FAR NORTH DISTRICT COUNCIL
Private Bag 752
KAIKOHE
Ph: 0800 920029
Fax: (09) 401 0987 or (09) 408 1404

BCAPP

INSPECTION ADVISE NOTICE

TO: B. Irwin **DATE:** 24-8-99

ADDRESS: **CONSENT NO:** 970172

VAL NO: 618-569.

TYPE OF INSPECTION CARRIED OUT

Site		Foundations	
Bond Beam		Slab	
Subfloor		Framing	
Preline		Drains	
Utility Services		Interim Final	
Final	✓	Fire place	
Other (specify)			

Notes and/or action to be taken List of work given to complete

FURTHER INSPECTION REQUIRED: YES / NO

SIGNED: (For Council - Building Officer) (For Applicant/Builder/Agent)

TIME: AM/PM **COPY REQUIRED:** ☐

Rawene Service Centre
PO Box 3
RAWENE

FORM 3
APPLICATION FOR BUILDING CONSENT
(Section 33, Building Act 1991)

Malcolm Stevenson
BUILDING INSPECTOR

Barry Moor
PLUMBING/DRAINAGE INSPECTOR

To: **FAR NORTH DISTRICT COUNCIL**

PART A : GENERAL [To be completed by all applicants]

Building Consent No: 970172

APPLICANT*

Name: BRIAN ERWIN Telephone: 4058817

Mailing Address: BOX 5, OMAPERE, HOKIANGA

Builder: AS ABOVE Telephone:

Address:

Contact Person: Telephone:

Address:

*Under section 33 of the Building Act 1991, the applicant must be the owner of the land on which building work is contemplated or a person who or which has agreed in writing, whether conditionally or unconditionally, to purchase the land or any leasehold estate or interest in the land, or to take a lease of the land, while the agreement remains in force.

PROJECT

- [x] New building — Area: ____ m²
- [ ] Relocated building — Area : ____ m²
- [ ] Alteration — Area : ____ m²
- [ ] Demolition — Area : ____ m²
- [ ] Plumbing/Drainage Only

Intended uses(s):

Description of work: NEW BUILDING

Intended life:

- [x] Indefinite but not less than 50 years
- [ ] Specified as ____ years

Estimated Value (inclusive of GST)

Building : $ 90-000-00 Plumbing & Drainage: $ 8-500 Total : $ 98-500-00

PROJECT LOCATION

Street Address : SH 12, OMAPERE, HOKIANGA.

Legal Description (as shown on certificate of title) : LOTS 8 & 9 DP 50736 BLK VII HOKIANGA SD

Area: 0.04700 ~~m²~~/ha. Valuation No: 00590-569-00

THIS APPLICATION IS FOR :

- [ ] Building consent only, in accordance with project information memorandum No : ____
  Issued on : ____
- [ ] Both building consent and a project information memorandum

FOR COUNCIL USE

Date Received: 2-8-96 Minimum Estimated Charge : 350-00 Receipt No: 91869

PART B: PROJECT DETAILS [*Complete only if a separate project information memorandum has not been applied for*]

Provide information on the following matters as relevant [*Cross applicable boxes and attach information in duplicate*] :

- ☐ Location, in relation to legal boundaries, and external dimensions of all existing, new, relocated, or altered buildings or demolition work
- ☐ New and/or existing provisions for vehicular access, including parking
- ☐ Provisions to be made in building over or adjacent to any road or public place
- ☐ New and/or existing provisions for disposing of stormwater and wastewater
- ☐ Precautions to be taken where building work is to take place over existing drains or sewers or in close proximity to wells or watermains or under/over cables
- ☐ New and/or existing connections to public utilities
- ☐ New and/or existing provisions for water supply
- ☐ Provisions to be made in any demolition work for the protection of the public, suppression of dust, disposal of debris, disconnection from public utilities, and suppression of noise
- ☐ Any cultural heritage significance of the building or building site, including if it is on a marae.

PART C: BUILDING DETAILS [To Be *Completed by all Applicants*]

This application is accompanied by [*Cross applicable boxes, attach relevant documents in duplicate*]:

- ☐ Are there existing buildings on the property? Yes/No
- ☐ The site plan and drawings, specifications, and other documents according to which the building is proposed to be constructed to comply with the provisions of the building code, with supporting documents, if any, including:
  - ☐ Building certificates
  - ☐ Producer statements
  - ☐ References to accreditation certificates issued by the Building Industry Authority
  - ☐ References to determinations issued by the Building Industry Authority
- ☐ Proposed procedures, if any, for inspection during construction

PART D: COMPLIANCE SCHEDULE DETAILS

D1 : SYSTEMS NECESSITATING A COMPLIANCE SCHEDULE

[*Complete Part D1 for all new buildings and alterations, <u>except</u> single residential dwellings*]

The building will contain the following [*Cross applicable boxes and attach proposed inspection, maintenance, and reporting procedures* in duplicate]:

- ☐ Automatic sprinkler systems or other systems of automatic fire protection
- ☐ Automatic doors which form part of any fire wall & which are designed to close shut and remain shut on an alarm of fire
- ☐ Emergency warning systems for fire or other dangers
- ☐ Emergency lighting systems
- ☐ Escape route pressurisation systems
- ☐ Riser mains for fire service use
- ☐ Any automatic back-flow preventer connected to a potable water supply
- ☐ Lifts, escalators, or travelators or other similar systems
- ☐ Mechanical ventilation or air conditioning system serving all or a major part of the building
- ☐ Any other mechanical, electrical, hydraulic, or electronic system whose proper operation is necessary for compliance with the building code
- ☐ Building maintenance units for providing access to the exterior and interior walls of buildings
- ☐ Such signs as are required by the building code in respect of the above-mentioned systems
- ☐ None of the above

D2 : OTHER SYSTEMS AND FEATURES TO BE INCLUDED IN THE COMPLIANCE SCHEDULE

[*Complete Part D2 only if the building contains one or more of the systems listed in Part D1*]

The building will contain the following [*Cross applicable boxes and attach proposed inspection, maintenance, and reporting procedures* in duplicate]:

- ☐ Means of escape from fire
- ☐ Safety barriers
- ☐ Means of access and facilities for use by persons with disabilities which meet the requirements of section 25 of the Disabled Persons Community Welfare Act 1975
- ☐ Hand-held hoses for fire fighting
- ☐ Such signs as are required by the building code or section 25 of the Disabled Persons Community Welfare Act 1975

PART E: KEY PERSONNEL [*Complete as relevant*]

Designer : _____ Reg No: _____

Address: _____ Tel : _____

Registered drainlayer : _____ Reg No: _____

Address: _____ Tel : _____

Registered plumber : _____ Reg No: _____

Address: _____ Tel : _____

Registered gasfitter : _____ Reg No: _____

Address: _____ Tel: _____

Registered electrician : _____ Reg No: _____

Address: _____ Tel: _____

Other : _____

_____

If you intend to use a Building Certifier, provided information below.

Building certifier(s) : _____ Reg No: _____

Address: _____ Tel: _____

Signed by or for and on behalf of the applicant:

Name : _____

Position : _____ Date : ____/____/____

FAR NORTH DISTRICT COUNCIL

Kerikeri PO Box 417
Phone (09) 4077033
5 Homestead Road

Kawakawa PO Box 11
Phone (09) 4040371
State Highway 1

Kaeo PO Box 69
Phone (09) 4050297
Leigh Street

Valuation Ref: 590-569-00

Date: 16.12.96

Mr/Mrs: Brian Erwin
Box 5
OMAPERE

B/P File: 970172

Dear Sir/Madam,

I have to advise that following are the fees for the proposed

New dwelling

at State Highway 12

Building Permit Plumbing & Drainage ESBAABC	1150.00	Water Meter/Connection	
Street Damage Deposit DPBAADD		Relocation Bond DPBAADD	
Branz Levy BRANZ	99.00	Fire Service Fee ESBAAFSR	
B.I.A. Levy BIA	64.35		
SUBTOTAL:	1313.35	SUBTOTAL:	

TOTAL PAYABLE: 1313.35

LESS FEES ALREADY RECEIVED
(Receipt 918696 paid 2-8.96) 1150.00

BALANCE NOW DUE: 163.35

Please note that no Building Consent will be issued until all scheduled fees have been paid.

BUILDING CLERK

OFFICE USE ONLY:

RECEIPT. NO. 4774

AMOUNT: 163-35

DATE: 17-12-96

PAID BY: Brian Erwin

Julie McIndoe,
Kawakawa Sc,
DD.

FAR NORTH DISTRICT COUNCIL

Kerikeri PO Box 417
Phone (09) 4077033
5 Homestead Road

Kawakawa PO Box 11
Phone (09) 4040371
State Highway 1

Kaeo PO Box 69
Phone (09) 4050297
Leigh Street

Valuation Ref: 590-569-00

Date: 16.12.96

Mr/Mrs: Brian Edwin
Box 5
OMAPERE

B/P File: 970172

Dear Sir/Madam,

I have to advise that following are the fees for the proposed

New dwelling

at State Highway 12

Building Permit Plumbing & Drainage ESBAABC	1150.00	Water Meter/Connection	
Street Damage Deposit DPBAADD		Relocation Bond DPBAADD	
Branz Levy BRANZ	99.00	Fire Service Fee ESBAAFSR	
B.I.A. Levy BIA	64.35		
SUBTOTAL:	1313.35	SUBTOTAL:	

TOTAL PAYABLE: 1313.35

LESS FEES ALREADY RECEIVED
(Receipt 918696 paid 2-8.96) 1150.00

BALANCE NOW DUE: 163.35

Please note that no Building Consent will be issued until all scheduled fees have been paid.

BUILDING CLERK

OFFICE USE ONLY:

RECEIPT. NO. _____ AMOUNT: _____

DATE: _____ PAID BY: _____

BUILDING CONSENT NO BC 970172
TRACKING SHEET

NAME: ERWIN, BRIAN ***DATE:*** ~~6~~ 2 August 1996

VAL. NO: **00590-569-00**

LEGAL DESC: LOTS 8 9 DP 50736 BLK VII HOKIANGA SD

BUILDING: NEW DWELLING

LOCATION: STATE HIGHWAY 12 OPONONI/OMAPERE

RESOURCE PLANNER

DATE: ***SIGNED:***

CONDITIONS: RC

DEVELOPMENT ENGINEER

DATE: ***SIGNED:***

CONDITIONS:

PLUMBING & DRAINAGE INSPECTOR

DATE: 7/11/96 ***SIGNED:*** T B Moor

CONDITIONS:

BUILDING INSPECTOR

DATE: 7/11/96 ***SIGNED:*** M Pearson

CONDITIONS:

OTHER : _____

DATE: ***SIGNED:***

CONDITIONS:

(please turn over)

BUILDING CONSENT NO.

