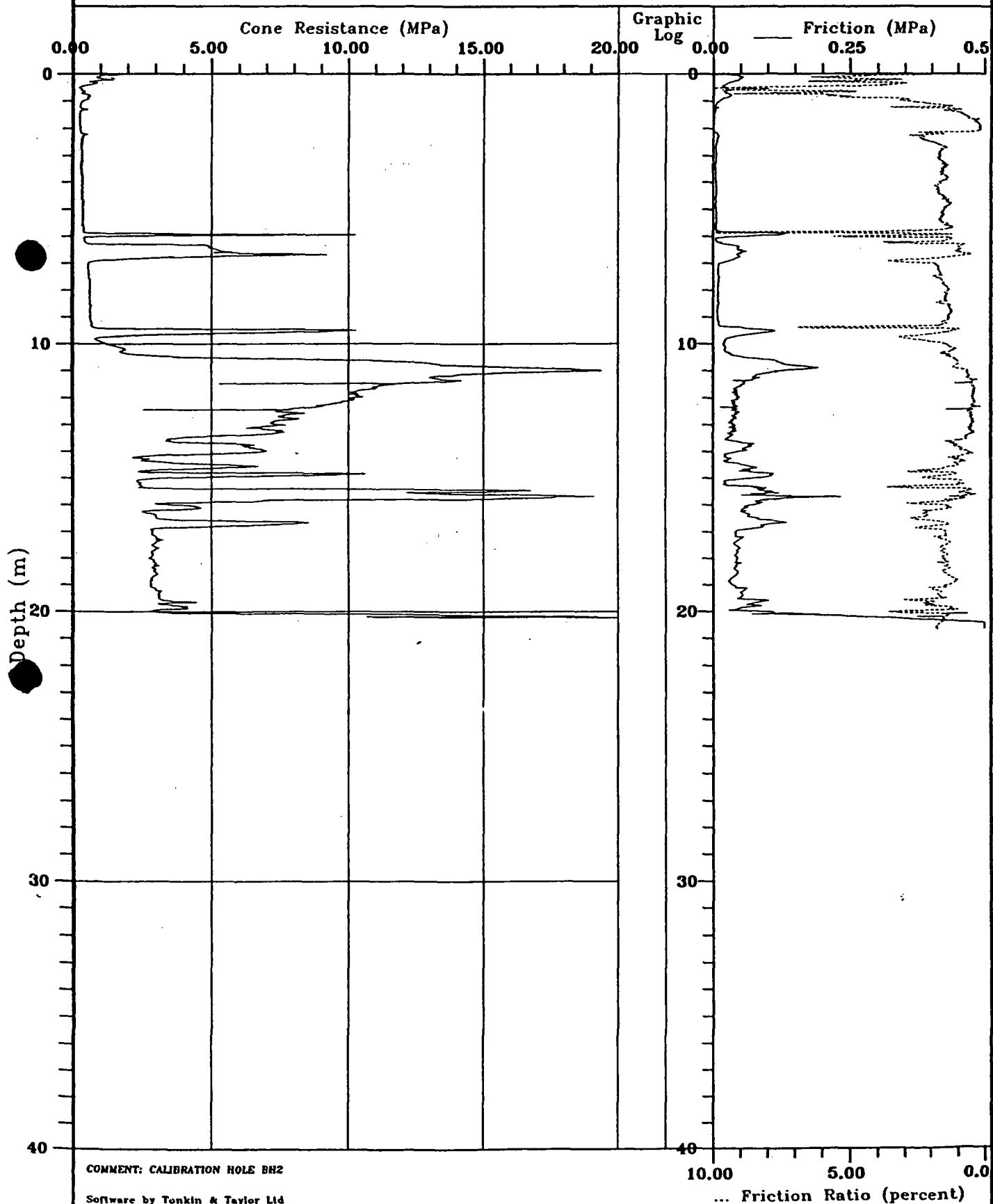
Operator: G.L.BARNETT

East: -

Datum: -

Grid Ref: -

North: -



GEOTECH DRILLING CONE PENETROMETER

CLIENT: PUKUATUA ST PARTNERS

CPT No: cpt3
1 of 1

PROJECT: CPT SURVEY

LOCATION: PUKUATUA ST

JOBNO: 11722

Date: 11-27-1992

Cone Range: 100kN

Client Ref: -

R.L.: -

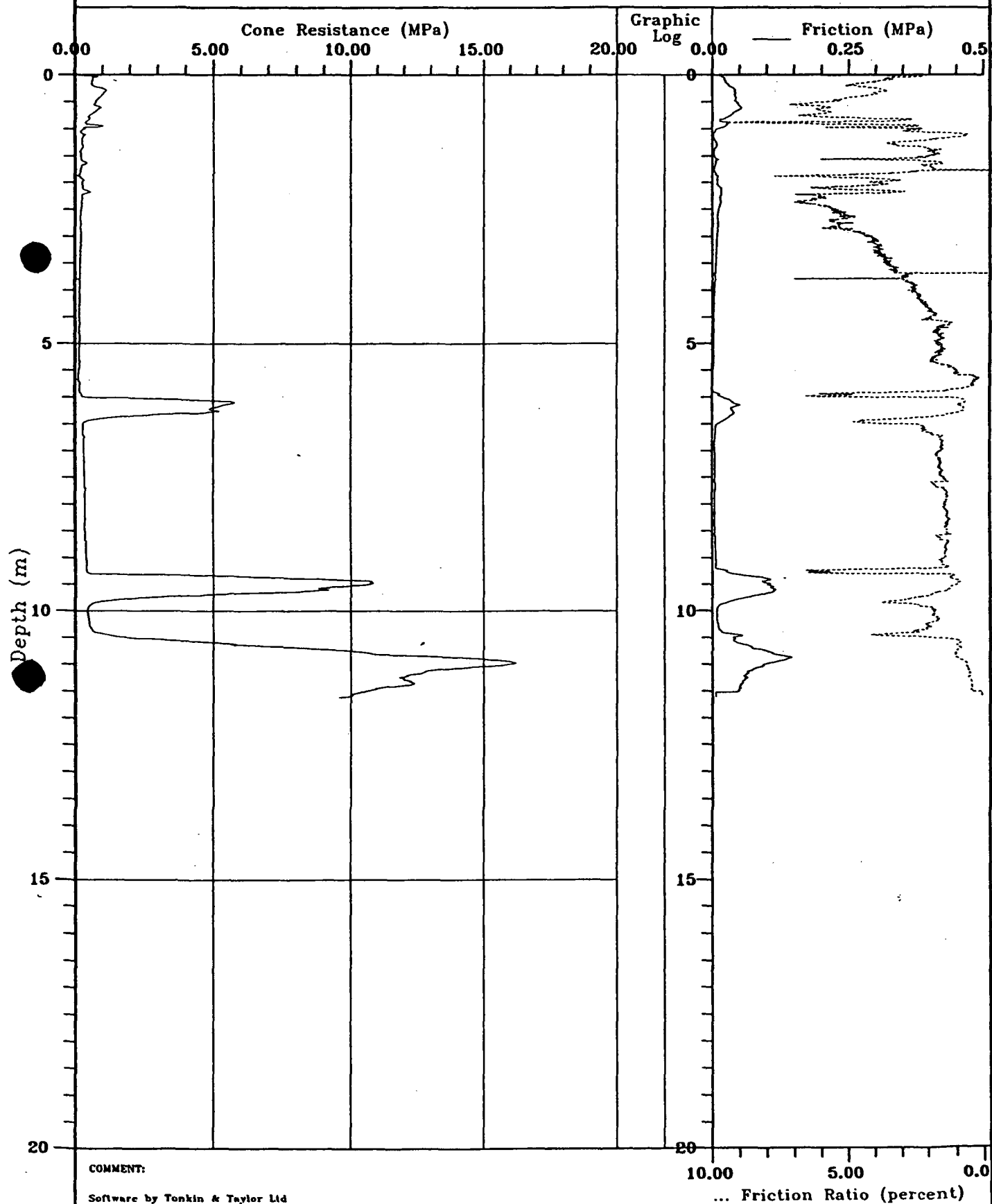
Operator: G.L.BARNETT

East: -

Datum: -

Grid Ref: -

North: -



COMMENT:

