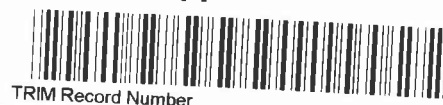


**111115054070**  
**2154012711**



## Form 7

# Code compliance certificate

**080258**

### Section 95, Building Act 2004

#### The building

Street address of building: 685 DEPOT RD

Legal description of land where building is located: Lot 2 DP 383229

Valuation number: 2154012711

Building name:

Location of building within site/block number:

Level/unit number:

Current, lawfully established, use:

Year first constructed:

#### The owner

Name of owner: McDowell Murray David & Heritage Trustee Company Ltd

Contact person: MURRAY MCDOWELL

Mailing address: Trustees Of The Broken River Trust, PO Box 43, Oxford 7443

Street address/registered office:

Phone number: Landline:

Mobile: 0274 375275

Daytime: 3123452

After hours: 3123452

Facsimile number:

Email address: BUILDBEST@CLEAR.NET.NZ

Website:

First point of contact for communications with the council/building consent authority:

As above

#### Building work

Building consent number: 080258

Consent description: DWELLING WITH ATTACHED GARAGE WITH LOGBURNER WEGJ 2000 YUNCA

Issued by: Waimakariri District Council

#### Code compliance

The building consent authority named below is satisfied, on reasonable grounds, that —

- (a) the building work complies with the building consent



A handwritten signature in blue ink, consisting of a large loop followed by several smaller, connected strokes.

Signature

A handwritten signature in blue ink, consisting of a large loop followed by several smaller, connected strokes.

Position

On behalf of: Waimakariri District Council

Date: 2/09/11

2 September, 2011

M MCDOWELL & HERITAG TRUST COMPANY LIMITED  
685 DEPOT ROAD  
RD 1  
OXFORD 7495

RE: Building Consent Application No. 080258  
DWELLING WITH ATTACHED GARAGE WITH LOGBURNER WEGJ 2000  
YUNCA  
685 DEPOT RD  
2154012711

Dear M MCDOWELL & HERITAG TRUST COMPANY LIMITED,

We completed a final inspection of the above building project and have audited the working file.

During this audit or as part of the site inspection we have found that we require the following information to be provided or remedial work to be completed prior to the issue of the Code Compliance Certificate. The outstanding items are listed below.

1. Please supply the solid fuel heater installation sheet

The Code Compliance Certificate cannot be issued until all of the above items have been addressed to our satisfaction and your assistance in having this attended to in a timely manner would be greatly appreciated.

You should also note that any additional inspections will have to be paid prior to the release of the CCC.

In the interim if you have any queries please contact me.

Yours faithfully



Sarah Smith  
Administration





WAIMAKARIRI  
DISTRICT COUNCIL

## File sign off for issue of a CCC

Job Number 080258 Final By Robert Auditor Sordh

Project Description

New dwelling with garage.

Items highlighted (\*\*) are to be sent to the council.

Legend: . Pass — N.A . Required

Audit items	
Form 6, signed and dated**	✓
Final landscaping photos**	✓
Heating check sheet**	✗
Drainage Plan**	✓
Exterior Plaster PS3**	—
Gas Certificate**	—
Electrical Certificate**	✓
Drain layers Reg No: <u>16406</u>	✓
Plumbers Reg No:	✓
Plumber pressure Test PS4** Consents from 1.11.07	✓
Tanking PS3**	✓
Cladding type/s as per plans	✓
Drain layers Eff. PS3**	✓
W.D.C effluent approval & Fenced	✓
Well water test** <u>Open rural</u>	✓
Engineers site notes**	✓
Engineers PS4**	✓
Membrane warranty**	✓
Membrane Roof Pitch	✓
Membrane installers PS4**	✓
Construction Statements**	✓
Inspection Notices**	✓
Consent fees owed	✓
CCC**	Inspection Notices**

Jobs on HOLD outstanding items (list)

① Fire install sheet.





## File sign off for issue of a CCC

Commercial	
Access & Facilities	
FPS PS4**	
FPIS Certificate**	
HVACPS4**	
Compliance Schedule application**	
Surveyors cert.**	

- **Read File – PIM Conditions.**

Check above with site notes and working file.

- **Check all site notices, rearrange file with notes in date sequence.**

Site File to be arranged in

- RH Side – Inspection notes in date order, stapled twice along top
- LH side – Drainage plan, PS4's, Energy Certificates etc
- Put all remaining documentation in date sequence, including plans and specs, bind and place in working file.

- **Follow up all failed inspection items thoroughly, sign and date decision and briefly describe outcome.**

*Use space on back of sheet to write up any back ground notes ie: where a follow through of a site inspection requirement is not 100% clear from another reinspection but has been conveyed in other inspections. Also note any discussion with field officer/other staff to show how acceptance was achieved.*

Inspection notices correctly completed and signed off Yes. No.

Outstanding Items Yes No OK for CCC Yes No

(signed) [Signature] Date 2.9.11.

# Form 6

## Application for code compliance certificate

Section 92, Building Act 2004

### The building consent

Building consent number: 080258

Issued by: Waimakariri District Council

### \*The owner

Name of owner: M MCDOWELL & HERITAG TRUST COMPANY LIMITED

†Contact person: MURRAY MCDOWELL

Mailing address: 685 DEPOT ROAD, RD 1, OXFORD

Street address/registered office:

Phone number: Landline:

Mobile: 0274 375275

Daytime: 3123452

After hours: 3123452

Facsimile number:

Email address: BUILDBEST@CLEAR.NET.NZ

Website:

The following evidence of ownership is attached to this application: [copy of certificate of title, lease, agreement for sale and purchase, or other document showing full name of legal owner(s) of the building]

First point of contact for communications with the council/building consent authority:

As above

### Application

All building work to be carried out under the above building consent has been completed.

The personnel who carried out the building work are as follows:

Builder: BUILDBEST CONSTRUCTION LTD 685 DEPOT ROAD RD 1 OXFORD : 3123452

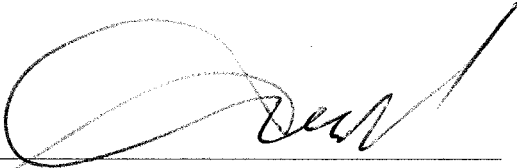
Designer: MURRAY MCDOWELL 685 DEPOT ROAD RD 1 OXFORD : 3123452

Drainlayer: K & T DRAINAGE LIMITED BOX 20126 BISHOPDALE CHCH : 3594463

Plumber: PETER DIVER PLUMBING LTD 44 MACES ROAD BROMLEY CHCH : 3848111  
3848748FAX

I request that you issue a code compliance certificate for this work under section 95 of the Building Act 2004.

The code compliance certificate should be sent to: 685 DEPOT ROAD, RD 1, OXFORD (Owner)

  
Signature of owner  
Name of person signing

Date: 11/8/11.

**Attachments**

The following documents are attached to this application:

¶ Certificates from the personnel who carried out the work

¶ Certificates that relate to the energy work

¶ Evidence that specified systems are capable of performing to the performance standards set out in the building consent

\*Delete this section if details have not changed from the building consent.

† Delete if owner is an individual.

‡ Delete this section if the application is not being made on behalf of the owner.

§ Delete if the agent is an individual.

|| Contact details must be in New Zealand.

¶ Delete items not applicable.



APPLICATION NO: 080258

PRIME NO: 200815000

### Compliance Schedule Sticker

NAME: M MCDOWELL & HERITAG TRUST  
PHONE: 3123452  
LOCATION: 685 DEPOT RD  
BUILDER: BUILDBEST CONSTRUCTION LTD  
PHONE: 3123452  
PE: New (& prebuilt) House, Unit, Bach, Crib  
ATE RECEIVED: 28/02/08  
ISTRICT: Waimakariri

**RESOURCE CONSENT  
APPLIES SECTION 37 BAct**

RC: \_\_\_\_\_ issued ☐  
Plan Administration Unit Notified

Date: \_\_\_\_\_

ED:

PROCESSED BY:

ENDORSEMENTS (Any special conditions/endorsements on the Building Consent and/or documents that must be drawn to the attention of the owners/subcontractors)

These are noted on the left inside page (see over)

PROJECT COMPLETE/ CCC APPROVED -

INSPECTOR'S SIGNATURE: \_\_\_\_\_

NAME: \_\_\_\_\_

DATE:

## INSPECTION ISSUES

INSPECTION ISSUES NOTED DURING PROCESSING:

- ~~\* CHECK FOR COPPER RELIEF PIPE AT FINAL~~
- ~~- NO ACCESS INSIDE DIVERGENCE AT DRAINAGE INSPECTION.~~
- ~~- LOOKS LIKE PVC RELIEF PIPE RUNNING IN TO GULCH TRAP.~~

AMENDMENTS (AFTER CONSENT ISSUE):

DATE:

ENGINEER TO INSPECT:

SURVEYOR REQUIRED (PEGGING / FFL / RECESSION PLANE):

FIRE ENGINEER TO INSPECT:

ITEMS FOR COUNCIL TO INSPECT (SUCH AS EFFLUENT/POOL FENCING):

CONSTRUCTION REVIEWS REQUIRED TO SUPPORT PRODUCER STATEMENT DESIGN AND INSPECTION:





# NOTICE OF INSPECTION

Section 90 Building Act 2004

Owners Name: M Mc Dowell + MERITAS TRUST

Local Auth. Consent No. 080258

Site Address: 685, Depot Rd

Officer: LEE BRYAN

To the Owner / Agent / Occupier / Contractor

How Notified

☒ Notified Direct

☐ Left on Site

☐ Faxed

Please take note that on the 19 / 8 / 11 at 1:40 am/pm pm this site was inspected pursuant to Building Act 2004

Inspection Type: Final Re-inspection

Project Description: DWS ATT SHOWER

Inspection Notes: Passed Items

TV CLIPPED AS REQD ✓

PIPEWORK LASSON FROM CUNIVER TO TEMP VALVE ✓

TUN - DISH FITTED ✓

HOT WATER ON @ 55° ✓

SHOWER TEST COMPLETED ✓

PLUMBERS PS3 + ELECTRICAL CCC RECEIVED

All work as per consent documents ☒ Yes ☐ No

Amendments required ☐ Yes ☒ No

Reinspection Required ☐ Yes ☒ No

Signature [Signature]



# NOTICE OF INSPECTION

Section 90 Building Act 2004

Owners Name: MCDOWELL / HERITAGE TRUST

Local Auth. Consent No. 080258

Site Address: 685 DELPET RD

Officer: B BERT BAILEY

To the Owner / Agent / Occupier / Contractor

How Notified

☒ Notified Direct

☐ Left on Site

☐ Faxed

Please take note that on the 11 / 8 / 11 at 10:30 am this site was inspected pursuant to Building Act 2004

Inspection Type: FIRE - DRY BACK

Project Description: NEW HOUSE

PASSED

Inspection Notes: YUNCA FIRE FIXED TO CONCRETE FLOOR, CLEARANCES ALL ROUND AS CONSENT PLANS ✓  
S/S FLUE FIXED TO FIRE, THREE S/S RIVETS TO JOINTS, YUNCA FLUE BOARD TO FLUE ✓  
CENDING PLATE IN PLACE, CLEARANCES AS CONSENT PLANS ✓  
HEATSEVER FLUE SYSTEM IN PLACE ✓  
BOOT TO COLOUR STEEL FLASHING OVER CHIMNEY, FLASHING FIXED TROUGH SIDES ✓  
FLUE HIGH AS REQUIRED, CAP IN PLACE ✓  
SNOKE DETECTORS IN PLACE ✓

All work as per consent documents ☒ Yes ☐ No

Amendments required ☐ Yes ☒ No

Reinspection Required ☐ Yes ☒ No

Signature [Signature]





# NOTICE OF INSPECTION

Section 90 Building Act 2004

Owners Name: MCDOWELL / HER TAG JUST

Local Auth. Consent No. 080258

Site Address: 685 DEPOT RD

Officer: ROBERT BAILEY

To the Owner / Agent / Occupier Contractor

How Notified

☒ Notified Direct ☐ Left on Site ☐ Faxed

Please take note that on the 11 / 8 / 11 at 11 am/pm this site was inspected pursuant to Building Act 2004

Inspection Type: EFFLUENT FIELD

Project Description: NEW HOUSE

PASSED

Inspection Notes: FIELD SITED AS CONSENT PLAN ✓

FIELD SIZE AS CONSENT PLANS ✓

FIELD FENCED. ✓

All work as per consent documents ☒ Yes ☐ No

Amendments required ☐ Yes ☒ No

Reinspection Required ☐ Yes ☐ No

Signature [Signature]





# NOTICE OF INSPECTION

Section 90 Building Act 2004

Owners Name: M McDOWELL & HEALING TRUST Local Auth. Consent No. 080258

Site Address: 685 DEPT. ROAD  
OXFORD Prime Job No. 200815000

Officer: WES HOLMAN

## How Notified

☒ Notified Direct ☒ Left on Site ☐ Faxed

To the Owner / Agent / Occupier / Contractor

Please take note that on the 28 / 2 / 11 at 11:00 am/pm this site was inspected pursuant to Building Act 2004

Inspection Type: DRAINS

Project Description: PASSED ITEMS

Inspection Notes: - PASSED ITEMS

- DRAINAGE - K & T DRAINAGE - MARK 16406 ✓
- AS BUILT" PROVIDED BY DRAINAGE. ✓
- PIPEWORK Laid IN BEDDING CHIP. ✓
- GRADIENT 1:80. ✓
- 90m UPVC STORMWATER LINES TO SOAK PITS. ✓
- FILTER CLOTH TO SOAKPITS ✓
- 100m UPVC SEWER LINE TO BIO CYCLE TANK. ✓

NOTE - NO WATER ON SITE TO CARRY OUT TEST -

OK TO BACKFILL WHEN READY ✓

## SITE INSTRUCTIONS

- ENSURE ADEQUATE COVER TO WASTE PIPES TO GULLY AT BACK DOOR. ✓

All work as per consent documents ☒ Yes ☒ No

Amendments required ☒ Yes ☒ No

Reinspection Required ☐ Yes ☒ No

Signature [Signature]





# NOTICE OF INSPECTION

Section 90 Building Act 2004

Owners Name: DOWELL

Local Auth. Consent No. 080258

Site Address: DEBOT RD

Prime Job No. -

Officer: ROBERT BAILEY

To the Owner / Agent / Occupier Contractor

How Notified

☒ Notified Direct ☐ Left on Site ☐ Faxed

Please take note that on the 13 / 9 / 10 at 10:21 am/pm this site was inspected pursuant to Building Act 2004

Inspection Type: PRESTOL

Project Description: NEW HOUSE

PASSED

Inspection Notes: 10 - STANDARD GIB TO WALLS ✓

13 - STANDARD GIB TO CEILINGS ✓

10 - AQUALINE TO SOME WALLS IN BATHROOM BUT BEHIND SHOWERS ✓

BS4, GS14 AND GS2 NAILLED OF AS WINSTONES GUIDE BOOK ✓

All work as per consent documents ☒ Yes ☐ No

Amendments required ☐ Yes ☒ No

Reinspection Required ☐ Yes ☐ No

Signature R



# NOTICE OF INSPECTION

Section 90 Building Act 2004

Owners Name: M McDOWELL & HERITAGE TRUST Local Auth. Consent No. 080258

Site Address: 685 DEPOT ROAD  
OXFORD.

Prime Job No. 200815000.

