

# Sharalyn Fraser *Agency*

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# DO YOU NEED A BUILDING PERMIT?



## A GUIDE TO APPLICANTS FOR BUILDING PERMITS

### WHERE DO YOU APPLY?

Kapiti Coast District Council  
Ngarara Building  
Rimu Road  
PARAPARAUMU

### BUILDING PERMITS ARE REQUIRED when

1. A new building is to be constructed.
2. There is to be a change to the existing structure of a building.
3. Any outbuilding is to be altered or constructed, ie sheds, glasshouses, conservatories etc.

4. When there is a change of use, ie a dwelling converted to flats, a warehouse converted to offices etc.
5. Where there is to be demolition in whole or part of a building.
6. The reinstatement of fire or other damage.
7. Any retaining wall over 1200mm high or which is erected a distance less than its height from the boundary.
8. Any tank or swimming pool erected.
9. Any wall or fence, other than a retaining wall, over 1800mm in concrete or masonry, over 2400mm in timber, or over 3600mm in framing and netting, is erected.
10. Any mast, pole, radio or TV aerial over 6300mm in height.
11. Any construction or platform that exceeds 5m<sup>2</sup> and 1200mm in height from its lowest ground level.
12. A tent or marquee exceeding 28m<sup>2</sup>.
13. Any sign or hoarding or the repainting or refacing of any sign or hoarding.
14. Solid fuel heaters.

### WHAT SHOULD YOU BRING?

Every application for a Building Permit, in accordance with NZS 1900 for a building purporting to comply with this standard, shall be accompanied by two copies of a properly drawn plan showing the following:

- (a) Site plan — 1:100 scale
- (b) A floor plan of each floor level
- (c) An elevation of each external wall — 1:100 or 1:50 scale
- (d) A cross-section
- (e) The type and location of each foundation element (for example, reinforced masonry foundation wall, anchor pile, cantilevered pile, etc).
- (f) Adequate information on all subfloor, floor, wall and roof, framing, including the type and location of each subfloor brace, diagonal brace and wall bracing element, and the number of bracing units assigned to each wall bracing element.
- (g) The type and location of cladding, sheathing and lining.
- (h) And any other necessary information in order to show the exact nature and character of the proposed undertaking as required by NZS 1900: Chapter 2.
- (i) Two copies of a complete specification.

Plans to be in ink or prints, drawn to scale and clearly legible.

For domestic garages, glasshouses and minor alterations, the following is required:

- (a) Site plan — 1:100 scale
- (b) A floor plan of each floor level
- (c) An elevation of each external wall — 1:100 or 1:50 scale
- (d) A cross-section
- (e) Two copies of a complete specification.

If plans and specifications are not of an acceptable standard delays will result.

NEW ZEALAND BUILDING INSPECTOR 49



KAPITI COAST DISTRICT COUNCIL

## APPLICATION FOR PERMIT

TO : The General Manager, Kapiti Coast District Council

I/WE B. KOFOED (Print) of  
P.O. Box 1593 PARAPARAUMU BEACH (Postal Address) 87821 (Telephone)  
hereby make application for permission to have the work described herein, and set out in the plans and specifications attached, carried out on the premises situated at: (Please ensure this portion is complete fully)

| SITE ADDRESS                     |
|----------------------------------|
| Street No. <u>105 A</u>          |
| Street Name <u>WINARA AVENUE</u> |
| Town <u>WAIKANAHE</u>            |

| LEGAL DESCRIPTION             |
|-------------------------------|
| Valuation No. ....            |
| Lot <u>73</u> DP <u>29377</u> |
| Section ..... Block           |
| Survey District .....         |

| OWNER                                                   |
|---------------------------------------------------------|
| Name <u>MR D. HARPER</u>                                |
| Address <u>4- Box 1593</u><br><u>PARAPARAUMU BEACH.</u> |
| Phone No. .... Home ..... Bus                           |

| LAND AREA | Ha/sqm |
|-----------|--------|
| .....     | .....  |

[Signature] 21/8/90  
PP D Harper  
SIGNATURE OF APPLICANT DATE

## BUILDING

| DESCRIPTION OF PROPOSED WORK     |
|----------------------------------|
| <u>DWELLING</u>                  |
| FLOOR AREA <u>520?</u> sq metres |

| BUILDER TO Be Advised         |
|-------------------------------|
| Name .....                    |
| Address .....                 |
| Phone No. .... Home ..... Bus |

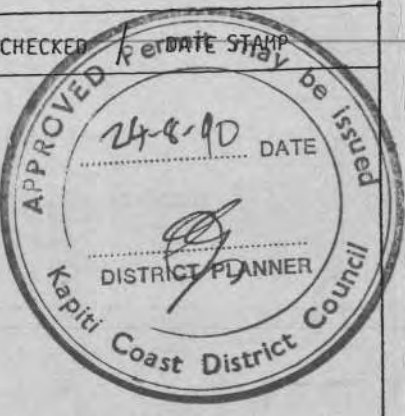
| ESTIMATED VALUES (incl. GST) |                   |
|------------------------------|-------------------|
| Building                     | \$ <u>400,000</u> |
| Plumbing                     | \$ <u>13,500</u>  |
| Drainage                     | \$ <u>7,500</u>   |
| TOTAL                        | \$ <u>430,000</u> |

| DOCUMENTS SUBMITTED WITH THIS APPLICATION (please tick box) IN DUPLICATE AND TO SCALE |                                                               |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------|
| Site and/or Drainage Plans <input checked="" type="checkbox"/>                        | Wall Bracing Calculations <input checked="" type="checkbox"/> |
| Floor Plans <input checked="" type="checkbox"/>                                       | Specifications <input checked="" type="checkbox"/>            |
| Cross-sections and details <input checked="" type="checkbox"/>                        | Structural Calculations <input checked="" type="checkbox"/>   |
| All elevations <input checked="" type="checkbox"/>                                    | Other <input type="checkbox"/>                                |

IMPORTANT - No work to be commenced before permit is issued.

PLUMBING & DRAINAGE DTC

OWNER D. HARPER LOT 73 DP 29377  
PROPERTY ADDRESS 105 A Winara Avenue DATE REC'D  
Type of Building: Dwelling ☒ Retail ☐ Additions ☐ Accessory ☐  
New ☐ Industrial ☐ Alterations ☐ Other ☐

| DEPT             | REQUIREMENTS               | YES | NO | COMMENTS                                          | CHECKED                                                                               |
|------------------|----------------------------|-----|----|---------------------------------------------------|---------------------------------------------------------------------------------------|
| Town Planning    | Zoning Conforms            |     |    |                                                   |    |
|                  | Dispensation               |     |    |                                                   |                                                                                       |
|                  | Planning Consent           |     |    |                                                   |                                                                                       |
| Plumbing         |                            |     |    |                                                   |   |
| Drainage         |                            |     |    | comments on Plans                                 |                                                                                       |
| Stormwater       | To Channel                 |     |    |                                                   |                                                                                       |
|                  | To Drain                   |     |    |                                                   |                                                                                       |
|                  | Confined To Lot            |     |    |                                                   |                                                                                       |
| Building General |                            |     |    |                                                   |  |
| Commercial       |                            |     |    |                                                   |                                                                                       |
| Egress           | To NZS 4121                |     |    |                                                   |                                                                                       |
| Structural       | Specific Design            |     |    | PETER BOLTON (Raukumeta Hill)                     |                                                                                       |
|                  | Foundation                 |     |    | OK JPK                                            |                                                                                       |
|                  | Structure                  |     |    |                                                   |                                                                                       |
|                  | Roof                       |     |    |                                                   |                                                                                       |
|                  | Special Floor Level        |     |    |                                                   |                                                                                       |
|                  | E/Works Bylaw Conditions   |     |    |                                                   |                                                                                       |
| Engineer         | Access Crossing Type A/B/C |     |    | FOOTPATH ADJACENT TO KERB / CROSSING EXISTING, OK |                                                                                       |
|                  | Sealed                     |     |    |                                                   |                                                                                       |
|                  | Comm                       |     |    |                                                   |                                                                                       |

# PLUMBING AND DRAINAGE

TO BE ADVISED

| DESCRIPTION OF PROPOSED PLUMBING AND DRAINAGE WORK |
|----------------------------------------------------|
| Plumbing and Drainage to new dwelling              |
|                                                    |
|                                                    |

| PLUMBERS                    |
|-----------------------------|
| Name <u>S. DAVIS</u>        |
| Address <u>23 A GLEN RD</u> |
| <u>RAUMATI 5TH</u> Reg. No  |
| Phone No. Home Bus          |

| DRAINLAYERS                |
|----------------------------|
| Name <u>S. O'CONNELL</u>   |
| Address <u>Box 139</u>     |
| <u>PARAPARAUMU</u> Reg. No |
| Phone No. Home Bus         |

Signature Date

Signature Date

| ESTIMATED VALUES     |       |
|----------------------|-------|
| Plumbing \$          | 13500 |
| Drainage \$          | 7500  |
| TOTAL P&D \$         | 21000 |
| (Labour & Materials) |       |

Fees on 30%

Fees on 50%

## FOR OFFICE USE ONLY

|                        | FEES      |
|------------------------|-----------|
| Building               | \$ 1084   |
| Plumbing               | 543       |
| Drainage               | 348       |
| Sewer Connection       | NC        |
| Water Connection       | NC        |
| Drainage               | \$        |
| Vehicle Crossing       | \$        |
| Damage Deposit         | \$ 400    |
| Structural Checking    | \$        |
| Building Research Levy | \$ 430    |
| Development Levy       | \$        |
| TOTAL                  | \$ 2805   |
| GST INCLUDED           | \$ 811-60 |

|                    |
|--------------------|
| BUILDING PERMIT NO |
| 19752              |
| DATE ISSUED        |
| 12-9-90            |
| PLUMBING PERMIT NO |
| 2608               |
| DATE ISSUED        |
| 15-2-91            |
| DRAINAGE PERMIT NO |
| 2609               |
| DATE ISSUED        |
| 15-2-91            |

|             |
|-------------|
| INVOICE NO. |
| 1964        |
| DATE        |
| 5-9-90      |

|             |
|-------------|
| RECEIPT NO. |
| 115262      |
| DATE        |
| 12-9-90     |

D/Deposit refund Auth. No 1076.  
Full refund \$400-  
to C. Van de Meer 18.9.91  
Builder.

# Horowhenua County Council

Fees not to be paid until requested by Office

PERMIT No. 14644

B021639

## SCALE OF FEES

For the examination of plans and specifications of any building and for the inspection of such building the following fees shall be payable according to the estimated value of the work.

In any dispute as to value, the County Engineer shall have the absolute determination of the value of the proposed work or building.

LOCALITY WAIKANAHE

DATE RECEIVED

9 : 8 : 83

DATE ISSUED

7 : 9 : 83

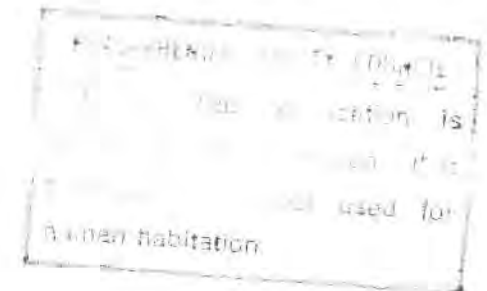
## APPLICATION FOR BUILDING PERMIT

OWNER'S NAME

Dr G.P. Hallwright

FOR OFFICE USE ONLY

REMARKS:



| ESTIMATED VALUE OF WORK |                           |           |  | FEES     |
|-------------------------|---------------------------|-----------|--|----------|
|                         | Not exceeding             | \$1,000   |  | \$12.00  |
| Over                    | \$1,000 and not exceeding | \$3,000   |  | \$18.00  |
|                         | \$3,000                   | \$7,000   |  | \$40.00  |
|                         | \$7,000                   | \$10,000  |  | \$60.00  |
|                         | \$10,000                  | \$15,000  |  | \$75.00  |
|                         | \$15,000                  | \$20,000  |  | \$100.00 |
|                         | \$20,000                  | \$25,000  |  | \$125.00 |
|                         | \$25,000                  | \$30,000  |  | \$150.00 |
|                         | \$30,000                  | \$40,000  |  | \$175.00 |
|                         | \$40,000                  | \$50,000  |  | \$200.00 |
|                         | \$50,000                  | \$60,000  |  | \$225.00 |
|                         | \$60,000                  | \$70,000  |  | \$250.00 |
|                         | \$70,000                  | \$80,000  |  | \$275.00 |
|                         | \$80,000                  | \$90,000  |  | \$285.00 |
|                         | \$90,000                  | \$100,000 |  | \$295.00 |
|                         | \$100,000                 | \$150,000 |  | \$325.00 |
|                         | \$150,000                 | \$200,000 |  | \$350.00 |

For every \$50,000 extra add \$50.00.

### FEES PAYABLE FOR SPECIAL DUTIES

- For inspection required in the case of proposed structural alterations before plans for approval \$10.00
- For inspecting every detached stove, furnace, oven, close fire or forge erected subsequently to the building \$20.00
- For inspecting old timber before re-using the same in a new building \$10.00
- For any inspection that may be deemed necessary in connection with any building or work in respect of which no fee has otherwise been paid \$10.00
- For inspecting any timber or building outside the County prior to re-using or resiting within the County — actual expenses incurred.
- For structurally checking plans and specifications by Council's Engineers, an increase of 25% of the building permit fee based upon the total value of the work will be charged.



NOTE.—

1 All Plans and Specifications must be in ink.

## APPLICATION FOR BUILDING PERMIT

TO THE BUILDING INSPECTOR,  
Horowhenua County Council,  
Bath Street,  
Levin.

Postal Address: Horowhenua County Council,  
P.O. Box 258,  
Levin.

I, the undersigned, do hereby apply for PERMISSION to erect BUILDINGS in accordance with the under-mentioned particulars in Waiakanae RIDING.

## 1. Type of Building:

Dwellings, etc.; additions or alterations.

Particulars of Building: Foundations: Jan/Imber Walls: S/Ino Roof: S/Ino

Total floor area: 7 sq. metres.

## 2. Purpose for which every part of Building is to be used or occupied. (Describing separately each part intended for use or occupation for a separate purpose)

To store garden tools

## 3. Allotment:

Lot: 73

D.P.: 29377

Section:

Area:

Block:

S.D.

Locality:

## 4. Owner's Full Name:

Dr S P Hallwright

Address:

2 Sefton St Baddestown

## 5. Previous Owner

If Section  
has been  
recently  
transferred

## 6. Frontage (Length):

Name of Street or Road:

105 WINARA AVE

## 7. Estimated Value of Building—

\$ 700 :

Plumbing and Drainage—

\$ / :

Total \$ 12 : 00

## 8. Fees \$

12 : 00

No. of Receipt 1931

See Scales of Fees on Back Page.

Building Research Levy \$

:

Footpath Damage Deposit \$

:

All work will be carried out in accordance with Horowhenua County Council's By-laws.

NOTE:—The following MUST accompany this Application:—

## Plans and Specifications in Duplicate to be provided.

Together with every application there shall be submitted to the Engineer, in duplicate, detailed plans, elevations, cross sections, and specifications, which shall together furnish complete details of design and qualities and descriptions of all materials of construction and workmanship, and which shall be of sufficient clarity to show to the satisfaction of the Engineer the exact nature and character of the proposed undertaking and the provision made for full compliance with the requirements of the By-laws including:

- A Floor plan of each floor level;
- An elevation of each external wall;
- The type and location of each foundation element (for example; reinforced masonry foundation wall. Anchor pile, cantilevered pile, etc.);
- Adequate information on all subfloor, floor, wall and roof framing, including the type and location of each subfloor brace, diagonal brace, and wall bracing element and the number of bracing units assigned to each wall bracing element;
- The type and location of cladding, sheathing and lining.
- Where a building requires Plumbing and Drainage Work, a separate application form must be filled in and Permit obtained before commencing any such work.

Signature of Applicant

Sacinto

as BUILDER or  
OWNER.

Address

105 Winara Avenue Waiakanae

Builder's Name  
and Address

{ if not  
the  
applicant }

above  
7 Do. Rd. Raumati St

## PLAN OF ALLOTMENT

Showing position of proposed building on such allotment.  
NOTE.—Distances of each building from boundary lines must be clearly indicated.  
(Scale: Two squares to one metre.)

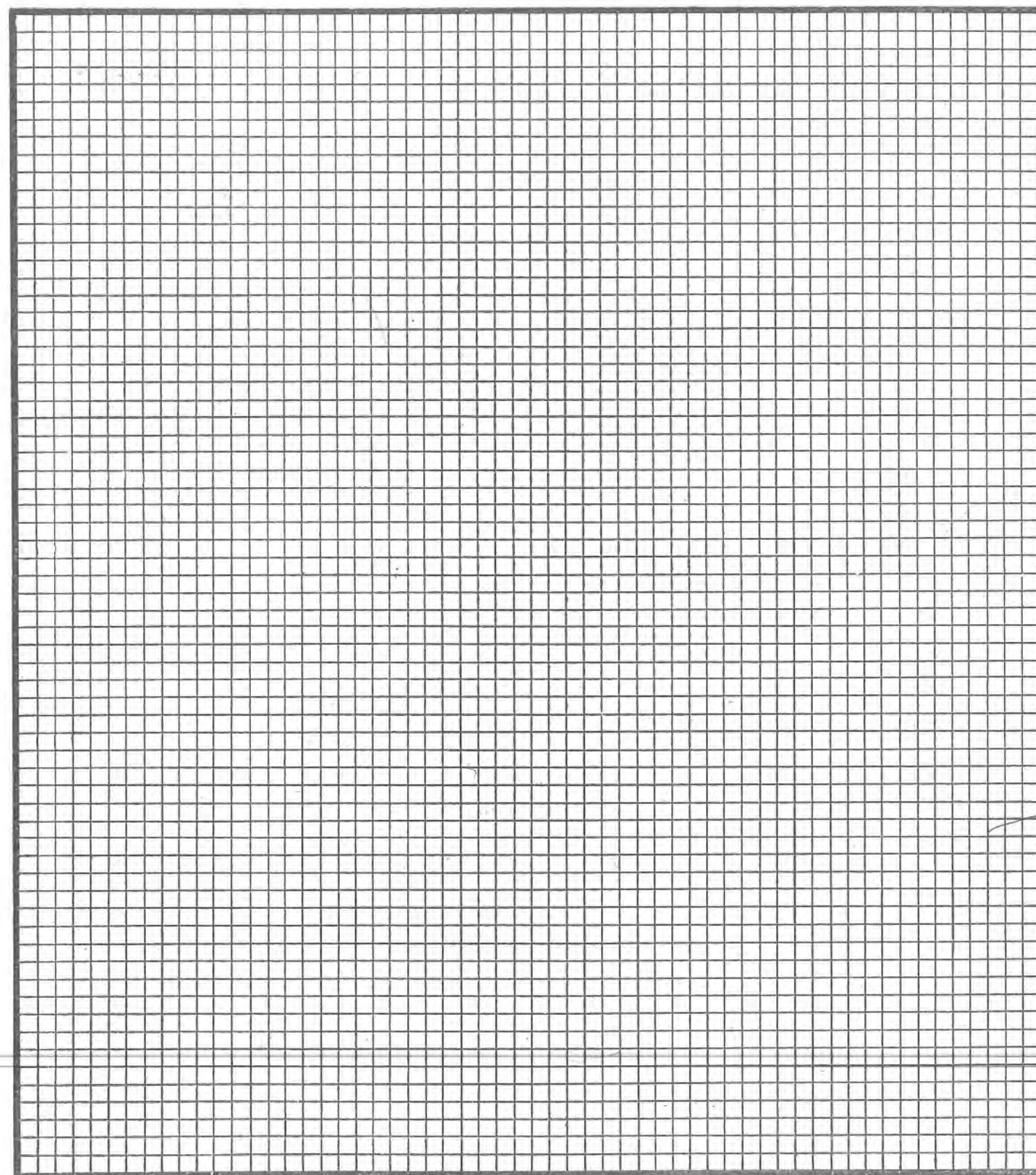
Boundary Lines to be shown thus: ————

Generally DWELLINGS must NOT be ERECTED within 1.5 METRES of ADJOINING properties.

Frontage to

Winara Avenue

Road



3811.



KAPITI COAST DISTRICT COUNCIL  
UNION PARAPARAUMU



KAPITI COAST DISTRICT COUNCIL  
PRIVATE BAG, PARAPARAUMU

2609

15-2-1991

**PLUMBING**

**PLUMBING AND DRAINAGE PERMIT**

M. S. O'Connell

P.O. Box 139

Paraparaumu

is hereby authorised to carry on the work described herein as set forth in the plan deposited with me, on the premises.

Situated 105A Winara Ave Waikanae

Being Lot 73 D.P. 29377

Owner D. Harper

Builder As Owner

Such work is to be carried out in strict accordance with the DRAINAGE and PLUMBING REGULATIONS 1978 under the HEALTH ACT, 1956, AND NOTICE GIVEN WHEN THE WORK IS COMPLETED AND READY FOR INSPECTION.

Posted

Tradesman's Signature

Estimated Value of:

Plumbing \$

Drainage \$ 3750

Fee Paid:

Plumbing \$

Drainage \$ 348

Sewer \$

Water \$

**DESCRIPTION OF WORK**

**DESCRIPTION OF WORK AS PER PLAN AND SPECIFICATION**

Drainage Permit Only

Drainage Permit Only

P.P. & S. Ltd.

(or other officer authorised by the local authority)

Engineer



2608

KAITIAKI COAST DISTRICT COUNCIL  
PRIVATE BAG, PARAPARAUMU

15-2-91

# PLUMBING AND DRAINAGE PERMIT

M. S. Davis  
23<sup>rd</sup> Glen Rd  
Raumati Sth

is hereby authorised to carry on the work described herein as set forth in the plan deposited with me, on the premises.

Situated 105<sup>A</sup> Winara Ave Waikanae

Being Lot 73 D.P. 29377

Owner D. Harper

Builder As Owner

Such work is to be carried out in strict accordance with the DRAINAGE and PLUMBING REGULATIONS 1978 under the HEALTH ACT, 1956, AND NOTICE GIVEN WHEN THE WORK IS COMPLETED AND READY FOR INSPECTION.

Tradesman's Signature *Posted*

Estimated Value of:

Plumbing \$ 4050  
Drainage \$

Fee Paid:

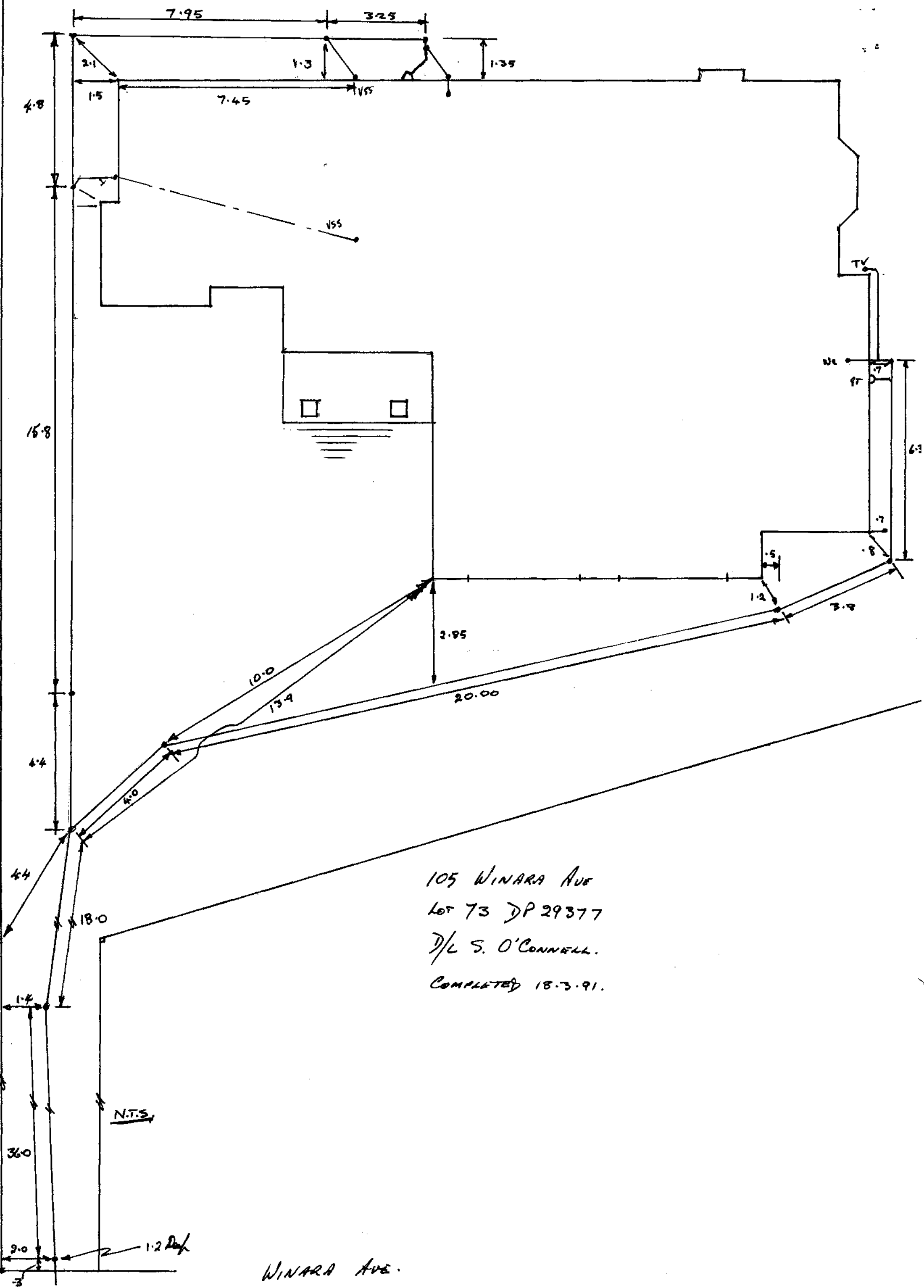
Plumbing \$ 543  
Drainage \$  
Sewer \$  
Water \$

## DESCRIPTION OF WORK AS PER PLAN AND SPECIFICATION

*Plumbing Permit Only*

*Ally Ball* Engineer

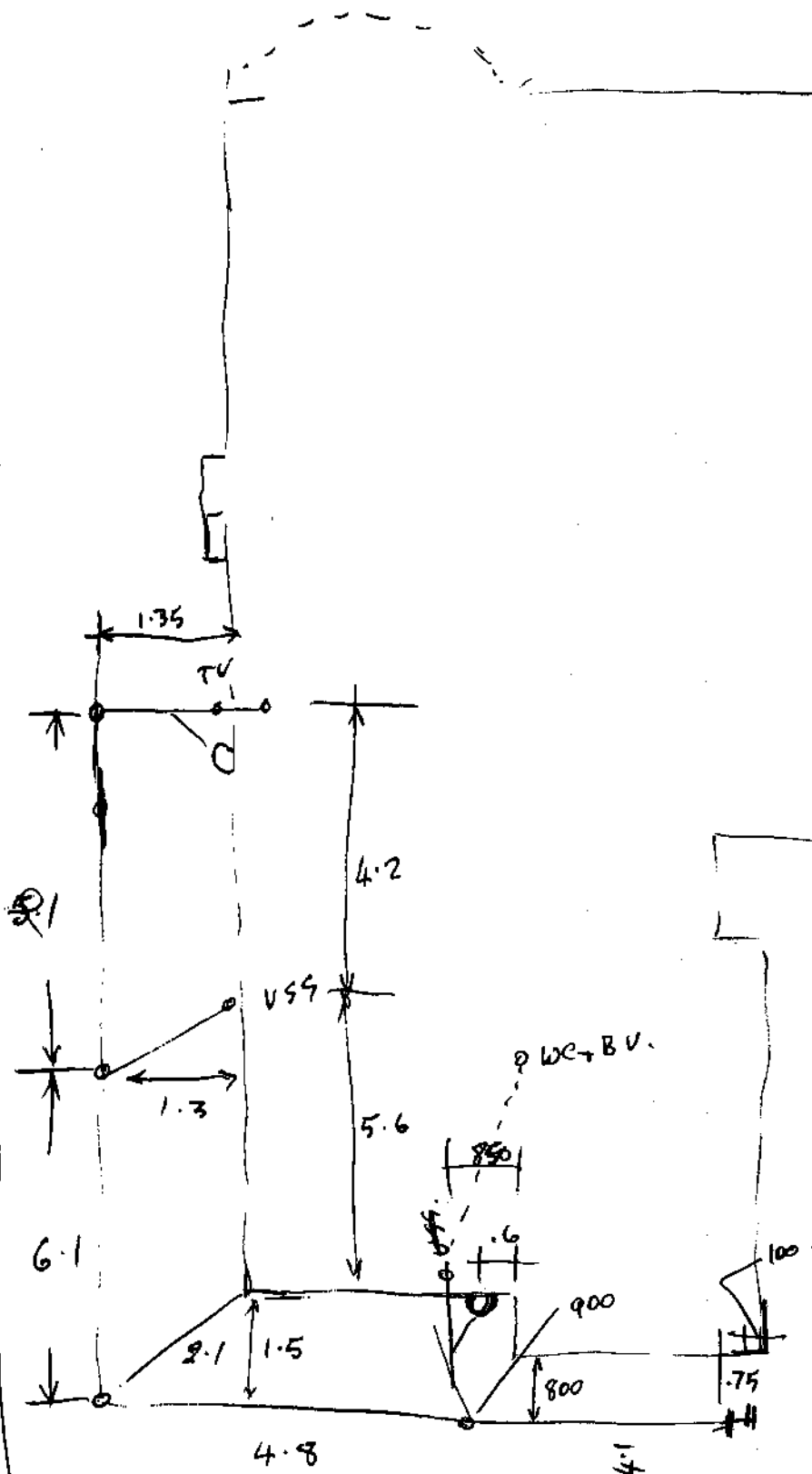
(or other officer authorised by the local authority)



Harber  
Winawa Ave.  
19-10-90

Part

Item 18.3-91



Row

1987

April

uesday

7

Move ~~Dele~~  
lab US

move 700

1-55

Deleter

B.3.71  
105 Summer Ave

330

Tammon  
D.T

garage

11.5

13.9

10.0

28.5

20-0

48.4

6.9

1.2

3.8

5

Drive

AUGUST 1987

| M  | T  | W  | T  | F  | S  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 |    |    |    |    |    |

SEPTEMBER 1987

| M  | T  | W  | T  | F  | S  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 |    |    |    |    |    |

OCTOBER 1987

| M  | T  | W  | T  | F  | S  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 |    |    |    |    |

NOVEMBER 1987

| M  | T  | W  | T  | F  | S  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 |    |    |    |    |    |

DECEMBER 1987

| M  | T  | W  | T  | F  | S  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 |    |    |    |    |

PERMIT

W

No

5767

## HOROWHENUA COUNTY COUNCIL

## WAIKANAЕ DISTRICT COMMUNITY

## PERMIT FOR A PLUMBER OR DRAINLAYER TO CARRY OUT PLUMBING OR DRAINAGE WORK

Mr R. J. Grant  
91 B Merrose RoadKland Bay (a licensed plumber or drainlayer), is hereby authorised to carry out the work described herein, and as set forth in the plan deposited with me, on the premises owned (or occupied) byMr G. Hallwright and situated in 105 Winata Avenue Street (or Road), Waikanae being described as lot 43 DP 2934

Description of work:

Instal Water service to property

Estimated Value of work excluding materials:

Estimated Cost \$ 100-00Permit Fee \$ 12-00Receipt No. 15514Connection Fee \$ -TOTAL \$ 12-00

Such work is to be carried out in strict accordance with the Plumbing and Drainage Regulations 1978 and Horowhenua County Council By-Law No. 9, and shall be completed on or before the

day of 19Date 9-9-83

County Engineer

This permit is issued subject to:

## HOROWHENUA COUNTY COUNCIL

## WAIKANAЕ DISTRICT COMMUNITY

## Notice of Completion of Work and Request for Inspection

To: The Health Inspector,  
Horowhenua County Council  
LEVIN.

I HEREBY GIVE NOTICE that I have completed at premises situated at

Street/Road, owned by Mr the plumbing/drainage

works specified in Permit No. issued on 19, and I do hereby request that such works should be inspected.

Dated this day of 19

Plumber/Drainlayer

Address of Plumber:

## FOR OFFICE USE ONLY

The works above referred to in Permit No.

I HEREBY CERTIFY that the work has been examined and found satisfactory.

Date: 19

Inspector

T &amp; L Levin

KAPITI COAST DISTRICT COUNCIL  
REGULATORY SERVICES  
INSPECTORATE BRANCH

No. 5-9-90FILE No. 48/1064ADDRESS OF PROPOSED WORK 105 WINARA AVEOWNER HARPER BUILDER \_\_\_\_\_

## BUILDING PERMIT CONDITIONS &amp; REQUIREMENTS

## 1. GENERAL REQUIREMENTS

(a) The District Building Inspector is to be given 24 hours notice before carrying out the following inspections, before placing any concrete/placing foundations and again before fitting any internal linings and upon completion of the work.

(b) To arrange for any of the above mentioned inspections by the DISTRICT BUILDING INSPECTOR

please contact either HANS GERLICH or ARNOLD HAWKINS  
on 85139 between the hours of 8.00am and 4.30pm

(c) All work is to be carried out in accordance with the Kapiti Coast District Council Bylaws, and in particular with the following SPECIAL REQUIREMENTS:

- 1 MAX CHIMNEY HEIGHT 2.4 M ABOVE ROOF  
INTERSECT, UNLESS SPECIFICALLY DESIGNED
- 2 VENEER HEIGHT MAX 4 M ABOVE FOOTINGS  
OR 7 M ABOVE GROUND LEVEL (LESSER)
- 3 LEVEL 1 & 2 (GARAGE & MAIN FLOOR)  
WAOBEARING WALLS 100 X 50 @ 400 C/S  
DOUBLE TOP PLATES
- 4 SPECIFY / DESIGN GARAGE DOOR LINELS
- 5 NOTE STRUCTURAL SUPERVISION BELOW

NB: It is the owners responsibility to ensure the satisfactory overall standard of the workmanship. The issue of the Building Permit does not in any way guarantee or imply continuous supervision of the works by the District Building Inspector.

STRUCTURAL SUPERVISION: All structural work is to be supervised or observed by the Engineer responsible for design who shall furnish a certificate to the District Inspector on completion of the structural work verifying that the work has been completed in accordance with his plans and specification as approved in the building permit and that the workmanship is of satisfactory quality.

I have read the foregoing requirements and the Owner/Builder/Authorised Person hereby agrees to comply with them.

OWNER/BUILDER/AUTHORISED PERSON [Signature]DATE 11.9.90

**Horowhenua County Council**PERMIT No. W5464LOCALITY WAIKANA

DATE RECEIVED : : .

DATE ISSUED 9.9.83FEES NOT TO BE PAID UNTIL REQUESTED BY OFFICE**APPLICATION  
FOR PLUMBING AND DRAINAGE PERMIT**OWNER'S NAME HALLWRIGHTFOR OFFICE USE ONLY

REMARKS:

PAID ON WAIKANA RECEIPT  
No 15314**SCALE OF PERMIT FEES**

| Estimated Labour Value of Work:                  | Fee Payable: |
|--------------------------------------------------|--------------|
| Not exceeding \$100 .....                        | \$12         |
| In excess of \$100 but not exceeding \$200 ..... | \$18         |
| In excess of \$200 but not exceeding \$300 ..... | \$24         |
| In excess of \$300 but not exceeding \$400 ..... | \$30         |

Plus \$6 for every \$100 or part thereof in excess of \$400.

NOTE.—In all cases where septic tanks are installed the site and position must be first approved by the County Health Inspector.

Valuation Book No. \_\_\_\_\_

Date 2nd Sept, 1983

# Application For Plumbing and Drainage Permit

TO THE COUNTY HEALTH INSPECTOR,  
Horowhenua County Council,  
Bath Street,  
Levin.

Postal Address:  
Horowhenua County Council,  
P.O. Box 258,  
Levin.

## PLAN OF ALLOTMENT

Showing position of proposed buildings, Sanitary fittings, Drains, Gully traps, Inspection pipes and Ventilators, Septic tanks, Sumps, Irrigation trenches, Sewers and Stormwater drains, if any.

No Septic Tank or Effluent Drainage System may be installed within 3.3 metres of a dwelling or 1.5 metres of any boundary.

Boundary Lines to be shown thus: \_\_\_\_\_

I, the undersigned, do hereby apply for a permit to carry out DRAINAGE and PLUMBING work in accordance with the undermentioned particulars.

Description of ~~Drainage~~ and Plumbing Work

INSTALL 20mm WATER SERVICE TO SECTION

Allotment. Lot: 73 D.P.: 29379 Section: \_\_\_\_\_ Area: \_\_\_\_\_

Block: \_\_\_\_\_ S.D.: \_\_\_\_\_ Locality: \_\_\_\_\_

Previous Owner { If Section has been recently transferred }

Frontage (Length) \_\_\_\_\_ (Name of Street or Road) 105 WINARA AVE WAIKANA

Water Supply (Description) \_\_\_\_\_

Est. Material Value of Plumbing Work \$ 300:00 Est. Labour Value of Plumbing Work \$ 120:00

Est. Material Value of Drainage Work \$ \_\_\_\_\_ Est. Labour Value of Drainage Work \$ \_\_\_\_\_

Total Value \$ 12:00

All work will be carried out in accordance with Horowhenua County Council's By-laws and the Drainage and Plumbing Regulations 1978 and Amendments.

Permit Fee Based on Labour Value \$ 12

Receipt No.: PAID WAIK REC NO. 15514

Water Connection Fee \$ \_\_\_\_\_

Receipt No.: \_\_\_\_\_

Full Name and Address of Owner: DR GUY HALLWRIGHT

2 SEFTON ST WADESIDE

NOTE.—The following MUST accompany this Application:—

(a) Ground Plan of Building showing all drains, vents, sumps, septic tanks and sanitary fittings to be plotted on opposite page. For a sewer connection, complete enclosed carbonised form.

(b) Specifications of work materials to be used.

Plan showing drain should be drawn to scale of 1-100.

Stormwater drains should be shown (if any) in dotted lines.

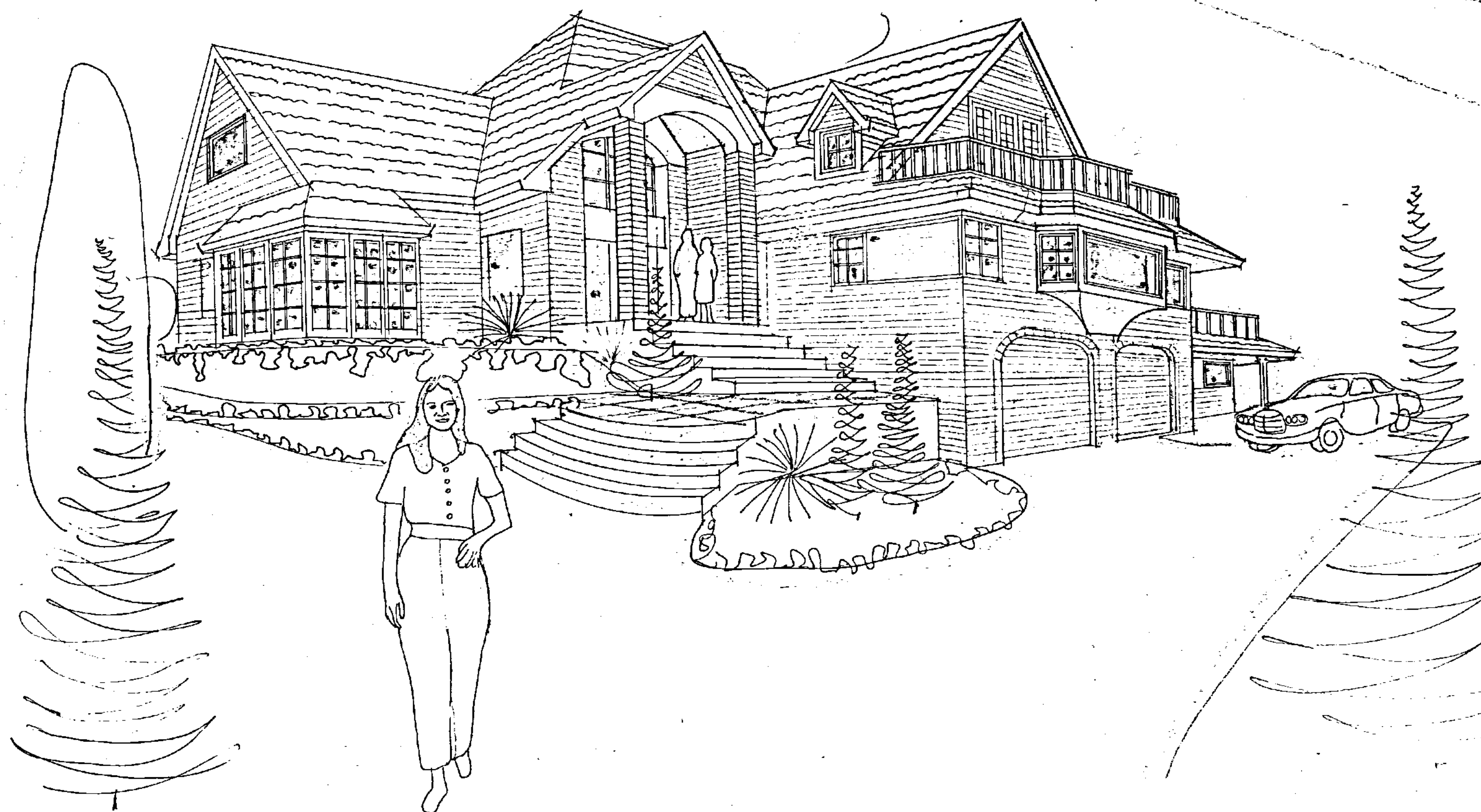
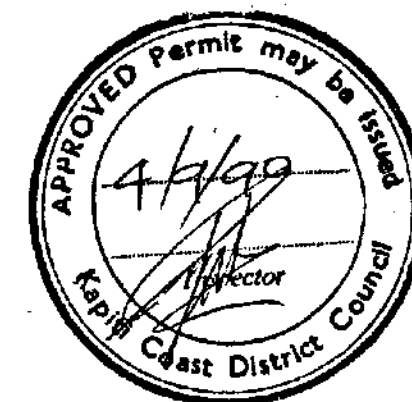
Signature of Applicant: A.W. WOODS

Address 4 SMITH ST BEKARARIKI

Craftsman  
Plumber's Signature,  
Address, and  
Registered No.

125 Signet 04161  
915 MURROCK RD ISLAND BAY

Registered Drainlayer's  
Signature, Address, and  
Registered No.



NOTE = ALL CONNECTIONS  
OF ENGINEER DESIGNED  
MEMBERS AS DETAILED  
IN ENGINEERS  
CALCULATIONS

New Home For Mr & Mrs Don Harper  
Winara av. Waikanae

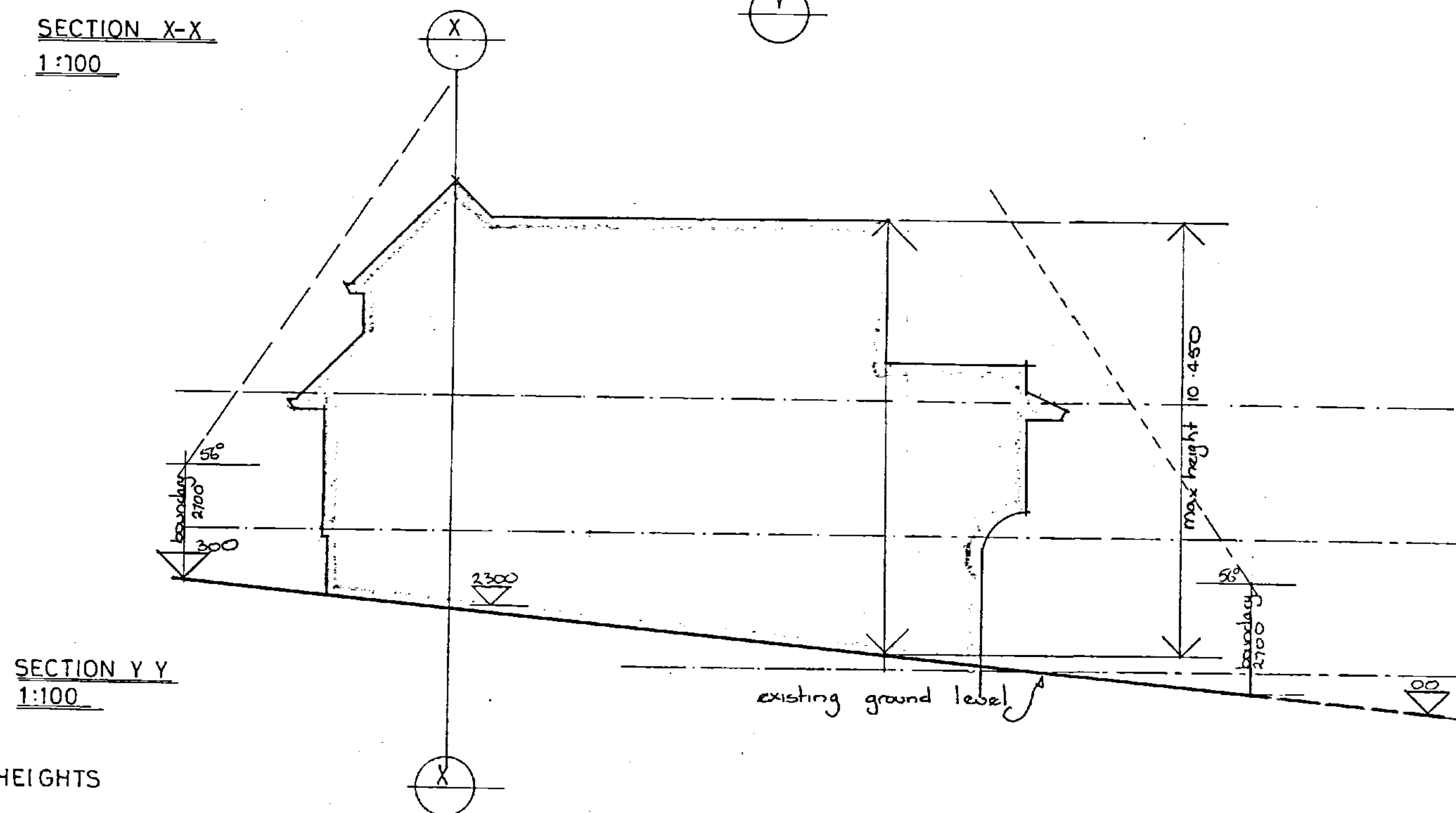
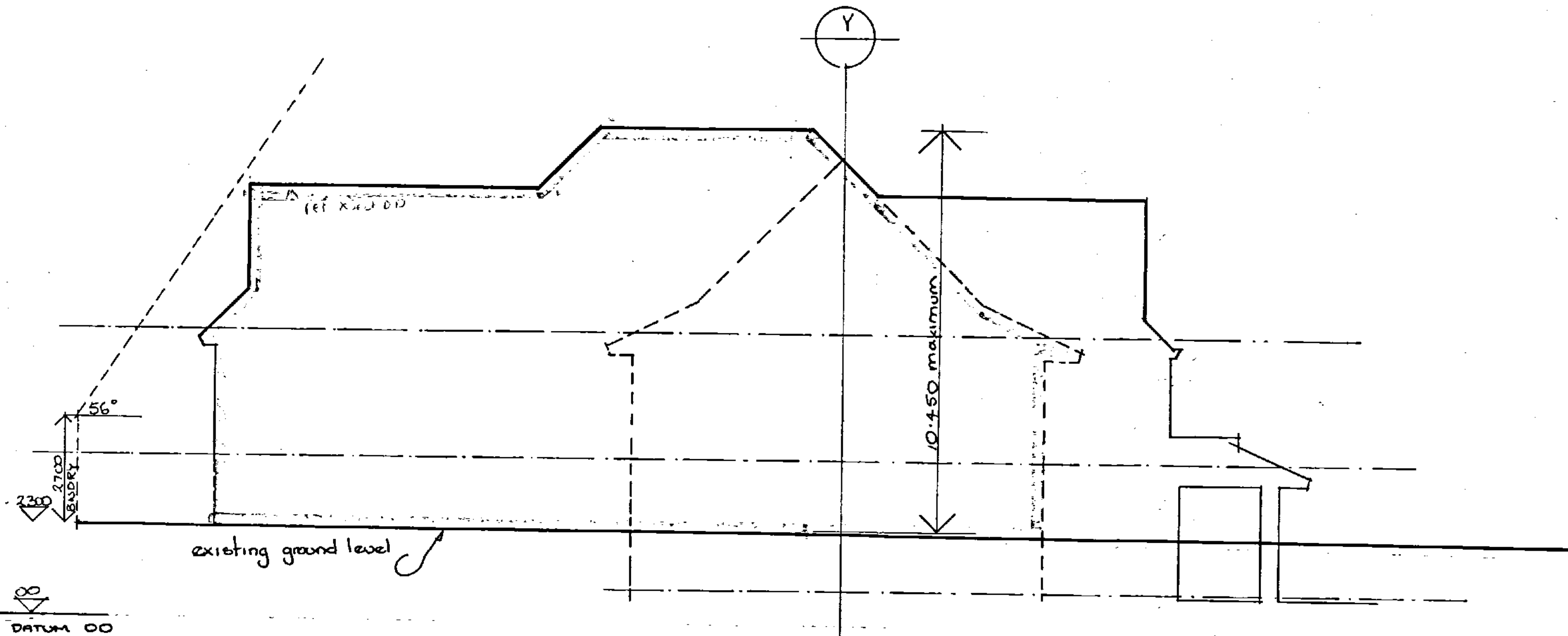
Rob Kofoed Barch Anzia Riba AArBINZ  
Chartered Architect

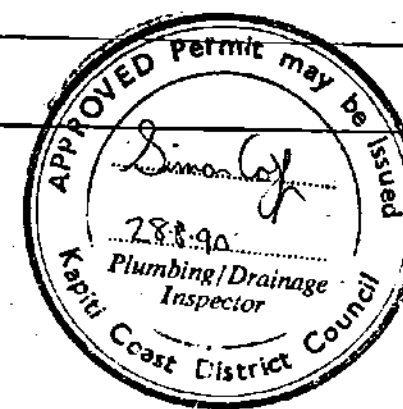
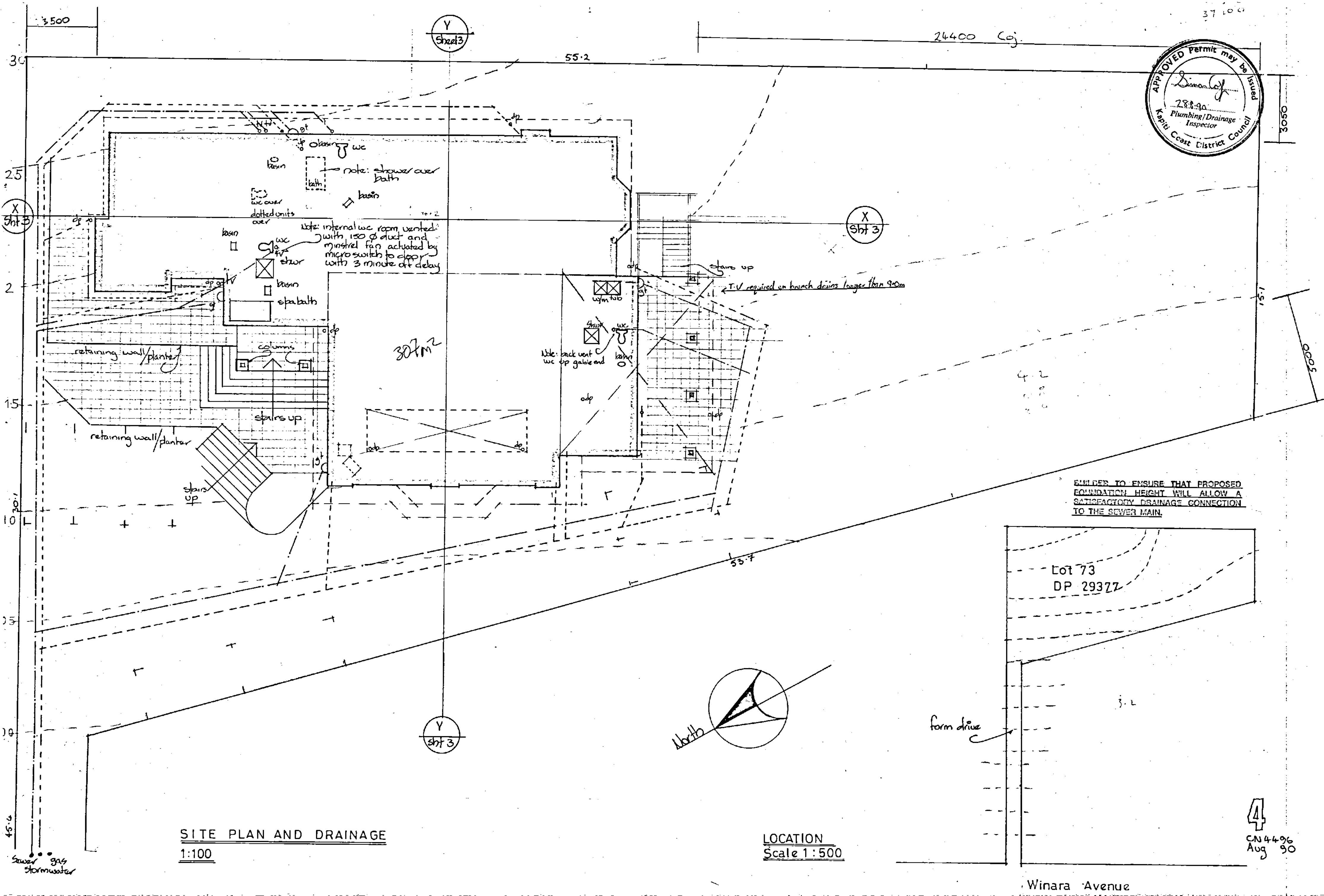
87 821

1  
CW 4496  
May 1990

## INDEX TO DRAWINGS

|    |                          |
|----|--------------------------|
| 1  | Cover Sheet Perspective  |
| 2  | Index                    |
| 3  | Critical Heights         |
| 4  | Site Plan and Drainage.  |
| 5  | Lower Floor Plan         |
| 6  | Main Floor Plan          |
| 7  | Upper Floor Plan         |
| 8  | Elevations , west, north |
| 9  | Elevations East, south   |
| 10 | Section A-A              |
| 11 | Section B-B              |
| 12 | Section C-C              |
| 13 | Section D-D              |
| 14 | Section E-E              |
| 15 | Foundation Plan          |
| 16 | Roof Plan                |
| 17 | Foundation Details       |
| 18 | Roof Details             |





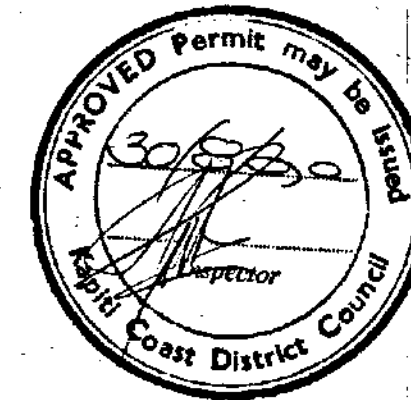
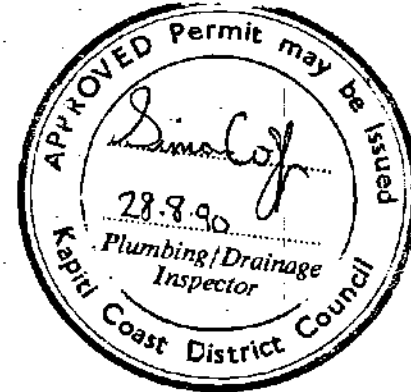
BUILDERS TO ENSURE THAT PROPOSED FOUNDATION HEIGHT WILL ALLOW A SATISFACTORY DRAINAGE CONNECTION TO THE SEWER MAIN.