Software by Tonkin & Taylor Ltd

GEOTECH DRILLING CONE PENETROMETER

CLIENT: PUKUATUA ST PARTNERS

CPT No: cpt4
1 of 1

PROJECT: CPT SURVEY

LOCATION: PUKUATUA ST

JOBNO: 11722

Date: 11-27-1992

Cone Range: 100kN

Client Ref: -

R.L.: -

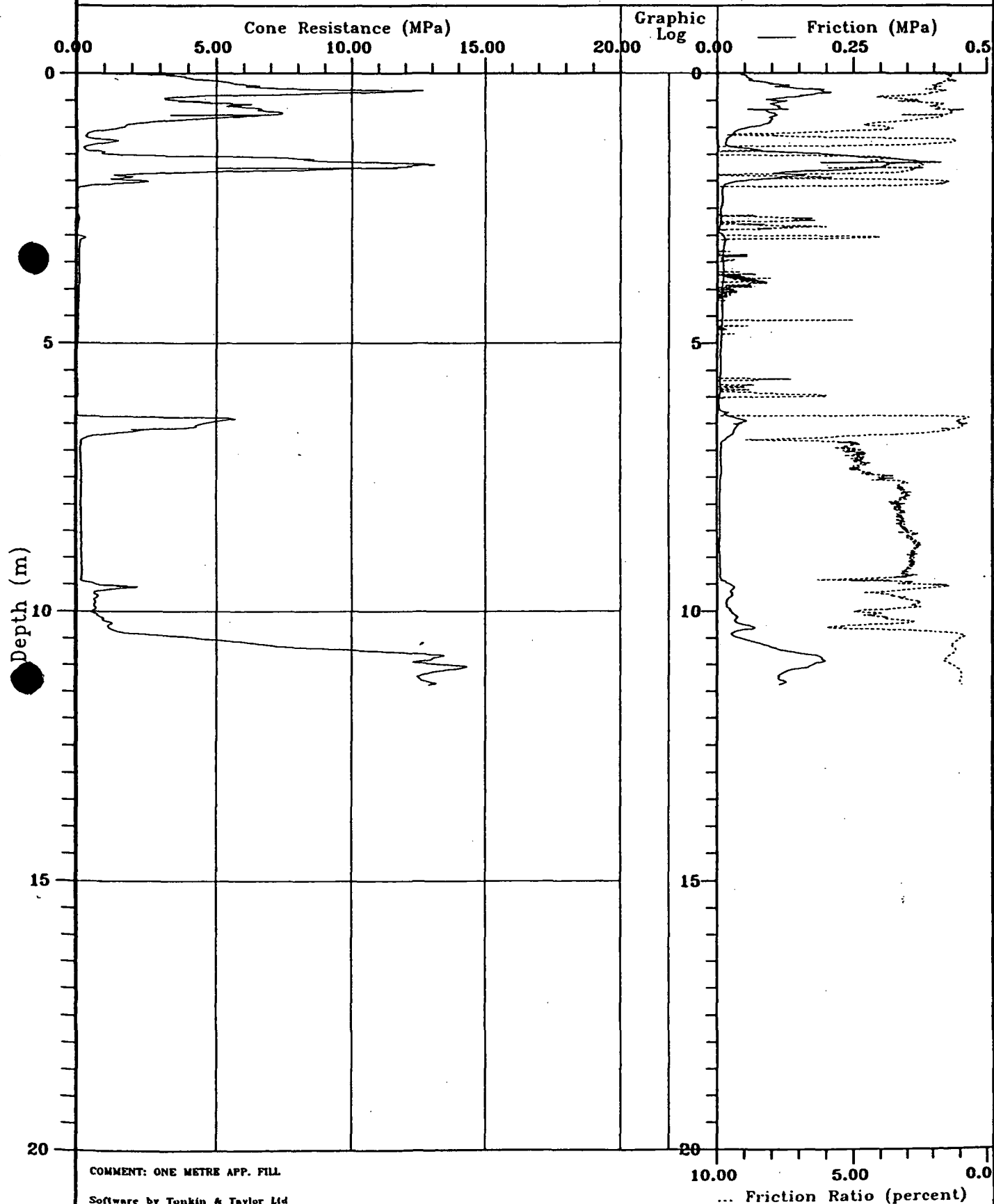
Operator: G.L.BARNETT

East: -

Datum: -

Grid Ref: -

North: -



GEOTECH DRILLING CONE PENETROMETER

CLIENT: PUKUATUA ST PARTNERS

CPT No: cpt5
1 of 1

PROJECT: CPT SURVEY

LOCATION: PUKUATUA ST

JOBNO: 11722

Date: 11-27-1992

Cone Range: 100kN

Client Ref: -

R.L.: -

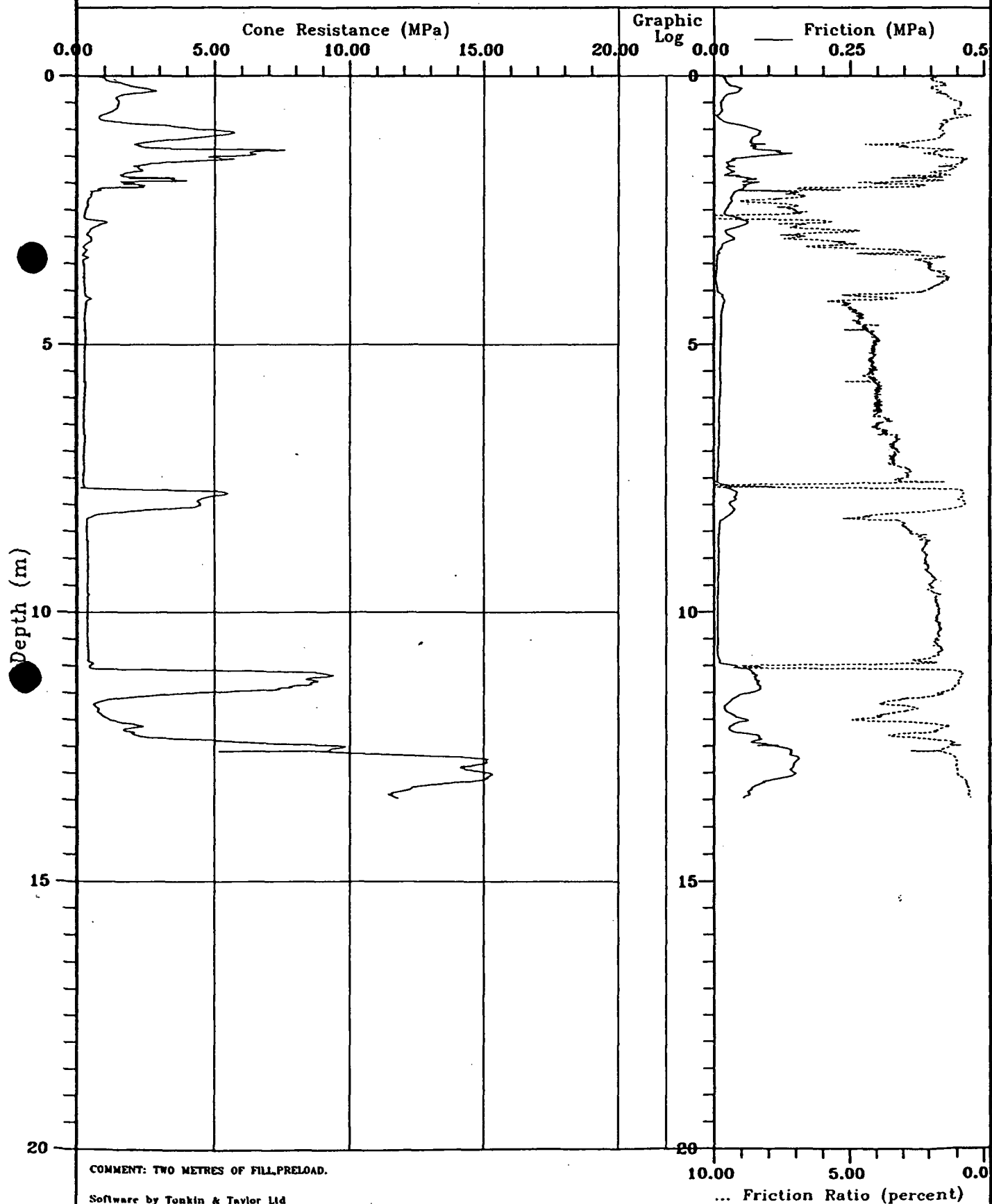
Operator: G.L.BARNETT

East: -

Datum: -

Grid Ref: -

North: -



GEOTECH DRILLING CONE PENETROMETER

CLIENT: PUKUATUA ST PARTNERS

CPT No: cpt6
1 of 1

PROJECT: CPT SURVEY

LOCATION: PUKUATUA ST

JOBNO: 11722

Date: 11-27-1992

Cone Range: 100kN

Client Ref: -

R.L.: -

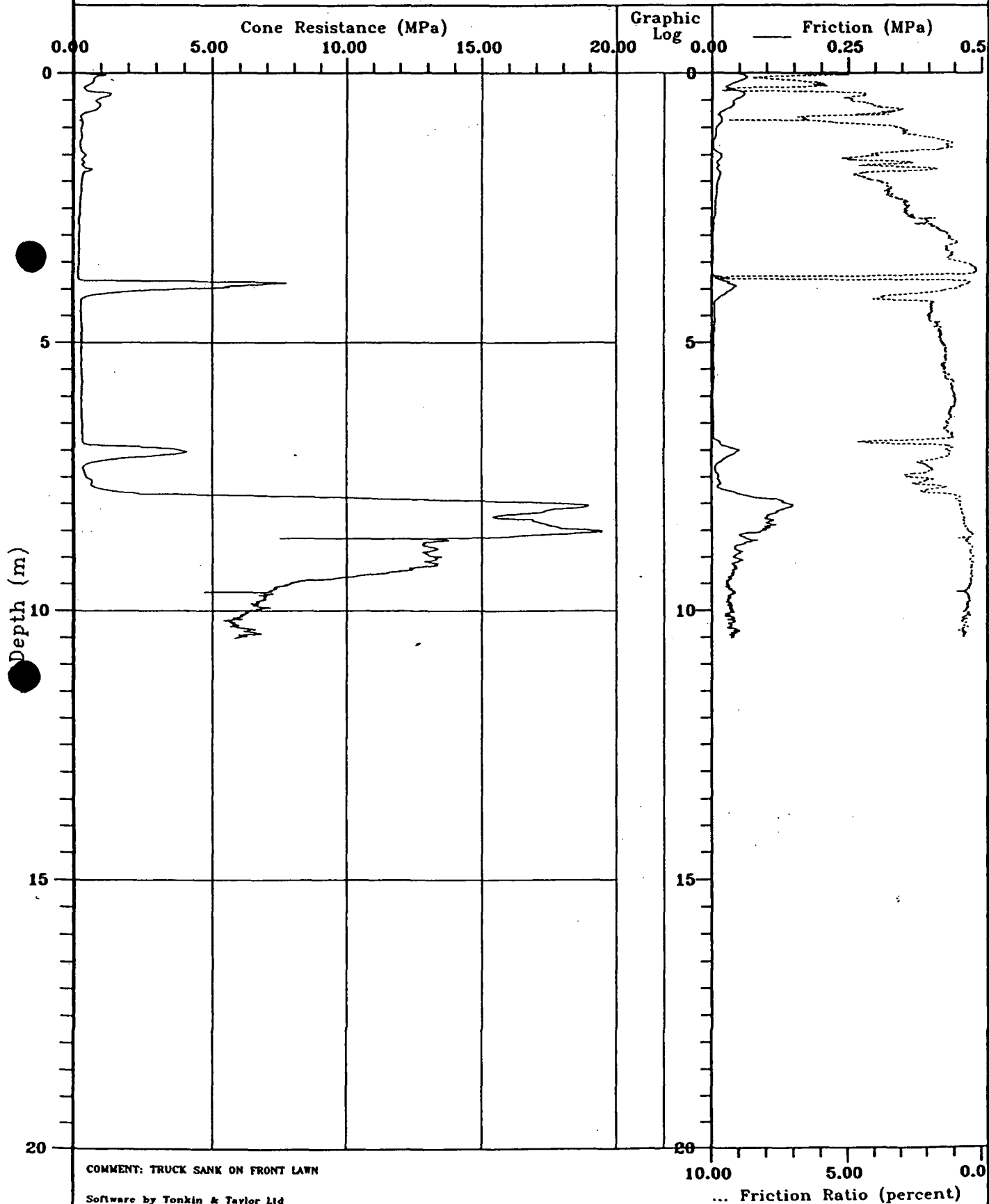
Operator: G.L.BARNETT

East: -

Datum: -

Grid Ref: -

North: -



GEOTECH DRILLING CONE PENETROMETER

CLIENT: PUKUATUA ST PARTNERS

CPT No: cpt7
1 of 1

PROJECT: CPT SURVEY

LOCATION: PUKUATUA ST

JOBNO: 11722

Date: 11-27-1992

Cone Range: 100kN

Client Ref: -

R.L.: -

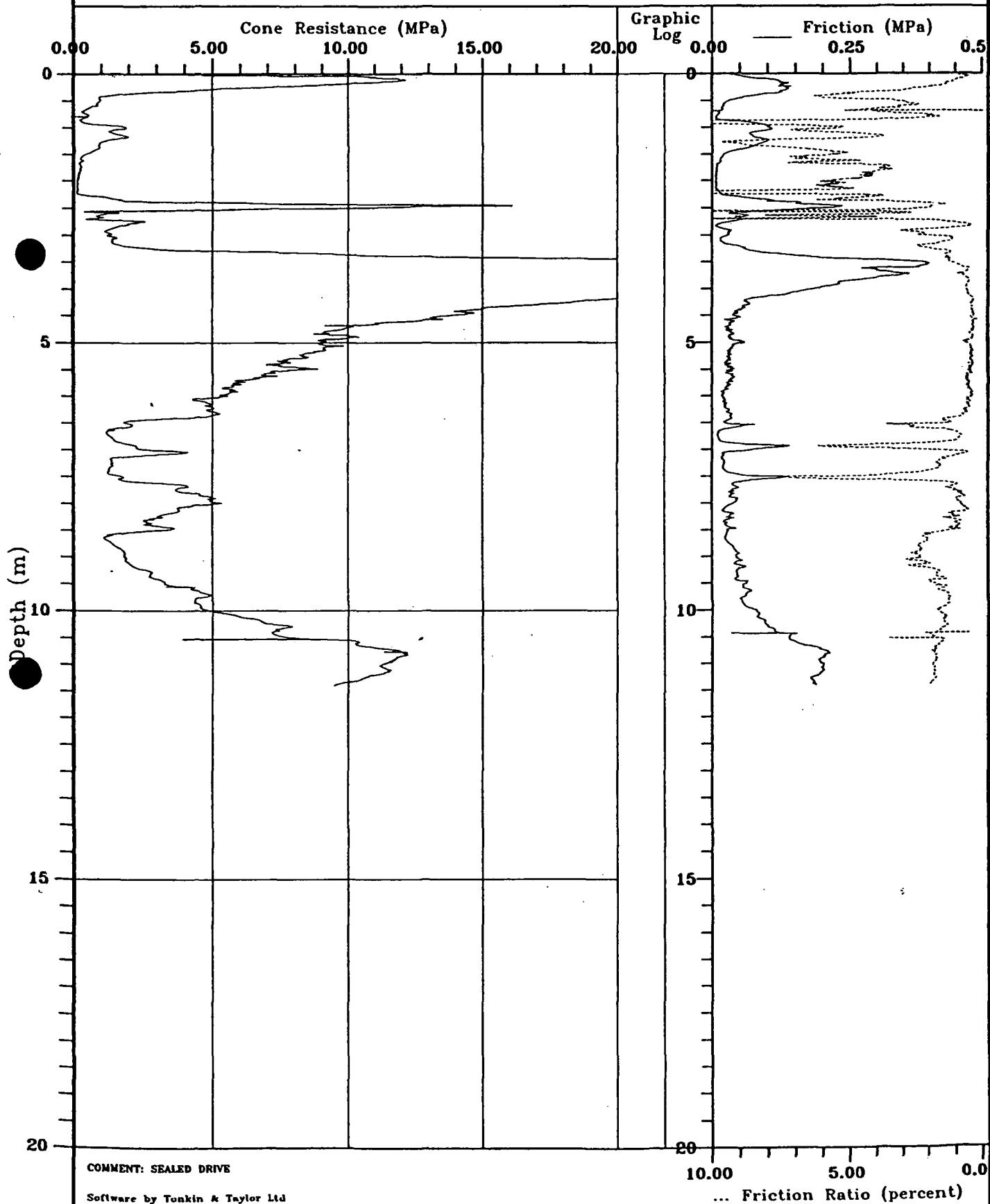
Operator: G.L.BARNETT

East: -

Datum: -

Grid Ref: -

North: -



COMMENT: SEALED DRIVE

Software by Tonkin & Taylor Ltd

GEOTECH DRILLING CONE PENETROMETER

CLIENT: PUKUATUA ST PARTNERS

CPT No: cpt8
1 of 1

PROJECT: CPT SURVEY

LOCATION: PUKUATUA ST

JOBNO: 11722

Date: 11-27-1992

Cone Range: 100kN

Client Ref: -

R.L.: -

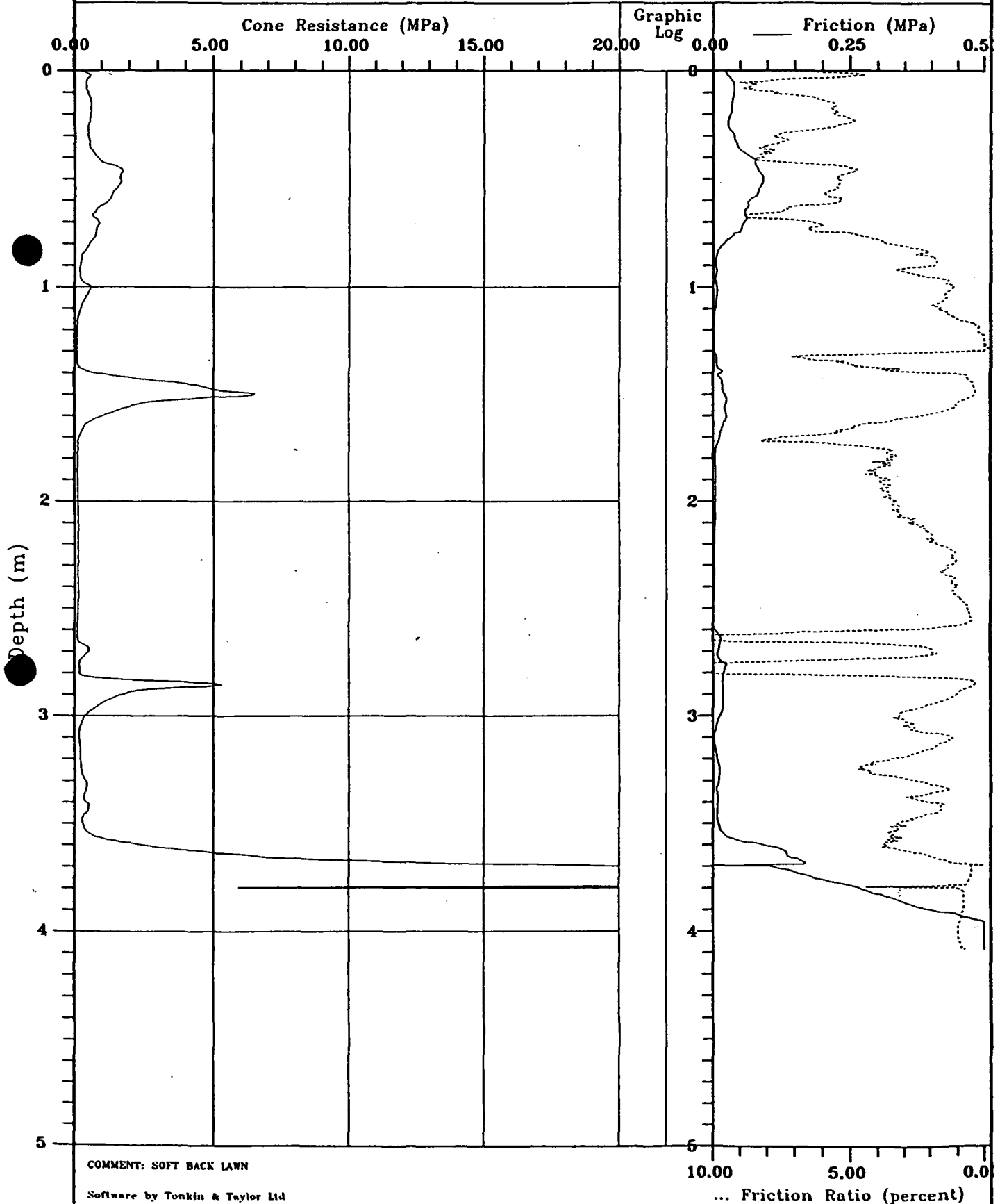
Operator: G.L.BARNETT

East: -

Datum: -

Grid Ref: -

North: -



GEOTECH DRILLING CONE PENETROMETER

CLIENT: PUKUATUA ST PARTNERS

CPT No: cpt9
1 of 1

PROJECT: CPT SURVEY

LOCATION: PUKUATUA ST

JOBNO: 11722

Date: 11-27-1992

Cone Range: 100kN

Client Ref: -

R.L.: -

Operator: G.L.BARNETT

East: -

Datum: -

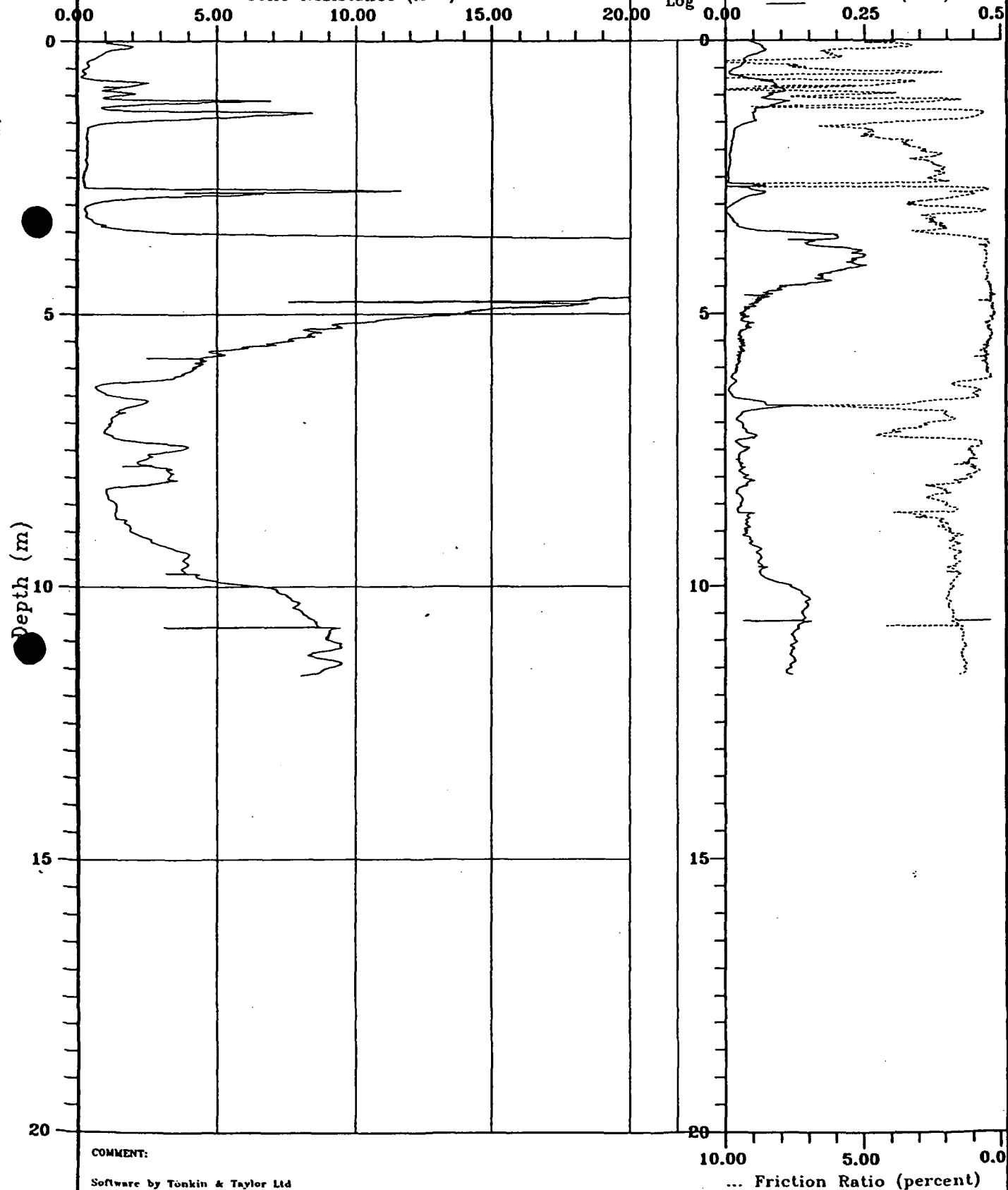
Grid Ref: -

North: -

Cone Resistance (MPa)