Officer: WES HOLLAND

To the Owner / Agent / Occupier ☒ Contractor

How Notified

☒ Notified Direct ☒ Left on Site ☐ Faxed

Please take note that on the 13 / 04 / 10 at 1230 am/pm this site was inspected pursuant to Building Act 2004

Inspection Type: ONLINE

Project Description: DWELLING ATTACHED GARAGE

Inspection Notes: PASSED 100MS

- 90x45 TIMBER FRAMING, MOISTURE CONTENT 11%. ✓
- 70x35 TIMBER CEILING BATTENS @ 400mm c. ✓
- R3.2 PINK BATT INSULATION TO CEILING ✓
- \* R2.6 PINK BATT INSULATION TO WALLS ✓
- \* AIR SEALS TO ALL OPENINGS. ✓
- DUX PIPEWORK & FITTINGS CHIPPED & WARGED ✓
- ALL PIPEWORK TO BE TESTED TO 1500KPA. ✓

OK TO LIVE.

## SITE INSTRUCTION

- ENSURE WALL INSULATION TO HOUSE/GARAGE COMPLETE.
- COMPLETE SMALL PART OF CEILING INSULATION TO BATHROOM  
CILING.
- COMPLETE AIR SEAL TO HEAD OF OPENINGS.

All work as per consent documents ☒ Yes ☐ No

Amendments required ☐ Yes ☒ No

Reinspection Required 15 ☐ Yes ☒ No

Signature



# NOTICE OF INSPECTION

Section 90 Building Act 2004

Owners Name: Mc Dowell + HERITAS Trust

Local Auth. Consent No. 080258

Site Address: 685, DEPT RD

Prime Job No. 200815000

Officer: LEE BITHAM

To the Owner / Agent / Occupier / Contractor

How Notified

☒ Notified Direct ☐ Left on Site ☐ Faxed

Please take note that on the 18 / 3 / 10 at 1-15 am/pm this site was inspected pursuant to Building Act 2004

Inspection Type: MHB

Project Description: DWS ATT GARAGE

Inspection Notes: PASSED ITEMS

40mm Cavity maintained ✓

Ties @ Every 2<sup>ND</sup> Course ✓

Wool Hous Formed ✓

Cavity Close ✓

Flashing to openings ✓

Blue Band Fitted ✓

\* LINTOLS OVER SMALL WINDOWS TO BE THERE @ WRAP .

All work as per consent documents ☒ Yes ☐ No

Amendments required ☐ Yes ☒ No

Reinspection Required ☐ Yes ☒ No

Signature





66579

**NOTICE OF INSPECTION**

Section 90 Building Act 2004

Owners Name: McDonnell  
Site Address: 685 Depot Rd  
Oxford

Local Auth. Consent No. 080258  
Prime Job No. 200815000  
Officer: Kerry Walsh  
0274538142

To the Owner / Agent / Occupier Contractor

## How Notified

☒ Notified Direct ☒ Left on Site ☐ Faxed

Please take note that on the 11/02/08 at 10.16 am/pm this site was inspected pursuant to Building Act 2004

Inspection Type: Wrap

Project Description: New dwelling

Inspection Notes: - 2 x Gslair now braced  
- shed to top plate type c's complete  
- 2 nails to fly rafters in place

wrap.

- texture bldg wrap  
- alupand installed with orange corner  
- gable end has air rated rate

side instruction

- install blue banding or similar  
- install addition wrap to gge door reveal  
side where short.

All work as per consent documents ☐ Yes ☒ No  
Amendments required ☐ Yes ☒ No  
Reinspection Required ☐ Yes ☒ No

Signature UW

**PRIME BUILDING COMPLIANCE LTD**

211 High Street, PO Box 387 Rangiora Tel: (03) 311-8240 Fax: (03) 313-1645



66158

# NOTICE OF INSPECTION

Section 90 Building Act 2004

Owners Name: McDOWELL + HERITAS Trust Local Auth. Consent No. 080258Site Address: 685, DEPOT RD Prime Job No. 200815000Officer: LEE BITHAMTo the Owner / Agent / Occupier / Contractor

How Notified

☒ Notified Direct ☐ Left on Site ☐ FaxedPlease take note that on the 5 / 12 / 08 at      am/pm this site was inspected pursuant to Building Act 2004Inspection Type: Pre- RoofProject Description: DWS ATT GARAGEInspection Notes: Passed Items

90 x 45 D-Frame - D-P-C UNDER Bottom Plank ✓

~~SLAB~~ L050 MULCHER ✓

CT. STRAPS FITTED ✓

JOIST HANGERS NAILED OFF ✓

HOLD DOWN PLANKS SUPPLIED ✓

LINCOLN STRAPS FITTED ✓

M3 UNION BOLTS FITTED ✓

PURVIS NAILING / SCREW FIXING AS REQUIRED ✓

SITE INSTRUCTIONS - COMPLETE FOR WRAP INSPECTION

✓ 2x 55L BRACKS TO BE CHANG ✓

STRAP BRACKS (ANSWER OUTSIDE BRACKS)

✓ STUD/TOP PLANK C' TRIP TO COMPLETE

TO INSIDE FACE.

\* NOTE - CHIMNEY BEING BRACK

BY 4x 90x45 - NOT FIB - OK.

All work as per consent documents ☒ Yes ☐ NoAmendments required ☐ Yes ☒ NoReinspection Required ☐ Yes ☒ No

Signature

PRIME BUILDING COMPLIANCE LTD

211 High Street, PO Box 387 Rangiora Tel: (03) 311-8240 Fax: (03) 313-1645





65392

# NOTICE OF INSPECTION

Section 90 Building Act 2004

Owners Name: Mc Dowell

Local Auth. Consent No. 080258

Site Address: 685, Depot Rd

Prime Job No. 200815000

Officer: LEE BISHOP

To the Owner / Agent / Occupier Contractor

How Notified

☒ Notified Direct ☐ Left on Site ☐ Faxed

Please take note that on the 6 / 11 / 08 at 1-20 am/pm this site was inspected pursuant to Building Act 2004

Inspection Type: PRE-Pour slab

Project Description: DWS ATT GARAGE

Inspection Notes:

Block Pout D.P.M Laid ✓  
Wastes Taped @ D.P.M - Falls As Road ✓  
100mm Thick slab ✓

OK To Pour ✓

All work as per consent documents ☒ Yes ☐ No  
Amendments required ☐ Yes ☒ No  
Reinspection Required ☐ Yes ☒ No

Signature [Signature]



64204

**NOTICE OF INSPECTION**

Section 90 Building Act 2004

Owners Name: Mc DowallLocal Auth. Consent No. 080258Site Address: 685, Depot RdPrime Job No. 200815000Officer: LEE BITHAMTo the Owner / Agent / Occupier / Contractor

How Notified

☒ Notified Direct ☐ Left on Site ☐ FaxedPlease take note that on the 3 / 10 / 08 at 11:30 am this site was inspected pursuant to Building Act 2004Inspection Type: Pre-Pour SLABProject Description: DWS ATT GARAGE

Inspection Notes:

PART ONLYGARAGE SUB + SW CORNERTAILINGS LNDBLACK POLY D.P.M LND100mm THICK SUBOK TO POURAll work as per consent documents ☒ Yes ☐ NoAmendments required ☐ Yes ☒ NoReinspection Required ☐ Yes ☒ NoSignature **PRIME BUILDING COMPLIANCE LTD**

211 High Street, PO Box 387 Rangiora Tel: (03) 311-8240 Fax: (03) 313-1645



63420

# NOTICE OF INSPECTION

Section 90 Building Act 2004

Owners Name: MCDOWELLLocal Auth. Consent No. 080258Site Address: 685 DEPOT RDPrime Job No. 200815000Officer: LEE BITMAN

## How Notified

☒ Notified Direct ☐ Left on Site ☐ FaxedTo the Owner / Agent / Occupier ContractorPlease take note that on the 22 / 9 / 08 at 9 am/pm this site was inspected pursuant to Building Act 2004Inspection Type: PRE - Pour FoundationProject Description: DWS ATT GARAGE

Inspection Notes:

Site as Plans  
TRENCH TO SOLID  
3x 12" DIA with 16 STARTERS @ 600  
2x 12" DIA with 16 STARTERS @ 600 to VIBRATOR ARMS

\* SITE INSTRUCTIONS

\* SCALES OFF VEGETATION

\* COMPLETE WASTE 1st ROWS

All work as per consent documents ☒ Yes ☐ No  
Amendments required ☐ Yes ☒ No  
Reinspection Required ☐ Yes ☒ No

Signature

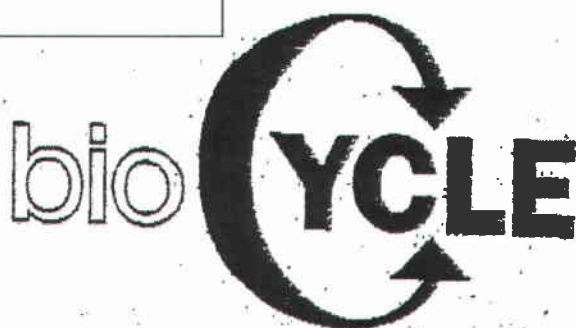
PRIME BUILDING COMPLIANCE LTD

211 High Street, PO Box 387 Rangiora Tel: (03) 311-8240 Fax: (03) 313-1645





110328010723/  
2154012711



WASTE WATER  
TREATMENT SYSTEMS

Resource Consent No. CKL 083093 (Date)  
Building Consent No. \_\_\_\_\_ (Local Authority)

### PRODUCER STATEMENT - DESIGN

Issued by: K & T Drainage (Contractor)  
To: Biocycle South Ltd (Owner/Designer)

In Respect of On-site Sewage Disposal System

At 685 Deloit Rd (Address)  
OXFORD

Lot 8 DP: 59418

I: K & T Drainage being contracted to: David Lee Construction  
(Contractor) (Owner/Builder)

To construct the on-site disposal system as designed by BIOCYCLE SOUTH LTD.

I Gordon Kinnear (Authorised Agent)

Authorised agent of K & T Drainage (Contractor)

Have installed Effluent Disposal System as designed by BIOCYCLE SOUTH LTD.

Signed: [Signature] (Authorised Agent) dt: 28-3-11

On behalf of

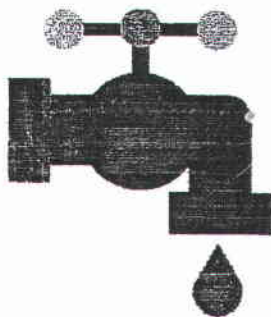
K & T Drainage (Contractor)

P.O. Box 20126 (Address)

BIRAPPALE CH CH



# PRODUCER STATEMENT PIPEWORK TESTING



Please complete and return to:

Prime Building Compliance

PO Box 387

Rangiora

Email: [info@primebc.co.nz](mailto:info@primebc.co.nz)

Fax: 03 313 1645

Building Consent Number:	BC 080 258
Issued by: (Registered Craftsman Plumber)	Brian Savin
For: (Owner)	McDowell + Heritage Trust Company Ltd.

In respect of the testing of water pipe work prior to concealment.

At: (address)	685 Depot Road, Oxford
------------------	------------------------

I hereby state that I have personally tested the water pipe work installed in the building authorised under this Building Consent by the method indicated hereunder.

- ☒ By pressurising the pipe work to 1500 kpa for a period of not less than 15 minutes for the hot and cold water supply and checking to see there are no leaks. (NZBC G12/AS1 7.5.1 (a), (b).)
- ☐ By pressurising the upvc pipe work to 1.5 times the maximum working pressure for a period of not less than 15 minutes and checking that there are no leaks. (NZBC G12/AS1 7.5.2, NZS 7643). Max working pressure was .....
- ☐ By pressurising the pipe work to 1500 kpa for a period of not less than 5 minutes and checking to see there are no leaks. (NZBC G12 VM1, AS3500:Part 1.2 1998)

And believe on reasonable grounds that the pipe work has passed that test.

- ☒ All work complies with the NZBC

I also understand that Prime Building Compliance in accepting this producer statement will be relying on it to issue the Code Compliance Certificate at the completion of the building work.

Signature of Craftsman Plumber:	B Savin
Date:	14-7-01
Craftsman Registration:	03302
Company Name:	Action Plumbing, Gas, Drainage Ltd



Safety • Competency

# Electrical Certificate of Compliance

No. 3246117

for a low voltage installation if prescribed electrical work has been done on any part of it and the prescribed electrical work involved placing, replacing, or repositioning conductors or fittings attached to conductors.

No. of attachments

To be completed whether or not an inspection is required.

## CUSTOMER INFORMATION - PLEASE PRINT CLEARLY

Name of customer Buildbest Construction Ltd Phone: 312 3452

Address of installation Lot 8 685 Depot Rd Oxford

Postal address of customer (if not as above) 685 Depot Rd Oxford

## DECLARATION OF CONFORMITY (Please tick (✓) appropriate boxes)

In accordance with Regulation 58 of the Electricity (Safety) Regulations 2010, the design of the installation or part of the installation to which this certificate applies

- (a) complies with either Part 2 of AS/NZS 3000:2007 ☒ or Part 1 of AS/NZS3000:2007 and Regulation 59 ☐ and  
 (b) the supply system of the installation or part of the installation to which this certificate applies is  
 230V/400 V MEN ☒ or attached other system ☐

## WORK DETAILS

29 No. of lighting outlets

1

No. of ranges

30 No. of socket outlets

2

No. of water heaters

Please tick (✓) as appropriate where work includes:

☒ Mains☒ Main earthing system

Was any installation work carried out by the homeowner?

Yes ☒ No☒ MEN Switchboard☐ Electric lines

Description of work carried out (If necessary attach any pages with work done) Rewire &amp; fit out house to above

number of outlets, wire for septic to rear, 1x main H/W/C & 1x underbench cylinder in kitchen.  
 master b/m has 4 sockets & 2 lights, 2nd & 3rd 3x outlets & 1x light each, each bathroom has an in shower  
 fan/light, & socket to wall. Kitchen has, Hob/oven, m/w, fridge & island power. MEN Board connected  
 c/w 1 phase 150, 2x R.C.D.s + m.c.B.s. stripped mains in meterbox, mains installed by main power

## CERTIFICATION OF WORK (Please tick (✓) appropriate boxes)

I certify that the completed installation or part of the installation to which this certificate applies

- ☒ has been installed in accordance with the design detailed in the Declaration of Conformity section above  
☒ has had tests which are required by the Electricity (Safety) Regulations 2010 satisfactorily completed  
☒ has an earthing system that is correctly rated  
☒ contains fittings which are safe to connect to a power supply  
☐ is safe to connect to a power supply

Fault Current 461 Earth loop Impedance 0.362

## ELECTRICAL WORKER DETAILS

Name Dale Atkins

Registration No. E16605

Company Atkins Electrical Ltd

Contact Ph No. 027 694 7955

Signature D Atkins

Date 30-9-10

## INSPECTION DETAILS

Electrical work requiring inspection by a registered electrical inspector

☒ Mains work (mains, MEN switchboards closest to the point of supply, or main earthing systems)☐ Attached other☐ Work carried out in accordance with Part 1 of AS/NZS 3000:2007

I certify that the items identified above are electrically safe and that the inspection has been carried out in accordance with the Electricity (Safety) Regulations 2010.

Name Peter Koppell

Registration No. T291 509

Signature P Koppell

Date 8/10/2010

Contact Ph No.

110824037775  
RC085104  
2154012711

24 AUG 2011

080258

24 August 2011

Buildbest Construction  
685 Depot Road  
RD 1  
Oxford 7495

Dear Sir/Madam

**COMPLIANCE MONITORING REPORT**  
**Resource Management Act 1991**

The attached monitoring report is a summary of your permitted activity, and compliance with the conditions. Please take time to read this report carefully.

**CANTERBURY REGIONAL COUNCIL OBLIGATIONS**

Under Section 35 of the Resource Management Act 1991, the Canterbury Regional Council has a duty to monitor all permitted activity exercised within its region, to make sure all the conditions are being complied with.