SITE PLAN AND DRAINAGE  
1:100

LOCATION  
Scale 1:500

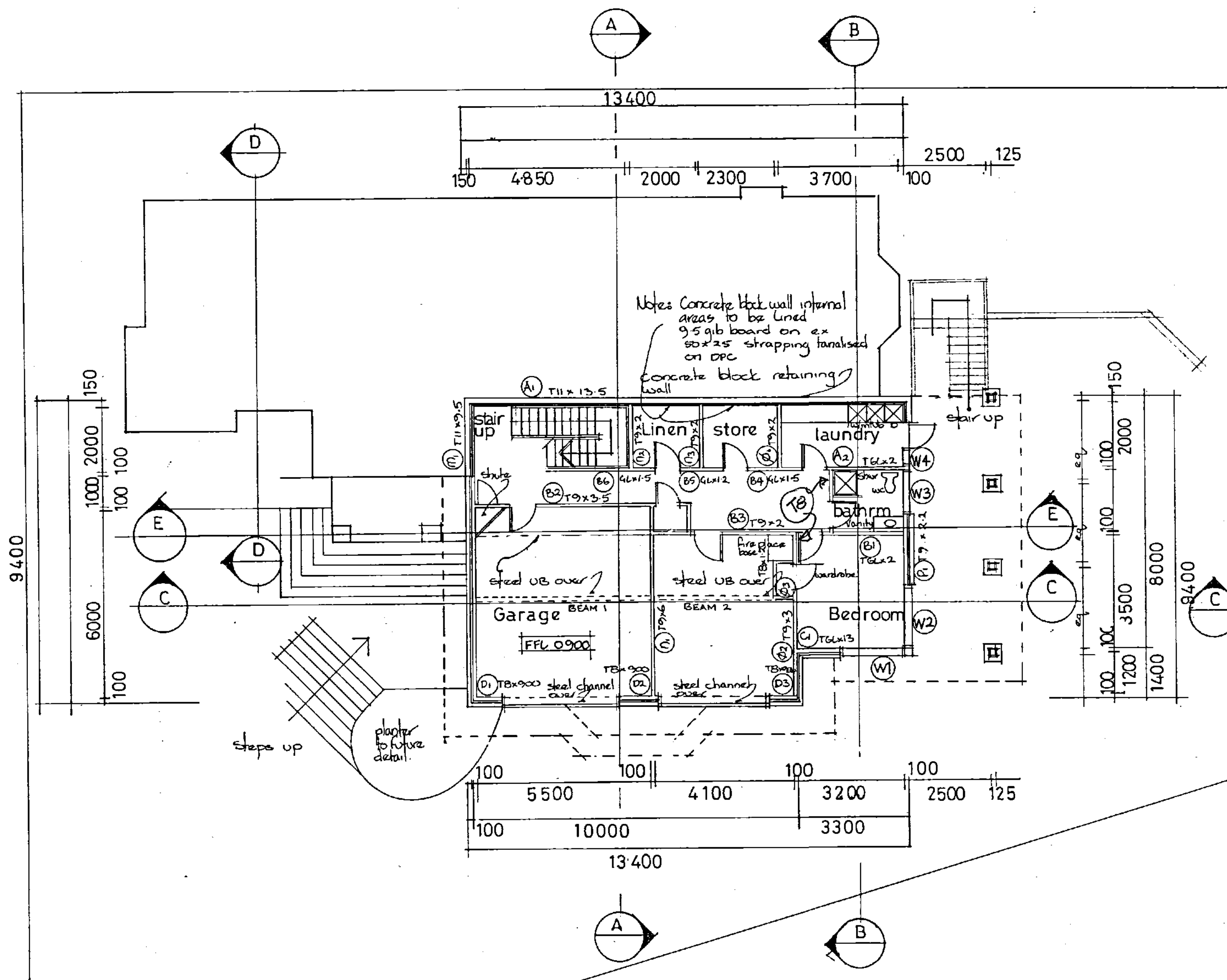
4  
CN4496  
Aug 90

Winara Avenue



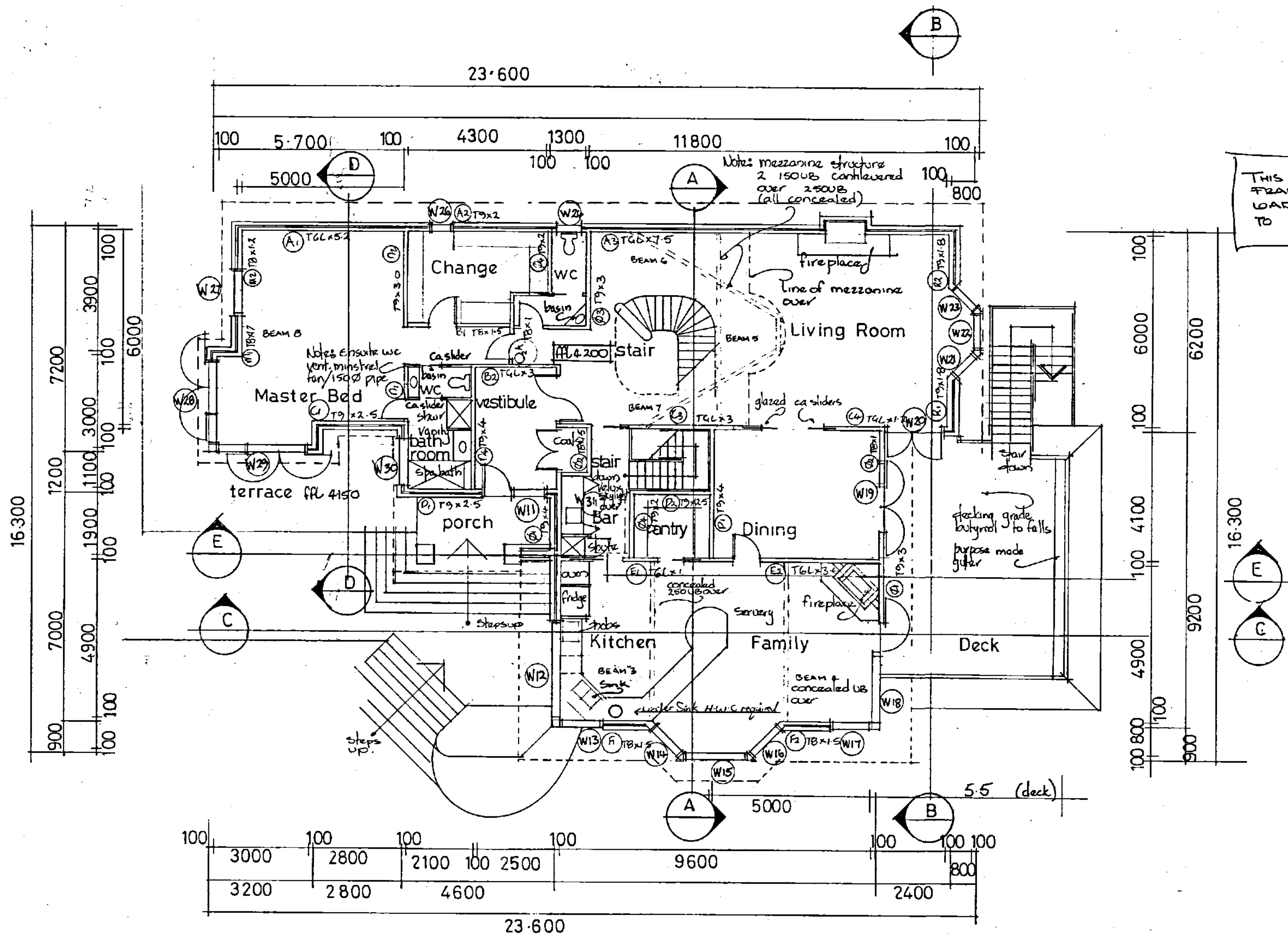
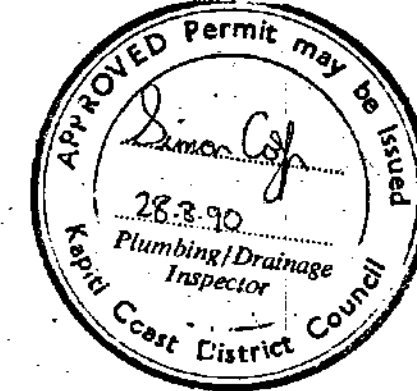
THIS LEVEL WALL FRAMING  
FOR LOADBEARING WALLS  
TO BE MIN. 100X50 @ 400

All Plumbing and Drainage work to be carried  
out in accordance with 1918 Drainage and  
Plumbing Regulations and with Kapiti Coast  
District Council Requirements.



LOWER FLOOR PLAN

1:100



THIS LEVEL WALL  
FRAMING FOR  
LOADBEARING WALLS  
TO BE MIN. 100x50 @ 400CS

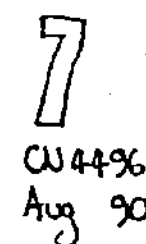
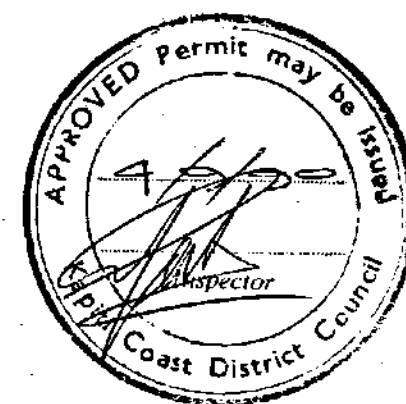


MAIN FLOOR PLAN

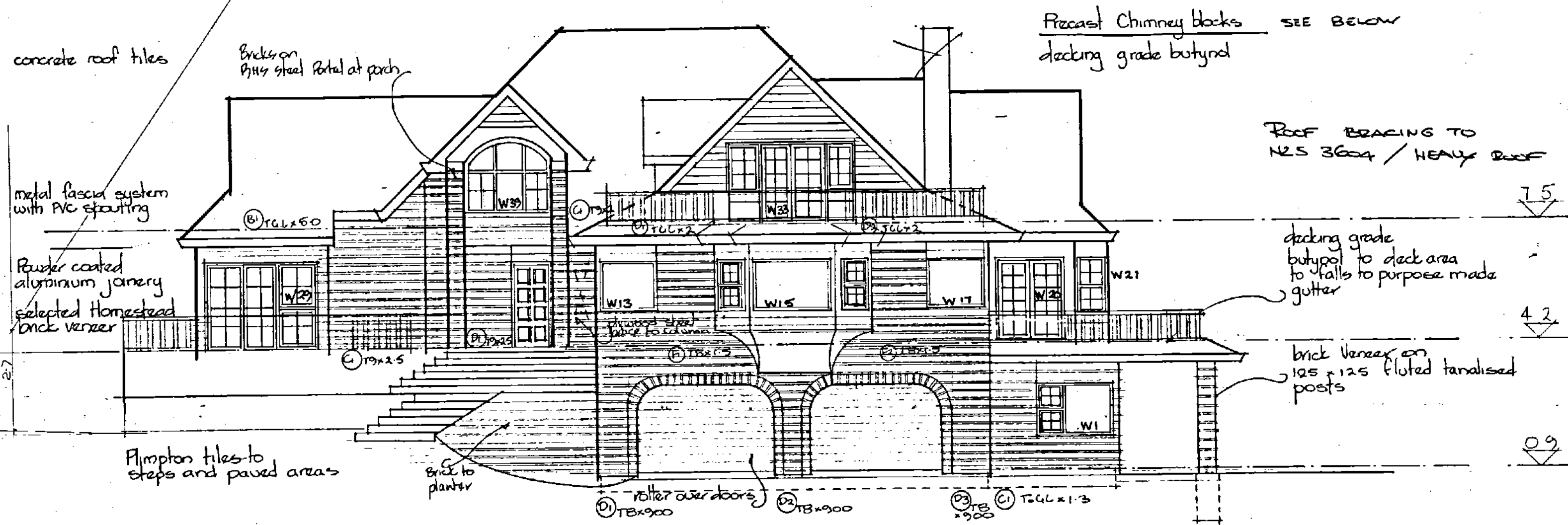
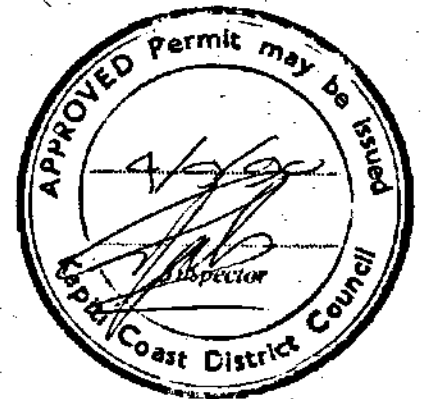
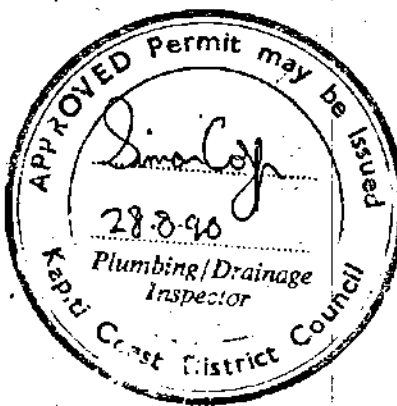
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6

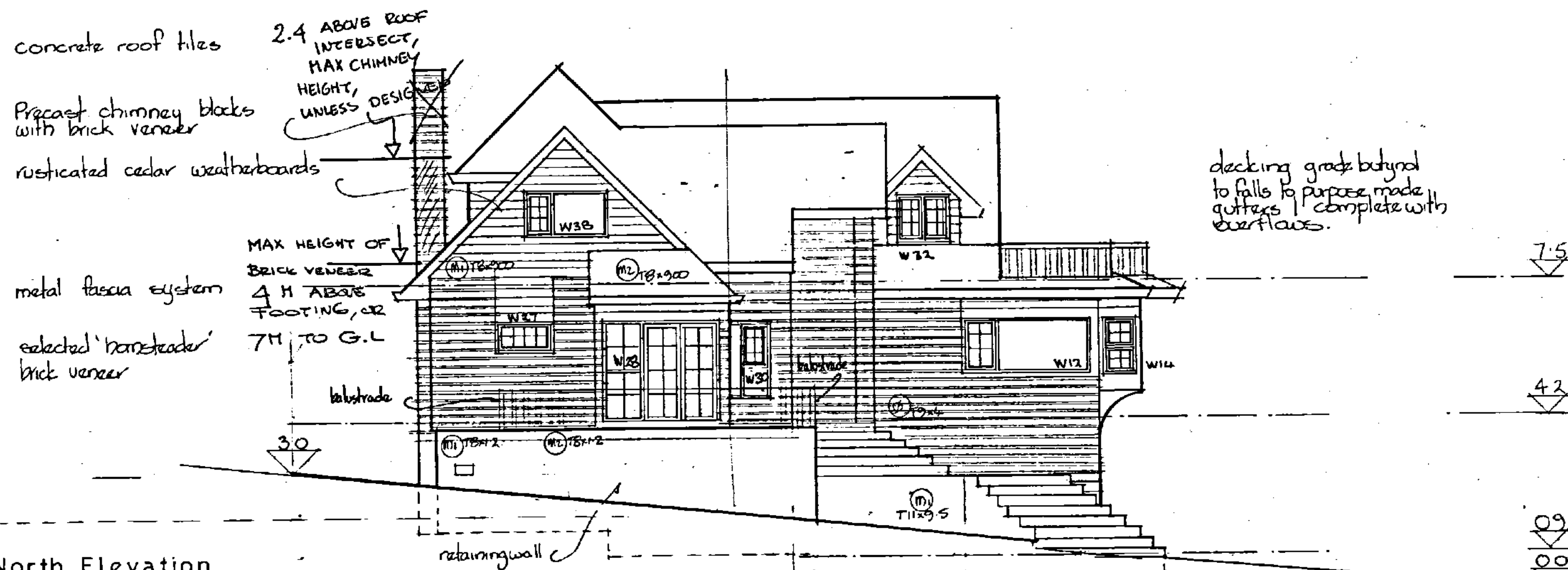
CU 44-96  
Aug 90



UPPER FLOOR PLAN  
1:100

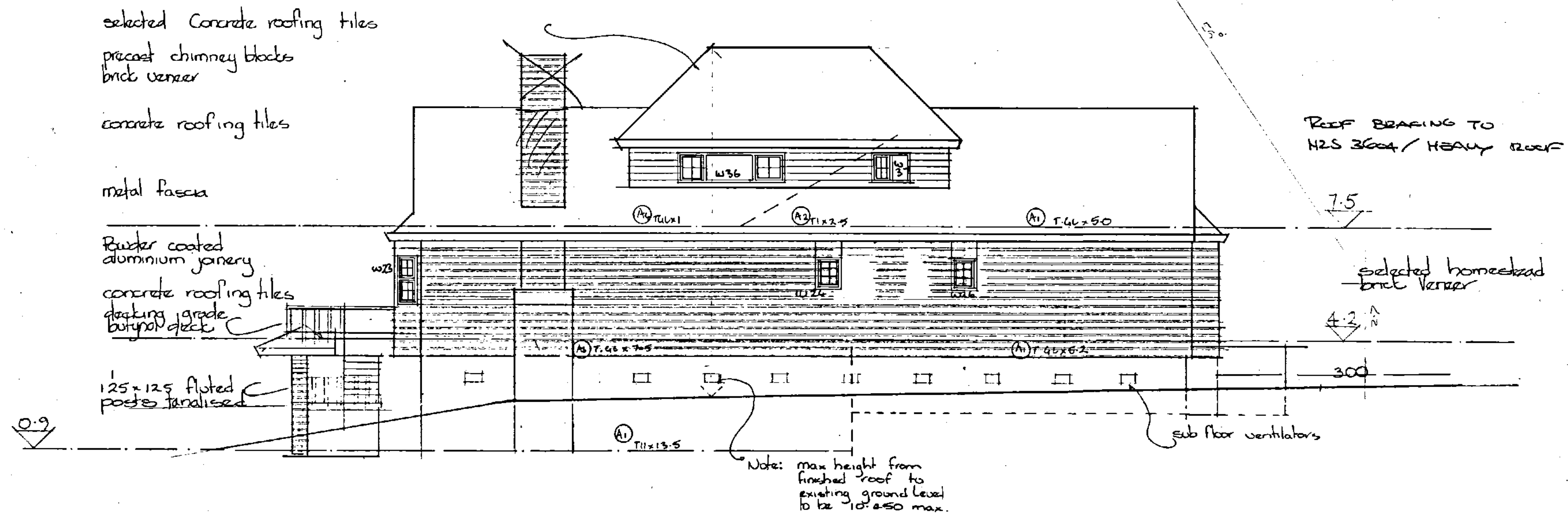
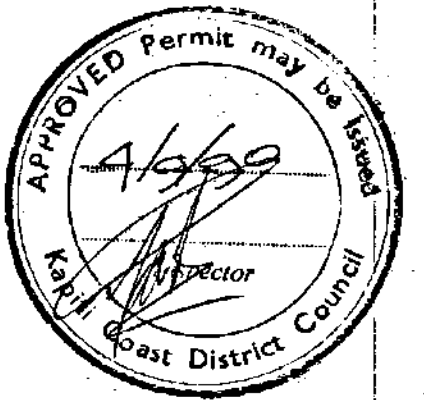
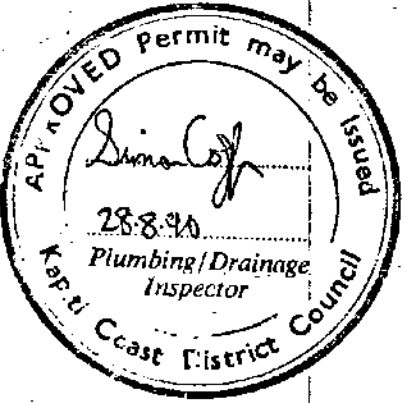


West Elevation



North Elevation

ELEVATIONS  
1:100



East Elevation

Notes  
max finished  
height from  
existing  
ground level  
to be  
max. 10.450

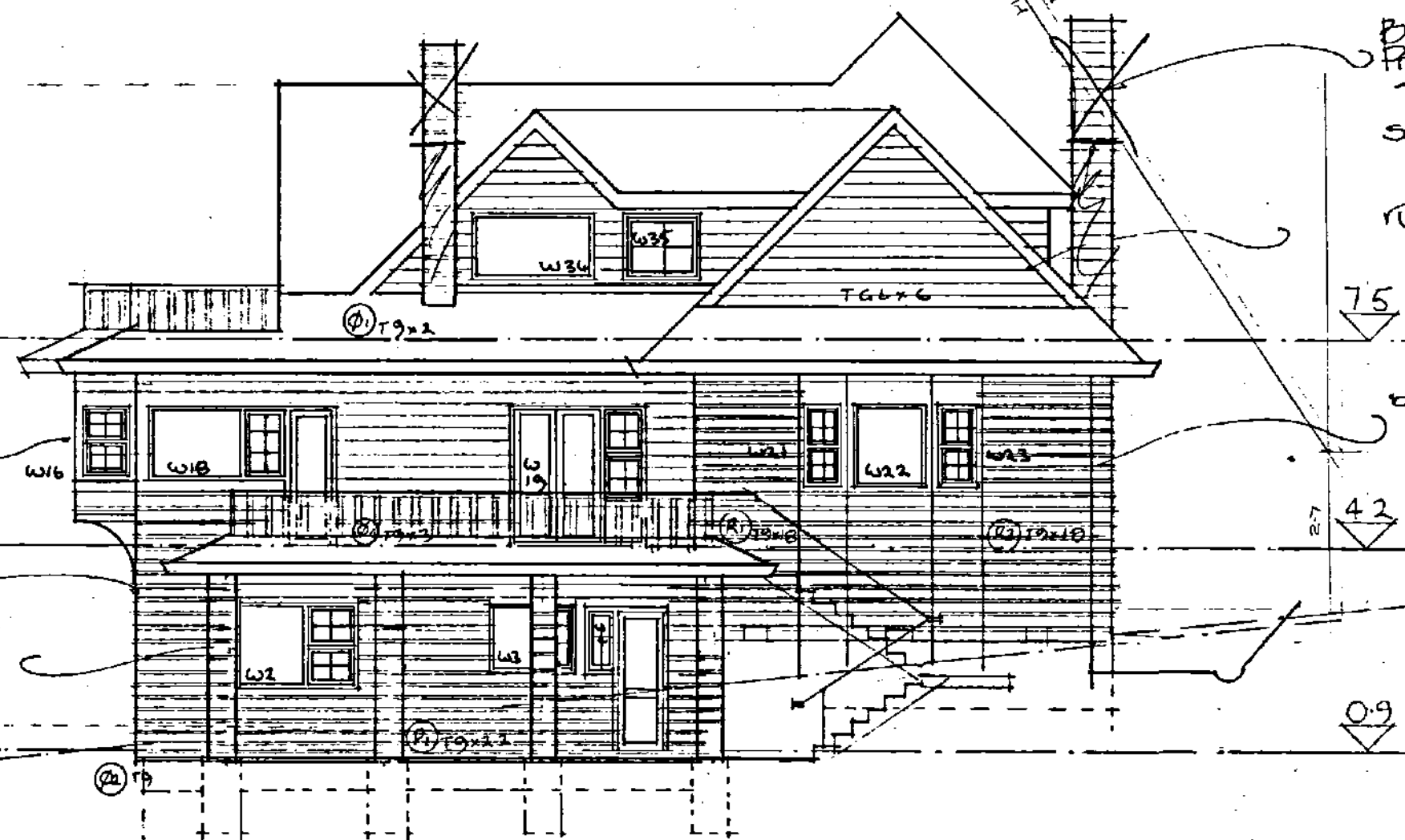
decking grade butynol to  
balcony on  
plywood substrate to falls  
to purpose made gutter  
rusticated cedar weatherboards  
Powder coated Aluminium joinery

Selected Homestead  
Brick Veneer  
fluted 125x125 tanalised posts

Brick Veneer on  
Precast Chimney blocks SEE PAGE 8

selected concrete roofing tiles  
rusticated Cedar weatherboards

selected Homestead brick veneer



South Elevation

approved gang nail trusses @ 900 ctrs

Selected concrete roof tiles  
on tanalised 50x50 battens  
on heavy duty building paper  
on trusses @ 900 m.ctrs

P 22 batts insulation

Ribbed metal  
fascia system

100x50 frame  
P 16 batts  
9.5 g.b board  
200x50 floor joists  
500 ctrs

vinyl tile floor  
on 20 particle  
board

Laminated Plym  
Stair system

Selected brick Veneer  
building paper  
100x50 frame  
P 16 batts  
insulation  
Concrete found.  
vents

Mezzanine

Games room

stair

250 UBC  
Notes Mezzanine structure  
2x150UB  
cantilevered over  
250 UBS  
all concealed above  
fibrous plaster  
ceiling lining

Note: conc block  
wall 9.5 g.b board  
on tanalised 25x50  
strapping on DPC

Beam 30  
2x steel UBS in  
foreground and background  
Concealed  
fibrous plaster ceiling  
Family

FRL 200

Steel UB  
BEAM  
9.5 particle board  
on 100x50 frame  
Garage

DECK

Decking Grade Butynol  
on 16 mm plywood substrate  
to falls  
to purposed made gutter  
with over flows.

Palustrade Capping  
ex 200x100 layered joint  
concrete roofing tiles on  
tanalised battens on  
building paper  
on 150x50 rafters @ 900 ctrs

spouting metal fascia over

Insulation

100x100 bearer

Protect  
Weld IFLEX  
OR SIMILAR

channel lintel with  
brick overhead

all field  
drains to  
be connected into the  
stormwater drain

FLOOR CONSTRUCTION

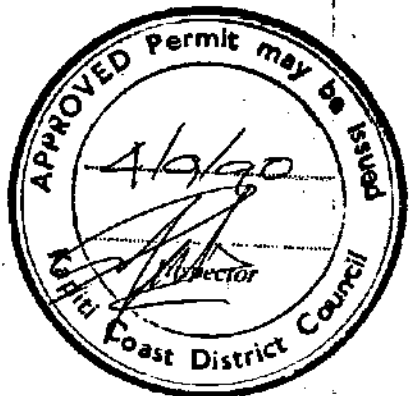
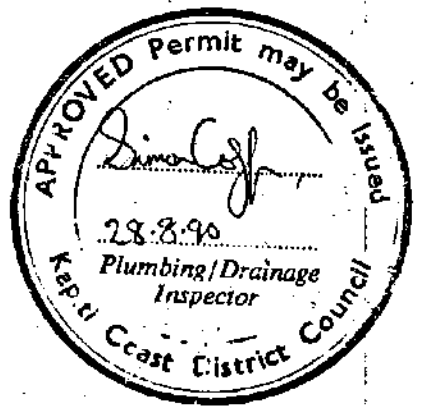
Plym Floor Boards Tounge & Grooved  
Glued and Secret nailed to  
200x50 floor joists 500 ctrs.  
Insulation insulation  
on 100x100 bearers  
with jack frame  
on conc. piles.

CONCRETE BLOCK RETAINING WALL

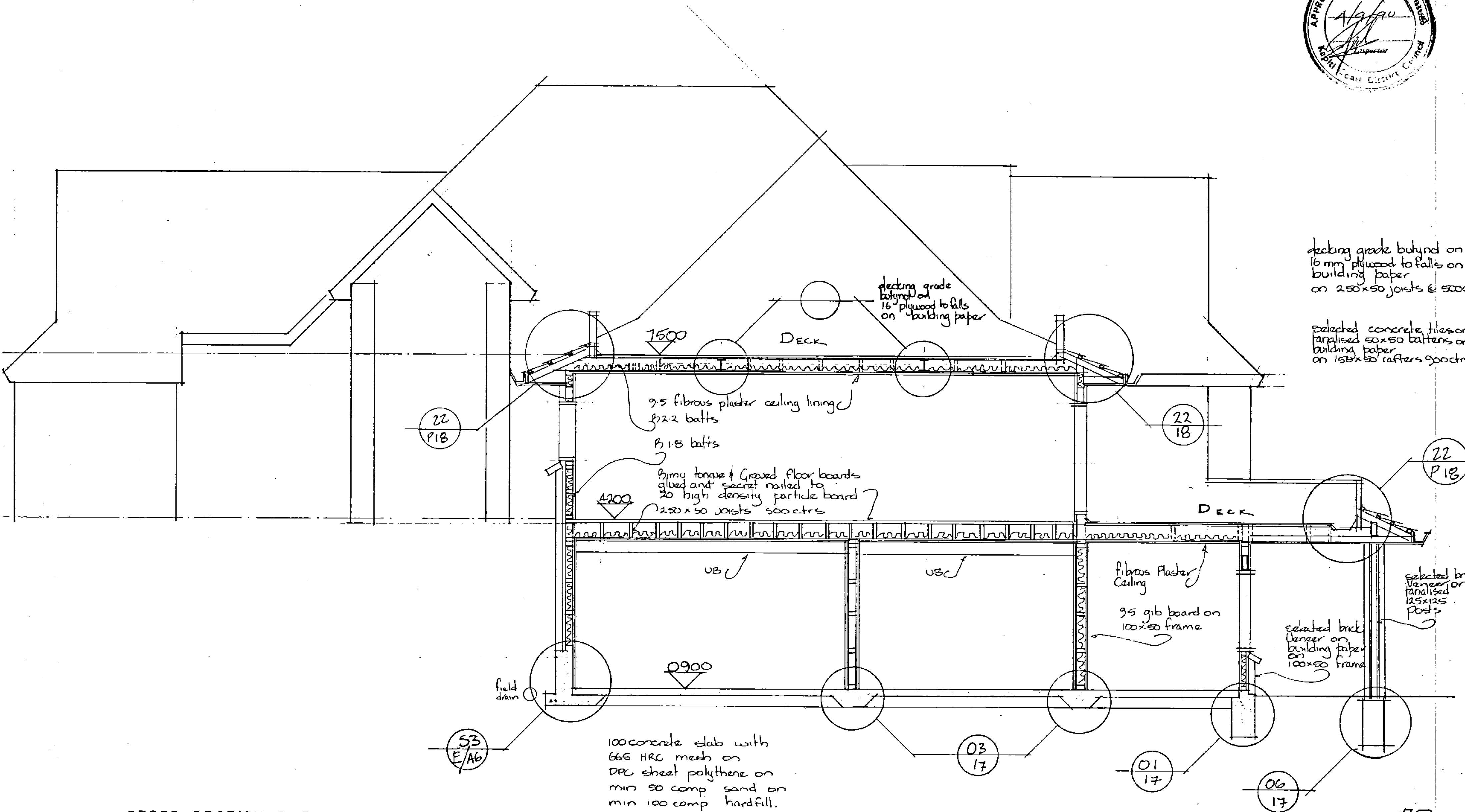
100 concrete floor with  
BRC 665 steel mesh  
on DPC sheet polythene  
on min 50 compacted sand  
on min 100 compacted Hardfill.

CROSS SECTION A A

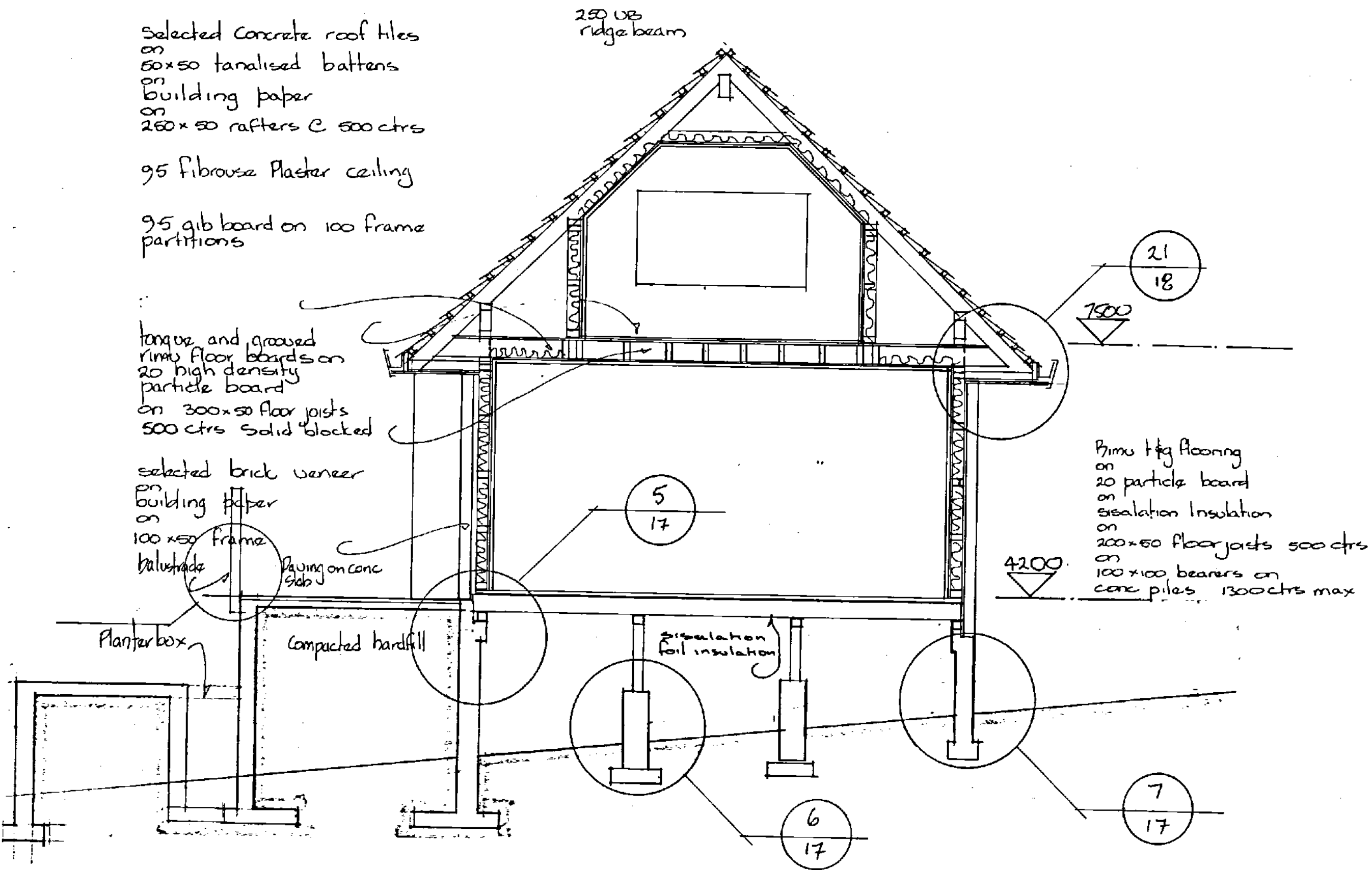
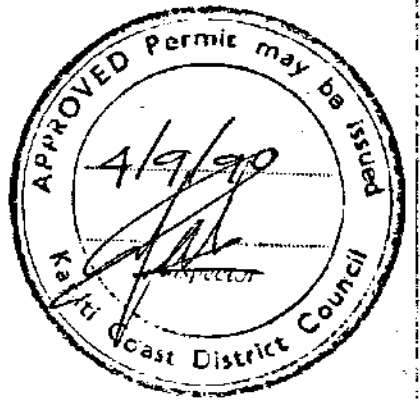
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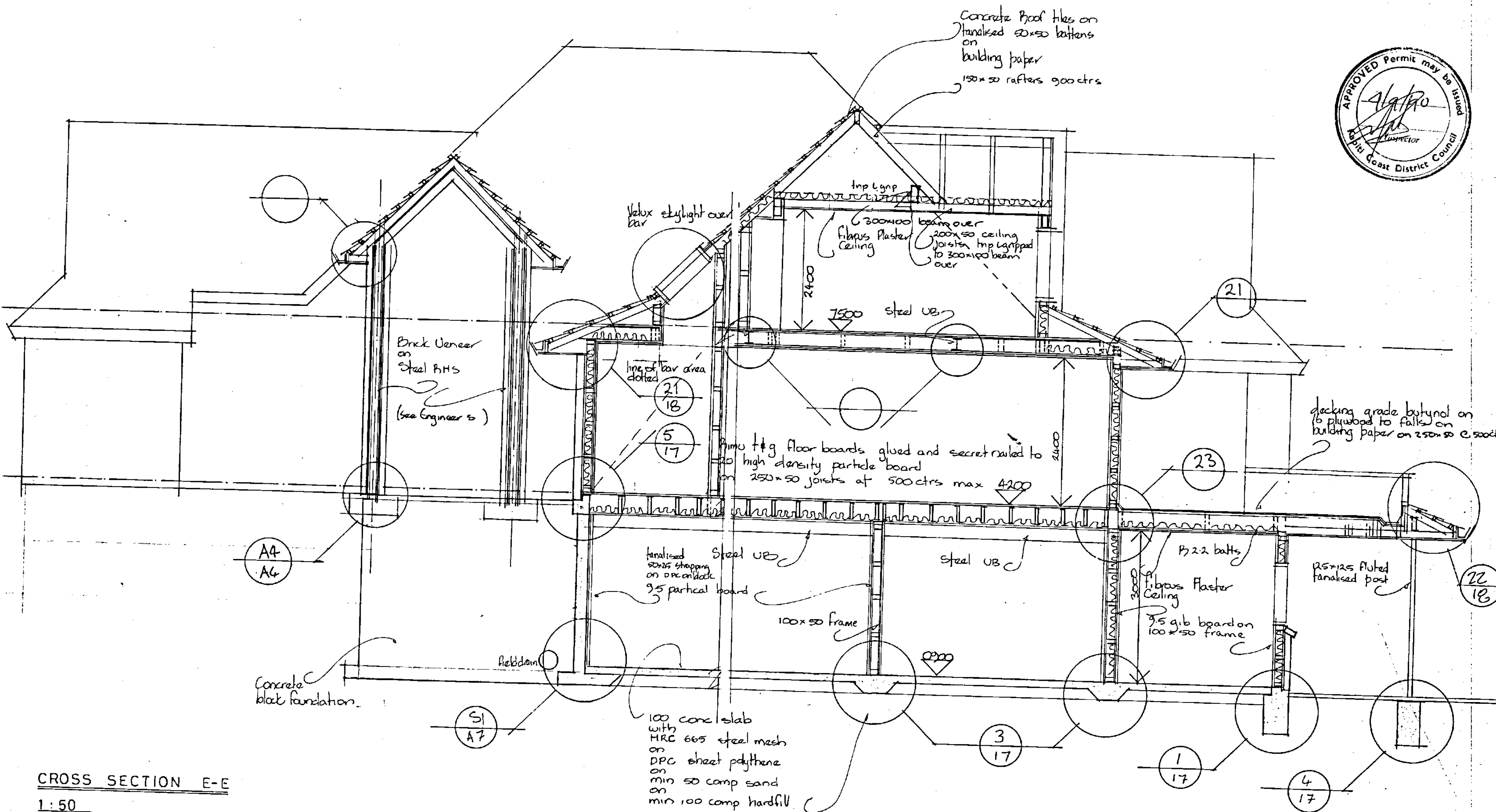




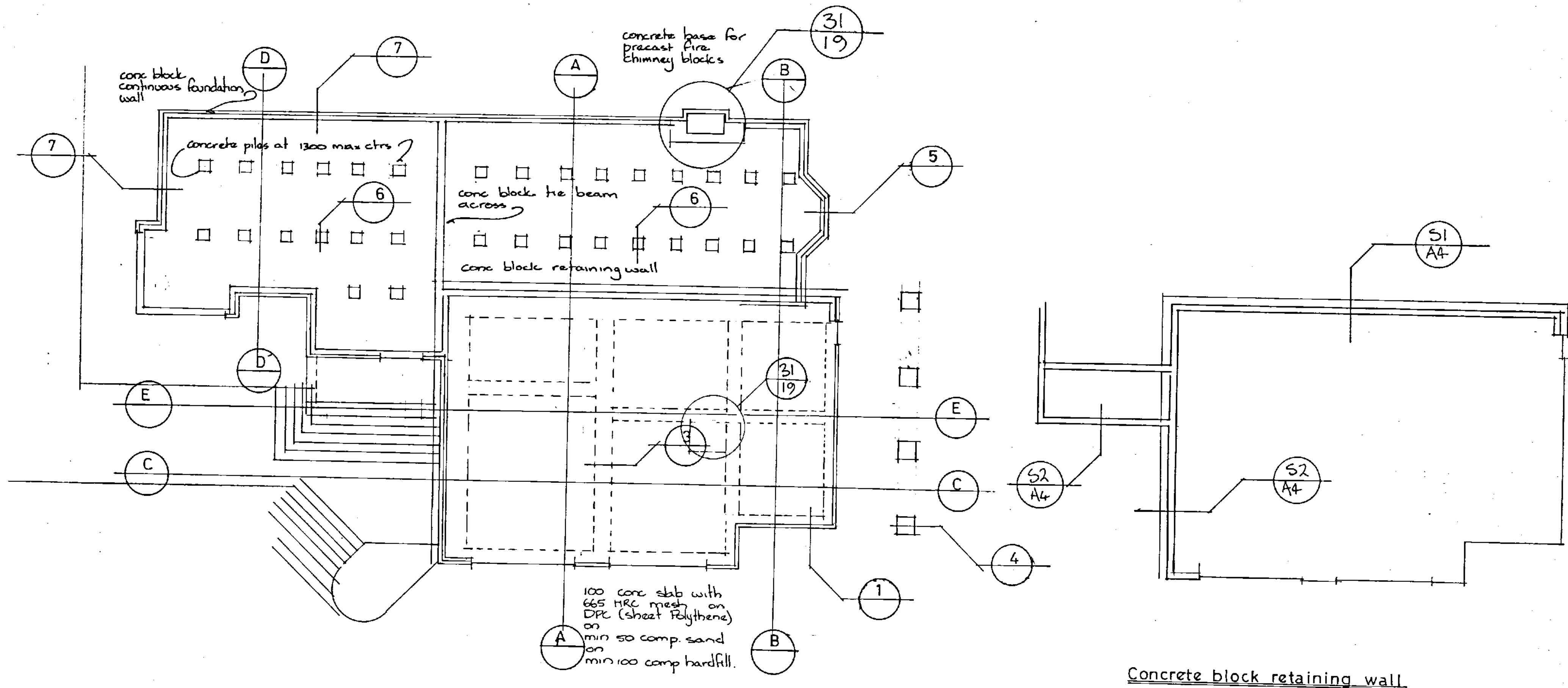
CROSS SECTION C-C  
1:50



CROSS SECTION D D  
1:50

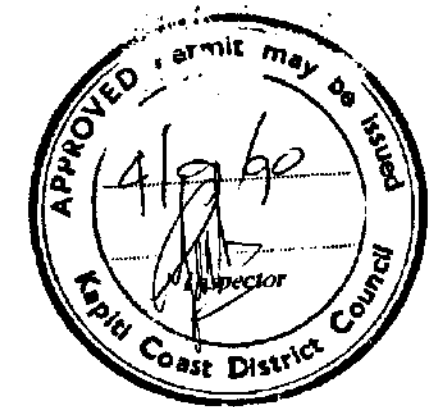


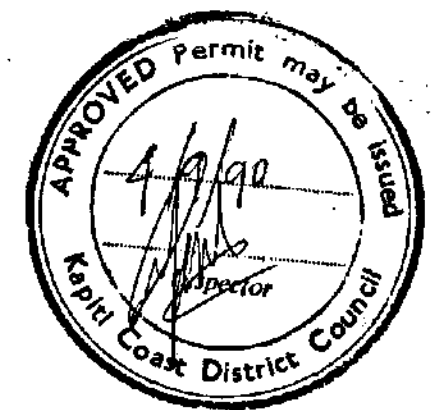
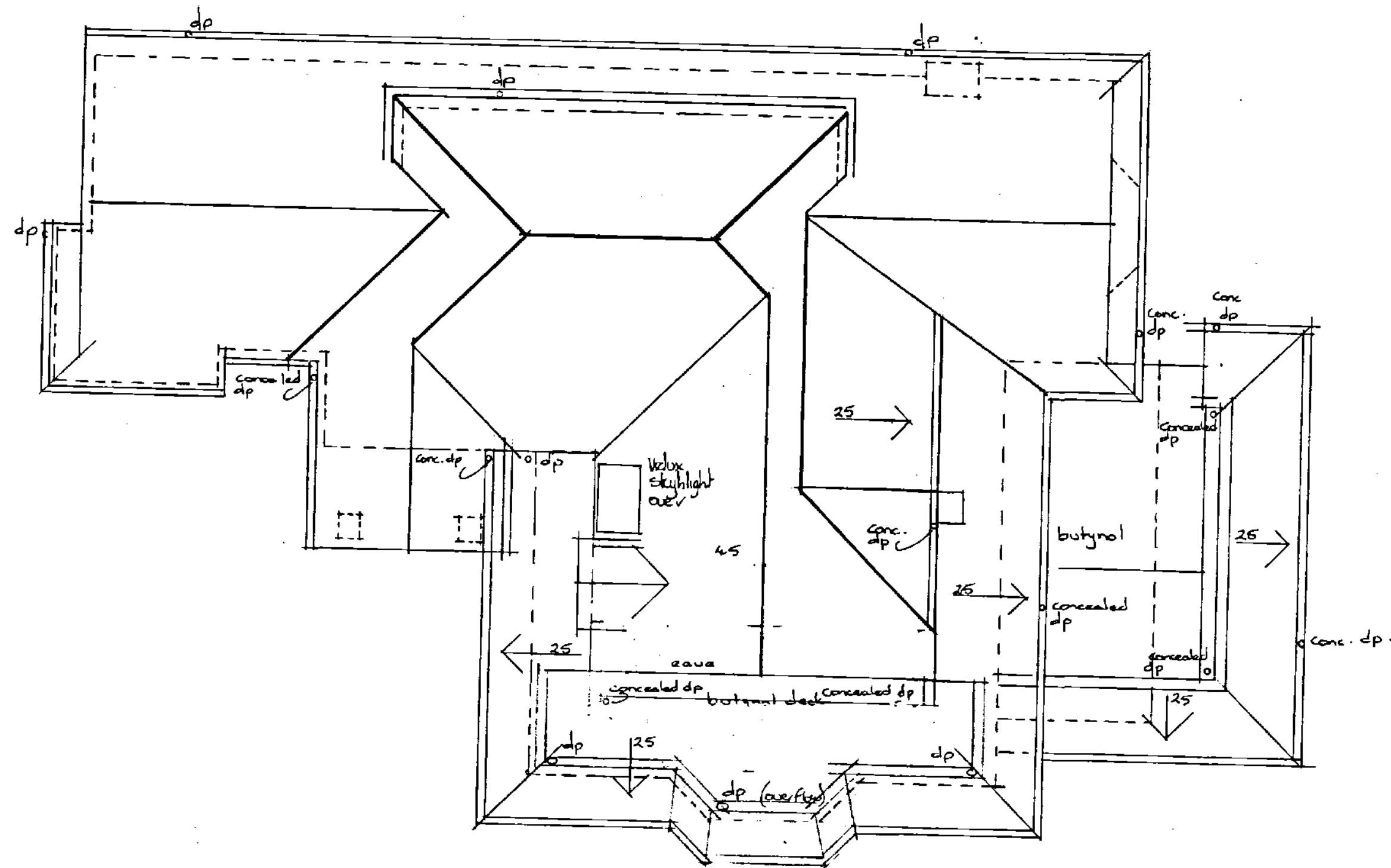
1 : 50