Graphic
Log

Friction (MPa)



COMMENT:

Software by Tonkin & Taylor Ltd

Plate No. 1

Page 2 of 6

Site : Pukuatua Road

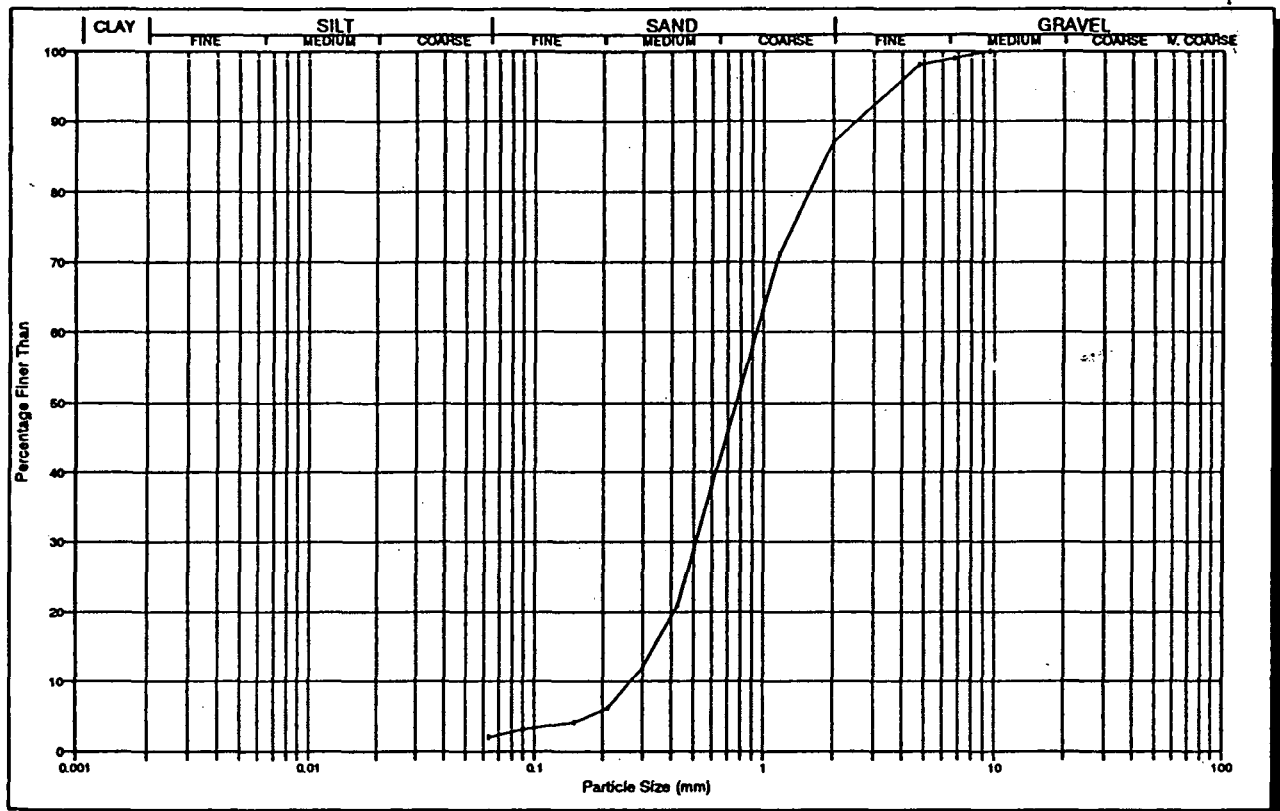
Job No. : 11722

Borehole No. : 1

Sample No. : 6

Depth : --- (m)

Test Method Used : NZS 4402:1986 Test 2.8.2 Dry Sieve



Sieve (mm)	Total % Passing
75.0	---
63.0	---
53.0	---
37.5	---
26.5	---
19.0	---
16.0	---
13.2	---
9.5	100
6.7	99
4.75	98

Sieve (mm)	Total % Passing
2.00	87
1.18	71
0.600	38
0.425	21
0.300	12
0.212	6
0.150	4
0.090	3
0.063	2

Sample history: As received natural.

Soil description: SAND, (fine - coarse), loose, grey, some fine gravels.

Remarks : Percentage gain = 0.3 %

Entered by : MRS

Date : 20-12-92

Checked by : RAF

Date : 21-12-92

Plate No. 2

Site : Pukuatua Road

Borehole No. : 2

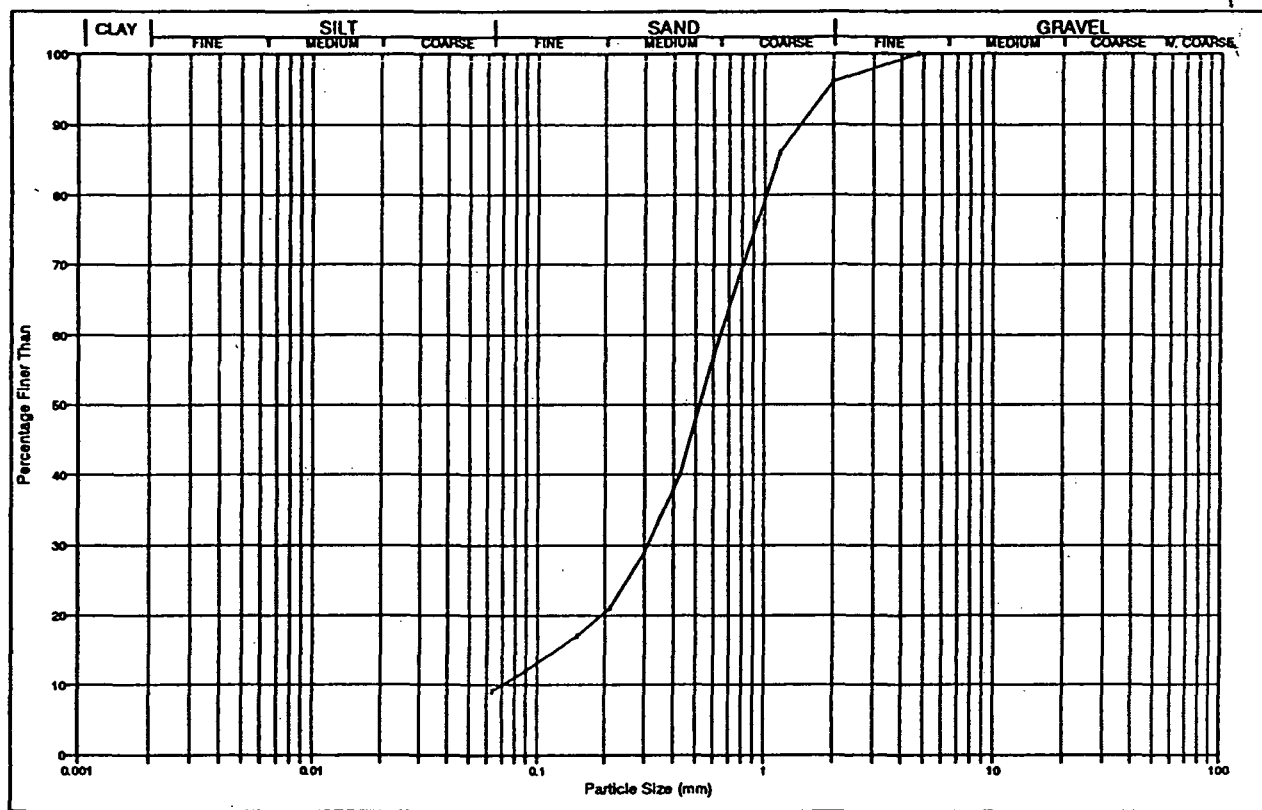
Sample No. : 9

Page 3 of 6

Job No. : 11722

Depth : 6.8 - 7.25 (m)

Test Method Used : NZS 4402:1986 Test 2.8.2 Dry Sieve



Sieve (mm)	Total % Passing
75.0	---
63.0	---
53.0	---
37.5	---
26.5	---
19.0	---
16.0	---
13.2	---
9.5	---
6.7	---
4.75	100

Sieve (mm)	Total % Passing
2.00	96
1.18	86
0.600	57
0.425	40
0.300	29
0.212	21
0.150	17
0.090	12
0.063	9

Sample history: As received natural.

Soil description: SAND, (fine - coarse), loose, grey, some silt.

Remarks : Percentage loss = 0.2 %

Entered by : MRS

Date : 20-12-92

Checked by : RAF

Date : 21-12-92

Site : Pukuatua Rd.

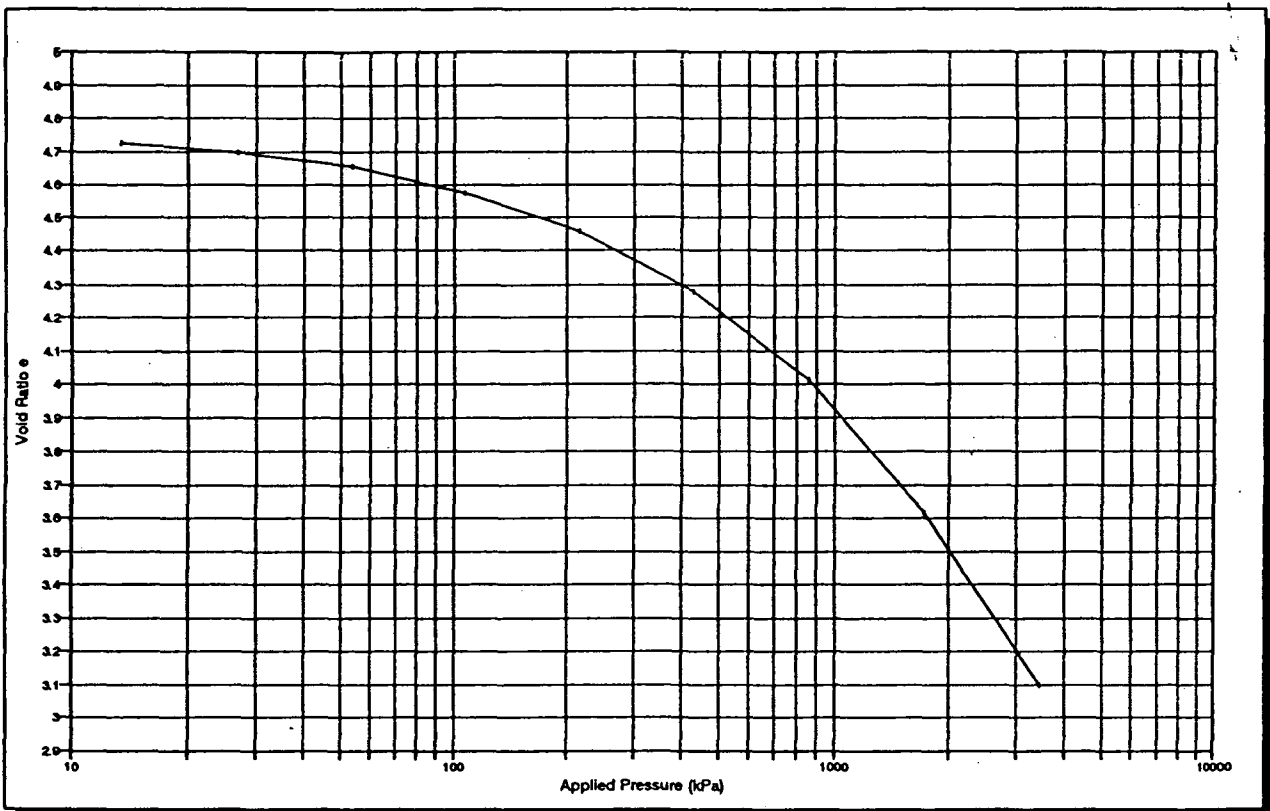
Job No. : 11722

Borehole No. : 1

Sample No. : 3

Depth : 1.3 (m)

Test Method Used : NZS 4402:1986 Test 7.1 One-Dimensional Consolidation



Pressure (kPa)	Void Ratio e	Pressure Increment (kPa)	Coefficient of Consolidation Cv (m ² /yr)	Coefficient of Compressibility Mv (m ² /MN)
As recieved 0	4.816			
13.4	4.727	0 to 13.4	NA	NA
26.8	4.698	13.4 to 26.8	240	0.38
53.6	4.658	26.8 to 53.6	68	0.25
107	4.575	53.6 to 107	59	0.27
215	4.457	107 to 215	300	0.19
429	4.279	215 to 429	120	0.14
858	4.015	429 to 858	270	0.11
1716	3.617	858 to 1716	240	0.08
3433	3.097	1716 to 3433	84	0.05
6867	---	3433 to 6867	---	---
Rebound 13.4	NA			

Sample History : Undisturbed core trimmed at NWC. SQR of time fitting method used.

Soil description : SILT, soft - firm, lt. grey - white.

Initial Dry Density : 0.46 (t/m³)

Initial Water Content : 170 (%)

Solid Density : 2.65 (t/m³) assumed

Initial Saturation : 93 (%)

Temperature During Testing : max = 22°C min = 15°C

Entered by : *MRS*Date : *20-12-92* Checked by : *RAF*Date : *21-12-92*

GEOTECHNICS LTD

19 MORGAN ST. NEWMARKET, AUCKLAND.

Site : Pukuatua Rd.

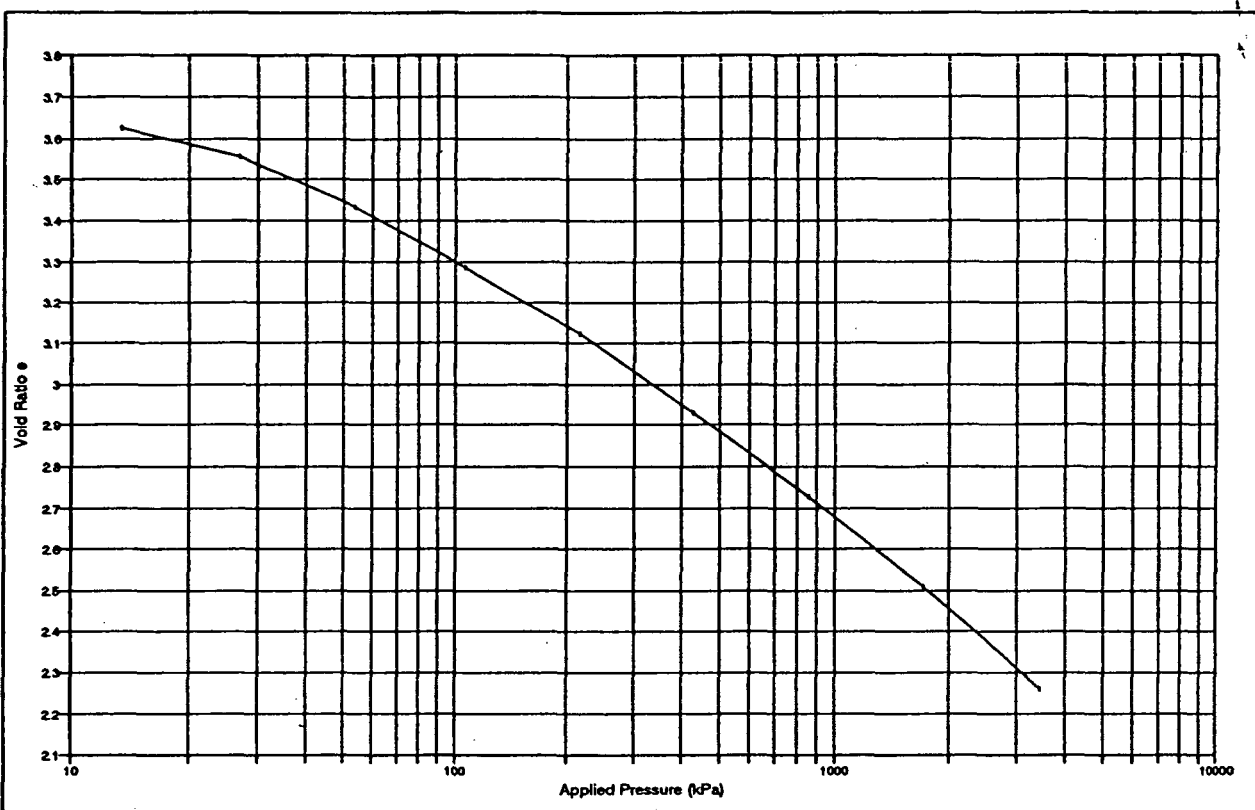
Job No. : 11722

Borehole No. : 2

Sample No. : 3

Depth : 2.3 (m)

Test Method Used : NZS 4402:1986 Test 7.1 One-Dimensional Consolidation



Pressure (kPa)	Void Ratio e	Pressure Increment (kPa)	Coefficient of Consolidation Cv (m ² /yr)	Coefficient of Compressibility Mv (m ² /MN)
As recieved 0	4.204			
13.4	3.625	0 to 13.4	NA	NA
26.8	3.556	13.4 to 26.8	4.5	0.99
53.6	3.434	26.8 to 53.6	6.6	0.87
107	3.286	53.6 to 107	20	0.53
215	3.125	107 to 215	21	0.29
429	2.930	215 to 429	25	0.17
858	2.729	429 to 858	54	0.09
1716	2.507	858 to 1716	49	0.05
3433	2.262	1716 to 3433	90	0.03
6867	---	3433 to 6867	---	---
Rebound 13.4	NA			

Sample History : Undisturbed core trimmed at NWC. SQR of time fitting method used.