**MONITORING FREQUENCY**

The frequency with which your activity is monitored will vary according to the type of activity your activity authorises, the conditions imposed and the extent to which you have complied with these conditions on previous visits. **If you fully comply with all conditions then frequency will reduce to the minimum set for the activity.**

**COSTS**

It is the Council's policy to recover all actual and reasonable costs of compliance monitoring of resource consents. Depending on the costs incurred in monitoring your consent, which we will endeavour to keep to a minimum at all times, you may be invoiced either quarterly, six-monthly or annually, the latter occurring after 30 June each year.

If you would like any further information regarding this report, please contact the undersigned.

Yours sincerely



Daniel Webster

**File No:** WWPA042080  
**Consent No:** CRC083093



**CONSENT NO.** CRC083093**Description of Consent:** Discharge of domestic wastewater to ground.**Location:** 685 Depot Road, OXFORD**Notice Accepted:** 23 Feb 2008**CONDITIONS & COMPLIANCE:****GENERAL COMMENTS:**

A certificate of completion was received from Biocycle Wastewater Treatment Systems on 31 March 2011. Based on the information supplied in that statement, the system was constructed in accordance with the requirements of this resource consent.

No site visit was carried out by Regional Council staff.

Please ensure that maintenance of the wastewater treatment system is carried out and copies of the reports from these maintenance visits are kept by the consent holder.

**Date Inspected:** 11 July 2011**Monitored By:** Daniel Webster**Signature:** 



WAIMAKARIRI  
DISTRICT COUNCIL

Building Unit  
PO Box 387  
Rangiora

Phone: (03) 311 8240  
Fax: (03) 313 1645  
Email: buildinginfo@wmk.govt.nz

## SOLID/LIQUID FUEL HEATING APPLIANCE For Installer to Complete

NB: Leave on Site for Building Inspector

Consent Number: 080258

Site Address: 685 Depot Road RD1 Oxbld

Free standing ☒ Inbuilt ☐ Wet back ☐

Make of SFB Yucca Model of SFB Weg 2020 Make of Flue Yucca Flue Kit

Tick as Appropriate:	Yes	No	N/A
Is the SFB and Flue as per the building consent	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chimney Cleaned	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fireplace surround/chimney face junction sealed with a heat resistant material	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
The flue pipe is constructed of austenitic stainless steel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seismic Restraint fitted	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flue sections are secured together with Stainless Steel Rivets	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Flue is secured to the heating unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The chimney void has been vented at the top	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Flue and appliance clearances have been achieved in terms of the manufacturers instructions and AS/NZS 2918:2001	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flue Joints sealed in Accordance with Manufactures Instructions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire Safety Valve connected and working correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If you have answered "no" to any items please comment:

If wetback is fitted, name the craftsman plumber who carried out the work:

Name: \_\_\_\_\_ Registration No: \_\_\_\_\_

I Murray McDowell (print name) certify that the above specified installation has been carried out as described and in accordance with the manufacturers installation instructions and the current building code requirements.

Installers Signature: \_\_\_\_\_ Date: 9/2/11

Address: 685 Depot Road RD1 Oxbld Waimakariri

Phone: 03 3123452 Fax: 03 3123452

# Vetting - Habitable Buildings

Provided	Further info needed
<input type="checkbox"/>	<input type="checkbox"/>

BC: <u>070758</u>
NAME: <u>McDowell</u>

**PIM** TO FOLLOW

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Zones (wind, earthquake, snow, corrosion) |
| <input type="checkbox"/> | <input type="checkbox"/> | Fire, Heritage                            |
| <input type="checkbox"/> | <input type="checkbox"/> | Resource consent application / approval   |
| <input type="checkbox"/> | <input type="checkbox"/> | Easements, restrictions                   |
| <input type="checkbox"/> | <input type="checkbox"/> | Warnings                                  |
| <input type="checkbox"/> | <input type="checkbox"/> | Requirements                              |

## DOCUMENTS

- |                                     |                          |   |
|-------------------------------------|--------------------------|---|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Application form, contact info                          |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Value, key personnel                                    |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Agent authorisation form                                |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | NZBC Schedule of Compliance                             |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Specifications  |
| <input type="checkbox"/>            | <input type="checkbox"/> | CT or S&P agreement                                     |
| <input type="checkbox"/>            | <input type="checkbox"/> | Specific design producer statements                     |
| <input type="checkbox"/>            | <input type="checkbox"/> | Bearing capacity report                                 |
| <input type="checkbox"/>            | <input type="checkbox"/> | Engineers reports, PS1, calcs, B1, B2, inspections, PS4 |
| <input type="checkbox"/>            | <input type="checkbox"/> | Surveyors, architects inspections                       |
| <input type="checkbox"/>            | <input type="checkbox"/> | Fire design summary                                     |
| <input type="checkbox"/>            | <input type="checkbox"/> | Disabled access and facilities                          |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Weather-tightness risk matrix                           |
| <input type="checkbox"/>            | <input type="checkbox"/> | Structural report on existing dwelling                  |
| <input type="checkbox"/>            | <input type="checkbox"/> | Alternative solution                                    |

## SITE PLAN

1:200 (1:500, 1:1000)

- |                                     |                          |  |
|-------------------------------------|--------------------------|--|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | North arrow  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Property boundary location and dimensions; fire wall |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Spot levels / datum for sloping sections             |
| <input type="checkbox"/>            | <input type="checkbox"/> | Vehicle access and parking                           |
| <input type="checkbox"/>            | <input type="checkbox"/> | Swimming / spa pool                                  |

Provided	Further info needed
<input type="checkbox"/>	<input type="checkbox"/>

## FOUNDATION / SLAB

1:100 (1:50)

- |                                     |                          |  |
|-------------------------------------|--------------------------|--|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Footing size, reinforcing, elements            |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Pile type, size, treatment, fixing, post holes |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Pile layout, anchor pile location.             |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Slab thickenings - 2 Story Dwellings           |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Slab cutting layout                            |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Supplementary steel                            |

## GROUND FLOOR PLAN

1:100, 1:50

- |                                     |                          |  |
|-------------------------------------|--------------------------|--|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Wall, door, window location and dimensions |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Light and ventilation, cantilever lintels  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Sanitary fixture / waste layout            |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Smoke alarm location                       |
| <input type="checkbox"/>            | <input type="checkbox"/> | Tanking system installation instructions   |

## UPPER FLOOR PLAN

1:100, 1:50

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Floor joist layout                              |
| <input type="checkbox"/> | <input type="checkbox"/> | Sanitary fixture / waste layout                 |
| <input type="checkbox"/> | <input type="checkbox"/> | Shower cubicle or tiled (waterproof membrane)   |
| <input type="checkbox"/> | <input type="checkbox"/> | Smoke alarm / escape route                      |
| <input type="checkbox"/> | <input type="checkbox"/> | Stair design, handrail, balustrades             |
| <input type="checkbox"/> | <input type="checkbox"/> | Deck details, step-down, barrier, tanking       |
| <input type="checkbox"/> | <input type="checkbox"/> | Roof plan, cladding, pitch, underlay, flashings |

## ELEVATIONS

1:100, 1:50

- |                                     |                          |   |
|-------------------------------------|--------------------------|---|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Exterior wall and roof cladding, roof pitch |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Opening windows marked                      |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Meterbox location                           |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Valley (change of direction)                |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Cladding control joints (if required)       |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Vermin Proofing                             |

Provided	Further info needed
<input type="checkbox"/>	<input type="checkbox"/>

## SECTIONS

1:50

- |                                     |                                     |   |     |     |     |
|-------------------------------------|-------------------------------------|---|-----|-----|-----|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Foundation size, reinforcing                            | FGL | FFL | DPM |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Stud height, timber treatment                           |     |     |     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Insulation to floor, wall R: ceiling R: H1 compliance   |     |     |     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Fire rating systems (fire walls)                        |     |     |     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Posts, lintels, beams, porches, verandas, garage lintel |     |     |     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Pool fence details and plan                             |     |     |     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Post fixing details                                     |     |     |     |

## CLADDING DETAILS

1:100, 1:50

- |                                     |                                     |   |
|-------------------------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Flashings to openings                                     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Meterbox flashings  |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Roof flashing details                                     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Specific weather-tightness (parapet, balconies, chimneys) |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Manufacturer's specs and details; Appraisal certificates  |

## BRACING

- |                                     |                                     |                                      |
|-------------------------------------|-------------------------------------|--------------------------------------|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Zones (wind, earthquake, snow)       |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Calculations, plan                   |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Sub-floor, wall, roof plane, ceiling |

## TRUSS

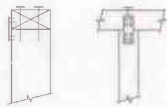
- |                                     |                                     |   |
|-------------------------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Design certificate / PS / Layout                |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Lintel and beam sizes                           |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Point and UDL loads on floors                   |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Fixings, (Truss end, purlin, lintel, top plate) |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Framed Roof/Skillion/Cove                       |

## PLUMBING

- |                                     |                                     |  |
|-------------------------------------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | G12 (NZBC)   |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Distance between hot water heater and kitchen taps |

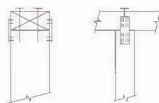


**FIXING TYPE B**  
1.7kN



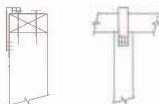
2/90x3.33 plain steel wire  
nails driven vertically into  
stud, plus single TYLOK  
2T4 plate.

**FIXING TYPE C**  
2.7kN

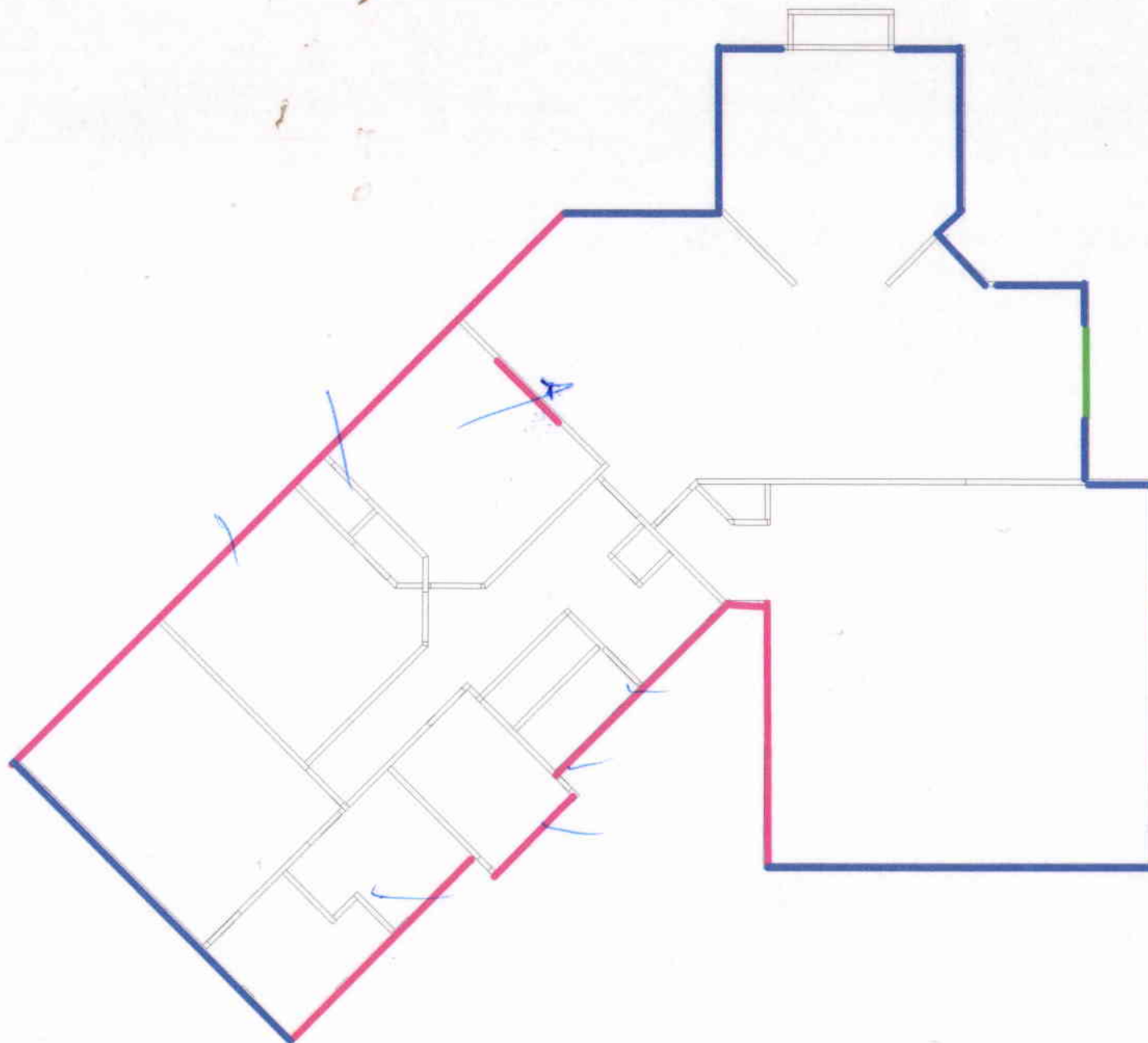


2/90x3.33 plain steel wire  
nails driven vertically into  
stud, plus pair TYLOK  
2T4 plates.

**FIXING TYPE D**  
6.0kN



2/90x3.33 plain steel wire nails  
driven vertically into stud, plus  
Lumberlok Stud Strap.



Mainland Prenail  
16 Yukon Pl  
Hornby  
Christchurch  
Ph 03 349 4354

Job Title :

**Bestbuild Ltd**

Sheet Title :

**Stud to Top Plate Fixing**

PrimeCAD V4.3

Drawing Number :

**MP71101**

Date : 20-5-08

Designed RC

Checked :

Scale : NTS

Drawn RC

Certified :

Sheet :

1/1

080258

**GIB® Wall Bracing Calculation Sheet A**

single storey

V85A

GIB® EzyBrace™

GIB® Bracing Systems, 2006

**Job Details**

Name Buildbest Construction Limited  
 Street and Number 685 Depot Road  
 Lot and DP Number Lot 8 part of Lot 2 DP 59418  
 City/Town/District Oxford  
 Designer and date M D McDowell 12-Feb-08  
 Company Name Buildbest Construction

**Building Specification**

Location of Storey	single	▲▼
Floor Loading	2 kPa	▲▼
Foundation Type	slab	▲▼
Building Height to Apex (m)	5	▲▼
Roof Height above Eaves (m)	3	▲▼
Stud Height (m)	2.4	▲▼
Cladding Weight (top or single)	heavy	▲▼
Cladding Weight (lower)	heavy	▲▼
Cladding Weight (subfloor)	heavy	▲▼
Roof Weight	light	▲▼
Roof Pitch (degrees)	0-25	▲▼
Room in Roof Space	no	▲▼
Building Length (m)	19.4	
Building Width (m)	13.4	
Gross Building Plan Area (m2)	172	

eaves 2 m or less from ground  
 not a valid building scope

not applicable (single storey building)  
 not applicable (slab)

**Building Location**

Wind Zone	High	
Region	R1	▲▼
Terrain	Inland	▲▼
Exposure	Exposed	▲▼
Topography	Moderate	▲▼

**Earthquake Zone**

B ▲▼

**Bracing Units required for Wind**

per m	subfloor	walls
W along	n/a	78 BUs/m
W across	n/a	78 BUs/m
<b>Totals</b>	<b>subfloor</b>	<b>walls</b>
W along	n/a	1045 BUs
W across	n/a	1513 BUs

**Bracing Units required for Earthquake**

per m2	subfloor	walls
E	n/a	3.9 BUs/m2
<b>Totals</b>	<b>subfloor</b>	<b>walls</b>
E along	n/a	671 BUs
E across	n/a	671 BUs

©Winstone Wallboards Limited, 1999-2006. All rights reserved.