FEES AND CHARGES

BUILDING CONSENT:

Building MEC } $ 1850.
P & D MEC }

BRANZ Levy $_____

BIA Levy $_____

TOTAL $_____

OTHER FEES:

Road Damage Deposit $_____

Water Connection $_____

Sewer Connection $_____

Other _____ $_____

_____ $_____

EXTRA PROCESSING COSTS:

Mileage

Photocopying

Other

_____

TOTAL BUILDING CONSENT FEES $_____

Less Deposit paid $_____

BALANCE NOW DUE $
==========

PLANNING CHECK SHEET

Zoning: commercial / (Hokianga) Settlement Core PP. NO SNA, OLU SLW

Does the project comply with all standards or ordinances within the zone?

Yes ☐

No ☑ List standards/ordinances not complied with and attach.

Type of Activity under RMA? _____

Does the project require a resource consent?

No ☐

Yes ☐

Resource Consent granted?

No ☐

Yes ☐ RC # _____ Date granted: _____

Conditions appropriate to this project?

None ☐

Yes ☐ Attached.

Comments: _____

_____

Is there a special classification applied to this land or building(s)?

No ☐

Yes ☐

☐ Site of Special Biological Interest classified by Department of Conservation (see attached)

☐ Historic or archaeological classification by Historic Places Trust (see attached)

☐ Other: _____

by _____ (see attached)

Licenses that may be required to operate:

☐ Liquor license

☐ Health license

☐ Dangerous goods license

☐ Other license _____

Note This listing is not intended to contain all licenses, permits or other legal requirements relevant to the proposed project.

PROJECT INFORMATION MEMORANDUM / BUILDING CONSENT REQUEST FOR INFORMATION (§30)

NAME: B. Erwin	DATE:	PIM/BC No: 970172	
VALUATION No:	LEGAL DESC:		
BUILDING: New Dwelling	LOCATION:		

RE: PIM / BC / BOTH

In order to process your application for a project information memorandum, the following information is requested. The time period for processing is hereby suspended as provided for under §30 and will not be resumed until the information is received.

The site is zoned Commercial 1 under the Hokianga section of the plan. The proposed dwelling is non-complying because it is not accessory ~~to the~~ to a proposed commercial operation.

Resource Planner _____ Date _____

The site is zoned Settlement Core under the proposed Far North Plan. The proposal exceeds the critical sunlight standard being 3m plus the shortest horizontal distance see 5.8.4.5.4 of the New plan. The proposal is non-complying in terms of this requirement.

Engineer _____ Date _____

Please also provide a copy of the certificate of title (earlier requested) and details of proposed excavation on site.

Information Required

Plumbing & Drainage Inspector _____ Date _____

(1) Certificate of Title
(2) Details of proposed filling or excavation proposed
(3) Resource Consent for a non-complying land use activity (i) Enclosed are all necessary forms
(ii) Fee is $500
(iii) attached is information required under proposed Plan which must be attached.

Building Inspector _____ Date _____

ACT\IPIMS30.doc

JM:BC 970172

Wayne Smith

13 November 1996

Brian Erwin
P O Box 5
OMAPERE

Dear Sir/Madam

RE: BUILDING CONSENT APPLICATION 970172 - NEW DWELLING

I write in reference to the abovenamed building consent application recently lodged with the District Council.

Pursuant to Section 34(2) of the Building Act 1991 the processing of your application has been suspended until the following additional information is provided:

1 The site is zoned Commercial 1 under the Hokianga Section of the Transitional District Plan. The proposed dwelling is non-complying because it is not accessory to a proposed commercial operation.

2 The site is zoned Settlement Core under the Proposed Far North Plan. The proposal exceeds the critical sunlight standard being 3m plus the shortest horizontal distance (see 5.8.4.5.4 of the new plan). The proposal is non-complying in terms of this requirement.

3 Please provide a copy of the Certificate of Title (earlier requested) and details of proposed excavation on site.

4 In short, please provide the following:
- Certificate of Title
- Details of proposed filling or excavations
- Resource Consent application for non-complying land use activity with a fee of $500.00

If you have any queries, please do not hesitate to contact Wayne Smith at the Kawakawa Service Centre.

Yours faithfully

Julie McIndoe
ENVIRONMENTAL SERVICES ADMINISTRATOR

PROJECT INFORMATION MEMORANDUM / BUILDING CONSENT REQUEST FOR INFORMATION (§30)

NAME: ERWIN		DATE: 06/08	PIM/BC No: 570172
VALUATION No: 590-569-00		LEGAL DESC: Lot 8 & 9 DP 50736	
BUILDING: NEW DWG.		LOCATION: St 12 ONAPERE	

RE: PIM / BC / BOTH

In order to process your application for a project information memorandum, the following information is requested. The time period for processing is hereby suspended as provided for under §30 and will not be resumed until the information is received.

1. Elevations of proposed new dwelling
2. Copy of certificate of Title.

Resource Planner _____ Date _____

Engineer _____ Date _____

Plumbing & Drainage Inspector _____ Date _____

Building Inspector _____ Date _____

ACT\1PIMS30.doc

JM:BC 970172

Resource Planner/Building Inspector

6 August 1996

Brian Erwin
P O Box 5
OMAPERE

Dear Sir/Madam

RE: BUILDING CONSENT APPLICATION 970172 - NEW DWELLING

I write in reference to the abovenamed building consent application recently lodged with the District Council.

Pursuant to Section 34(2) of the Building Act 1991 the processing of your application has been suspended until the following additional information is provided:

1 Please provide elevations of proposed new dwelling

2 Please provide a copy of the Certificate of Title.

3 Please refer to attached form "Information to Accompany Application for Building Consent" and provide highlighted information.

4 Please provide plans showing all doors, windows, ventilation and layout of all rooms.

5 Please note that building must have a continuous foundation.

If you have any queries, please do not hesitate to contact a Resource Planner or a Building Inspector at the Kawakawa or Rawene Service Centres.

Yours faithfully

Julie McIndoe
ENVIRONMENTAL SERVICES ADMINISTRATOR

Commercial 1 Hokianga

House - non-complying activity only.

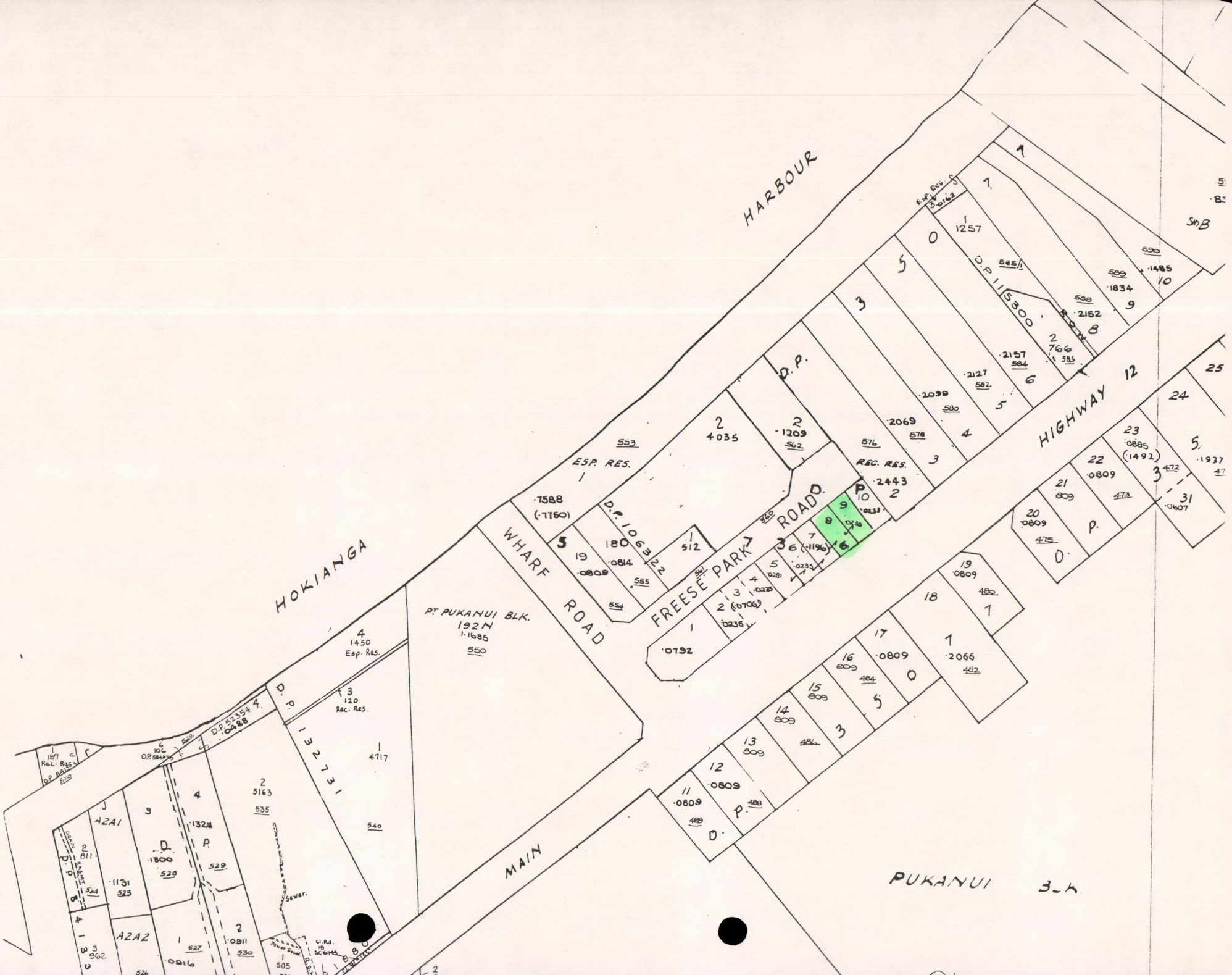
Settlement Core Zone.

Exceeds critical standard for ~~height in relation to boundary~~ sunlight - non-complying 3m ~~to~~ plus the shortest horizontal distance from boundary. Chapter 5.8.4.5.4

~~Setback from road boundary 2m. 5.8.4.3.6~~

~~Ver~~ 5.8.4.3.6 (b) requires all buildings to provide a verandah met.

Provide details of anticipated excavation.