Soil description : SILT, v. soft, lt. brown.

Initial Dry Density : 0.51 (t/m³)

Initial Water Content : 154 (%)

Solid Density : 2.65 (t/m³) assumed

Initial Saturation : 97 (%)

Temperature During Testing : max = 22°C min = 15°C

Entered by : MRS

Date : 20-12-92

Checked by : RAE

Date : 21-12-92



GEOTECHNICS LTD. MATERIALS TESTING & INSTRUMENTATION SPECIALISTS

PO BOX 5271 AUCKLAND NEW ZEALAND

19 MORGAN STREET NEWMARKET AKL 1

TELEPHONE (09) 753 057 TELEX NZ 21594 FAX (09) 370 265

Form No M 2

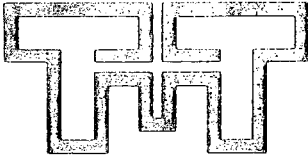
Sht. 1. of 6.

Engineer RJP Date 21-12-92 Site PUKUATUA Rd Job No 11722

BOREHOLE NO		1	1	2	2	2	2	2	2										
SAMPLE NO		3	6	3	1A	2	4	6	9										
DEPTH (m)		1.3		2.3				5.2	6.8										
WATER CONTENT (%)						90.2	84.9	132											
BULK DENSITY (t/m ³)																			
DRY DENSITY (t/m ³)																			
LIMITS	LL																		
For sample history and fraction tested, refer to test sheets	PL																		
	PI																		
SOLID DENSITY (Pycnometer/Vacuum) (t/m ³)																			
SIEVE			✓						✓										
SEDIMENTATION																			
ORGANIC CONTENT (%)																			
pH DETERMINATION																			
ALLOPHANE CONTENT (%)																			
COMPACTION																			
LABORATORY VANE (kPa) For vane details ref. test shts		67		3				0											
TRIAXIAL (UU)																			
TRIAXIAL (drained)																			
TRIAXIAL (CUP)																			
UNCONFINED COMPRESSION (kPa)																			
PERMEABILITY (f/head) (cm/sec)																			
PERMEABILITY (c/head Press.k) (cm/sec)																			
PINHOLE DISPERSION																			
CONSOLIDATION		✓		✓															
SUSPENDED SOLIDS (mgm/l)																			
RELATIVE DENSITY (kg/m ³)	MAX																		
	MIN																		
SHEAR BOX																			
Other:																			

CHECKED
INITIALS: mps ✓☒ - Test performed - see separate result sheet

TEST RESULT SUMMARY



TONKIN & TAYLOR LTD. ENVIRONMENTAL & ENGINEERING CONSULTANTS

19 MORGAN STREET NEWMARKET AUCKLAND NEW ZEALAND

PO BOX 5271 WELLINGTON 6140
PH 64-9-355 6000 FAX 64-9-355 6025

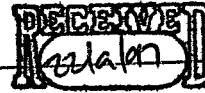
has granted this
in reliance on building certificate
number 12030 issued by an approved
building certifier under section 56 of the Building
Act 1991.

Signed: *AM*

Dated: 22.03.02

Our Ref: 15549
19 September 1997

BSK Consulting Engineers Ltd
P O Box 23
ROTORUA



PLANS APPROVED SUBJECT TO ALL
REQUIREMENTS OF THE BUILDING ACT
1991 BEING FULLY COMPLIED WITH

Date 22.03.02 Consent Number 12030

Officer *AM*

Attention: Mr John Kronast

Dear Sir

PROPOSED COMMERCIAL DEVELOPMENT PUKUATUA STREET, ROTORUA

In accordance with your request of 15 August regarding the review of the "subexcavation / replacement" option for the above project, we confirm completion of the study and this correspondence summarises our findings.

The use of shallow footings is an acceptable alternative for the site development subject to allowing for subexcavation of the upper soft subsoils and backfilling with a lightweight fill. There is a low risk of settlement under a design seismic event due to possible liquefaction of underlying loose sand lenses. Construction of the foundation and pavement works will need to be carefully planned to avoid remoulding of the weak soils.

1.0 BACKGROUND AND OBJECTIVES

The subject site, situated at the corner of Pukuatua Street and Ranolf Street, Rotorua, was the subject of a previous investigation carried out by our company in 1992 (ref 1). The results of this work show the site subsurface conditions are dominated by the presence of soft silts characterised by low shear strength and high compressibility. Below these weak materials, medium dense to dense sands were encountered at approximately 4 m depth in the eastern part of the site and 12 m in the western part. The measured groundwater levels ranged from 0.9 to 1.2 m depth below existing ground level.

We understand the proposed development concepts provide for either one or two storey timber frame lightweight buildings with cast in-situ concrete ground floors. Design (Dead plus Live) loads advised by BSK range from 12 kN/m for the perimeter walls to 21.5 kN/m for the internal walls. The objective of this requested geotechnical review has been to assess the concept of "subexcavation and replacement" of a sufficient thickness of the upper materials beneath the footings in order to provide acceptable founding conditions. Our previous foundation concepts were for pile foundations, taken down to the underlying medium dense sands.



2.0 SCOPE OF REVIEW

The scope of the review which has been carried out has comprised an assessment of appropriate foundation design parameters, estimates of likely settlements and issues to be considered for foundation construction. The review has been based upon the results of our geotechnical investigation and the structural loading information provided by BSK. We have also assessed pavement design concepts assuming concrete pavers would be used and details are presented below.

3.0 GEOTECHNICAL ENGINEERING

3.1 Introduction

Recommendations and opinions in this report are based on data from field tests previously carried out. The nature and continuity of the subsoils away from the test locations is inferred but it must be appreciated that the actual conditions could vary from the assumed model.

3.2 Shallow Foundations

On the basis of the field test results and providing for subexcavation to "2 x B" (B = footing width) below founding level, we consider an ultimate bearing capacity of 150 kPa can be assumed for design purposes. For the advised structural loads, the required footing widths are 0.40 m (perimeter) and 0.45 m (internal). The sub-excavation would need to extend "2 x B" beyond the side of the footing to allow for load spreading. Recommendations for backfilling are presented in section 3.6.

We have checked the likely settlement of the foundations based upon assessed consolidation parameters of $m_v = 3 \times 10^{-3} \text{ m}^2/\text{kN}$ for the upper silts, and $m_v = 2 \times 10^{-4} \text{ m}^2/\text{kN}$ for the compacted fill. This latter value is a lower bound for granular fill, taken to reflect the likely low standard of compaction which may be achieved due to the soft subgrade. The estimated settlements are 10 to 15 mm for the perimeter footing and 15 to 20 mm for the internal footing.

3.3 Ground Floor Slab

We understand that there will be minor filling ($\approx 0.2 \text{ m}$) carried out for the ground floor slab construction. Whilst only 0.2 m thickness may be required above existing ground level, we consider a thickness of not less than 0.3 m should be provided by way of subexcavation to improve the "raft" effects of this layer. Provision should be made for a geotextile over the subgrade and a geogrid reinforcement layer (i.e. Tensar 5520) would further improve the stiffness of the fill.

3.4 Seismic Risk

We have previously commented on the likely risk of liquefaction of the loose sand layers which are inferred to underlie the site. The results of the investigation appear to show that the sands are generally discontinuous lense formations. These materials are also of limited thickness which we consider unlikely to present a risk of severe damage due to liquefaction - under a design seismic event. Some minor isolated settlement may occur which should be relatively minor, provided the provisions for "stiffening" the backfill material are incorporated.

3.5 Pavement Construction and Design

The construction of the pavement for the site access would need to be carefully carried out given the soft subgrade conditions. It will be critical to avoid remoulding the insitu materials given their sensitive characteristics. The works will need to be progressively constructed, ensuring an adequate thickness of compacted pavement material beneath the construction plant.

We have prepared a preliminary design for the concrete block pavement based upon published charts and assuming a CBR of less than 3%. Vehicle loadings should be confirmed prior to detailed design. The concept design details are as follows:

Option 1:

- 80 mm ICB paving
- 20 mm Sand blinding
- 150 mm 3% cement stabilised M4 basecourse

Option 2:

- 80 mm ICB paving
- 20 mm Sand blinding
- 100 mm M4 basecourse
- 100 mm sub-basecourse
- 1 layer Tensar SS30 geogrid
- 50 mm sand
- 1 layer of filter cloth (eg Terram 1000S)

3.6 Construction Issues

For the subexcavation and backfilling works associated with the foundation construction it will be essential to consider the following issues:

i) Groundwater level

The measured groundwater level was relatively shallow and it will be necessary to make

provision for dewatering during construction. From our experience we would anticipate a relatively high level of contamination and Regional Council are expected to require discharge to a disposal pit on site..

ii) **Fill Material and Compaction**

The completed excavation would need to be lined with a suitable geotextile prior to backfilling. In addition, the geogrid layer beneath the floor slab should drop down and extend into the fill beneath the footing. The backfill material should comprise a suitable lightweight material such as a (quarry) pumice placed in the layers of say 100 to 200 mm loose thickness and lightly compacted with a roller. A detailed specification can be provided for construction.

4.0 CONCLUSIONS AND RECOMMENDATIONS

On the basis of the results of our previous investigation and the review presented in this report, we summarise our conclusions and recommendations as follows:

- i) Shallow footings would be appropriate for the lightweight development, subject to the provisions for subexcavation and backfill using compacted pumice fill.
- ii) A 0.3 m thick layer of pumice fill should be used beneath the ground floor slab.
- iii) The use of a suitable geotextile over the excavation subgrade and incorporation of a layer of geogrid within the fill would be appropriate beneath the building and foundations.
- iv) The construction works will need to be carefully planned in order to avoid remoulding and disturbance of the sensitive weak subsoils.
- v) Provision for dewatering of the foundations during construction will need to be considered and appropriate consents obtained for the on-site disposal of groundwater which is likely to be contaminated.
- vi) A concept pavement design comprising a thick layer of granular material would be appropriate for the carpark/access area. A detailed design should be carried out once actual vehicle loadings are available.

5.0 APPLICABILITY

This report has been prepared for the particular brief given to us and data or opinions contained in it may not be used in other contexts or for any other purpose without our prior review and agreement.

19 September 1997

During excavation and construction, the site should be examined by an engineer competent to judge whether the exposed subsoils are compatible with the inferred conditions on which the report has been based. We would be pleased to provide this service to you and believe your project would benefit from the continuity. However, it is important that we be contacted if there is any variation in subsoil conditions from those described in the report.

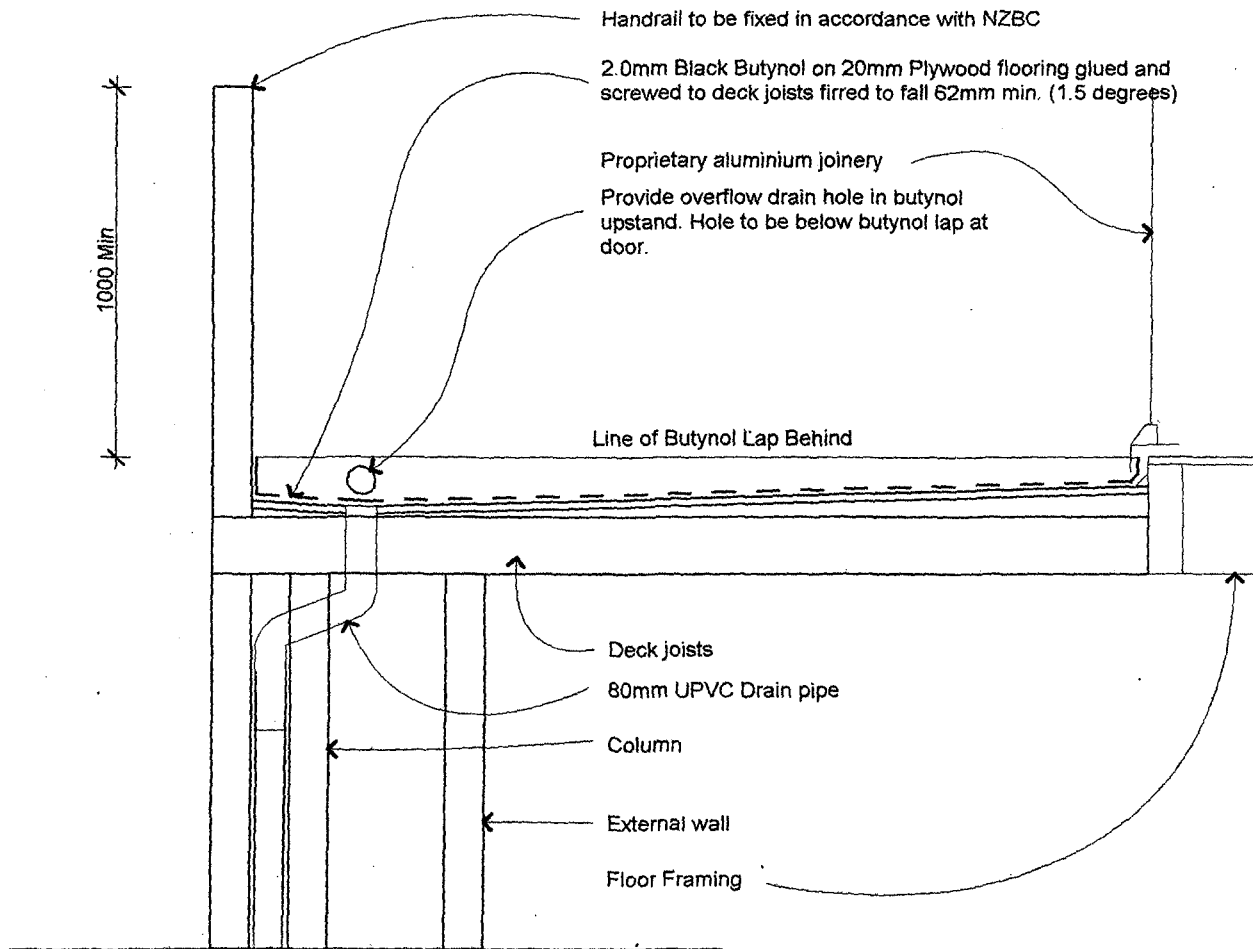
Yours faithfully
TONKIN & TAYLOR LTD



C J Freer
SENIOR GEOTECHNICAL ENGINEER

CJF:MCS
JA15549CJF1909.LTR
19 September 1997

BUILDING CONSENT DRAWINGS



Deck Detail

Scale 1:20

The Rotorua District Council has granted this building consent in reliance on building certificate number..... issued by an approved building certifier under section 56 of the Building Act 1991.

Signed:.....

Dated:.....

PLANS APPROVED SUBJECT TO ALL REQUIREMENTS OF THE BUILDING ACT 1991 BEING FULLY COMPLIED WITH

Date..... Consent Number.....

Officer

Noise Control and Fire Rated Wall Systems Two Way FRR - Double Timber Frame

Specification Number	Loadbearing Capability	STC	Rw	Fire Resistance Rating	Lining Requirements
GBT(L)A 60d	LB/NLB	63	62	(60)/60/60	1 layer 12.5mm Gib® Noiseline + 1 layer standard 9.5mm Gib® plasterboard each side

Framing

F5 stress grade or No. 1 visually graded kiln dried Radiata Pine actual dimensions 70 x 35mm minimum.
Alternatively, No. 1 framing grade H1 treated Radiata Pine nominal dimensions 75 x 50mm minimum.
The minimum overall cavity width shall be 205mm. (ie. 70mm actual framing requires a 65mm space between the frames).
Studs at 600mm centres maximum.
Nogs at 1350mm centres maximum.