080258

SUPERSEDED



080258

**GIB® Wall Bracing Calculation Sheet B**

single storey

V85A

GIB® EzyBrace™

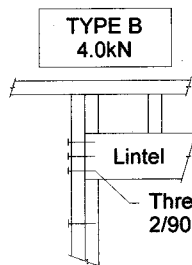
GIB® Bracing Systems, 2006

Along								Wind	Earthq.
Wall or Bracing Line		Bracing Elements provided						9W	10EQ
1	2	3	4	5	7	8	6		
Line Label	Minimum BUs Req/Ach	Bracing Element No.	Supplier	Bracing Type	Element Length L (m)	Element Height H (m)	Angle to Bracing line (degrees)	BUs Achieved	BUs Achieved
<b>A</b>	enter	1							
		2							
line totals		3	GIB®	GS1a	2.7	2.4		203	176
W	285	4	GIB®	GS1a	1.8	2.4	45	83	70
EQ	246	5							
<b>B</b>	enter	1							
		2	GIB®	GS2	2.8	2.4		252	224
line totals		3							
W	335	4	GIB®	GS1a	1.8	2.4	45	83	70
EQ	294	5							
<b>C</b>	enter	1	GIB®	GS1a	1.8	2.4		117	99
		2							
line totals		3							
W	200	4	GIB®	GS1a	1.8	2.4	45	83	70
EQ	169	5							
<b>D</b>	enter	1							
		2							
line totals		3	GIB®	GS1a	1.8	2.4		117	99
W	244	4							
EQ	209	5	GIB®	GS1a	2.4	2.4	45	127	110
<b>E</b>	enter	1	GIB®	GS1a	2.7	2.4	45	143	124
		2							
line totals		3							
W	143	4							
EQ	124	5							
<b>F</b>	enter	1	GIB®	GS1a	3.6	2.4	45	191	165
		2	GIB®	BL1	0.9	2.4	45	80	73
line totals		3							
W	270	4							
EQ	239	5							
<b>G</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>H</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
								Wind	Earthq.
Totals Achieved								1478	1281
								OK	OK
Totals Required (from Sheet A)								1045	671



Totals Required (from Sheet A)						1513	671
--------------------------------	--	--	--	--	--	------	-----

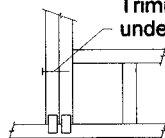
SUPERSEDED



**TYPE B**  
4.0kN

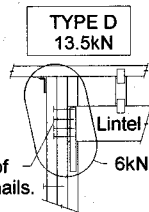
Three rows of  
2/90 x 3.3 nails.

Three sets of  
2/90 x 3.33 nails.  
Trimmer stud to  
understud.



Two TYLOK 2T4s  
one side of stud.

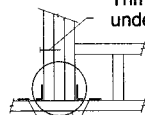
Fixing of jack stud to lintel &  
top plate, as per the top plate  
schedule. All other nailing as  
per NZS 3604:1999 table 8.19.



**TYPE D**  
13.5kN

Four rows of  
2/90 x 3.3 nails.

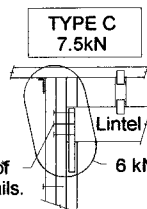
Three sets of  
2/90 x 3.33 nails.  
Trimmer stud to  
understud.



Pair 6kN Stud  
Anchors

Min. M12  
bolts with  
50x50x3  
washer to  
concrete  
floor.

Fixing of jack stud to lintel &  
top plate, as per the top plate  
schedule. All other nailing as  
per NZS 3604:1999 table 8.19.



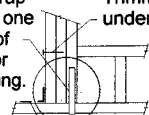
**TYPE C**  
7.5kN

Three rows of  
2/90 x 3.3 nails.

6 kN Stud Anchor

For timber  
floors run  
the strap  
down one  
face of  
joist or  
blocking.

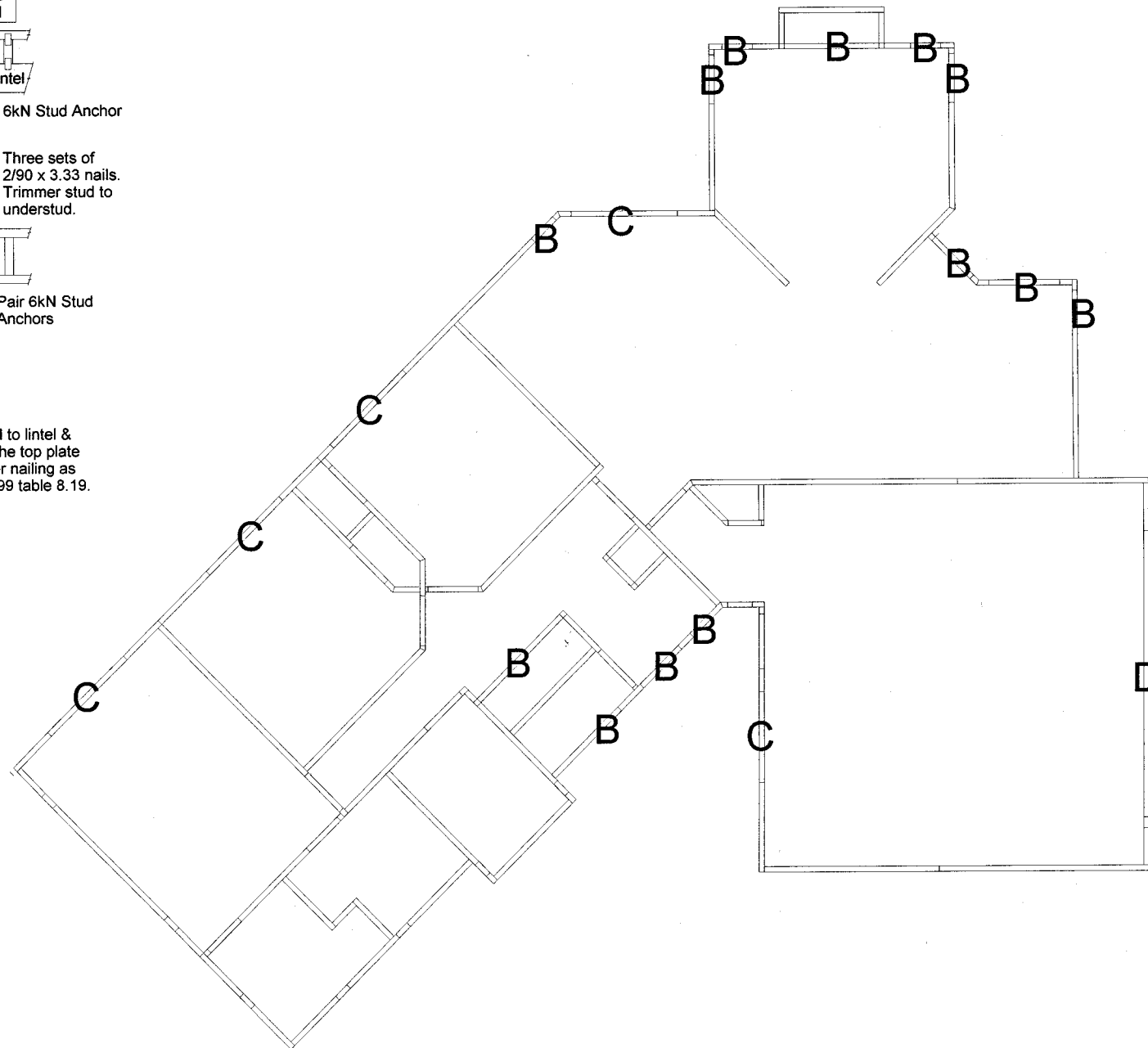
Three sets of  
2/90 x 3.33 nails.  
Trimmer stud to  
understud.



6 kN Stud Anchor

Min. M12  
bolts with  
50x50x3  
washer to  
concrete  
floor.

Fixing of jack stud to lintel &  
top plate, as per the top plate  
schedule. All other nailing as  
per NZS 3604:1999 table 8.19.



Mainland Prenail  
16 Yukon Pl  
Hornby  
Christchurch  
Ph 03 349 4354

Job Title :

**Buildbest Ltd**

Sheet Title :

**Lintel Fixing**

Date : 20-5-08

Designed RC

Checked :

Scale : NTS

Drawn RC

Certified :

PrimeCAD V4.3

Drawing Number :

**MP71101**

Sheet :

1 / 1

**A4**

Date: 13/3/08


Job: McDowell

Job Number: BC 080258

Location: 685 Depot Road, Oxford.

Page No	Issues & Queries	Comments																					
	the PIM is to be issued																						
	<table> <tr> <td>wind</td><td>High</td><td>1</td></tr> <tr> <td>storeys</td><td>Low</td><td>0</td></tr> <tr> <td>Roof/wall</td><td>High</td><td>3</td></tr> <tr> <td>Eaves</td><td>Medium</td><td>1</td></tr> <tr> <td>Envelope</td><td>Medium</td><td>1</td></tr> <tr> <td>Deck</td><td>Low</td><td>0</td></tr> <tr> <td></td><td>total</td><td>6</td></tr> </table>	wind	High	1	storeys	Low	0	Roof/wall	High	3	Eaves	Medium	1	Envelope	Medium	1	Deck	Low	0		total	6	
wind	High	1																					
storeys	Low	0																					
Roof/wall	High	3																					
Eaves	Medium	1																					
Envelope	Medium	1																					
Deck	Low	0																					
	total	6																					
	vert Corr & Brick Veneer OK.																						
	<p>The floor heights shown on the details aren't consistent. These need to be drawn and dimensioned specifically for this site.</p> <p>For the garage floor detail to be correct the main house floor level will need to be a min 250mm above finished ground level.</p>																						
	<p>Concrete floors reinforced with 608 are to have shrinkage control joints @ 3m c/s as they are deemed to be an unreinforced slab in 3604.</p> <p>If 605 mesh is installed the shrinkage control joints can remain as drawn.</p>																						

These pages must be kept with the file copy.

Consent Officer: 

Date: \_\_\_\_\_



# Memo Pad

PRIME BUILDING COMPLIANCE LTD 211 High Street PO Box 387 Rangiora  
Tel: (03) 311 8240 Fax: (03) 313 1645 www.primebc.co.nz

Date: 13/3/08

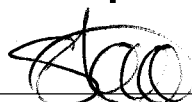
Job: McDowell

Job Number: BC 080258

Location: 685 Depot Road, Oxford.

Page No	Issues & Queries	Comments
	It is assumed that the reference to lintel sizes (190x45 solid 2) means the lintel is made up from <del>two</del> <sup>two</sup> pieces of timber to have a 90mm wide lintel. Please clarify.	
	Indicate the type of cladding over W23 & 24. If brick specify brick lintel sizes	
	The bracing calculations need to reflect the use in both materials and shape factors the bracing may have to be calculated as two separate wings.	
	Partin fixing details are required	
	Roof space access to be indicated	
	Specify the surface finish to the terrace at the entry to the house.	
	Window & door sill supports to be specified.	
	Indicate safety glass to all bathroom windows in schedule.	

These pages must be kept with the file copy.

Consent Officer: 

Date: \_\_\_\_\_



# Processing Check Sheet

## Dwelling

Applicants Name: McDowell & Heritage Trust.

Date: <u>13/3/08</u>		BC No. <u>080258</u>		Means of Compliance and Comments
Clause	N/A	Compliant	Required	
<b>Documentation</b>				
**Producer statement meets criteria	-			
PIM Issues			X	not yet issued
Specs Site Specific		✓		
Plans Site Specific		✓		
Risk Matrix		✓		score 6. claddings ok.
Schedule of Compliance	-			
A1 Classified Use		✓		Residential Dwelling
<b>B1 Structure</b>				
**Producer statement meets criteria	-			
Foundations		✓		as per 3604
Slab		✓		thickness 150mm
Slab Thickenings (see truss design)		✓		step in garage floor
Point Loads	-			
Mesh			X	668 means unreinforced
Steel & Sizing		✓		as per 3604
Slab Corner Steel	-			
Saw Cuts			X	need to reflect mesh used.
Piles (including bracing)	-			
Bearers	-			
Floor Joists	-			
Load Bearing Walls	-			
Proprietary Beams/Hyspan I Beams Hybeam etc.	-			
Fixing Guide	-			
Stud Centres GL		✓		100x50 @ 600cs
Long Studs - Over Size	-			
Dimensioned		✓		
Bracing of Over Size Studs	-			
Lintels			X	190x45 solid 12?
Brick Lintels			X	include type of cladding over w23 & 24
Shelf Angles (timber treatment)	-			
Brace Calculations			X	to be recalculated
Brace Distribution / Locations on plan			X	"
Diaphragm Bracing as per NZ 3604			X	"
Cladding (type) refer E2		✓		Brick & Cor Color steel
NZS3604 Support Beams	-			
Trusses		✓		truss plan & PS provided
Truss Point Loads	-			
Roof Fixings			X	Detail fixing details required
Roof Framing - Truss/Rafters		✓		Plan provided
Roof Bracing		✓		Plan provided
Roof Space Access			X	to be indicated



Date:				BC No.
Clause	N/A	Compliant	Required	Means of Compliance and Comments
Chimney Construction		✓		timber framed fake chimney
Solid Fuel Heater location		✓		on floor plate
Durability		✓		new fence line
Calculations	✓			
<b>B2 Durability</b>				
**Producer statement meets criteria	✓			
Durability Evaluation	✓			
Durability Applications	✓			
Flashings behind shelf angles	✓			
Generic Materials		✓		Brick Colorsteel
Timber Treatments		✓		noted on drawings
<b>C1 Outbreak of Fire</b>				
**Producer statement meets criteria	✓			
Solid Fuel Heater (Heat Transfer to walls)		✓		Being installed to manufacturers requirements
<b>C2 Means of Escape</b>				instructions in spec.
**Producer statement meets criteria	✓			
Escape Path Lengths (24m max)		✓		< 24m
<b>C3 Spread of Fire</b>				
**Producer statement meets criteria	✓			
Distance off boundary (1m)		✓		> 30m
<b>C4 Structural stability during fire</b>				
**Producer statement meets criteria	✓			
<b>D1 Access Routes</b>				
**Producer statement meets criteria	✓			
Slip Resistance			✗	specify terrace finish
Ramps	✓			
<b>D2 Mechanical</b>				
**Producer statement meets criteria	✓			
<b>E1 Surface Water</b>				
**Producer statement meets criteria	✓			
Minimum Floor Levels			✗	incorrect levels on details
Sub Soil Drainage & Discharge	✓			
Tanking	✓			
Down Pipes		✓		as per E1/AS
Gutters (Sizing)		✓		0.5 kPa
Snow Zone		✓		
Flood Zone	✓			
Soak Pit or Other		✓		codes & details on drawings
<b>E2 External</b>				
**Producer statement meets criteria	✓			
Weather Tightness Risk Factors (Floors/Decks/Cellars)	✓			
Cladding Systems		✓		Brick & corr colorsteel
Colour of plaster	✓			
Roofing Systems		✓		corr colorsteel
Window/Door Flashings to opening		✓		details on drawings
Window materials		✓		Alum
Door materials		✓		Alum
Door supports (spans > 1.5m)			✗	to be specified
Light Reflective Value for plaster	✓			
Building Wrap (gable end)	✓			
Penetrations		✓		details on drawings
Kick-out Flashings	✓			
Meter boxes Flashings / Location		✓		details on drawings
Roof Internal Gutters	✓			