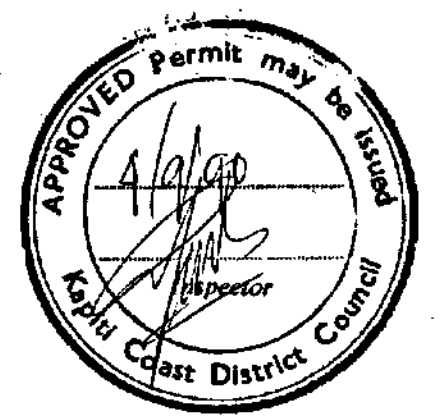
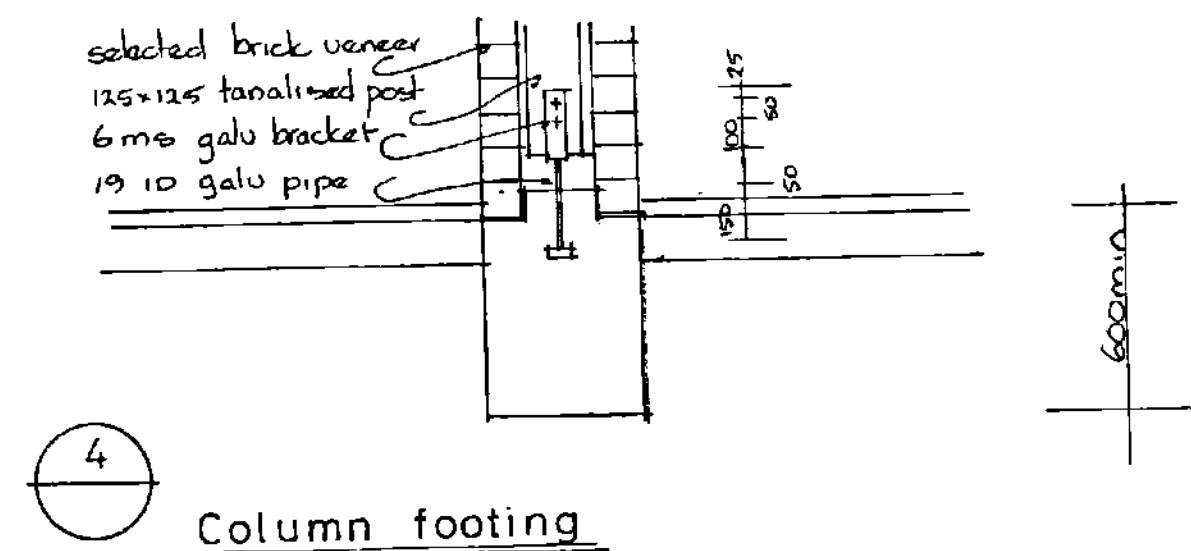
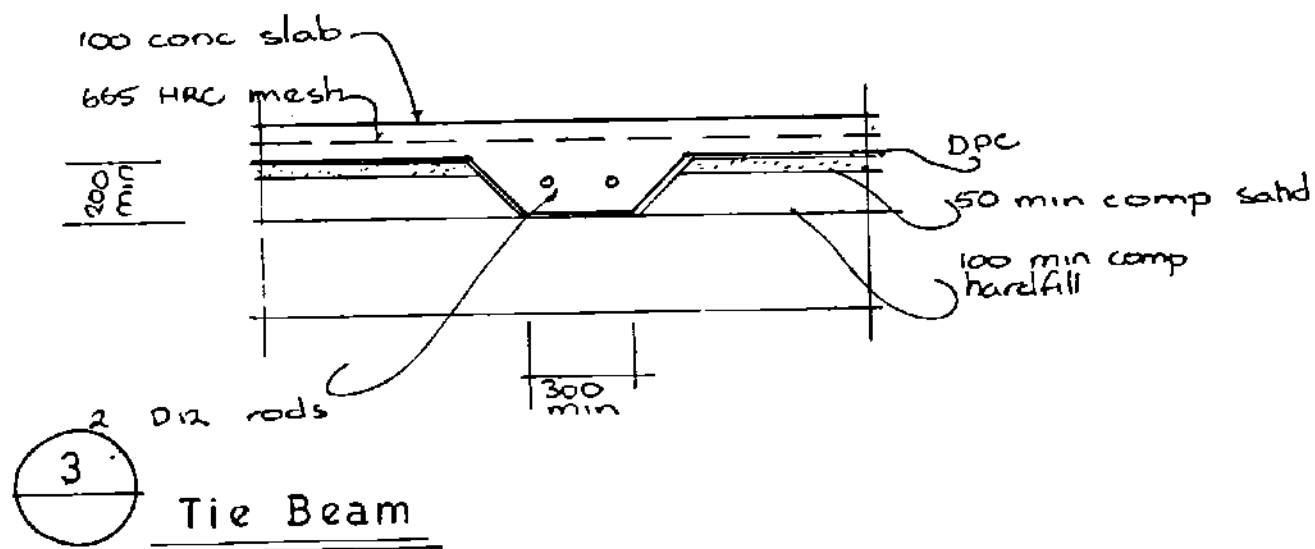
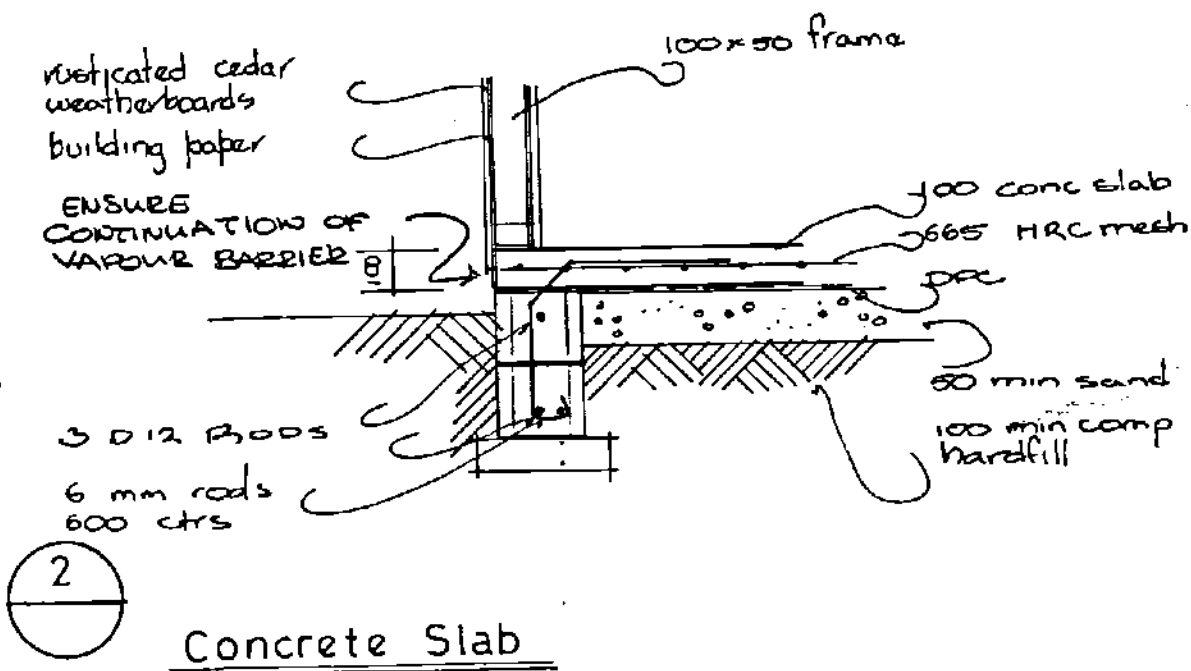
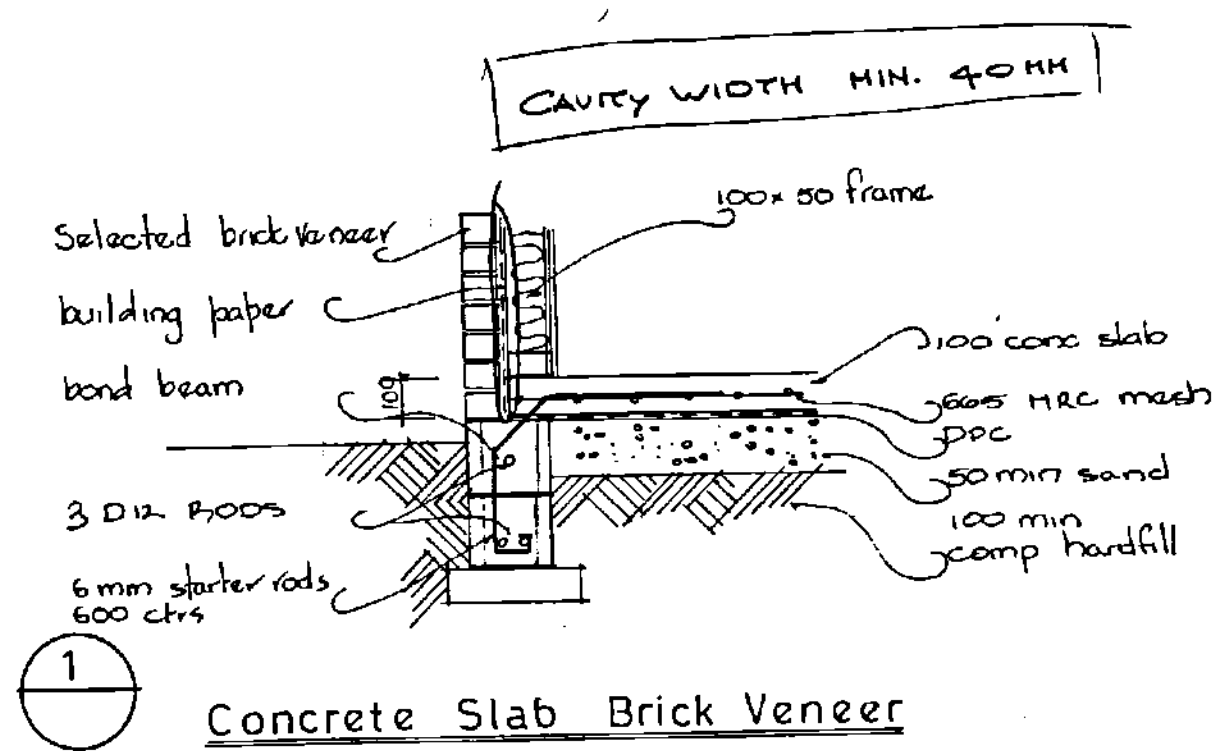
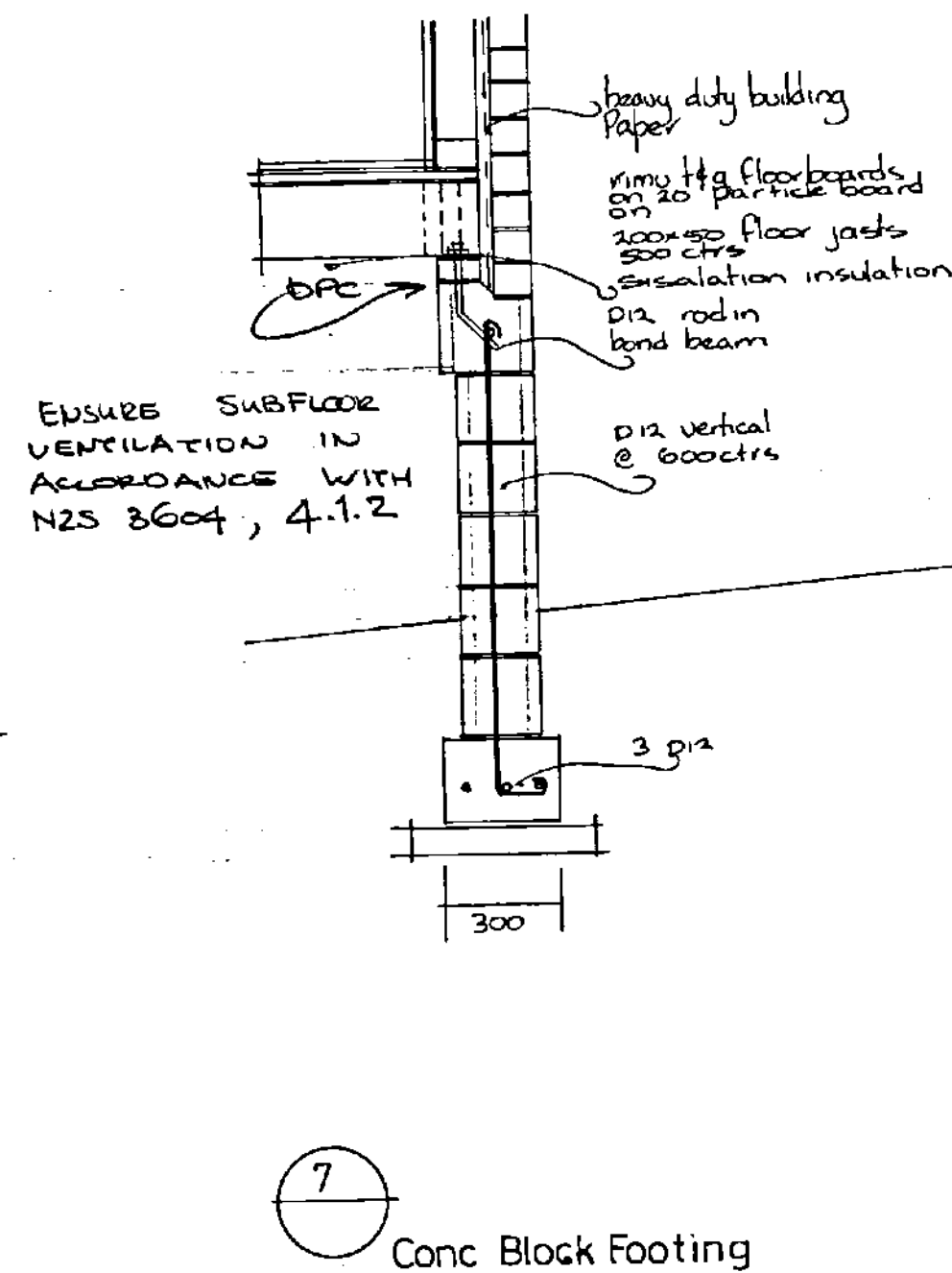
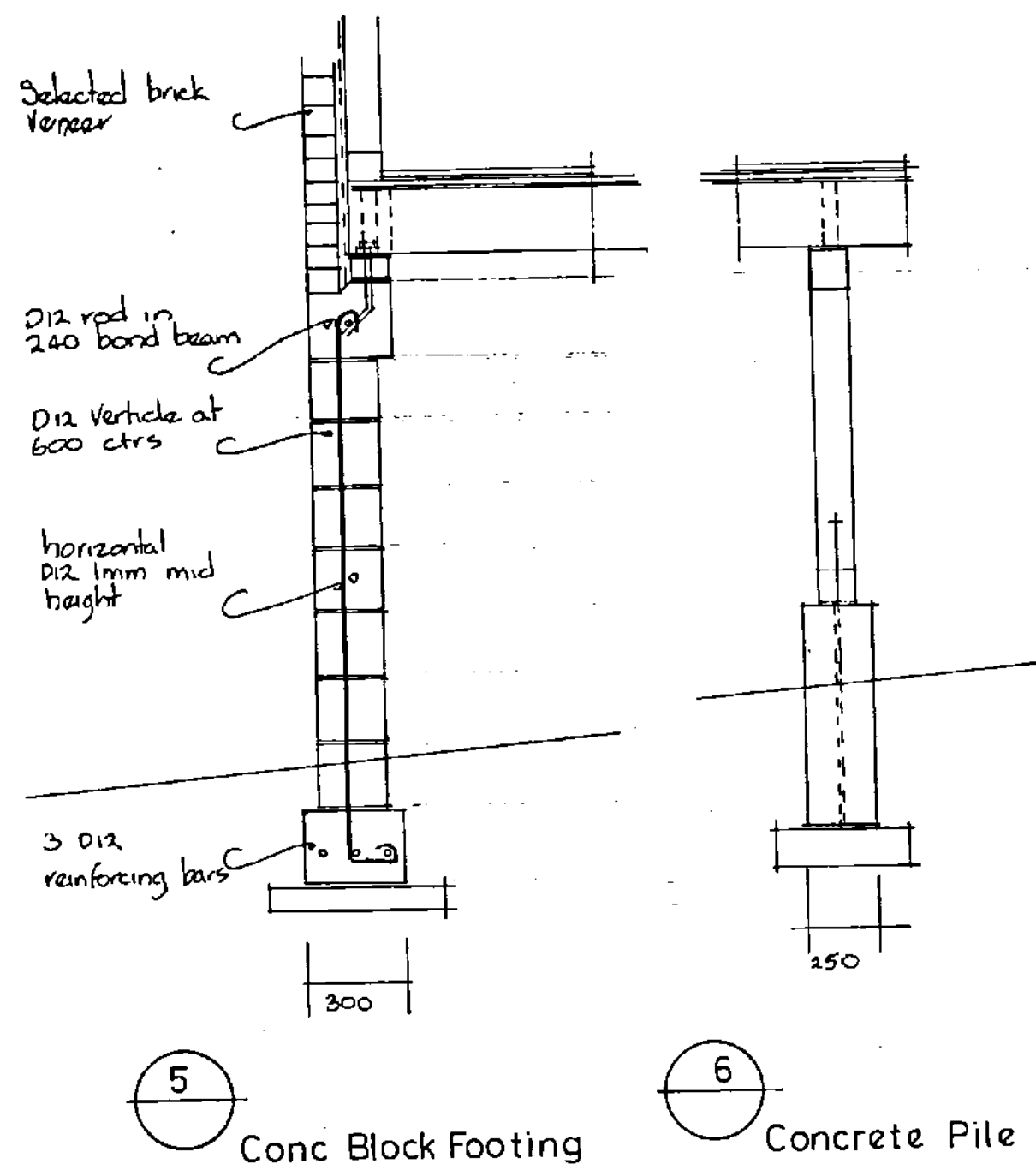
FOUNDATION PLAN

1:100



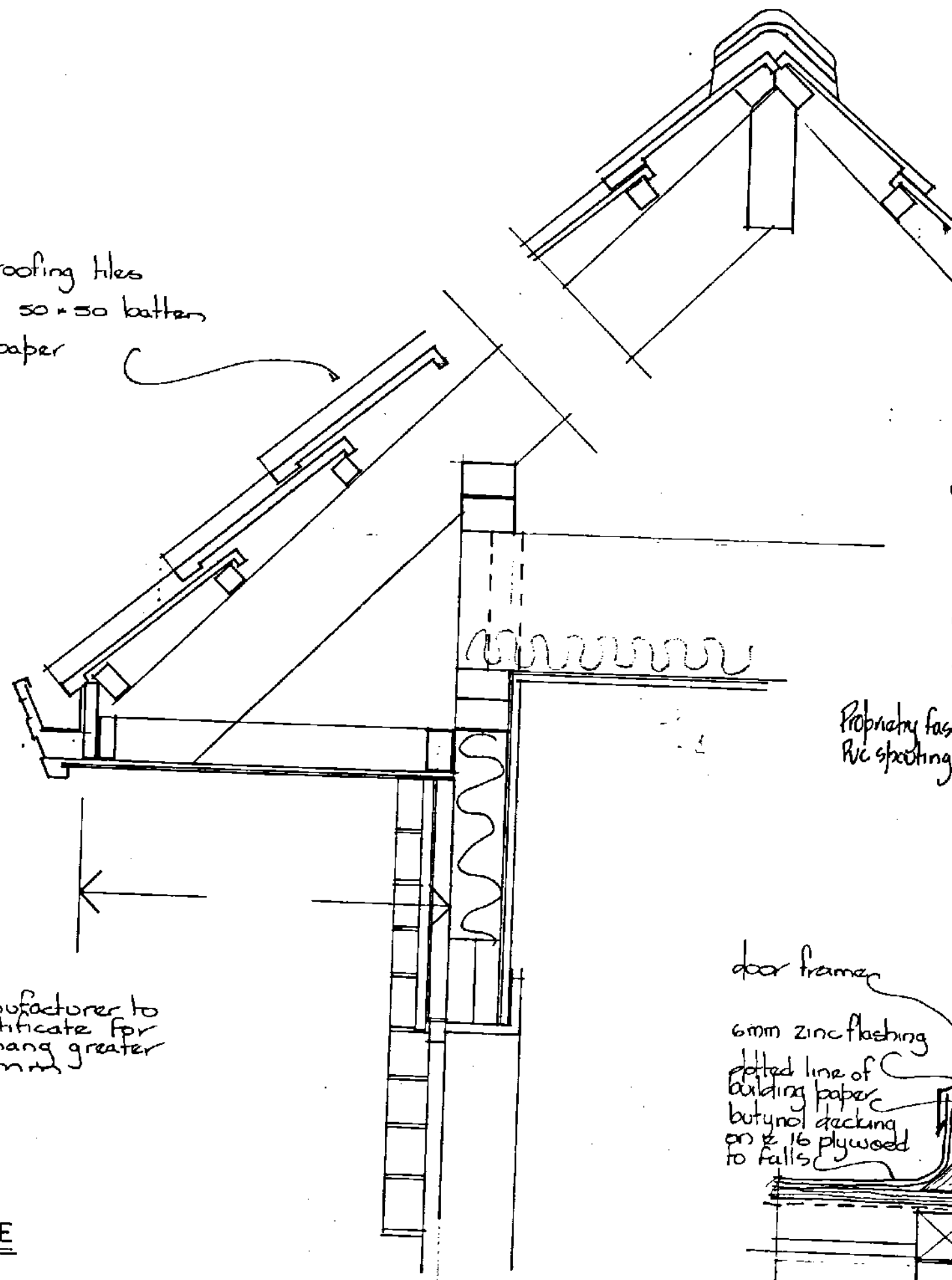


ROOF PLAN  
1:100



concrete roofing tiles  
on  
tanalised 50x50 batten  
on  
building paper

frame manufacturer to  
provide certificate for  
eave overhang greater  
than 750mm



Cantilever joists and  
concrete roofing tiles on  
tanalised 50x50 battens  
on building paper  
on 150x50  
rafters 900 ctrs  
2 D10 bolts

Proprietary fascia on  
PVC sheathing

hardiflex soffit  
recessed filled joints  
100x50 frame

door frame  
6mm zinc flashing  
dotted line of  
building paper  
butynol decking  
on 16 plywood  
to falls

blocking to rafter

flashing and  
overflashing

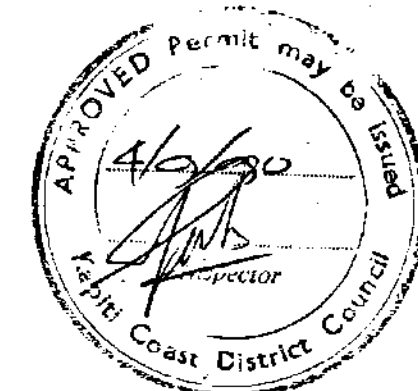
tanalised paint quality balustrade  
decking grade butynol to  
falls on  
16 plywood  
purpose made gutter  
complete with 2 DP & 2 overflows  
each end

P2.2 batts

21 ROOF AND EAVE  
1:10

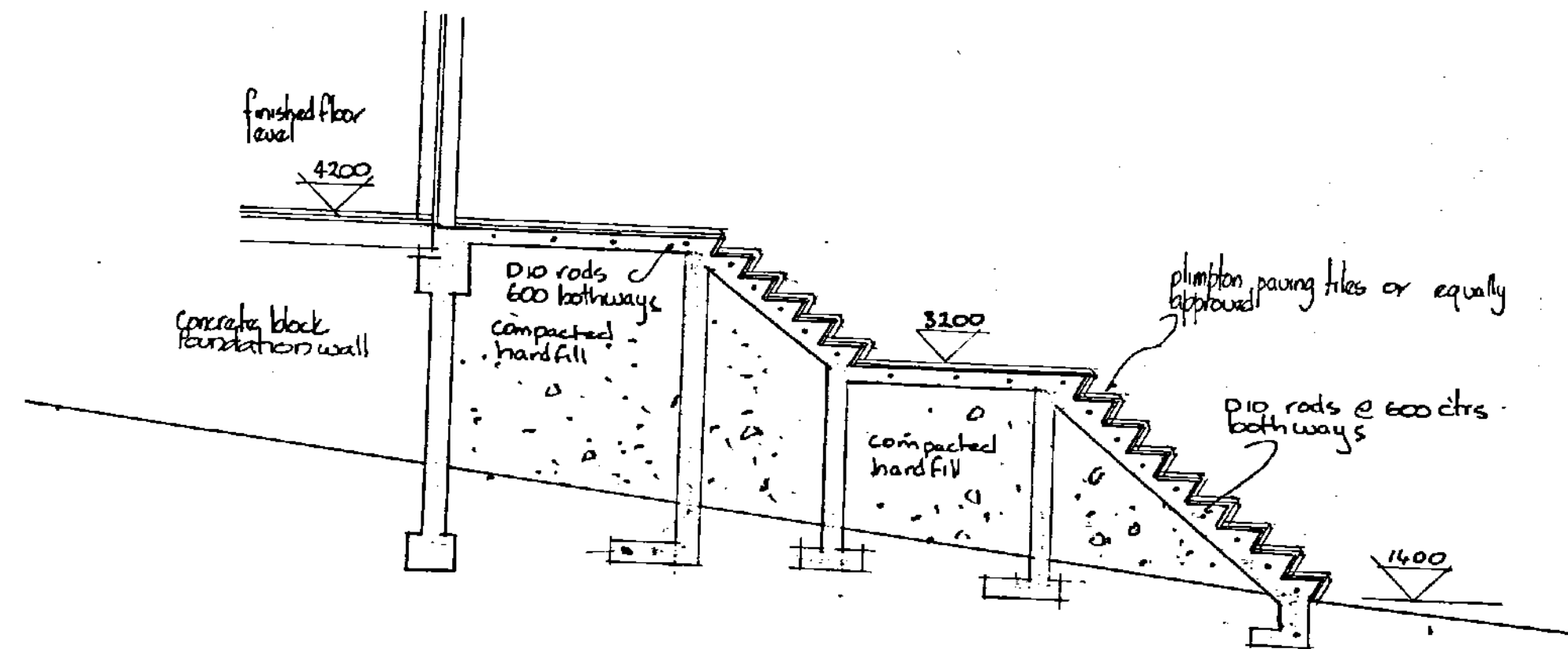
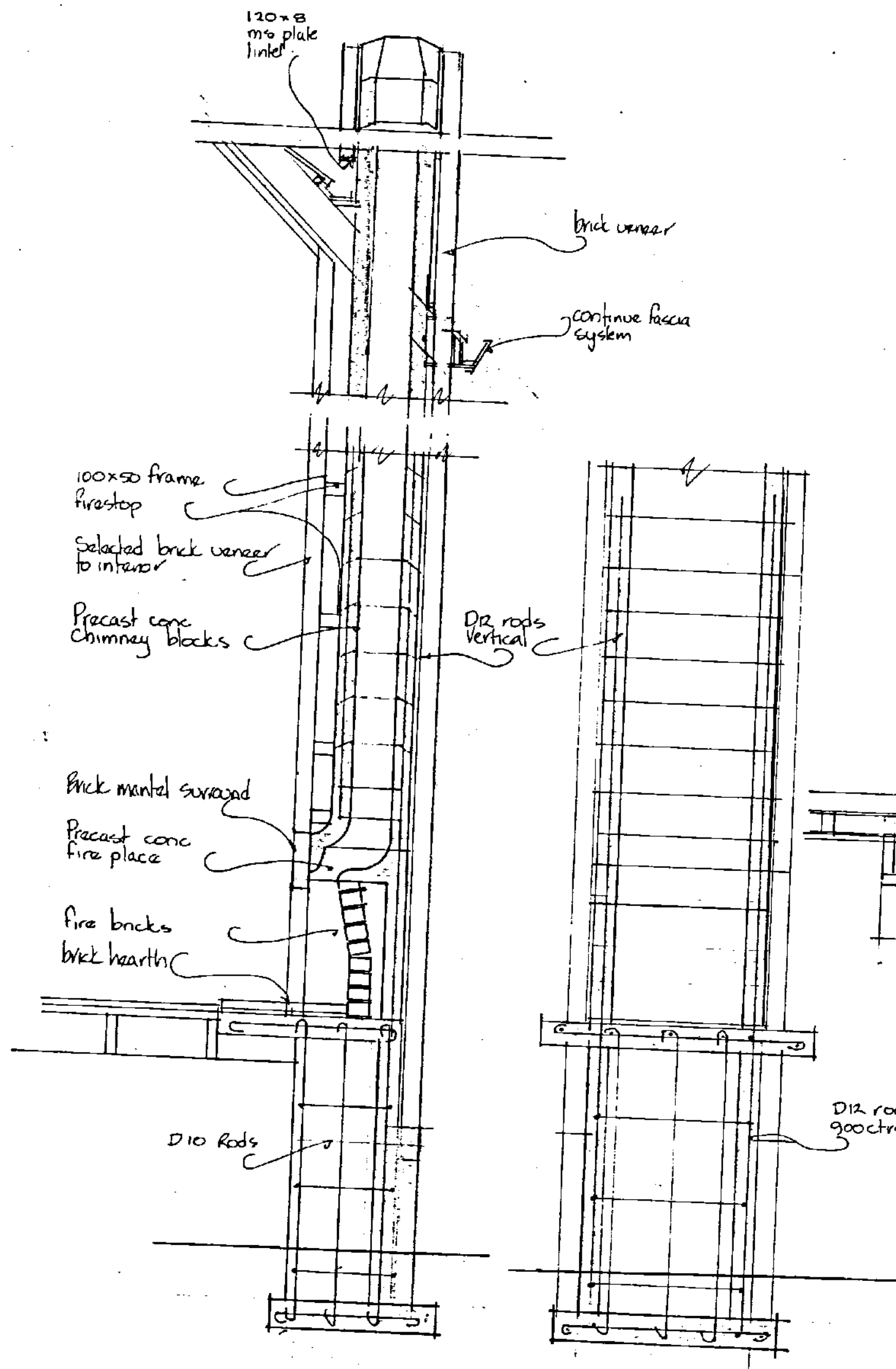
22

BALUSTRADE/EAVE

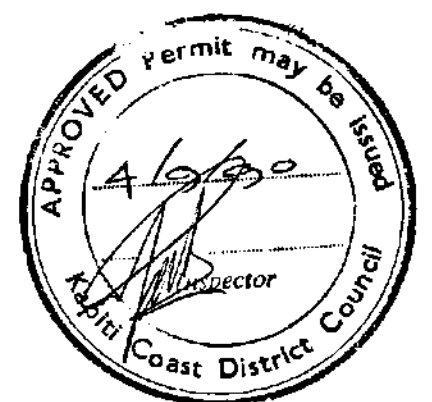
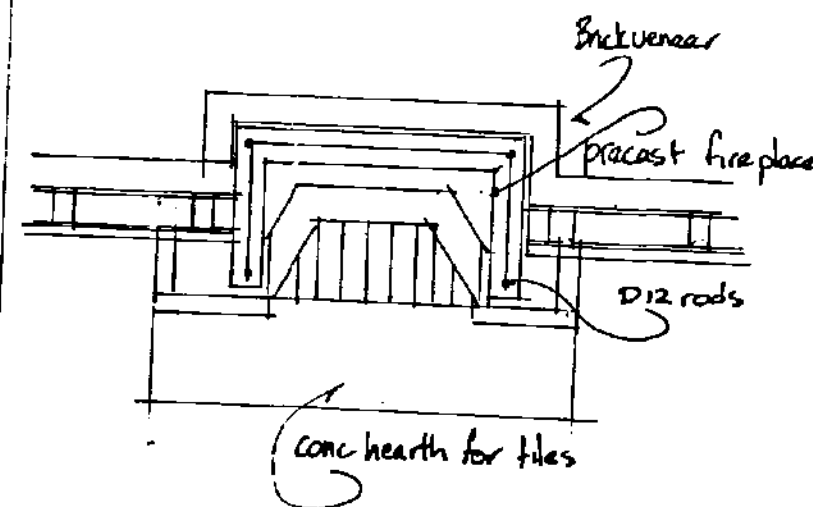


23 CILL DETAIL  
1:5

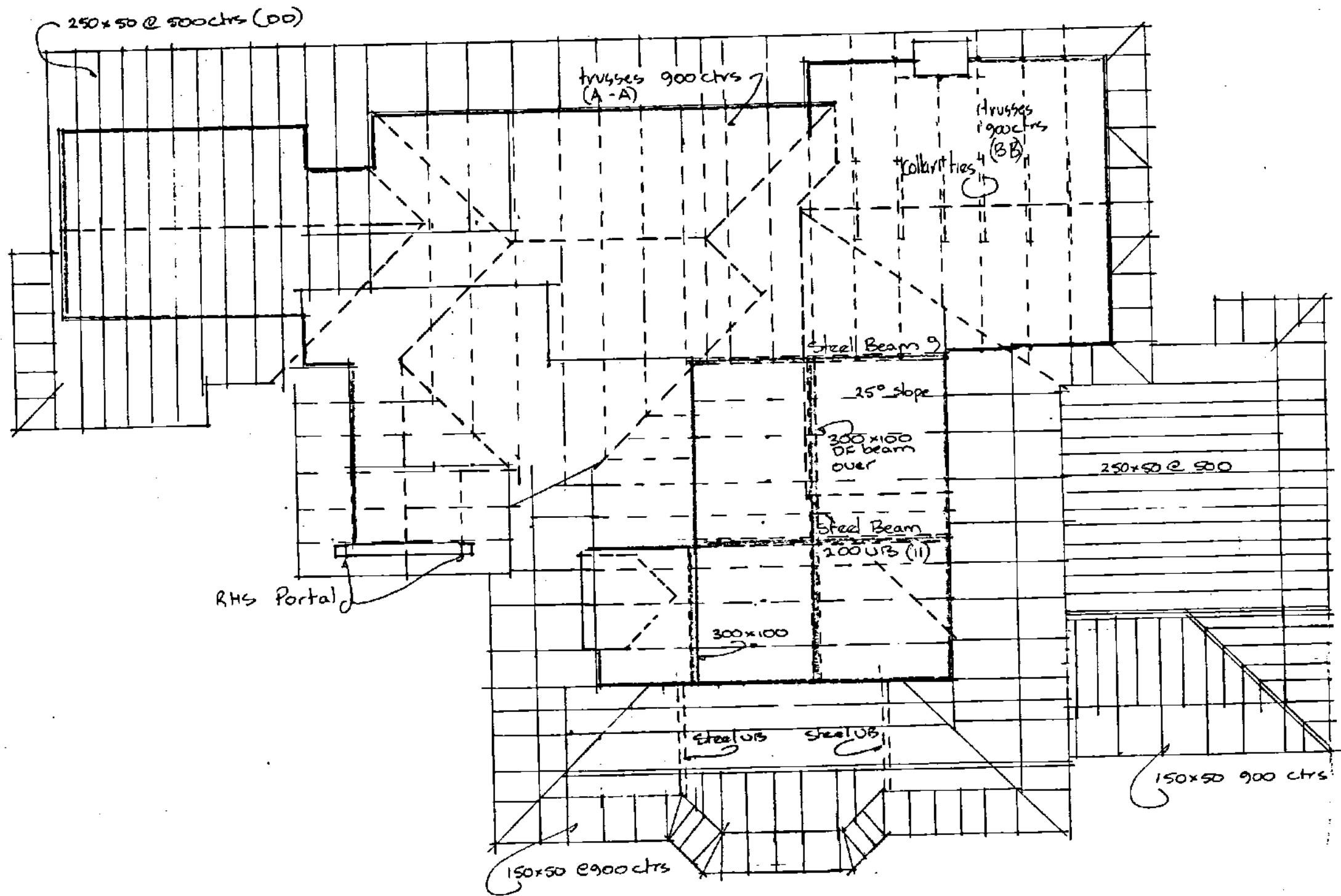
18  
CW 4496  
Aug 90



Steps at Entry  
1:50

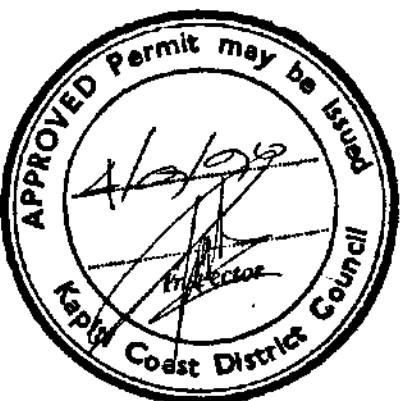


Fire Place and Chimney



# ROOF FRAMING PLAN

1:100



Jumbo Shed

2057 x 3530 mm

for Dr S. Hallwright  
at 105 Wanaue av  
Warkane

Lot 29377

S.p.

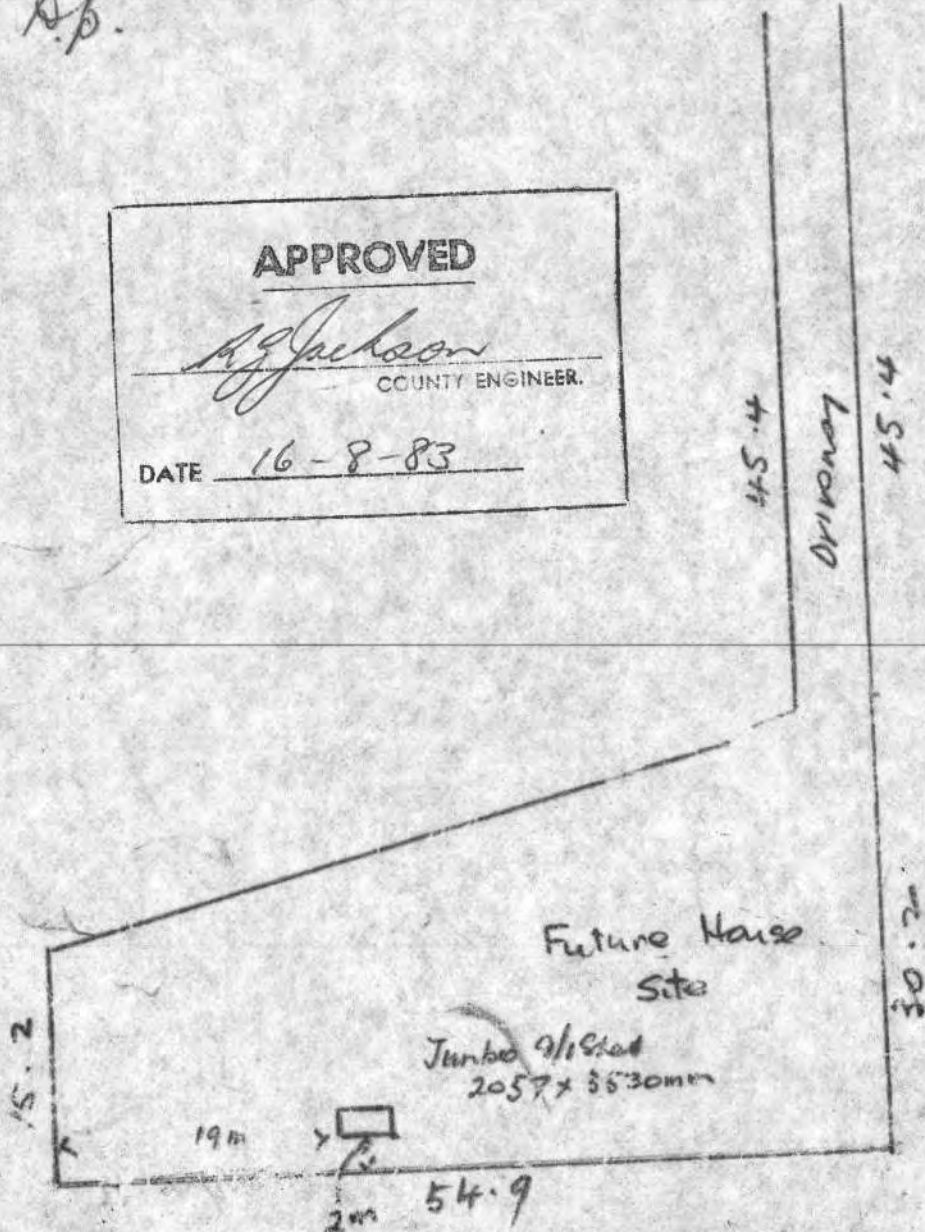
APPROVED

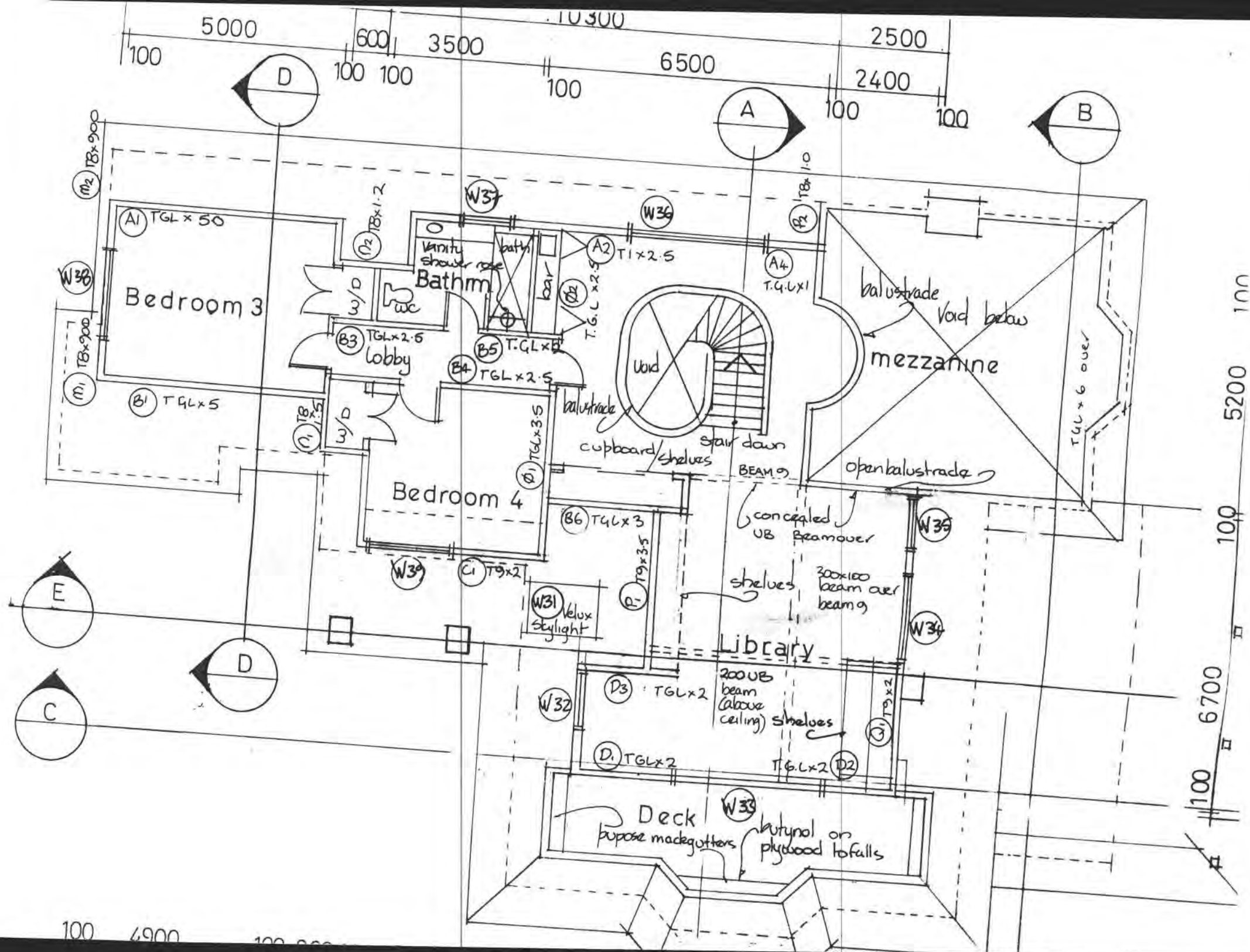
*A. Jackson*  
COUNTY ENGINEER.

DATE 16-8-83

MOROWHERUA COUNTY COUNCIL

NOTE: This application is approved on condition that the building is not used for human habitation.





150

4850

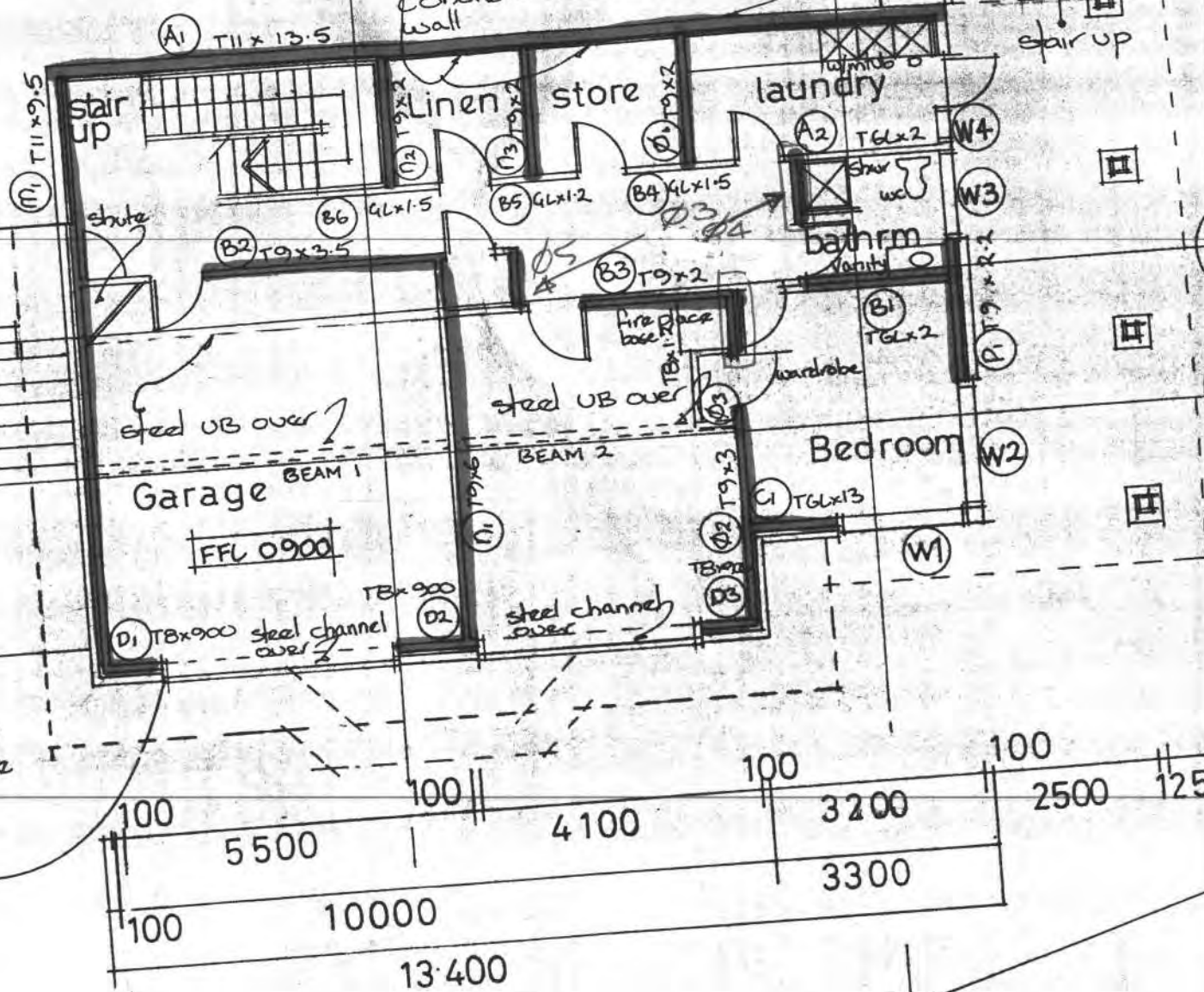
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2300

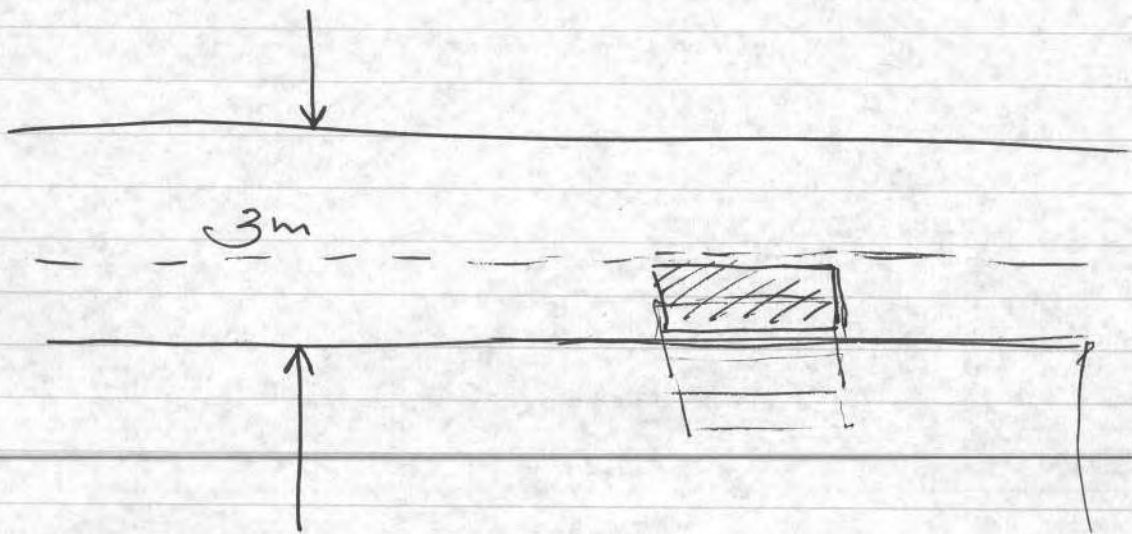
3700

150

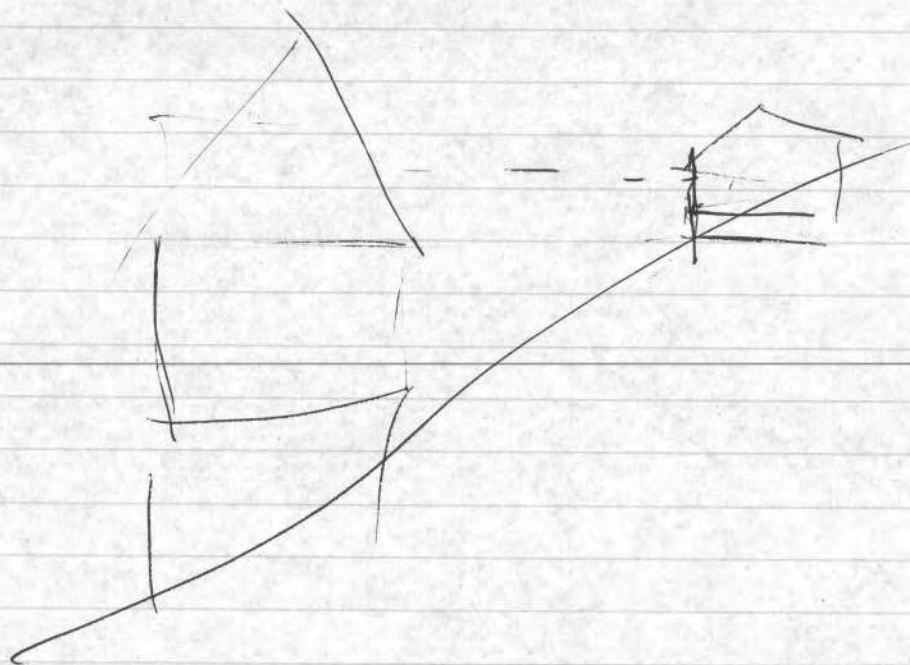
Notes: Concrete block wall internal areas to be lined 9.5 gib board on ex 50x25 strapping tankalised on DPC  
Concrete block retaining wall



LEVEL 1.

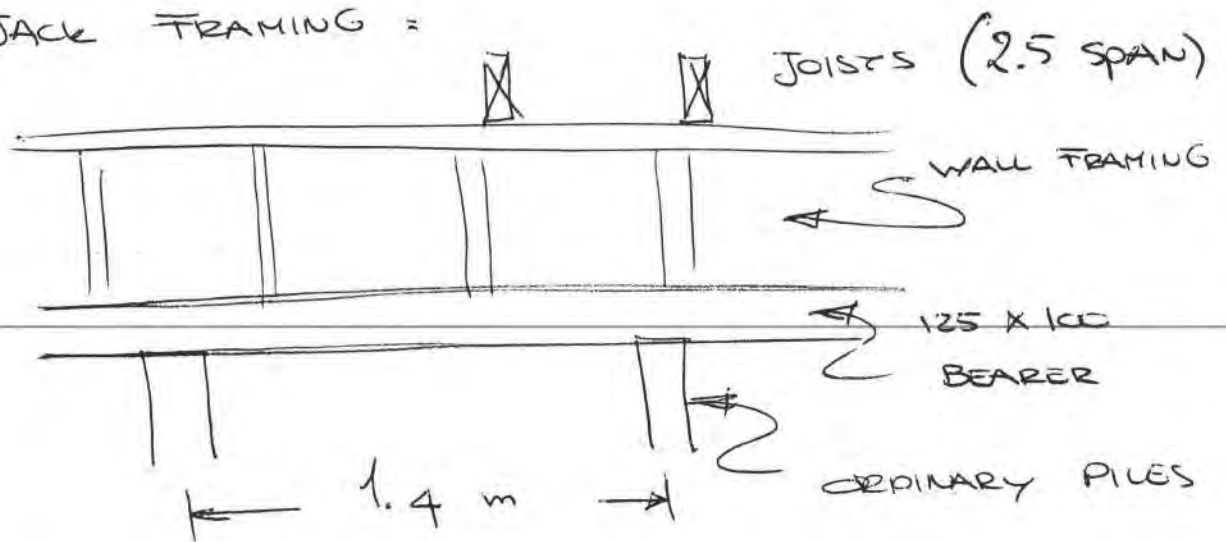


DISPENSATION



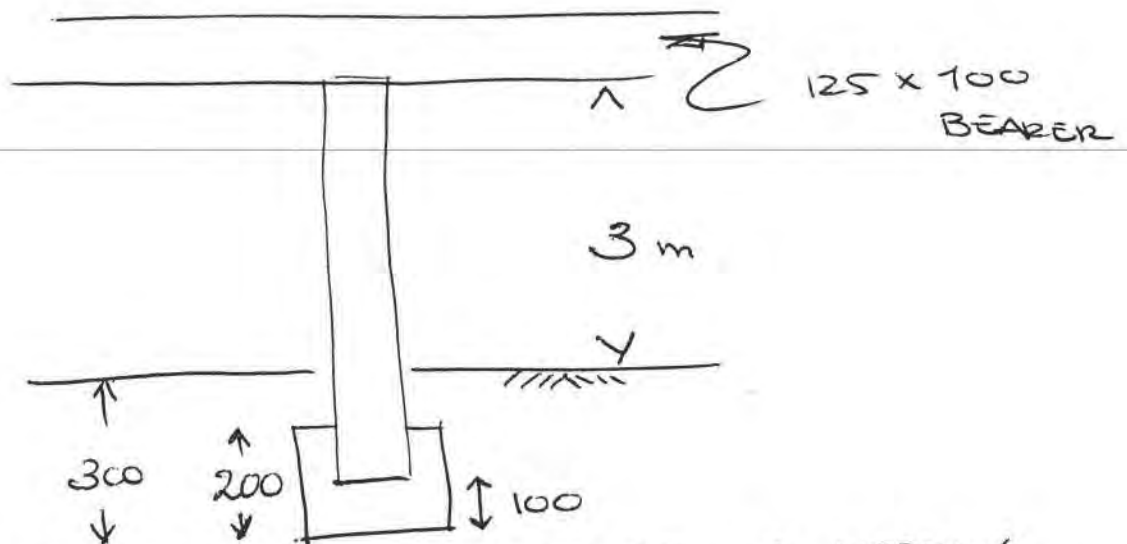
- ENGINEER WILL DESIGN WALL S2 FOR 3 M RETAINING HEIGHT

- JACK FRAMING :

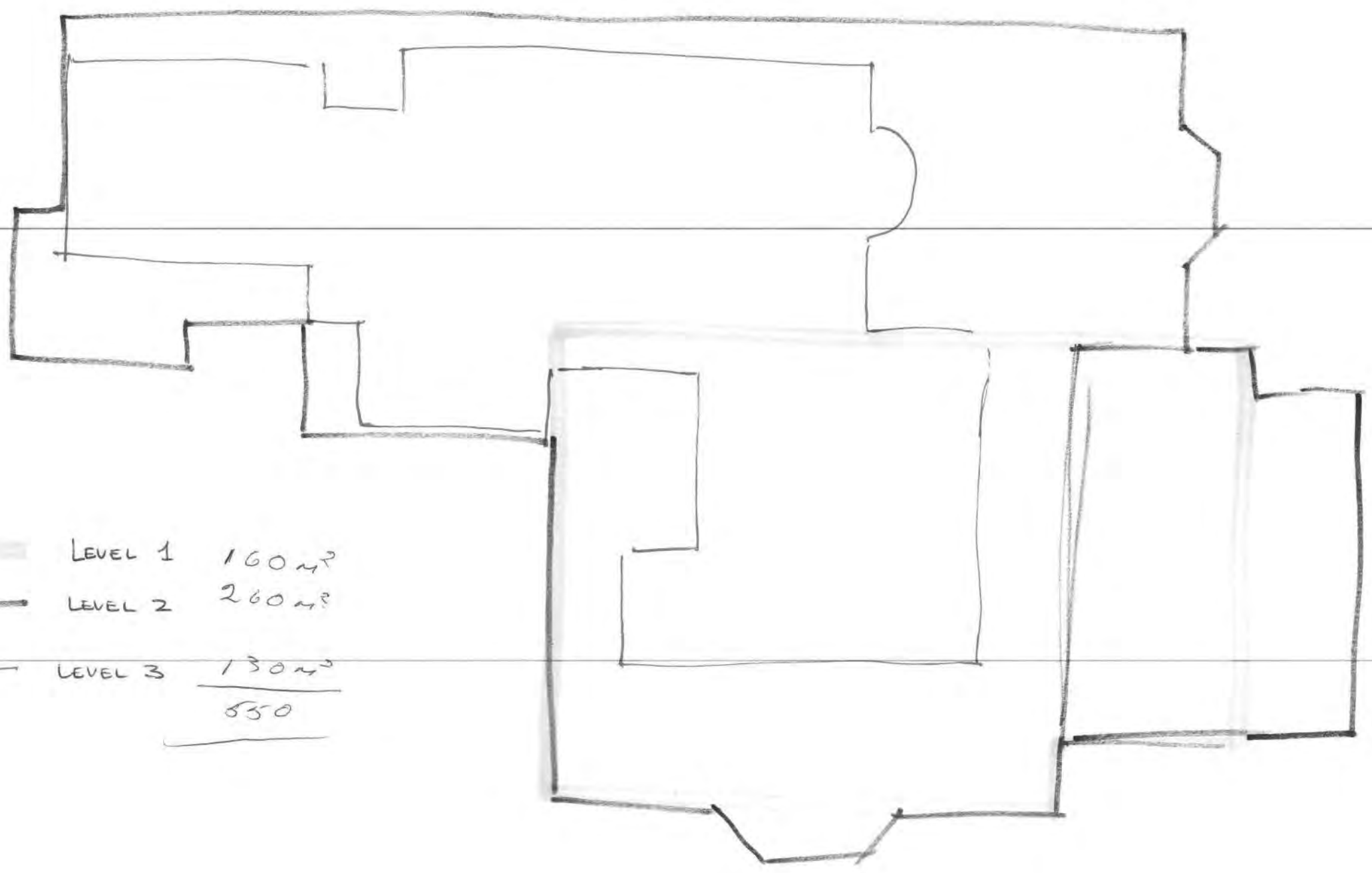


OR,

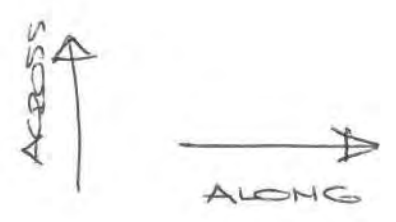
PILES MAX 3 m HIGH

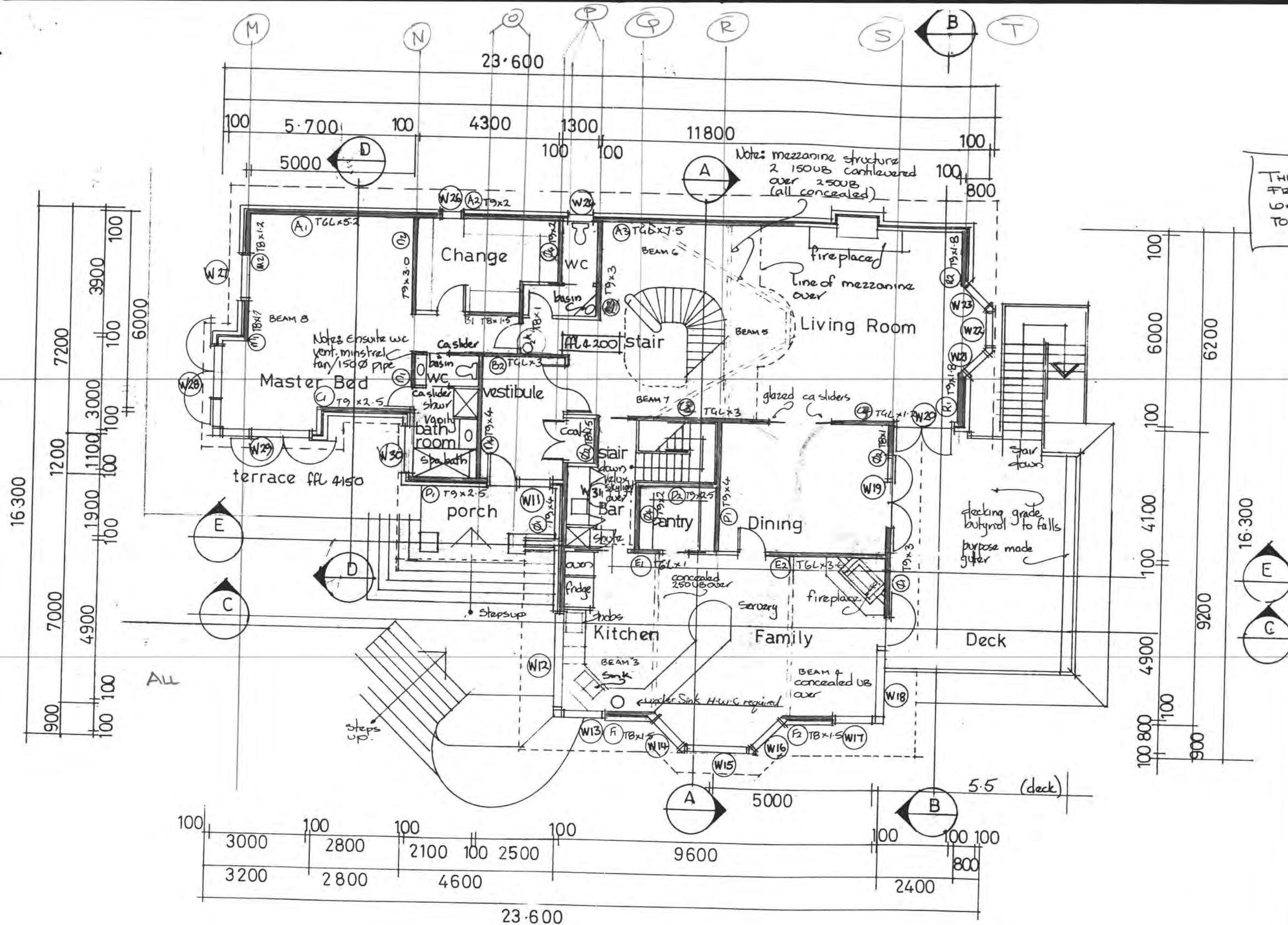


- WILL TRY AND ARRANGE A MEETING ON SITE WITH ARCHITECT / ENGINEER



|         |                    |
|---------|--------------------|
| LEVEL 1 | 160 m <sup>2</sup> |
| LEVEL 2 | 260 m <sup>2</sup> |
| LEVEL 3 | 130 m <sup>2</sup> |
|         | <hr/>              |
|         | 550                |





# DESIGN CERTIFICATE



To ..... Mr. D. Harper .....