Wall Heights and Framing Dimensions

Framing dimensions and height as determined by NZS3604 stud and top plate tables for non loadbearing and loadbearing walls.

Sound Control Infill

R1.8 (75mm) pink fibreglass batts installed between the studs and nogs on one side of the double frame.
Alternatively, Autex GreenStuf® R1.8, 95mm polyester.

Lining

1 layer of 12.5mm Gib® Noiseline (inner layer) plus 1 layer of standard 9.5mm Gib® plasterboard fixed vertically to each side of the frame.

Vertical joints of the outer layer are offset 600mm from those of the inner layer.

Full height sheets shall be used where possible. Where sheet end butt joints are unavoidable they must be formed over nogs with those of the outer layer offset from those of the inner layer.

Sheet joints are touch fitted.

All sheet joints must occur on framing.

Fastening the Lining

Fasteners

Inner Layer - 41mm x 6g Gib® Grabber Scavenger Head High Thread Drywall screws or 40mm x 2.8mm Gib® Nails.
Outer layer - 51mm x 7g screws as above or 50mm x 2.8mm Gib® Nails.

Fastener Centres

Inner layer - 300mm centres up each stud.
Outer layer - 300mm centres around the sheet perimeter. Pairs of nails (50mm apart) or single screws at 300mm centres to intermediate studs.
Place fasteners no closer than 12mm to the sheet edge.

Acoustic Sealant

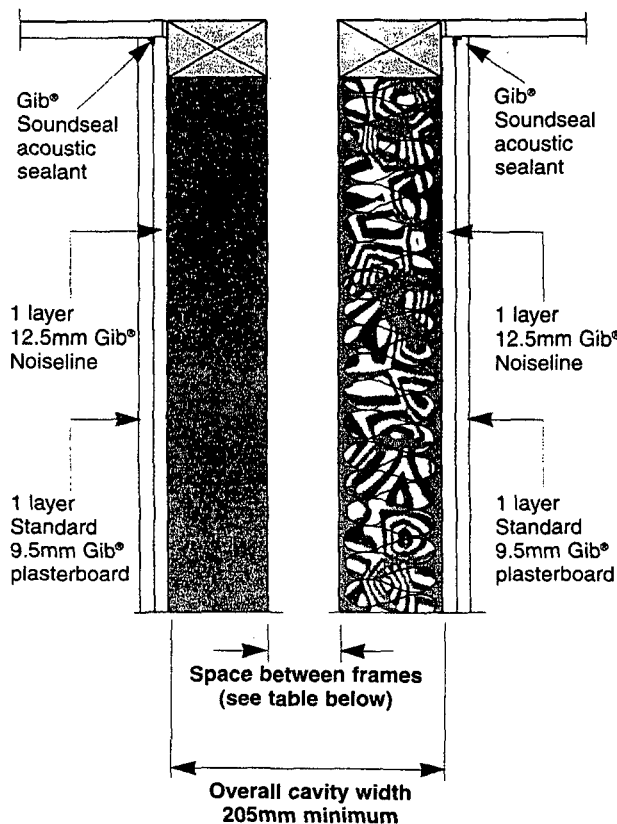
A bead of Gib® Soundseal acoustic sealant is required around the perimeter of the inner lining, the outer lining is then bedded onto the bead.

Jointing

Inner layer unstopped.

Outer layer - all fastener heads stopped and all sheet joints tape reinforced and stopped in accordance with the publication entitled "Gib Living Solutions Site Guide" 1999.

Wall to ceiling junctions are to be reinforced with paper tape and square stopped or finished with Gib® Cove.



Section Detail

70mm KD	65mm	249mm
90mm KD	25mm	249mm
Ex 75 x 50mm	65mm	249mm
Ex 100 x 50mm	25mm	257mm

IMPORTANT

The published STC for this system is based on the particle board flooring being non continuous over the double frame. Similarly, this rating will be achieved where the frames are constructed between concrete slabs. Where continuous timber flooring occurs, expect a performance loss of 3 STC points minimum. Refer detail, page 68.



Fire Rated Wall Systems Two Way FRR – Timber Frame

Specification Number	Loadbearing Capability	Fire Resistance Rating	Lining Requirements	Sound Transmission Class	System Weight Approx
GBT 30b	NLB	-/30/30	1 x 13mm Gib® Standard each side	STC 36	26kg/m²
GBTL 30b	LB	30/30/30			

Framing

GBT30b Non Loadbearing and GBTL30b Loadbearing

F5 stress grade or No.1 visually graded kiln dried Radiata Pine actual dimensions 70 x 35mm minimum. Alternatively, No.1 framing grade H1 treated Radiata Pine nominal dimensions 75 x 50mm minimum. Studs at 600mm centres maximum. Nogs at 800mm centres maximum for Vertical fixing. Nogs at 1200mm centres for Horizontal fixing.

Wall Heights and Framing Dimensions

GBT30b Non Loadbearing - Framing dimensions and height as determined by NZS3604 stud tables for non loadbearing partitions.

GBTL30b Loadbearing - Framing dimensions and height as determined by NZS3604 stud and top plate tables for loadbearing walls.

Lining

1 layer of 13mm Gib® Standard plasterboard each side of the frame.

Vertical or Horizontal fixing permitted.

Sheets shall be touch fitted.

When fixing vertically, full height sheets shall be used where possible.

All sheet joints must be formed over solid timber framing.

Fastening the Lining

Fasteners

41mm x 6g Gib® Grabber Scavenger Head High Thread Drywall screws or 40mm x 2.8mm Gib® nails.

Fastener Centres

300mm centres around the sheet perimeter, 12mm from the sheet edge.

Single screws or pairs of nails (50mm apart) at 300mm centres to intermediate studs.

Jointing

All fastener heads stopped and all sheet joints tape reinforced and stopped in accordance with the publication entitled "Gib Living Solutions® Site Guide".

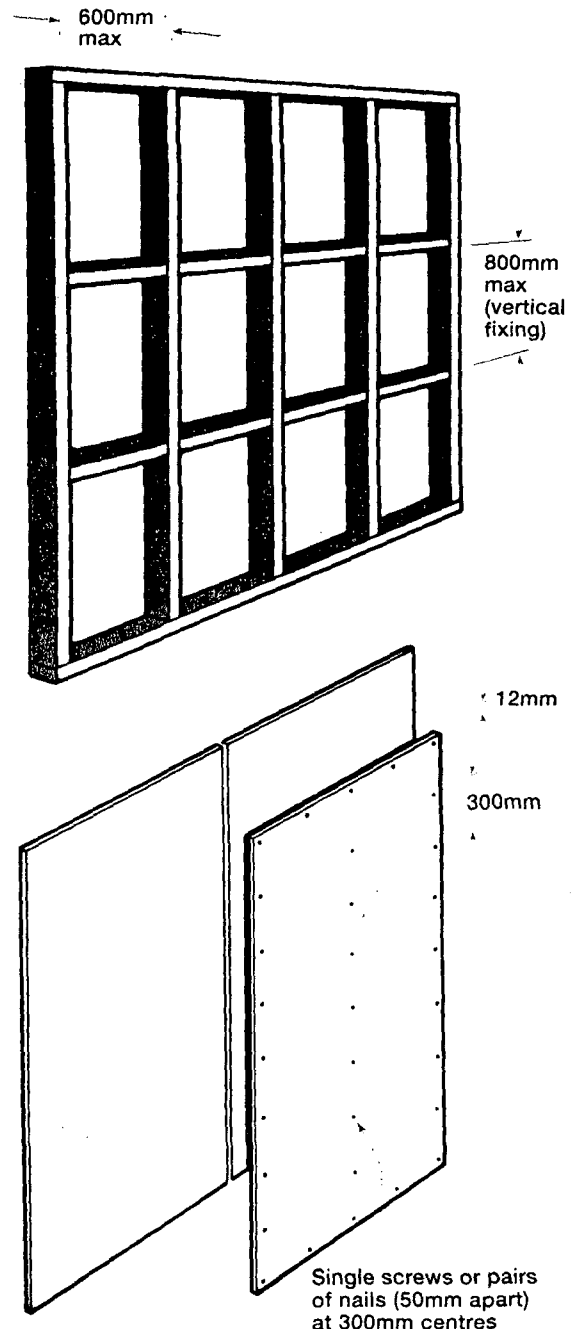
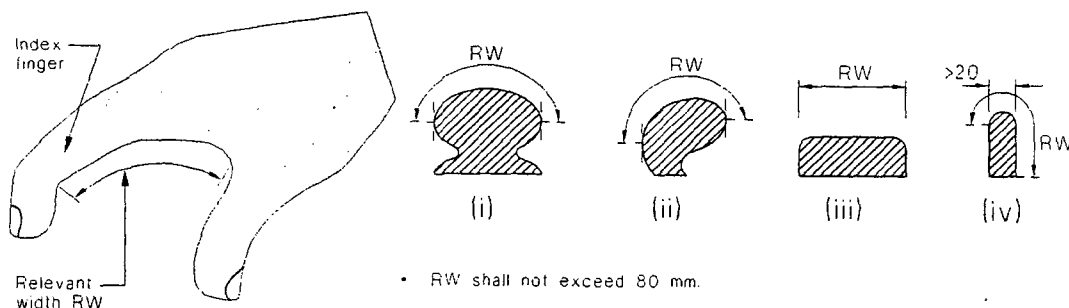
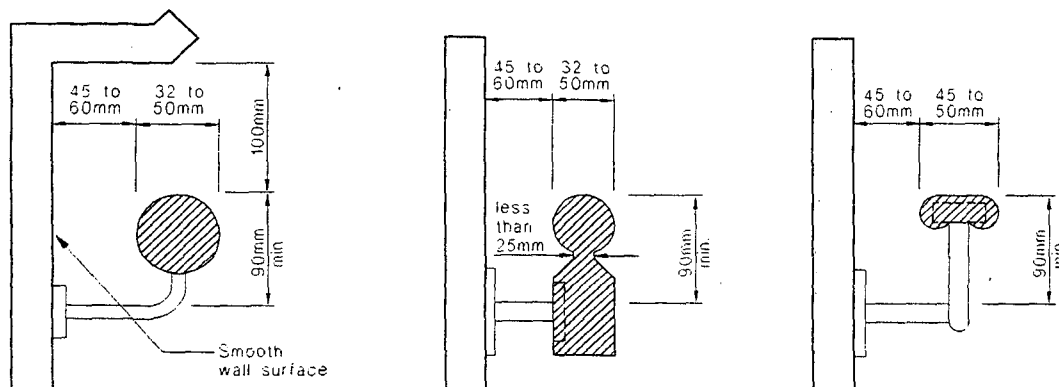


Figure 26: Handrail Profiles and Clearances
Paragraphs 6.0.8 and 6.0.9



- RW shall not exceed 80 mm.
- RW (relevant width) is measured around the upper surface perimeter of the handrail section between the vertical tangents on either side.
- Variations in shape are acceptable provided the effective grip is not reduced. For example, the side faces shown as vertical in details (iii) and (iv) are still acceptable even if slightly curved or sloped up to 5° from vertical.
- See fig. 26 (b) for wall clearances.

(a) Determination of relevant width for private and common stairways

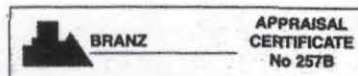


The profiles shown comply with the provisions for accessible handrails.

The clearances apply to all handrails and the maximum dimension must be used for rough textured wall surfaces.

(b) Acceptable profiles and clearances for accessible stairways

insulclad **'ultra'**®



EXTERNAL INSULATION & FINISHING SYSTEM

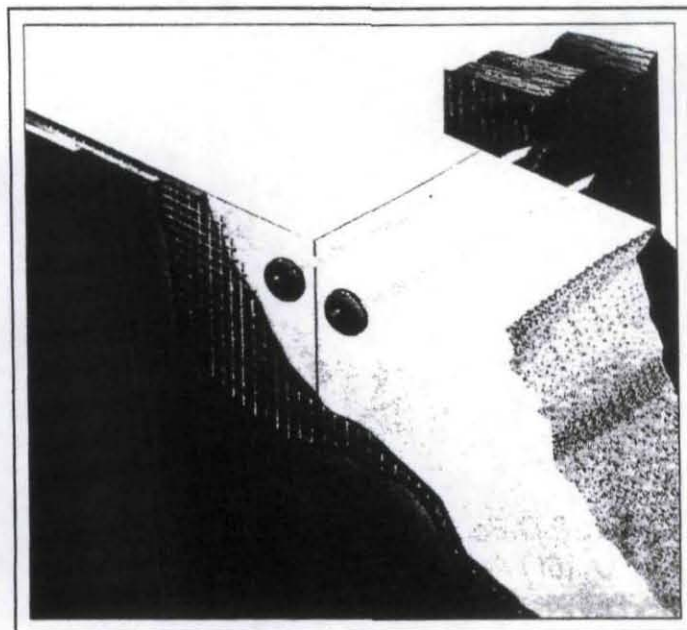
WHY CHOOSE **INSULCLAD 'ULTRA'** ?

- **ULTRA** WARM (SATISFIES NZS 4218:1996) R-VALUE=1.9 ON TIMBER FRAME CONSTRUCTION
- **ULTRA** DEEP WINDOW REVEALS (60mm)
- **ULTRA** ENERGY EFFICIENT
- **ULTRA** MONOLITHIC FINISH
- **ULTRA** HIGH QUALITY PROPRIETARY uPVC SILL AND JAMB FLASHINGS
- **ULTRA** WELL INSTALLED (LICENSED CONTRACTORS NETWORK)
- **ULTRA** COST EFFECTIVE

INTRODUCTION

There is currently a proposal underway to raise the thermal performance of homes situated in the cooler regions of New Zealand. NZS 4218:1996 will change the current thermal requirements for Zone 3 - the Ruapehu-Taupo District and the South Island region, increasing the required R-values for framed (cavity) wall construction from 1.5 to 1.9. To fulfil these requirements, Plaster Systems Ltd have developed a unique 60mm polystyrene external insulation and finishing system known as **INSULCLAD 'ULTRA'**

INSULCLAD 'ULTRA' is based on the time tested principles, and pedigree of the **INSULCLAD** System that has continued to evolve over the last 2 decades. Unlike other systems it is able to offer homeowners all the benefits of increased thermal insulation without compromising quality or cost effectiveness.



BENEFITS

The **INSULCLAD 'ULTRA'** System is the subject of BRANZ Appraisal Certificate Number 257B (1998), which ensures the system meets all the relevant provisions of the NZBC. The versatility and design flexibility offered by the **'ULTRA'** system gives both designers and homeowners the freedom to express their natural artistic flare. This sets this product development apart and ahead of any other cladding currently available.

As well as ensuring that the thermal envelope of a building meets the future standards, homes incorporating **INSULCLAD 'ULTRA'** will have deeper reveals, offering a look closer to that of solid masonry or polystyrene block. This architectural feature can now be achieved at a fraction of the price of block construction. The extra deep window reveals

will come as a standard detail with the **'ULTRA'** system, and are backed with high quality uPVC jamb and sill flashings to ensure long lasting, waterproof junctions between a homes joinery and its plaster work.