Entry Roof Flashings	-			
Roof penetrations		✓		detailed on drawing
Roof / Wall Junction Flashings	-			
Flue		✓		- "
Chimney		✓		- "
<b>E3 Internal Moisture</b>				
**Producer statement meets criteria	-			
Prevention of Fungal Growth		✓		house heated & ventilated.
Overflow between units	-			
Water Splash		✓		aqueous
Wet Area Shower	-			Shower cubicles
<b>F1 Existing Hazardous agents within site</b>				
**Producer statement meets criteria	-			
<b>F2 Hazardous Building Materials</b>				
**Producer statement meets criteria	-			
Glazing/Asbestos			X	Bed bathroom windows to have SG.
<b>F3 Hazardous Substances</b>				
**Producer statement meets criteria	-			
<b>F4 Safety from Falls</b>				
Opening Windows (760mm inside, 1.0m outside)	-			
Barriers	-			
<b>F5 Construction and Demolition hazard onsite</b>				
**Producer statement meets criteria	-			
<b>F6 Emergency Lighting</b>				
**Producer statement meets criteria	-			
<b>F7 Warning Systems</b>				
**Producer statement meets criteria	-			
Location of smoke alarms		✓		adjacent to beds & on escape routes
<b>F8 Exit Signs</b>				
**Producer statement meets criteria	-			
<b>G1 Personal Hygiene</b>				
**Producer statement meets criteria	-			
Number of Sanitary Fixtures		✓		as per G13
Location		✓		
<b>G2 Laundering</b>				
**Producer statement meets criteria	-			
Laundering Facilities		✓		Tub included
<b>G3 Food Preparation and Prevention of Contamination</b>				
**Producer statement meets criteria	-			
Appliances & Facilities		✓		Kitchen layout provided.
<b>G4 Ventilation</b>				
Producer statement meets criteria	-			
Ventilation		✓		opening windows > 5% room floor area
Ventilation Rate		✓		- "
<b>G5 Interior Environment</b>				
**Producer statement meets criteria	-			
Temperature Control & Space		✓		solid fuel heater
<b>G6 Airborne...</b>				
**Producer statement meets criteria	-			
<b>G7 Natural Light</b>				
**Producer statement meets criteria	-			
Vertical Window in External Walls		✓		windows > 10% room floor area
Awareness of Outside Environment		✓		- "
Light Reflective Value	-			
Colour Schemes	-			

Date:		BC No.		
Clause	N/A	Compliant	Required	Means of Compliance and Comments
***"Producer statement meets criteria" checks must record the authors name and authors number if applicable. The Producer statement must be signed and dated by the processor.				
<b>G8 Artificial Light</b>				
**Producer statement meets criteria	—			
Illuminance		✓		Electrical Plan provided.
<b>G9 Electricity</b>				
**Producer statement meets criteria	—			
Electrical Installation		✓		noted in spec
<b>G10 Installation Piped Services</b>				
**Producer statement meets criteria	—			
<b>G11 Gas supply system</b>				
**Producer statement meets criteria	—			
<b>G12 Water Supply</b>				
**Producer statement meets criteria	—			
Water Source (town, well, private scheme)		✓		Rural supply scheme.
Hot Water System		✓		
Materials and Installation		✓		
Pressure Pump system (mains, gravity feed with header tank)	—			
<b>G13 Foul Water</b>				
**Producer statement meets criteria	—			
Effluent Disposal		✓		has Reserve Consent
Bedroom Numbers		✓		
EDS Tank Size		✓		
EDS Daily Flow		✓		
Gully Traps		✓		
Pipe Materials		✓		noted in spec
Support & Thermal Movement	—			
Discharge Pipes		✓		detailed on drawings
Vent Pipes			*	Gt a sink requires venting.
Pipe Gradient & Size		✓		
Sanitary Plumbing Layout		✓		
Bedding & Backfill			*	detail required
Drains Under Buildings	—			
<b>G14 Industrial Liquid Waste</b>				
**Producer statement meets criteria	—			
<b>G15 Solid Waste provision</b>				
**Producer statement meets criteria	—			
<b>H1 Energy Efficiency</b>				
**Producer statement meets criteria	—			
Thermal Envelope				Walls R: Ceiling R: Floor R: ALF cels
Hot Water System location and insulation		✓		<12m to sink

#### Attachments

No of Producer Statements attached

No of Memo Sheets attached

Alternative solutions form No

Other

Processing has been completed by: (name)

Steve Arps

Signature:



Date:

14/3/08



12/159 Hardy St  
PO Box 1810  
Nelson 7010  
P. 03 546 8387  
F. 03 546 8087  
M. 027 216 1981  
E. [steve@bcsnelson.co.nz](mailto:steve@bcsnelson.co.nz)

14<sup>th</sup> March 2008

M. McDOWELL HERITAGE TRUST Co Ltd  
C/- BUILDBEST CONSTRUCTION Ltd.  
PO BOX 43  
OXFORD.

Building Consent Application Number: 080258

RESIDENTIAL DWELING WITH ATTACHED GARAGE.

485 DEPOT ROAD. OXFORD.

*Dear Applicant.*

I am currently processing your proposed building consent for compliance with the New Zealand Building Code on behalf of Prime Building Compliance, Rangiora.

I have assessed the documentation provided by you and I require further information and / or clarification as detailed on the attached page/s.

Waimakariri District Council has been notified of this request for further information and your job has been placed on "hold" until you have supplied all relevant information.

Once you have answered all my queries, I can continue processing your application for approval.

If you have any queries please contact me on the above address, or phone / email me.

*Yours faithfully*

Steve Arps  
Building Consent Officer



The one-stop building compliance company

# Validation Check Sheet

Date: 2/4/8

BC No: 080258

Item	✓ / ✗	Comments
Read all notes and letters	✓	
Read PIM notes take special note of wind, earthquake, snow load, and any land hazards.	✓	
Check that any issues coming from the notes & PIM issues have been dealt with.	✓	
Check all documents are correct for name, date, type etc i.e.: Truss layout, producer statements, septic tank and effluent etc.	✓	
Check papers sheet by sheet looking for inconsistencies.	✓	studs. snow straps
<p>Items to be check are but not limited to:</p> <p>Truss layout correct, wind weight etc ✓</p> <p>Siting (fire, easements, drains, tanks) ✓</p> <p>Lintels taking non-uniform loads and cantilevered ✓</p> <p>Site levels and relationship to ✓</p> <p>Flashing design ✗</p> <p>Treatment ✓</p> <p>Air Barriers ✓</p> <p>Plumbing achievable ✓</p> <p>Bracing ✓</p> <ul style="list-style-type: none"> <li>o Roof ✓</li> <li>o <del>Space</del></li> <li>o <del>Ceiling plane</del></li> <li>o Roof plane ✓</li> <li>o Wall ✓</li> <li>o Position ✓</li> <li>o Intersections ✓</li> <li>o Inspections correct <i>changed</i></li> <li>o Conditions correct <i>changed</i></li> <li>o Write up notes and peer review forms ✓</li> </ul>		



M. McDOWELL HERITAGE TRUST Co Ltd  
C/- BUILDBEST CONSTRUCTION Ltd.  
PO BOX 43  
OXFORD.

4 April 2008

WATKINS CONSULTANTS  
P. 03 314 7279

ATTENTION: Mr Brent Watkins.

RE: **Building Consent Application Number: 080258.** RESIDENTIAL DWELING WITH  
ATTACHED GARAGE. 685 DEPOT ROAD. OXFORD.

Dear Sir

Further to our conversation today, the following are the answers to the issues raised in your e-mail yesterday.

1. ✓ The issue of snow straps. As stated I have snow straps referred to and drawn in details on plans 6,10,11,12,and 13.
2. ✓ The fascia junction flashing required at its junction with the chimney is refereed to and drawn in one dimension in detail 6 plan 6. I do not think it is possible to draw an understandable detail showing all of the flashings that meet at this point (of which there are 6). An amount of reliance of tradesman knowledge and their understanding of lapping order combined with a visual analysis of the flashings at the pre-cladding inspection is a more appropriate method of achieving the acceptable solution in this instance. Attached is a plan view of 3 of these flashings.
3. Studs to chimney frame. As discussed the framing will be constructed in two lifts. The first lift up to 2.4m approximately and the second lift to the chimney cap height. The first lift will have 100x50 studs at 400 centres with 100x50 bottom and top plates with top plate complete with 200x40 extra top plate that will return and tie into extra top plates of adjoining walls. The ceiling in the lounge area extends into the chimney area therefore the top plates will tie back into the main ceiling of the house. The second lift will be constructed with 100x50 studs at 400 centres with 100x50 bottom and top plate. Dwangs are to be at 1350 centres maximum in both frames.
- ✓ 4. There will be a dimension change to the northern aspect of the chimney exterior wall. The reference to 1.4m will change to 1.6m. This is to allow the GS1a brace to be accurate to requirements.

I trust this information meets your expectations. If you have any further questions and it is appropriate you can call me on 0274 375275.

Yours faithfully

Murray McDowell

## Brent Watkins

---

**From:** Brent Watkins [brent.watkins@farmside.co.nz]  
**Sent:** Wednesday, 2 April 2008 5:43 p.m.  
**To:** 'buildbest@clear.net.nz'  
**Cc:** 'Roz Greenwood'; 'steve@bcsnelson.co.nz'  
**Subject:** BC 080258 685 Depot road

Hi Murray I have just completed an audit on your building consent for 685 Depot Road on behalf of Prime Building Compliance and have found the follow items that need to be corrected prior to issue of the consent.

You are more than welcome to contact me if you wish to discuss any of these items.

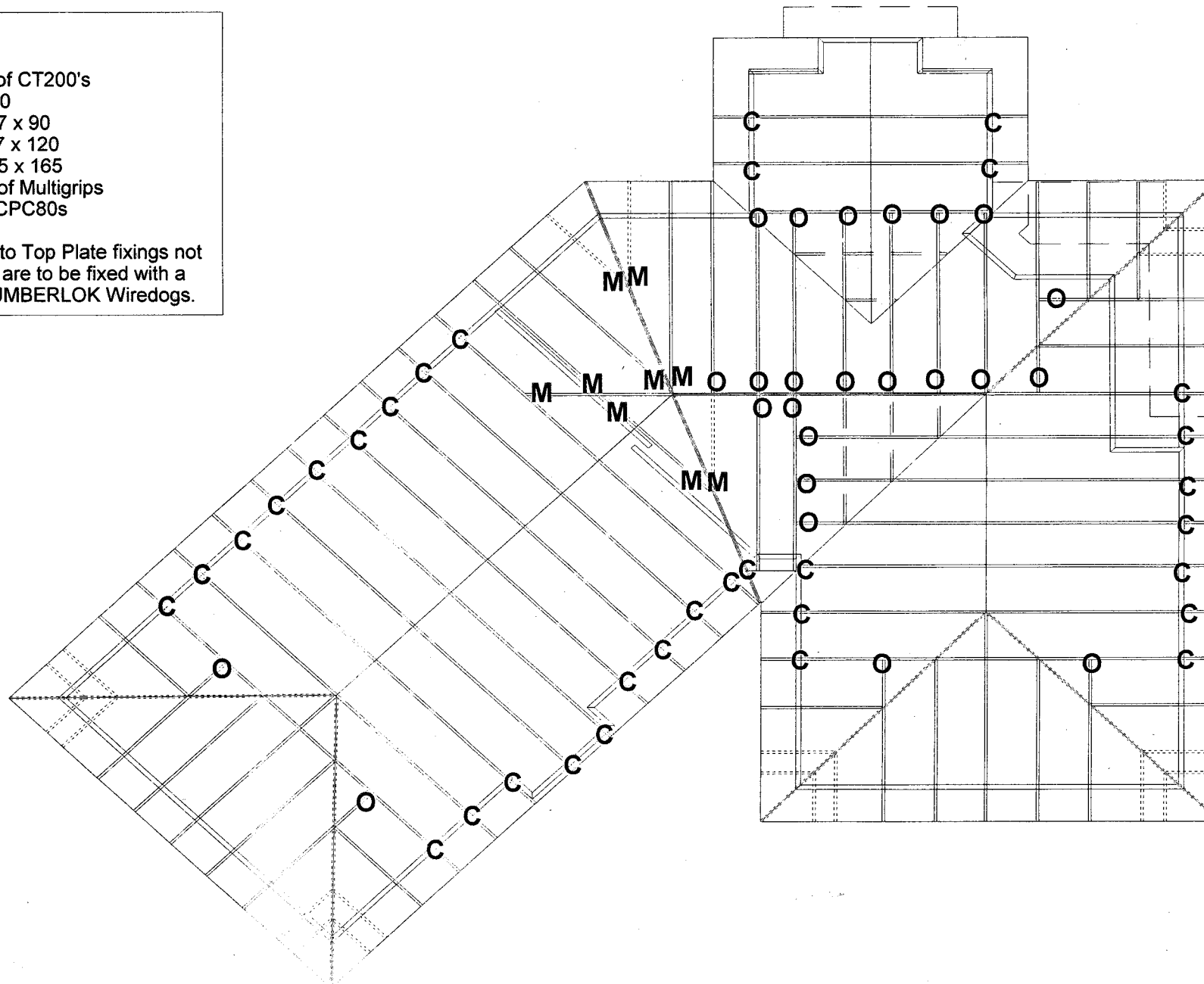
1. The studs to the chimney are outside NZS 3604 for size please amend.
2. The spouting in this area requires snow straps to be installed.
3. Were the barge board/fascia connects to the chimney a flashing detail is required for this area.

Regards  
Brent Watkins  
Ph (03) 314-7279  
Fax (03) 314-7289  
M 027 278-8158  
e brent.watkins@farmside.co.nz

# Key

C - Pair of CT200's  
 \ - CT600  
 O - JH 47 x 90  
 V - JH 47 x 120  
 # - JH 95 x 165  
 M - Pair of Multigrips  
 X - Pair CPC80s

All Truss to Top Plate fixings not indicated are to be fixed with a pair of LUMBERLOK Wiredogs.



A4

Mainland Prenail  
 16 Yukon Pl  
 Hornby  
 Christchurch  
 Ph 03 349 4354

Job Title :

Bestbuild Ltd

Sheet Title :

Truss Fixing

Date : 20-5-08

Scale : NTS

Designed RC

Drawn RC

Checked :

Certified :

PrimeCAD V4.3

Drawing Number :

MP71101

Sheet :

1/1

M. McDOWELL HERITAGE TRUST Co Ltd  
C/- BUILDBEST CONSTRUCTION Ltd.  
PO BOX 43  
OXFORD.

17 March 2008

PRIME BUILDING CONSULTANTS  
12/159 Hardy St  
PO Box 1810  
Nelson 7010  
P. 03 546 8387

ATTENTION: Mr Steve Arps. Building Consent Officer

RE: **Building Consent Application Number: 080258.** RESIDENTIAL DWELING WITH  
ATTACHED GARAGE. 485 DEPOT ROAD. OXFORD.

Dear Sir

The following are the answers to the issues raised in your letter 14 March 08.

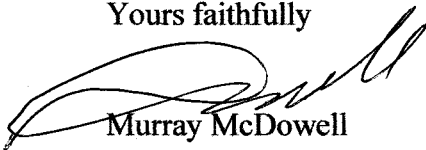
1. I understand you now have the PIM, I trust that it has no issues.
2. The floor heights have been changed. See attached revised plans 2,4 & 12. Note that the reference to minimum heights is due to the undulations in the ground and that the ground will require some levelling to achieve the minimum height requirement, or the floor height will need to be set from the highest point. This will mean that the 225mm requirement at the chimney will be achieved by default due to the falls in the existing platform. Exact method to be assessed upon house setout.
3. I have changed the foundation plan, see attached revised plan 4. This shows the removal of the 668 mesh and the inclusion of more shrinkage control joints.
4. I can confirm that the reference to (190x45 SOLID 2) means that the lintel is made up of two 190x45 forming the lintel.
5. I have revised the elevations and moved W23, W24, and W1 up to the same height as the rest of the windows. This was a drawing error as the window head detail for these windows are the same as Detail 5 Plan 10.
6. I have re-done the bracing calculations and attach a revised bracing plan showing the changes. Also attached are the methods of calculation.