..... C/- Rob Kofoed Architect .....

..... Copperfield, PARAPARAUMU BEACH .....

re ..... Harper Dwelling, Winara Avenue, WAIKANAE. ....

(Project Title)

I, ..... Kevin C.F. Spring ....., being a Registered Engineer and holding a current Annual Practising Certificate and being a Member of the Association of Consulting Engineers New Zealand and a ~~Principal~~ Director of ..... Rankine & Hill Ltd .....

....., hereby certify that:

- This Consulting Practice has been engaged to design and execute the appropriate engineering calculations for ..... floor and roof beams, retaining walls and portal entranceway. ....  
(Description & Type of Structure)

proposed to be constructed for ..... Mr. Don Harper .....

(Name of Owner)

located at ..... Winara Avenue, WAIKANAE. ....

(Street Address)

on .....  
(Legal Description of Site)

- The accompanying ..... 29 ..... sheets of ~~drawings~~ titled and numbered ..... 79930 1-22 A1-A7 .....  
(Number) ..... and dated ..... 21 August 1990 ..... and ~~specification sections~~ numbered .....  
..... adequately illustrate the design of the structure.

- I have exercised reasonable control over the design processes for the works defined above which have been designed in accordance with sound and widely accepted engineering principles to support the loads specified in .....  
NZS 4203 1984

and various aspects of the design are in accordance with the following relevant authorities .....

- I believe the stresses in the various materials of construction and force resisting elements of the structure including the foundation strata under the above loads are such as to ensure the safety and stability of the structure if the works are constructed in accordance with the above described drawings and specifications.

The name and qualifications of the principal structural designer are ..... Peter Bolton, BE NZCE

MIPENZ

Signature of ACENZ Member.....

Date.....

Professional Qualifications ..... MIPENZ MIE AUST

Registration No. 47925

For and on behalf of ..... Rankine & Hill Ltd

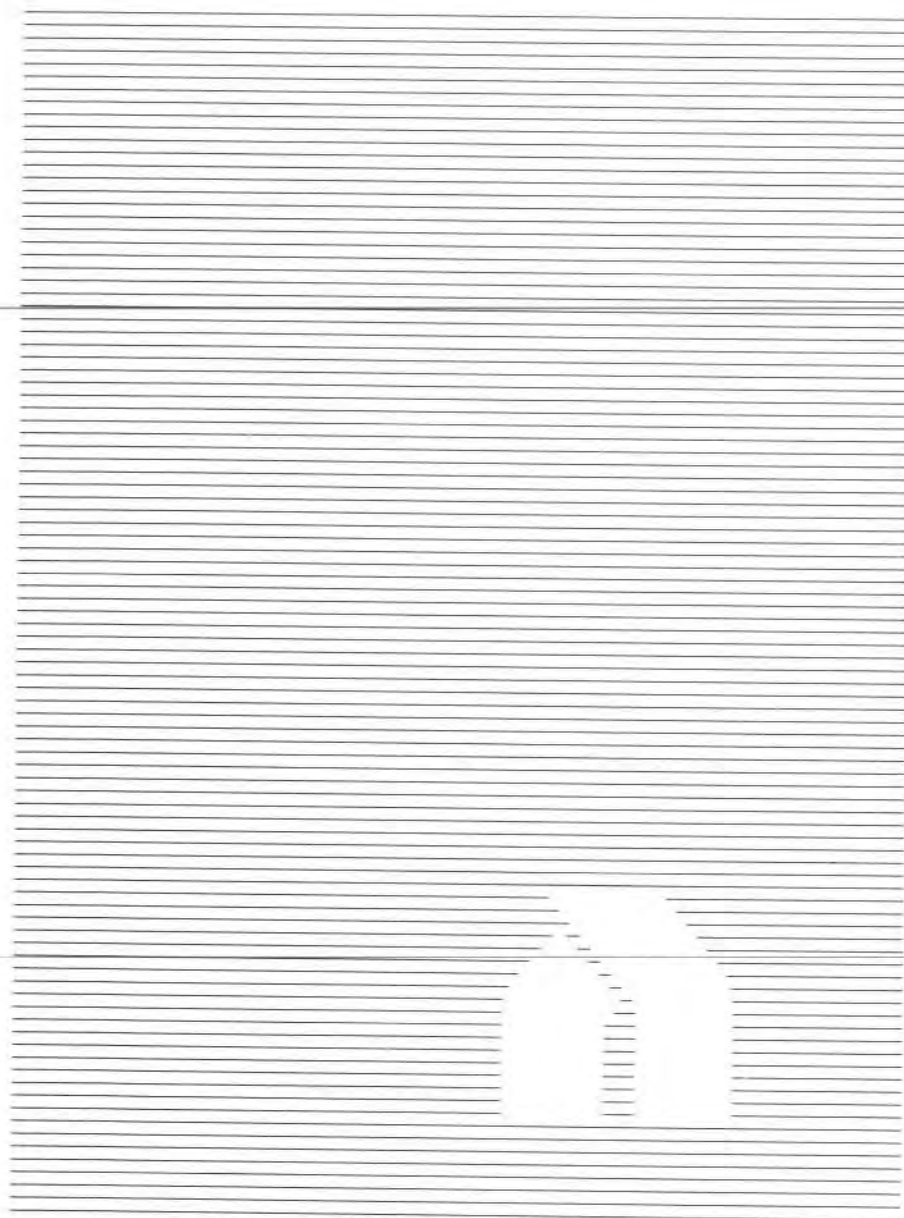
Address ..... P.O. Box 434

..... LEVIN. ....

ASSOCIATION OF  
CONSULTING ENGINEERS NEW ZEALAND

A Division of  
the Institution of Professional Engineers New Zealand

70196



Rankine & Hill

HARPER DWELLING

WINARA AVE

WAIKANA E

AUGUST 1993

## S T R U C T U R E     I N P U T     D A T A

File: -NOFILE-.DAT

LOAD Case: 1     Title: E/O\*

| NODAL LOADS |      |       |       |
|-------------|------|-------|-------|
| Num         | Node | Xload | Yload |
| 1           | 3    | 0.700 | 0.000 |
| 2           | 4    | 0.700 | 0.000 |

| MEMBER UDLs |        |        |         |
|-------------|--------|--------|---------|
| Num         | Member | St-UDL | Fin-UDL |
| 1           | 1      | -1.800 | -1.800  |
| 2           | 2      | -1.800 | -1.800  |
| 3           | 3      | -1.200 | -1.200  |
| 4           | 4      | -1.200 | -1.200  |
| 5           | 5      | 1.800  | 1.800   |

1  
1  
0  
0  
0  
1

Direction

# S T R U C T U R E     O U T P U T     D A T A ---

File: -NOFILE-.DAT

## LOAD COMBINATION

Number: 2  
 Title: D+L\*  
 Factor: 1.00

## NODAL DEFLECTIONS &amp; SUPPORT REACTIONS

| Node | X-Defln | Y-Defln | Z-Rotn | X-React | Y-React | Z-React |
|------|---------|---------|--------|---------|---------|---------|
| 1    | 0.000   | 0.000   | -0.004 | -0.243  | -3.609  | 0.000   |
| 2    | 0.009   | 0.000   | -0.003 | 0.000   | 0.000   | 0.000   |
| 3    | 0.010   | 0.000   | 0.002  | 0.000   | 0.000   | 0.000   |
| 4    | 0.007   | 0.003   | 0.000  | 0.000   | 0.000   | 0.000   |
| 5    | 0.004   | 0.000   | -0.003 | 0.000   | 0.000   | 0.000   |
| 6    | 0.000   | 0.000   | -0.002 | 0.243   | -3.123  | 0.000   |

## MEMBER AXIAL LOADS, SHEARS, &amp; MOMENTS

| Memb | Node | Axial  | Shear  | Moment | Node | Axial | Shear  | Moment |
|------|------|--------|--------|--------|------|-------|--------|--------|
| 1    | 1    | -3.609 | 0.243  | 0.000  | 2    | 3.609 | -0.243 | 0.583  |
| 2    | 2    | -3.609 | 0.243  | -0.583 | 3    | 3.609 | -0.243 | 1.166  |
| 3    | 3    | -2.724 | -2.380 | -1.166 | 4    | 0.344 | -0.000 | -1.190 |
| 4    | 4    | -0.000 | -0.344 | 1.190  | 5    | 2.380 | -2.036 | 0.486  |
| 5    | 5    | -3.123 | -0.243 | -0.486 | 6    | 3.123 | 0.243  | 0.000  |

## MEMBER STRESS AXIAL, SHEAR, &amp; BENDING

| Memb | Node | AxialStr | ShearStr | BendStr | Node | AxialStr | ShearStr | BendStr |
|------|------|----------|----------|---------|------|----------|----------|---------|
| 1    | 1    | -2.390   | 0.161    | 0.000   | 2    | -2.390   | 0.161    | 12.623  |
| 2    | 2    | -2.390   | 0.161    | 12.623  | 3    | -2.390   | 0.161    | 25.245  |
| 3    | 3    | -1.804   | -1.576   | 25.245  | 4    | -0.228   | 0.000    | 25.751  |
| 4    | 4    | -0.000   | -0.228   | 25.751  | 5    | -1.576   | 1.349    | 10.519  |
| 5    | 5    | -2.068   | -0.161   | 10.519  | 6    | -2.068   | -0.161   | 0.000   |

## EQUILIBRIUM SUMMARY

|                   | Horizontal | Vertical |
|-------------------|------------|----------|
| Applied Loads     | 0.000      | 6.732    |
| Support Reactions | 0.000      | -6.732   |

STRUCTURE INPUT DATA

File: -NOFILE-.DAT

## STRUCTURE DATA

## NODAL DATA

| Node | Xcoord | Ycoord | Xrestr | Yrestr | Zrestr |
|------|--------|--------|--------|--------|--------|
| 1    | 0.000  | 0.000  | 1      | 1      | 0      |
| 2    | 0.000  | 2.400  | 0      | 0      | 0      |
| 3    | 0.000  | 4.800  | 0      | 0      | 0      |
| 4    | 1.400  | 6.200  | 0      | 0      | 0      |
| 5    | 2.800  | 4.800  | 0      | 0      | 0      |
| 6    | 2.800  | 2.800  | 1      | 1      | 0      |

## MEMBER DATA

| Member | LHNode | RHNode | PropRef | EndFixity | Length |
|--------|--------|--------|---------|-----------|--------|
| 1      | 1      | 2      | 1       | 1         | 2.400  |
| 2      | 2      | 3      | 1       | 1         | 2.400  |
| 3      | 3      | 4      | 1       | 1         | 1.980  |
| 4      | 4      | 5      | 1       | 1         | 1.980  |
| 5      | 5      | 6      | 1       | 1         | 2.000  |

## PROPERTY DATA

| Ref | Elasticity | XArea     | Inertia   | Sect-Mod  | Description |
|-----|------------|-----------|-----------|-----------|-------------|
| 1   | 2.000E+08  | 1.510E-03 | 2.340E-06 | 4.620E-05 | 102*102 RHS |

# S T R U C T U R E     O U T P U T     D A T A

File: -NOFILE-.DAT

## LOAD COMBINATION

Number: 1  
 Title: E/Q\*

Factor: 1.00

## NODAL DEFLECTIONS &amp; SUPPORT REACTIONS

| Node | X-Defln | Y-Defln | Z-Rotn | X-React | Y-React | Z-React |
|------|---------|---------|--------|---------|---------|---------|
| 1    | 0.000   | 0.000   | -0.057 | -5.557  | -4.583  | 0.000   |
| 2    | 0.116   | 0.000   | -0.032 | 0.000   | 0.000   | 0.000   |
| 3    | 0.142   | 0.000   | 0.008  | 0.000   | 0.000   | 0.000   |
| 4    | 0.125   | 0.017   | 0.006  | 0.000   | 0.000   | 0.000   |
| 5    | 0.108   | -0.000  | -0.035 | 0.000   | 0.000   | 0.000   |
| 6    | 0.000   | 0.000   | -0.064 | -8.082  | 9.335   | 0.000   |

## MEMBER AXIAL LOADS, SHEARS, &amp; MOMENTS

| Memb | Node | Axial  | Shear  | Moment | Node | Axial  | Shear  | Moment  |
|------|------|--------|--------|--------|------|--------|--------|---------|
| 1    | 1    | -4.583 | 5.557  | 0.000  | 2    | 4.583  | -1.237 | 8.154   |
| 2    | 2    | -4.583 | 1.237  | -8.154 | 3    | 4.583  | 3.082  | 5.940   |
| 3    | 3    | -0.566 | -5.915 | -5.940 | 4    | 2.246  | 7.595  | -7.435  |
| 4    | 4    | 8.090  | -1.751 | 7.435  | 5    | -9.770 | 3.431  | -12.565 |
| 5    | 5    | 9.335  | 4.482  | 12.565 | 6    | -9.335 | -8.082 | 0.000   |

## MEMBER STRESS AXIAL, SHEAR, &amp; BENDING

| Memb | Node | AxialStr | ShearStr | BendStr | Node | AxialStr | ShearStr | BendStr |
|------|------|----------|----------|---------|------|----------|----------|---------|
| 1    | 1    | -3.035   | 3.680    | 0.000   | 2    | -3.035   | 0.820    | 176.494 |
| 2    | 2    | -3.035   | 0.820    | 176.494 | 3    | -3.035   | -2.041   | 128.574 |
| 3    | 3    | -0.375   | -3.917   | 128.574 | 4    | -1.487   | -5.030   | 160.926 |
| 4    | 4    | 5.358    | -1.160   | 160.926 | 5    | 6.470    | -2.272   | 271.970 |
| 5    | 5    | 6.182    | 2.969    | 271.970 | 6    | 6.182    | 5.353    | 0.000   |

## EQUILIBRIUM SUMMARY

|                   | Horizontal | Vertical |
|-------------------|------------|----------|
| Applied Loads     | 13.640     | -4.752   |
| Support Reactions | -13.640    | 4.752    |



### BEAM SCHEDULE

| No. | Type                       | Location                            | Remarks                                 |
|-----|----------------------------|-------------------------------------|-----------------------------------------|
| 1   | 200 UB 25<br>or 250 UB 31. | Garage                              | See Alternative schemes<br>A & B Pg A2. |
| 2   | 150 UB 14                  | Garage                              | See Note & Pg A2                        |
| 3.  | 250 UB 31                  | Kitchen                             | Precamber 10mm                          |
| 4   | 250 UB 31                  | Family                              | Precamber 10mm                          |
| 5.  | 200 UB 25                  | Living Room                         |                                         |
| 6.  | 150 UB 14                  | Cantilever living<br>room.          | See detail 1.<br>Pg A3.                 |
| 7.  | 150 UB 14                  | as Beam 6.                          | as Beam 6.                              |
| 8   | 200 UB 25<br>or 250 UB 31  | Garage                              | See alternative schemes<br>A & B Pg A2  |
| 9.  | 200 UB 25                  | Mezzanine                           |                                         |
| 10. | 200 UB 25                  | Bed 3 Ridge beam                    | Precamber 10.                           |
| 11  | 200 UB 25                  | Living Room Ridge                   | Precamber 25                            |
| 12  | 200 UB 25                  | Living Room/Mezzanine<br>Ridge Beam | Precamber 10                            |



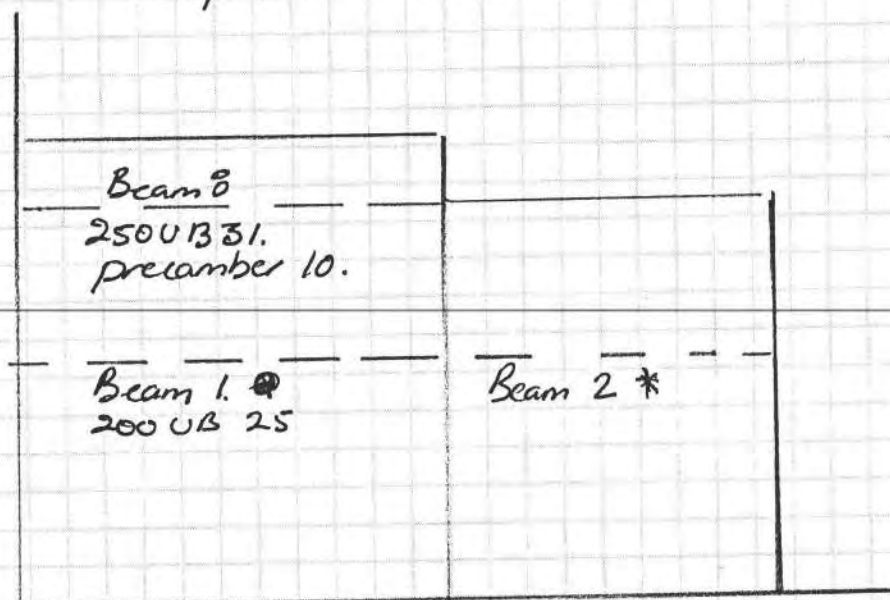
Job

By PB

Date 21.8.90

BEAMS 1, 2 & 8.

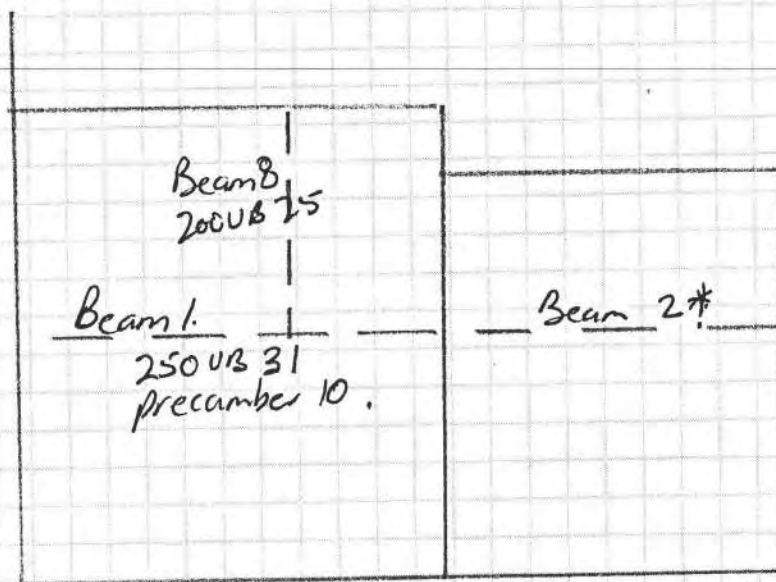
Beam 8 required to support beam 3 reaction from above.



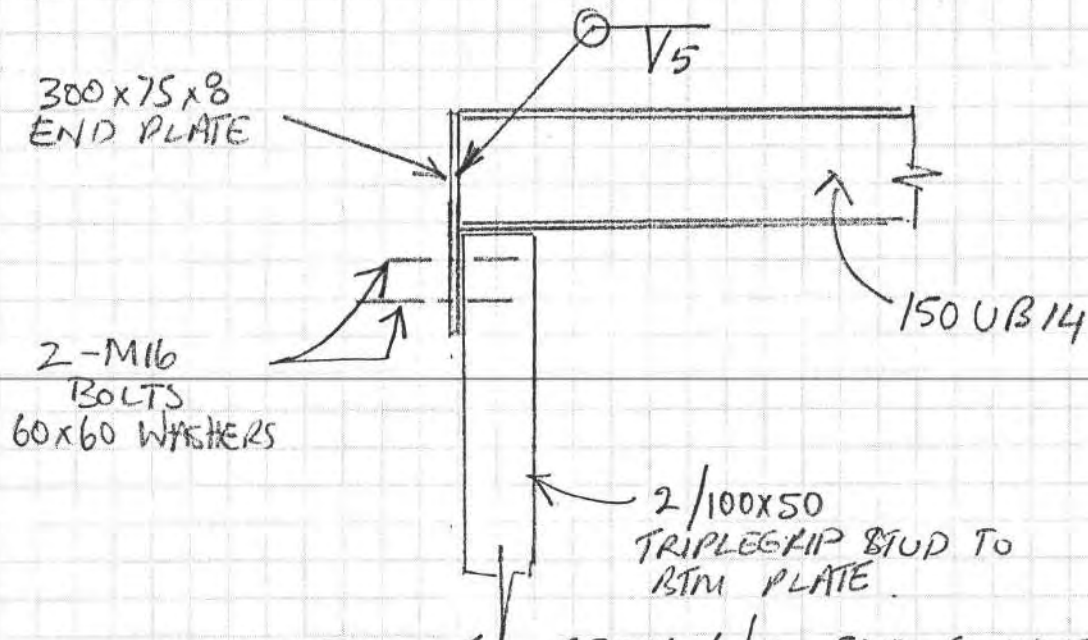
SCHEME A.

• may replace with 300 x 50 - 450 %.

\* may replace with 250 x 50 - 600 %.



SCHEME B.



DETAIL 1 BEAM 6/7 END CONNECTION

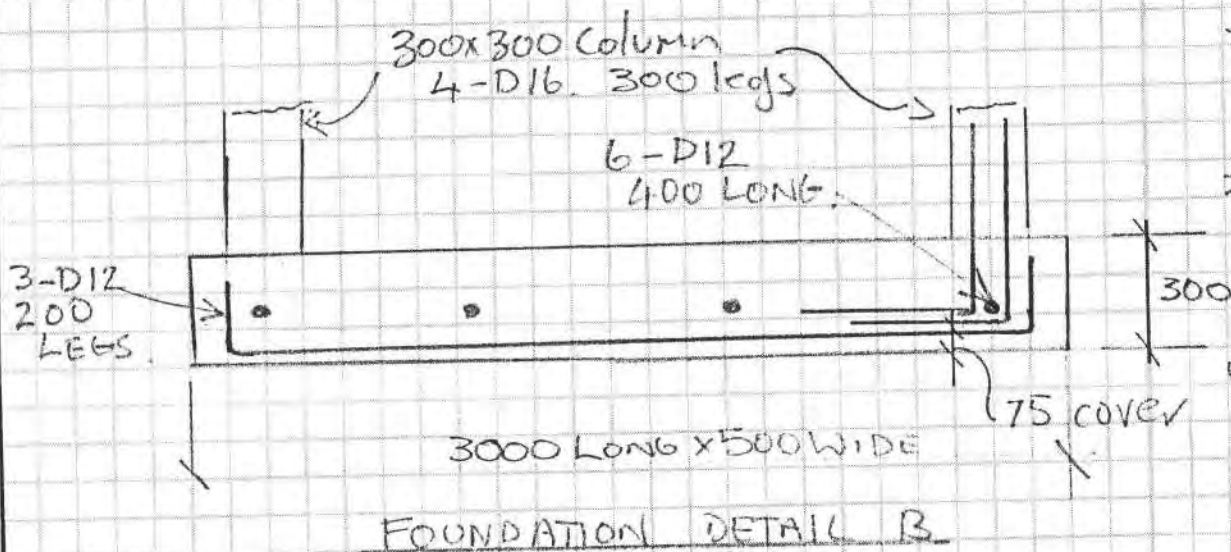
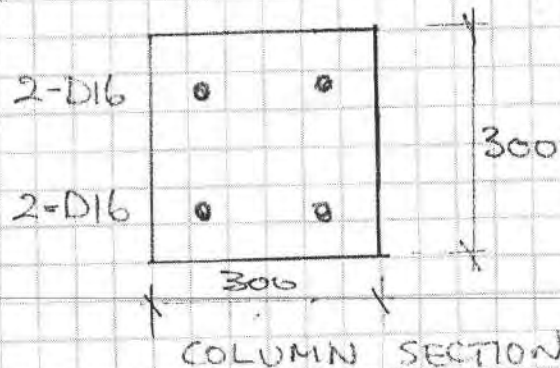
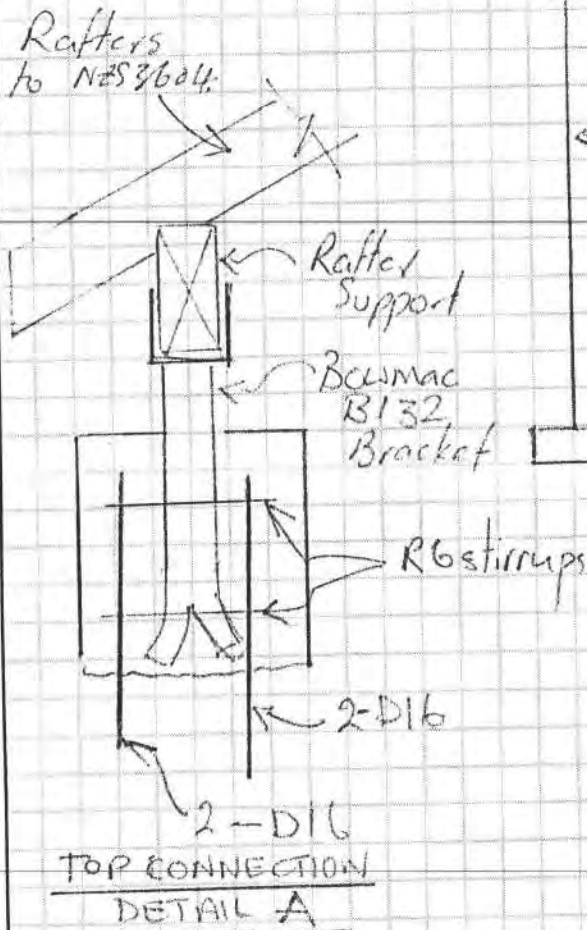
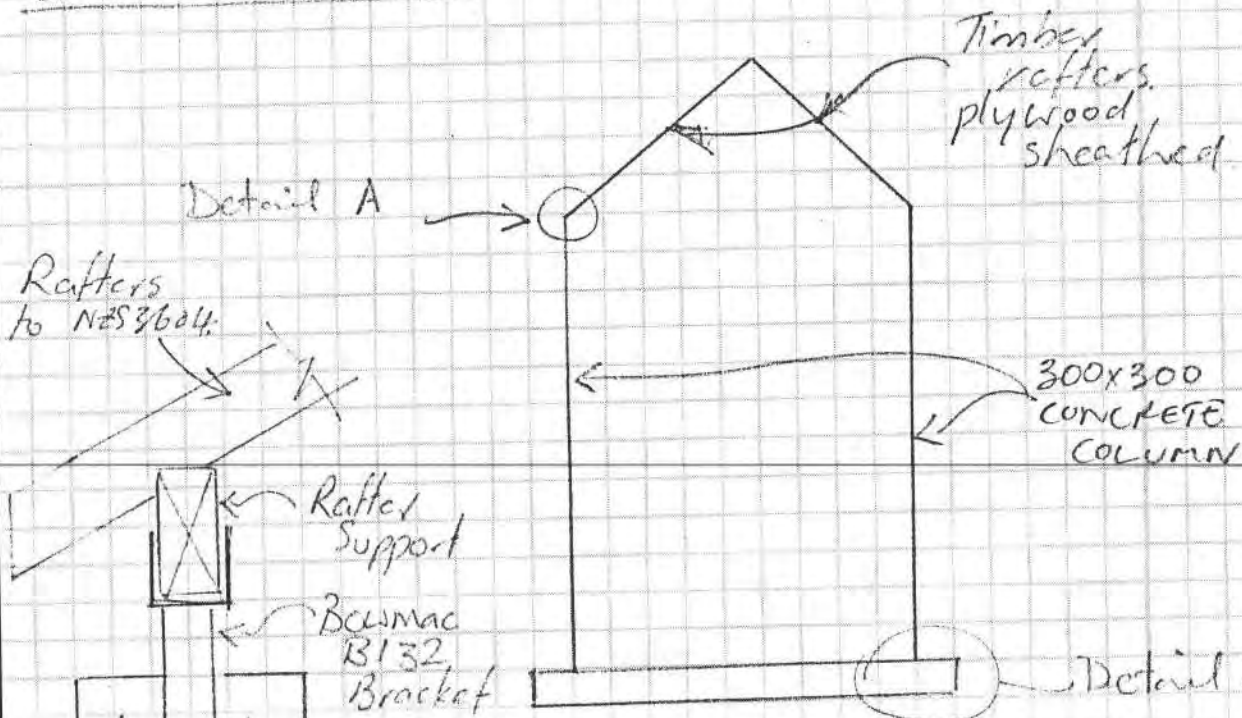


Job

By P/Bolton

Date 31 August

## ENTRANCE PORTAL



Ensure thorough vibration of columns  
Use brick veneer as permanent formwork  
Concrete strength 20 MPa @ 28 days  
Lap length for bars 500 mm

NB

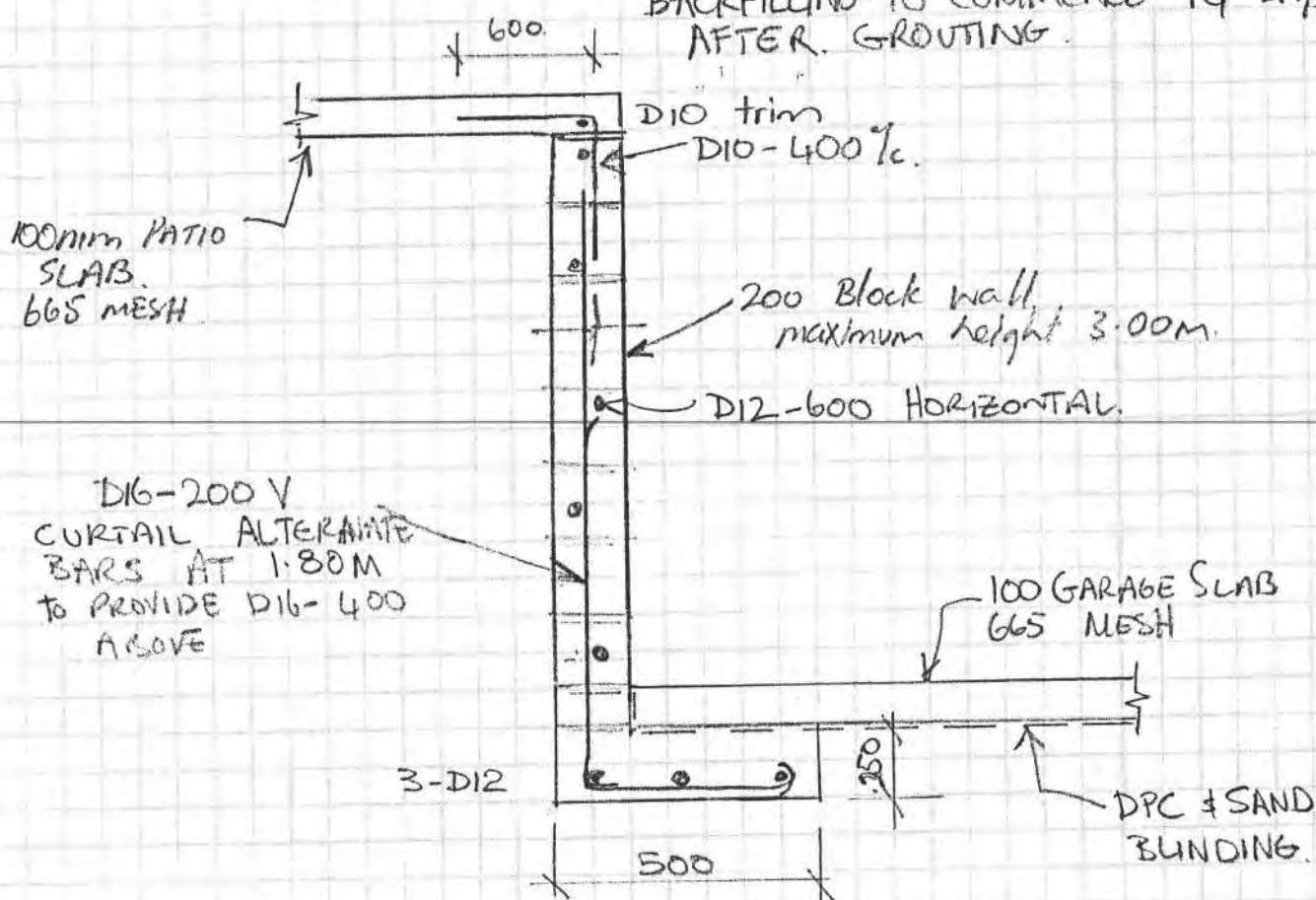
Job HARPER FOUNDATION

BLOCK WALL S1

NB

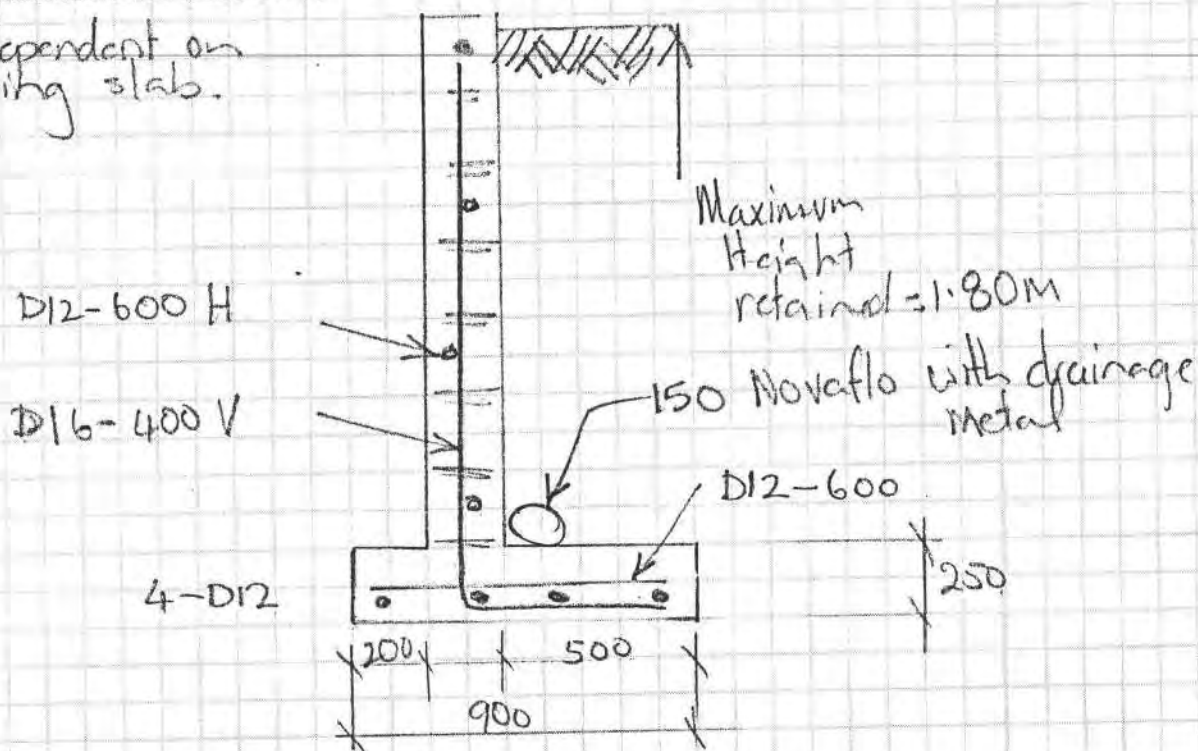
NB THIS WALL MUST BE PROPPED TO PERMIT BACKFILLING.

BACKFILLING TO COMMENCE 14 DAYS AFTER GROUTING.



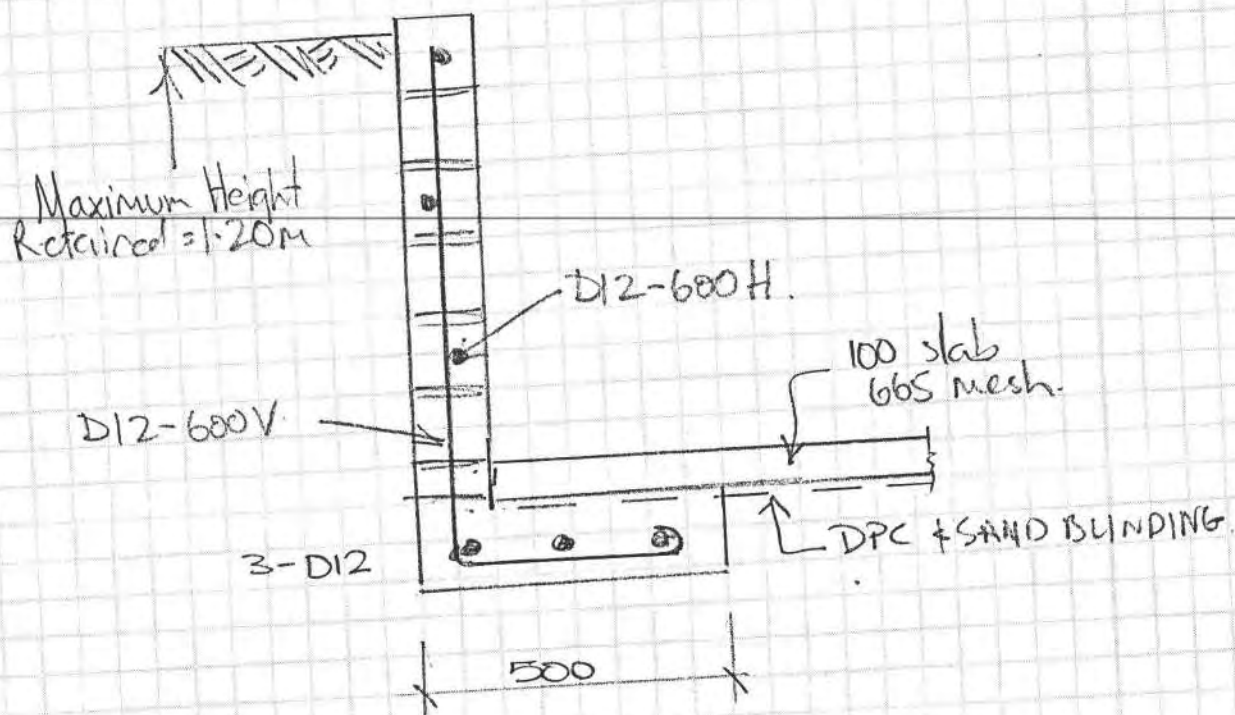
BLOCK WALL S2

Not dependent on paving slab.





## BLOCK WALL S3



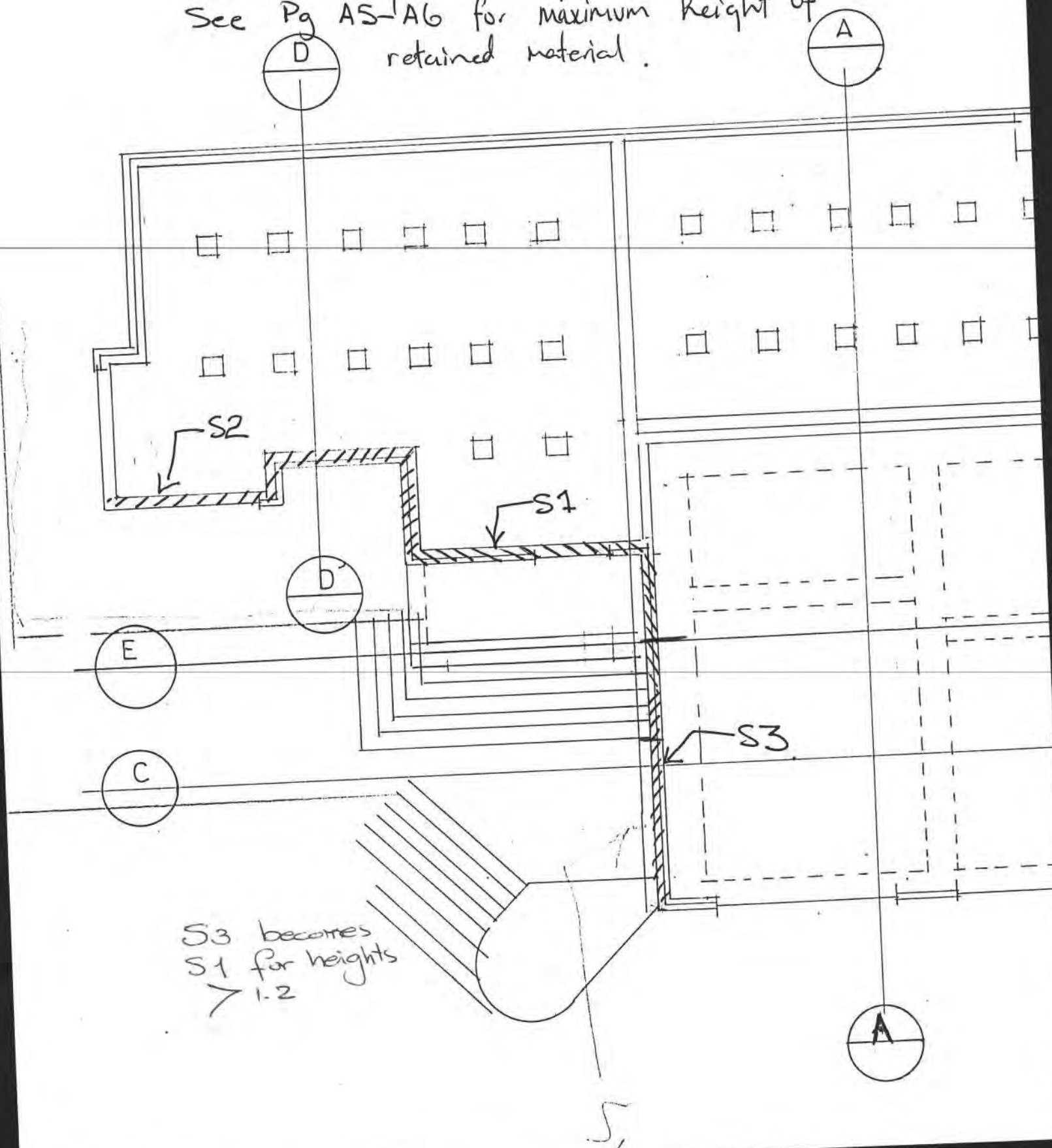
### NOTES

- 1/ BLOCKWORK ALL CELLS FILLED 20MPA
- 2/ ENSURE THOROUGH CURING WITH MOISTURE FOR MINIMUM 7 DAYS.
- 3/ ALL STEEL 275 MPa
- 4/ LAP LENGTH 600 MM.

Block WALL PLAN.

Locations typical only.

See Pg AS-A6 for maximum height of retained material.





### BRIEF

Provide structural design for

- 9 beams.
- 2 lintels
- 2 retaining foundation walls
- portal entranceway.

14 drawings provided by R. Kofoed.

Design to be in accordance with

|               |               |
|---------------|---------------|
| NZS 4203:1984 | Loadings Code |
| NZS 4230:1985 | Masonry Code  |
| NZS 3404:1989 | Steel Code    |
| NZS 3101:1982 | Concrete Code |

Construction be in accordance with

|                |                       |
|----------------|-----------------------|
| NZS 4210P:1981 | Masonry Construction  |
| NZS 3109:1980  | Concrete Construction |

### LOADINGS

#### Roof

|                         |      |
|-------------------------|------|
| concrete tiles          | 0.53 |
| batters. 50 x 50        | 0.04 |
| rafters 250 x 50 - 500% | 0.15 |
| ceiling                 | 0.09 |
| insulation              | 0.02 |
| misc.                   | 0.03 |

DEAD 0.86  
LIVE 0.25 kPa  
1.11 kPa

#### Walls

##### External

|                |      |
|----------------|------|
| brick veneer   | 1.70 |
| timber framing | 0.10 |
| lining         | 0.11 |
| insulation etc | 0.04 |

DEAD 1.95 kPa

##### Internal

|         |      |
|---------|------|
| framing | 0.10 |
| lining  | 0.22 |
| misc    | 0.02 |

DEAD 0.34 kPa



Job

BEAM 10 Bedroom 3 roof ridge beam

From section DD beam takes roof load only.  
Dead + Live will govern.

Span = 5.20m

$$W = 1.11 \times 5.8 = 6.4 \text{ kN/m}$$

Bending Moment M

$$M = \frac{Wl^2}{8} = 6.4 \times 5.2^2 / 8 = 27.8 \text{ kN}\cdot\text{m}$$

Try 200 UB 25

$$Z = 232 \text{ cm}^3$$

Actual Bending Stress  $f_b$

$$f_b = \frac{M}{Z} = \frac{27.8 \times 10^6}{232 \times 10^3} = 94 \text{ MPa}$$

allowable Bending Stress  $F_b$

$$F_b = 165$$

$$\frac{f}{f_y} = \frac{500}{31} = 16. \quad \frac{D}{T} = 29$$

Deflection

$$S_{dl} = \frac{5 W l^4}{384 E I} = \frac{5 \times 6.4 \times 5.2^4}{384 \times 200 \times 23.6} = 13 \text{ mm accept.}$$

$$S_{dead} = \frac{13 \times 0.86}{1.11} = 10 \text{ mm}$$

BEAM 10

200 UB 25

PRECAMBER

10mm

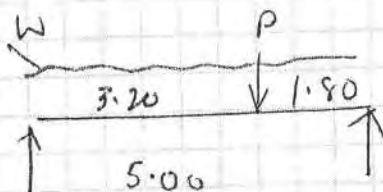


### BEAM 9 Mezzanine / Library Roof beam

Section AA beam spans 5.0 m and takes roof truss load over mezzanine plus point load from library roof trim beam.

$$w = 1.11 \times 4.0 = 4.44 \text{ kN/m}$$

$$P = 1.11 \times \frac{6.0}{2} \times \frac{3.4}{2} = 5.7 \text{ kN}$$



Bending Moment M

$$M = \frac{Pl}{4} + \frac{wl^2}{8} = \frac{5.7 \times 5.0}{4} + \frac{4.44 \times 5.0^2}{8} = 24.9 \text{ kN.m}$$

Try 200UB25.

$$f_b = \frac{24.9 \times 10^6}{232 \times 10^3} = 107 \text{ MPa}$$

$$f_b = 138 \text{ MPa accept}$$

$$\frac{l}{r_y} = \frac{3101}{31} = 103$$

$$D_T = 29$$

Deflection

$$\delta = \frac{l^3}{48EI} \left[ P \left( \frac{3a}{l} - 4 \left( \frac{a}{l} \right)^3 \right) + \frac{wl}{8} \right]$$

$$= \frac{5.0^3}{48 \times 100 \times 23.6} \left( 5.7 \left( \frac{3 \times 1.8}{5.0} - 4 \left( \frac{1.8}{5.0} \right)^3 \right) + \frac{4.44 \times 5.0}{8} \right)$$

$$= 4 \text{ mm accept}$$

BEAM 9  
200UB25

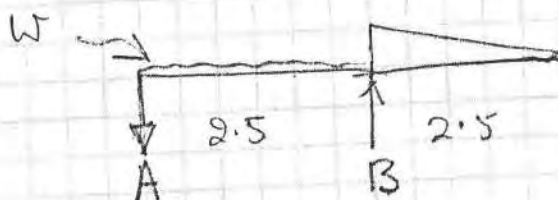


Job

BEAMS 6/7

Cantilever Beams over Living Room.

Span 5.0 m



Floor Loading

Decking  
joists  
ceiling  
misc

300 x 50 - 500

0.14

0.18

0.09

0.02

0.43 kPa

DEAD

LIVE

1.50 kPa

2.00 kPa

BALCONY

$$W = \frac{1}{2} \cdot 2.43 \cdot 1.6 = 1.9 \text{ kN}$$

Bending Moment

$$M = W \cdot \frac{1}{3} = 1.9 \cdot \frac{2.5}{3} = 1.6 \text{ kN.m.}$$

Try 150 UB 14

$$\frac{M}{I_b} = \frac{1.6}{0.0888} = 18 \text{ MPa}$$

$$F_b = 74 \text{ MPa} > 18 \text{ OK}$$

$$\frac{L}{I_y} = \frac{2 \times 2500}{17.1} = 292$$

$$D_T = 16$$

Deflection

$$\delta_{DL} = \frac{W \cdot \frac{1}{3}}{15 \cdot E \cdot I} = \frac{1.9 \times 2.5^3}{15 \times 200 \times 6.66}$$

2 mm plus transverse beam deflection (7) BEAMS 6/7

= 9 mm

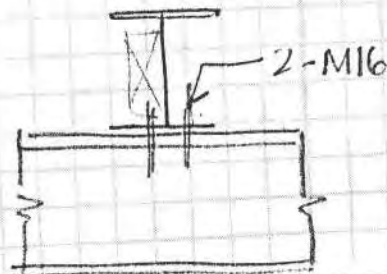
total accept.

150UB14

CONNECTIONS

At B

Over Transverse beam





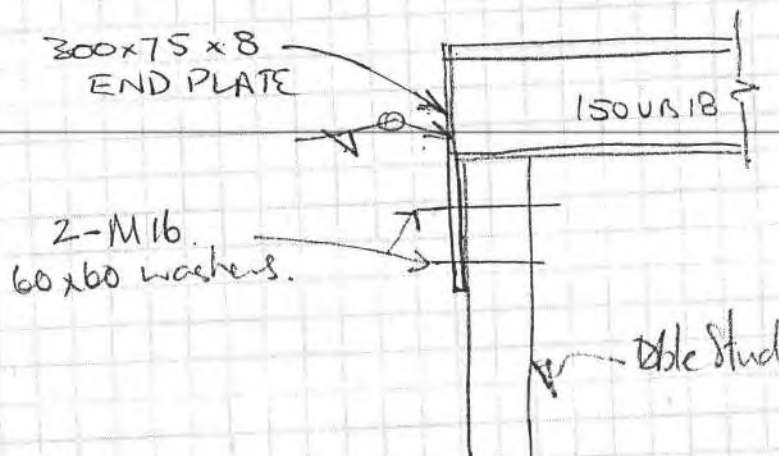
### CONNECTION AT A

Design to prevent uplift

Assumed live load only on balcony.

$$1.9 \times 2.5 \times \frac{2}{3} = 2.5 R$$

$$R = 1.3 \text{ kN} \uparrow$$



### Check Bolts in Shear

$$R = 1.3 / 2 = 0.6 \text{ kN/bolt}$$

By NZS 3603 Table 19

$$P_B = 5.49 \text{ kN} \quad \text{M16 in 90 mm timber}$$

$$P_A = 1.35 \times 5.49 = 7.4 \text{ kN} > 0.6 \text{ kN} \text{ accept}$$

NB. Ensure btm of double stud and stud connections below are all of minimum 1.0 kN capacity. eg. Triple grip



Job

BEAM 5 Supporting Beam for two cantilevered UBs

$$P = 1.9 + 0.43 \times 2.0 \times 1.0 = 2.8 \text{ kN}$$

$$W = 1.93 \times 4.0 / 2 + 0.3$$

$$= 4.2 \text{ kN/m}$$

$$M = Pa + Wl^2/8$$

$$= 2.8 \times 1.5 + 4.2 \times 6.0^2 / 8 = 23.0 \text{ kNm}$$

Try 200 UB 25

$$f_b = \frac{23.0}{0.232} = 100 \text{ MPa}$$

$$f_b = 138 \text{ MPa}$$

$$l/r_y = \frac{3000}{31} = 97$$

$$D/T = 29$$

Deflection

$$\delta = \frac{Pl^3}{6EI} \left[ \frac{3a}{4l} - \left( \frac{a}{l} \right)^3 \right] + \frac{Wl^4}{384EI}$$

$$\leq \underline{\underline{7 \text{ mm}}}$$

$$= 0.001 \text{ span accept.}$$

BEAM 5

200 UB 25



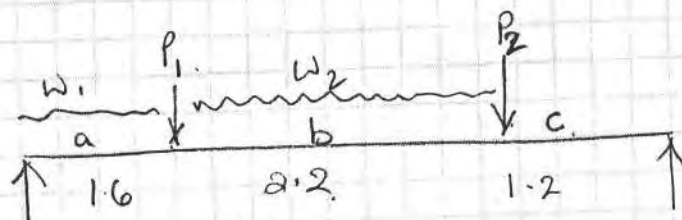
Job

BEAM 4/3 Family Room Beam  
Kitchen Beam

Span 5.0M

Beams take roof load, balcony, floor  
Loading

Check 3m long  
joists to take roof  
loading etc



$P_1$  = roof + wall  
 $P_2$  = balustrade - roof

$w_1$  = 1.5 kPa interior floor  
 $w_2$  = 2.0 kPa balcony

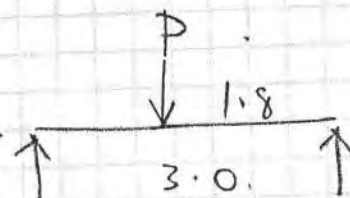
FLOOR JOISTS

Span 3.0M

Roof loading = 1.1 kPa rafters @ 500%.

$$P = 1.1 \times 0.5 \times 5.4 = 3.0 \text{ kN}$$

$$M = 3.0 \times 1.8 \times 1.2 / 3.0 = 2.2 \text{ kN}\cdot\text{m}$$



For 250x50 joists

$$f_b = \frac{2.2 \times 10^6}{0.466 \times 10^6} = 4.7 \text{ MPa} \text{ accept.}$$

$$\delta = \frac{3.0 \times 3.0^3}{48 \times 8 \times 113.79} \left( \frac{3 \times 1.8}{3} - 4 \left( \frac{1.8}{3.0} \right)^3 \right)$$

$$= 2 \text{ mm} \text{ Negl.}$$

250x50  
OK



### BEAM 4 CONTINUED

$$P_1 = 1.11 \times \frac{3.0}{2} \times \frac{5.2}{2} + 1.95 \times 2.4 \times \frac{7.0}{2} = 20.7 \text{ kN}$$

$$P_2 = 1.11 \times \frac{7.0}{2} \times \frac{2.4}{2} = 4.7 \text{ kN}$$

$$W_1 = 1.93 \times \frac{7.0}{2} = 6.7 \text{ kN/m}$$

$$W_2 = 2.43 \times \frac{7.0}{2} = 8.5 \text{ kN/m}$$

Bending Moment

$$M = \frac{P_1 a (b+c)}{l} + \frac{P_2 (a+b)c}{l} + \frac{W_1 a^2}{2} \left(1 - \frac{a}{2l}\right)^2 + W_2 \left(\frac{x^2 - a^2}{2}\right)$$

$$\text{Where } x = a + \frac{R_a}{W} = 2.4 \text{ m}$$

$$M = 20.7 \times \frac{1.6 \times 3.4}{5.0} + 4.7 \times \frac{(3.8) \times 1.2}{5.0} + \frac{6.7 \times 1.6^2}{2} \left(1 - \frac{1.6}{10}\right)^2 + 8.5 \left(\frac{2.4^2 - 1.6^2}{2}\right)$$

$$M = 46.4 \text{ kN.m}$$

Try 250 UB 31

$$f_b = \frac{46.4 \times 10^6}{353 \times 10^6} = 132 \text{ MPa}$$

$f_b = 165 \text{ MPa}$  restraint provided by joists

$$\delta = \frac{2Pl^3}{48EI} \left( \frac{3a}{l} - 4\left(\frac{a}{l}\right)^3 \right)$$

$$= 13 \text{ mm} = 0.003 \text{ span asept.}$$

BEAM 3/4

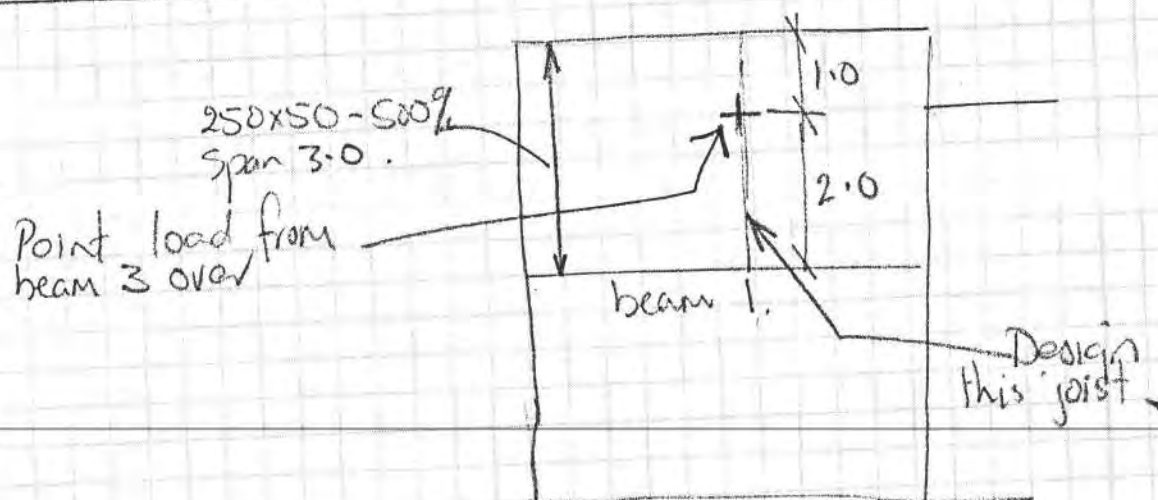
250 UB 31

PRELAMBER  
10mm



Job

## Check Floor Joists over Garage



$$\text{Span} = 3.0 \text{ m}$$

$$W = 1.93 \times 0.5 = 0.97 \text{ kN/m}$$

$$P = \frac{1}{6.0} (20.7 \times 3.4 + 4.7 \times 1.2 + 6.7 \times 1.6 \times 5.2 + 8.5 \times 3.1 \times 2.2)$$

$$P = 31.6 \text{ kN}$$

For 2/250x50

$$M = 0.97 \times 3.0 \times \frac{3.0}{8} + 31.6 \times 1.0 \times \frac{2.0}{3.0} = 22.2 \text{ kN.m}$$

Additional Beam Required.