HARBOUR
HIGHWAY
HOKIANGA
MAIN
ROAD
WHARF ROAD
FREESE PARK ROAD
PUKANUI
ESP. RES.
REC. RES.
Pt PUKANUI BLK. 192H
D.P. 10632
D.P. 11300
D.P. 52354
D.P. 132731
Sewer
Power Easement
Cl. Rd. 19 SCHEME
A2A1
A2A2

FAR NORTH DISTRICT COUNCIL

KAWAKAWA SERVICE CENTRE

TELEPHONE: (09) 404-0371
FAX: (09) 404-1544

STATE HIGHWAY ONE
P O BOX 11
KAWAKAWA 0292

FAX TRANSMISSION SHEET

NUMBER OF PAGES (INCLUDING THIS SHEET): _____

TO: _____

ATTENTION: _____

FAX NUMBER: _____

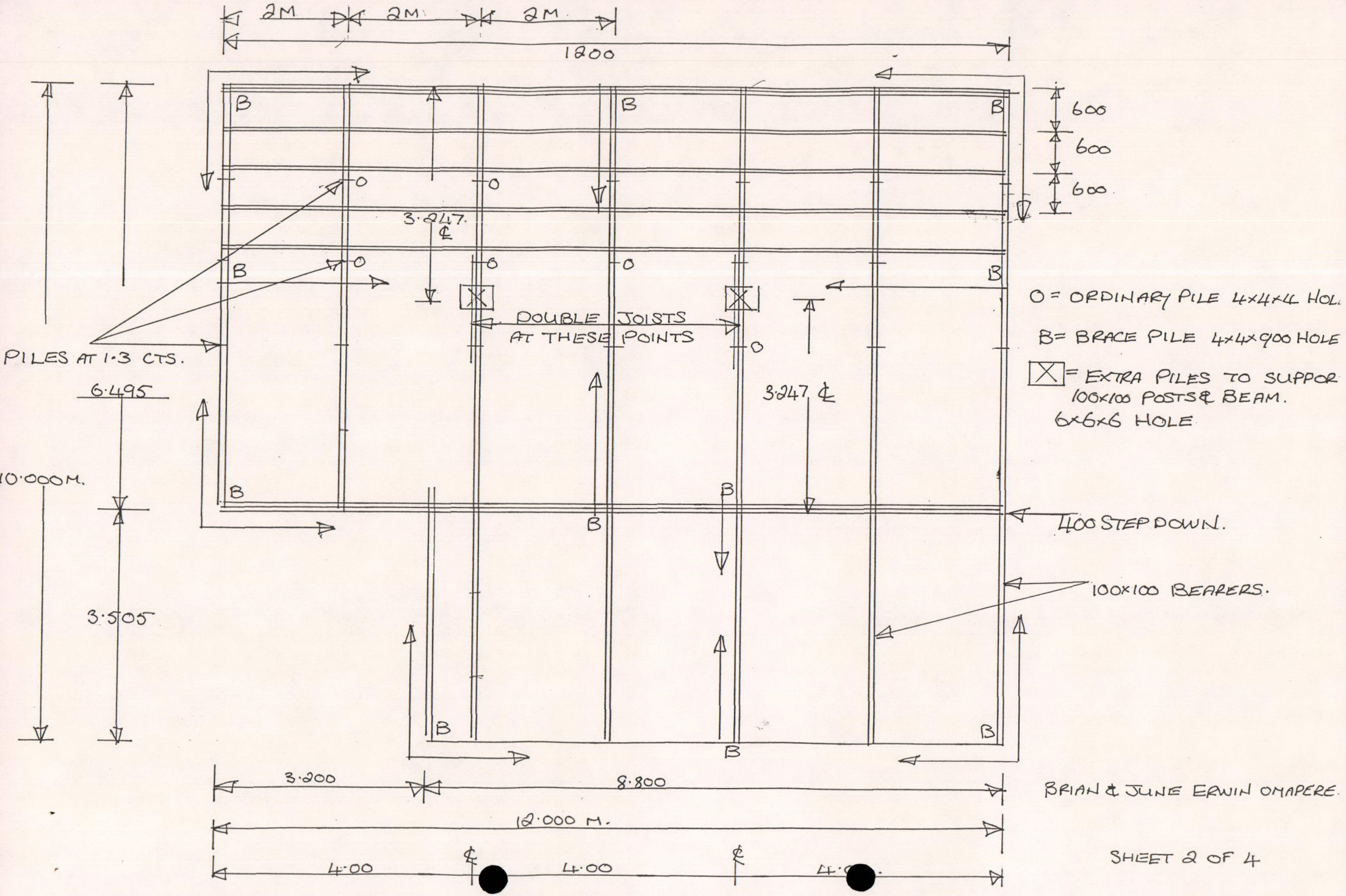
DATE: _____

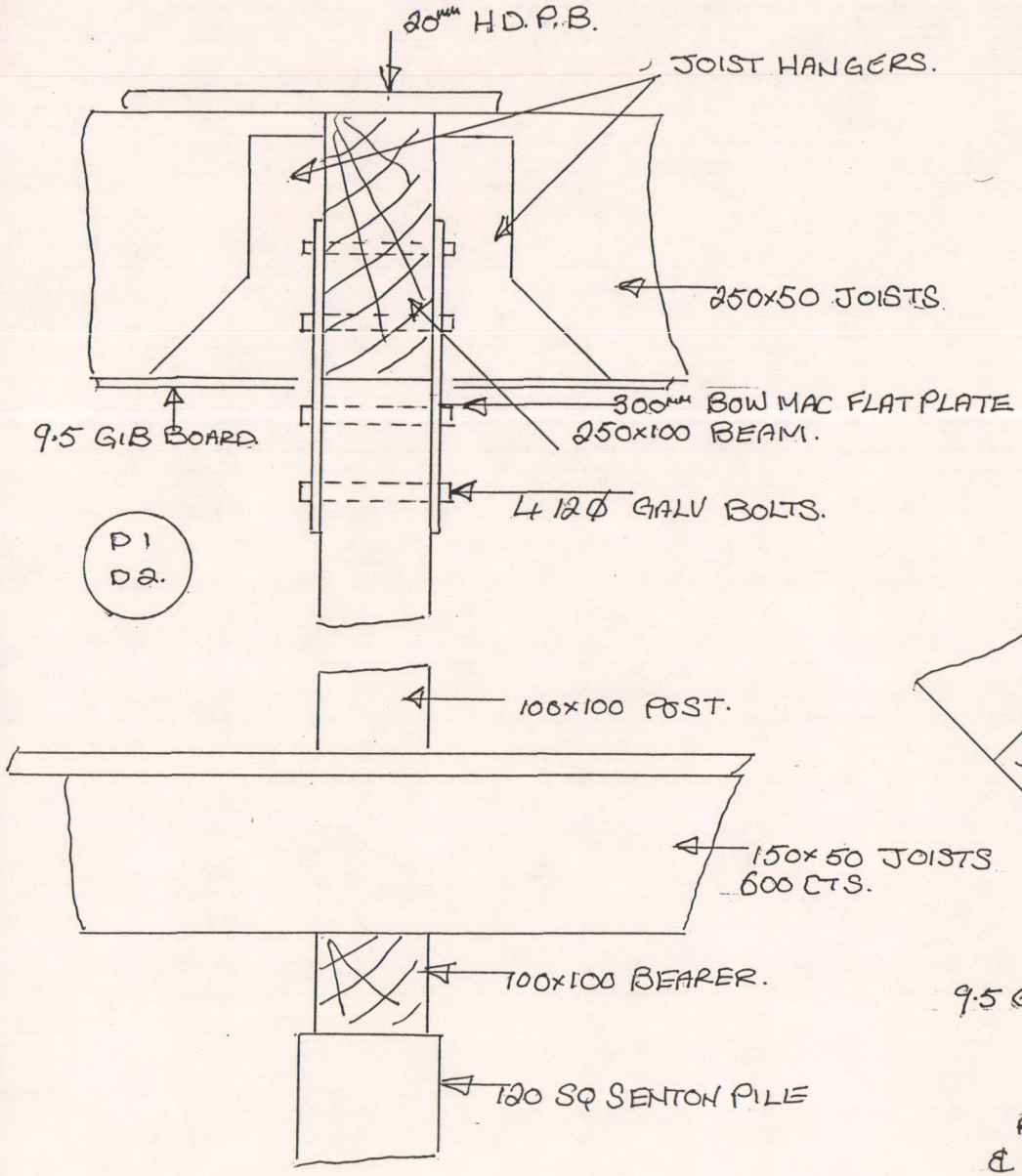
FROM: _____

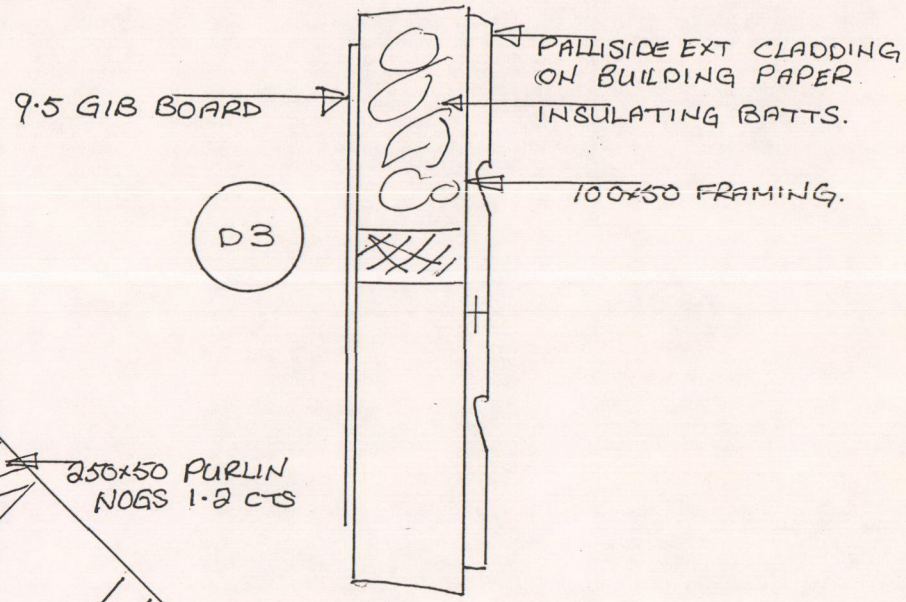
MESSAGE: _____

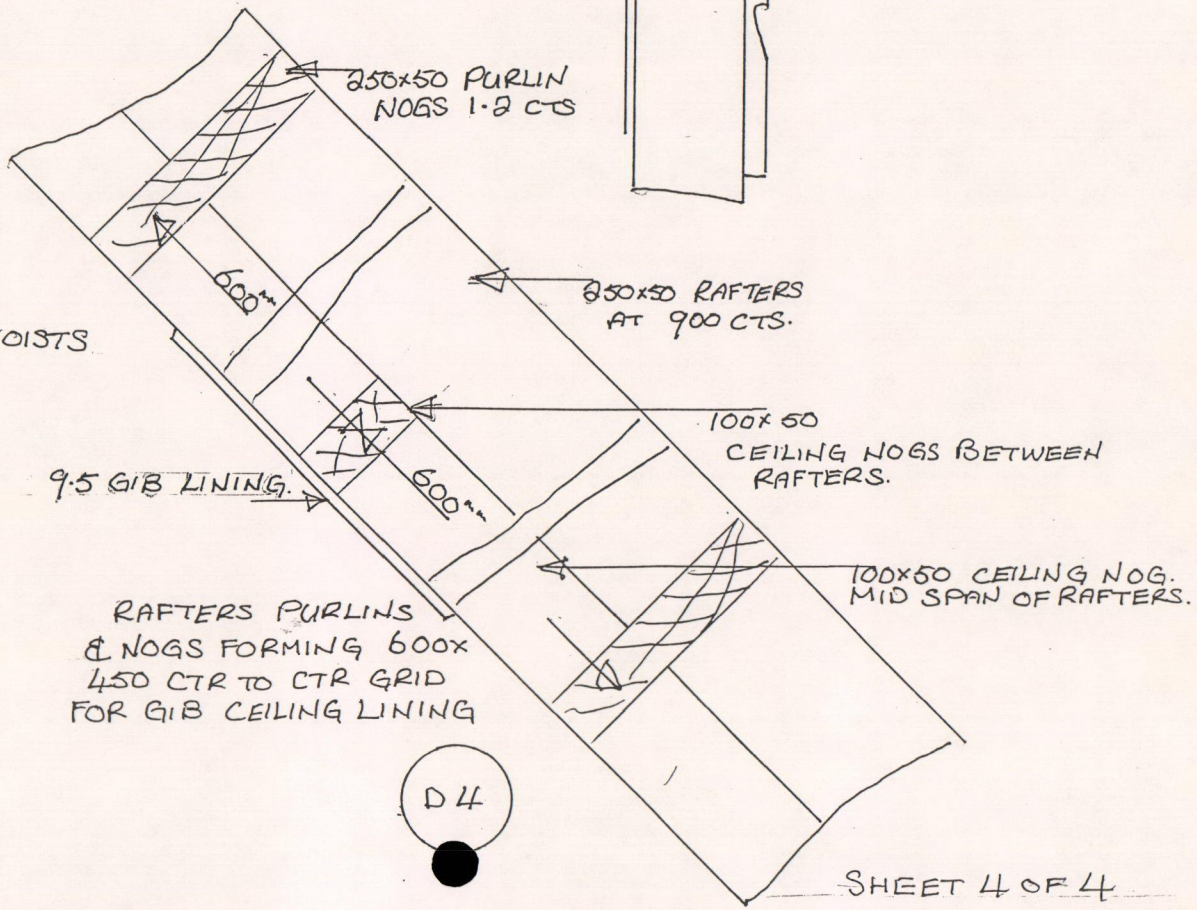
MGS
+
LBM

IF YOU HAVE NOT RECEIVED ALL THE PAGES OR FIND THAT ANY OF THEM ARE ILLEGIBLE, PLEASE CALL THE SENDER ON KAWAKAWA (09) 404-0371 DURING BUSINESS HOURS. THANK YOU. D:\DATA\WP\GENERAL\FAX.DOC : GME 15/2/94


2M
2M
2M
1200
600
600
600
B
O
3·247 ℄
DOUBLE JOISTS
AT THESE POINTS
PILES AT 1·3 CTS.
6·495
10·000M.
3·505
3·247 ℄
400 STEP DOWN.
100x100 BEARERS.
O = ORDINARY PILE 4x4x4 HOL
B= BRACE PILE 4x4x900 HOLE
= EXTRA PILES TO SUPPOR
100x100 POSTS & BEAM.
6x6x6 HOLE
3·200
8·800
12·000 M.
4·00
4·00
BRIAN & JUNE ERWIN OMAPERE.
SHEET 2 OF 4







BRIAN & JUNE ERWIN OMAPERE.

SHEET 4 OF 4

RECEIPT

Date 1 / 8 / 19 96.

286588

Received from Omapere Glass.

the sum of One Thousand One Hundred & fifty Dollars ESBAABC

FAR NORTH DISTRICT COUNCIL
KAWENE SERVICE CENTRE
G.S.T. NO. 52-004-8

per

Cheque	$	1150 : —
Cash	$	:
Total	$	1150 : —

WILJEF No. 15—8

STRUCTURAL CALCULATIONS FOR PROPOSED NEW DWELLING

FOR

BRIAN AND JUNE ERWIN
STATE HIGHWAY 12
OMAPERE.

The following calculations have been done to determine the structural adequacy of the proposed new dwelling for Brian + Jane Irwin, Omapere

Loadings:

GRAVITY:

Roof:

Dead:

Roofing	= 0.06 kPa
Framing	= 0.10
Insulation	= 0.02
Ceiling	= 0.10
Ceiling Batten	= 0.05
miscellaneous	= 0.02
	0.35 kPa

Loading in roof plan area $= \frac{0.35}{\cos 45°} = 0.49$ kPa

Live Load = 0.25 kPa

DL + LL = 0.74 kPa CRITICAL

0.7D + WT = 0.24 − 0.92 = 0.68 kPa↑

TIMBER FLOOR

Dead Load = 0.50 kPa
Live Load = 1.50
2.0 kPa

TIMBER DECK

Dead Load = 0.45 kPa
Live Load = 2.0 kPa
2.45 kPa