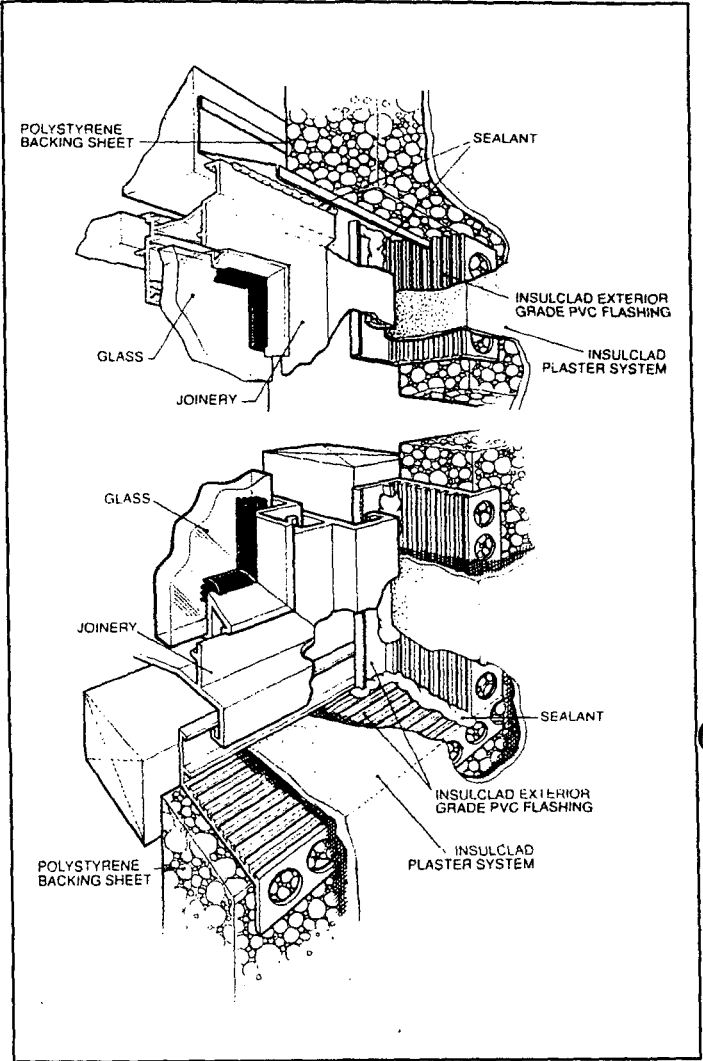
The **INSULCLAD 'ULTRA'** system over framed construction which has been lined internally with a paper faced plaster board, has excellent sound insulation properties. Full scale testing of the **INSULCLAD** system by the University of Auckland, School of Architecture shows the system has a Sound Transmission Class (STC) Rating of 40.

The additional insulation provided by the **'ULTRA'** system will provide homeowners with cumulative energy cost savings which far exceed the minimal extra cost of the system. Other proven benefits from the increased insulation are:-

- reduced heat loss from conduction and radiation through the structure
- reduced risk of mildew growth due to warmer internal surfaces
- lower heat gain during summer
- improved durability of internal finishes.

The **INSULCLAD 'ULTRA'** system is installed by highly trained licensed contractors, giving customers confidence in the knowledge that they will be provided with the highest quality product and finish available.

The fibre glass reinforcing mesh used in the **INSULCLAD 'ULTRA'** system can be specified in two grades to provide adequate resistance against impact loadings likely to occur in normal residential or **commercial** environments. In high traffic areas which specify a **commercial** finish, heavy grade (370g/m²) fibreglass reinforcing mesh is embedded in 5mm of plaster to provide over 4 times the impact strength of standard **INSULCLAD**. The specification of **commercial** grade **INSULCLAD 'ULTRA'** in vulnerable areas should be considered at the design stage.



SYSTEM	R-VALUE	IMPACT STRENGTH	REVEAL DEPTH
Standard INSULCLAD (40mm Polystyrene)	1.5	12Nm	40mm
INSULCLAD 'ULTRA' (60mm Polystyrene)	1.9	12Nm	60mm
Commercial INSULCLAD (40mm Polystyrene)	1.5	46Nm	40mm
Commercial INSULCLAD 'ULTRA' (60mm Polystyrene)	1.9	46Nm	60mm

'NO OTHER CLADDING SYSTEM OFFERS SO MUCH FOR SO LITTLE'

Insulclad is a registered trademark of Plaster Systems Limited

plaster
SYSTEMS LTD 121 Diana Drive, Glenfield. P O Box 40-130, Auckland, New Zealand.
Phone (09) 444-6440. Fax: (09) 444-9561. Toll Free: (09) 444-6300.
A NUPLEX GROUP COMPANY

GANGLAM

LINTELS

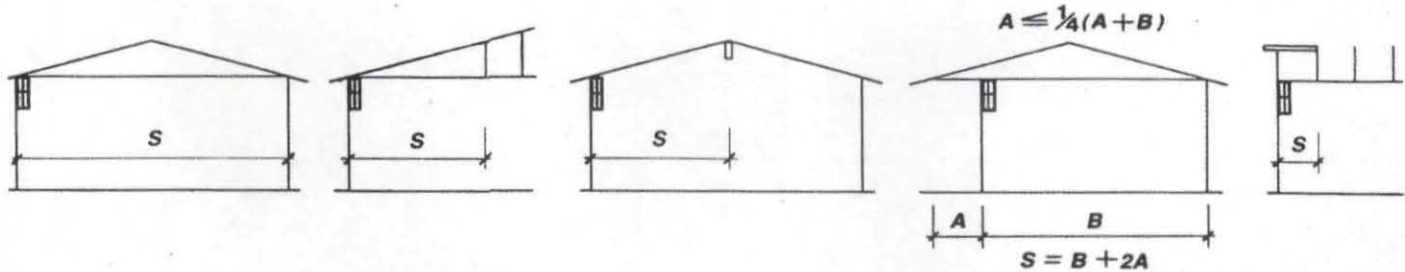


TABLE 1:
LINTELS SUPPORTING ROOF AND CEILING ONLY

	LINTEL SIZE	MAXIMUM LINTEL SPAN (m)										
		SUPPORTED ROOF SPAN 'S' (m)										
		5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
LIGHT ROOF	100 x 100	1.56	1.49	1.43	1.36	1.30	1.24	1.19	1.14	1.10	1.07	1.04
	125 x 100	2.08	1.98	1.90	1.82	1.73	1.65	1.59	1.53	1.47	1.42	1.38
	150 x 100	2.43	2.31	2.22	2.12	2.02	1.93	1.85	1.78	1.72	1.66	1.61
	200 x 100	3.29	3.14	3.01	2.88	2.74	2.62	2.51	2.42	2.33	2.25	2.19
	250 x 100	4.16	3.96	3.80	3.64	3.46	3.31	3.17	3.05	2.94	2.85	2.76
	300 x 100	4.62	4.40	4.22	4.07	3.94	3.82	3.71	3.62			
	350 x 100	5.44	5.19	4.98	4.80	4.64	4.50	4.38	4.23			
	400 x 100	6.27	5.98	5.73	5.52	5.34	5.15	4.94				
	450 x 100	7.09	6.76	6.49	6.22	5.92	5.66					
	500 x 100	7.92	7.55	7.16	6.77	6.44						
	550 x 100	8.74	8.13	7.64	7.23							
	600 x 100	9.29	8.65	8.12								
HEAVY ROOF	100 x 100	1.26	1.20	1.15	1.11	1.07	1.04	1.00	0.96	0.93	0.90	0.87
	125 x 100	1.68	1.60	1.54	1.48	1.43	1.39	1.33	1.28	1.24	1.19	1.16
	150 x 100	1.96	1.87	1.79	1.73	1.67	1.62	1.55	1.49	1.44	1.39	1.35
	200 x 100	2.66	2.54	2.43	2.35	2.27	2.20	2.11	2.03	1.96	1.89	1.83
	250 x 100	3.36	3.21	3.08	2.96	2.87	2.77	2.66	2.56	2.47	2.39	2.32
	300 x 100	3.74	3.56									
	350 x 100	4.40	4.20									
	400 x 100	5.07	4.84									
	450 x 100	5.74	5.47									
	500 x 100	6.41	6.11									
	550 x 100	7.07	6.74									
	600 x 100	7.62	7.35									

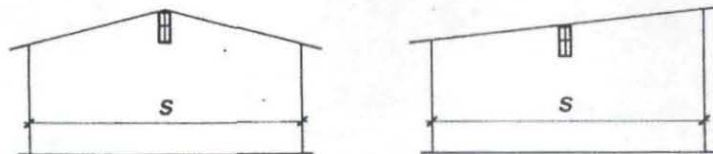


TABLE 1:
GANGLAM RIDGE BEAM SUPPORTING ROOF AND SARKING
(RAFTERS @ 1200MM CRS MAX)

	LINTEL SIZE	MAXIMUM LINTEL SPAN (m)										
		SUPPORTED ROOF SPAN 'S' (m)										
		5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
LIGHT ROOF	300 x 100	5.04	4.74	4.51	4.31	4.14	4.00	3.88	3.77	3.67	3.58	3.50
	350 x 100	5.94	5.59	5.31	5.08	4.88	4.72	4.57	4.44	4.32	4.22	4.12
	400 x 100	6.84	6.44	6.12	5.85	5.62	5.43	5.26	5.11	4.98	4.85	4.74
	450 x 100	7.62	7.28	6.92	6.62	6.36	6.14	5.95	5.78	5.63	5.49	5.37
	500 x 100	8.28	7.91	7.61	7.36	7.10	6.86	6.64	6.45	6.29	6.13	5.99
	550 x 100	8.92	8.52	8.20	7.93	7.70	7.50	7.32	7.13	6.94	6.77	6.62
	600 x 100	9.54	9.11	8.77	8.48	8.24	8.02	7.83	7.66	7.51	7.37	7.24
HEAVY ROOF	300 x 100	4.08	3.84	3.65	3.49							
	350 x 100	4.81	4.52	4.30	4.11							
	400 x 100	5.53	5.21	4.95	4.73							
	450 x 100	6.26	5.89	5.60	5.35							
	500 x 100	6.99	6.58	6.25	5.98							
	550 x 100	7.61	7.26	6.90	6.60							
	600 x 100	8.14	7.77	7.48	7.22							

Issue Document

Building Consent No:12030
Section 35, Building Act 1991
Issued:22Mar02

Project Information Memorandum No: 10976

Owner

D C HEARD LTD
C/O ROTORUA BLDG CERTIFIERS
P O BOX 1373
ROTORUA 3215

Agent

ROTORUA BUILDING CERTIFIERS
P O BOX 1373
ROTORUA 3215

Site Information

PROPERTY ID: 00858
ASSESSMENT NO: 06500/729.00
STREET ADDRESS: 96 PUKUATUA STREET, ROTORUA CENTRAL, ROTORUA 3201
LEGAL DESCRIPTION: LOT 2 DPS 82612

Project Information

PROJECT IS FOR: New Work
INTENDED USE(S): 6X APARTMENTS
INTENDED LIFE: Indefinite but not less than 50 years
VALUE OF WORK: \$800,000.00
NUMBER OF STAGES: 1

Fees

COUNCIL'S TOTAL CHARGES FOR THIS BUILDING CONSENT ARE: \$3,408.00

PAYMENTS RECEIVED TO DATE:

Receipt number:	957027	Date:	05Mar02	Amount:	\$1,370.00
Receipt number:	963453	Date:	21Mar02	Amount:	\$38.00
Receipt number:	963453	Date:	22Mar02	Amount:	\$0.00
Receipt number:	957028	Date:	05Mar02	Amount:	\$2,000.00

Building Consent: 12030

See attached page(s) for any other conditions.

Page : 1

1: Standard Conditions

This building consent is permission to undertake building work in accordance with the approved plans and specifications. All work must comply with the provisions of the Building Code. Any alterations from the original plans and specifications must have prior approval from the Building Control Manager.

2: Standard Statement

~~THIS BUILDING CONSENT IS ISSUED SUBJECT TO ALL OTHER OUTSTANDING CONSENTS HAVING BEEN APPROVED. WORK SHALL NOT COMMENCE AND INSPECTIONS WILL NOT BE UNDERTAKEN UNTIL THOSE OUTSTANDING CONSENTS HAVE BEEN COMPLIED WITH.~~

Signed for and behalf of the Council:

Name: P Lawrence Position: Building Control Manager

Signed: Peter Lawrence Date: 22/03/2002

Pir 1976

BUILDING SERVICES - BUILDING CONSENT

APPLICATION NO: 12030

VALUATION NO:

06500/729.00

OWNER:

DC Heard Ltd

PROPERTY NO:

P00858

PROJECT LOCATION:

96 Pukutua St

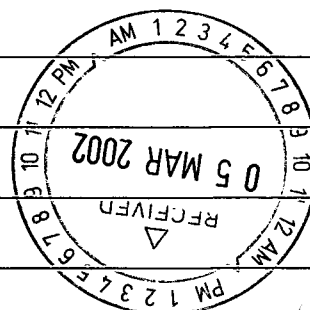
DESCRIPTION OF WORK:

Erect 6 Apartments

CHECK APPLICATION - BUILDING OFFICER:

DATE RECEIVED: 7-3-02	DUE DATE: 21-3-02
DATE SUSPENDED: 14-20-03-02	DATE ISSUED: 22-03-02

PROCESSING	REVIEW	DATE	TIME TAKEN	APPROVED	DATE
Hazard	New King, West area, Specific Substation Design, personal sub soil formation, 10				
Administration			40	AM	7-3-02
Building			30	PM	19-3-02
Resource Engineers					
Hazardous Substances					
Geothermal					
Environmental Health					
Disabled Persons					



NOTES AND CONDITIONS: (Please circle appropriate code for checkboxes)

200 a b c d e g h i j k
 l m n o p q r s t u

201 a b c d e g f

202 a b f

203 a f

204 f

205 a b f

206 **a** **b** **c** **f**

207 a f

208 a f

209 a f

210 a b c f

211 **a** **b** **c** **f**

212 a f

213 a b c d e g h i j k
l m n o p q r s f

214 a b f

215 a b c f

216 a f

217 a b f

218 a b c d e g h i f

219 f

220 a

FREE TEXT:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.



Private Bag 3029
Rotorua
New Zealand
Telephone 07-348 4199
Fax 07-346 3143
E-mail mail@rdc.govt.nz

ROTORUA DISTRICT COUNCIL

APPLICATION FOR A BUILDING CONSENT

Section 33, Building Act 1992
(Attach all relevant documents in duplicate)

APPLICATION NUMBER 12030

PART A : GENERAL

(Complete Part A in all cases)

1. OWNER

Name	DC Heard Ltd.
Postal Address	
Phone Number	
Fax Number	

2. CONTACT (If not owner)

Contact Name	ROTORUA BUILDING CERTIFIERS
Postal Address	22 Whitworth Road, PO Box 1373 ROTORUA Ph. 025-276-1575
Phone Number	
Fax Number	

3. PROJECT LOCATION

Address:	96 Pukunatua St, Rotorua
----------	--------------------------

4. LEGAL DESCRIPTION

Valuation Number 06500/729.00		OFFICE USE ONLY Property ID: P 00858	
Lot(s) (Section) 2	DP/S (Block) 82612	Lot Area(s) m ² /ha	No. of new toilets/urinals

5. PROJECT

5.1 New Building <input checked="" type="checkbox"/>	5.2 Intended Life Indefinite but not less than 50 yrs <input checked="" type="checkbox"/>	5.3 Description of Work: 6 x apartments (2 x blocks of 3)
Alteration <input type="checkbox"/>	or	5.4 Intended Use(s) (in detail) Residential
Relocation <input type="checkbox"/>	Specified as <input type="checkbox"/> yrs	5.5 Estimated Value: \$ 800,000.00 (GST INCL)
Demolition <input type="checkbox"/>		

☒ Application for Building Consent only, in accordance with Project Information Memorandum No. 10976

Signed by the owner/owner's agent:

Signature

Name: M.J. Skelton Date: 21/1/2002.
(PLEASE PRINT)

Office Use Only
TARGET DATE

1 1

PART B : PROJECT DETAILS

6. (Complete Part B only if you have NOT applied separately for a project information memorandum).

The project involves the following matters; tick each applicable box, if any, and attach relevant information in duplicate.

- (a) ☐ Location, in relation to legal boundaries, and external dimensions of new, relocated, or altered buildings. (Site Plan with elevations, Topography, drawn to scale, Elevations in relation to natural ground level and proposed finish level).
- (b) ☐ Details of any known or potential erosion, avulsion, falling debris, filled ground, subsidence, slippage, alluvion, inundation, geothermal, hazardous contaminants on or near the site.
- (c) ☐ Provision to be made for vehicular access, including parking and materials used. (To be shown on site plan).
- (d) ☐ Provisions to be made in building over or adjacent to any road or public place.
- (e) ☐ Provisions to be made for disposing of stormwater and wastewater. (To be shown on site plan).
- (f) ☐ Precautions to be taken where building work is to take place over existing drains or sewers or in close proximity to wells or watermains.
- (g) ☐ New connections to public utilities, i.e. water supply, stormwater system, wastewater system.
- (h) ☐ Provisions to be made in any demolition work for the protection of the public, suppression of dust, suppression of noise, disposal of debris and disconnection from public utilities.
- (i) ☐ Details of any cultural or heritage significance of the building or building site, including whether it is on a marae, or waahi tapu.
- (j) ☐ Copy or reference to, of any resource consent or planning approval for this project.
- (k) ☐ Details of volume of Proposed Excavations: Include volumes for Site Preparation, Basement, and Driveway.

PART C : PROJECT DETAILS

(Complete Part C in all cases)

This application is accompanied by (tick each applicable box, attach relevant documents in duplicate).