BEAM 2 ~~At~~ BEAM 1

$$M = 31.6 \times 2.4 \times \frac{3.0}{5.4} = 42.1 \text{ kN.m} \text{ requires } 250 \text{ UB } 31.$$

Try 2<sup>o</sup> Beam onto BEAM 1

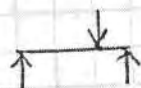
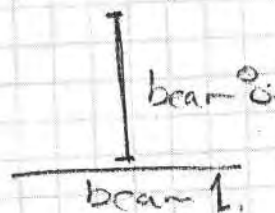
$$M = 31.6 \times 1.0 \times \frac{2.0}{3.0} = 21.0 \text{ kN.m}$$

Use 200 UB.

Additional load on Beam 1

$$P = 10.5 \text{ kN}$$

$$M_{\text{add}} = 10.5 \times 2.4 \times \frac{3.0}{5.4} = 14.0 \text{ kN.m} \quad M_{\text{TOT}} = 21.9 + 14.0 = 35.9 \text{ kN.m}$$

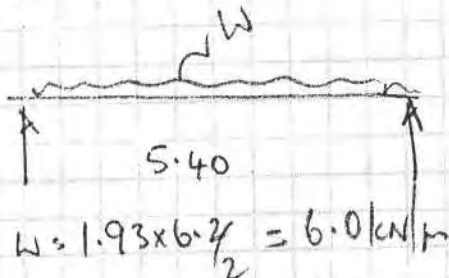


SCHEME B  
200 UB 25  
BEAM 2  
250 UB 31  
BEAM 1  
10 percent



## BEAM 1/2 GARAGE BEAMS

### Beam 1.



$$W = 1.93 \times 6.2 / 2 = 6.0 \text{ kN/m}$$

### Bending Moment M

$$\begin{aligned} M &= W \ell^2 / 8 \\ &= 6.0 \times 5.4^2 / 8 \\ &= 21.9 \text{ kN.m} \end{aligned}$$

Try 200 UB 25

$$f_b = \frac{21.9 \times 10^6}{0.232 \times 10^3} = 94 \text{ MPa}$$

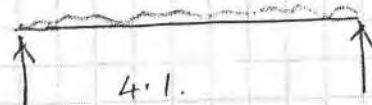
For flange supported by floor joist

$$f_b = 165 \text{ MPa}$$

### Deflection

$$\delta = \frac{5 \times 6.0 \times 5.4^4}{384 \times 200 \times 23.6} \leq 2 \text{ mm}$$

### Beam 2.



$$W = 1.93 \times 5.3 / 2 = 5.1 \text{ kN/m}$$

$$\begin{aligned} M &= 5.1 \times 4.1^2 / 8 \\ &= 10.7 \text{ kN.m} \end{aligned}$$

Try 150 UB 14

$$f_b = \frac{10.7}{0.888} = 120 \text{ MPa}$$

$$\delta = \frac{5 \times 5.1 \times 4.1^4}{384 \times 200 \times 6.66} \leq 14 \text{ mm}$$

$$\leq 0.003 \text{ span}$$

accept

Use 200 UB 25

Use 150 UB 14

### Alternatively,

Change joist direction to span

5.4 m 300 x 50 - 450 %

and 4.1 m 250 x 50 - 600 % thus eliminate Beams 1 & 2

Job

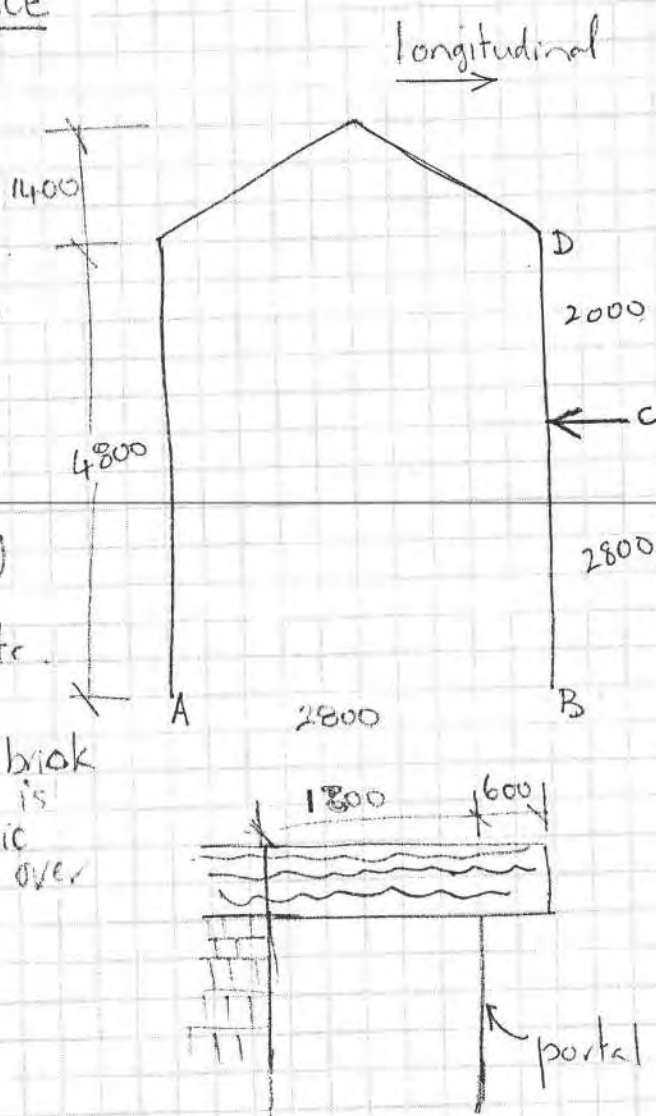
## PORTAL ENTRANCE

Bital for entrance,  
way supports roof  
only.

Support is provided to one leg of portal at C in longitudinal direction and at D in transverse direction.

Support is provided by  
timber Traming.  
Check bracing of  
framing is adequate.

As portal legs are brick surrounded and roof is concrete tiles seismic loading will govern over wind.



## PORTAL FRAME UNDER SEISMIC LOADING

## Loading

$$\text{Roof} = 1.1 \times (0.9 + 0.6) = 1.7 \text{ kN/m}$$

Brick columns =  $0.5 \times 0.5 \times 24 = 6.0 \text{ kN/m}$

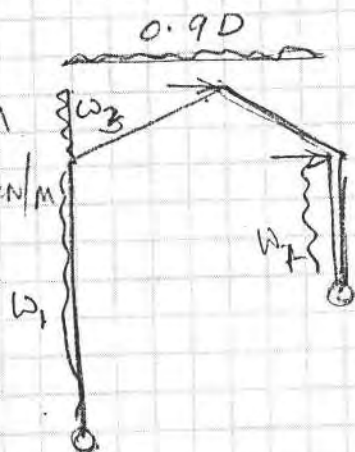
$$C_p = 0.3$$

$$U = 0.9 D + E$$

$$w_1 = 0.3 \times 6.0 = 1.8 \text{ kN/m}$$

$$0.90 = 0.9 \alpha \cdot 1.7 = 1.5 \text{ kN/m} =$$

$$w_3 = 0.3 \times 1.7 \times \frac{2.8}{1.4} = 1.0 \text{ kN/m}$$





Job

By P.B.

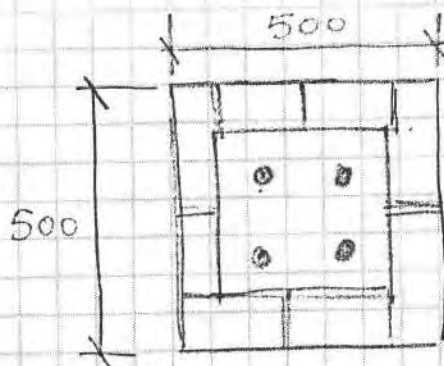
Date Aug 31 1990.

## CONCRETE PORTAL LEGS

Use brick veneer as  
formwork

Core dimensions  
300 x 300

$$E = 20 \text{ GPa}$$



Design Portal Leg as  
cantilevered from base.

Bending Moment

$$M_u = 1.8 \times \frac{4.8^2}{2} + 1.0 \times 1.4 \times 5.5$$

$$M_u = 28.4 \text{ kN}\cdot\text{m}$$

Try 2 - D16 bars

$$M_u = \phi A_s f_y (d - 0.5 a)$$

$$a = \frac{A_s f_y}{0.85 f'_c b}$$

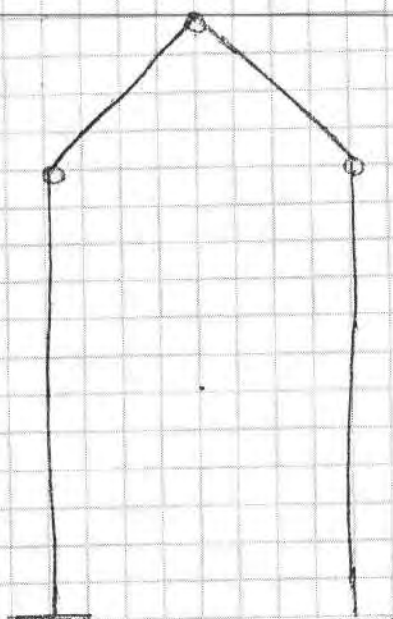
$$= \frac{402 \times 275}{0.85 \times 20 \times 300}$$

$$= 21.7 \text{ mm}$$

$$M_u = 0.9 \times 402 \times 275 (300 - 40 - 8 - 11)$$

$$= 24.0 \text{ kN}\cdot\text{m} \geq 28.4 \text{ accept.}$$

Use ply bracing in  
roof plane.

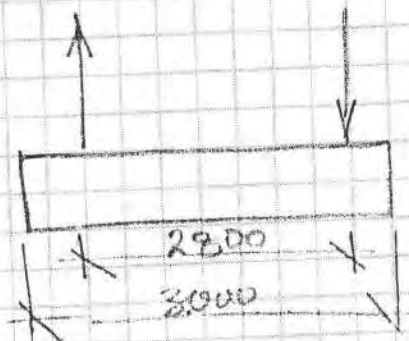




## FOUNDATIONS

From printout

Uplift = 4.8 kN



Try Pad 3000, 500x300.

Gravity load =  $3.0 \times 0.5 \times 0.3 \times 24.0 \times 0.9 = 9.7 \text{ kN}$

$\geq 4.8 \text{ accept}$

Bearing Pressure Under D+L

$P = 6.7 \text{ kN}$

$$f_{br} = \frac{6.7 \times 2}{3.0 \times 0.5} = 10 \text{ kPa} \leq 16.7 \text{ kPa}$$

accept

## SHEAR CHECK

$$V_u = 1.0 \times 1.4 + 1.8 \times 4.8 \leq 10.0 \text{ kN}$$

$$d = 300 - 40 - 8 = 252$$

$$V_u = \frac{10.0}{0.85 \times 300 \times 252} = 0.16 \text{ MPa}$$

$$V_c = (0.07 + 10 \rho_w) \sqrt{f'_c}$$

$$= \left( 0.07 + 10 \times \frac{402}{300 \times 252} \right) \sqrt{20}$$

$$\leq 0.55 \text{ MPa}$$

As  $V_c \geq V_u$  No stirrups necessary



## CONCRETE BLOCK RETAINING WALL S1

Maximum height retained 3.0m

For granular backfill

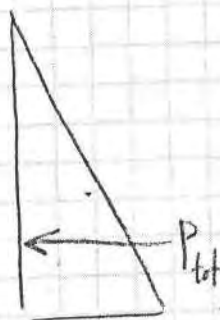
$$\rho = 1800 \text{ kg/m}^3$$

$$\gamma = \rho g = 17.6 \text{ kN/m}^3$$

Angle of repose  $\phi = 30^\circ$

Coefficient of Active Earth Pressure

$$K_a = \frac{1 - \sin \phi}{1 + \sin \phi} = 0.33$$



$$P_{max} = K_a \rho g h$$

CONSIDER WALL CANTILEVERED

Stem Moment

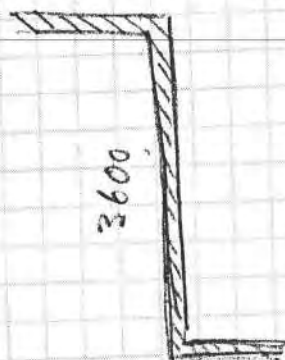
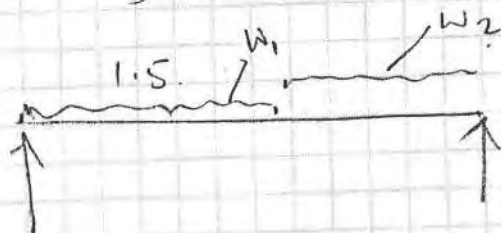
$$M_s = K_a \rho g h^3 / 6 = 0.33 \times 17.6 \times 3.0^3 / 6 = 26 \text{ kN}\cdot\text{m}$$

$$M_u = 1.7 M_s = 44.4 \text{ kN}\cdot\text{m/m}$$

for this is too great for masonry units NBG

Try Spanning Wall Horizontally

Loading



$W_1$  = full height retained 3.0m

$W_2$  = retained to 1.0m

$$W_1 = K_a \rho g h = 0.33 \times 17.6 \times 3.0 = 17.4 \text{ kN/m}$$

$$W_2 = 5.8 \text{ kN/m}$$



For 3.60 beam

$$M = \frac{Wl^2}{24} + (w_1 - w_2) \frac{a^2}{2} \left(1 - \frac{a}{2L}\right)^2$$

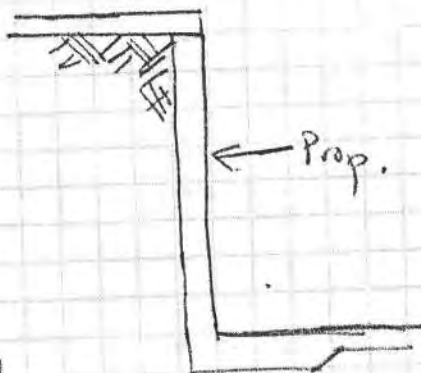
$$= 5.8 \times 3.6^2 / 24 + (17.4 - 5.8) \frac{1.5^2}{2} \left(1 - \frac{1.5}{2 \times 3.6}\right)^2$$

$$= 17.6 \text{ kN.m}$$

$M_u = 30.0 \text{ kN.m}$  Too high. N66

Design steps as restrained at top. This will mean propping of wall during backfilling.

CONSIDER WALL HELD AT TOP



$$M_{max} = 0.128 Wl$$

Where  $W = \frac{1}{2} \cdot k_a \rho g h^2$

$$= 26.1 \text{ kN/m}$$

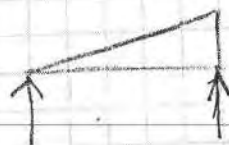
$$M_{max} = 0.128 \times 26.1 \times 3.0$$

$$= 10.8 \text{ kN.m / m length}$$

$$M_u = 17.1 \text{ kN.m}$$

Try D16-200 ctrs

$$M_u = \phi \rho b d^2 f_y \left(1 - 0.59 \rho \frac{f_y}{f_c}\right)$$



$$\rho = \frac{A_s}{b d}$$

$$= \frac{1005}{95 \times 1000}$$

$$= 0.010$$

$$= 0.85 \times 0.010 \times 1000 \times 95^2 \times 275 \left(1 - 0.59 \times 0.010 \times \frac{275}{8}\right)$$

$$M_u = 17.5 \text{ kN.m accept}$$

Propping me. Across props @ 1.00m c/c.  
@ 2.0m up face of block.

D16-200 V.  
propped  
wall



CONSIDER BLOCK WALL S2.

height retained = 1.8 m Sect D-D.

$$M_s = k_a \rho g h^3 = 0.33 \times 17.6 \times 1.8^3 = 5.6 \text{ kN.m.}$$

$$M_u = 1.7 \times 5.6 = 9.6 \text{ kN.m.}$$

Try D16-400.

$$M_u = 0.85 \times 0.0056 \times 90^2 \times 10^3 \times 275 \left( 1 - 0.39 \times 275 \times \frac{0.0056}{8} \right) \rho = 0.0056.$$

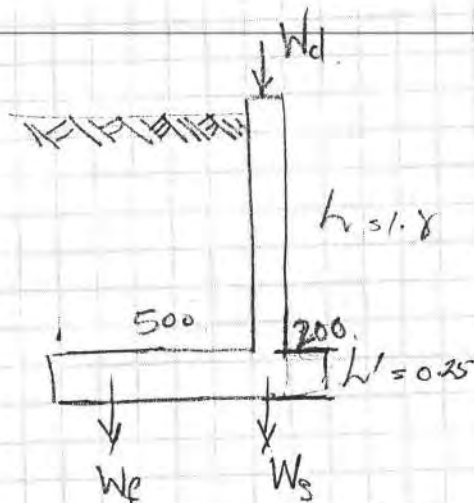
$$= 9.4 \text{ kN.m accept.}$$

STABILITY

Overturning Moment

$$OTM = k_a \rho g (h + h')^3 / 6$$

$$= 8.4 \text{ kN.m}$$



$$W_d = 1.1 \times 6.0 + 1.95 \times 2.4 = 11.3 \text{ kN.}$$

$$W_s = 1.8 \times 23.6 \times 0.19 = 8.2$$

$$W_e = 0.5 \times 0.25 \times 24 = 3.0$$

$$W_g = 0.5 \times 1.6 \times 18 = 14.4$$

$$0.90 \quad 33.2 \quad 15.6$$

$$\text{Factor of Safety Against Overturning} = \frac{15.6}{8.4} = 1.9 \text{ accept}$$

Bearing Pressure

$$e = \frac{15.6 - 8.4}{33.2} = 0.22 \text{ m}$$

$$f_{br} = \frac{33.2}{2 \times 0.22 \times 1.0} = 76 \text{ kPa}$$

$$f_{br} = \frac{Q_{ul}}{1.7} = 176 \text{ kPa} > 76 \text{ accept.}$$

S2  
D16-400 V  
D12-600 H.



Job

CONSIDER BLOCK WALL S3.

Maximum Height Retained  $\leq 1.20 \text{ m}$ .

$$M_s = \frac{17.6 \times 1.2^3}{18} \leq 1.7 \text{ kN.m}$$

Use nominal D12-600 SN.

Consider Overturning

$$OTM = \frac{17.6 \times 1.45^3}{18} \leq 3.0 \text{ kN.m}$$

$$W_s = 6.4 \quad 0.4 \quad 2.6$$

$$W_f = 0.5 \times 1.25 \times 24 = 3.0 \quad 0.25 \quad 0.8$$

$$W_s = 0.1 \times 1.0 \times 24 = 2.4 \quad 0.5 \quad 1.2$$

$$W_R = 1.11 \times 3.0 = 3.33 \quad 0.4 \quad 1.3$$

$$\frac{15.1}{0.90} \quad 13.6 \quad 5.3$$

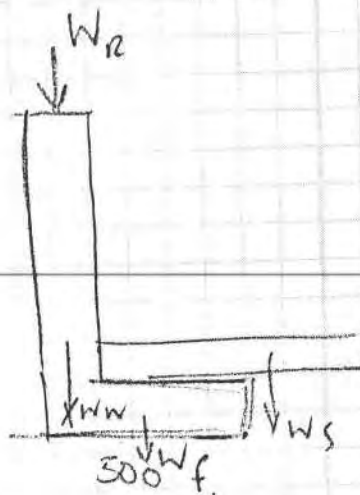
$$\text{Factor of Safety} = \frac{5.3}{3.0} = 1.8 \text{ accept.}$$

$$e = \frac{5.3 - 3.0}{13.6} = 0.17 \text{ m}$$

$$f_{br} = \frac{13.6}{2 \times 0.17} \leq 40 \text{ kPa}$$

< 176 accept.

S3  
D12-600  
BW.





Job

By P Bolton

Date 31 Aug 1998

### LIVING ROOM RIDGE BEAM 11.

Design roof ridge beam to span 7.0m.

Supported one end by bay window lintel to

Supported at mezzanine end by transverse beam 12.

### Loading

$$\text{Roof} = 1.11 \times 4.50 = 5.0 \text{ kN/m}$$

self wgt

$$0.3$$

$$5.3 \text{ kN/m}$$

### Bending Moment

$$M = 5.3 \times 7.0^2 / 8 = 32.4 \text{ kN.m.}$$

Try 200 UB 25

$$f_b = \frac{32.4}{0.232} = 140 \text{ MPa}$$

$f_b = 165 \text{ MPa}$  restrained by rafters.

### Deflection

$$\delta = \frac{5 \times 5.3 \times 7.0^4}{384 \times 200 \times 23.60} = 35 \text{ mm.}$$

$$S_{\text{Live}} = \frac{0.25 \times 55}{1.11} = 8 \text{ mm}$$

LIVING RM  
BEAM 11

200UB25  
Pecumber  
25mm



Job

By P. Bolton

Date 31 Aug 1990

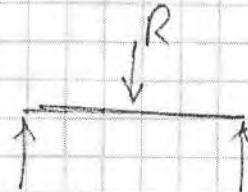
TRANSVERSE LIVING ROOM / MEZZANINE ROOF BEAM 12

Span = 5.6m from AA

Loading

$$R = 5.3 \times 7.0 / 2 = 18.6 \text{ kN}$$

$$W = 0.3 \text{ kN/m}$$



Bending Moment

$$M = 18.6 \times \frac{5.6}{4} + 0.3 \times \frac{5.6^2}{8} = 27.1 \text{ kN}\cdot\text{m}$$

Use 200 UB 25

Deflection

$$\delta = \frac{18.6 \times 5.6^3}{48 \times 200 \times 23.60} + \frac{0.3 \times 5.0 \times 5.6^4}{384 \times 200 \times 23.60} = 15 \text{ mm}$$

BEAM 12.  
Span 5.6m.

200 UB 25  
PRECAMBER  
10mm.



22 NOV 1990

Job No 79930

Page B1

Job HARPER DWELLING

Hura St.

By P. BOLTON

Date 20.11.90

Amendments

### (A) Brick Veneer Support over Garage

Builder Carl Vander Meer proposes to use 250x8 MS PL bolted to btm flange of garage door lintel to support veneer.

#### Check Bending

$$Z_{plate} = \frac{bd^3}{6} = \frac{100 \times 0.8^3}{6} = 10.67 \text{ cm}^3$$

0.8

#### Bending

$$M = Pa$$

$$P = 1.7 \text{ kN/m}^2 \text{ for } 3.4 \text{ m} \\ = 5.8 \text{ kN}$$

$$M = 5.8 \times 0.13 = 0.75 \text{ kN.m}$$

$$f_b = \frac{M}{Z} = \frac{0.75 \times 10^6}{10.67 \times 10^6} = 70 \text{ MPa}$$

#### Allowable Stress

$$f_b = 165 \text{ MPa} \gg 70 \text{ MPa} \text{ accept}$$

#### Connections

Consider 2/M10-400 %.

$$0.75 = R \times$$

$$x = 133 - 2(30) = 73$$

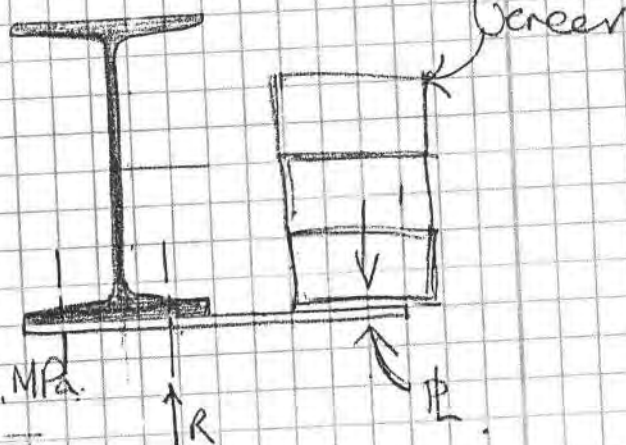
$$R = \frac{0.75 \times 10^6}{73} \\ = 10.3 \text{ kN}$$

$$\text{Load/Bolt} = R/2 = 5 \text{ kN}$$

Allowable load M10 bolt @ 130 MPa

$$P = \frac{\pi}{4} \times 10^2 \times 130 = 10.2 \text{ kN} > 5 \text{ accept}$$

TWO  
M10-400 %  
250x8 MS PL





(B) ENTRANCE PORTAL

Consider use of PVC pipe as formwork for columns

$$I/D = 315 \text{ mm}^2$$

$$A = 0.08 \text{ m}^2$$

NZ R.C.  
Design  
Handbook  
Chart C6.5.

axial load  $P=0$

$$\Rightarrow \frac{P_i}{f'_c D^2} = 0$$

$$M_i = \frac{M_y}{\phi} = \frac{28.4}{0.9} = 31.5$$

$$\frac{M_i}{f'_c D^3} = \frac{31.5 \times 10^6}{20 \times 315^3} = 0.05$$

$$f'_c = 20 \text{ MPa}$$

$$m = \frac{f_y}{0.85 f'_c} = 16.18$$

$$\rho_t m = 0.20$$

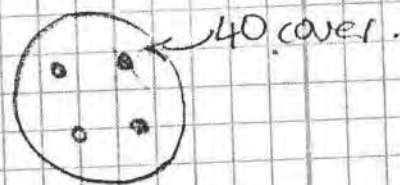
$$\rho_t m_{min} = 0.16$$

$$\rho_t = \frac{0.20}{16.18} = 0.012$$

$$\rho_t = \frac{A_s}{A_G}$$

$$A_s = 0.012 \times 0.08 \times 10^6 = 990 \text{ mm}^2$$

Use 5 D16



315 column

40 cover.

5 D16  
equally  
spaced.



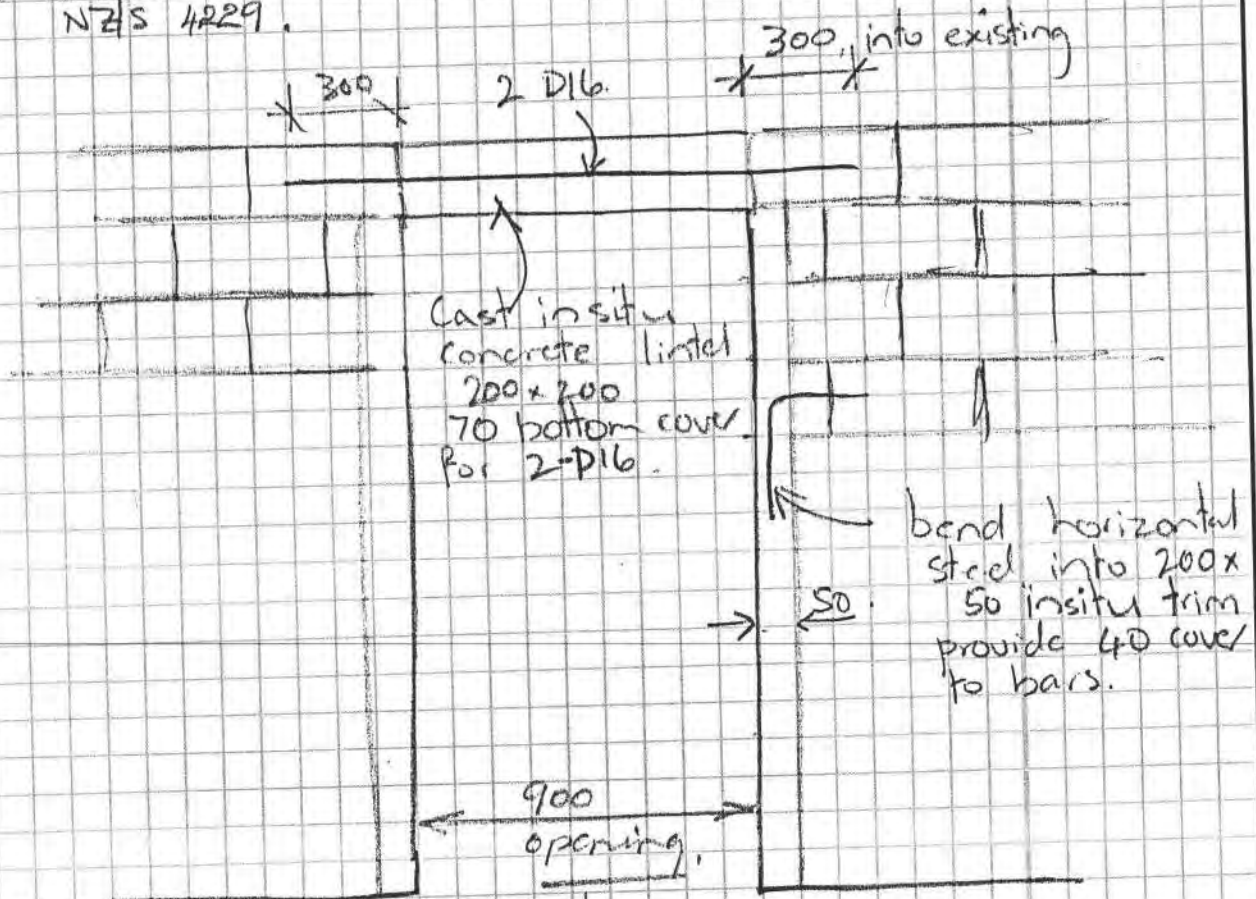
Job

© FIREWOOD STORAGE

It is proposed to utilise the space under the vestibule for firewood storage. This area was originally to have been backfilled.

Any alteration shall need to take the portal footings into consideration.

As the wall in question is not now retaining (as per S2 detail page AS) the opening need only a standard lintel in accordance with NZS 4229.



# MINI-SHEDS

"Handy little buildings"



**BY THE POOL**



**IN THE GARDEN**



**AS A PLAYHOUSE**



**WITH THE CARPORT**

Manufactured by:  
**MINILINE PRODUCTS LTD.**  
Penrose

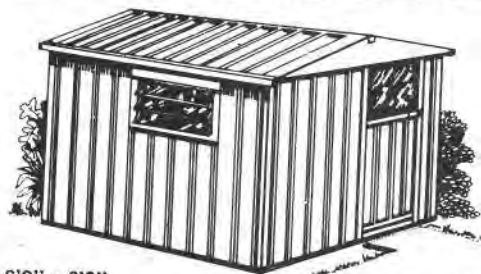
Distributed throughout N.Z. by:  
**LINDSAY COOK LTD.**  
Box 12261 Penrose

In association with:  
**SKYLINE BUILDINGS LTD.**  
Penrose

# SHEDS

ASSEMBLED  
READY TO USE

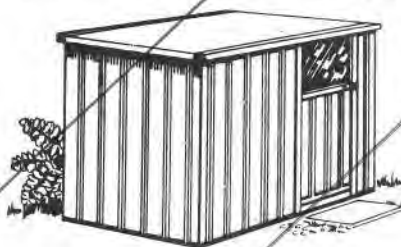
## MINI SHEDS



6'9" x 6'9"  
2057 x 2057

**\$350.00**

## MINI-MINI SHEDS

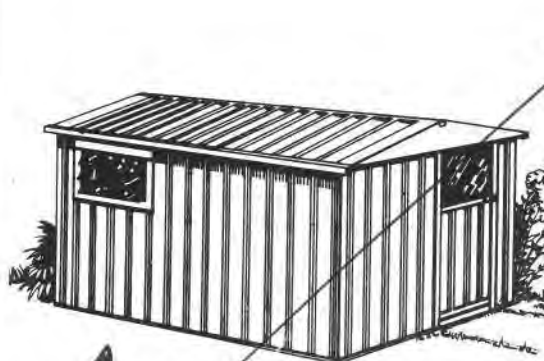


6'6" x 3'9 3/4"  
1981 x 1163

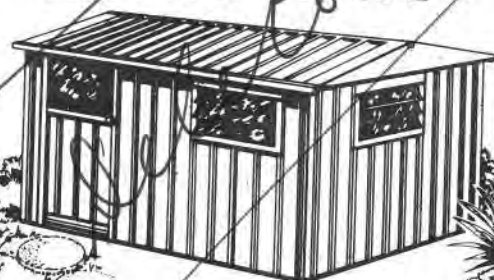
**\$250.00**

## MAXI - SHEDS

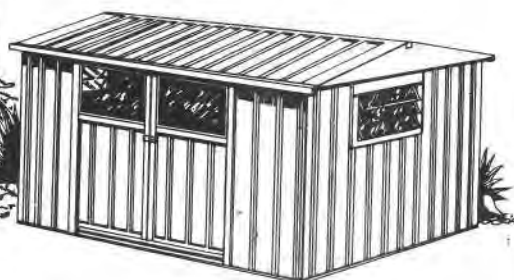
2057 x 2790 6'9" x 9'2"



ONE DOOR  
ONE WINDOW.  
**\$420.00**



ONE DOOR  
TWO WINDOWS.  
**\$440.00**



DOUBLE DOORS  
TWO WINDOWS.  
**\$465.00**

## The New JUMBO - SHEDS

ONE DOOR, TWO WINDOWS  
**\$525.00**

2057 x 3530 6'9" x 11'7"  
TWO DOORS, THREE WINDOWS  
**\$555.00**

ALSO AVAILABLE - QUIK LAY FLOORS MINI-MINI SHED \$30.00  
MINI SHED \$50.00 MAXI SHED \$70.00

QUICK FIX SHELVES 1200mm (4ft) \$4.00, 2055mm (6'9") \$5.00

*Jumbo Shed for Dr S Hallwright  
at 105 Wunnamur  
Warranale*

SKYLINE BUILDINGS LTD. P.O. BOX 12261, PENROSE. Ph. 591-226

EQ.

LEVEL 1.

CONSIDER AS LOWER OF THREE  
FOR 40 M<sup>2</sup> & LOWER OF TWO  
120 M<sup>2</sup> (TOTAL 180 M<sup>2</sup>)

SO = 40 M<sup>2</sup> @ 9 BU  
120 M<sup>2</sup> @ 7 BU } 1200 BU.  
(EACH DIRECTION)

WIND

SEE ELEVATION

9 M LENGTH ALONG

13<sup>5</sup> M LENGTH ACROSS

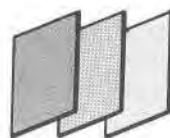
ACROSS. ROOF HEIGHT (AV) 2.5  
WALL LOWER TWO,  
3 M STUD 67 → 100

ALONG ROOF HEIGHT (AV) 3.0

ROOF = 50 }  
WALL = 83 } 133 \* 13<sup>5</sup> =  
1795 BU

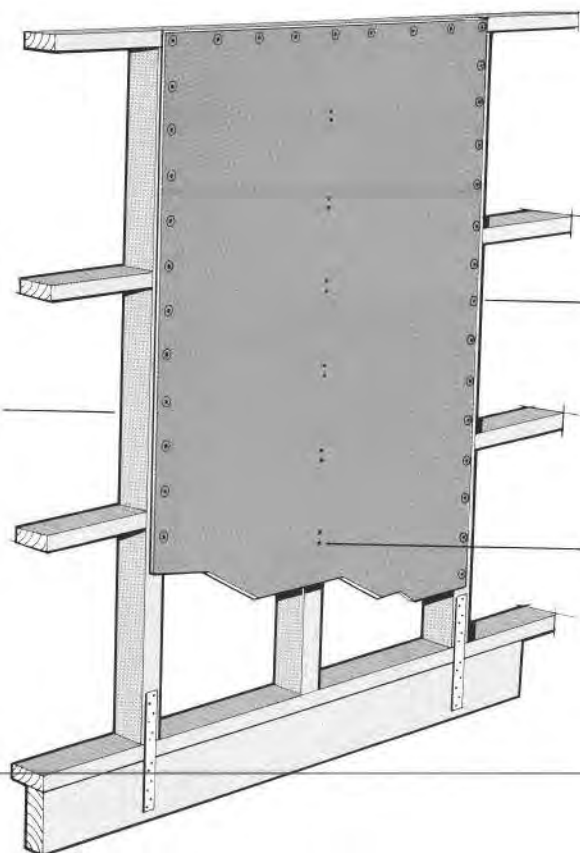
ROOF = 60 }  
WALL = 83 } 143 \* 9 =  
1287 BU

WIND GOVERNS.



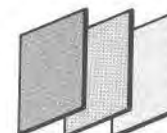
**SHEET BRACE PANEL**  
(See Table 1)

100 x 50 STUDS  
AT 600mm  
CENTRES

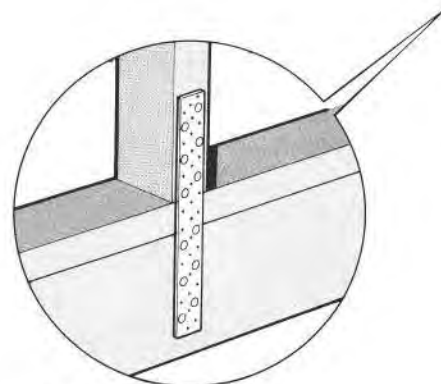
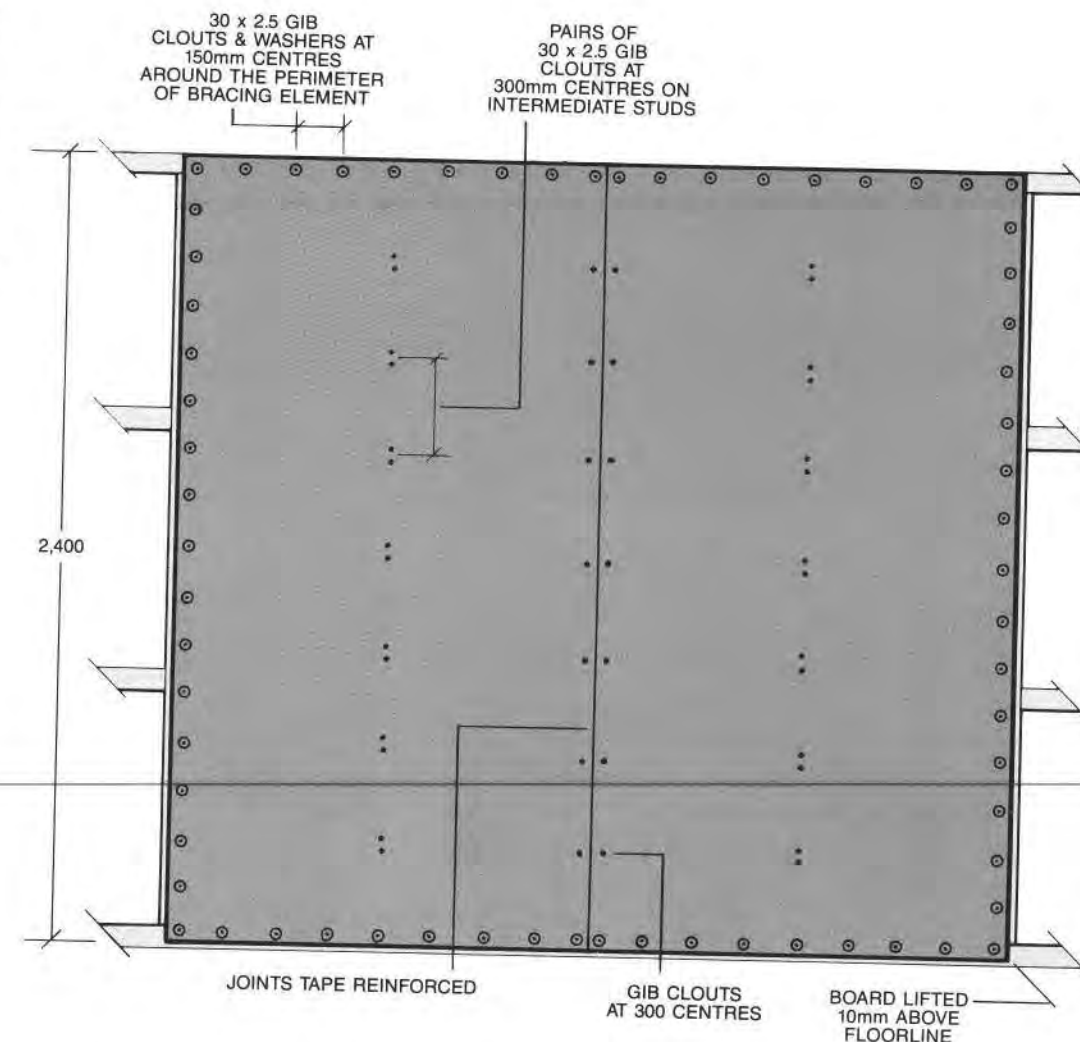


30 x 2.5 GIB  
CLOUDS & WASHERS AT  
150mm CENTRES  
AROUND THE PERIMETER  
OF BRACING ELEMENT

PAIRS OF  
30 x 2.5 GIB  
CLOUDS AT  
300mm CENTRES ON  
INTERMEDIATE STUDS



**VERTICAL  
FIXING**  
(Table 2)



METAL STRAP IN ACCORDANCE  
WITH K4.5 NZS 3604 : 1990

### Fixing and Jointing

- ★ Braceline Gibraltar Board shall be fastened with 30mm x 2.5mm galvanised Gib Clouts. The clouts shall be used in conjunction with 15mm galvanised steel washers in the locations specified below.
- ★ Vertical Fixing: Insert clouts/washers at 150mm centres around the perimeter of the bracing element. Double nail Gib Clouts (no washers) at 300mm centres to intermediate studs.
- ★ Horizontal Fixing: Insert clouts/washers at 150mm centres around the perimeter of the bracing element. Insert single nails (no washers) to each stud at the point where the horizontal joint crosses the stud and double nail (no washers) at 300mm centres to intermediate studs.
- ★ Clouts should be driven at right angles to the lining so that they and the washers are finally seated in a slight dimple or recess.
- ★ Braceline sheets should be fixed leaving a 10mm gap at the floor line to allow for movement of framing members.
- ★ All joints shall be tape reinforced and finished in accordance with the publication "Gibraltar Board Systems — Fixing and Jointing Instructions".

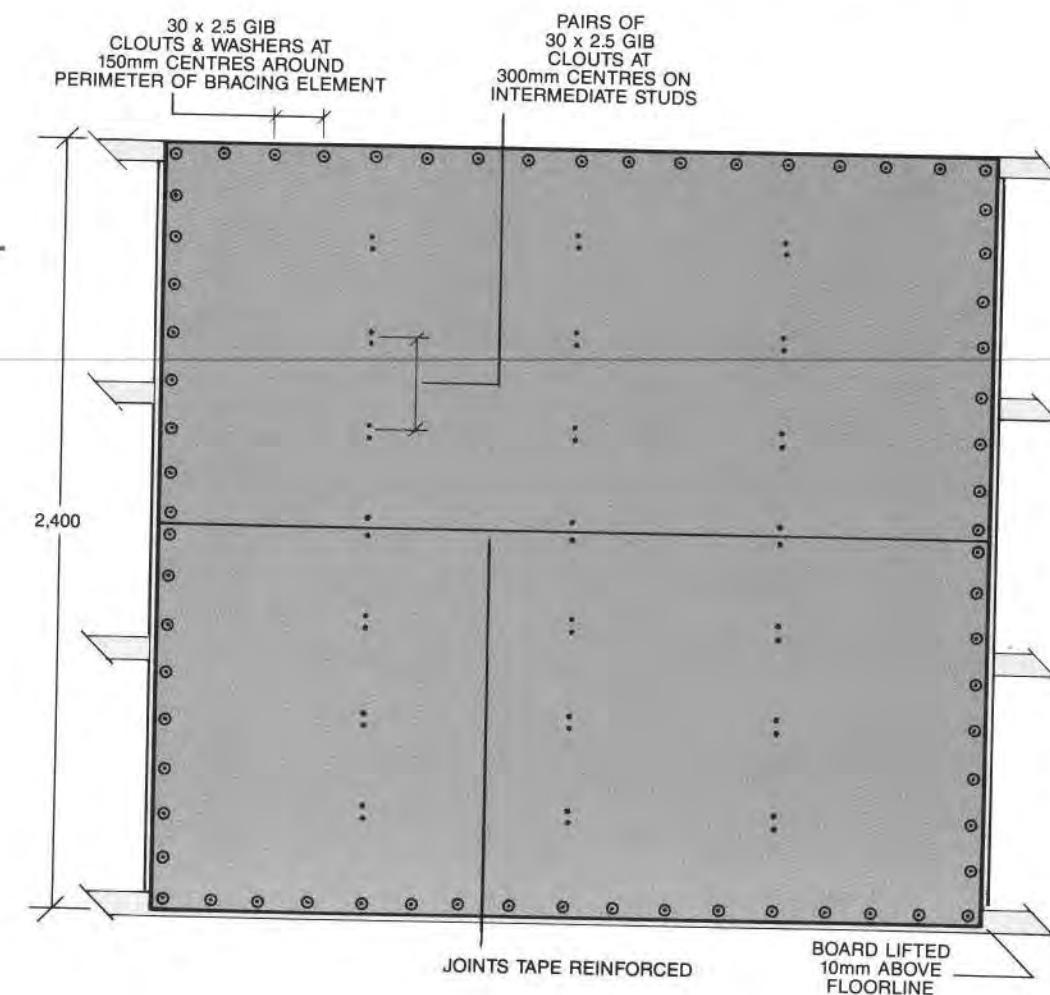
### Concrete Slab Floors

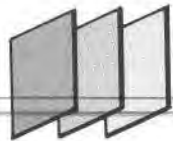
Where Braceline Gibraltar Board sheet bracing panels are fixed to concrete slab flooring, the stud to plate fixing is required to have a 6kN capacity for Types BR4, BR5 and BR7. Type BR6 requires the stud to plate fixing to have a 12kN capacity connection.

### Handling and Storage

Where possible, Gibraltar Board should be delivered to the site immediately prior to installation to reduce the risk of damage. The sheets should be stored in neat flat stacks (clear of the floor) with care taken to avoid sagging or damage to ends, edges and surfaces. All materials should be kept dry preferably by being stored indoors. If outside storage is unavoidable, Gibraltar Board should be supported off the ground on a level surface and fully protected from the weather and direct sunlight.

**HORIZONTAL  
FIXING**  
(Table 2)





## BRACING PERFORMANCE AND CALCULATION

When construction is in accordance with section 6.3 of NZS 3604 : 1990 or 6.0 of NZS 3604 : 1984 "Light Timber Frame Buildings" the following Bracing Unit (BU) ratings apply. Braceline Gibraltar Board has been tested to BRANZ Technical Paper P21 1988.

**TABLE 1: BRACELINE GIBRALTAR BOARD SHEET BRACE PANELS**

| Type | Primary Bracing Element                                                                                                            | Secondary Bracing Element                                                                             | NZS 3604 : 1990<br>Ratings in bracing<br>units per metre of<br>element length |            | NZS 3604 : 1984<br>Ratings in bracing<br>units per metre of<br>element length |
|------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------|
|      |                                                                                                                                    |                                                                                                       | Wind                                                                          | Earthquake |                                                                               |
| BR4  | Braceline Gibraltar Board on one face, not less than 0.9m long and a maximum of 2.4m in length                                     | Metal strap in accordance with K4.5 of NZS 3604 : 1990                                                | 91                                                                            | 85         | 60                                                                            |
| BR5  | Braceline Gibraltar Board on one face, not less than 1.2m long and a maximum of 2.4m in length                                     | Metal strap in accordance with K4.5 of NZS 3604 : 1990                                                | 98                                                                            | 87         | 63                                                                            |
| BR6  | Braceline Gibraltar Board on one face, 9.5mm Gibraltar Board on the other, not less than 1.2m long and a maximum of 2.4m in length | 2 metal straps of 6kN capacity fixed to both ends of the wall or alternative 12kN capacity connection | 142                                                                           | 112        | 83                                                                            |
| BR7  | Braceline Gibraltar Board on one face and 7.5mm ply on the other. Not less than 0.9m long and a maximum of 2.4m in length          | Metal strap in accordance with K4.5 of NZS 3604 : 1990                                                | 124                                                                           | 148        | 83                                                                            |

**TABLE 2: BRACELINE GIBRALTAR BOARD WALL SYSTEMS**

| Type | Primary Bracing Element                                                            | Secondary Bracing Element | NZS 3604 : 1990<br>Ratings in bracing<br>units per metre of<br>element length |            | NZS 3604 : 1984<br>Ratings in bracing<br>units per metre of<br>element length |
|------|------------------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------|
|      |                                                                                    |                           | Wind                                                                          | Earthquake |                                                                               |
| BR1  | Braceline Gibraltar Board on one face 1.8m-2.4m 2.4m and longer                    | Diagonal Brace            | 72<br>91                                                                      | 59<br>74   | 48<br>58                                                                      |
| BR2  | Braceline Gibraltar Board on one face, vertically fixed 1.8m-2.4m 2.4m and longer  | N/A                       | 75<br>86                                                                      | 59<br>50   | 50<br>55                                                                      |
| BR3  | Braceline Gibraltar Board on one face, horizontal fixing 1.8m-2.4m 2.4m and longer | N/A                       | 61<br>94                                                                      | 46<br>65   | 38<br>63                                                                      |

### GIBRALTAR BOARD PRODUCTS

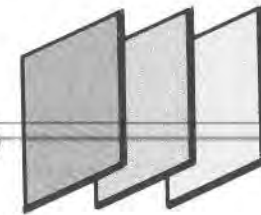
Manufactured and distributed by Winstone Wallboards Ltd through authorised distributors.

The information contained herein is believed to be correct and no liability is accepted for any loss which may be sustained arising from the use of the information.



**WINSTONE**  
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HARPER'S  
BRACELINE  
ALTERNATIVE

## PRODUCT DESCRIPTION

- ★ Braceline Gibraltar Board is a tapered edge high density internal lining suitable for wall bracing applications including sheet bracing.  
(Patent Application No. 231712)

## SCOPE OF USE

Braceline Gibraltar Board is used in areas where wall bracing is required in light timber frame buildings constructed in accordance with NZS 3604 : 1990. The product is part of and compatible with the total Gib system and is fixed at the same time as the standard Gibraltar Board linings.

## ADVANTAGES

- ★ Complies with NZS 3604 : 1990 (and NZS 3604 : 1984).
- ★ Supported by BRANZ Appraisal Certificate No. 177
- ★ Compatible with Gibraltar Board internal linings.
- ★ Face paper is coloured blue for easy identification.
- ★ Recessed studs not required.
- ★ Braceline Gibraltar Board can be substituted for 9.5mm Fyrelime Gibraltar Board in non-load bearing fire rated walls.
- ★ Quick and easy to install.