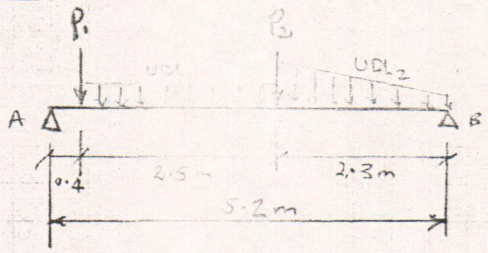
EXTERIOR WALLS
Allow for 0.40 kPa per unit wall area.

Interior WALLS
Allow for 0.30 kPa per unit wall area.

ROOF STRUCTURE:

RB1

Geometry



$R_A = R_B = 6\,kN$

Loads:

Distributed:

$UDL_1 = 1.7 \times 0.74 = 1.26\ kN/m$
$+ \text{ self wt.} = 0.14$
$1.40\ kN/m$

$UDL_{2\,max.} = (3.5 \times 0.74) + 0.15 = 2.74\ kN/m$
$UDL_{2\,min.} = (1.75 \times 0.74) + 0.15 = 1.46\ kN/m$

Concentrated:

$P_1 = P_2 = 1.07\,kN = (1.75 \times 1.3 \times 0.74 \times 0.5 \times 2)$

$$UDL\ equivalent = \frac{(1.7 \times 2) + (2.1 \times 2.3) + (1.4 \times 2.5)}{5.2} = 2.26\ kN/m$$

Analysis:

$BM = 2.26 \times 5.2^2 / 8 = 7.64\ kN\text{-}m$

$\Delta = 13.02 \times 2.26 \times 5.2^4 / EI\ mm = 21515/EI\ m$

$\Delta_{limit} = 0.004L = 21\,mm$

Design:

TRY Timber, Radiata Pine, No 1 Framing Grade.

$F_b = 6.0\ MPa$
$K_1 = 1.35$ $\quad Z_r = 943 \times 10^3\ mm^3$
$F_b = 8.1\ MPa$
$E = 9.0\ GPa$ $\quad I_r = 199 \times 10^6\ mm^4$
$K_2 = 1.75$

For 300 x 100 ~ $Z = 1354 \times 10^3\ mm^3$ OK
$I = 199 \times 10^6\ mm^4$ OK

USE

300 x 100 Timber, Radiata Pine Grade for Ridge Beam RB1	No 1 Framing

RB2

Span = 2.5m
UDL = (2.5 × 0.74) + 0.15 = 2.0 kN/m $R_A = R_B = 2.5$ kN

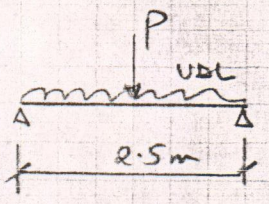
USE 200 × 100 Timber Beam for RB2

RB3

Span = 2.5 m
UDL = (4.5 × 0.74) + 0.15 = 3.5 kN/m $R_{ms} = 4.4$ kN

USE 200 × 100 Timber Beam for RB3

RB4



$R_{xm} = 2.5 + 1 = 3.5$ kN

UDL = 1.3 + 0.74 = 1.0 kN/m

P = 1.0 × 2.5 × 0.74 = 1.85 kN

$BM = \left(1 \times \frac{2.5^2}{8}\right) + \left(1.85 \times \frac{2.5}{4}\right) = 0.8 + 1.2 = 2.0$ kN·m

$Z_r = 242 \times 10^3$ mm³

use 200 × 50 for RB4

RB5

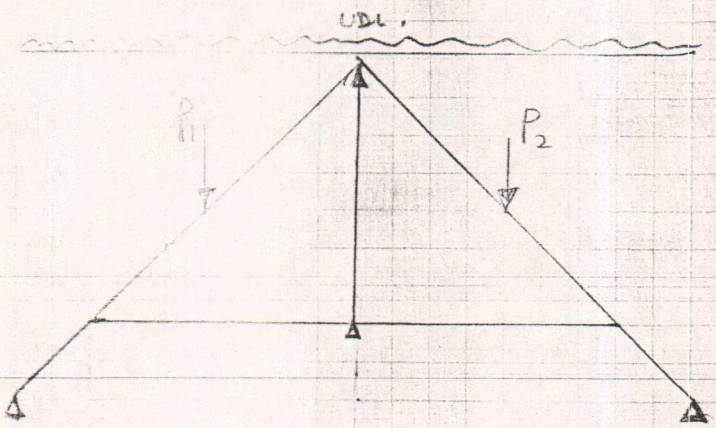
Span = 2.5 m
UDL = 0.9 × 0.74 = 0.7 kN/m
P = 2.5 × 1.0 × 0.74 = 1.85 kN

$BM = 0.7 \times \frac{2.5^2}{8} + 1.2 = 1.75$ kN·m

$Z_r = 216 \times 10^3$ mm³

use 200 × 50 for RB5

RB6 + RB7



$P_1 = P_2 = 3.5kN$

$UDL = 0.9 \times 0.74 = 0.7 kN/m$.

$BM_{max} = \left(3.5 \times \frac{3.5}{4}\right) + \left(\frac{0.7 \times 3.5^2}{8}\right) = 4.13 kN\text{-}m$

$\Delta = [(13.02 \times 0.7 \times 3.5^4) + (20.8 \times 3.5 \times 3.5^3)] / EI \ mm$

$= (1367 + 3121) / EI \ mm$

$= 4488 / EI \ mm$

$K_2 = 1.75$

$\Delta_L = 14 mm$.