- 7. ☐ The drawings, specifications, and other documents according to which the building is proposed to be constructed to comply with the provision of the New Zealand Building Code, with supporting documents, if any, including:
 - 8. ☐ Building certificates
 - 9. ☐ Producer statements
 - 10. ☐ References to accreditation certificates issued by the Building Industry Authority.
 - 11. ☐ References to determinations issued by the Building Industry Authority.
 - 12. ☐ Proposed procedures, if any, for inspection during construction.

PART D

(Complete as far as possible in all cases)

Give names, addresses, telephone numbers. Give relevant numbers if known.

13. DESIGNER(S)

Name: Kenton Cox.

Address:

Phone Number: Fax Number:

BUILDER

Name: DC Heard Ltd.

Address:

Phone Number: Fax Number:

DRAINLAYER

Name: Colin Tetley Reg. No.

Address:

Phone Number: Fax Number:

PLUMBER

Name: Colin Tetley Reg. No.

Address:

Phone Number: Fax Number:

If more than number allowed for, please provide details on a separate sheet.

CONFIDENTIALITY

I/we require that my/our ☐ plans ☐ specifications be treated as
 confidential in order to protect: ☐ copyright ☐ security of building.

14.

Floor Area of Proposed Work	Area square metres
Buildings Other Than Detached Accessory Buildings:	sq.m.
Floor	sq.m. <u>730 m² total.</u>
Basement	sq.m.
Ground Floor	sq.m.
First Floor	sq.m.
Second Floor	sq.m.
Additional Floors (Total)	sq.m.
Mezzanine	sq.m.
Decks	sq.m.
Total	sq.m.
Detached Accessory Buildings:	Area square metres
Garage	sq.m.
Carport	sq.m.
Other Buildings	sq.m.
Total	sq.m.

FOR OFFICE USE ONLY

FEES		
Fees paid on Application	\$	c
Plan Review		
Project Information Mem.		
TOTAL FEE GST incl.		
Fees payable on approval	\$	c
Building Consent ^{SAS 7027} 5.3.02	50	00
Footpath Damage Deposit ^{SAS 7028} 5.3.02	1000	00
Crossing Deposit	1000	00
BRANZ Levy ^{SAS 1097} 5.3.02	800	00
B.I.A. Levy	520	00
Water Connection		
Sewer Connection		
Disconnection of Services		
Controlled Activity Fee		
Controlled Activity Bond		
Reserve/ Development Contribution		
See 362 notice	38	
Structural Check		
Resiting Bond		
Service Lane Information		
Other ^{specialist} design	50	
APPROVAL TOTAL	38.00	

CONSENT ISSUE AUTHORITY	
Receipt No.	<u>5963453</u>
Date of Issue	<u>21.3.02</u>
Authorised By	<u>[Signature]</u>
Date authorised	<u>19.3.02</u>

REFERRALS	
SENT	RETURNED
Structural	

AMENDED DETAILS RECEIVED		
	DATE	SIGN
Planning		
Health		
P & D		
Trade Waste		
Rec & Com		
DG/GEO		
Res Eng		
Building		
Structural		



22 Whitworth Road, PO Box 1373, Rotorua. Ph: 025 2761575, Fax: 07 3479676

FEES ASSESSED FOR PROJECT

Owner: DC Heard Ltd.
Site Address: 96 Pukunui St.
Project: 6x Apartments Value: \$800,000.00

PIM Fee	\$.....
Water Admin Fee	\$.....
BRANZ Levy	\$ <u>800.00</u>
BIA Levy	\$ <u>520.00</u>
Crossing Deposit	\$ <u>1000.00</u>
Damage Deposit	\$ <u>1000.00</u>
Consent Fee	\$ <u>50.00</u>
Certificate Fee	\$.....
Other Certifier's Certificate	\$.....
Engineering Peer Review	\$.....
Resource Consent Fee	\$.....
Total Cost	\$.....

BUILDING CERTIFICATE

P00858

Section 56, Building Act 1991

ISSUED BY **Bay Building Certifiers Ltd**

20 Park Street
P.O.Box 2230, Tauranga
Ph. 07 578-3427 Fax 07 578-5395

Issued by Bay Building Certifiers Ltd, Building Certifier No.9, currently approved and registered as a building certifier in all areas with no limitations.

To: Rotorua District Council

Consent Number (if issued)

Project Information Memorandum No (If issued)

PROJECT	PROJECT LOCATION
New or relocated building <input checked="" type="checkbox"/>	Owner Details DC Heard Ltd
Alteration <input type="checkbox"/>	96 Pukuatua Street
Intended use(s) (in detail)	Rotorua
Erect 6 dwellings	
Intended Life:	Site Address 96 Pukuatua Street
Indefinite, but not less than 50 years <input checked="" type="checkbox"/>	Rotorua
Specified as years <input type="checkbox"/>	
Demolition <input type="checkbox"/>	Lot 2
	D.P. S 82612

This is to certify that:

The building certifier has been engaged to inspect specified building work in relation to the provisions of the building code as detailed below:

☐ All building work as detailed on attached Plans and Specifications, Excluding N.Z. Building Code clauses G9 (Electricity) and G11 (Gas as an energy source).

☒ Work described in attached scope of Building Certifiers Engagement.

The building certifier is satisfied on reasonable grounds that:

☒ The proposed building work would comply with the applicable provisions of the building code if properly completed in accordance with the attached plans and specifications.

☐ The building work complied with the listed provisions of the building code on the date of certification.

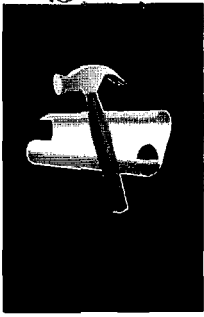
Signed by or for and on behalf of the building certifier

Name: 

Position:

Date: Monday, 11 February 2002

Wayne Wellington
MANAGING DIRECTOR



Bay Building Certifiers Ltd

The Construction Compliance
Certifiers

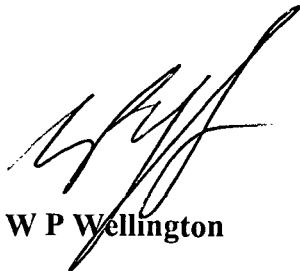
20 Park Street
P O Box 2230, Tauranga
Facsimile: 07 578 5395
Telephone: **07 578 3427**

12 February 2002

SCOPE OF ENGAGEMENT

Bay Building Certifiers have been engaged to certify the plans and specifications and carry out site inspections on the construction of 6 dwellings located at 96 Pukuatua Street, Rotorua, Lot 2, DPS 82612.

Bay Building Certifiers Ltd certificate is issued with the condition that the structural engineer is to supervise the sub excavation and replacement filling on the site, and confirm that the site has been filled in accordance with BSK Ltd design criteria.



W P Wellington



Q - Base, a Division
of Telarc New Zealand

16 January 2002

Building Control Manager
Rotorua District Council
Private Bag RO 3029
ROTORUA

Dear Sir

**RE: UNIT DEVELOPMENT FOR D C HEARD
PUKUATUA STREET ROTORUA**

OUR REF: 12848

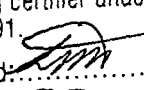
We confirm that we have carried out a structural design relating to the following structural elements of the above building -

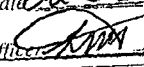
1. Foundations. (Refer also to Tonkin & Taylor Geotechnical reports reference 11722 dated December 1992 and reference 15549 dated September 1997.)

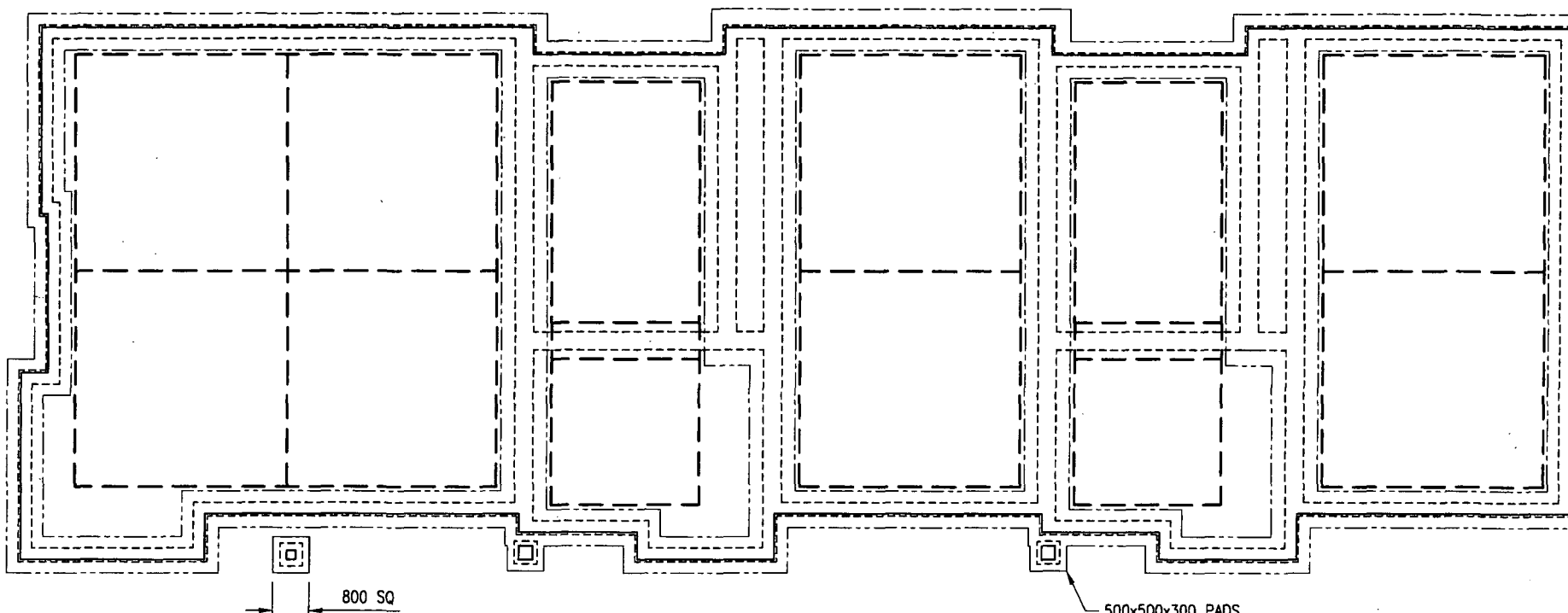
These foundations, as shown on BSK Consulting Engineers drawings reference 12848 Sheets 1 - 2, have been designed in accordance with sound and widely accepted Engineering Principles to support the loadings specified in NZS 4203:1992 "General Structural Design and Design Loadings for Buildings" and comply with Section B1 of the New Zealand Building Code.

Yours faithfully


BSK CONSULTING ENGINEERS LTD

Design Loadings for Buildings and
Building Code. The Council has granted this
number...12030... issued by an approved
building certifier under section 56 of the Building
Act 1991.
Signed: 
Dated: 22-03-02

PLANS APPROVED SUBJECT TO ALL
REQUIREMENTS OF THE BUILDING ACT
1991 BEING FULLY COMPLIED WITH
Data 22-03-02 Consent Number 12030
Official 



GENERAL NOTES:

1. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS ETC.
2. REFER ALSO TO TONKIN & TAYLOR GEOTECHNICAL REPORTS REF: 11722 & 15549.

SPECIFICATION:

1. FOR COMPACTION OF THE PUMICE SAND BACKFILL THE FOLLOWING CLAUSES ARE APPLICABLE.

AFTER PLACING THE GEOTEXTILE, THE FIRST LAYER OF BACKFILL MATERIAL, CONSISTING OF CLEAN WELL GRADED PUMICE SAND, SHALL BE PLACED IN A LAYER NOT EXCEEDING 300mm THICKNESS (LOOSE), AND THEN COMPACTED USING A LIGHTWEIGHT STATIC ROLLER. PROVISION SHALL BE MADE FOR THE GEOGRID IN THE LOWER PART OF THIS LAYER, IN ACCORDANCE WITH THE DRAWINGS.

ROLLING SHALL CONTINUE UNTIL THE FOLLOWING COMPACTION CRITERIA ARE ACHIEVED.

- (a) CLEGG IMPACT VALUE (CIV) OF NOT LESS THAN 6.
- (b) A RELATIVE DENSITY OF NOT LESS THAN 40%.

2. SUBSEQUENT FILL LAYERS SHALL BE PLACED IN LAYERS NOT EXCEEDING 150mm THICKNESS (LOOSE).

ROLLING OF A LIGHTWEIGHT STATIC ROLLER SHALL CONTINUE UNTIL THE FOLLOWING COMPACTION CRITERIA HAVE BEEN ACHIEVED.

- (a) A (CIV) OF NOT LESS THAN 9.
- (b) A RELATIVE DENSITY OF NOT LESS THAN 70%.

FLOOR SLAB & FOUNDATION PLAN 1:100

500x500x300 PADS
302 REINF BOTH WAYS
75 BOTTOM COVER

LINE LEGEND

—————	SLAB OUTLINE
- - - - -	SAWCUT
- - - - -	EXCAVATION OUTLINE
- - - - -	FOUNDATION

bsk
CONSULTING ENGINEERS LTD
P.O. BOX 23, 144 HINEMOA STREET, ROTORUA
NEW ZEALAND
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PROJECT:

UNIT DEVELOPMENT FOR D.C. HEARD
PUKUATUA STREET
ROTORUA

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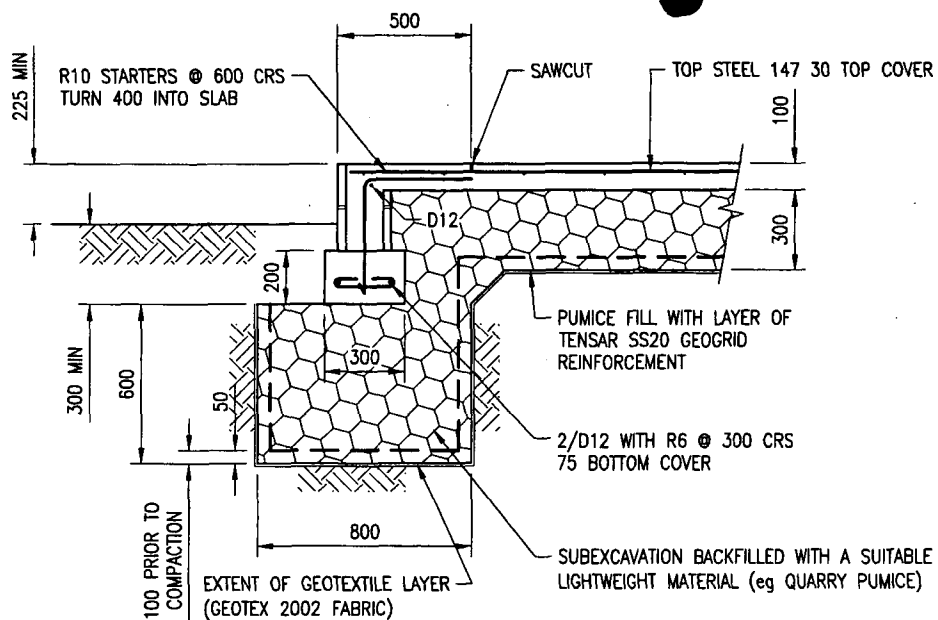
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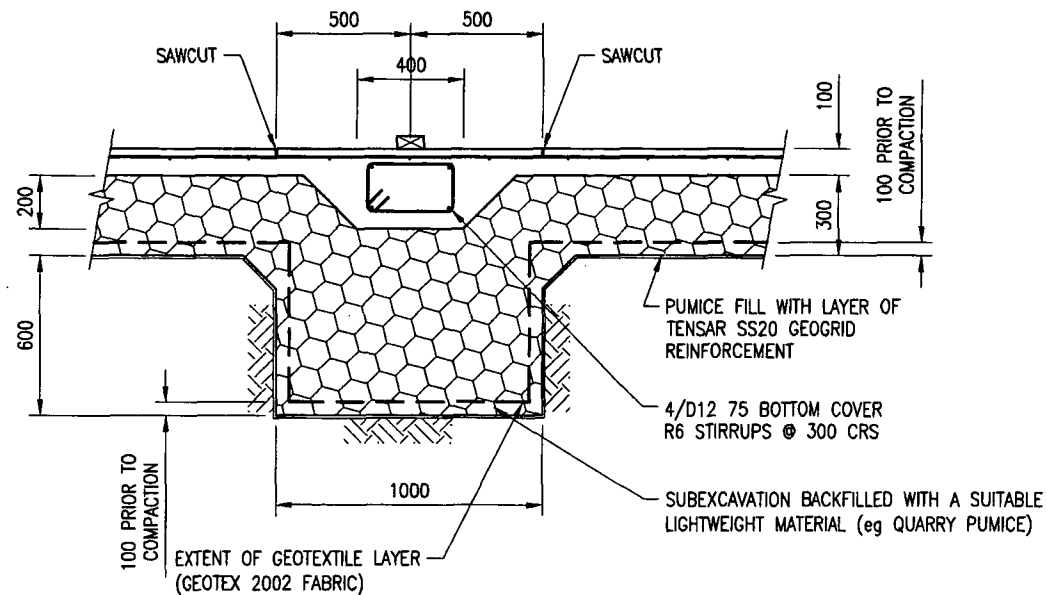
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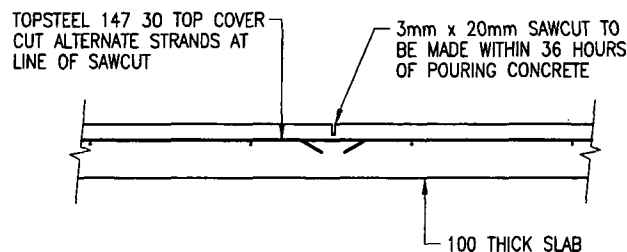
SHEET No: 1 OF 2



TYPICAL PERIMETER FOOTING 1:20



TYPICAL INTERNAL FOUNDATION 1:20



SAWCUT DETAIL 1:10

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Monday 07 January 2002

Geological Report: 96 Pukuatua Street

This report is provided following your verbal instructions of December 2001. On site investigations were done on Sunday 06 January 2002.