7. The details for the purlin fixings are on Plans 10,11,12, and 13. I omitted the details from plan 6 to reduce the quantity of type on that plan. Sorry for the confusion.
8. I can confirm that there is no ceiling in the garage and therefore the access to the roof space will via the garage area. I have marked this on the revised plan 12 attached.
9. The surface of the terrace is to be exposed aggregate. Note of this has been made on revised plan 13 attached.
10. I can confirm that the detail 2 plan 10 showing the floor slab supporting the bottom of the window units W6 and W10 will be achieved by carrying the concrete slab out under the aluminium extrusion. W8 and W9 will be supported under the mullion with a proprietary cill support.
11. I have hand written the word safety on the window schedule W13. There was a typo on the original schedule however the spec is that same as that of W14. Revised page 4 of schedule attached.
12. I have included a vent to the branch drain to the Kitchen gully and have shown this on the revised drainage plan 5.
13. I can confirm that the septic tank will not be installed until the house drains have been laid. Reference to this is made on the revised drainage plan 5.
14. The detail of the bedding and backfilling is referenced in the specification section 74. I have also made reference to this on revised drainage plan 5.

I trust this information meets your expectations. If you have any further questions and it is appropriate you can call me on 0274 375275.

Thanks for your guidance.

Yours faithfully



Murray McDowell





## FURTHER INFORMATION REQUIRED

Please amend details and provide 3 FULL SETS.

I have processed the plans provided by you, however there are still some issues that require addressing, please note the following.

Also please note, I have processed your consent application by following our consent process check list.

1. I have not received the PIM at the time of processing your consent. Additional information may be required upon receipt of the PIM.
2. The floor heights shown on the details aren't consistent and need to be dimensioned specifically for this site. For the garage floor level to be correct the house floor level will have to be 225mm above ground level, this height will be required at the chimney area.
3. Concrete floors reinforced with 668 mesh are to have shrinkage control cuts at 3m centres as they are deemed to be unreinforced in NZS3604:1999. If 665 mesh is installed the shrinkage control joints can remain as shown on the drawings.
4. It is assumed that the reference to lintel sizes (190x45SOLID2) means the lintel is made up of two separate pieces of timber to have a total width of 90mm, please clarify.
5. Indicate the type of cladding over W2, W24 & the entry door. If brick specify the brick lintel size.
6. The bracing calculations are to reflect the house both in materials and shape. The bracing may have to be recalculated to meet this criteria.
7. Purlin fixing details are required.
8. Roof space access is to be indicated on the drawings. *No ceiling to garage.*
9. Specify the surface finish to the terrace at the entrance to the house,
10. Indicate sill supports for all windows and door which have an overall frame opening greater than 1.5m in width.
11. Indicate safety glass to all bathroom windows in the schedule.
12. The branch drain to the kitchen gully trap requires venting.
13. Confirm the septic tank and effluent field will not be installed until the sewer drains for the house have been laid.
14. Provide details of the bedding and backfilling of the drains.



12/159 Hardy St  
PO Box 1810  
Nelson 7010  
P. 03 546 8387  
F. 03 546 8087  
M. 027 216 1981  
E. [steve@bcnelson.co.nz](mailto:steve@bcnelson.co.nz)

14<sup>th</sup> March 2008

M. McDOWELL HERITAGE TRUST Co Ltd  
C/- BUILDBEST CONSTRUCTION Ltd.  
PO BOX 43  
OXFORD.

Building Consent Application Number: 080258

RESIDENTIAL DWELING WITH ATTACHED GARAGE.

485 DEPOT ROAD. OXFORD.

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I have assessed the documentation provided by you and I require further information and / or clarification as detailed on the attached page/s.

Waimakariri District Council has been notified of this request for further information and your job has been placed on "hold" until you have supplied all relevant information.

Once you have answered all my queries, I can continue processing your application for approval.

If you have any queries please contact me on the above address, or phone / email me.

*Yours faithfully*

Steve Arps  
Building Consent Officer



#### FURTHER INFORMATION REQUIRED

Please amend details and provide 3 FULL SETS.

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3. Concrete floors reinforced with 668 mesh are to have shrinkage control cuts at 3m centres as they are deemed to be unreinforced in NZS3604:1999. If 665 mesh is installed the shrinkage control joints can remain as shown on the drawings.
4. It is assumed that the reference to lintel sizes (190x45SOLID2) means the lintel is made up of two separate pieces of timber to have a total width of 90mm, please clarify.
5. Indicate the type of cladding over W2, W24 & the entry door. If brick specify the brick lintel size.
6. The bracing calculations are to reflect the house both in materials and shape. The bracing may have to be recalculated to meet this criteria.
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10. Indicate sill supports for all windows and door which have an overall frame opening greater than 1.5m in width.
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13. Confirm the septic tank and effluent field will not be installed until the sewer drains for the house have been laid.
14. Provide details of the bedding and backfilling of the drains.

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ADDENDA

*Note: The standard text in the technical sections of this specification may have been customised to suit the project being specified.*

## PROJECT INFORMATION

---

### OWNER

Name: **MURRAY McDOWELL & HERITAGE TRUST COMPANY  
LIMITED**

Mailing address: **685 DEPOT ROAD, RD1 OXFORD, NORTH CANTERBURY**

Telephone: **0274 375 275**

### CONTRACTOR

Name: **BUILDBEST CONSTRUCTION LIMITED**

Mailing address: **BOX 43 OXFORD, NORTH CANTERBURY**

Telephone: **0274 375 275**

### DESIGNER

Name: **M D McDOWELL.. T/A HOMES DIRECT**

Mailing address: **685 DEPOT ROAD, RD 1 OXFORD, NORTH CANTERBURY**

Telephone/Facsimile: **03 312 3452**

### PROJECT LOCATION

Street address: **685 DEPOT ROAD OXFORD**

Legal description: **Proposed Lot 8, part Lot 2 DP 383229**

Identifier: **332285**

### PROJECT DESCRIPTION

Type: **NEW DWELLING**

Intended use: **Single residential building**

Intended life: **Indefinite but not less than 50 years / ~ years**



## DRAWINGS

---

<u>Drawing number</u>	<u>Drawing Title</u>
<i>1</i>	<i>SITE PLAN</i>
<i>2</i>	<i>FLOOR PLAN</i>
<i>3</i>	<i>ELEVATIONS</i>
<i>4</i>	<i>FOUNDATION PLAN</i>
<i>5</i>	<i>DRAINAGE PLAN</i>
<i>6</i>	<i>ROOF PLAN</i>
<i>7</i>	<i>BRACING PLAN</i>
<i>8</i>	<i>ELECTRICAL PLAN</i>
<i>9</i>	<i>TRUSS LAYOUT</i>
<i>10</i>	<i>CROSS SECTION DETAILS 1</i>
<i>11</i>	<i>CROSS SECTION DETAILS 2</i>
<i>12</i>	<i>GARAGE &amp; BATHROOM CROSS SECTIONS</i>
<i>13</i>	<i>TERRACE CROSS SECTION</i>
<i>14</i>	<i>MISCELLANEOUS DETAILS</i>

## COMPLIANCE INFORMATION

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### SITE DATA

Soil type:	(280mm Top Soil, 590mm Sandy Gravel, Shingle from 870mm free draining)
Exposure zone:	(EXPOSED)
Wind zone:	( HIGH)
Topographical class:	(ESCARPMENT, MODERATE)
Earthquake zone:	(B)
Snow Loading:	(Zone 4)
Rain water intensity for design	(50mm/h)
Ground soakage rate for design	(>500mm/h)

### BUILDING DATA

Building classification:	(V)
Floor live load:	KPa (1.5)
Overall height of building:	<b>4.85M</b>
Risk assessment:	(8 POINTS TOTAL)

## PRODUCT INFORMATION

---

Producer Statements:	<b>BIOCYCLE WASTE WATER TREATMENT SYSTEM.</b> <b>MAINLAND PRENAIL LTD, TRUSS DESIGN</b>
Product Certification:	~
BRANZ Appraisals:	<b>~No. 521 (2006) TWO STOREY BRICK VENEER SYSTEM.</b>
Manufacturers' literature:	<b>YUNCA HEATING, WEGJ 2000 FREE STANDING WOOD BURNER</b>

## SELECTIONS

### 22 PREPARATION

---

Granular base: *20/40 tailings*  
Backfill: *EXCAVATED SPOIL*

### 31 CONCRETE

---

DPC – brand/type: *250mu, 4m WIDE BLACK POLYTHENE*  
Concrete: *20 MPa*  
Surface finish: *F4*  
Insulation – brand/thickness: *N/A*

### 33 CARPENTRY

---

#### Timber species, grade and treatment

Exterior wall framing: *PINUS RADIATA, NO1, H3.1*  
Drained cavity battens: *PINUS RADIATA, NO1, H3.1*  
Roof framing: *PINUS RADIATA, NO1, H1.2*  
Exterior exposed timbers: *PINUS RADIATA, NO1, H3.2*  
Exterior finishing timbers: *PINUS RADIATA, NO1, H3.2*  
Interior framing: *PINUS RADIATA, NO 1, H1.2*  
*200x35 & 150x35 Top plates. PINUS RADIATA, NO 1, H1.2*

ceiling battens *GIB-RHONDO METAL BATTEN AT 400 CENTRES DIRECT FIXED TO ROOF CEILING FRAMING*  
Building wrap - brand/type: *BITUMAC 360 ROOF UNDERLAY TO WALLS, BITUMAC 860 SELF SUPPORTING ROOF UNDERLAY TO ROOF.*

Insulation (brand/type/R value)

- floor: *N/A*  
- walls: *PINK BATTS R2.2*  
- ceiling: *PINK BATTS R3.2*

### 41 WALL CLADDING

---

Building wrap/type: *BITUMAC 360 ROOFING UNDERLAY*  
Cladding:  
- WALLS:  
*• CORRIGATED ZINCALUM, .40 GAUGE*  
*• 70 SERIES CLAY BRICK 230X120*  
  
- finish:  
*• COLOUR COTEL, ZR8*  
*• SHIEFIELD HERITAGE RANGE*

Fixings: metal and frequency to suit cladding, wind zone and exposure zone

Fixings – type/finish: *TO CORRIGATE CLADDING, 12mm Diameter Hot dip gavanized hexagonal head wood screws complete with neoprene washer. Fixed to framing through the pan of cladding to a minimum depth of 25mm every second pan.*

Trims – type//finish: *EX 200X40 PINUS RADIATA H3.2 RS*

Soffit cladding:

- type/thickness: *6mm Hardie soffit.*

- finish: *Smooth.*

Fixings – type/finish: *40mm galvanized clouts as per manufactures specifications.*

Jointers – type/finish: *ProprietaryHardies PVC jointer*

Penetration flashings:

- metal/sealant: *Zincalum, Colourcote, Fosroc-Silaflex MS*

Flashings - metal/finish: *Zincalum, Colourcote, ZR8, 0.55mm*

## **42 BRICK VENEER CLADDING**

---

Brick brand: *230X120X70 Heritage Range, Canterbury Clay Brick*  
type: *Manderville*  
Pointing - form: *Racked out , charcoal coloured.10mm thick plus or minus 2mm.*

## **44 ROOF CLADDING**

---

Roofing underlay: *Bitumac 860 self supporting roofing underlay.*  
BMT: *0.4mm*  
Roofing:  
- type/brand/profile/material: *Corrigated Colourcote, Calder stewart- Corrigate, Zincalum.*  
- finish: *Colorcote. ZR8, 0.40mm*  
Penetration flashing:  
- metal/sealant: *Zincalum, Colourcoted, Silaflex clear roofing sealant,*  
Flashings- metal/finish: *Zincalum, Colourcoted. ZR8 ,0.55mm*

## **46 RAINWATER SYSTEM**

---

Spoutings:  
- brand type/size material: *CONTINUOUS, 1/4 ROUND, 135mmx65mm back.*  
- finish: *Colourcote ZR8*  
Downpipes:  
- type/size material finish: *Zincalum, Colourcote ZR8, 0.55mm, 65mm diameter.*

## **47 TIMBER WINDOWS AND DOORS**

---

Flashings - metal finish: *Zincalum, Colourcote, ZR8, 0.55mm*  
Garage door:  
- type/model: *GARADOR, SECTIONAL*  
- door controller: *GARADOR*

## 48 ALUMINIUM WINDOWS AND DOORS

---

Brand:	<b>NULOOK</b>
- Finish:	<b>POWDER COATED</b>
Jamb liners:	
- type/treatment/finish:	<b>PINUS RADIATA, H3.1, CLEAR</b>
Sashes:	
- type:	<b>NUTECH, WEATHER TIGHT</b>
- stays:	<b>INTALOK</b>
- catches/finish:	<b>COLOUR MATCH</b>
- locks:	<b>N/A</b>
- restrictors:	<b>N/A</b>
Doors:	
- type:	<b>SLIDERS, &amp; OPENING</b>
- hinges (metal):	<b>INTALOK COLOUR MATCH</b>
- latch/locks:	<b>MILTON ARIA LCL 4 POINT KEY/TURN</b>
- handles/finish:	<b>INTALOK, COLOUR MATCH</b>
Glass – type/thickness:	<b>A4F, A5F, &amp; P4WSD</b>

## 49 GLAZING

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Glass types/thickness:	
- doors:	<b>A5F, T4F</b>
- windows:	<b>A4F, P4WSD, A5F,</b>
- shower/bath screens:	<b>ENGLEFIELD, 6mm clear toughened safety glass.</b>
Mirrors – type/thickness:	<b>TRENDY MIRROR, PEM 3636, 4.5mm</b>

## 51 INTERIOR PARTITIONS AND DOORS

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Standard plasterboard brand/thickness/finish level:

- walls: **Winstones. 10mm Standard Gib, level 4 finish**
- ceilings: **Winstones. 10mm Standard Gib, level 4 finish**

Special plasterboard brand/type/thickness/finish level:

- Bracing - walls: **Winstones. 10mm Bracline Gib, level 4 finish**
- Bathroom, Ensuite, & Laundry - walls: **Winstones. 10mm Aqualine Gib, level 4 finish.**
- ceilings: **Winstones. 10mm Aqualine Gib, level 4 finish\**

Other special wall lining location/brand/thickness

- Bath walls-6mm Hardiglaze to bath walls to full height. Refer to annexed manufacturers instructions for fixing details.**
- Shower walls-6mm Hardiglaze to bath walls to full height. Refer to annexed manufacturers instructions for fixing details.**
- Laundry tub splash back- 6mm Hardiglaze to bath walls to full height. Refer to annexed manufacturers instructions for fixing details.**

(fix in accordance with 5.1.2 and table 2 of Hardiglaze Technical Specifications) Refer plan30a for jointing details.)