$Z_r = 510 \times 10^3 mm^3$

$I_r = 62.3 \times 10^6 mm^4$

USE

200 x 100 Beams for RB6 + RB7
ie Double Rafter

USE

200 x 50 Rafters @ 900 c/c everywhere
Collar Ties at Ceiling height. (ie Ceiling Joists)
Ceiling Joists 150 x 50 @ 900 c/c if span ≤ 3.10m
" " 200 x 50 @ 900 c/c if span ≤ 4.2m.
Purlins 75 x 50 on flat @ 900 c/c, Ceiling battens 50 x 40's

RB8

span = 2.0m
UDL = 1.3 × 0.74 = 1.0 kN/m

Use: 150 × 50 Ridge Beam for RB8

RB9

Use: 100 × 50 for RB9

RB10 + RB13

span = 1.0m
P = 1.0kN
BM = $\frac{1 \times 1}{4}$ = 0.25 kN-m
Z_r = 31×10^3 mm³

Use: 100 × 100 Lintel for RB10 + RB13

RB11

100 × 100 Timber Lintel for RB11

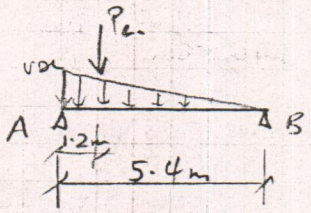
RB12 + RB14

span = 2.5m
P = (1.25 + 0.5) = 1.75kN
BM = $\frac{2.5 \times 1.75}{4}$ = 1.1 kN-m
Z_r = 135×10^3 mm³

Use: 150 × 100 Lintel for RB12 + RB14

RB15

span = $\frac{4.4m}{\cos 35^\circ}$ = 5.4m



R_A = 4.8kN
R_B = 2.4kN

UDL max = 2.8 × 0.74 = 2.0 kN/m
UDL min = 0 kN/m.

UDL equivalent = 0.5 × 2.0 × 1.33 = 1.33kN/m

Pc = 2.0 × 0.15 × 2.0 = 0.6 kN ignore.

BM = $\frac{1.40 \times 5.4^2}{8}$ = 5.1 kN-m

Δ = (14,724)/EI mm. Δ_L = 22mm.
Z_r = 630×10^3 mm³
I_r = 112×10^6 mm⁴

Use: 250 × 100 Beam for RB15
OR 3/200 × 50's

RB16:

Span = 4.4m

$BM = 1.4 \times \frac{4.4^2}{8} = 3.4$ kN-m $Z_r = 418 \times 10^3 mm^3$

$\Delta = 6832/EI$ mm

$Z_r = \frac{6832 \times 1.50}{9 \times 18} = 63 \times 10^3 mm^3$

Use 200 x 100 Timber Hip Beam for RB16

RB17

Span = 1.5m

$P = 6kN \times 2.5 = 8.5kN$ $R_A = R_B = 4.25kN$

$BM = 1.5 \times \frac{8.5}{4} = 3.2kN\text{-}m$

$Z_r = 394 \times 10^3 mm^3$

Use 200 x 100 Lintel for RB17

RB18 - Ceiling Joist Support Beam.

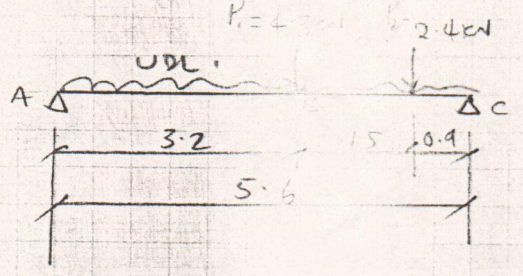
Span = 3.8m

UDL = 1.5 x 0.2 = 0.3kN/m

Use 2/200x50 Ceiling Joist ie Double up.

UPPER FLOOR STRUCTURE

FB1



$R_A = 11.9 + 2 + 0.5 = 14.4$ kN
$R_B = 11.9 + 2.5 + 1 = 15.4$ kN

UDL = 2.0 × 2.0 = 4.0 kN/m
Deef = 0.25
4.25 kN/m

$BM_{UDL} = 4.25 \times \frac{5.6^2}{8} = 16.66$ kN-m

$BM_{P1} = 4.3 \times 3.2 \times \frac{2}{5.6} = 5.9$ kN-m

$BM_{P2} = 2.4 \times 0.9 \times \frac{2}{5.5} = 1.8$ kN-m

BMvertical = 16.66 + 5.9 + 1 = 23.6 kN-m

$\Delta = [(13.02 \times 4.25 \times 5.6^4) + (20.8 \times 4.3 \times 5.6^3)]/EI$ mm

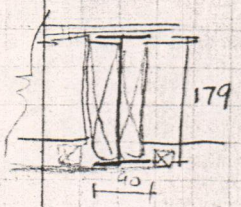
$= 70126/EI$ mm

$\Delta_{limit} = 0.004L = 22$ mm

STEEL:

$F_y = 250$ MPa
$E = 200$ GPa
$F_{bc} = 165$ MPa

$Z_r = 143 \times 10^3$ mm³
$I_r = 15.9 \times 10^6$ mm⁴



USE

180 UB 22 STEEL Beam for FB1

FB2 + FB3

Span = 3.3m
UDL = 2.0 × 2.0 = 4.0 kN/m
+ deef = 0.15
+ (3.5 × 0.74)/2 = 1.30
+ 4 × 0.28 × 0.5 = 0.56
+ 3/3 = 1.0
7.01 kN/m

$R_{ins} = 12$ kN

If Timber need 300×100 Beam

STEEL

BM = 9.5 kN-m
$\Delta = 10,803/EI$ mm

$Z_r = 58 \times 10^3$ mm³
$I_r = 5.4 \times 10^6$ mm⁴

USE Either 300×100 Timber or 150UB14 STEEL for FB2 + FB3

FB4

Span = 2.5m

UDL = floor: 0.3 × 2.0 = 0.6 kN/m
deck: 1.75 × 2.5 = 4.4
wall: 0.4 × 0.4 = 0.16
roof = 0.15
5.31 kN/m

$R_A = R_B = 6.6$ kN

Use **250 × 100 Timber Lintel for FB4**

FB5

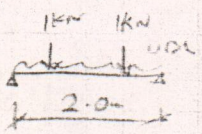
Span = 2.5m

UDL fl. 1.35 × 2 = 2.7 kN/m
wall = 0.16
roof = 0.14
3.0 kN/m

$R_A = R_B = 3.8$ kN

Use **200 × 100 Timber Beam for FB5**

FB6



UDL: roof: 0.74 × 2.25 = 1.7 kN/m
wall: 3.0 × 0.4 = 1.2
floor: 0.3 × 2.0 = 0.6
self: = 0.15
+ C. Roof: 1.0 × 0.6 = 0.6
4.25 kN/m

$R_{kns} = 4.3$ kN

Use **200 × 100 Lintel for FB6 ie Double Joists.**

FB7: Span = 2.2m

UDL → roof: 0.6 kN/m
wall: 1.2
fl. 0.6
self 0.15
2.55 kN/m

$R_{yn} = 2.8$ kN

Use **150 × 100 Lintel for FB7 ie Double Joists**

FB8:

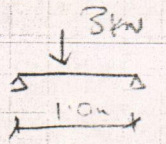
Span = 1.5m

UDL = 0.8 × 2.0 = 1.6 kN/m
+ Roof 0.6
+ 1.8 × 0.74 = 1.3
+ 1.5 × 0.4 = 0.6
self = 0.15
4.25

Rxn = 3.2kN

use 150 × 100 For FB8

FB9:



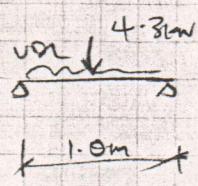
UDL = 1.3 × 2 = 2.20 kN/m
roof. 0.6
self 0.15
3.45 kN/m

Rxn = 2.0kN

BM = 0.5 + 0.25 = 0.75 kN-m
Zr = 156 × 10³

use 150 × 100 For FB9.

FB10.



UDL = 2.1 × 2.0 = 4.2 kN/m
self = 0.1
4.3 kN/m

BM = 4.3 × 1²/8 + 4.3 × 1/4 = 1.6 kN-m

Zr = 200 × 10³ mm³

Rxn. 2.5kN

use 150 × 100 Timber for FB10

FB11:

as for FB7 → use 150 × 100 Lintel for FB11

FB12:

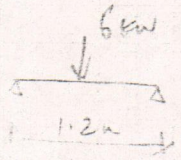
Span = 2.1m

UDL = fl. 1.7 × 2.0 = 3.4 kN/m
Deck 2.5 × 1.0 = 2.5
wall. 1.0 × 0.4 = 0.4
self = 0.2
6.5 kN/m

Rxn. 6.8kN

use 200 × 100 Timber Lintel for FB12

FB12



M_{max} = 1.8kN-m

Z_x = 222 x 10^3 mm^3

R_{xn} = 3kN

Use **150 x 100 Timber Lintel for FB13**

FB14

Span = 1.6m

UDL: fl. 1.35 x 2.0 = 2.70 kN/m
roof: 0.74 x 1.75 = 1.30
w. 1.5 x 0.4 = 0.60
roof. 0.60
5.2kN/m

R_{xn} = 4kN

Use **150x100 Lintel for FB14**

FB15

Use **150x100 Lintel above for FB15**

FB16

Span = 3.0m
UDL = 3x2 = 6.0 kN/m

R_{xn} = 9kN

Use **250x100 Lintel for FB16**

DECK STRUCTURE (UPPER)

D1: Span = 2.0m
UDL = 2.5 × 1.8 = 4.5 kN/m

USE

200 × 50 for D1

D2. Span = 5.3m
UDL = 1.8 × 2.5 = 4.5 kN/m

Bm = 15.8 kN-m

Δ = 462.30 / EI mm

Δ = 18 mm

$Z_r = 96 \times 10^3\ mm^3$

$I_r = 12.84 \times 10^6\ mm^4$

USE

either 180 UB 22 STEEL Beam or 180 × 75 STEEL Channel.

(*) D3: Span = 3.0 m
UDL = 1.0 × 2.5 = 2.5 kN/m

$Z_r = 361 \times 10^3\ mm^3$

$I_r = 51.4 \times 10^6\ mm^4$

USE

250 × 50 for D3 max. span 3.0 m

Roof Lower:

Rafters: USE 125 × 50 @ 900 c/c

Purlins 75 × 50 on flat @ 900 c/c

Beams: span = 3.0m
UDL = 0.9 × 1.0 = 0.9 kN/m

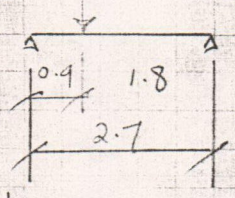
USE

150 × 50	Span upto 3.0m
200 × 50	Span upto 4.0m

125 × 125 Posts, embed 900 mm in ϕ 350 hole. 2M12 Bolts per end.