## SHEET SIZES AND WEIGHT

| Thickness                              | Width  | Length                     |
|----------------------------------------|--------|----------------------------|
| 9.5mm                                  | 1200mm | 2400mm<br>2700mm<br>3000mm |
| Maximum weight<br>8.5kg/m <sup>2</sup> |        |                            |

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CI/SIB

Rf7

JANUARY 1991

# BRACELINE GIBRALTAR BOARD Wall Bracing System



1991

SHEET A  
(CIRCLE whichever is applicable)

LEVEL 1

NAME:

STOREY: Single or top  
Lower of two or middle of three  
Lower of three

WIND AREA: High / Medium / LowSTOREY HEIGHT = 3.0 m

SITE ADDRESS:

WINARA AVEHARPERZ

1)

## FOR EARTHQUAKE

Roof weight: light / heavyAverage roof slope: 45°Earthquake Zone: A / B / C

$$E = \frac{40 \text{ m}^2 @ 9}{120 \text{ m}^2 @ 7} \text{ B.U.'s/m}^2 = 1200 \text{ BU (EACH DIR)}$$

2)

## WIND along the building (W1)

Average roof height: 3.0 mGreatest roof slope: 45°

ALONG

w1 wall = 83 B.U.'s/mw1 roof = 60 B.U.'s/mW1 total = 143 B.U.'s/m

3)

## WIND across the building (W2)

Average roof height: 2.5 mGreatest roof slope: 45°

ACROSS

w2 wall = 83 B.U.'s/mw2 roof = 50 B.U.'s/mW2 total = 133 B.U.'s/m

ROOF or BUILDING LENGTH

BL = 13.5 m

ROOF or BUILDING WIDTH

BW = 9 m

GROSS ROOF or BUILDING PLAN AREA

GPA = 160 m<sup>2</sup>

EARTHQUAKE: LOAD (ALONG and ACROSS)

E x GPA = AS ABOVE = 1200 B.U.'s

WIND: LOAD ALONG

W1 x BW = 143 \* 9 = 1287 B.U.'s

WIND: LOAD ACROSS

W2 x BL = 133 \* 13.5 = 1795 B.U.'s

= WIND GOVERNS =

## SHEET A

(CIRCLE whichever is applicable)

NAME :

STOREY :      Single or top  
                  Lower of two or middle of three  
                  Lower of three

WIND AREA :      High / Medium / Low

STOREY HEIGHT = \_\_\_\_\_ m

SITE ADDRESS :

1)

## FOR EARTHQUAKE

Roof weight :      light / heavy

Average roof slope : \_\_\_\_\_ °

Earthquake Zone:      A / B / C

E = \_\_\_\_\_ B.U.'s/m<sup>2</sup>

2)

## WIND along the building (W1)

Average roof height : \_\_\_\_\_ m

Greatest roof slope : \_\_\_\_\_ °

ALONG

w1 wall = \_\_\_\_\_ B.U.'s/m

w1 roof = \_\_\_\_\_ B.U.'s/m

W1 total = \_\_\_\_\_ B.U.'s/m

3)

## WIND across the building (W2)

Average roof height : \_\_\_\_\_ m

Greatest roof slope : \_\_\_\_\_ °

ACROSS

w2 wall = \_\_\_\_\_ B.U.'s/m

w2 roof = \_\_\_\_\_ B.U.'s/m

W2 total = \_\_\_\_\_ B.U.'s/m

ROOF or BUILDING LENGTH

BL = \_\_\_\_\_ m

ROOF or BUILDING WIDTH

BW = \_\_\_\_\_ m

GROSS ROOF or BUILDING PLAN AREA

GPA = \_\_\_\_\_ m<sup>2</sup>

EARTHQUAKE: LOAD (ALONG and ACROSS)

E x GPA = \_\_\_\_\_ = \_\_\_\_\_ B.U.'s

WIND: LOAD ALONG

W1 x BW = \_\_\_\_\_ = \_\_\_\_\_ B.U.'s

WIND: LOAD ACROSS

W2 x BL = \_\_\_\_\_ = \_\_\_\_\_ B.U.'s

BRENZ

## SHEET B

ALONG

| 1                                                | Wall or Bracing Line |                         | Wall Bracing Elements Provided |                 |                          |                       |                 |
|--------------------------------------------------|----------------------|-------------------------|--------------------------------|-----------------|--------------------------|-----------------------|-----------------|
|                                                  | 2                    | 3                       | 4                              | 5               | 6                        | 7                     | 8               |
| Total Bracing Units Required for this storey     | Line Label           | Minimum B.U.'s Required | Bracing Element NO.            | Type (table 20) | Rating B.U.'s (table 20) | Length of Element (m) | B.U.'s Achieved |
| From sheet A greater of earthquake or wind along | A                    | 135                     | A1                             | 1               | 67                       | 13.5                  | 95              |
|                                                  |                      |                         |                                |                 | 2.4/1.8*50               |                       |                 |
|                                                  | B                    | 70                      | B1                             | BRG             | 66                       | 2.0                   | 132             |
|                                                  |                      |                         | B2                             | BRG             | 66                       | 2.4                   | 158             |
|                                                  |                      |                         | B3                             | BRG             | 66                       | 2.0                   | 132             |
|                                                  | C                    | 70                      | C1                             | BR7             | 66                       | 1.3                   | 86              |
|                                                  | D                    | 100                     | D1                             | BR7             | 66                       | 0.9                   | 60              |
|                                                  |                      |                         | D2                             | BR7             | 66                       | 0.9                   | 60              |
|                                                  |                      |                         | D3                             | BR7             | 66                       | 0.9                   | 60              |
|                                                  | E                    |                         |                                |                 |                          |                       |                 |
| 1287                                             |                      |                         |                                |                 | TOTAL                    |                       | 1593            |

$$83 * \frac{2.4}{3} =$$

$$\sqrt{\frac{2.4}{3} * 83} = 66$$

ACROSS

| 1                                                 | Wall or Bracing Line |                         | Wall Bracing Elements Provided |                 |                          |                       |                 |
|---------------------------------------------------|----------------------|-------------------------|--------------------------------|-----------------|--------------------------|-----------------------|-----------------|
|                                                   | 2                    | 3                       | 4                              | 5               | 6                        | 7                     | 8               |
| Total Bracing Units Required for this storey      | Line Label           | Minimum B.U.'s Required | Bracing Element NO.            | Type (table 20) | Rating B.U.'s (table 20) | Length of Element (m) | B.U.'s Achieved |
| From sheet A greater of earthquake or wind across | M                    |                         | M1                             | 1               | 54                       | 9.5                   | 58              |
|                                                   |                      |                         | N1                             | BRG             | 66                       | 1.2                   | 79              |
|                                                   | N                    |                         | N1                             | BRG             | 66                       | 2.4                   | 317             |
|                                                   |                      |                         | N2                             | BRG             |                          | 2.0                   | 132             |
|                                                   |                      |                         | N3                             | BRG             |                          | 2.0                   | 132             |
|                                                   | O                    |                         | O1                             | BRG             |                          | 2.0                   | 132             |
|                                                   |                      |                         | O2                             | BRG             |                          | 2.4                   | 158             |
|                                                   |                      |                         | O3                             | BR7             | 66                       | 1.0                   | 66              |
|                                                   | <del>P</del>         |                         | O4                             | BR7             | 66                       | 1.0                   | 66              |
|                                                   |                      |                         | O5                             | BR7             | 66                       | 1.0                   | 66              |
|                                                   | <del>P</del>         |                         | P1                             | BR7             | 66                       | 2.2                   | 145             |
| 1795                                              |                      |                         |                                |                 | TOTAL                    |                       | 1811            |

$$\frac{2.4}{3} * 50$$

$$\frac{2.4}{3} * 83$$

SHEET A  
(CIRCLE whichever is applicable)

LEVEL 2

FLOOREY: Single or top  
Lower of two or middle of three  
Lower of three

WIND AREA: High / Medium / Low

FLOOREY HEIGHT = 3.0 m

SITE ADDRESS:

FOR EARTHQUAKE

Roof weight : light / heavy

Average roof slope : 45°

Earthquake Zone: A / B / C

132 M<sup>2</sup> @ 7  
E = B.U.'s/m<sup>2</sup>  
134 M<sup>2</sup> @ 4

1460 BU  
(EACH DIR)

WIND along the building (W1)

Average roof height : 3.5 m

Greatest roof slope : 45°

ALONG

w1 wall = 28 B.U.'s/m

w1 roof = 70 B.U.'s/m

W1 total = 98 B.U.'s/m

WIND across the building (W2)

Average roof height : 3.2 m

Greatest roof slope : 45°

ACROSS

w2 wall = 28 B.U.'s/m

w2 roof = 64 B.U.'s/m

W2 total = 92 B.U.'s/m

BUILDING LENGTH

BL = 23 m

BUILDING WIDTH

BW = 15 m

GROSS or BUILDING PLAN AREA

GPA = 266 m<sup>2</sup>

WIND LOAD (ALONG and ACROSS)

E x GPA = AS ABOVE = 1460 B.U.'s

BRNZ

PRACELINE

ALONG

SHEET B

| 1                                                   | Wall or Bracing Line |                         | Wall Bracing Elements Provided |                 |                          |                       |                 |
|-----------------------------------------------------|----------------------|-------------------------|--------------------------------|-----------------|--------------------------|-----------------------|-----------------|
|                                                     | 2                    | 3                       | 4                              | 5               | 6                        | 7                     | 8               |
| Total Bracing Units Required for this storey        | Line Label           | Minimum B.U.'s Required | Bracing Element NO.            | Type (table 20) | Rating B.U.'s (table 20) | Length of Element (m) | B.U.'s Achieved |
| From sheet A<br>greater of earthquake or wind along | A                    |                         | 1                              | BR2             | 55                       | 5.0                   | 275             |
|                                                     |                      |                         | 2                              | BR2             | 55                       | 3.0                   | 165             |
|                                                     |                      |                         | 3                              | BR2             | 55                       | 5.0                   | 275             |
|                                                     | B                    |                         | 1                              | BR5             | 63                       | 1.5                   | 94              |
|                                                     |                      |                         | 2                              | BR2             | 55                       | 3.0                   | 165             |
|                                                     | C                    |                         | 1                              | BR2             | 55                       | 2.5                   | 137             |
|                                                     |                      |                         | 2                              | BR2             | 55                       | 3.0                   | 165             |
|                                                     |                      |                         | 3                              | BR5             | 63                       | 1.2                   | 75              |
|                                                     | D                    |                         | 1                              | BR2             | 55                       | 2.5                   | 137             |
|                                                     |                      |                         | 2                              | BR2             | 55                       | 2.5                   | 137             |
|                                                     | E                    |                         | 1                              | BR4             | 60                       | 1.0                   | 60              |
|                                                     |                      |                         | 2                              | BR2             | 55                       | 3.0                   | 165             |
|                                                     | F                    |                         | 1                              | BR5             | 63                       | 1.5                   | 94              |
|                                                     |                      |                         | 2                              | BR5             | 63                       | 1.5                   | 94              |
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|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          | </                    |                 |

ACROSS

| 1                                                    | Wall or Bracing Line |                         | Wall Bracing Elements Provided |                 |                          |                       |                 |
|------------------------------------------------------|----------------------|-------------------------|--------------------------------|-----------------|--------------------------|-----------------------|-----------------|
|                                                      | 2                    | 3                       | 4                              | 5               | 6                        | 7                     | 8               |
| Total Bracing Units Required for this storey         | Line Label           | Minimum B.U.'s Required | Bracing Element NO.            | Type (table 20) | Rating B.U.'s (table 20) | Length of Element (m) | B.U.'s Achieved |
| From sheet A<br>greater of earthquake or wind across | M                    |                         | 1                              | BR7             | 83                       | 1.2                   | 100             |
|                                                      |                      |                         | 2                              | BR7             | 83                       | 1.2                   | 100             |
|                                                      | N                    |                         | 1                              | BR6             | 83                       | 2.4                   | 200             |
|                                                      |                      |                         | 2                              | BR4             | 60                       | 1.0                   | 60              |
|                                                      | O                    |                         | 1                              | BR1             | 58                       | 4.0                   | 232             |
|                                                      |                      |                         | 2                              | BR6             | 83                       | 1.2                   | 100             |
|                                                      | P                    |                         | 1                              | BR6             | 83                       | 2.0                   | 166             |
|                                                      |                      |                         | 2                              | BR1             | 58                       | 4.5                   | 261             |
|                                                      |                      |                         | 3                              | BR6             | 83                       | 2.4                   | 200             |
|                                                      | X                    | P                       | 4                              | BR6             | 83                       | 1.5                   | 124             |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      | Q                    |                         | 1                              | BR6             | 83                       | 2.0                   | 166             |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      | R                    |                         | 1                              | BR1             | 58                       | 4.0                   | 232             |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      | S                    |                         | 1                              | BR7             | 83                       | 1.0                   | 83              |
|                                                      |                      |                         | 2                              | BR7             | 83                       | 2.4                   | 199             |
|                                                      | T                    |                         | 1                              | BR7             | 83                       | 1.8                   | 149             |
|                                                      |                      |                         | 2                              | BR7             | 83                       | 1.8                   | 149             |
|                                                      |                      |                         |                                | * 2.4/3         |                          |                       | 242             |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
| 2116                                                 | + STAIRS =           |                         |                                |                 | TOTAL                    |                       |                 |
|                                                      | OK                   |                         |                                |                 | 1940                     |                       |                 |

AS  
BR1  
+  
AS  
(292)  
(321)  
(292)  
(2601)  
(2081)

SHEET A  
(CIRCLE whichever is applicable)

NAME:

LEVEL 3  
(CONSIDER 3.6,  
NO ROOF)

STOREY: Single or top  
Lower of two or middle of three  
Lower of three

WIND AREA: High / Medium / Low

STOREY HEIGHT = \_\_\_\_\_ m

SITE ADDRESS:

1)

FOR EARTHQUAKE

Roof weight : light / heavy

Average roof slope : 45 °

Earthquake Zone: A / B / C

E = 4 B.U.'s/m<sup>2</sup>

2)

WIND along the building (W1)

Average roof height : 3.6 m

Greatest roof slope : / °

ALONG

w1 wall = 27 B.U.'s/m

w1 roof = / B.U.'s/m

W1 total = 27 B.U.'s/m

3)

WIND across the building (W2)

Average roof height : \_\_\_\_\_ m

Greatest roof slope : \_\_\_\_\_ °

ACROSS

w2 wall = \_\_\_\_\_ B.U.'s/m

w2 roof = \_\_\_\_\_ B.U.'s/m

W2 total = 27 B.U.'s/m

ROOF or BUILDING LENGTH

BL = 17.5 m

ROOF or BUILDING WIDTH

BW = 12 m

GROSS ROOF or BUILDING PLAN AREA

GPA = 132 m<sup>2</sup>

EARTHQUAKE: LOAD (ALONG and ACROSS)

E x GPA = 132 \* 4 = 528 B.U.'s (EACH WAY)

WIND: LOAD ALONG

W1 x BW = 12 \* 27 = 324 B.U.'s

WIND: LOAD ACROSS

W2 x BL = 17.5 \* 27 = 472 B.U.'s

= EQ GOVERNS =

ALONG

SHEET B

| 1                                                | Wall or Bracing Line |                         | Wall Bracing Elements Provided |                 |                          |                       |                 |
|--------------------------------------------------|----------------------|-------------------------|--------------------------------|-----------------|--------------------------|-----------------------|-----------------|
|                                                  | 2                    | 3                       | 4                              | 5               | 6                        | 7                     | 8               |
| Total Bracing Units Required for this storey     | Line Label           | Minimum B.U.'s Required | Bracing Element NO.            | Type (table 20) | Rating B.U.'s (table 20) | Length of Element (m) | B.U.'s Achieved |
| From sheet A greater of earthquake or wind along | A                    |                         |                                |                 |                          |                       |                 |
|                                                  |                      |                         |                                |                 |                          |                       |                 |
|                                                  | B                    |                         |                                |                 |                          |                       |                 |
|                                                  |                      |                         |                                |                 |                          |                       |                 |
|                                                  | C                    |                         |                                |                 |                          |                       |                 |
|                                                  |                      |                         |                                |                 |                          |                       |                 |
|                                                  | D                    |                         |                                |                 |                          |                       |                 |
|                                                  |                      |                         |                                |                 |                          |                       |                 |
|                                                  | E                    |                         |                                |                 |                          |                       |                 |
|                                                  |                      |                         |                                |                 |                          |                       |                 |
|                                                  |                      |                         |                                |                 |                          |                       |                 |
|                                                  |                      |                         |                                |                 |                          |                       |                 |
|                                                  |                      |                         |                                |                 |                          |                       |                 |
|                                                  |                      |                         |                                |                 |                          |                       |                 |
|                                                  |                      |                         |                                |                 |                          |                       |                 |
| 528                                              |                      |                         |                                |                 |                          |                       |                 |
|                                                  |                      |                         | TOTAL                          |                 |                          |                       |                 |

ORIGINAL  
OK  
PLENTY SPARE  
CAPACITY

ACROSS

| 1                                                 | Wall or Bracing Line |                         | Wall Bracing Elements Provided |                 |                          |                       |                 |
|---------------------------------------------------|----------------------|-------------------------|--------------------------------|-----------------|--------------------------|-----------------------|-----------------|
|                                                   | 2                    | 3                       | 4                              | 5               | 6                        | 7                     | 8               |
| Total Bracing Units Required for this storey      | Line Label           | Minimum B.U.'s Required | Bracing Element NO.            | Type (table 20) | Rating B.U.'s (table 20) | Length of Element (m) | B.U.'s Achieved |
| From sheet A greater of earthquake or wind across | M                    |                         |                                |                 |                          |                       |                 |
|                                                   |                      |                         |                                |                 |                          |                       |                 |
|                                                   | N                    |                         |                                |                 |                          |                       |                 |
|                                                   |                      |                         |                                |                 |                          |                       |                 |
|                                                   | O                    |                         |                                |                 |                          |                       |                 |
|                                                   |                      |                         |                                |                 |                          |                       |                 |
|                                                   | P                    |                         |                                |                 |                          |                       |                 |
|                                                   |                      |                         |                                |                 |                          |                       |                 |
|                                                   | Q                    |                         |                                |                 |                          |                       |                 |
|                                                   |                      |                         |                                |                 |                          |                       |                 |
|                                                   |                      |                         |                                |                 |                          |                       |                 |
|                                                   |                      |                         |                                |                 |                          |                       |                 |
|                                                   |                      |                         |                                |                 |                          |                       |                 |
|                                                   |                      |                         |                                |                 |                          |                       |                 |
|                                                   |                      |                         |                                |                 |                          |                       |                 |
| 528                                               |                      |                         |                                |                 |                          |                       |                 |
|                                                   |                      |                         | TOTAL                          |                 |                          |                       |                 |

PLY CAN BE REPLACED  
WITH BRACELINE



### SPECIFICATION

New Home For Mr & Mrs Don Harper  
Winara av.      Waikanae

Rob Kofoed  
Chartered Architect

CN 4496

PROPOSED NEW HOME FOR MR AND MRS. DON HARPER

AT 105 A WINARA AVENUE WAIKANAE

INDEX TO SPECIFICATION

1. PRELIMINARY AND GENERAL.
2. EARTHWORKS.
3. CONCRETOR.
4. METALWORK#
5. CARPENTRY
6. JOINERY
7. ALUMINIUM WINDOWS
8. ROOF COVERINGS .
9. PLUMBING
10. DRAINAGE
11. SOLID PLASTERER.
12. ELECTRICIAN.
13. PAINTING
14. BRICKWORK.

APPENDIX A LINTELS

APPENDIX B NAILING SCHEDULE.

APPENDIX C BRACING SCHEDULE.

APPENDIX 3

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BRACING SCHEDULE

---

SHEET A  
(CIRCLE whichever is applicable)NAME: D HARPERSTOREY: Single or top  
Lower of two or middle of three  
Lower of threeWIND AREA: High / Medium / LowSTOREY HEIGHT = 3.0 m

SITE ADDRESS:

WINARA AV  
WAIKANA E(Interpolate 3) 2.4 → 3.6

1)

## FOR EARTHQUAKE

Roof weight: light / heavyAverage roof slope: 45°Earthquake Zone: A / B / C

Interpolate for 2½ Floors -

E = 8 B.U.'s/m²

2)

## WIND along the building (W1)

Average roof height: 4.5 mGreatest roof slope: 45° / Flat

ALONG

|            | ①         | ②                   |
|------------|-----------|---------------------|
| w1 wall =  | <u>33</u> | <u>100</u> B.U.'s/m |
| w1 roof =  | <u>0</u>  | <u>100</u> B.U.'s/m |
| W1 total = | <u>33</u> | <u>200</u> B.U.'s/m |

3)

## WIND across the building (W2)

Average roof height: 2.5 mGreatest roof slope: 45° / Flat

ACROSS

|            | ①         | ②                   |
|------------|-----------|---------------------|
| w2 wall =  | <u>33</u> | <u>90</u> B.U.'s/m  |
| w2 roof =  | <u>0</u>  | <u>40</u> B.U.'s/m  |
| W2 total = | <u>33</u> | <u>130</u> B.U.'s/m |

ROOF or BUILDING LENGTH

BL = 18 m <sup>① 3.5</sup>  
<sup>② 7.0</sup>

ROOF or BUILDING WIDTH

BW = 10.5 m <sup>① 6.5</sup>  
<sup>② 12</sup>

GROSS ROOF or BUILDING PLAN AREA

GPA = 189 m²

EARTHQUAKE: LOAD (ALONG and ACROSS)

E x GPA = 8 x 189 = 1512 B.U.'s

WIND: LOAD ALONG

W1 x BW = ① 33 x 3.5 = 115 B.U.'s  
② 200 x 7.0 = 1400

WIND: LOAD ACROSS

W2 x BL = ① 33 x 6.5 = 214 B.U.'s  
② 130 x 12 = 1560

ALONG

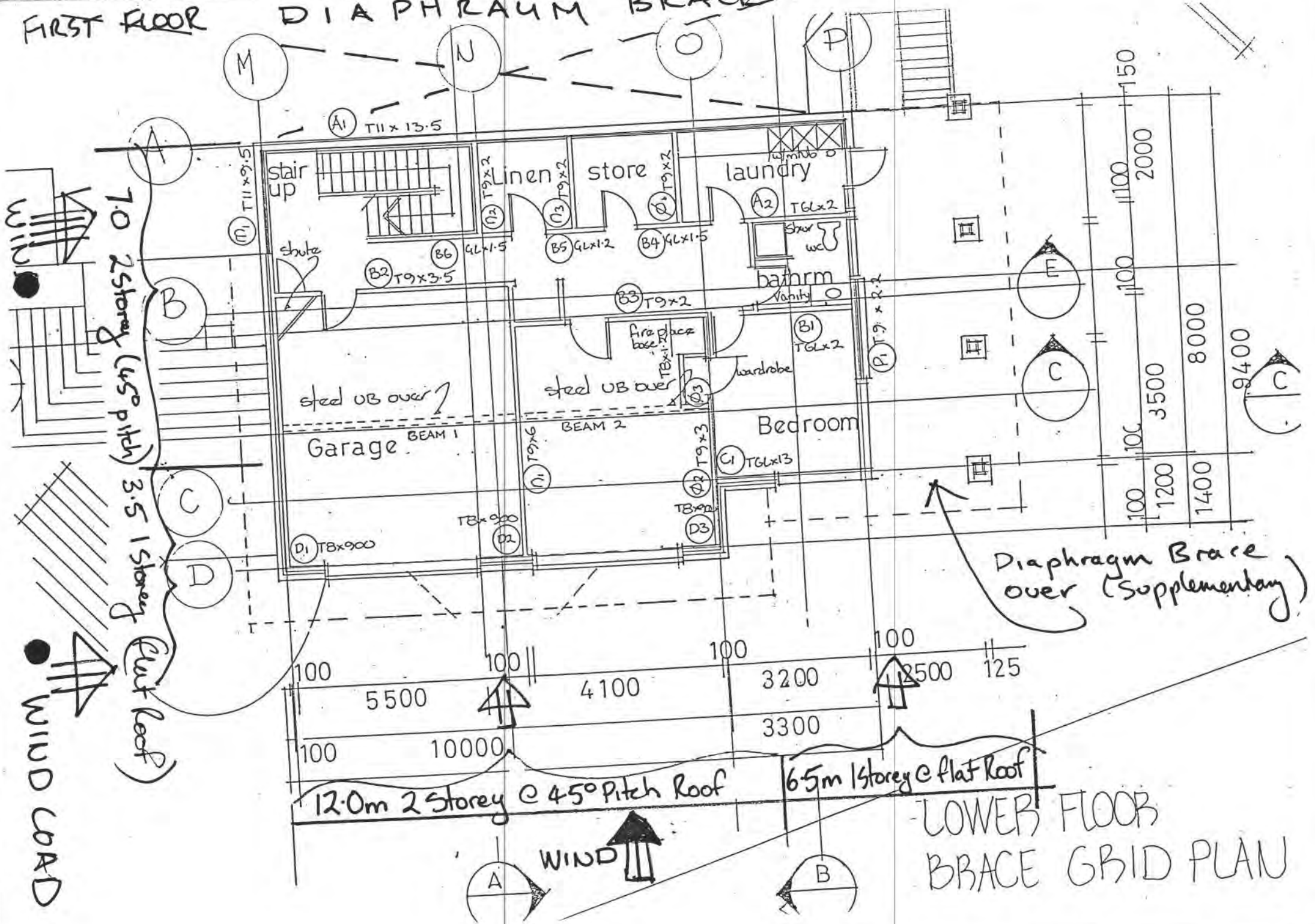
[illegible]

### ACROSS

| 1                                                    | Wall or Bracing Line |                         | Wall Bracing Elements Provided |                 |                          |                       |                 |
|------------------------------------------------------|----------------------|-------------------------|--------------------------------|-----------------|--------------------------|-----------------------|-----------------|
|                                                      | 2                    | 3                       | 4                              | 5               | 6                        | 7                     | 8               |
| Total Bracing Units Required for this storey         | Line Label           | Minimum B.U.'s Required | Bracing Element NO.            | Type (table 20) | Rating B.U.'s (table 20) | Length of Element (m) | B.U.'s Achieved |
| From sheet A<br>greater of earthquake or wind across | M                    |                         | m <sub>1</sub>                 | 11              | 42                       | 9.5                   | 399             |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      | N                    |                         | n <sub>1</sub>                 | 9               | 83                       | 6                     | 498             |
|                                                      |                      |                         | n <sub>2</sub>                 | 9               | 83                       | 2                     | 166             |
|                                                      |                      |                         | n <sub>3</sub>                 | 9               | 83                       | 2                     | 166             |
|                                                      | O                    |                         | o <sub>1</sub>                 | 9               | 83                       | 2                     | 166             |
|                                                      |                      |                         | o <sub>2</sub>                 | 9               | 83                       | 3                     | 249             |
|                                                      |                      |                         | o <sub>3</sub>                 | 8               | 67                       | 1.2                   | 80              |
|                                                      | P                    |                         | p <sub>1</sub>                 | 9               | 83                       | 2.2                   | 182             |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      | Q                    |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
| 1574                                                 |                      |                         |                                |                 |                          | TOTAL                 | 1906            |

Lower Floor

# FIRST FLOOR DIA PHRAUM BRACE



LOWER FLOOR BRACE GRID PLAN

SHEET A  
(CIRCLE whichever is applicable)

NAME:

D. HARPER

STOREY:

Single or top

Lower of two or ☒ middle of three

Lower of three

WIND AREA:

☒ High

/ Medium / Low

STOREY HEIGHT

= 3.0 / 2.4 m

SITE ADDRESS:

105a Winara Avenue

WAIKANA E

→ interpolate 2.4 → 3.6 / 2.4

1)

## FOR EARTHQUAKE

Roof weight : light / ☒ heavy

Average roof slope : 45°

Earthquake Zone: A / B / C

E = 7 B.U.'s/m<sup>2</sup>

2)

## WIND along the building (W1)

Average roof height : 1.5 m

Greatest roof slope : 45°

ALONG

w1 wall = 80 B.U.'s/m

w1 roof = 30 B.U.'s/m

W1 total = 110 B.U.'s/m

3)

## WIND across the building (W2)

Average roof height : 1.5 m

Greatest roof slope : 45°

ACROSS

w2 wall = 80 B.U.'s/m

w2 roof = 30 B.U.'s/m

W2 total = 110 B.U.'s/m

ROOF or BUILDING LENGTH

BL = 24.6 m

ROOF or BUILDING WIDTH

BW = 17 m

GROSS ROOF or BUILDING PLAN AREA

GPA = 250 m<sup>2</sup>

EARTHQUAKE: LOAD (ALONG and ACROSS)

E x GPA = 7 x 250 = 1750 B.U.'s

WIND: LOAD ALONG

W1 x BW = 110 x 17 = 1870 B.U.'s

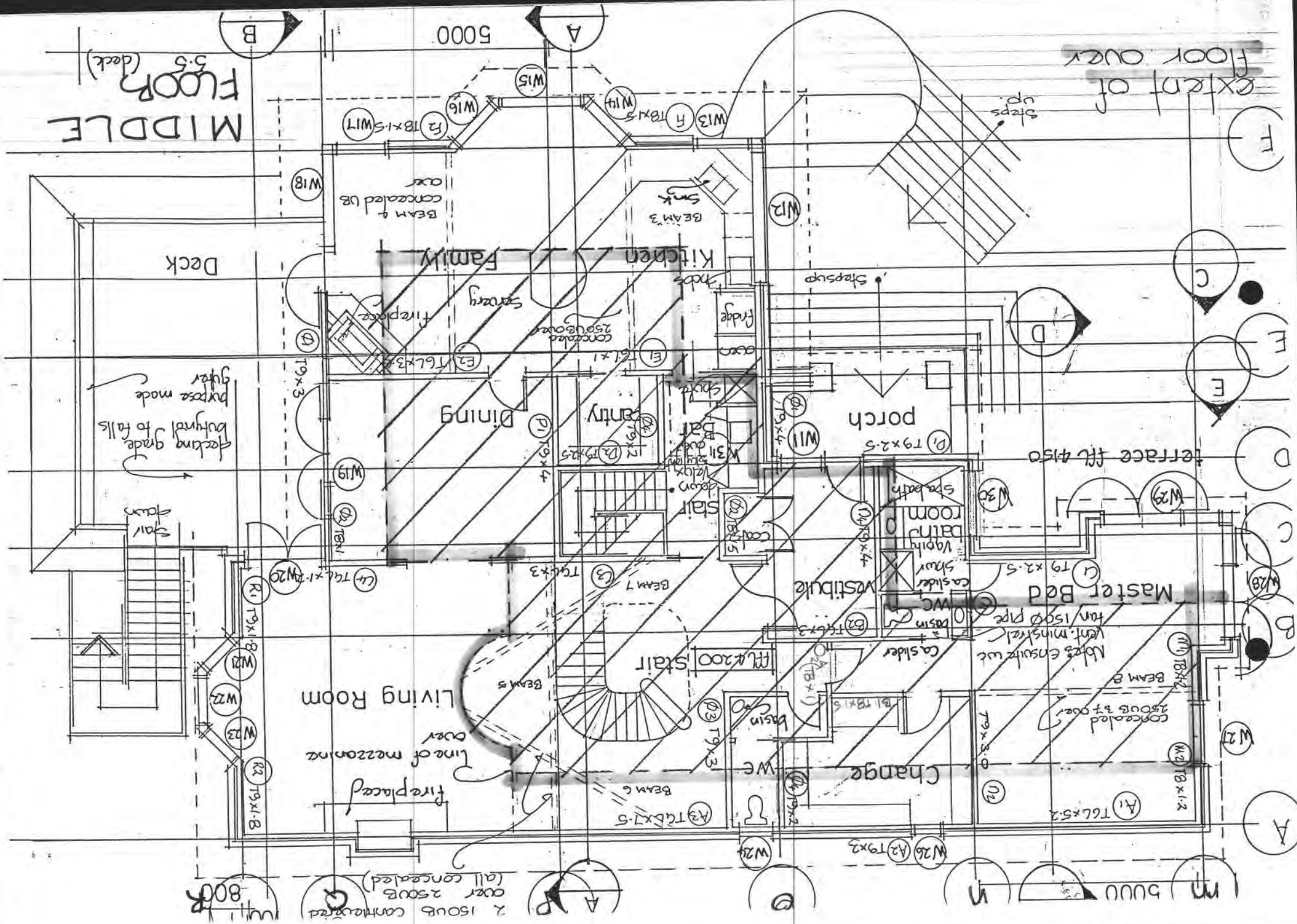
WIND: LOAD ACROSS

W2 x BL = 110 x 23.6 = 2596 B.U.'s

## ALONG

| 1                                                                            | Wall or Bracing Line |                         | Wall Bracing Elements Provided |                 |                          |                       |                 |
|------------------------------------------------------------------------------|----------------------|-------------------------|--------------------------------|-----------------|--------------------------|-----------------------|-----------------|
|                                                                              | 2                    | 3                       | 4                              | 5               | 6                        | 7                     | 8               |
| Total Bracing Units Required for this storey                                 | Line Label           | Minimum B.U.'s Required | Bracing Element NO.            | Type (table 20) | Rating B.U.'s (table 20) | Length of Element (m) | B.U.'s Achieved |
| From sheet A<br>greater of earthquake or wind along<br>GL = gible<br>60 BU/m | A                    | 230                     | A1                             | GL              | 60                       | 5.2                   | 312             |
|                                                                              |                      |                         | A2                             | 9               | 83                       | 3                     | 249             |
|                                                                              |                      |                         | A3                             | GL              | 60                       | 7.5                   | 450             |
|                                                                              | B                    | 230                     | B1                             | 8               | 67                       | 1.5                   | 100             |
|                                                                              |                      |                         | B2                             | GL              | 60                       | 3                     | 180             |
|                                                                              | C                    | 220                     | C1                             | 9               | 83                       | 2.5                   | 207             |
|                                                                              |                      |                         | C3                             | GL              | 60                       | 3                     | 180             |
|                                                                              |                      |                         | C4                             | GL              | 60                       | 1.2                   | 72              |
|                                                                              |                      |                         | D1                             | 9               | 83                       | 2.5                   | 207             |
|                                                                              | D                    | 100                     | D2                             | 9               | 83                       | 2.5                   | 207             |
|                                                                              |                      |                         |                                |                 |                          |                       |                 |
|                                                                              | E                    | 100                     | E1                             | GL              | 60                       | 1                     | 60              |
|                                                                              |                      |                         | E2                             | GL              | 60                       | 3                     | 180             |
|                                                                              | F                    | 100                     | F1                             | 8               | 67                       | 1.5                   | 100             |
|                                                                              |                      |                         | F2                             | 8               | 67                       | 1.5                   | 100             |
|                                                                              |                      |                         |                                |                 |                          |                       |                 |
|                                                                              |                      |                         |                                |                 |                          |                       |                 |
|                                                                              |                      |                         |                                |                 |                          |                       |                 |
|                                                                              |                      |                         |                                |                 |                          |                       |                 |
|                                                                              |                      |                         |                                |                 |                          |                       |                 |
|                                                                              |                      |                         |                                |                 |                          |                       |                 |
| 1870                                                                         |                      |                         |                                |                 |                          | TOTAL                 | 2604            |

| 1                                                                             | Wall or Bracing Line |                         | Wall Bracing Elements Provided |                 |                          |                       |                 |
|-------------------------------------------------------------------------------|----------------------|-------------------------|--------------------------------|-----------------|--------------------------|-----------------------|-----------------|
|                                                                               | 2                    | 3                       | 4                              | 5               | 6                        | 7                     | 8               |
| Total Bracing Units Required for this storey                                  | Line Label           | Minimum B.U.'s Required | Bracing Element NO.            | Type (table 20) | Rating B.U.'s (table 20) | Length of Element (m) | B.U.'s Achieved |
| From sheet A<br>greater of earthquake or wind across<br>GL = gible<br>60 BU/m | M                    | 80                      | m1                             | 8               | 67                       | 1.2                   | 80              |
|                                                                               |                      |                         | m2                             | 8               | 67                       | 1.2                   | 80              |
|                                                                               | N                    | 100                     | n2                             | 9               | 83                       | 3                     | 249             |
|                                                                               |                      |                         | n3                             | 8               | 67                       | 9.0                   | 60              |
|                                                                               |                      |                         | n4                             | 9               | 83                       | 4                     | 332             |
|                                                                               | O                    | 200                     | o1                             | 9               | 83                       | 4                     | 332             |
|                                                                               |                      |                         | o2+a                           | 8               | 67                       | 2.5                   | 167             |
|                                                                               |                      |                         | o3+o4                          | 9               | 83                       | 3.2=5                 | 415             |
|                                                                               | P                    | 200                     | p1                             | 9               | 83                       | 4                     | 332             |
|                                                                               |                      |                         |                                |                 |                          |                       |                 |
|                                                                               | Q                    | 200                     | q1                             | 9               | 83                       | 3                     | 249             |
|                                                                               |                      |                         | q2                             | 8               | 67                       | 1                     | 67              |
|                                                                               | R                    | 80                      | r1                             | 9               | 83                       | 1.8                   | 149             |
|                                                                               |                      |                         | r2                             | 9               | 83                       | 1.8                   | 149             |
|                                                                               |                      |                         |                                |                 |                          |                       |                 |
|                                                                               |                      |                         |                                |                 |                          |                       |                 |
|                                                                               |                      |                         |                                |                 |                          |                       |                 |
|                                                                               |                      |                         |                                |                 |                          |                       |                 |
|                                                                               |                      |                         |                                |                 |                          |                       |                 |
|                                                                               |                      |                         |                                |                 |                          |                       |                 |
| 2596                                                                          |                      |                         |                                |                 |                          | TOTAL                 | 2661            |



SHEET A  
(CIRCLE whichever is applicable)

NAME:

D Harper.

STOREY:

☒ Single or top

Lower of two or middle of three

Lower of three

WIND AREA:

☒ High

/ Medium / Low

STOREY HEIGHT = 2.4 m

SITE ADDRESS:

Winara Avenue

Waikeane

1)

## FOR EARTHQUAKE

Roof weight : light / ☒ heavy

Average roof slope : 45 °

Earthquake Zone: ☒ A / B / CE = 4 B.U.'s/m<sup>2</sup>

2)

## WIND along the building (W1)

Average roof height : 1.5 m

Greatest roof slope : 45 °

ALONG

w1 wall = 22 B.U.'s/m

w1 roof = 30 B.U.'s/m

W1 total = 52 B.U.'s/m

3)

## WIND across the building (W2)

Average roof height : 1.5 m

Greatest roof slope : 45 °

ACROSS

w2 wall = 22 B.U.'s/m

w2 roof = 30 B.U.'s/m

W2 total = 52 B.U.'s/m

ROOF or BUILDING LENGTH

BL = 19 m

ROOF or BUILDING WIDTH

BW = 11.5 m

GROSS ROOF or BUILDING PLAN AREA

GPA = 117 m<sup>2</sup>

EARTHQUAKE: LOAD (ALONG and ACROSS)

E x GPA = 4 x 117 = 468 B.U.'s

WIND: LOAD ALONG

W1 x BW = 52 x 11.5 = 598 B.U.'s

WIND: LOAD ACROSS

W2 x BL = 52 x 19 = 988 B.U.'s

BRANZ

HARPER TOP FLOOR

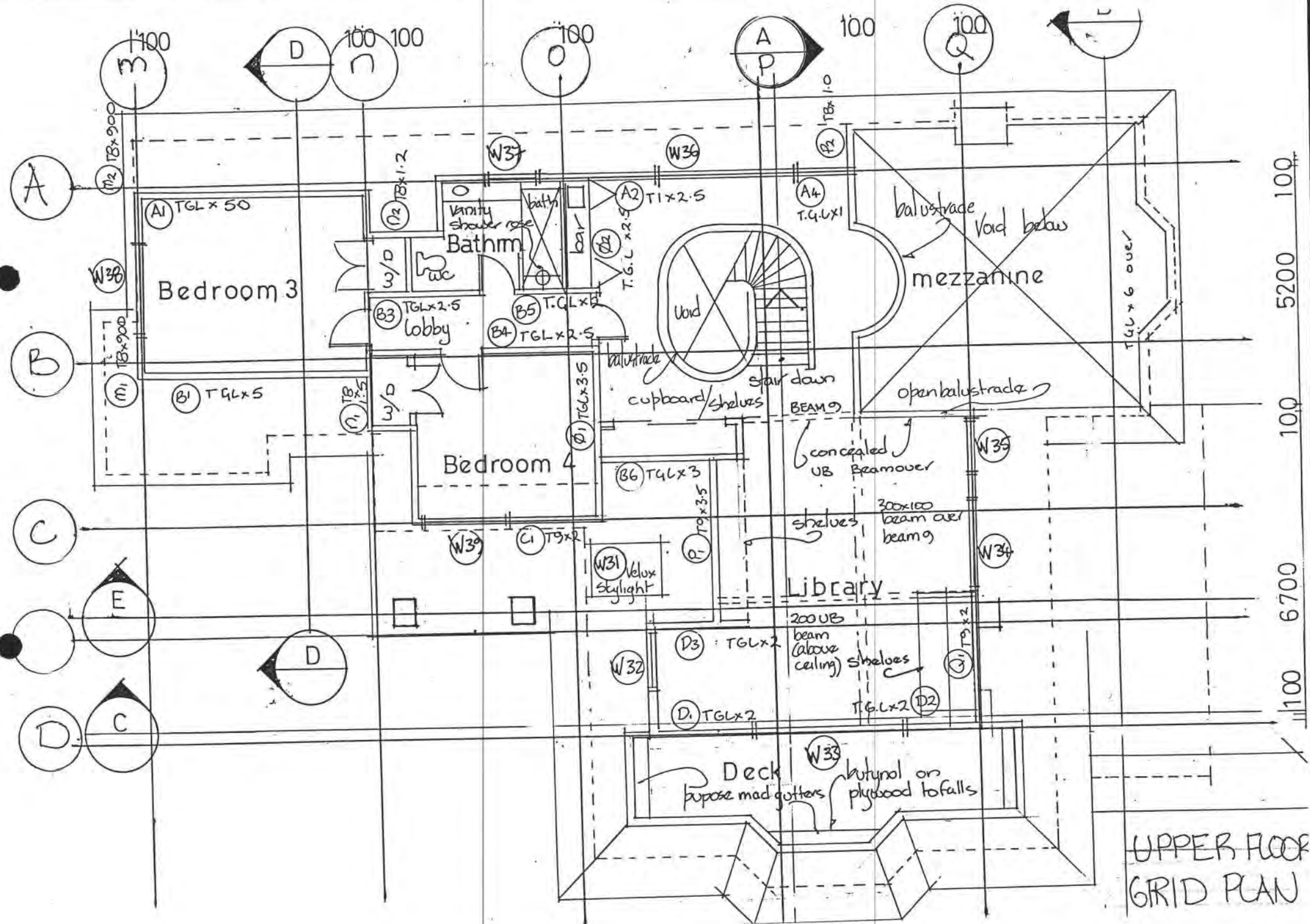
SHEET B

ACROSS

ALONG

| 1                                                   | Wall or Bracing Line |                         | Wall Bracing Elements Provided |                 |                          |                       |                 |
|-----------------------------------------------------|----------------------|-------------------------|--------------------------------|-----------------|--------------------------|-----------------------|-----------------|
|                                                     | 2                    | 3                       | 4                              | 5               | 6                        | 7                     | 8               |
| Total Bracing Units Required for this storey        | Line Label           | Minimum B.U.'s Required | Bracing Element NO.            | Type (table 20) | Rating B.U.'s (table 20) | Length of Element (m) | B.U.'s Achieved |
| From sheet A<br>greater of earthquake or wind along | A                    | 160                     | A1                             | T4L             | 60                       | 5                     | 300             |
|                                                     |                      |                         | A2                             | I               | 42                       | 2.5                   | 105             |
|                                                     |                      |                         | A4                             | T4L             | 60                       | 1.0                   | 60              |
|                                                     | B                    | 160                     | B1                             | T4L             | 60                       | 5                     | 300             |
|                                                     |                      |                         | B345                           | T.4L            | 60                       | 7                     | 420             |
|                                                     |                      |                         | B6                             | T4L             | 60                       | 3                     | 180             |
|                                                     | C                    | 120                     | C1                             | 9               | 83                       | 2                     | 166             |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     | D                    | 80                      | D1                             | T.4L            | 60                       | 2                     | 120             |
|                                                     |                      |                         | D2                             | T4L             | 60                       | 2                     | 120             |
|                                                     | E                    |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
|                                                     |                      |                         |                                |                 |                          |                       |                 |
| 598                                                 |                      |                         |                                |                 |                          | TOTAL                 | 1771            |

| 1                                                    | Wall or Bracing Line |                         | Wall Bracing Elements Provided |                 |                          |                       |                 |
|------------------------------------------------------|----------------------|-------------------------|--------------------------------|-----------------|--------------------------|-----------------------|-----------------|
|                                                      | 2                    | 3                       | 4                              | 5               | 6                        | 7                     | 8               |
| Total Bracing Units Required for this storey         | Line Label           | Minimum B.U.'s Required | Bracing Element NO.            | Type (table 20) | Rating B.U.'s (table 20) | Length of Element (m) | B.U.'s Achleved |
| From sheet A<br>greater of earthquake or wind across | M                    | 70                      | m <sub>1</sub>                 | 8               | 67                       | 900                   | 60              |
|                                                      |                      |                         | m <sub>2</sub>                 | 8               | 67                       | 900                   | 60              |
|                                                      | N                    | 70                      | n <sub>1</sub>                 | 8               | 67                       | 1.5                   | 100             |
|                                                      |                      |                         | n <sub>2</sub>                 | 8               | 67                       | 1.2                   | 80              |
|                                                      |                      |                         | n <sub>3</sub>                 | T 4L            | 60                       | 2                     | 120             |
|                                                      | O                    | 100                     | Ø <sub>1</sub>                 | T 4L            | 60                       | 3.5                   | 210             |
|                                                      |                      |                         | Ø <sub>2</sub>                 | T 4L            | 60                       | 2                     | 120             |
|                                                      | P                    | 160                     | P <sub>1</sub>                 | 9               | 83                       | 3.5                   | 290             |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      | Q                    | 160                     | Q <sub>1</sub>                 | 9               | 83                       | 2                     | 166             |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
|                                                      |                      |                         |                                |                 |                          |                       |                 |
| 988                                                  |                      |                         | TOTAL                          |                 |                          |                       | 1016            |



## 1. PRELIMINARY & GENERAL

This contract comprises of the supply of all plant, equipment, materials and labour etc. necessary for the thorough execution, completion and maintenance of the whole of the work specified herein and/or shown on the drawings or reasonably implied as a standard building requirement. Every item expressed or implied in the contract documents, or as necessary in accordance with the best trade practice for the due and proper completion of the works shall be deemed to be allowed for by the Contractor.

## 2. CONTRACT DOCUMENTS

The Contract Documents are as follows:

- a. General Conditions of Contract current edition as negotiated between N.Z. Institute of Architects and the N.Z. Master Builders' Federation. A copy is available at the office of the Architect for inspection.
- b. Any Special Conditions of Contract that may be described within this specification.
- c. This specification and any addendum sheets accompanying this specification or described within this specification.
- d. Drawings as marked with the relative commission number.
- e. The Contractors tender
- f. Letter of acceptance from the client or his representative.

## 3. ITEMS TO ACCOMPANY THE TENDER

- a. Tender shall be delivered to the Architect before the prescribed closing time in a sealed envelope marked with the appropriate commission number.
- b. Shall include the specification and drawings etc. as supplied to the Tenderer for the purpose of tendering.
- c. Deposit cheque if called for.
- d. Progress chart setting out the tenderer's commencement stage and completion stage for the work.

## 4. CONTRACTORS RESPONSIBILITIES.

The Contractor is directly responsible for all his Sub-contracting work. All trades shall, before commencing their own work, shall satisfy themselves that all surfaces, materials, measurements and all necessary preliminary works are all in position, properly finished and in suitable condition to enable them to execute and complete their own work in the best tradesmanlike manner and to a first class finish. Commencement of work by any trade shall be deemed acceptance by that trade of the condition and all matters affecting the production by them of a first class job. All work by Sub-trades is the responsibility of the main contractor and he must closely supervise all sub-contract work in accordance with his contract and he must be prepared to fully certify for all their work if called upon to do so.

The Contractor shall inspect and check all work performed under this contract. Any error or fault whatsoever shall be immediately reported to the Architect.

The Contractor shall be responsible to draw to the attention of all sub-contractors pricing any of this work, their full responsibilities in relation to this contract.

**SITE:**

The site is located at 105 A Winara avenue, Waikanae, and is indicated on the drawings. Tenderers shall inspect the site and satisfy themselves on all surface conditions.

**7. SUB SOIL**

It shall be assumed in tendering that the sub - soil is of sufficient bearing capacity to meet the minimum requirements of nzss for foundations unless otherwise drawn or specified. Where the subsoil is not of sufficient bearing capacity to meet the minimum requirements of nzss unless otherwise shown on the drawings, all work, labour and materials to provide adequate foundations to bearing capacity shall be dealt with as a variation to the contract.

**8. DRAWINGS AND SPECIFICATIONS:**

This specification shall be read in conjunction with the contract working drawings and any further detailed drawings that may be implied as a reasonable interpretation of the contract. All figured dimensions shall be taken in preference to those scaled. All detailed drawings shall supersede those of smaller scale.

**9. DISCREPANCIES ETC:**

Where any variation, discrepancy, or ambiguity occurs in the contract documents it shall be reported to the Architect immediately it is found and before proceeding with the work affected. When tendering the contractor shall allow for the most expensive alternative; the architect's interpretation shall be final and binding and if a cheaper alternative is adopted the appropriate credit shall be allowed to the contract.

**10. BYLAWS ACTS, REGULATIONS, STATUTES, ETC.**

The Work shall conform to all acts, regulations, statutes, Rules, Local Bylaws and other local conditions having jurisdiction.

**11. PERMITS AND FEES:**

The Contractor shall give notices to and obtain all necessary permits and authorisations from all authorities. All fees and levies payable by the contractor shall be deemed part of the Contract amount. Any pre paid fees by the owner or architect shall be adjusted as a variation. Any permit conditions affecting the contract shall be immediately reported to the architect. If such condition shall become a variation to the contract unless confirmed in writing by the Architect.

## 12. PROTECTION OF WORK

The Contractor shall at his own expense sufficiently light and watch the works. For this purpose he shall provide all the necessary fencing, boardings, light and all other matters which could be deemed necessary for the due and proper protection of the public and all property near or liable to be affected by the work. The Contractor shall ensure that all trades take the necessary precautions to prevent finished work from subsequent damage in any way whatsoever before the works are complete. If any such damage should occur it shall be fully made good at the Contractors expense.

## 13. MATERIALS.

All materials shall be the best of their respective kinds and shall conform to the standards of the relevant nzss. If no nzss should exist for a particular material then it shall conform with the standard of the relevant British ss.

## 14. PROPRIETARY PRODUCTS.

All proprietary products and materials shall be used in strict accordance with the Manufacturer's instructions and recommendations. If required, the Manufacturer shall provide a ~~competant and knowledgeable representative to supervise thoroughly the complete~~ use of the product or material. The Contractor shall notify the Manufacturer of any such material or product. The Manufacturer shall be held jointly responsible with the Contractor for any failure or unsatisfactory performance of the proprietary product or material.

## 15. MATERIAL SUPPLIES ETC.

The Contractor shall be responsible for the supply on time of all materials required for the works inclusive of Sub-contractors materials etc. No extensions of time will be approved for any delays in the delivery of any items.

## 16. PLANT AND EQUIPMENT

The Contractor shall provide all necessary plant and equipment for the necessary completion of the works to the specified standards and the time limit.

## 17. CLEANING AND TIDINESS

The works and site shall be kept clean of all excess dirt, refuse, dust and waste materials as the job progresses and as required by the Architect. All spaces shall be thoroughly cleaned before any finishing work is commenced. The Contractor shall take all reasonable precautions to limit the amount of noise, dust and other forms of nuisance to the Public, adjoining Owners etc. Any damage or nuisance caused shall be the responsibility of the Contractor.

## 18. VARIATIONS AND ADDITIONAL WORK.

Variations and additional work will not be recognised unless instructed in writing in the form of VARIATION ORDERS issued by the Architect. When a variation occurs a description of the variation will be recorded on a PROVISIONAL VARIATION INSTRUCTION and the Contractor shall submit within one week a price for the work and a time variation. When the cost and time variations are agreed by the Architect then a VARIATION ORDER shall be issued. If no reply to the PROVISIONAL VARIATION ORDER is received within one week or agreed extention thereto then it shall be agreed that there is no price or time variation to the contract except in the case of credits to the contract price.

## 19. INDENTITY AND INSURANCE

The Contractor shall arrange Insurance Covers in strict accordance with the General Conditions of Contract of the N Z Institute of Architects current edition.

The Contractor shall produce to the Architect the appropriate cover agreement from an approved Insurance Company to show that full cover is in force for the duration of the contract for the requirements of insurances as set out in the N Z Institute of Architects Standard Conditions of Contract. No progress payment certificate may be issued unless proof of proper cover is presented. If for any reason cover may be cancelled or cease to be effective the Contractor shall notify the Architect immediately.

## 20. TEMPORARY SERVICES

The Contractor shall provide and maintain, as necessary, all temporary services required for the proper execution of the works. Provide power, lighting, drainage, water, telephone, etc. and all other facilities required. Pay all fees and charges in connection with temporary services. Remove on completion. The Contractor shall make these services available to all Sub-contractors as required. If any of these services are provided by the Owner then proper arrangements must be made prior to tendering.

## 21. INTERPRETATIONS

a. The words 'provide', 'fix', 'install', and 'supply' if used separately, shall be deemed to mean 'provide and fix', 'provide and install' and 'supply and fix' unless explicitly stated otherwise.

b. Where New Zealand or other standards Specifications are referred to in any section of these specifications, it shall mean the latest issue of such standard specification, all subsequent amendments and metric handbooks applying to such standards. Where applicable, it is mandatory that the materials covered by these Standard Specifications shall be marked with the Standard Mark and the Specification Number.

c. Where reference is made in this specification to any act of Parliament, Regulation made thereunder, Statutory Instrument, Code of practice National Standard, Manufacturers Instructions or similar instructions, it shall be construed to mean the edition with all amendments current at the time of the issue of these Contract Documents.

d. Reasonable care has been taken to classify under each trade, but the onus is on all trades to make themselves conversant with any and all clauses in this Specification that may affect their work.

## 22. ATTENDANCE

Allow for the use of ordinary scaffolding, special scaffolding plant, power, water and working space to all Sub-contractors etc. as and when required by them for the efficient execution of the contract.

Attend upon, cut away for, and make good after all trades and Sub-contractors as and when required.

## 23. COMPLETION.

On completion remove from the site all rubbish and temporary work arising from this contract. Clean thoroughly the entire building and clean and polish all glass on both sides. Clean and polish all floors tiled areas, plastic surfaces, all aluminium and bright metal work, polish woodwork, fittings and machines, appliances and all work generally. Leave the whole of the work clean and fit for immediate occupation with all equipment, services and fittings in good

23. COMPLETION (continued)

condition, complete and in proper working order and the whole building completely weatherproof and bird proof.

EARTHWORKS, SCOPE:

Location of exisint access between 105 and 107 Winara Avenue.

(1). Drive to be formed with compacted hardfill to provide acceptable access for heavy vehicles and form base for final seal. All services to be installed prior to drive formation.  
That is: Power, Gas, Drains (stormwater and sewer), Telephone etc.

(2). Existing soil to be stripped at location of house and paving, good topsoil to be stock piled to south of house as directed by the architect.

(3). Trees to be protected at architects direction.

(4). Existing fences to be protected. Damage to existing fences to be repaired at contractor's expense.

(5). Structure to be set out complete with terraces, decks and stairs, final levels to be ascertained before commencement of formwork.

## EARTHWORKS

PRELIMINARY. The Preliminary and General sections of this specification is applicable to all Sub-trades

this includes the General Conditions of Contract of the New Zealand Institute of Architects current edition. The Main Contractor is directly responsible for all work by his Sub-contractors and must ensure that their work is performed in strict accordance with all the Main Contractor's requirements.

EXTENT OF WORK. Clear all vegetation, topsoil and rubbish from all areas to be built over or paved, allow for removal of 150mm minimum depth.

Excavate and fill as necessary to bring the site to its final levels.

Excavate as required for foundations and services and backfill. Sundry other excavations as necessary and making good as

required to properly complete the works.

Care shall be taken to avoid damaging existing trees to remain and avoid damaging any existing underground services. All damage shall be made good at the Contractor's expense.

SURPLUS MATERIALS. All surplus materials as determined by the Main Contractor shall be removed from the site unless otherwise instructed. Any topsoil as defined as surface layers of earth containing humus and vegetable matter shall be stacked on the site where instructed.

EXCAVATIONS FOR FOUNDATIONS AND SERVICES. All excavations for foundations, trenches,

drains etc. shall be true to level and grade. All excavations shall be kept reasonably dry until all building operations are complete. Pump if necessary. All water shall be removed from excavations etc. before any concrete is poured. All backfilling as required shall be with approved material and thoroughly compacted.