Doors:

- type: *Plyco, Boulevard (v-grooved)*
- latch: *Schlage, lever handle, R10, Rubens, SC*
- handles/finish: *Schlage, lever handle, R10, Rubens, SC*

Finishings - material/dimensions:

- skirtings: *60x12 BE custom wood*
- trim: *55mm gid cove*

## 52 JOINERY FIXTURES AND FITTINGS

- Carcass - material/finish: *melamine*
- Bench - material: *wilson art laminate*

## 61 TILING

- Tile - type/brand/code: *PIZARRA*
- Adhesive - brand/type: *Monoflex, flexible adhesive.*
- Grouting - type: *Cemgrout, sanded grout.*
- Tiling selections
- Location Details
- ENTRY AREA* *2m2 AREA INSIDE DOOR*

## 62 PAINTING AND PAPERHANGING

Exterior painting selections:

- Item Manufacturer /System
- Shadowclad, Cover battens, Fascia, Siffit lining, and Dummy Rafters.* *Wattyl, Forestwood, 'Natural Finish Oil Stain, Rustic Oak.*

Interior painting and paperhanging selections:

- | <u>Room/item</u>                         | <u>Walls</u>                                    | <u>Ceiling</u>                                  | <u>Trim</u>                                  |
|--|---|---|--|
| <i>All rooms other than below</i>        | <i>Taubmans, Living Proof Interior acrylic.</i> | <i>Taubmans, Living Proof Interior acrylic.</i> | <i>Taubmans, Ultra Proof Acrylic Emanel.</i> |
| <i>Bathroom, Ensuite, &amp; Laun dry</i> | <i>Taubmans, Ultra Proof Acrylic Emanel.</i>    | <i>Taubmans, Ultra Proof Acrylic Emanel.</i>    | <i>Taubmans, Ultra Proof Acrylic Emanel.</i> |

## 71 WATER SYSTEMS

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Pipework - type: *Polybutylene.*  
Pipework - insulation: *Armaflex, 13mm side wall thickness to hot and cold.*  
Exposed pipework- type: *chrome plated copper*  
HWC – brand/type/capacity: *Peter Cocks , 270l low pressure, single element 3kw.*  
Water Pump *Wallace, Maxi pump MP3000.*

Tapware:

<u>Location</u>	<u>Manufacturer/Type</u>
<i>Vanity taps</i>	<i>Englefield, Cabriole, single lever basin mixer.</i>
<i>Bath/shower mixers</i>	<i>Englefield,Dolphis, concealed mixer.</i>
<i>Bath spout</i>	<i>Englefield, Elevation wall mount bath spout.</i>
<i>Shower Roses</i>	<i>Englefield, Elevation Plus Slide Shower.</i>
<i>Kitchen mixer</i>	<i>Englefield, Cabriole Loop mixer.</i>

## 72 SANITARY PLUMBING, SANITARYWARE AND ACCESSORIES

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Sanitaryware and accessories selections:

<u>Location</u>	<u>Manufacturer/Type</u>
<i>Toilets</i>	<i>Englefield, Milano Back to Wall toilet suite.</i>
<i>Shower Enclosure</i>	<i>Englefield, Valencia Quadrant, base-door&amp;return. 6mm Hardiglaze walls to ceiling.</i>
<i>Bath</i>	<i>Englefield,Studio Rectangle Bath, 1800 long.6mm Hardiglaze to walls to ceiling.</i>
<i>Vanities</i>	<i>Englefield, Sapphire, standard 900. Full width mirror to upstand and sealed.</i>
<i>Shower fan/light</i>	<i>Manrose, 150mm Extract-a-lite</i>
<i>Laundry Tub</i>	<i>Robin Hood ST3100. 6mm Hardiglaze splash back and sealed.</i>





22 February 2008

BuildBest Construction  
679 Depot Road  
Oxford

58 Kilmore Street, PO Box 345, Christchurch

General enquiries: 03 365 3828

Fax: 03 365 3194

Email: [ecinfo@ecan.govt.nz](mailto:ecinfo@ecan.govt.nz)

Customer services: 03 353 9007

or: 0800 EC INFO (0800 324 636)

Website: [www.ecan.govt.nz](http://www.ecan.govt.nz)

Attention: Murray McDowell

Dear Mr MCDowell

**Wastewater Treatment & Disposal System For BuildBest Construction, 685 Depot Road, Oxford, Lot 8 DP 59418.**

I am now able to confirm that in my opinion the location and installation of a BioCycle 8000 Series Wastewater Treatment System, and the discharge of sewage effluent from that system via pumped dose to 400m<sup>2</sup> of Dripline Irrigation, as set out and described in the application dated 21 February 2008, **complies** with the General Authorisation for Sewage Tank Effluent Disposal and with Rule WQL8 set out in Chapter 4 of the Proposed Natural Resources Regional Plan.

Therefore, it is my opinion that, if the wastewater treatment and land application system is constructed and installed in accordance with the details submitted in the application, **the discharge of domestic wastewater at the above location can be considered a permitted activity.**

To ensure that the discharge at the above location maintains its permitted activity status **you must ensure that:**

- The discharge will not result in sewage effluent flowing, seeping, or ponding on the surface of the ground.
- There will be no discharge of sewage effluent directly to surface water or directly into groundwater.
- When the construction of the treatment and land application system or soakage hole is completed:
  - (a) The work will be certified by a suitably qualified and competent person as having been carried out in accordance with the design plans: and
  - (b) A copy of the certificate will be forwarded to Environment Canterbury within twenty working days following completion of the work.
- The treatment and land application system will be operated and maintained in accordance with the system's design specifications for maintenance.

**Our Ref:** WWPA042080/CRC083093

**Contact:** *Chloe Armour*  
[chloe.armour@ecan.govt.nz](mailto:chloe.armour@ecan.govt.nz)

- The primary treatment tank or chamber will:
  - (a) Have an access point or points for inspecting and maintaining the effluent filter, monitoring the accumulation of sludge and desludging the tank or chamber. The access point or points will be accessible for these purposes at all times: and
  - (b) Be inspected at least once a year and the depth of accumulated sludge in the primary treatment tank or chamber measured: and
  - (c) Be deslugged when the accumulated scum and sludge occupy more than two thirds of the volume of the tank or chamber.
- The following information will be recorded, and a copy of these records made available to Environment Canterbury upon request:
  - (a) Maintenance of the treatment and land application system, including inspection, desludging or remedial work: and
  - (b) Dates works are undertaken and the name of the company undertaking the work.

Failure to comply fully with these requirements may result in the requirement for resource consent to authorise the discharge.

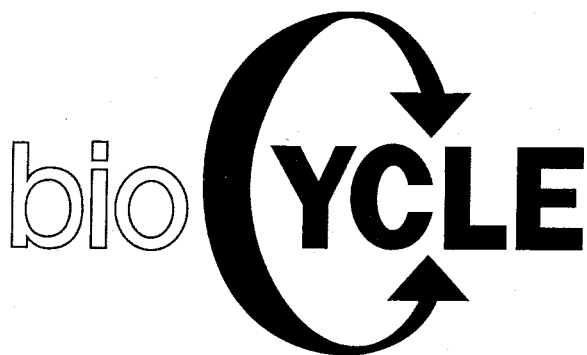
Yours sincerely



Chloe Armour

**Environmental Protection Officer**

Cc Hamish Dean, Waimakariri District Council  
Gordon Kenning, Biocycle South Ltd



## WASTE WATER TREATMENT SYSTEMS

**SPECIFICATIONS FOR:** BuildBest Construction, 685 Depot Road, Oxford  
Lot 8. DP59418

**TYPE OF SYSTEM:** BioCycle 8000 Series Wastewater Treatment System

**SOIL TYPE:** Test holes revealed:  
240mm top soils  
460mm sandy gravels  
Shingle from 700mm free draining

**WELL:** There is no well onsite (town supply).

**OPEN DRAINS:** There are no open drains on site or near.

**WATER TABLE:** Below 6m

**HOUSE SIZE:** 4 bedrooms

**BOUNDARYS:** Effluent disposal is to Ecan boundary requirements.

This plan and associated specification(s) have  
been inspected and in my opinion are able to  
meet the requirements of the relevant rules set  
out in the operative and proposed regional plans.

Signed Chloe Armon

Date 22 February 2008

**BIOCYCLE SOUTH LIMITED**

P O Box 20126, Bishopdale, Christchurch Phone: (03) 359 4443 Fax: (03) 359 4463

**NOTES**

- Subdivision proposal plan only.  
- Areas and dimensions subject to final survey.  
- Plan prepared for the purpose of obtaining a Resource Consent.

Note: Scandlyn Surveying accepts no responsibility for the use of this plan for any other purpose other than that intended (obtaining a Resource Consent).

Note: Lots 6-7, 12-15 have no frontage to a public road.

**Approved Application**

Plan

Access

M. Casey  
District Surveyor

**Proposed staging**

- Stage 1: Lot 1 (amended) and Lot 99 (bal.ct)
- Stage 2: Lots 8-10 and Lot 98 (bal.ct)
- Stage 3: Lots 2-5, 15 and Lot 97 (bal.ct)
- Stage 4: Lots 6-14

Proposed house site  
50x50 square

120x120 square

Stage 2

Proposed Entrances

McPhedrons Road  
Legal 3 Road

Signed Colin Arner  
Date 22 February 2008

PROPOSED EXCHANGES			
Notes	Lot	Area (sq m)	Area (sq ft)
Lot 1 & 2	1	10	10
Lot 3 & 4	3	10	10
Lot 5 & 6	5	10	10
Lot 7 & 8	7	10	10
Lot 9 & 10	9	10	10
Lot 11 & 12	11	10	10
Lot 13 & 14	13	10	10
Lot 15 & 16	15	10	10

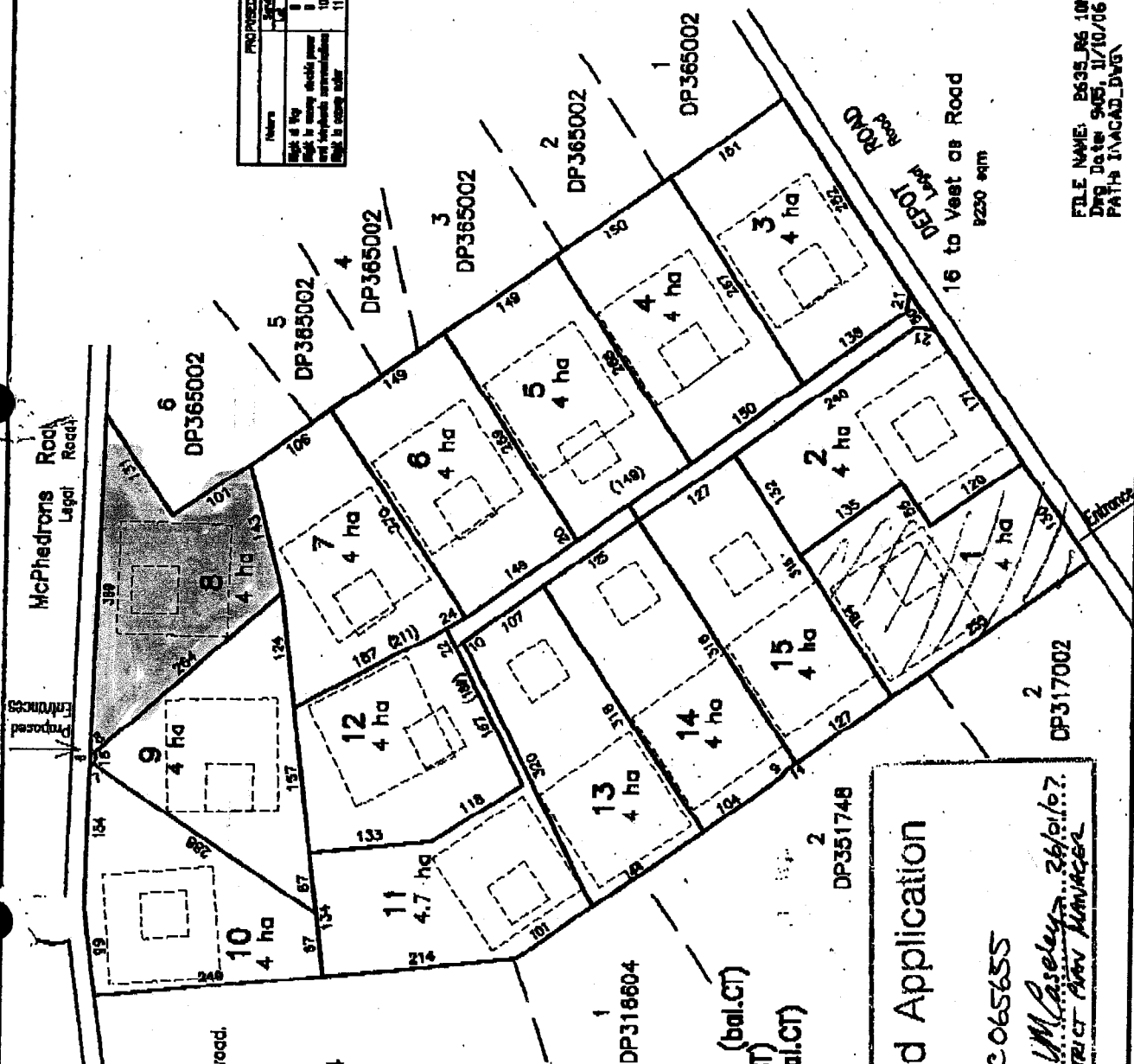
Lots 1-15 being subdn of Lot 2 DP59418

FILE NAME: 2635\_R6\_STAGE LANDSUBDIV  
Dwg Date: 10/05/06  
PATT: EXCHANGE.DWG

Prepared by: Scandlyn Surveying Ltd  
2008 High Street  
RANGIORA  
Ph 3131272, Fax 3131274



PROPOSED EXEMPTIONS			
Notes	Section	Regional	Current Interest
Right of Way	A		Lot 1010
Right to occupy existing power	B		Lot 1010
and telephone infrastructure	C		Lot 1010
Right to occupy water	D		Lot 1010



**NOTES**  
 Subdivision proposal plan only.  
 Areas and dimensions subject to final survey.  
 Plan prepared for the purpose of obtaining a Resource Consent.  
 Note : Scandlyn Surveying accepts no responsibility for the use of this plan for any other purpose other than that intended (obtaining a Resource Consent).  
 Note : Lots 6-7,12-15 have no frontage to a public road.

2  
 DP318604

I, the undersigned, have inspected and in my opinion are able to meet the requirements of the relevant rules set out in the operative and proposed regional plans.

Signed Chloe Adams

Date 22 February 2008

### Proposed staging

- Stage 1: Lot 1 (amended) and Lot 99 (bal.ct)
- Stage 2: Lots 8-10 and Lot 98 (bal.ct)
- Stage 3: Lots 2-5, 15 and Lot 97 (bal.ct)
- Stage 4: Lots 6-14

Proposed house site  
 50750 square

120x120 square

Approved Application

RC065655

Plan W. McPhedrons 26/01/07  
 District Plan Manager

FILE NAME: B635\_R6\_10NDV06\_ALL.DWG  
 Drawn Date: 9/05/11/10/06  
 Path: I:\ACAD.DWG

Prepared by: Scandlyn Surveying Ltd  
 209B High Street  
 RANGIORA  
 Ph 3131272, Fax 3131274  
 Reference: 2635\_RS04 10 Nov 06

Waimakariri District Council  
 Comprised in CT 354/223 81,8500 ha  
 Original scale 1:5000 Format (A3)

Lots 1-15 being subdn of Lot 2 DP59418





Table 1: Definitions of risk Paragraph 3, E2/AS1			Elevation A
A: Wind zone	Low risk	Low wind zone as described by NZS 3604	
	Medium risk	Medium wind zone as described by NZS 3604	
	<u>High risk</u>	High wind zone as described by NZS 3604	
	Very high risk	Very high wind zone as described by NZS 3604	
B: Number of storeys	<u>Low risk</u>	One storey	
	Medium risk	Two storeys in part	
	High risk	Two storeys	
	Very high risk	More than two storeys	
C: Roof/wall intersection design	Low risk	Roof-to-wall intersection fully protected (e.g. hip and gable roof with eaves)	
	Medium risk	Roof-to-wall intersection partly exposed (e.g. hip and gable roof with no eaves)	
	High risk	Roof-to-wall intersection fully exposed (e.g. parapets, enclosed balustrades or eaves at greater than 90° to vertical with soffit lining)	
	<u>Very high risk</u>	Roof elements finishing within the boundaries formed by the exterior walls (e.g. lower ends of aprons, chimneys, dormers etc)	
D: Eaves width <sup>(1)(2)</sup>	Low risk	Greater than 600 mm for single storey	
	<u>Medium risk</u>	451 – 600 mm for single storey, or over 600 mm for two storey	
	High risk	101 – 450 mm for single storey, or 451 – 600 mm for two storey, or greater than 600 mm above two storey	
	Very high risk	0 – 100 mm for single storey, or 0 – 450 mm for two storey, or less than 600 mm above two storey	
E: Envelope complexity	Low risk	Simple rectangular, L, T or boomerang shape, with single cladding type	
	<u>Medium risk</u>	Moderately complex, angular or curved shapes (e.g. Y or arrowhead) with no more than two cladding types	
	High risk	Complex, angular or curved shapes (e.g. Y or arrowhead) with multiple cladding types	
	Very high risk	As for High risk, but with junctions not covered in C or F of this table (e.g. box windows, pergolas, multi-storey re-entrant shapes etc)	
F: Deck design <sup>(3)</sup>	<u>Low risk</u>	None, timber slat deck or porch at ground floor level	
	Medium risk	Fully covered in plan by roof, or timber slat deck attached at first or second floor level	
	High risk	Enclosed deck exposed in plan or cantilevered at first floor level	
	Very high risk	Enclosed deck exposed in plan or cantilevered at second floor level or above	

## NOTES:

(1) Eaves width measured horizontally from external face of wall cladding to outer edge of overhang, including gutters and fascias.