Floor Point Loads:

Span = 2.7m

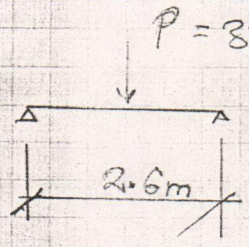


BM = $\frac{2.5 \times 1.8}{2.7}$ = 1.5

Z_r = 150 x 10³ mm³

Use | Need Triple Joist DJ1 |

DJ2



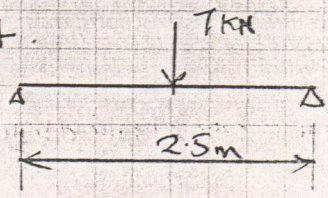
BM = 3 x 2.6 / 4 = 1.95kN-m

Z_r = 3 mm³

$Z_{double\ extra\ joists}$ = 32[illegible] mm³ ok.

Use. | Triple Joists for DJ2 |

DJ3 + DJ4.



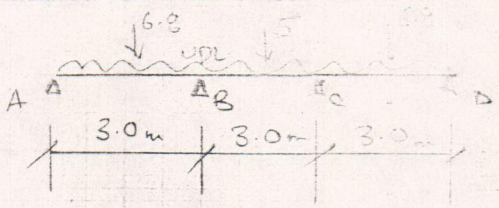
BM = 4.4kN-m

Z_r = 540 x 10³ mm³

Use | TRIPLE Joists for DJ3 + DJ4 |

FOUNDATION BEAM:

EXTERIOR SUPPORT BEAM BL1.



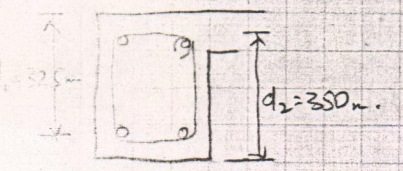
$R_A = R_D = 0.4 \times 18.5 \times 3 = 22$ kN
$R_B = R_C = 1.1 \times 3 \times 18.5 = 61$ kN

UDL:

Roof:	0.5 ×	0.6	=	0.3 kN/m
wall:	0.4 ×	4.5	=	1.8
floor:	1.7 ×	2.1	=	3.6
deck:	1.0 ×	2.5	=	2.5
wall:	2.4 ×	0.4	=	1.0
slab:	2.5 ×	1.7	=	4.25
self:	0.4×0.3×	25	=	3.0
				16.45 kN/m

UDL eq = 18.45 kN/m.

$-BM = -0.10 \times 18.5 \times 3 \times 3 = 16.7$ kN-m
$+BM = -0.08 \times 18.5 \times 9 = 13.3$ kN-m



$M_{dep} = 0.9\, A_s f_y j d$

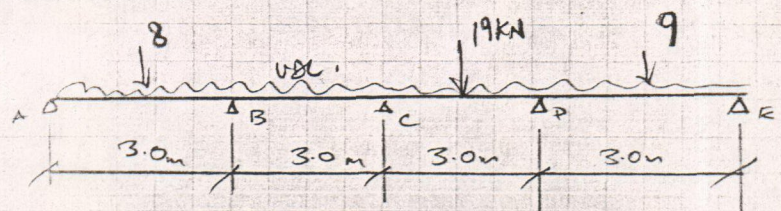
$A_{sr} = \dfrac{M}{0.9\, f_y j d}$

$A_{sr1} = \dfrac{16.7 \times 10^6 \text{ N-mm}}{0.9 \times 300 \times 315} = 196 \text{ mm}^2$

$A_{sr2} = \dfrac{13.3 \times 10^6}{0.9 \times 300 \times 293} = 168 \text{ mm}^2$

2D12 → $A_s = 2 \times \pi \times 6^2 = 226 \text{ mm}^2$ ok.

BL2 - INTERIOR SUPPORT Beam



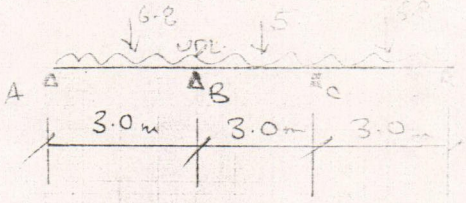
$R_D = 1.143 \times 17.5 \times 3 = 60$
$+ 9.5 + 4.5$
$R_{OT} = 74$ kN

UDL =

floor:	3.0 ×	2.1	=	6.3 kN/m
wall:	2.4 ×	0.3	=	0.7
slab:	3.0 ×	2.5	=	7.5
self:				3.0
				17.5 kN/m

FOUNDATION BEAMS

INTERIOR SUPPORT BEAM - BL1.



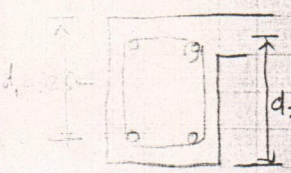
$R_A = R_D = 0.4 \times 3.0 \times 18.5 = 22$ kN
$R_B = R_C = 1.1 \times 3 \times 18.5 = 61$ kN

UDL:

Roof:	0.5 ×	0.6	=	0.3 kN/m
wall:	0.4 ×	4.5	=	1.8
floor:	1.7 ×	2.1	=	3.6
deck:	1.0 ×	2.5	=	2.5
wall:	2.4 ×	0.4	=	1.0
slab:	2.5 ×	1.7	=	4.25
self:	0.4×0.3×	25	=	3.0
				16.45 kN/m

UDL eq = 18.45 kN/m.

$-BM = -0.10 \times 18.5 \times 3 \times 3 = 16.7$ kN-m
$+BM = -0.08 \times 18.5 \times 9 = 13.3$ kN-m



$M_{dep} = 0.9\, A_s f_y j d$

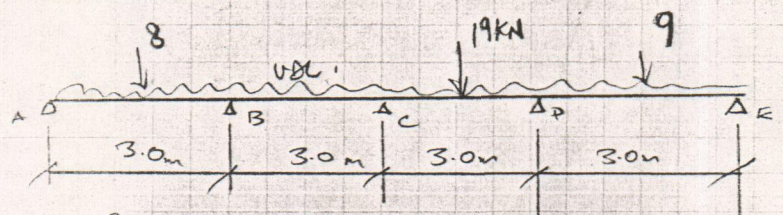
$$A_{sr} = \frac{M}{0.9\, f_y j d}$$

$$A_{sr_1} = \frac{16.7 \times 10^6 \text{ N-mm}}{0.9 \times 300 \times 315} = 196 \text{ mm}^2$$

$$A_{sr_2} = \frac{13.3 \times 10^6}{0.9 \times 300 \times 293} = 168 \text{ mm}^2$$

2D12 → $A_s = 2 \times \pi \times 6^2 = 226 \text{ mm}^2$ ok.

BL2 - INTERIOR SUPPORT Beam



$R_D = 1.143 \times 17.5 \times 3 = 60$
$+ 9.5 + 4.5$
$R_{OT} = 74$ kN

UDL =

floor:	3.0 ×	2.1	=	6.3 kN/m
wall:	2.4 ×	0.3	=	0.7
slab:	3.0 ×	2.5	=	7.5
self:				3.0
				17.5 kN/m

$BM_{cnts} = -0.071 \times 17.5 \times$ = 11.2 kN
+ $-0.161 \times 19 \times$ = 9.2
20.4 kN

$BM_{centre\ span} = 0.116 \times$ = 6.1
+ $0.036 \times 17.5 \times 3 \times 3$ = 5.7
11.8 kN-m

4D12 OK ✓

Check -ve Reinforcement

$A_{sr} = \dfrac{20.4 \times 10^6}{0.9 \times 300 \times}$ mm² = 238 mm²

Composite beam OK ✓

BL4

UDL:

Roof:	1.9 ×	=	1.1 kN/m
walls:	4.0 ×	=	1.6
floor:	1.5 ×	=	3.2
rail:	1.5 ×		0.9
slab:	2.5 ×		3.8
Reef =			3.0
			13.6 kN/m

UDL eq: 16 kN/m

$-BM = 16.0 \times 3.5 \times 3.5 \times -0.1 = -19.6$ kN-m

$+BM = 0.08 \times 3.5 \times 3.5 \times 16 = 15.7$ kN-m

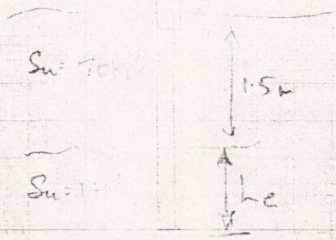
BM cap of 4D12 → $M_{cap} = 0.1 \times 226 \times 300 \times 315$
= 17.2 kN-m OK ✓

USE

4 D12 + R6 Stirrups @ 200 c/c for
400 × 300 foundation beams
Beam to be integral with slab
Slab starters D12 @ 600 c/c
500 into slab
665 Mesh 40 Top Cover.

PILE DESIGN

For [illegible] Pile.



P_{skin} STORE (1) → $\pi \times 0.3 \times 1.5 \times (70 \times 0.4) = 39kN$

P_{skin} STORE (2) → $\pi \times 0.3 \times 0.5 \times 100 = 47kN$

$0.5 P_{end}$ = $0.15^2 \times 140 \times 0.5$ = 5kN

TOTAL Resistance = 91kN

$F.O.S = \frac{91}{74} = 1.2$ ok. ✓

300 mm ϕ PILES, 4 D12 + R6 @ 150 c/c
Embed a minimum of 0.5 m into consolidated Sand layer.
ie piles to be a minimum of 2.0m Long.