SUPPORTS STRUTTING ETC. All necessary shores, struts etc shall be provided sufficiently erected to keep all trenches and excavations clear, open and safe. The Main Contractor shall supervise any work for safety requirements.

SUB-FLOOR PREPARATION. All material under floor slabs etc. shall be compacted to maximum density as required with heavy powered vibrating roller until there is

EARTHWORKS (cont'd)

no appreciable movement. Filling shall be deposited and consolidated in layers not exceeding 150mm. thick. Compacting shall be carried out close to walls and foundations. Finished surfaces shall be regular and even.

REINSTATEMENT. Any existing work affected by this contract shall be restored to the condition at the commencement of this contract and the whole site left in a neat and tidy condition.

DRIVEWAYS. Roughly form driveways, parking areas etc to allow maximum traffic consolidation before later completion.

DRIVEWAYS AND PARKING AREAS. Workmanship shall be to the standard complying with the National Roads Board Specification F1. for construction and formation. Grades shall be even in all directions, alignments true and smooth transitions to all changes of direction.

CONSOLIDATION. Bind base of driveway topcourse surface with crusher dust to form well bound even surface. Compact thoroughly with heavy powered approved vibrating roller until no appreciable movement occurs. Dress the surface during rolling to remove any irregularities. Finish surfaces to correct levels with falls, crowns and stable edges.

3.12 MATERIALS GENERALLY  
Comply with NZS 1900 Chapter 9.3A 1970.

3.13 WALLS BELOW GROUND  
Dampproof with 3 coats of Flintkote or similar approved.

### 3. CONCRETOR

3.1 P & G  
See applicable clauses.

3.2 SCOPE

3.3 SITE-MIXED CONCRETE  
NZS 1900 Chapter 9.3A 1970 C127.1

3.4 READY-MIXED CONCRETE  
NZS 1900 Chapter 9.3A 1970 C127.2

3.5 GRADE  
NZS 1900 Chapter 9.3A 1970 Table 1

3.6 QUALITY  
NZS 1900 Chapter 9.3A 1970 C116

3.7 FORMWORK  
NZS 1900 Chapter 9.3A 1970 C131

3.8 PLACING COMPACTION & CURLING  
NZS 1900 Chapter 9.3A 1970 C128

3.9 REINFORCING STEEL  
Rods - NZS 1900 Chapter 9.3A 1970 C 19  
Hooks, bends, laps, cleaning, placing  
spacing - C1s33 to 36

3.10 BOLTS & FITTINGS  
Timber plates - 9mm dia bolts with  
nuts and washers at 900mm crs- max.  
All shoes, straps, lugs, etc as  
required.

3.11 SLABS  
Level ground surface. Roll hardcore  
flush; blind with sand if necessary.  
Lay continuous layer Moistop 737.  
Seal with 50mm wide pressure  
sensitive tape, lap 225mm. 17.5MPa  
concrete (37mm slump). Fully compact  
with vibrating screeding board.

### SCHEDULE OF REINFORCING STEEL WALLS

Up to 900 mm high: 12mm bar in bottom  
9mm bar in top

Up to 1800mm high: ditto plus 9mm bars  
at 380mm crs b/w

Supporting 2 storeys : 2.9mm bars in  
bottom (or one 19mm  
barr)

Retaining walls as detailed on the  
drawings.

### SLABS

100mm thick: 665 HRC Mesh.

All other steel as detailed on the  
drawings.

#### 4.5 SCHEDULE OF METALWORK

##### i) Bolts

| Location | Diameter | Length |
|----------|----------|--------|
|----------|----------|--------|

SEE DRAWINGS

#### 4. METALWORKER

##### 4.1 P & G

See applicable clauses.

##### 4.2 SCOPE

See schedule

##### 4.3 STANDARDS

NZS 898 1966

##### 4.4 FINISH

ALL metal exposed to the weather to be hot dip galvanised.

##### ii) Plates

| Location | Size |
|----------|------|
|----------|------|

INTERIOR  
DOOR

Hot dip giv. flat 3  
bracket with 2" x 1/2"  
pipe with "COX" x 10"  
plate.

Roofs - beams

2 - 150 x 75 x 5  
galv. mild steel str  
4 - 110 galv. bolts.

## CARPENTER

PRELIMINARY. The preliminary and general sections of this specification are applicable to all Sub-Trades. This includes the General Conditions of Contract of the N.Z. Institute of Architects currently in force. The Main Contractor is directly responsible for all work by his Sub-Contractors and must ensure that their work is performed in strict accordance with all Main Contractor requirements.

STANDARDS. All materials and workmanship, unless otherwise specified shall conform to the relevant N.Z. Standard Specification.

### TIMBER.

STACKING. All timber, immediately on arrival at the site, shall be fillet stacked. All joinery kiln dried timber shall be continuously protected from the weather and from any possible damage during the currency of the contract.

THICKNESSING. All framing timbers, wherever lined both sides, and elsewhere as specified, shall be guaged to produce regular plane surfaces.

TIMBER TREATMENT. All radiata pine and sap timber, other than N.Z. douglas fir and oregon not treated unless otherwise specified, shall be pressure treated in accordance with specification provisions of the Timber Preservation Authority. All treated timber, including items made of treated timber, shall be suitably identified and marked. Finishing timbers specified to be varnished or clear finished shall be treated in a manner which does not stain or mark the timber.

MOISTURE CONTENT. The Contractor shall provide certification that timber used is of the specified moisture content and of the specified grade and species. All timber shall be seasoned either in the open air or in a kiln. The following moisture content percentages are based on oven dry weight and are maximum moisture content factors allowable in the timber at the time of fixing or machining.

Generally the moisture content shall be as follows:

|                                                               |            |
|---------------------------------------------------------------|------------|
| Timber for interior joinery and interior timber for dressing. | 12% to 14% |
| Framing timber                                                | 15% to 17% |
| Exterior joinery and dressed timber exposed to outside.       | 13% to 15% |

In areas centrally heated the above percentages shall be reduced by at least 2%. In all cases the percentages for Ht. Matai shall be reduced by 2%.

WORKMANSHIP. All work shall be executed in a workmanlike manner to produce a first class job. Set out and erect all framing accurately, level, square and plumb as required to produce an even finish for linings etc. Make all joints in the strongest possible manner. Stagger laps and joins where possible. All joists, rafters and purlins which may have a crook shall be fixed with the crook facing up. All exposed surfaces shall be wrought and left suitable for specified finishes. All machine marks shall be removed from exposed timbers. Ensure that all finishing trades are entirely satisfied that the work can achieve their first class finish for which the Main Contractor shall be responsible.

NAILING. Skew nail wherever practicable, punch below flush all nails in exposed work. Exercise all necessary care in nailing exposed work to ensure that no surface damage to timber results. Any damage shall be satisfactorily rectified. Use galvanised or other specified fixings to totara and redwood. Use brads in all exposed work, roseheads in framing. Nails generally shall penetrate the second or holding timber at least half their length, except where the second timber is pinus radiata the length of penetration shall then be increased by 25%. Brads which shall be used generally to attach trim members, flooring, linings and finishings shall be in length three times the thickness of the attached material with generally a minimum length of 40mm. All nails in laps, scarfs, halving etc. of framing timbers shall be not less than 25mm longer than the total thickness of the timbers through which they are driven and shall have ends well clenched. Where possible double skew-nail all framing timbers at intersections and in pinus radiata similarly secure with four skew-nails. Well drive all nails in framing until head is flush.

SCREWING. Generally drill attached member for sliding fit and drill holding member with smaller diameter to produce a firm fixing. Unless otherwise specified countersink all screws and use counter sunk head/

BOLTING. Unless detailed or specified otherwise, generally secure all framing timber to masonry by bolting as follows:

All framing members shall be fixed through 40mm thickness or more of timber, shall generally be bolted with 12mm diam. bolts at 1350mm crs. Bolts of sufficient length shall be set in at least 150mm masonry and having a standard nut anchorage or other approved anchorage. Allow a full turn of the thread to protrude from nut after securely tightening. Supply and fit all bolts with 2mm thick washers with minimum dimension three times the diameter of the bolt. Unless otherwise directed, all framing members fixed through less than 40mm thickness of timber shall generally be bolted with 10mm diameter 'Terrier' or similar approved bolts. Bolts at maximum 600mm crs. of sufficient length for full thread of nut. Provide and fix washers of minimum size of three times bolt diameter.

MAKING GOOD ON COMPLETION. Attend upon and make good after all trades on completion. Leave all Carpentry and Joinery in first class condition. Make good any shrinkages. Clean down as required and necessary and leave all completely fit for finishing and use.

DAMP COURSE. Protect all timber in contact with concrete or masonry with a continuous full width D.P.C. or three-ply malthoid or other approved material.

VERMIN STOPS. All effective means shall be adopted by inserting plates and stops to prevent rats and mice from getting into and about the structure.

BUILDING PAPER. Provide and fix breather type building paper complying with n.z.s. 2295 and secure to exterior face of stud framing or sheet bracing material. Run building paper horizontal with upper faces lapping over lower faces not less than 75mm. Adequately secure to plates bearers and studs, extending from upper side of top plate to the underside of the bearers or wall plates supporting ground floor joists.

Replace or adequately repair to approval any punctured or torn building paper immediately before fixing exterior covering.

TIMBER GENERALLY. All timber shall comply with N.Z. 3631:1971 and updating - Classification and Grading of New Zealand Timber, National Timber Grading Rules and all subsequent amendments.

All timber shall be the best of its kinds, free from all defects and/or blemishes which would render it unsuitable for the purpose for which it is to be used.

All timber shall be of the sizes and grades specified and all exposed timber shall be dressed except where otherwise specified. All defective timber shall be removed from the site if directed. All timber shall be true to standard grading and equal to or better than Building 'A' for all framing timbers and Dressing 'A' for all finishing timbers. All timber for specified purposes shall be as scheduled hereafter.

FINISHING TIMBERS GENERALLY. Finishing timbers shall have all machine marks, roughness and stains removed and shall be dressed, scraped and sanded smooth and clean. This applies to finishing timbers throughout.

Exterior Finishing Timbers - Heart or tanalised treated Rimu, Matai or White Pine, or as detailed on Plans.

Interior Finishing Timbers - Heart B.A. Rimu or finger jointed pinus where painted as approved.

SUB FLOOR FRAMING. Lay bearers across piles and foundation walls in the sizes shown on the drawings.

Fix bearers and jack studs to ordinary piles with 4mm diam. galvanised wire passing through the pile, wrapped over bearers, or 200mm up jack studs and securely fixed to the timber with not less than three galvanised staples per fixing.

Fix bearers or plates across cantilevered piles with 12mm diam. bolts or rods set into piles. Provide nuts and washers to bolts to secure timbers or by clenching down rods. Bearers shall be joined over supports with minimum landing of 45mm otherwise bearers shall have minimum landing of 90mm.

Fix braces to anchor piles with 12mm bolts.

Bearers shall be laid in straight lines and packed level off piles. Where possible packing shall be avoided, but where required provide full support to bearers. Malthoid packing shall not exceed three layers. Where greater depth of packing is required it shall consist of accurately guaged timber set under the bearer and shall be securely fixed to prevent displacement.

FLOOR JOISTS. Floor joists shall be of the sizes noted and at centres shown on drawings.

Guage all joists level and fix in straight lines. Minimum landing on supports shall be 32mm. Make all joints over supports except at canterlevered joists. Joists may be butted over supports except joists to which diagonal bracing is attached. These joists and every third joist shall be lapped 300mm over the centre of a support or shall have a 300mm timber flitch plate centred on the joint and connected to each joist with 4-100mm nails to each joist alternatively 2 connectors each having a capacity of 3kN. Provide double joists under all bearing walls. Double joists may be separated by 50mm packings at not more than 600mm centres. Non load bearing walls shall be over joists or may be supported by 100mm x 50mm blocking between parallel joists at each end of the wall, at each side of door openings and at not more than 1.2m crs. Fix 25mm thick boundary joists as trimmers to the ends of all joists or fix other support as may be detailed on drawings or as permitted by NZS 3604.

Provide full depth blocking or herring bone strutting at mid-span of all joists exceeding 2.4m span as indicated on drawings. All joists shall be fixed to supporting bearers, beams or plates as required by the nailing schedule with additional fixings as shown on the drawings.

FLOOR SANDING. At the completion of the works all nails in floor shall be punched and the floors shall be sanded to provide a smooth even surface. Finish with a fine sandpaper where floors are to be varnish finnished. Particle board floors shall be sanded with rotary type sander. Care shall be exercised to avoid excess depth in sanding.

INTERIOR LININGS. All interior linings shall be fixed in strict accordance with the manufacture's instructions. See schedule of linings for materials to be used. All lining material shall be carefully handled and stacked under cover on site to prevent any damage.

GIBRALTER BOARD. Where shown on drawings and/or the schedule of linings line walls with standard 9.5mm gibraltar board or 9.5mm gibfoil.

Sheets may be fixed horizontally or vertically according to the details provided by the manufacturer, except where the lining forms part of the wall bracing element, dwanging must be provided at all edges of the sheets. Linings to exterior walls and ceilings shall preferably be gibfoil. Standard gibraltar board may be

used but sheets must be fixed over an approved polythene vapour barrier. Where gibraltar board forms part of a wall bracing element or ceiling diaphragm they shall be fixed to framing all round and at intermediate framing as set out in the nailing schedule.

Except at bracing elements or ceiling diaphragms, linings may be fixed to framing using gib fix adhesive with adequate supplementary nailing.

Leave adequate gaps to joints in sheets. Where wall paper is applied stop joints and nailing with 4F stopping plaster or gibstopping compound, feathered out approximately 100mm each side of joint and trowelled to a smooth and even surface. Where walls are to be painted joints and corners shall be finished using gib bedding compound, perf-a-tape and gib finishing compound with stopping carefully feathered out at all edges. After stopping has set, sand lightly to a smooth even surface using 120 grit abrasive paper. Fix timber or expanded metal strips at all external corners of linings.

PINEX INSULATING BOARD. Where shown on the drawings or on the schedule of linings, line ceilings with 12mm pre-primed pinex insulating board. Sheets shall be set out to form a pattern on the ceiling. Fix to roof framing or battens as shown with double angled nails or galvanised clouts as recommended by the manufacturer. Sheets shall be veed at joints and rebated and shall have mouldings inserted in the rebate. Joins in mouldings shall be mitred or scribed to suit. All fixing nails shall be stopped with 4F plaster and shall be lightly rubbed with a piece of scrap lining to provide a textured surface to match.

PINEX TILES, PLANKS AND PANELS. Where shown on the drawings and schedule of linings fix pinex

tiles, planks or panels to walls or ceilings.

Linings shall be fixed to battens at ceilings as shown, stapled to framing as recommended by the manufacturer.

PRE-FINISHED WALLBOARDS. (formica wallboard, seratone, etc) Where shown on drawings line walls and ceilings with pre-finished wallboards. Linings shall be fixed to framings with wallboard adhesive stik pads or similar approved. All joints shall be set in extruded P.V.C. mouldings.

Where linings are fixed in shower cubicles the back edges of sheets shall be primed for 100mm in from the edges before fixing.

Set the edges of sheets against baths into extruded P.V.C. bath-flash mouldings, bedded down onto the edge of bath in white butylmastic sealant. Carefully clean off any excess sealant.

Where a wall bracing element occurs prefinished wallboard lining shall be fixed over the Gib. board or hardboard lining forming part of the bracing element.

HARDBOARD. Where shown on drawings or schedule of linings, line walls and ceilings with 4.5mm or 6mm standard or oil tempered hardboard fixed strictly in accordance with the manufacturers instructions. Joints shall be veed and butted or set into P.V.C. mouldings as specified. Except where used as part of a wall bracing element linings may be fixed using an approved wallboard adhesive.

PANELING. Where shown on the drawings or schedule of linings line walls and ceilings with selected plywood or solid timber panelling. Plywood shall be fixed with wallboard adhesive and/or nailing with joints set in extruded P.V.C. moulding or with timber moulding between joints as specified. Where the sheets are butt jointed or have a jointer bead. the edges shall be planed to provide a neat true joint. Shiplap or other solid timber lining shall be secret nailed. All boards shall be fixed true and plumb.

INTERIOR FINISHING TIMBERS. Provide and fix all skirtings, architraves, scotias, sillboards and other mouldings and beadings required to complete the works.

Where finishing timbers are specified to be clear finished they shall be Rimu heart or figured as specified. Elsewhere they may be Rimu or finger-jointed treated radiata pine or other approved. Joints in lengths of runs of skirtings or scotias shall be neatly and accurately mitred. At corner intersections joints shall be neatly and accurately scribed to fit. Any inaccurately fitted joints will be rejected.

Sillboards shall be out of 25mm timber neatly fitted to jambs and mullions. Skirtings shall generally be out of 100mm x 25mm bull nosed with grooved back. Architraves shall be out of 50mmx25mm timber bullnosed with grooved back.

Drill holes for fixing at ends of all finishing timbers and fix with 40mm long panel pins. Any splits shall be rectified to approval, and may be rejected.

Before fixing in place all finishing timbers shall be hand sanded to a satisfactory and acceptable finish.

Scotias shall generally be 40mm standard pattern. Where shown on drawings provide pelmets over sliding doors and windows as detailed or described on the addenda.

SHOWER. Frame up for shower where shown on drawings. Recess framing around shower tray to keep lining 5mm out from the upstand of the shower tray, or pack framing out 5mm all round. Carry framing across front of cubical as required. Trim opening for sliding or folding door as shown on the drawings and in the addenda. carry linings around jambs and sill.

BATH. Frame up cradle for bath out of 100mm x 50mm timber. Check out studs around top as necessary to house bath lip and allow for P.V.C. bath flash-moulding to be accurately seated on rim of bath.

SWITCHBOARD. Trim opening for switchboard with provision to hinge board for access to wiring etc. at rear of box formed to house switchboard..Line inner faces of box with firestop gib-board or two layers of 9.5mm gib-board. Fit door to face of switchboard complete with selected catch. Check with Electrical Contractor for all of his switchboard requirements etc.

BATHROOM CABINETS. Trim wall openings for recessed cabinets where shown on drawings. Cabinets shall be of size and type as noted on the addenda or other selected cabinet. Lining around cabinets shall be neatly fitted to all sides.

INSULATION. Ground floor timber floors shall be insulated with sisalation 737 or similar with perforations. Lay over joists with 100mm drape between joists. Insulate all exterior walls with R2.0 fibreglass wall batts placed in all exterior wall cavities. Line ceilings with R2.2 fibreglass batts placed in all ceiling framing cavities.

HARDWARE. The Contractor shall allow in his tender the P.C. Sum for supply of hardware as shown in the addenda including taking delivery and fixing all items supplied from the P.C. Sum. See also related P & G clauses. Items charged against P.C. Sum shall include door latches and pulls, locks and furniture, window fasteners for windows other than aluminium or J.M.F. but shall include cupboard latches and pulls, sliding door tracks and fittings, towel rails and other similar items but shall not include nails, bolts, screws or similar connecting

devices or fixings.

BUILT-IN OVEN. If shown on drawings frame up for built-in oven unit. Framing shall be out of 75mm x 50mm timber on edge or flat if shown. Frame up to sizes shown on drawings or to suit the selected unit from installation instructions provided by the Electrical Contractor. Provide shelves and vents as required.

HEATING APPLIANCES. Where shown on the drawings make provision for the installation of built-in or free standing metal fireplaces or supplementary water heaters. Provide hearth slabs as required. All heaters shall be installed strictly according to the recommendations of the manufacturers and all Local Authority requirements. Provide heat resistant linings and clearances from walls and fittings as detailed on installation instructions provided with each unit. Hearth slabs shall be precast of sizes shown and with surface finish as shown on drawings or addenda.

GARAGE DOORS. Supply and install garage doors of sizes and types shown on the drawings or in the addenda. All doors shall be provided with locks and all fittings and operating gear and shall be installed according to the manufacturer's details and instructions to approval.

HOT WATER CYLINDER CUPBOARD. Frame up for hot water cylinder cupboard where shown with stand for cylinder framed up out of 100mm x 50mm timber with ex 25mm timber decking. The stand shall be framed up at a level to suit the cylinder model and installation.

Cylinders connected to wet-back heaters shall be at a level to suit the height of boiler connections and shall be as high as possible. Check with Plumber for details of type and any requirements for cylinder stand.

If cylinder is fixed at floor level provide slatted shelves above cylinder top. Provide slatted shelves at side of cylinder if and where shown on drawings. Shelves shall generally be 250mm apart.

EXTERIOR CLADDING. Exterior cladding shall be as shown on the drawings and set out on the addenda. All materials shall be fixed according to the manufacturer's recommendations and details according to the best accepted trade practices. All exterior linings shall be fixed over breather type building paper as specified above.

All fixing nails shall be galvanised or other non-corrodable metal as noted on the addenda. Unless otherwise noted all nails in timber cladding shall be punched below surface.

Weatherboards shall be out of 25mm timber, bevelled back, rusticated weatherboards shall be out of 200mm or 250mm timber. All laps, butt joints and mitres shall be primed before fixing. Weatherboards shall be fixed to framing with 1/60 x 2.8mm nail to each stud just above the lap and just below the rebate groove. Horizontal laps shall not be less than 23mm for weatherboards with a rebate not less than 25mm and 32mm for non-rebated weatherboards. All weatherboards shall have an anti-capillary groove at lap.

All end joints shall be mitred and made over studs with bored holes for nailing at end joints and corners. Do not drill into studs. ~~Mitre external corners or fit with cover boards and~~ scribes or rebate plugs as shown on drawings and/or noted in the addenda.

Internal angles shall be neatly scribed. Unless weatherboards are redwood or cedar they shall be treated.

Pinex weathersides and hardieplanks cladding shall be fixed as recommended by manufacturers with soakers at joints, internal and external angles. All sheet cladding shall be of thicknesses shown on the drawings. Where cladding forms any part of the bracing elements it shall be fixed as previously described and as required by NZS 3604; 6.9.4. and as shown in the nailing schedule. Unless otherwise shown vertical joints between linings shall be set in extruded P.V.C. mouldings. Horizontal joints shall be flashed with a galvanised Z flashing tucked 50mm behind upper sheet and carried 20mm down over lower sheets.

Where shown or noted on drawings joints shall be sealed with a non-slump elastomeric sealant applied as recommended by the manufacturers, with surfaces primed.

Vertical boards, shiplap and battens shall be fixed where shown. Both types of cladding shall be fixed to 50mm x 40mm dwangs at not more than 480mm c/s. Claddings shall be in continuous lengths. Vertical boards and battens shall have weather grooves not more than 12mm from each edge and shall be fixed with not more than 6mm between boards. Unless noted otherwise timber for boards and battens shall be redwood or cedar out of 200mm x 25mm boards with battens out of 75mm x 25mm. Nails for fixing shall be as indicated. Shiplap boarding shall have laps of 30mm minimum with weather grooves on each face of laps.

See Bricklayer for requirements for brick or stonework veneer.

SOFFITS. Where shown on drawings soffits shall be lined with 6mm hardieflex. Lining shall be close fit to wall framing and shall fit into grooved fascia at outer edge. Joints in sheets shall be fitted into extruded P.V.C. mouldings. Fix with galvanised shear point nails.

Other type soffit linings shall be as shown on drawings and fixed in accordance with standard trade practice.

EXTERIOR FINISHING TIMBERS. Supply and fix all exterior timbers fascias, barges, cornerstops, scribes etc. required to complete the works. Scribes shall be out of 12mm timber. All other finishing timbers shall be generally out of 25mm timber. Fascias to eaves shall be grooved to take soffit linings. Fascias to windows and exterior doors shall be out of 75mm wide timber unless otherwise noted. Fascias and barges to roofs shall be out of suitable width timber. All joints in exterior finishing timbers shall be mitred and shall be primed before fixing. Mitres shall be neatly and accurately fitted.

TIMBER DECKS. Where shown on the drawings construct timber framed decks with plates fixed to wall framing as shown. connect deck joists to wall plates with galvanised connector plates as shown. All fixing nails and bolts shall be galvanised. Erect posts and beams to carry deck as detailed. All deck framing timbers including joists, beams, posts, decking and balustrades shall be treated to T.P.A. C7 specification or better.

FLOORING. Lay high density temporary waterproofed flooring grade particle board or T & G flooring as indicated on drawings. Joints in sheet flooring shall be made over supports. Where necessary provide and fix 75mm x 50mm dwangs between joists. Fix flooring to joists not less than 10mm from edges all around the sheets and at each intermediate joist at centres required by the nailing schedule.

Where floor is required to act as a diaphragm sheets shall be not less than 1.200m x 2.400m except where building size prevents full sized sheets being used..

Where flooring remains exposed set out sheets to form a uniform pattern.

Timber strip flooring shall be tongue and grooved boarding closely cramped at joints. Generally timber shall be rimu or tawa. Minimum finishing thicknesses shall be as required by table 10 of NZSS 3604 relating to the spacing of the joists.

Boards that do not have end matched joints shall be joined only over joists. All joints shall be staggered. End matched boards may be joined between joists provided each length of unjoined board shall span between 2 or more joists and there shall be two or more unjoined boards between the joined boards.

Sheet bracing shall be of the materials and location as shown on the drawings. In addition to the nail fixing required by the nailing schedule, sheet bracing floor elements shall be connected to bottom plates and joists or trimmer joists as shown in fig.67 of NZSS 3604.

INTERNAL WALLS. Internal walls acting as bracing elements shall be connected to exterior walls at top plate level either directly by a framing member in the line of the wall or other direct connection as approved. Connection shall be at right angle to exterior wall. Connections shall be made using nail plates or 25mm x 1mm steel straps 6/30 x 2.5 f.h. nails into each member.

Top plates in walls containing bracing elements shall be butted together and jointed with metal connections as shown. See addenda and drawings for nail plate sizes and numbers of steel plates required at each connection. See also clause 6.7K NZSS 3604.

POSTS AND BEAMS. Where shown on the drawings erect posts and beams out of sawn timber treated to TPA C7 specification. Posts shall be anchored to concrete base pads with 50mm x 6mm galvanised steel fishtailed straps 450mm long set 225mm minimum into concrete each side of post. Fix posts to plates with 2/12mm diam. galvanised bolts. Connect posts to beams with 50mm x 6mm x 400mm long galvanised steel plates each side and 2/12mm diam. galvanised bolts through plate into each member or as otherwise detailed on the drawings.

ROOF AND CEILING FRAMING. Frame up for roof as shown on drawings. Where roof trusses are used they shall be constructed in a properly equiped factory using approved nail plates at all joints.

TRUSSES. Trusses shall be constructed to the standard designs of the manufacturer noted on the drawings or to the equivalent design of other approved manufacturers. All trusses shall be certified by the manufacturer as being constructed to the standards required by the designers. (Pryde or Gang nail) as required by NZSS 3604; 10.2.3.

Where alterations are required to standard designs to fit the construction the design amendment shall be carried out by the original truss designer and the fee for this work shall be allowed in the contractor's priced tender.

Trusses shall be carefully handled and stacked on the site to prevent damage. Damaged trusses shall be removed from the site or repaired and certified by the designer or manufacturer.

Trusses shall be fixed to top plates with 2 skewed 100mm x 3.75 nails plus additional fixing to top plates and wall studs consisting of 4mm diam. wire dogs or 4mm diam. galvanised wire ties wrapped over top chord and stapled to studs or other plate connectors. Multigrip anchors, Galvanised steel straps or similar.

Connect jack trusses to common trusses with connectors and blocking as detailed by the manufacturers.

Provide 75mm x 50mm blocking between bottom chord or ceiling battens as shown on drawings.

FRAMED ROOFS. Frame up for roof as shown on drawings. Rafters shall be birdsmouthed over top plates to not more than  $\frac{1}{4}$  of their depth. Fix to 25mm ridge board. Ridge board shall be full depth of rafter. Fix rafter to ridge as shown in nailing schedule.

Rafters shall be fixed to top plates with 2/100mm x 3.75mm skew nails plus additional fixings securing rafters to studs and top plate as shown on drawings. These shall consist of 4mm diam. galvanised steel dogs or 4mm diam. galvanised wire wrapped over rafters and stapled to studs or proprietary steel plate connectors multigrip anchors or similar all used in accordance with manufacturers recommendations.

Fix 25mm x 150mm timber cleats to each pair of rafters directly under ridge with 4/75mm x 3.15 nails to each rafter.

Fix under purlins, collar ties, purlin struts, chocks and strutting beams and ceiling joists as shown on drawings or as necessary for sound construction.

Nailing at all joints shall be as shown on the nailing schedule. The feet of each pair of rafters shall be connected by a ceiling joist at the top plate level unless shown otherwise in the drawings. Ceiling joists shall have a minimum bearing on their supports of 32mm. At joints ceiling joists shall be lapped 150mm over supports and spiked together or butted and flitched with 300mm long members to match joists. Nailing shall be as required in the nailing schedule.

Fix ceiling runners accross ceiling joists as shown on drawings. Runners shall be supported off packing onto top plates of walls and shall be held vertical at ends. Hang ceiling joists from runners with 50mm x 50mm hangers on alternative sides of runner or with proprietary metal hangers.

Ceiling joists and runner sizes shall be of the size shown on the drawings and complying with tables 23 & 24 of NZSS 3604. Under purlins shall be fixed in the position and of the sizes shown on the drawings and in accordance with table 25 of NZSS 3604. Under purl'n struts shall be located at centres and sizes shown on the drawings and in accordance with NZSS 3604; 10.3.8. Fix strutting beams where shown on drawings. Beams shall be kept 25mm clear of the top of ceiling joists with packings at supports. Strutting beams shall be of the sizes shown on the drawings and as required by table 26 of NZSS 3604.

PURLINS & TILING BATTENS. Securely fix purlins and/or tiling battens as shown on the drawings.

Purlins shall be set out equally along the length of the rafters at centres not greater than shown on drawings. Fix purlins to rafters with nailing as required in the nailing schedule plus any additional fixings that may be required on the drawings. Tiling battens shall be of the sizes shown on the drawings and at the required centres to suit the specified tile materials. Tiling battens shall be supplied and fixed by the Roofing Sub-contractor. The Main Contractor shall provide any temporary members required to hold roof framing in position until tiling battens are fixed.

ROOF BRACING. Provide and fix roof bracing as shown on the drawings and as required by NZSS 3604. Roof plane bracing shall consist of pairs of 25mm x 1.2mm steel strap bracing fixed to each truss or rafter at crossing point and to the top plate of external walls. Bracing may be fixed to either the top or under side of rafters. Where shown on drawings fix roof space bracing.

WALL FRAMING. Frame up for walls and partitions as shown on drawings. Studs shall be cut square at ends or true to angles of gables or sloping frames. All studs shall be continuous for full length from top to bottom plates including plates at roof level on gable frames. Fix ribbon plates to studs for fixing ceiling joists at gable and frames. Framing generally shall be out of 100mm x 50mm framing grade

treated radiata pine.

Top and bottom plates shall be sizes complying with tables 18 & 19 of NZSS 3604. and as shown on drawings. Studs shall be of sizes and centres shown on the drawings and as required by tables 12, 14 and 15 of NZSS 3604.

Provide two rows of dwangs in the height of each wall to provide stiffness to framing and support for lining.

LINTOLS. Lintols shall be of the sizes shown on the drawings and complying with table 16 of NZSS 3604, Appendix A.

Lintols shall be supported at ends by checking trimmer studs not less than 15mm or more than 20mm for 100mm deep lintols. Lintols not exceeding 200mm deep shall be supported by a 50mm thick doubling stud. Lintols not exceeding 300mm deep shall be supported by 75mm thick doubling stud. Lintols shall be fixed to trimmer studs and trimmer studs to floor joists at the bottom with 25mm wide galvanised straps or other similar fixings as required by NZSS 3604.

Refer also to drawings and/or fig. 41 NZSS 3604.

All nailing of treated framing shall be as shown in the nailing schedule.

BRACING. All bracing elements shall be located strictly in the positions shown on the drawings.

Metal bracing shall be 22mm x 22mm x 1.2mm galvanised steel angles or pairs of 22mm x 22mm x 1.2mm steel strip braces fixed to top and bottom plates and studs as shown on the nailing schedule.

Where angle braces are used they shall be set in straight lines and saw cuts in framing shall only be sufficient width and depth to neatly cover the bracing requirement. Excess depth of cut will not be permitted and studs with excess cuts will be removed and replaced.

Bracings shown on drawings are those required by NZSS 3604 compliance. The contractor may provide additional bracing to hold frames square and true during erection.

The plan lengths of bracing shall be not less than shown on the drawings.

Linings fixed over bracing and forming part of the bracing element shall be fixed to framing ALL ROUND with fixings at centres as set out in the nailing schedule.

Generally types 1 and 3 bracing units require the lining to be fully fixed on one face of the framing only whilst type 2 & 4 require complete fixing of the lining on both faces of the framing over the area of wall covered by the brace.

.1

Joinery

General

### JOINERY

PRELIMINARY: All Trade Sections and Subcontracts are subject to the N.Z.I.A. General Conditions of Contract and to all provisions of Preliminary Section of this Specification as appropriate.

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TIMBER: All timber for joiner's work shall be of joiner's quality free from defects and thoroughly seasoned. All timber shall be as scheduled under Carpentry and all joinery timber exposed externally shall be of durable species in heart or treated quality. The sizes of timber shall be as detailed or scheduled subject to proper allowance for cutting or dressing.

All timber shall be in accordance with NZSS 3631:1971 Classification and Grading of New Zealand Timber (National Grading Rules).

MOISTURE CONTENT: The maximum moisture content at the time of joinery manufacture shall be:-

|                  |              |
|------------------|--------------|
| Exterior joinery | 16%          |
| Interior joinery | 12% $\pm$ 2% |

Timbers showing signs of excessive or faulty kiln drying will be rejected. Air dried timber only shall be used for exterior joinery.

WORKMANSHIP: If members are not drawn from stock they shall be run as soon as possible after commencement of the contract. All work in the shop shall be carried out as closely as possible in accordance with N.Z.S.S. 468:1952. Corrugated fasteners shall not be used. The assembly of doors, sashes, frames, fittings shall be by means of joints capable of developing the maximum strength of the materials used. Mortice and tenon, housing, rebating, dowelling and dovetailing shall be used. All joints shall be glued and tightly cramped. Tenons shall be one third the thickness of the framing. Framed doors shall have haunched mortice and tenon joints between rails and stiles. Top rails of framed doors shall be undercut and bevelled to receive sheathing.

Joinery

General

SEASONING: Flush door cores shall be reduced to a moisture content of 10% to compensate for moisture absorbed from the glues.

FINISH: All timbers shall be machine dressed on four faces and all surfaces exposed to view shall be finished with sandpaper. All arrises in any way accessible shall be smoothed off. All nails shall be punched. Screw heads shall be sunk and plugged where exposed unless otherwise detailed. ~~Drum sanding of flush door skins after manufacture shall not be allowed.~~

DOOR AND WINDOW FRAMES: Construct door and window frames integrally with one another where these frames are combined. Heads and transoms shall be checked into jambs and securely fixed. Exterior frames shall have joints primed before assembly.

DOORS: All doors shall be of approved recognised manufacture to highest standards framed and jointed as scheduled. All glazing in doors shall be fixed with wood beads. Flush doors to finished thickness scheduled. Solid flush doors to have solid laminated cores, cross banded and face veneered with selected veneers and 13mm clashing strips of approved timbers to suit veneers. Cooperate with floor layer to enable door clearance to suit thickness of floor covering. Where not otherwise specified, hollow core flush doors to have approved form of frame and cores with 5mm thick selected plywood faces pressed and glued with 13mm clashing strips on both edges as above. ~~Where indicated or as required, frames shall be suitable to accommodate flush door closers.~~

Where shown vents in doors to be in Cemac or similar type grille.

Doors scheduled to be painted, to be paint quality veneer. Doors scheduled to be clear finish, to be lit. Rimu slice cut veneer.

MATERIALS: Substitution of specified materials shall be made only with the Architect's approval.

GLUES: Shall be casein or ureaformaldehyde. Glue for exterior work shall be fortified ureaformaldehyde waterproof glue.

Joinery

General

SCREWS, NAILS, BRADS AND METAL FIXINGS: Shall be steel plated to match visible fastenings, hinges, etc. Exterior joinery shall have galvanised, stainless or brass fixings as appropriate.

Fixings to steel stud partitions shall be of suitable and approved type.

COREBOARD: Shall be glued end and edge jointed treated Pinus Radiata for core and finished both faces with specified veneers. The finished thickness when finished shall be 20mm.

PROTECTION: All items shall be protected during transit and on site by adequate weather proof coverings. Should any clear finished items be damaged due to water, approved treatment shall be carried out to achieve the scheduled finish. Any damaged work replaced. Any mastics, solvent or adhesives to be neutralised by recommended procedures before application of the finish scheduled.

ACCURACY: All joinery items shall be accurately run in accordance with the details. Full allowance to be made for adjustment and shrinkage. Co-operate with other Sub-trades where items are adjacent or inter related.

HINGES:

|       |                                      |                                      |
|-------|--------------------------------------|--------------------------------------|
| Three | 90mm loose pin hinges                | to all doors                         |
|       | Interior doors, BMA steel butts      |                                      |
|       | Exterior doors, brass and brass pins | tap screws                           |
| Two   | 90mm                                 | for small doors up to 1800mm x 600mm |
| Two   | 64mm                                 | for bench cupboard doors.            |

BEADS: Where specified beads to be accurately cut and mitred or scribed at angles. Fixings to be galvanised, brass c.p. or bronze. Where specified beads removable they shall be fitted with cupped screws at even centres. When painted, cups and screws temporarily removed.

Aluminium Windows and Glazing  
General

ALUMINIUM WINDOWS AND GLAZING

PRELIMINARY: All trades sections and subcontracts are subject to the A.E.I.A. General Conditions of Contract and to all provisions of Preliminary Section of this specification as appropriate.

CO-OPERATION: Work shall be carried out in full co-operation with the main contractor and other subcontractors. The window contractor shall programme his work to suit the progress of other work and in accordance with the requirements of the main contractor and as set out in the Scope and Detail section of the specification. Any allowances for co-ordination shall be included in the tender. No later claims will be recognised.

STORAGE: Storage for window components will be made available on the site. The window contractor shall state in his tender the area necessary for such storage.

PROTECTION: See also Preliminary and General Section of this specification.

Arrange with main contractor a programme for protection of Aluminium Windows from their arrival on site, until the building is complete.

Method and type of protection and to be stated in tender, to be maintained and made good if necessary or as directed throughout the contract period.

TIME FOR COMPLETION: The window contractor shall co-operate with the main contractor to ensure that the window installation does not in any way prejudice the programme of the main contractor. The successful tenderer for this contract will be required to enter into discussions with the main contractor so that the programming for fabrication, installation and completion of the window installation is embraced in the programmes for erection stated by the prospective tenderers in their tenders.

## Aluminium Windows and Glazing

### General

SCAFFOLDING: It is anticipated that the general scaffolding of the external faces of the building will be provided by the main contractor. Tenders for this section of the work shall be based on this assumption and shall include normal costs associated with the general scaffolding referred to above.

Confer with tenderers at tendering stage.

ALUMINIUM WORKMANSHIP: All window, door, screens and sidelight assemblies shall be of best workmanship free from defects and weathertight. All mechanical connections shall be true, square, straight rigid and out of wind. Any welded connections where visible and at points of overlap with adjacent members, shall be ground flush and polished prior to anodising. All mechanical sections shall be such that no visible damage occurs to finished anodised surfaces. Remove ferrous wires, drillings etc. from all surfaces of aluminium immediately. All window heads and opening sashes to have drip bars. All cavities formed by assembly of sections to be fully and densely packed with approved sealants. Subcontractor to satisfy himself that rebates, etc. are in satisfactory state for his installation regarding line and state of material. Co-operate with positioning and size of rebates.

WINDOW SECTIONS AND DETAILS: Details of windows shown on the architectural drawings serve only as a guide to the nature and intent of the work and in no way restrict the window contractor in the substitution of sections to suit production techniques. It shall be the responsibility of the window contractor to recommend panel gauges and sections appropriate to the requirements conveyed by the details and as specified.

The window contractor shall supply to the Architect structural calculations for either vertical or horizontal elements which prove the structural stability of such elements under an exposure "X" wind loading without ingress of water. Deflection of any frame member under these conditions shall not exceed 1/300 of its clear span.

All as set out in N.Z.S.S. 1900, Chapter 5, 8 and 10. Allow accordingly for thermal and seismic movement, allow for a seismic drift of  $\pm 20\text{mm}$ .

See details and Scope and Detail for locations for thermal and seismic movement.

## GLAZING

### PRELIMINARY

The Preliminary and General section of this specification is binding on all trades and subcontractors.

### MATERIALS

- (a) Putty: Putty for timber beads and frames shall be best joiners linseed oil putty. Putty for steel beads and frames shall be special steel sash putty.
- (b) Glass: All glass clear float quality free from all blemishes and distortions and of the types and weights shown on the drawings. All exposed edges ground and polished.
- (c) Screws: Unless detailed otherwise, all interior timber glazing beads fixed with A.C. finished counter sunk steel raised head wood screws. Exterior fixings similar but all brass.

### WORKMANSHIP

- (a) Generally: All workmanship of best trade practice and in accordance with NZS 2258:1969. All exterior rebates and beads primed all round by Painter before fixing. Allow to dry. Rebates and grooves dry, clean and unobstructed immediately before glazing. All putty solid and complete. Neatly trim off all putty to even flush line on completion.
- (b) Glass Sizes: All square cut to accurate sizes with allowances for clearance and movement.
- (c) Back Putty: Apply sufficient bed of putty in rebate so that when glass has been evenly and firmly pressed into position back putty is 1.5 mm thick with surplus putty squeezed out above rebate. Trim off at slight angle to allow water to run off.
- (d) Setting Blocks: In all squares over 0.19 square metres in area set glass on setting blocks of timber. Blocks 50 mm long. In fixed lights block at bottom only a 75 mm from corners and 600 mm crs for intermediate points.
- (e) Putty Glazing: After back puttying sprig in glass with non corrosive sprigs at 225 mm crs and 50 mm from corners. Putty in front of glass by solidly puttying front. Strip off evenly to front of rebate. Top of front putty 1.5 mm below back putty. Accurately mitre corners.
- (f) Beads: Secure wooden glazing beads with r-head screws at 75 mm max. distance from ends and at 225 mm max. intermediate crs. Metal beads fixed as supplied. Externally bed bead in putty against rebate and glass similarly for back putty. Beads primed all around by Painter. Internally bed bead in putty against glass only. Trim off putty, weathered to shed water.
- (g) In Grooves: All glass set in grooves, bedded all around and trimmed off as for beads.

### MIRRORS

All mirrors electroplated 6 mm polished plate or float glass with polished edges. Fix as indicated on drawings. Allow for movement of mirrors. Where backings are indicated supply and fix same.

### THE WORK

Execute as above all the work indicated on the drawings. In general this comprises the supply and installation complete of all interior glazing, all mirrors, all exterior glazing into all wood frames and sashes (i.e. all other than the exterior anodised aluminium and steel windows).

### COMPLETION

All debris, off cuts, empty containers etc shall be removed from the site. All glass shall be given one coat of french chalk and water paste to render glass surfaces opaque.

Aluminium Windows and Glazing

General

Subcontractors are to submit details and drawings with quotations regarding sections and details of fixing, flashing, weathering and glazing, for approval. Samples of each section are to be submitted.

ALUMINIUM GLAZED DOORS: Glass set in neoprene sealing strips provided by Window Manufacturer, with push plates, threshold straps, nylon brush strips, flush floor closers and master keyed locks (cylinders provided under net sum for hardware).

FINAL SHOP DRAWINGS: The window contractor shall prepare fully detailed shop drawings showing full size sections of all components of metal windows of the various types scheduled together with full details indicating the proper relationship of all adjoining work. These details shall embrace all perimeter and intermediate details, together with details of mechanical connections at right angle junctions in sashes and frames. Shop drawings shall include elevations showing the number, dimensions and form of all windows including opening sections, the form and location of all hardware. Detailed window sections shall include outlines of the closed and open positions of all elements of operating hardware. Shop drawings shall be submitted for approval and shall be amended to incorporate all revisions considered as appropriate to conform with the Architect's requirements.

When finally approved, copies of such shop drawings shall be supplied to the Architect, the main contractor, Clerk of Works and all subcontractors concerned with the work adjoining windows.

Approval of such shop drawings will not relieve the window subcontractor from responsibility of checking all dimensions and details, co-relating all windows and other parts of the work and maintenance of the windows as specified under "Guarantee".

Construction drawings may be examined at the office of the Architect for clarification of all work conveyed by the Specification and Contract Drawings.

EXTRUSIONS: Extrusions to be Alloy 11E 9WP 505-T5 within allowable tolerances in BSS 1476.

Aluminium Window and Glazing,  
General

FIXINGS: All fixings between anodised aluminium members to be matching non ferrous and non staining type to withstand the superimposed loads as specified elsewhere. Stainless steel bolts of appropriate size between members as necessary, together with stainless steel or nylon washers and spring washers. All fixings to concrete openings to approval with full co-operation with main contractor.

EXPANSION: Full provision shall be made for expansion of all elements including fixings appropriate to the section used and slotted holes in angle fixings or diagonal elements.

SEPARATION FROM CONCRETE OR PLASTER: All metal windows or related elements shall be separated from direct contact with concrete or plasterwork by the application of two coats of an approved bituminous paint. Such bituminous coating shall be applied all around subframes, frames, lugs, etc. set against concrete work. Any unavoidable damage to such bituminous coatings during the installation of windows shall be made good by touching up as directed by the Architect.

SEPARATION FROM STEELWORK: All metal windows and related elements shall be separated from structural steelwork (primed by others before erection) by an approved plastic separator minimum thickness 1mm, trimmed neatly to size of contact area.

ROOF COVERINGS:

The whole of the works shall be carried out in accordance with and shall conform to the bylaws and regulations of the Local Authority.

SCOPE OF WORK:

This trade consists of the supply and fixing by approved fixers, of roofing and accessories.

Concrete roof tiles as shown on the drawings.

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Where reference to 'Monier' in this specification shall be deemed as meaning 'Monier or equally approved'.

Butynol decking grade material to exterior decks.

Guarantees to be supplied to be valid for a minimum of fifteen years before completion of contract.

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The roofing shall be fixed with galvanised steel strip clip continuously fastened to every purlin, with an additional galvanised steel single side fix clip used at every fixing around the perimeter of the roof area. Form downturns to gutter edges of roof to approximately 20 degrees to the horizontal. Fit all ridge or hip cappings as required.

#### CONCRETE ROOF TILES

To roof areas where shown on drawings.

a) Materials

The tiles shall be Monier "Centurion" (colour as selected by owner).

b) Underlay

Over the whole of roof area fix underlay of 6.8kg saturated roofing felt. Lap over all hips, ridges and over fascia board far enough to give drip into gutter. Where the rise of the fascia above rafter top could cause ponding, an anti-ponding board or a device giving similar results should be provided.

Fix battens to a maximum gauge of 350mm. Size of batten shall be not less than that shown on the drawings, with rafter spacing up to 450mm centres 50mm x 25mm, between 450mm and 600mm centres 50mm x 37mm, between 600mm and 900mm centres 50mm x 50mm battens.

c) Tiling

Lay tiles to a minimum head of 75mm. Secure every eaves course tile, every top course tile, all perimeter tiles with 57mm x 25mm galvanised clouts on 50mm x 2.5mm battens and 76mm - 25mm galvanised clouts on 50mm x 37mm and 50mm x 50mm battens. Secure every alternative tile within the body of the roof.

The first course of Monier Tiling shall be fixed so as to provide an adequate projection over the fascia into the gutter.

d) Valleys

Cut Monier tiling neatly and cleanly to the rake of the valley leaving a gap of 75mm to 100mm between the cut edges.

e) Hips

Fix starter hip tiles at the foot of all hips. Cut Monier tiling closely to the rake of the hip. Cover all hips with Monier ridge tiles to colour as specified, bedded and struck pointed in cement mortar coloured to blend in with tiles. Hip and ridge tiles must be bedded solid only at the ends or at the junction of hip and ridge. Starter hip ridge and every alternative ridge to be mechanically secured.

Cover all ridges with Monier ridge tiles of selected colour bedded and pointed to match the tiles. The end ridge and every alternative edge must be mechanically secured. All ridge tile mortar must have weep holes fitted when mortar is still wet.

f) Mortar

All bedding mortar shall be specially mixed mortar and for this purpose shall consist of 4 parts clean sharp sand and 1 part cement and C.P. 30 or similar at the rate of 1.52 litres to 1 bag of cement. The mortar to be coloured to match tiling.

## ROOFING SHEET BUTYNOL

PRELIMINARY: All trade sections and subcontracts are subject to the NZIA General conditions of contract and to all provisions of the preliminary section of this specification as appropriate.

GUARANTEE Subcontractor for the Butynol roofing shall provide a written guarantee in approved form to maintain his work in a satisfactory and watertight condition for a period of ten years after completion. Under the guarantee the subcontractor shall undertake to remedy all defects as soon as practicable after Notification, failing which he shall accept responsibility for the cost of engaging others to carry out such remedial work and for any consequential damage arising from failure to remedy notified defects promptly.

MATERIALS AND WORKMANSHIP. Roofing shall be the heaviest grade butynol for decking laid by recognised specialist contractors and expert workmen. Contractor shall satisfy himself that Grades and levels of finish of the gutters is in a satisfactory state for a first class finish. Butynol shall be secured at joints with butynol tape and two pot adhesive. At downpipes and spoutings the top edges of the downpipes and spoutings shall be taped and Butynol shall be carried a minimum of 75mm inside downpipe and spouting with proper adhesive.

### NOTE

ALL JOINTS TO RUN PARALLEL WITH FALL OF DECKS.  
NO PONDING AT ALL WILL BE ACCEPTABLE.

Plumbing

General

### PLUMBING

**PRELIMINARY:** All Trade Sections and Subcontractors are subject to the N.Z.I.A. General Conditions of Contract and to all provisions of Preliminary Section of this Specification as appropriate.

**STANDARDS:** All Plumbing shall comply with all provisions of the Drainage and Plumbing Regulations and any amendments thereto all as currently in operation together with the appropriate Local Bylaws. Plumbing subcontractor shall obtain all necessary permits and consents and shall pay all fees for same which relate to his section of the work.

**MATERIALS:** Not otherwise specified shall be the best of their respective kinds and of gauges, weights and thicknesses scheduled hereafter. All materials to the relevant N.Z. Standard Specification.

|       |                                 |                        |
|-------|---------------------------------|------------------------|
| Pipes | Cast Iron                       | B.S. 416 and B.S. 437  |
|       | Screwed galvanised wrought iron | N.Z.S. 821             |
|       | <del>Copper tube</del>          | <del>N.Z.S. 3301</del> |
|       | " (light gauge)                 | BS2871                 |
|       | P.V.C.                          | N.Z.S. 7648 & NZS 7649 |
| Sheet | Galvanised Steel                | N.Z.S. 3403            |
|       | Aluminium                       | B.S. 1470              |
|       | Copper                          | B.S. 2870              |

All incidental materials, fittings, etc. shall be of best quality and used in accordance with recognised trade practice.

**ARRANGEMENT OF PIPES:** All pipework shall be neatly arranged and wherever practicable shall be concealed except where clearly intended otherwise. All exterior pipework shall be set out from wall to clear surface finish. Wherever pipes pass through exterior walls they shall be properly weathered and carefully caulked with mastic to ensure watertight conditions. All fittings, brackets, bolts, screws etc. used externally shall be brass or copper unless otherwise shown.

~~COPPER PIPE SHALL BE USED~~

~~All Plumbing shall be concealed except where clearly intended otherwise~~

## Plumbing

## General

General arrangement of pipes is shown on drawings as a guide only and revisions may be made to Architect's approval. Where pipes are run in pipe ducts or pipe casings, plumbing subcontractor shall check with Contractor. Plumbing subcontractor to check provision of all holes, access panels and other requirements to suit his services. Where pipes are unavoidably exposed in finished spaces, they shall run in positions approved by the Architect and arranged as neatly and inconspicuously as possible. Exposed interior steel and copper pipes will be painted, P.V.C. piping will be left unpainted.

WORKMANSHIP: All plumbing work shall be carried out by or under direct control of properly qualified tradesmen and to recognised standards of performance. All jointing materials shall be compatible with the metals in contact. All pipework shall be neatly arranged. Plumbing subcontractor shall co-operate with Contractor to ensure that proper provision for flashings etc. is made.

SEPARATION OF METALS: Wherever different metals occur in circumstances which could produce contact or electrolytic action by a water film, full precautions shall be taken to ensure adequate separation by use of bituminous felt separators and bituminous paint. Wherever pipes of copper or other metal are in contact with or built into masonry work, they shall be wrapped with Denso tape or similar material to provide complete separation and freedom of movement.

TEMPERATURE MOVEMENT: All plumbing work shall be arranged in a manner which will respect in full the adjustments arising from contraction or expansion under temperature changes. All such plumbing work shall be arranged with tolerances and form of jointing which will allow for temperature movement without risk of prejudice to watertight conditions or damage from straining to pipes which will generate failures and leaks.

ACCESSIBILITY: All plumbing work shall be arranged in a manner which will allow the utmost future accessibility for repairs and maintenance. Where pipes are unavoidably run in locations to be covered by linings or other finish, special care shall be exercised to mark their locations as soon as linings are positioned to minimise the hazard of nailings penetrating pipes and all such damage arising from nailings or other damage to the pipes shall be remedied without delay with all consequential work made good.

Plumbing

General

WEATHER SEAL AT BOLTS ETC.: Wherever pipes, bolts, screws or other fastenings pass through exterior finish such as roofs, weatherboards, blockwalls etc. such pipes or fastenings shall be provided with a suitable compressible weather seal gasket of the correct size both sides set in mastic and compressed to ensure absolute security of weather seal.

TESTING: All water or other plumbing services shall be completed in stages which will allow for proper testing under normal working pressures prior to the application of insulation, concealment or other enclosures to pipework. All leaks disclosed from such testing shall be remedied and retested before proceeding. On completion the whole of the plumbing services shall be subjected to full operational tests with all defects properly remedied.

INSPECTION ACCESS: The whole of the plumbing system shall be arranged and installed to enable all wastes, vents and other plumbing pipes to be properly serviced and maintained.

The plumbing subcontractor shall confer with the Contractor on provision of access panels or other services necessary to ensure this result.

DUCT SIZES: Plumbing subcontractor shall satisfy himself that sizes shown for ducts and penetrations are large enough to accommodate all pipework required for his trade. Failure to advise Architect of inadequate size of duct before concrete is poured shall render the plumber responsible for any remedial work required.

~~COPPER PIPEWORK: All copper pipework shall be fixed with proper copper saddles and pipe clips supported to prevent sagging and vibration and arranged to avoid air locks. Joints in copper pipework shall be brazed or silver soldered. Cross unions not permitted on hot water pipework apart from final connection to a tap. Where pipes are buried in concrete, tubes shall be wrapped in two layers of Denso tape before concrete is poured.~~

~~In brazed work straight joints shall be formed by expanding one pipe for a length of 25mm to form female end for insertion of other pipe.~~

ALL PIPEWORK TO BE APPROVED POLYPROPYLENE MATERIAL OR SIMILAR. BUTELINE for the water.

## Plumbing

### General

**WASTE AND SOIL PIPES:** All fittings shall have trapped waste, and soil pipes sized in accordance with Drainage and Plumbing Regulations, and generally as indicated on the plumbing diagrams.