1.0 BRIEF

To inspect site at 96 Pukuatua Street and supply a geological report about ground conditions with respect to potential geothermal hazards. A separate report on engineering investigations of this area has already been provided by Tonkin and Taylor (their report No. 15549 and dated 19 September 1997).

2.0 SITE DESCRIPTION

The section is at 96 Pukuatua Street and the land parcel is known as Lot 2, DPS 82612, Town of Rotorua. Its area is 1465m² and is flat lying, on the south side of Pukuatua Street opposite the old netball courts and Kuirau Park.

Presently the site is undeveloped and is sparsely vegetated in temperate pastoral grasses. A residential dwelling had been present on this site since at least 1932 up until about 1987. Soon after that date the old house was removed and a rhyolite gravel infill brought in to compress the land and also raise its elevation.

In January 2002 the section was level with no topsoil present and the hard gravel infill partially exposed. Ground surface was about 0.3m below the level of Pukuatua Street, so that it occupies a topographic low lying area. There was no surface evidence of any warm or hot ground, nor any sulphurous deposits, to indicate any presently occurring geothermal activity.

3.0 GEOLOGICAL SETTING

The section is located on a low lying plain comprised of shallow lake silts and swampy peats. It is immediately west of higher ground under the Central Business District (CBD) of Rotorua, which is located over the broad top of a buried lava dome that outcrops as Pukeroa (or Hospital) Hill. Numerous hot spring upflows occur along the northern and western margins of this lava dome and result in the abundant geothermal activity in Kuirau Park.

Lake Rotorua water level has varied greatly but by 9,000 years ago it fell quickly to about its present day level of 280m above sealevel (m asl). About 7,000 years ago it rose again by about 13m, at which time this site at Pukuatua Street was submerged and yet again accumulated fine lake silts. By 2,000 years ago the lake had fallen to near its present day levels and this area was a swampy marsh.

This section at 96 Pukuatua Street has no evidence of surface geothermal activity nor evidence of such activity in the top 2.5m depths, which represent the past c. 2,000 years. However, deep drillhole stratigraphy and fluid data, chemistry and other information indicates that geothermal conditions are present beneath this section.

Production well RR875 is located in the northeast corner of No.96 Pukuatua Street. It is 137m deep and produces fluid of about 160°C, indicating that only a thick cover of impermeable sediments is preventing any surface geothermal activity on this property.

4.0 INVESTIGATION PROCEDURES AND RESULTS

Four ground inspection holes were augered up to 2.5 metres deep at places shown in Figure 1. These holes were sited to examine the subsurface ground conditions around the section and because of the general uniformity of subsurface materials and conditions, four holes were considered sufficient.

Stratigraphic summaries of these holes are shown in Figure 2, which also include notes about temperatures. Heatflows across the section have not been contoured because all results were at ambient, or non geothermal values.

4.1 Geothermal Wells

Any geothermal well is an additional potential threat because its steel casing is prone to corroding away and allowing superheated waters to escape to the surface, sometimes with explosive and destructive consequences.

The nearest known geothermal well is RR875 located on this section. Due north across Pukuatua Street is well RR219, which has been disused since 1987. That well is about 50m away and is under pressure. It was drilled in the 1950s and because of its age it represents a possible safety issue for surrounding property and persons. However, it is likely to be cement grouted shut very soon because of its age. There is no soakhole or flowing hot spring on this property.

4.2 Auger Hole Materials and Conditions

Locations of augered inspection holes are shown in Figure 1 and descriptions of materials found in each hole are given in Figure 2. All holes are were of broadly similar materials, with assorted infill comprising the upper 0.5-0.7 metres of ground. This was underlain by a rich loamy black soil 0.1-.2m thick, under which was a fine grained massive silt unit.

This silt was pale fawn colour in its upper horizons but graded into pale creamy grey colour within ~0.5m or so. It contained root hairs (flax and manuka?) but no evidence of any geothermal attack or weathering. No silica sinters or cemented sediments were found, confirming the absence of geothermal activity here during the last c. 7,000 years.

Water levels were at about 2m or less depth from ground level, but these water temperatures were all ambient and the waters non mineralised; ie. it was recent rain waters only. The silt was not penetrated to its base, but from well drilling information is expected to be in the order of 30-100m thick.

However, the silt unit is very thixotropic, or sensitive to liquefaction upon any sustained vibration. This same material occurs beneath a large area of central urban Rotorua city at very shallow depths, but in historical time spanning the past c.150 years there is no knowledge of any liquefying event having occurred anywhere in Rotorua.

4.3 Heat and Gas Flows

Auger hole profiles (Figure 2) show measured temperatures at indicated depths. All 0.2m and one metre depth temperatures measured were at ambient or non geothermal ground values of 16-18°C at 0.2m depth and of 18-22°C at one metre depth.

These ground temperatures represent natural conductive and non-geothermal (or ambient) heatflows of about 0.5 Watts per square metre (W.m^2) or less. Gas and steam upflow was not evident anywhere on the property, nor from any augered hole.

5.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

The section has been stable and without any geothermal activity or thermal problems throughout historical times spanning the past c.150 years. A house was on site during c.1932-1988 and had no history of any geothermal activity or problems. The naturally present ground materials down to at least 2.5m depth had no evidence of any geothermal alteration, attack or corrosion.

The present heatflow across the section is entirely ambient non geothermal conductive heating, of the same values as a similar site outside of the geothermal field.

5.1 Stormwater Disposal

Soakholes will not be able to infiltrate rainwaters on this property, due to the very thick and fine grained silts and clays. These fine sediments are up to about 100m thick and are unlikely to contain any coarse grained permeable beds to take water. On the contrary, any permeable unit will be under artesian pressure and will actually upflow water instead. Ideally there should be no in ground soakholes at all and rainwater should be channeled off the section if possible.

5.2 Building Footings and Ventilation

Any footings excavations should be founded upon an adequate load bearing material, which may have to be brought into the site. Although the site has a rhyolite gravel infill present, this is upon a rich organic soil layer and a peaty layer around the central to northwest of the site.

5.3 Corrosion Tolerant Materials

There is no need for any in ground pipes or cables to be constructed from materials tolerant of acid gases or high temperatures.

6.0 POTENTIAL GEOTHERMAL HAZARDS

This property is at some risk from natural and manmade geological hazards, due to its location inside the Rotorua caldera. However, it is at no greater risk from many of these potential threats than many other properties in Rotorua. The owners need to be aware of some small potential threat due to underlying geothermal conditions, as it is feasible that strong ground shaking could open fissures to allow geothermal gases or fluids to rise here. However, there is no evidence of such an event here in the past c.7,000 years.

6.1 Natural Geothermal Hazards

Any risk from natural geothermal activity to this site is most likely to be caused by strong earthquake shaking, which could be due to tectonic earthquakes or to those accompanying resumed volcanic activity near to Rotorua city. Earthquakes of sufficient strength to cause ground shaking and rupturing in Rotorua city are expected about once every 40-50 years with modified Mercalli magnitude of MM 7 or greater and about 180 years for MM 8 or greater (Hull, Downes, Van Dissen, 1994). Any resumption of nearby volcanic activity may occur at any time in the future.

6.2 Manmade Geothermal Hazards

This site could be affected by thermal activity induced by inappropriate human actions. Any geothermal well nearby would pose some risk due to its possible blowout, especially as it aged and its casing corroded away. Rotorua District Council (RDC) and Ministry of Labour both have various responsibilities to ensure reasonable safety of geothermal wells, although wells have a history of causing property damage in Rotorua city.

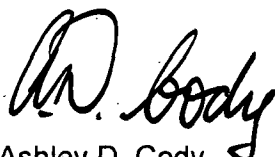
Uncontrolled increased drawoff from geothermal wells could lower the RGF pressure so that much greater zones of boiling may form; which in turn would lead to the possibility of gas or steam upflows. However, it is unlikely in the foreseeable future that geothermal energy use could become unmanaged in Rotorua.

7.0 REFERENCES

Hull, A.; Downes, G.; Van Dissen, R. 1994: "Earthquake hazards of the Bay of Plenty Region". Bay of Plenty Regional Council Resource Planning Publication 95/1, June 1995.

Please contact me if further discussion is required.

Yours sincerely



Ashley D. Cody
Geothermal Geologist

Pukuatua Street

edge of roadside berm

Well
RR875

○ A1

21.3°C

○ A4a

○ A4

18.7°C

○ A3

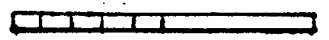
18.3°C

○ A2

18.6°C

~N

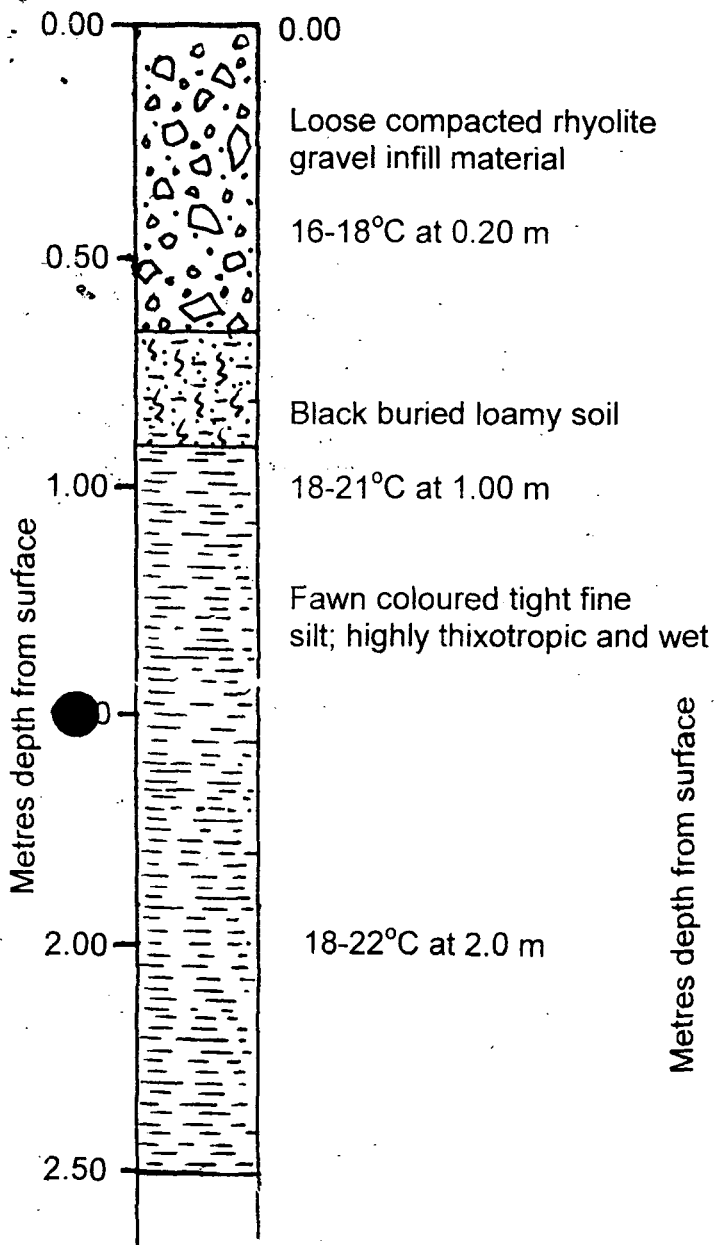
Scale in metres:



0 5 10

Figure 1: Location diagram of No.96 Pukuatua Street section, showing locations or augered inspection holes (A1 – A4). Scale is 4mm = one metre. Geothermal production well RR875 in cellar at northeast corner of site. Hole A4a abandoned at 0.6m depth onto horizontally lying wide concrete slab. Ground temperatures at one metre depths also shown (°C).

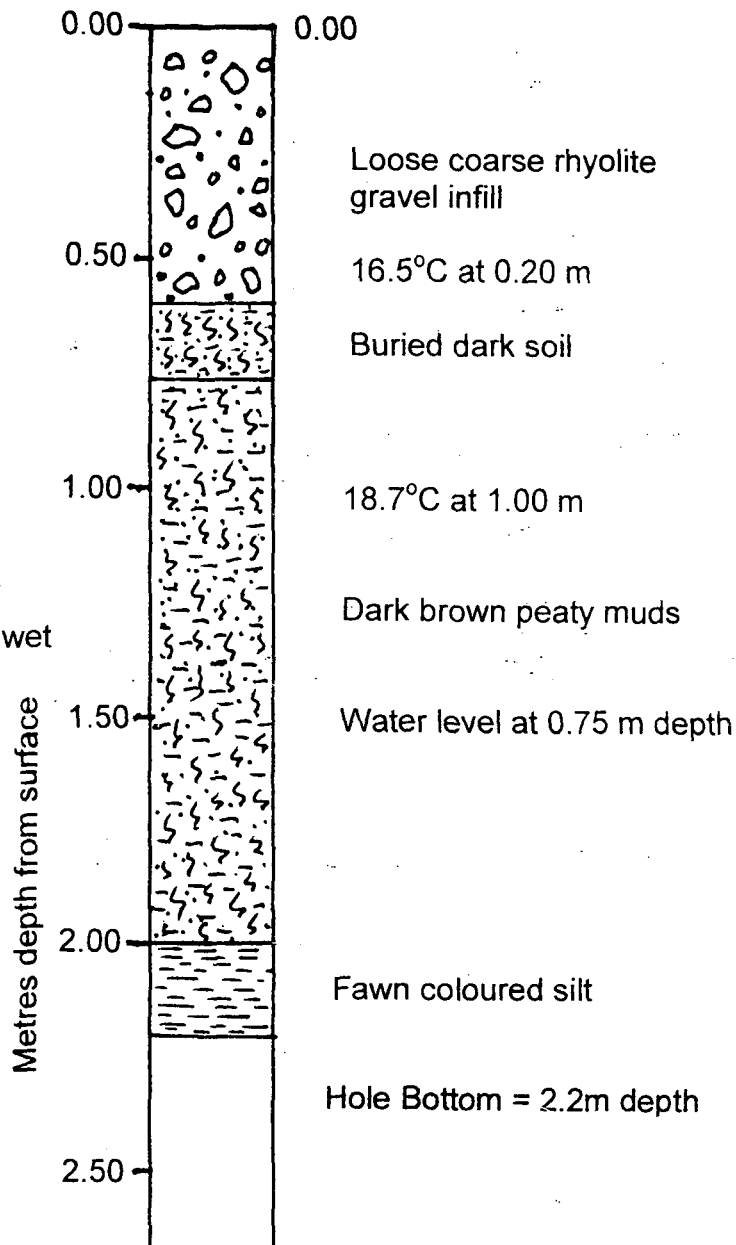
Auger Holes A1-A3



Hole Bottoms = 2.5m depth

Water level 1.56m in hole A1;
holes A2 and A3 both "dry".

Auger Hole A4



Hole Bottom = 2.2m depth

Figure 2: Ground geology in augered holes A1 – A4. Left hand profile is for all holes A1 – A3 due to close similarity of conditions and depths. Right hand profile is of hole A4, which contained a thick sequence of peat and artesian water. WL = waterlevel in metres.