BROWN & THOMSON

Auckland 09 529-2404
Kerikeri 09 407-9832

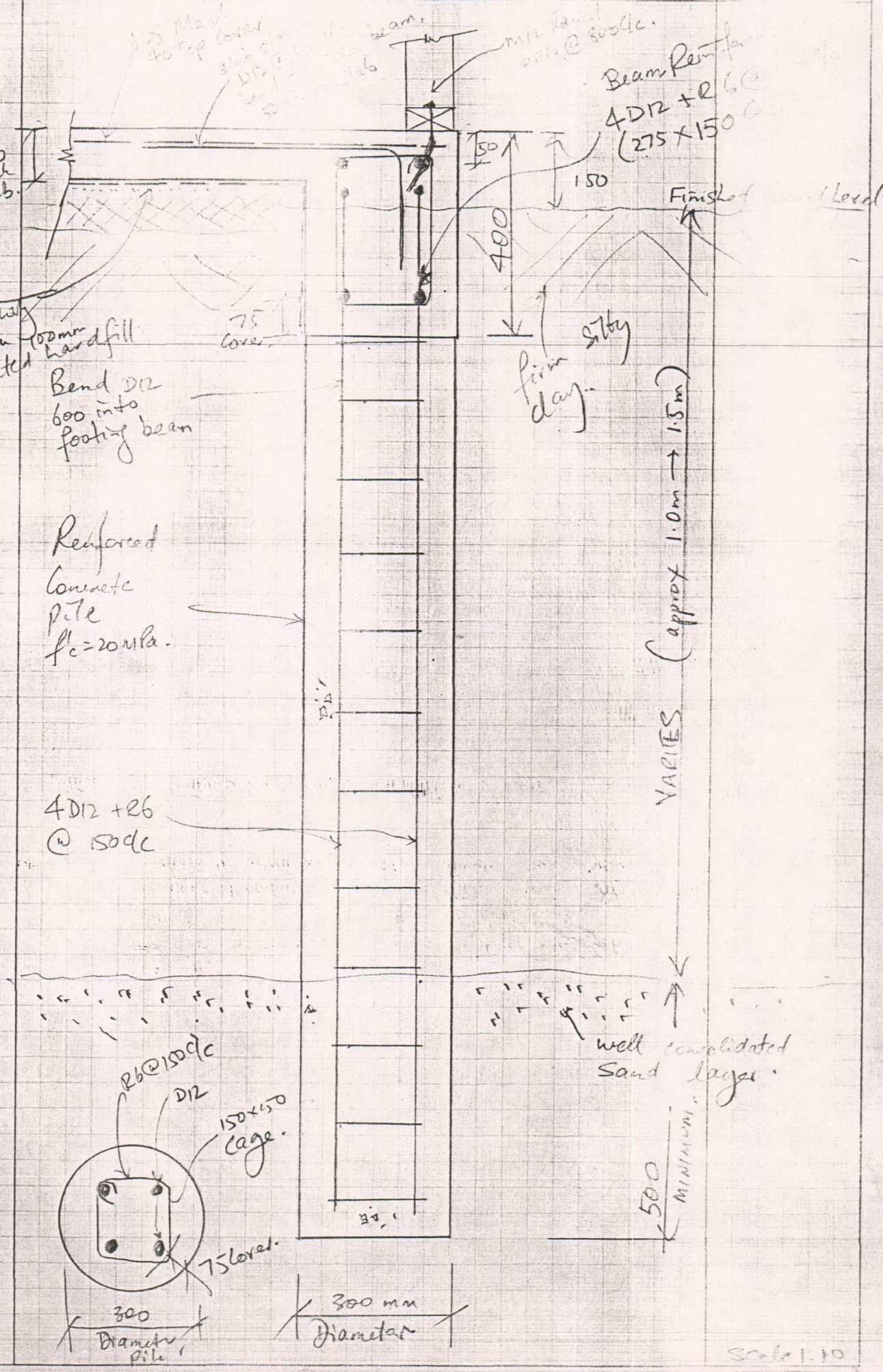
Title: B+J LEWIN
ONAPERE

Job No

Designer: P.K.

Page 1/15

Date



Scale 1:10

WALL BRACING

$q = 0.613 \times (48 \times 0.75)^2 / 100 = 0.79$ kPa

UPPER LEVEL:
Requirement

Across: $0.79 \times 1.1 \times 12.4 \times 2.5 \times 20 = 330$ BUs

Along: $0.79 \times 1.1 \times 10.4 \times 2.5 \times 20 = 270$ BUs

LOWER LEVEL:

Across: $(0.79 \times 1.1 \times 12.4 \times 2.4 \times 20) + 330 = 847$ BUs

Along: $(0.79 \times 1.1 \times 10.4 \times 2.4 \times 20) + 270 = 700$ BUs

WALL BRACING PROVIDED

	DIRECTION	ELEMENT Number	LENGTH (m)	TYPE	MERIT BUs	TOTAL BUs	
UPPER LEVEL	Across	A	0.9	BR4	100	90	
		B	0.9	BR4	100	90	
		C	1.8	GIB2	75	135	
		D	2.6	GIB2	80	208	
		E	2.4	GIB 2	80	192	
		F	1.0	BR4	100	100	
	330	G	1.0	BR4	100	100	
						915	easily ok.
	Along	1	0.6	BR9	110	66	
		2	0.7	BR9	110	77	
		3	0.6	BR9	110	66	
		4	1.8	GIB2	75	135	
		5	2.5	GIB2	80	200	
	270	6	1.0	BR4	100	100	
		7	1.0	BR4	100	100	
		8	2.5	GIB2	80	200	
						944	easily ok

BROWN & THOMSON

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Job No

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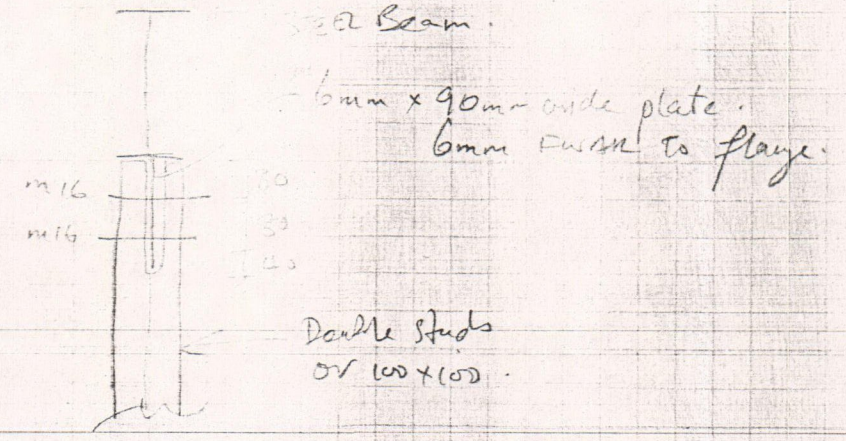
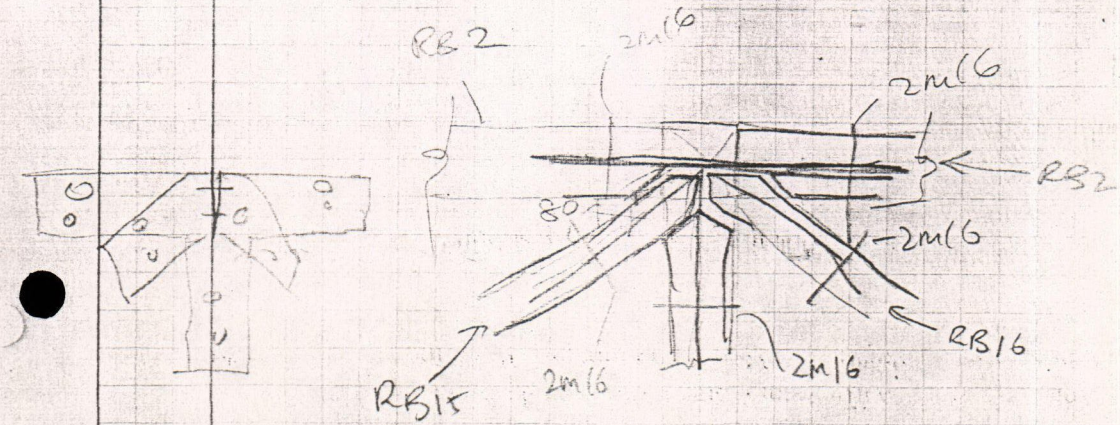
Date

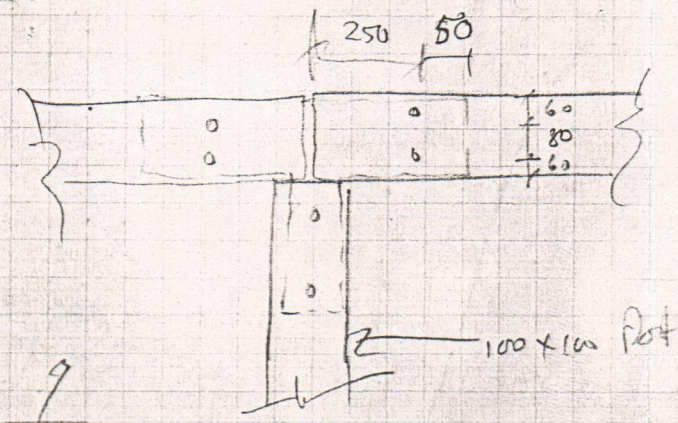
	Direction	Element Number	Length	Type	Merit Rn	Times Rn	
Lower Level	Axis 247	H	0.6	BR9	110	66	
		I	0	BR9	110	66	
		J	1.4	BR5	115	161	
		K	2.7	GIB2	80	216	
		L	0.7	BR9	110	77	
		M	0.6	BR9	110	66	
		N	2.7	GIB2	80	216	
		O	1.8	GIB2	75	135	
		P	0.6	BR9	110	66	
		Q	0.9	BR9	110	99	
		R	0.7	BR9	110	77	
						1237	ok. ✓
	Axis 9	9	1.1	BR9	110	121	
		10	1.1	BR9	110	121	
		11	2.4	GIB2	80	192	
		12	1.1	BR9	110	121	
		13	2.0	GIB2	75	150	
		14	1.4	BR5	115	161	
		15	2.0	GIB2	75	150	
		16	1.3	BR5	115	150	
		17	2.0	GIB2	25	150	
						1316	ok. ✓



STEEL Beam to Post Connection

RB2/RB15/&RB16/ Post Connection



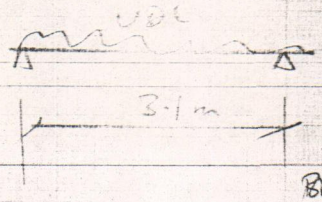


MDH — Draw To Scale and see if will fit!!