All soil stack pipes shall have full provision for temperature movement to avoid distortion and subsequent damage to the system. All junctions of copper pipes shall be neatly brazed and made watertight with all necessary inspection panels, cleaning eyes etc. as required by Local Authority. Obtain similar approval for junctions between copper and cast iron. Bottoms of all soil and waste pipes shall have spring bend or slow curve delivery into horizontal pipes or drains and shall be supported to approval. Provide all inspection panels in soil pipes as required by Drainage Inspector.

Generally the sizes and location for wastes is shown on the drawings. Where wastes pass through concrete, wrap in Denso tape. Provide access points as required by local authority. Wastes up to and including 50mm dia. shall be run in u.p.v.c. or polypropylene unless otherwise noted or where run in concrete.

**VENTS:** All fittings throughout shall be vented in strict accordance with Plumbing and Drainage regulations. All vents in u.p.v.c. or polypropylene pipe. Bottom 1.83m of external vent pipes at ground level shall be in galvanised wrought iron or cast iron pipe. Generally the sizes and locations of vents are shown on the drawings. Connect to all fittings and drains as shown with overflashing at roof and plastic balloons at top.

**RIGID P.V.C. PIPEWORK:** Rigid p.v.c. pipework shall be Nova pipe, or Nova soil, complete with proper fittings as manufactured by Novaplast Limited, or similar approved.

Pipework shall be properly assembled, solvent jointed and securely supported in accordance with the manufacturer's instructions and recommendations.

All pipes shall be cut square and clean at joints with swarf completely removed and both pipe and fitting cleaned and twice coated with solvent before jointing.

At junction to metal pipework, valves, fittings, etc. moulded threaded fittings shall be used and sealed with P.T.F.E. tape over threads.

1.1

Drainage Work

General

### DRAINAGE WORK

**PRELIMINARY:** All Trade Sections and subcontracts are subject to the N.Z.I.A. General Conditions of Contract and to all provisions

**DRAINAGE WORK:** All drainage work shall comply with all requirements of the N.Z.S. Plumbing Regulations and amendments which are currently applicable. All drainage work shall be carried out by properly qualified tradesmen and to the complete satisfaction of the Local Authority. Allow for any inspection fees by Local Authority. The Drainage Subcontractor shall obtain from the Local Authority a drainage certificate covering the sewerage part of the work and submit it to the Architect before commencing work.

**PIPES:** In g.e.w. or as required by the Local Authority. Jointing in accordance or as required by the Local Body requirements. Drains laid to even and regular falls with all necessary bends, inspection junctions, gully traps, cleaning eyes, inspection pipes, vent connections etc. Drains as laid to be recorded on plan with cleaning eyes marked and dimensioned. Check all existing and new invert levels before proceeding.

**SURFACES:** All existing road, footpath and other surfaces where disturbed shall be made good with backfilling to all trenches mechanically consolidated to existing standards to the complete satisfaction of the Architect and the Local Authority.

**TESTING:** All drains tested before covering in to the satisfaction of the Local Authority.

**STANDARD:** All sewerage and stormwater systems to conform to N.Z.S.S. 4452:1974.



## SOLID PLASTERER

### PRELIMINARY AND GENERAL

Read and note all clauses under Preliminary and General of this specification where they apply to this trade.

### WORK INCLUDED

The solid plastering or trowelling of all interior floor slabs, the front and back porch slab and steps, also terrace if shown.

### MATERIALS

Cement: shall be as specified under "Concretor".

Sand: shall be river sand sharp and coarse grained and free of any foreign matter.

Hydrated Lime: shall be mill hydrated of an approved brand.

Adhesion Agents: if used shall be in accordance with maker's instructions.

Plasticising agents, used strictly in accordance with the manufacturer's specification, may be used in lieu of hydrated lime.

### WORKMANSHIP

All to the best trade practice. Generally, where plastering is required by drawings, it means finishing to 12mm thickness with a mix of one part cement to three parts sand with 10% of hydrated lime added and finished to a straight and even surface with a wood float.

### FOUNDATIONS

Concrete foundation walls shall be prepared by removing projections, making good any defects, straightening and finishing with a dash coat of 1 to 3 cement and sand applied to give a regular and satisfactory coverage. Texture finish as shown.

### CONCRETE FLOORS (Main) See Drawings

Co-operate with Concretor and allow for plastering of main floor. Float up to true level and steel float finish to remove pattern. Do not over-trowel. A hard dense finish is required.

### PORCH AND STEPS AND TERRACE (if shown)

Plaster up in one operation. One coat 12mm thick to terraces and porch slabs, 12mm thick to verticals and sides, etc. Wood float up then give light sweeps with steel float to remove blemishes.

### VENTS

Supply and install pre-cast concrete or other suitable ventilators in foundation walls where shown.

### COMPLETION AND CURING

Leave all work complete and clear away all plaster droppings. Keep work damp and maintain all finishes to the completion of the work.

## ELECTRICIAN

### PRELIMINARY AND GENERAL

Read and note all clauses under Preliminary and General of this Specification where they apply to this trade.

### FEES

Pay all fees and charges and obtain all necessary permits for this trade.

### SCOPE OF WORK

Carry out the whole of the electrical installations in strict accordance with the latest Electrical Wiring Regulations and Local Authority's By-Laws. Provide all lighting and power points as shown on the drawings or as otherwise directed by the Owners.

### MATERIALS AND WORKMANSHIP

All materials used under this Contract shall be of approved British or New Zealand Standard Specification. Allow for all materials necessary to complete the contract whether specified or not. All work shall be carried out by a Registered Electrician in accordance with regulations and best trade practice and in a manner which will cause minimum inconvenience to other workmen and the work as a whole. Do all cutting away, drilling, etc., and with timber cut the minimum only away for the entry of cables. All wiring shall be run in T.P.S. cable and shall be kept clear of insulation in walls and ceilings.

### CO-OPERATION

Co-operate with the Building Contractor and other sub-contractors in all phases of work. Give ample notice to enable the Contractor to arrange the necessary void, chase data, etc.

### COMPLETION AND CONNECTION OF POWER

Leave the work complete, pay all charges and arrange for all inspections and tests and for the connection of power to the works.

It is the responsibility of the Electrical Contractor to ensure that no delay is caused to the job once the Contract is complete.

### POWER BOARD SUPPLY

Arrange with the Power Board, allow for and pay all fees for the connection of an underground or overhead supply to the residence. Arrange for any power poles required to carry overhead power lines.

### METER BOX

Provide and install meter box where shown. Confer with Carpenter for trimming same. The meter box shall be recessed into wall and shall have a weather-proof cover.

### MAIN SWITCHBOARD

Provide and install a recessed main switchboard, complete with all fuses, circuit breakers, switches, bell transformer, and auxiliary equipment. Arrange with the Carpenter to provide a cabinet for switchboard.

## Plumbing

## General

POLYPROPYLENE PIPEWORK: Shall be DUX 'Fast-Fit' complete with proper fittings all as manufactured by Dux Engineers Ltd. Pipework shall be properly assembled and jointed all securely supported all in accordance with the manufacturer's instructions and recommendations.

All pipes shall be cut clean and square at joints with swarf completely removed. All joints shall be made with the correct fittings.

PIPE INSULATION: All hot water pipes except short branches to individual fittings shall be insulated with adhesive paper-back aluminium foil or double sided building foil used as recommended in BRANZ research report 233.

#### HOOD OR AIR EXTRACT FAN

Provide and install a range hood or air extract fan where shown on the drawings with switches and power for the operation of same. The fan shall be of the size and type shown on the drawing or in the addenda. Allow the P.C. Sum shown in the addenda for the supply of the range hood.

#### SHAVER POINT

Provide a point for electric shaver where shown on the drawing if also noted on the addenda.

#### SINK DISPOSAL UNIT

Provide wiring and switch for waste disposal unit to be fitted in sink if shown on the drawings or noted in the addenda.

#### HEATERS

Provide and install electric heaters, complete with Thermostats, where shown on the drawings. Heaters shall be the size and type shown on the drawings.

#### WATER HEATER

Allow for the connection of the water heater to the electrical system. Provide and install 1,500 watt, or other suitable sized element and thermostat to hot water cylinder provided by the Plumber. Provide switch for water heater on adjacent wall and flexible, metal sheathed cable to Element box.

#### POWER POINTS

All wall plugs shall be 230 volt, 10 amp 3-pin flush type with switches. Generally, install plugs 300mm above floor or 225mm above bench top. Points to washer, dryer and refrigerator - 1200mm from floor. The exact position of all power points shall be determined on the job by the Owner. Allow for the power points in the locations shown on the drawings. All power points are to be switch type.

#### LIGHTS

Provide light points where shown on the drawings. The Contractor is to allow in his tender to provide batten holder type fittings to all lights, with angled fittings to wall lights. All lights are to have flush wall mounted switches. All exterior lights shall be watertight fittings. Fittings under soffits shall be ball type.

#### LIGHT SWITCHES

Light switches generally, shall be 5 amp. all insulated P.O.L. micro-gap type or equal. Where indicated, fit flush type with plain flush plate. Fix switches generally 1200mm above floor. Provide dimmer switches where noted on drawings or required in the addenda.

SPECIAL FITTINGS

The Contractor shall allow in his tender for the supply of special light fittings to the value of the P.C. sum shown in the addenda. The Contractor shall allow in his tender for taking delivery of and fixing fittings supplied from the P.C. sum.

BELL

Provide transformer on switchboard for doorbell or chimes and provide wiring and bell push for the same. The bell or chimes are to be purchased from the P.C. sum allowance.

## 10. ELECTRICIAN

### 10.1 P & G

See applicable clauses.

### 10.2 WORKMANSHIP

Electrical Wiring Regulations

### 10.3 TEMPORARY SERVICE

Switchboard for Contractor.

Remove on completion.

### 10.4 CABLE

PVC to NZS 2250

### 10.5 SWITCHBOARD & METER CABINET

Gael or similar

### 10.6 PLUG SOCKET OUTLETS

NZS 198. 10amp surface pattern.

3 pin SC3 switch/plug combination

Ring Grip, ivory plates. 380mm above floor or bench top.

### 10.7 LIGHT SWITCHES

NZS 2065. 5 amp Ring Grip, ivory. 900mm above floor.

### 10.8 LAMP HOLDERS

NZS 144. Bayonet type.

### 10.9 CYLINDER

Thermostat. NZS 2149

## 10.10 SCHEDULE OF ELECTRICS

Location

Ceiling  
Light

Pendant

Wall  
Light

Power  
Point

Other

Painting

General

### PAINTING

PRELIMINARY: All Trade Sections and Subcontracts are subject to the N.Z.I.A. General Conditions of Contract and to all provisions of Preliminary Section of this Specification as appropriate.

CONDITIONS FOR PAINTING: All painting work shall be undertaken only when the surfaces to be painted are in a fit and proper condition to ensure first class results. All surfaces for painting, oiling, varnishing or other surface coverings which are required to be properly prepared by other trades and which require remedial work to bring them into suitable condition shall be referred to the Architect for attention before proceeding.

Painting Subcontractor shall take over all surfaces from other trades and shall carry out such normal work for preparation of such surfaces as may be required. Painting Subcontractor shall be fully responsible for defects which arise through lack of proper surface condition of preparation. All external painting work shall be carried out under conditions of weather which will avoid any prejudice to the final results and all surfaces shall be in a suitable condition free from moisture, grease, dust, dirt or other deleterious circumstances.

Any painting work damaged by subsequent weather shall be properly remedied, prepared and redone.

MATERIALS: All materials ready mixed highest quality reputable N.Z. manufacture delivered in unopened containers and approved by Architect.

Precautions taken to prevent staining flooring, etc. Painting, oiling or varnishing only in clean rooms free from dust and finished work protected. Materials used only for purpose and in manner intended and to comply with manufacturer's instructions.

Thinning to manufacturer's recommendations.

COLOURS: Colours ready mixed and not mixed on job from paints in oil. Colours to be used only as approved. Highest quality only of any brands permitted. Allow for a variation of colours which will be selected later.

All work shall be performed by skilled tradesmen.

All scaffolding, tools, appliances, etc. required for the satisfactory execution of the work shall be supplied by the Painter.

All metal fittings, hardware and fastenings shall be removed before preparatory processes are commenced and shall be cleaned and refixed in position on completion of the work.

All coats of paint, enamel, lacquer, etc. must be thoroughly dry before subsequent coats are applied, and rubbed down with fine waterproof abrasive where necessary. Tint of undercoats are to approximate those of finishing colours. Each succeeding coat to be of a different tint.

Where work is specified to be finished in a particular finish, it shall mean the provision of all preparatory work necessary to ensure proper finish whether expressly mentioned or not.

#### STANDARDS

All work in accordance with N.Z.S. 2239.

#### TOOLS AND APPLIANCES

All tools and appliances shall be in good condition and satisfactory for the work to be done.

#### CLEANLINESS

The areas to be worked in must be thoroughly cleaned and kept so until the work is completed.

Thoroughly dust and sweep out each area to be worked in each day before commencing work. Wet down concrete floors as required to prevent dusting.

#### PREPARATION

Woodwork: All knots in woodwork shall be treated to prevent bleeding. Large or loose knots shall be cut out and replaced with sound wood, or cut back and the surface made good with stopping. Smaller knots shall be treated with two thin coats of approved knotting.

Thoroughly clean down, sand and rub down and leave perfectly clean and smooth.

Metalwork: Remove all rust and scale with wire brushes, scrapers or grinding machines. Thoroughly clean off dirt, grease, rust or mill scale before priming. Priming shall be followed promptly by the specified painting system.

Metalwork delivered to the job already primed shall be carefully examined for any areas where the priming coat has been damaged or is missing. Such areas shall be thoroughly cleaned and touched up with a primer of the same type as that already applied.

Prepare aluminium and copper surfaces for painting by thoroughly washing or scrubbing with equal portions of mineral turpentine and solvent naphtha, abraded with steel wool and finally rinsing with clean solvent.

Generally: Thoroughly clean and prepare all surfaces fit to receive specified finishes.

Prepare all surfaces by sanding and scraping, etc. to completely remove all irregularities and bumps, etc. Fill all holes and hollows with materials approved by the Architects and suitable for the substrate (see stopping and filling clauses).

Rub down and sand smooth all surfaces prior to commencing stain, varnish, paint, paper or hessian finishing and as necessary to provide for first class finish.

## STOPPING AND FILLING

External: 'Polyfilla' plaster of paris type fillers not to be used on any external surfaces. For stopping of nail holes and splits in timber use putty and for larger areas use plastic wood or two pot epoxy fillers. For stopping of concrete surfaces, two pot epoxy filler or cement mortar with an approved latex plasticizer additive, e.g. Cemstik or similar approved.

Internal: Generally putty not to be used internally, only to Architect's approval. For stopping of hammer marks, nail and screw holes, cracks, graining of timber and torn wood grains, use 'Polyfilla' or similar approved. For stopping of larger areas use plastic wood or two pot epoxy fillers. For stopping of gibraltar board and fibrous plaster, use 'Polyfilla' or plaster of paris.

General: Putty shall not be applied to unprimed timber. Apply primer prior to puttying. Putty shall not be left unpainted for longer than 2 weeks when exposed to the weather.

Polyfilla, epoxy resins and plastic wood fillers shall be applied prior to applying any paint and shall be used strictly in accordance with the manufacturer's instructions. The stopping and filling of substrates shall be executed using a material suitable for the surface being filled.

All putty for stopping best linseed oil putty finely ground.

Where work is to be varnished, waxed, stained, special care shall be taken to colour match the filler to the finished colour of the adjoining work. If the timber should vary in its tones, then the filler shall be toned accordingly.

All stopping and filling shall be highly sanded down to present a dense smooth surface finishing flush with the surrounding area. Filler not to show through after the paint or paper has been applied.

## FINISHES

### 1. Wallpaper (w)

Size and paste. All size and paste Davis best quality or equal approved.

Sizing. Size all surfaces by completely brushing on size to thoroughly cover the whole surface.

Hangings. Hang all papers plumb with all joins tightly and uniformly butted. Neatly cut to all margins and all services. Brush out papers to give an even flat surface - all drops full length.

Match all patterns. Roll edges as required to completely adhere paper. Do not roll embossed papers.

Consistency of paste to suit type of paper. Hang papers as specified to areas scheduled in Schedule of finishes.

Leave complete and free of blemishes, paste marks, etc.

### 2. Staining (s.f.)

Where stained finish work is scheduled, stop nail/screw holes and the like using a stopping that will take the stain (not putty), sand down and apply selected colour stain. Stain evenly applied at a constant rate with particular care taken to avoid hit and miss application. Protect all adjoining work from marking with stain. Apply sanding sealer and two coats polyurethane as for clear varnish finish work, (v.2).

Painting Subcontractor to allow in his tender for providing three selected stains applied to the finishing timber to be used.

### 3. Gloss Finish Varnish (v.1)

Where gloss finish varnish is scheduled on woodwork, seal with clear sanding sealer, stop to match adjacent colour, finish with two good coats clear gloss finish polyurethane. Lightly sand between coats using fine grade wet and dry paper.

4. Semi Gloss Varnish (v.2)

Where semi gloss finish varnish is scheduled on woodwork, seal with clear sanding sealer, stop to match adjacent colour, finish with two good coats clear semi gloss finish polyurethane. Lightly sand between coats using fine grade wet and dry paper.

5. Matt Finish Varnish (v.3)

Where matt finish varnish is scheduled on woodwork, seal with clear sanding sealer, stop to match adjacent colour, finish with two good coats matt finish polyurethane. Lightly sand between coats with fine wet and dry paper.

6. Interior Full Gloss Enamel (f.g.e.)

Where scheduled for interior full gloss enamel, on woodwork apply one coat of primer undercoat; on plaster, hardboard, concrete, etc. apply one coat of sealer undercoat. Stop flush with appropriate stopping materials. Apply primer undercoat as a second coat. Apply full gloss enamel as a third coat Dulux Super Enamel or equal approved. Colours to be selected.

7. Interior Semi Gloss Enamel (s.g.e.)

Apply first and second coats and stopping as for "full gloss enamel". Apply semi gloss enamel as a third coat. Dulux Super Satin Enamel or equal approved. Colours to be selected.

8. Interior Plastic Paint (p.v.a.)

Where scheduled to be finished in p.v.a. paint, thoroughly prepare surfaces and apply two coats p.v.a. paint. Stop all plaster, etc. work prior to first coat. Stop all woodwork prior to second coat. For a matt finish use Dulux Spring or equal approved. For a semi gloss finish use Dulux Vinyl Satin Plastic or equal approved.

9. Exterior Full Gloss Enamel

Paint as for interior full gloss enamel, but note that all paint applications shall be the correct formulation for exterior walls. Note that the formulation shall be the correct type for the surface being painted. All work strictly to Paint Manufacturer's specifications. On galvanised iron, work down first with white spirit and soap solution as specified for roof painting, then prime with etching primer. All enamel shall be Dulux Hi-gloss or equal approved.

10. Sprayed Vinyl (s.v.f.)

Surfaces thoroughly dry and free from dirt and grease. Remove all loose material, stop and seal as required to present a first class substrate surface.

Apply sprayed vinyl, 'Situflex' as manufactured by Revertex Industries, Muraflex or similar approved, all in strict accordance with manufacturers' instructions.

11. Hessian Faced Surfaces

In general hessian faced surfaces shall be supplied and fixed by the Contractor (see Carpentry and Joinery) in proprietary "Panelweave" panels or equally approved 12 mm softboard pre-faced with coloured hessian fully bonded to face and rolled around edges. Where circumstances demand the application of hessian on surfaces as an on site work, the following method shall be followed:-

Hessian fixed using heavy consistency wallpaper paste, Davis or equal approved. Hang Hessian vertically with joints lapped approximately 50mm. Brush out Hessian to give an even flat surface with weave running true to line. All drops full length with no horizontal joints.

Trim off all excess to margins after paste has dried and all shrinkage has taken place. After paste has dried, knife through lap joint and peel back excess hessian re-paste to give a tight straight butt joint.

#### 12. Class One Surface Flame Spread

Where scheduled for class one surface flame spread on hessian, hardboard, pinex, softboard, hardiflex, particle board, gibraltar board and fibrous plaster, paint as follows:

- 1) First coat Resene (or similar approved) Intumat paint, applied with lambswool roller.
- 2) Second coat as (1) above but tinted to approximate final colour.
- 3) Two finish coats of enamel paint (same brand as Intumat paint).

Note: Finish coats shall be pigmented colours, not tinted; tinters react with Intumat paint. Do not use water base paints over Intumat paint.

Note: If Intumat paint to be applied over hessian, fix hessian using a p.v.a. glue not wallpaper paste.

#### 13. Class Two Surface Flame Spread

Where scheduled for class two surface flame spread on hessian, hardboard, pinex, softboard, hardiflex, particle board, gibraltar board and fibrous plaster, paint as follows:

- 1) First coat Resene (or similar approved) Intumat paint, tinted to approximate final finished colour. Intumat paint applied with lambswool roller.
- 2) Two finish coats of enamel paint, gloss or semi-. Same brand as Intumat paint.

Note: Finish coats shall be pigmented colours, not tinted; tinters react with Intumat paint.

Note: If Intumat paint to be applied over hessian, fix hessian using a p.v.a. glue not wallpaper paste.

#### 14. Oiled Finish

Where oiled finish to interior work is scheduled, apply three coats of 'Bourne G57' oil or similar approved.

Where oiled finish to exterior work is scheduled, apply three coats Gold X NF 11 oil of selected colour or similar approved.

Oils applied in strict accordance with manufacturer's instructions.

#### SCOPE

Generally the scope of work is set out in the schedule of finishes

All exterior metalwork aluminium or stainless steel pipes penetrating roofing shall be painted fge.

Confer with Architects before proceeding with painting work and check requirements.

#### LINING PAPER

All Gibraltar Board surfaces specified for paint finish shall be covered with lining paper. Hang lining paper as for wallpaper to first class finish.

#### D.P.'s AND R.W.H.'s

Note that all rainwater heads and down pipes shall be finished with a selected colour full gloss enamel of a polyurethane type, Epiglass Epithane or similar approved.

#### CUPBOARDS AND FITTINGS

Generally and unless specified otherwise all woodwork fittings and cupboards, joinery and shelvings, doors and trim etc. shall be stained and polyurethaned.

#### PAINT COLOURS

Colour schedules for the work will be issued during the course of the contract. Colour shall be specified in accordance with the colour reference system as set out in B.S.S. The Contractor shall supply paint in the colours selected from the above British Standard

Brick Paving and Brick Work  
General

BRICK PAVING AND BRICK WORK

PRELIMINARY: All Trade Sections and Subcontracts are subject to the N.Z.I.A. General Conditions of Contract and to all provisions of Preliminary Section of this Specification as appropriate.

BRICKS: All bricks to comply with approved and selected samples, first quality free from defects to comply with N.Z.S.S. 95 Part X Clauses 1003 to 1010.

MORTAR: 4 parts clean sharp sand to one part cement with the addition of an approved plasticiser. All sand shall be from the same source for colour match of all mortar joints.

WORKMANSHIP: Work to best trade practice laid to falls shown. All joints even to all directions 9mm wide. Paving bricks fully bedded on concrete substrate, joints completely filled. Bricks and substrate wetted to approval 24 hours before paying.

BOND: Paving bricks laid with straight joints in both directions. At raking walls bricks shall be machine cut to present a smooth junction.

CLEANING: Clean down on completion with sulphuric acid to remove mortar runs, etc. Any damaged bricks replaced.

PAVING SUBGRADE: Allow to inspect paving sub-grade and ascertain suitability as a surface for paving, check levels and grades. Report back to main contractor if sub-grade unacceptable. Commencement of work under this trade shall be deemed acceptance of all matters affecting the production of a first quality finish.

Brick Paving and Brick Work

General

METAL BONDING: All brickwork shall have approved welded galvanised wire fabric bonding of correct width in every fourth course.

First strip in fourth joint from bottom and one strip just above and below all openings. Bonding fully bedded having overlapped and locked joints well tied around corners, at cross walls, and to adjoining concrete work.

TIES: Ties shall comply with NZSS 3604

Brickwork pull ties to be Hot dip Galvanised mild steel ties 25mm (min) wide by 1.5 (min) thick must be spaced at not more than 600 Horizontally and not more than 350mm vertically.

## BUILDING CLEANING

### PRELIMINARY

The Preliminary and General section of this specification is binding on all Subcontractors.

### GENERAL

On completion, and immediately before handing the new building over to the Employer, the building shall be cleaned entirely and throughout.

Remove all rubbish and debris from the site. Clean down all roof and wall surfaces and wash off any dirt, foreign matters and stains.

Clean and polish all exterior glass on both faces.

Clean and polish all anodised aluminium work and leave completely free from stains and blemishes. Clean down all concrete surfaces and exterior paintwork.

Clean and polish all floors, tiled areas, china ware, plastic surfaces, both faces of all internal glazing, all aluminium and bright metal work, polished woodwork, fittings and machines, appliances and all items generally. Leave the whole work clean and fit for immediate occupation with all equipment, services and fittings in perfect condition and full working order.

Table 16

LINTELS  
1.5 kPa and 2.0 kPa floor loads

| Maximum clear width of opening (span of lintel)<br>(m) | Maximum span of member supported* | Depth of lintel supporting:                         |      |      |                                                                |      |      |                                                           |      |      |
|--------------------------------------------------------|-----------------------------------|-----------------------------------------------------|------|------|----------------------------------------------------------------|------|------|-----------------------------------------------------------|------|------|
|                                                        |                                   | Roof only where lintel thickness (mm) is: (Fig.40A) |      |      | Roof and walls only where lintel thickness (mm) is: (Fig. 40B) |      |      | All other cases where lintel thickness (mm) is: (Fig.40C) |      |      |
|                                                        |                                   | 50                                                  | 75   | 100  | 50                                                             | 75   | 100  | 50                                                        | 75   | 100  |
| (m)                                                    | (m)                               | (mm)                                                | (mm) | (mm) | (mm)                                                           | (mm) | (mm) | (mm)                                                      | (mm) | (mm) |

## A Light roof

|     |      |     |     |     |     |     |     |     |     |     |
|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0.9 | 8.0  | 125 | 100 | 100 | 125 | 125 | 100 | 125 | 125 | 100 |
|     | 12.0 | 150 | 125 | 100 | 150 | 125 | 100 | 150 | 125 | 100 |
| 1.2 | 8.0  | 125 | 100 | 100 | 150 | 125 | 100 | 200 | 150 | 125 |
|     | 12.0 | 150 | 125 | 125 | 200 | 125 | 125 | 200 | 200 | 150 |
| 1.5 | 8.0  | 150 | 125 | 100 | 150 | 125 | 100 | 250 | 200 | 150 |
|     | 12.0 | 200 | 150 | 125 | 200 | 150 | 125 | 300 | 250 | 200 |
| 1.8 | 8.0  | 150 | 125 | 125 | 200 | 150 | 125 | 250 | 200 | 200 |
|     | 12.0 | 200 | 150 | 150 | 200 | 200 | 150 | -   | 250 | 250 |
| 2.1 | 8.0  | 200 | 150 | 150 | 200 | 200 | 150 | -   | 250 | 250 |
|     | 12.0 | 250 | 200 | 200 | 250 | 200 | 200 | -   | 300 | 300 |
| 2.4 | 8.0  | 250 | 200 | 150 | 250 | 200 | 200 | -   | 300 | 250 |
|     | 12.0 | 300 | 250 | 200 | 300 | 250 | 200 | -   | -   | 300 |
| 2.7 | 8.0  | -   | 200 | 200 | -   | 250 | 200 | -   | -   | 300 |
|     | 12.0 | -   | 250 | 250 | -   | 300 | 250 | -   | -   | 300 |
| 3.0 | 8.0  | -   | 250 | 200 | -   | 250 | 200 | -   | -   | -   |
|     | 12.0 | -   | 300 | 250 | -   | 300 | 250 | -   | -   | -   |
| 3.6 | 8.0  | -   | 300 | 250 | -   | 300 | 250 | -   | -   | -   |
|     | 12.0 | -   | -   | 300 | -   | -   | 300 | -   | -   | -   |

\* The greater of roof dimension S (see clause 6.4.3.), span of joists, span of under-purlins, or span of strutting beam, as appropriate:

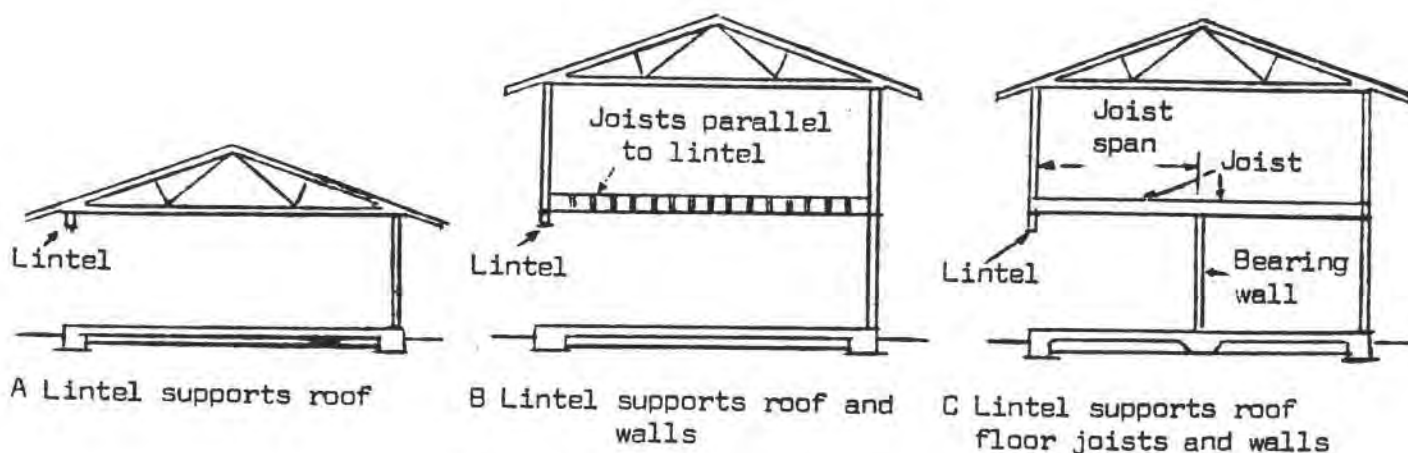


Fig.40 : Lintel loads for the purposes  
of Table 16

Table 30

NAILING SCHEDULE

| Joint | Length (mm) x<br>diameter (mm)<br>and type | Number<br>and<br>Location |
|-------|--------------------------------------------|---------------------------|
|-------|--------------------------------------------|---------------------------|

## Subfloor framing

|                                                     |              |                |
|-----------------------------------------------------|--------------|----------------|
| Bearer to jackstud .....                            | 100 x 3.75   | 2 (skewed)     |
| Bearer to jackstud adjacent to cut-between brace... | 100 x 3.75   | 4 (skewed)     |
| Bearer end to cut-between plates .....              | 100 x 3.75   | 4 (skewed)     |
| Bearer to top plate of wall framing .....           | 100 x 3.75   | 4 (skewed)     |
| Flitch to each bearer end .....                     | 100 x 3.75   | 4              |
| Flitch to jackstud .....                            | 100 x 3.75   | 4 (skewed)     |
| Stud or jackstud to plate .....                     | 100 x 3.75   | 2 (end nailed) |
|                                                     | or           |                |
|                                                     | 75 x 3.15    | 4 (skewed)     |
| Sheet material for subfloor brace to:               | 30* x 2.5 FH |                |
| (a) Framing members at sheet edges .....            |              | 150 mm centres |
| (b) Intermediate supports .....                     |              | 300 mm centres |

## Floor framing

|                                                     |            |                                    |
|-----------------------------------------------------|------------|------------------------------------|
| Joist to plate or bearer .....                      | 100 x 3.75 | 2 (skewed)                         |
| Lapped joint in joist .....                         | 100 x 3.75 | 2 (each side)                      |
| Flitched joint in joist .....                       | 100 x 3.75 | 4 (each end)                       |
| Herringbone strutting to joist .....                | 60 x 2.8   | 2 (skewed)                         |
| Solid blocking to joist .....                       | 100 x 3.75 | 2 (end nailed)                     |
|                                                     | or         |                                    |
|                                                     | 75 x 3.15  | 4 (skewed)                         |
| Joist to plate on foundation walls .....            | 100 x 3.75 | 12 (skewed)<br>per 1.5 m<br>length |
| Solid blocking between joists to plate or bearer... | 100 x 3.75 | 4 (skewed)                         |
| Boundary joist to end of each joist .....           | 100 x 3.75 | 2 (end nailed)                     |
| Curtailed joist not exceeding 3 m long to trimmer.. | 100 x 3.75 | 3 (end nailed)                     |
| Curtailed joist to trimmer when half housed .....   | 100 x 3.75 | 2 (end nailed)                     |

## Floor decking

|                                                            |                                                      |                |
|------------------------------------------------------------|------------------------------------------------------|----------------|
| Strip flooring not exceeding 75 mm wide to floor joist ..  | 2½ x finished thickness                              | 1              |
| Strip flooring not exceeding 100 mm wide to floor joist .. | 2½ x finished thickness                              | 2              |
| Sheet decking (not exceeding 21 mm thick) to:              | 60* x 2.8<br>or<br>57* x 11.1<br>x 1.8 mm<br>staples |                |
| (a) Supports at sheet edges .....                          |                                                      | 150 mm centres |
| (b) Intermediate supports .....                            |                                                      | 300 mm centres |

\* See clause A6

Table 16 (cont.)

## LINTELS

1.5 kPa and 2.0 kPa floor loads

| Maximum clear width of opening (span of lintel) | Maximum span of member supported* | Depth of lintel supporting:                         |      |      |                                                                |      |      |                                                           |      |      |
|-------------------------------------------------|-----------------------------------|-----------------------------------------------------|------|------|----------------------------------------------------------------|------|------|-----------------------------------------------------------|------|------|
|                                                 |                                   | Roof only where lintel thickness (mm) is: (Fig.40A) |      |      | Roof and walls only where lintel thickness (mm) is: (Fig. 40B) |      |      | All other cases where lintel thickness (mm) is: (Fig.40C) |      |      |
|                                                 |                                   | 50                                                  | 75   | 100  | 50                                                             | 75   | 100  | 50                                                        | 75   | 100  |
| (m)                                             | (m)                               | (mm)                                                | (mm) | (mm) | (mm)                                                           | (mm) | (mm) | (mm)                                                      | (mm) | (mm) |

## B Heavy roof

|     |      |     |     |     |     |     |     |     |     |     |
|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0.9 | 8.0  | 125 | 125 | 100 | 150 | 125 | 100 | 150 | 125 | 100 |
|     | 12.0 | 200 | 125 | 125 | 200 | 150 | 125 | 200 | 150 | 125 |
| 1.2 | 8.0  | 150 | 125 | 100 | 200 | 125 | 125 | 200 | 150 | 150 |
|     | 12.0 | 200 | 150 | 125 | 200 | 200 | 150 | 250 | 200 | 200 |
| 1.5 | 8.0  | 200 | 150 | 125 | 200 | 150 | 125 | 250 | 200 | 200 |
|     | 12.0 | 250 | 200 | 150 | 250 | 200 | 150 | 300 | 250 | 200 |
| 1.8 | 8.0  | 200 | 150 | 125 | 200 | 200 | 150 | 300 | 250 | 200 |
|     | 12.0 | 250 | 200 | 200 | 250 | 200 | 200 | -   | 300 | 250 |
| 2.1 | 8.0  | 250 | 200 | 200 | 250 | 200 | 200 | -   | -   | 300 |
|     | 12.0 | 300 | 250 | 200 | 300 | 250 | 200 | -   | -   | 300 |
| 2.4 | 8.0  | 300 | 250 | 200 | 300 | 250 | 200 | -   | -   | -   |
|     | 12.0 | -   | 300 | 250 | -   | 300 | 250 | -   | -   | 300 |
| 2.7 | 8.0  | -   | 250 | 250 | -   | 300 | 250 | -   | -   | -   |
|     | 12.0 | -   | -   | 300 | -   | -   | 300 | -   | -   | -   |
| 3.0 | 8.0  | -   | 300 | 250 | -   | 300 | 250 | -   | -   | -   |
|     | 12.0 | -   | -   | 300 | -   | -   | 300 | -   | -   | -   |
| 3.3 | 8.0  | -   | 300 | 250 | -   | -   | -   | -   | -   | -   |
|     | 12.0 | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 3.6 | 8.0  | -   | -   | 300 | -   | -   | 300 | -   | -   | -   |
|     | -    | -   | -   | -   | -   | -   | -   | -   | -   | -   |

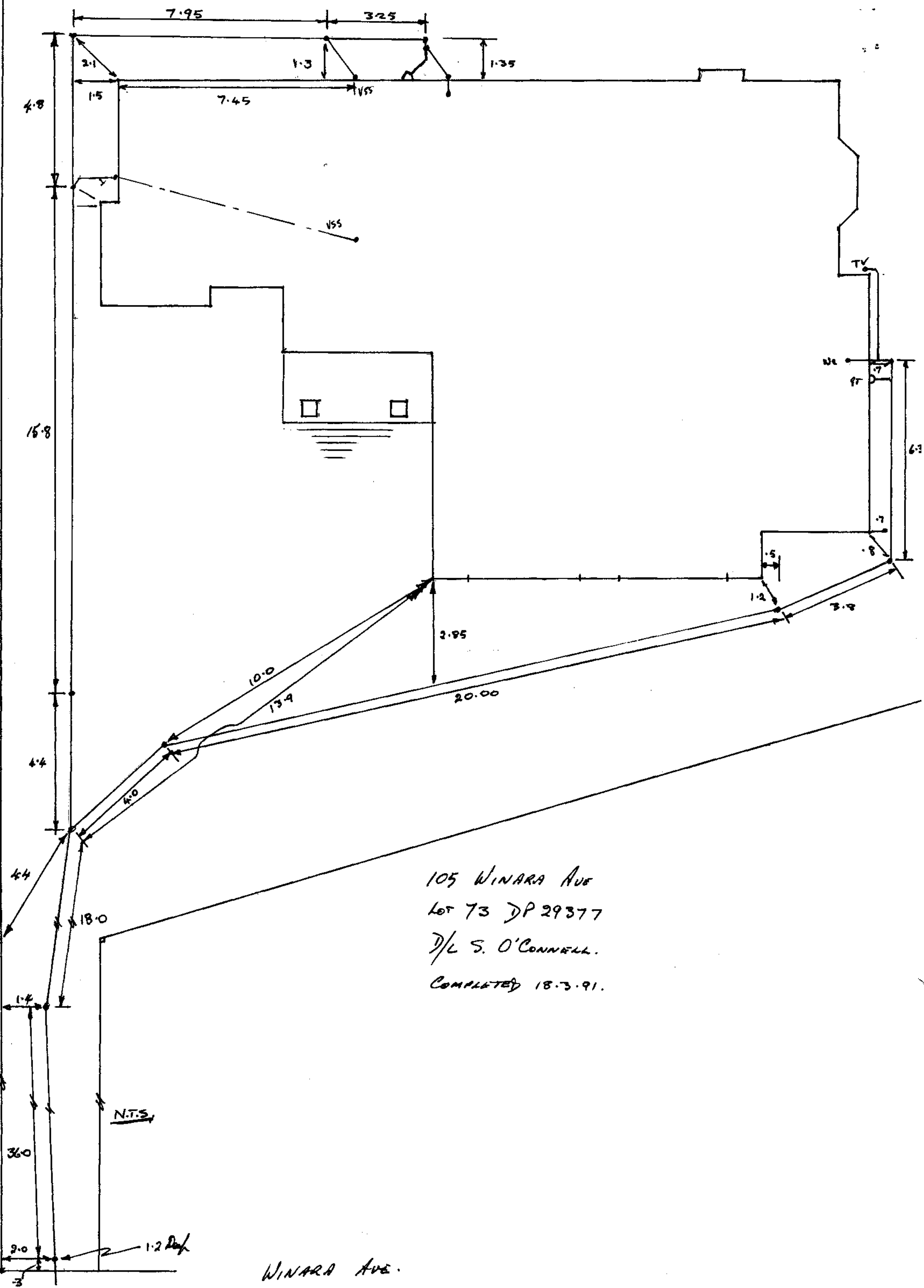
\* The greater of roof dimension S (see clause 6.4.3.), span of joists, span of under-purlins, or span of strutting beam, as appropriate.

NOTE - Where a lintel supports one floor and non-loadbearing walls only then the lintel size may be obtained from the column headed "Roof and walls only" in Table 16B (heavy roof).

- BRACING AS DETAILED
- LEVEL 1 & 2 LOADBEARING WALLS 100 X 50 @ 400  
(DOUBLE TOP PLATES)
- CHIMNEY HEIGHT RESTRICTION
- VENEER HEIGHT RESTRICTION

{ LIVING ROOM ROOF DESIGN  
{ IDENTIFY BEAMS IN DESIGN CERT.  
{ SUPPLY CALCS

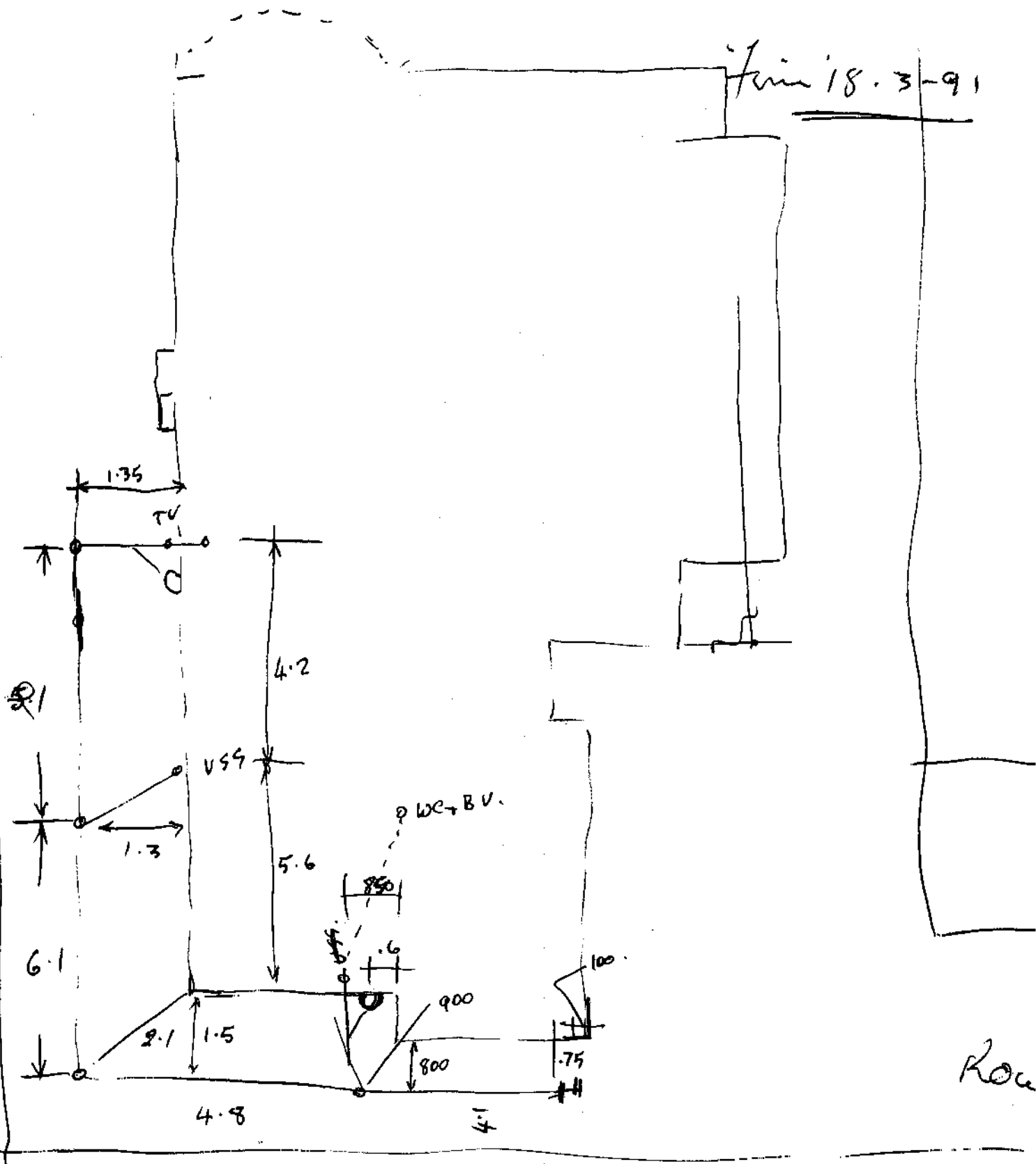
CONCRETE TO RETAIN



Harber  
Winawa Ave.  
19-10-90

Part

Item 18.3-91



1987

April

uesday

7

Move ~~Delet~~  
128 US

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1-55

Deleter

B.3.71  
105 Summer Ave

330

Tamworth  
D.T

garage

11.5

13.9

10.0

28.5

20-0

48.4

6.9

1.2

3.8

5

AUGUST 1987

| M  | T  | W  | T  | F  | S  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 |    |    |    |    |    |

SEPTEMBER 1987

| M  | T  | W  | T  | F  | S  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 |    |    |    |    |    |

OCTOBER 1987

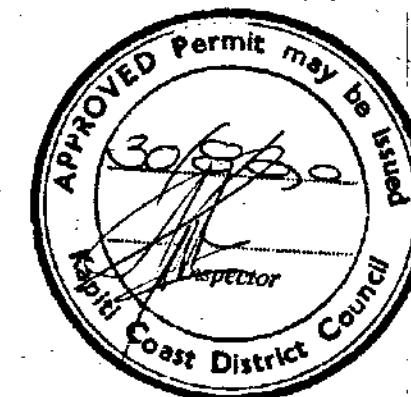
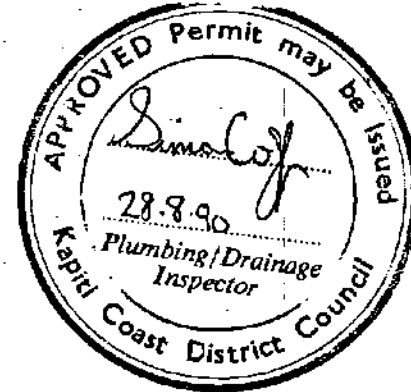
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|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 |    |    |    |    |

NOVEMBER 1987

| M  | T  | W  | T  | F  | S  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 |    |    |    |    |    |

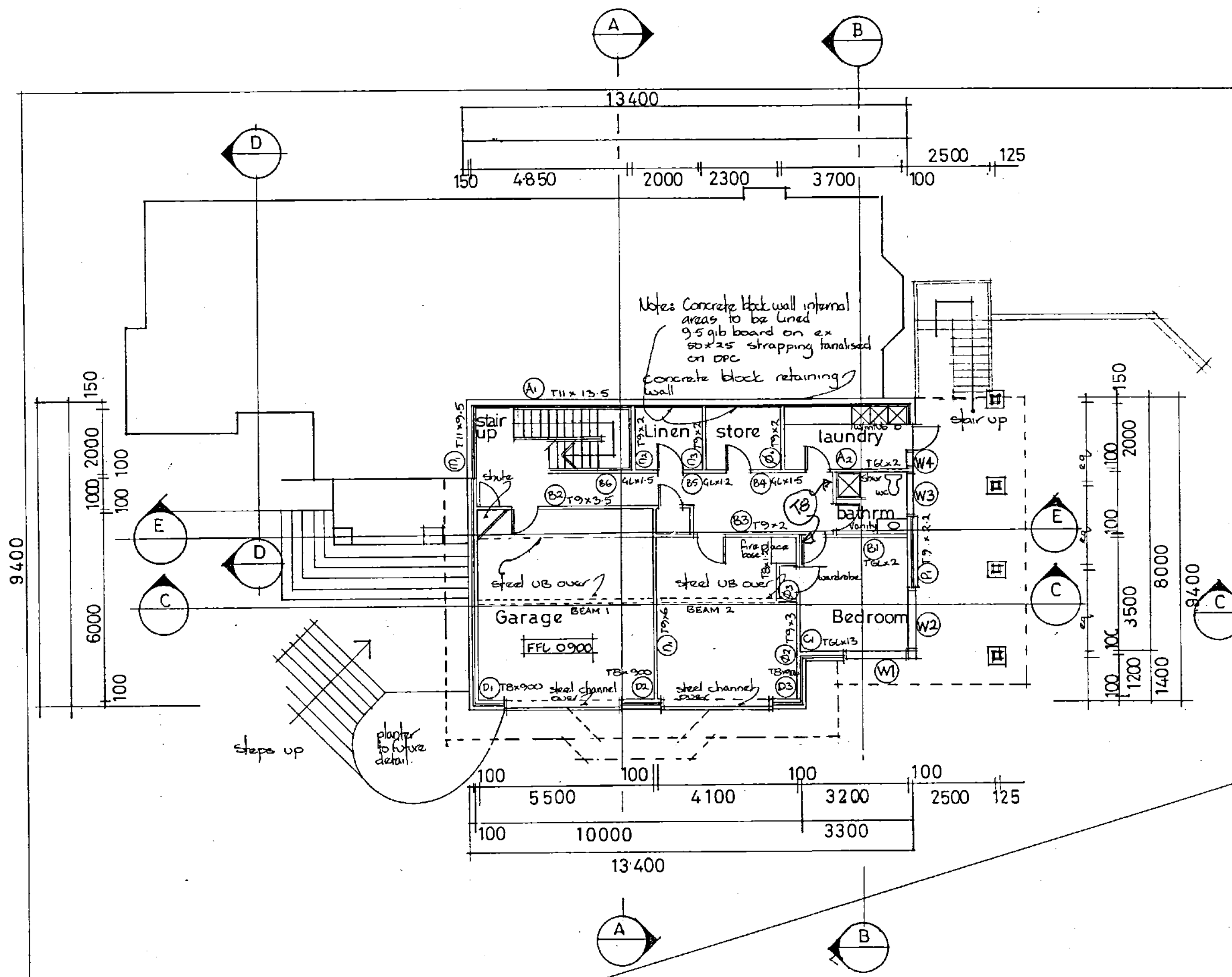
DECEMBER 1987

| M  | T  | W  | T  | F  | S  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 |    |    |    |    |



THIS LEVEL WALL FRAMING  
FOR LOADBEARING WALLS  
TO BE MIN. 100X50 @ 400

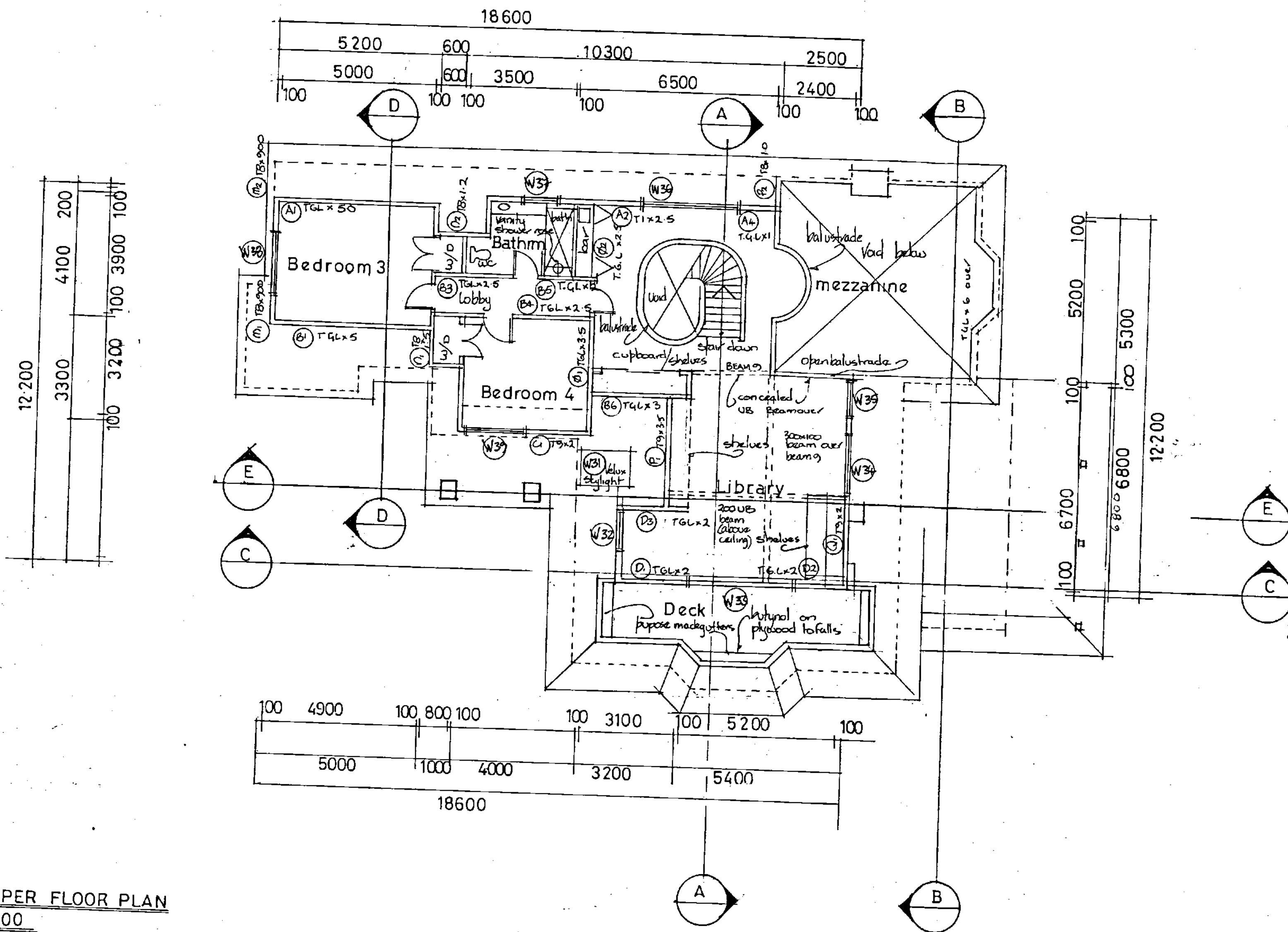
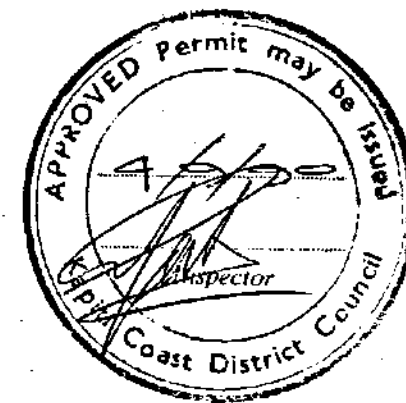
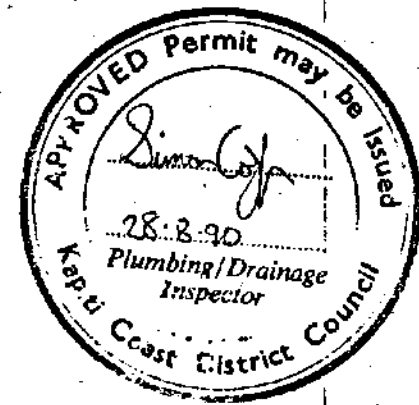
All Plumbing and Drainage work to be carried  
out in accordance with 1918 Drainage and  
Plumbing Regulations and with Kapiti Coast  
District Council Requirements.



LOWER FLOOR PLAN

1:100





UPPER FLOOR PLAN  
1:100