Deck Joists Lower Level

Use 150×50 @ 400 c/c for Joists

Deck Beam



UDL = 1.0×(2.5) = 2.5 kN/m
self wt = 0.15
2.65 kN/m

BM = $2.65 \times \frac{3.1^2}{8}$ = 3.2 kN-m

$Z_r = 398 \times 10^3$ mm³

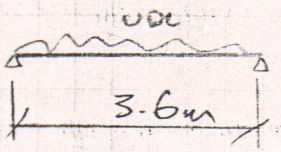
$\Delta = 13.02 \times 2.65 \times 3.1^4 / EI$ mm
$= 3186 / EI$ mm

$I_r = \frac{3186 \times 1.5}{8 \times 10} = 59.7 \times 10^6$ mm⁴

Rx = 8.2 kN
+ 1.9
10 kN

USE

250×50 For Lower Level Deck Beam
Maximum span 3.1m



UDL = 2.6 kN/m

BM = 4.2 kN-m
Δ = 568 / EI mm
Δ_L = 0.0033L = 12mm

2m16 ~~8.1~~ 8.1×2×1.35
= 8.4 kN

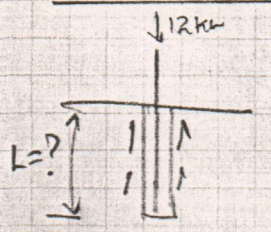
$Z_r = 519 \times 10^3$ mm³
$I_r = 89 \times 10^6$ mm⁴

Rxn = 9.36 + 2.2 = 11.5 kN

use

250×75 Deck Beam for Lower Level to span upto 3.6m

Posts Supporting Deck + Roof



End Bearing = $\pi \times \frac{0.3^2}{4} \times 100$ = 7 kN
Skin friction = $\pi \times 0.3 \times 1.5 \times 10$ = 14 kN
Total 21 kN

F.O.S = $\frac{21}{12}$ = 1.75 OK

use 100×100 Posts, 1.5 in to ground @ 300

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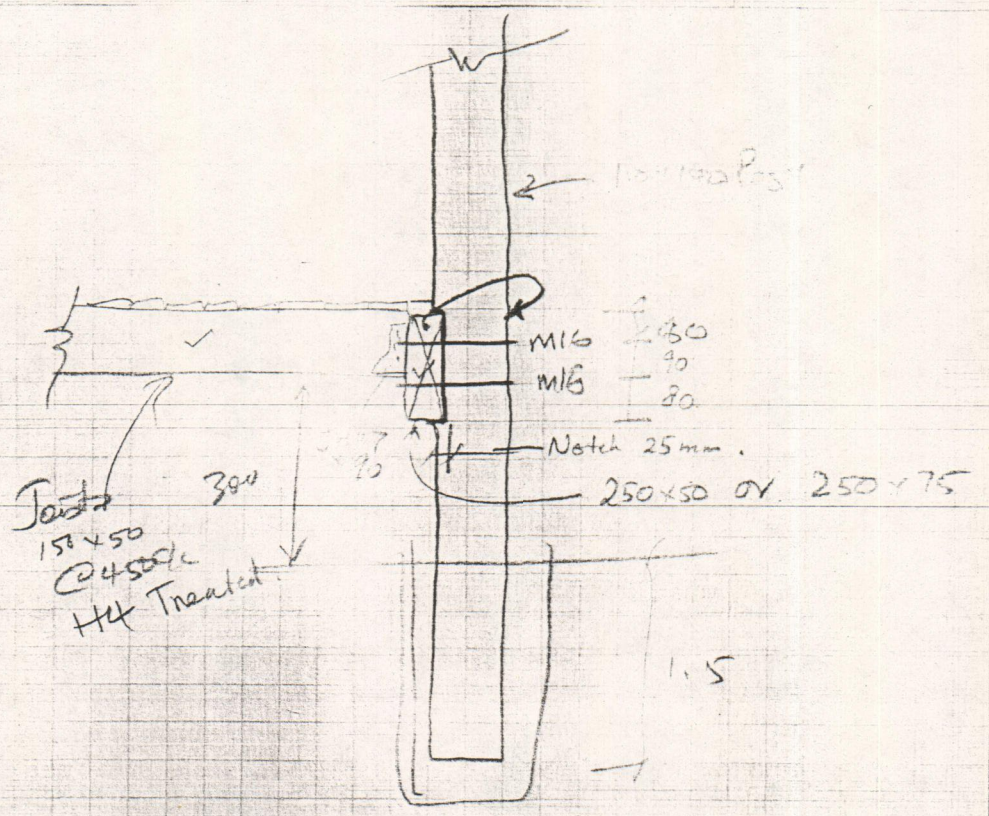
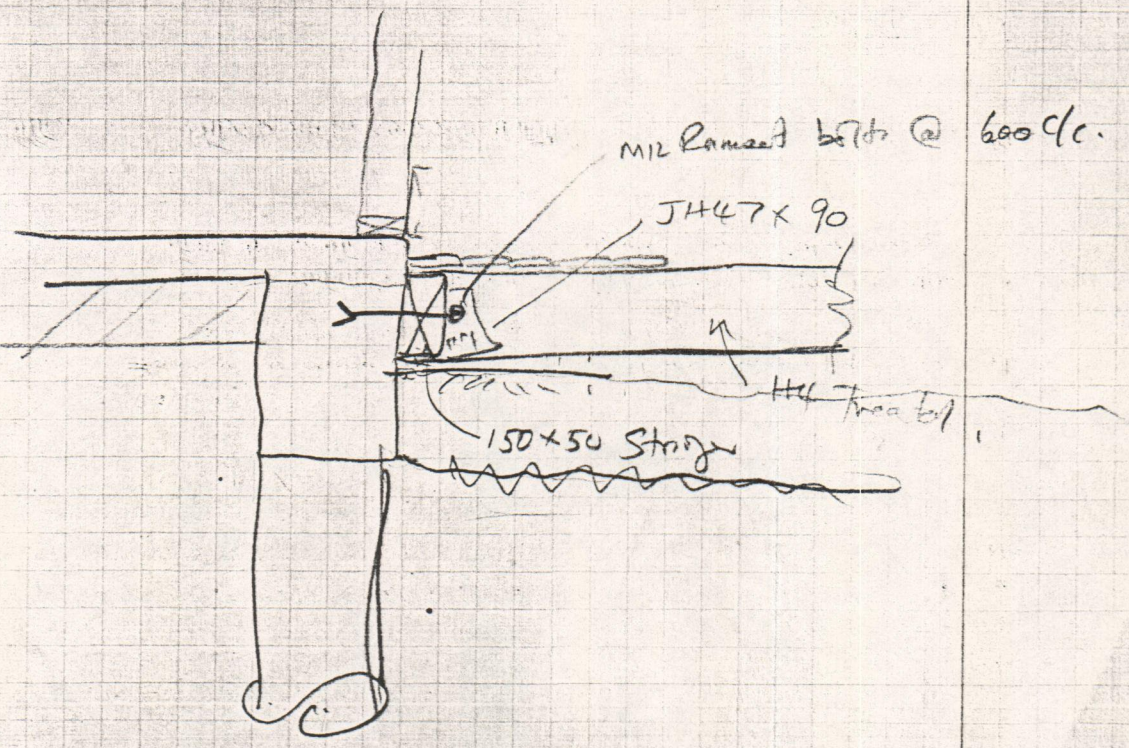




GARAGE:

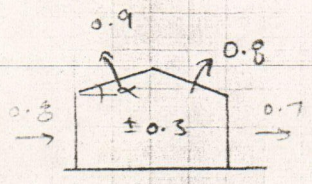
Loadings

GRAVITY.

Roof: Dead Load = 0.30
Live Load 0.25
0.55 KPa

Wind:

$q = 0.613 \times \left(\frac{48 \times 0.74}{1000}\right)^2 = 0.77 \text{ KPa}$.



uplift press. = 1.2 × 0.77 = 0.92 KPa

Lateral press = 1.1 × 0.77 = 0.85 KPa →

$\alpha = 12.5°$

$0.7D + W = 0.21 - 0.92 = 0.71 \text{ KPa} \uparrow$ critical

Roof Structure:

Rafters: span = 3.1m

use

150 × 50 Rafters @ 900 c/c
75 × 50 Purlin on flat @ 900 c/c

Central Ridge Beam:

span = 6.0m

UDL strength = 0.71 × 3.0 = 2.13 kN/m
UDL deflection = 0.55 × 3.0 = 1.65 kN/m

$BM = 2.13 \times \frac{36}{8} = 9.6 \text{ kN-m}$

$\Delta_{UL} = 13.02 \times 1.65 \times 6^4 / EI \text{ mm}$
$= 27{,}842 / EI \text{ mm}$

$R_A = R_B = 5 \text{ kN} \downarrow$ or $6.4 \text{ kN} \uparrow$

$\Delta_{limit} = 0.004L = 24 \text{ mm}$ $K_1 = 1.5$

Timber:

$F'_b = 6.0 \text{ MPa}$
$K_1 = 1.5$
$F_b = 9.0 \text{ MPa}$
$E = 9.0 \text{ GPa}$

$Z_r = 1067 \times 10^3 \text{ mm}^3$
$I_r = 193 \times 10^6 \text{ mm}^4$

use

300 × 100 Ridge Beam For Garage

DOOR LINTELS:

Span = 2.4m → 150 x 100 E [illegible] ok ✓

WINDOW LINTEL:

Span = 2.0m
UDL = 1.65 x 1.5 = 2.5
+ 0.4 x 0.3 = 0.2
2.7 kN/m ⇒ 150 x 100 ok.

WALL BRACING

Requirements.

Along + Across: P_{wall} = 0.85 x 6 x 2.4 = 12.24 kN
= 2.45 Bus.

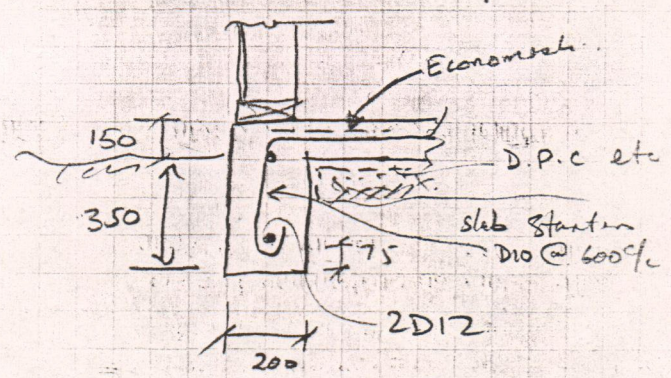
Multibrace with 15 end nails → 13.5 kN ok. ✓

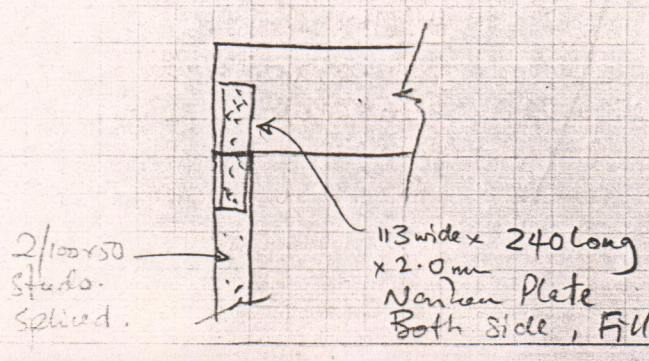
USE

1 Pair of Bowmac Multibrace minimum on 3 walls, 15 Nails per end.

FOOTINGS:

If structure founded on natural ground.



Detail G1

Ridge Beam End Connection