(2) Balustrades and parapets count as 0 mm eaves.

(3) The term deck includes balconies, as described in the Definitions.

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Table 2: Building envelope risk matrix  
Paragraph 3.4.2, Figure 1

*Elevation A*

Risk factor	Risk severity				Subtotals for each risk factor
	LOW 0-1000	MEDIUM 1000-2000	HIGH 2000-3000	VERY HIGH 3000-4000	
Wind zone (per NZS 3604)	0	0	1	2	1
Number of storeys	0	1	2	4	0
Roof/wall intersection design	0	1	3	5	5
Eaves width	0	1	2	5	1
Envelope complexity	0	1	3	6	1
Deck design	0	2	4	6	0
Total risk score:					8

(Enter the appropriate risk severity score for each risk factor in the score columns. Transfer these figures across to the right-hand column. Finally, add up the figures in the right-hand column to get the total risk score.)

Table 3: Suitable wall claddings

Paragraphs 3.4.2, 3.4.3, 3.4.4, 3.4.5, 3.4.6, 3.4.7, 3.4.8, 3.4.9, 3.4.10, 3.4.11, 3.4.12, 3.4.13, 3.4.14, 3.4.15, 3.4.16, Figure 1

Risk  
Score

Suitable wall claddings<sup>(1)</sup>

Direct fixed to framing

Over nominal 20 mm drained cavity

0 - 6

- a) Timber weatherboards - all types
- b) Fibre cement weatherboards
- c) Vertical profiled metal <sup>(2)</sup> - corrugated and symmetrical
- d) Fibre cement sheet <sup>(3)</sup>
- e) Plywood sheet
- f) EIFS

- a) *Masonry veneer* <sup>(4)</sup>
- b) *Stucco*
- c) Horizontal profiled metal <sup>(2)</sup> - corrugated and trapezoidal only

7 - 12

- a) Bevel-back timber weatherboards
- b) Vertical timber board and batten
- c) Vertical profiled metal <sup>(2)</sup> - corrugated only

- a) *Masonry veneer* <sup>(4)</sup>
- b) *Stucco*
- c) Horizontal profiled metal - corrugated and trapezoidal only
- d) Rusticated weatherboards
- e) Fibre cement weatherboards
- f) Fibre cement sheet
- g) Plywood sheet
- h) EIFS

13 - 20

- a) Vertical profiled metal <sup>(2)</sup> - corrugated only

- a) *Masonry veneer* <sup>(4)</sup>
- b) *Stucco*
- c) Horizontal profiled metal - corrugated and trapezoidal only
- d) Rusticated weatherboards
- e) Fibre cement weatherboards
- f) Fibre cement sheet
- g) Plywood sheet
- h) EIFS
- i) Bevel-back weatherboards

Over 20

- a) Redesign the building to achieve a lower score, or
- b) Specific design
  - The design may need changing to reduce the risk
  - The building consent authority may require more comprehensive details and documentation providing evidence of weathertightness
  - The building consent authority, designer or owner may require more inspections
  - A third party audit of the design may be required.

NOTES: (1) The wall claddings in this table are limited to those covered in this Acceptable Solution.

(2) Traditional masonry veneer as per SNZ HB 4236, with minimum 40 mm cavity.

(3) Refer Figure 38 for profiles.

(4) Except stucco over a fibre cement backing.

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Table 1: Definitions of risk

Paragraph 3.1.1, Figure 1

Elevation B

A: Wind zone	Low risk	Low wind zone as described by NZS 3604
	Medium risk	Medium wind zone as described by NZS 3604
	<u>High risk</u>	High wind zone as described by NZS 3604
	Very high risk	Very high wind zone as described by NZS 3604
B: Number of storeys	<u>Low risk</u>	One storey
	Medium risk	Two storeys in part
	High risk	Two storeys
	Very high risk	More than two storeys
C: Roof/wall intersection design	Low risk	Roof-to-wall intersection fully protected (e.g. hip and gable roof with eaves)
	Medium risk	Roof-to-wall intersection partly exposed (e.g. hip and gable roof with no eaves)
	High risk	Roof-to-wall intersection fully exposed (e.g. parapets, enclosed balustrades or eaves at greater than 90° to vertical with soffit lining)
	<u>Very high risk</u>	Roof elements finishing within the boundaries formed by the exterior walls (e.g. lower ends of aprons, chimneys, dormers etc)
D: Eaves width <sup>(1)(2)</sup>	Low risk	Greater than 600 mm for single storey
	<u>Medium risk</u>	451 – 600 mm for single storey, or over 600 mm for two storey
	High risk	101 – 450 mm for single storey, or 451 – 600 mm for two storey, or greater than 600 mm above two storey
	Very high risk	0 – 100 mm for single storey, or 0 – 450 mm for two storey, or less than 600 mm above two storey
E: Envelope complexity	Low risk	Simple rectangular, L, T or boomerang shape, with single cladding type
	<u>Medium risk</u>	Moderately complex, angular or curved shapes (e.g. Y or arrowhead) with no more than two cladding types
	High risk	Complex, angular or curved shapes (e.g. Y or arrowhead) with multiple cladding types
	Very high risk	As for High risk, but with junctions not covered in C or F of this table (e.g. box windows, pergolas, multi-storey re-entrant shapes etc)
F: Deck design <sup>(3)</sup>	<u>Low risk</u>	None, timber slat deck or porch at ground floor level
	Medium risk	Fully covered in plan by roof, or timber slat deck attached at first or second floor level
	High risk	Enclosed deck exposed in plan or cantilevered at first floor level
	Very high risk	Enclosed deck exposed in plan or cantilevered at second floor level or above

## NOTES:

Amend 2  
Jul 2005

(1) Eaves width measured horizontally from external face of wall cladding to outer edge of overhang, including gutters and fascias.

Amend 2  
Jul 2005

(2) Balustrades and parapets count as 0 mm eaves.

(3) The term deck includes balconies, as described in the Definitions.

Amend 2  
Jul 2005Amend 2  
Jul 2005Amend 2  
Jul 2005Amend 2  
Jul 2005

Table 2: Building envelope risk matrix  
Paragraphs 3.1.2, 3.2, Figure 1

*Erection B*

Risk factor	Risk severity						Subtotals for each risk factor
	LOW	score	MEDIUM	score	HIGH	score	
Wind zone (per NZS 3604)	0		0		1	2	
Number of storeys	0		1		2	4	
Roof/wall intersection design	0		1		3	5	
Eaves width	0		1		2	5	
Envelope complexity	0		1		3	6	
Deck design	0		2		4	6	
						Total risk score:	
							<u>8</u>

(Enter the appropriate risk severity score for each risk factor in the score columns. Transfer these figures across to the right-hand column. Finally, add up the figures in the right-hand column to get the total risk score.)

Table 3: Suitable wall claddings

Paragraphs 3.1.2, 3.4.1.1, 3.4.2.1, 3.4.2.2, 3.4.3.2, 3.5.1, 3.5.4.1.2, 3.5.4.1.3, 3.5.6, Figure 1

Risk Score	Suitable wall claddings <sup>(1)</sup>	
	Direct fixed to framing	Over nominal 20 mm drained cavity
0 – 6	a) Timber weatherboards – all types b) Fibre cement weatherboards c) Vertical profiled metal <sup>(3)</sup> – corrugated and symmetrical d) Fibre cement sheet <sup>(4)</sup> e) Plywood sheet f) EIFS	a) Masonry veneer <sup>(2)</sup> b) Stucco c) Horizontal profiled metal <sup>(3)</sup> – corrugated and trapezoidal only
7 – 12	a) Bevel-back timber weatherboards b) Vertical timber board and batten c) Vertical profiled metal <sup>(3)</sup> – corrugated only	a) Masonry veneer <sup>(2)</sup> b) Stucco c) Horizontal profiled metal – corrugated and trapezoidal only d) Rusticated weatherboards e) Fibre cement weatherboards f) Fibre cement sheet g) Plywood sheet h) EIFS
13 – 20	a) Vertical profiled metal <sup>(3)</sup> – corrugated only	a) Masonry veneer <sup>(2)</sup> b) Stucco c) Horizontal profiled metal – corrugated and trapezoidal only d) Rusticated weatherboards e) Fibre cement weatherboards f) Fibre cement sheet g) Plywood sheet h) EIFS i) Bevel-back weatherboards
Over 20	a) Redesign the building to achieve a lower score, or b) Specific design <ul style="list-style-type: none"> <li>– The design may need changing to reduce the risk</li> <li>– The building consent authority may require more comprehensive details and documentation providing evidence of weathertightness</li> <li>– The building consent authority, designer or owner may require more inspections</li> <li>– A third party audit of the design may be required.</li> </ul>	

NOTES: (1) The wall claddings in this table are limited to those covered in this Acceptable Solution.

(2) Traditional masonry veneer as per SNZ HB 4236, with minimum 40 mm cavity.

(3) Refer Figure 38 for profiles.

(4) Except stucco over a fibre cement backing.

Table 1: Definitions of risk

Paragraph 8	Figure	Elevation C
A: Wind zone	Low risk	Low wind zone as described by NZS 3604
	Medium risk	Medium wind zone as described by NZS 3604
	<u>High risk</u>	High wind zone as described by NZS 3604
	Very high risk	Very high wind zone as described by NZS 3604
B: Number of storeys	<u>Low risk</u>	One storey
	Medium risk	Two storeys in part
	High risk	Two storeys
	Very high risk	More than two storeys
C: Roof/wall intersection design	<u>Low risk</u>	Roof-to-wall intersection fully protected (e.g. hip and gable roof with eaves)
	Medium risk	Roof-to-wall intersection partly exposed (e.g. hip and gable roof with no eaves)
	High risk	Roof-to-wall intersection fully exposed (e.g. parapets, enclosed balustrades or eaves at greater than 90° to vertical with soffit lining)
	Very high risk	Roof elements finishing within the boundaries formed by the exterior walls (e.g. lower ends of aprons, chimneys, dormers etc)
D: Eaves width <sup>(1)(2)</sup>	Low risk	Greater than 600 mm for single storey
	<u>Medium risk</u>	451 – 600 mm for single storey, or over 600 mm for two storey
	High risk	101 – 450 mm for single storey, or 451 – 600 mm for two storey, or greater than 600 mm above two storey
	Very high risk	0 – 100 mm for single storey, or 0 – 450 mm for two storey, or less than 600 mm above two storey
E: Envelope complexity	Low risk	Simple rectangular, L, T or boomerang shape, with single cladding type
	<u>Medium risk</u>	Moderately complex, angular or curved shapes (e.g. Y or arrowhead) with no more than two cladding types
	High risk	Complex, angular or curved shapes (e.g. Y or arrowhead) with multiple cladding types
	Very high risk	As for High risk, but with junctions not covered in C or F of this table (e.g. box windows, pergolas, multi-storey re-entrant shapes etc)
F: Deck design <sup>(3)</sup>	<u>Low risk</u>	None, timber slat deck or porch at ground floor level
	Medium risk	Fully covered in plan by roof, or timber slat deck attached at first or second floor level
	High risk	Enclosed deck exposed in plan or cantilevered at first floor level
	Very high risk	Enclosed deck exposed in plan or cantilevered at second floor level or above

## NOTES:

Amend 2  
Jul 2005

(1) Eaves width measured horizontally from external face of wall cladding to outer edge of overhang, including gutters and fascias.

Amend 2  
Jul 2005

(2) Balustrades and parapets count as 0 mm eaves.

(3) The term deck includes balconies, as described in the Definitions.

Amend 2  
Jul 2005Amend 2  
Jul 2005Amend 2  
Jul 2005Amend 2  
Jul 2005

Table 2: Building envelope risk matrix  
Paragraphs 3.1.2, Figure 1

Evaluation

Risk factor	Risk severity				Subtotals for each risk factor
	LOW score	MEDIUM score	HIGH score	VERY HIGH score	
Wind zone (per NZS 3604)	0	0	1	2	1-0-0-0-0-0 = 0
Number of storeys	0	1	2	4	
Roof/wall intersection design	0	1	3	5	
Eaves width	0	1	2	5	
Envelope complexity	0	1	3	6	
Deck design	0	2	4	6	
Total risk score:					3

(Enter the appropriate risk severity score for each risk factor in the score columns. Transfer these figures across to the right-hand column. Finally, add up the figures in the right-hand column to get the total risk score.)

Table 3: Suitable wall claddings

Paragraphs 3.1.2, 3.4.1.1, 3.4.2.1, 3.4.2.2, 3.4.3.1, 3.4.3.2, 3.4.3.3, 3.4.3.4, 3.4.3.5, 3.4.3.6, 3.4.3.7, 3.4.3.8, 3.4.3.9, 3.4.3.10, 3.4.3.11, 3.4.3.12, 3.4.3.13, 3.4.3.14, 3.4.3.15, 3.4.3.16, 3.4.3.17, 3.4.3.18, 3.4.3.19, 3.4.3.20, 3.4.3.21, 3.4.3.22, 3.4.3.23, 3.4.3.24, 3.4.3.25, 3.4.3.26, 3.4.3.27, 3.4.3.28, 3.4.3.29, 3.4.3.30, 3.4.3.31, 3.4.3.32, 3.4.3.33, 3.4.3.34, 3.4.3.35, 3.4.3.36, 3.4.3.37, 3.4.3.38, 3.4.3.39, 3.4.3.40, 3.4.3.41, 3.4.3.42, 3.4.3.43, 3.4.3.44, 3.4.3.45, 3.4.3.46, 3.4.3.47, 3.4.3.48, 3.4.3.49, 3.4.3.50, 3.4.3.51, 3.4.3.52, 3.4.3.53, 3.4.3.54, 3.4.3.55, 3.4.3.56, 3.4.3.57, 3.4.3.58, 3.4.3.59, 3.4.3.60, 3.4.3.61, 3.4.3.62, 3.4.3.63, 3.4.3.64, 3.4.3.65, 3.4.3.66, 3.4.3.67, 3.4.3.68, 3.4.3.69, 3.4.3.70, 3.4.3.71, 3.4.3.72, 3.4.3.73, 3.4.3.74, 3.4.3.75, 3.4.3.76, 3.4.3.77, 3.4.3.78, 3.4.3.79, 3.4.3.80, 3.4.3.81, 3.4.3.82, 3.4.3.83, 3.4.3.84, 3.4.3.85, 3.4.3.86, 3.4.3.87, 3.4.3.88, 3.4.3.89, 3.4.3.90, 3.4.3.91, 3.4.3.92, 3.4.3.93, 3.4.3.94, 3.4.3.95, 3.4.3.96, 3.4.3.97, 3.4.3.98, 3.4.3.99, 3.4.3.100

Risk  
Score

Suitable wall claddings<sup>(1)</sup>

Direct fixed to framing

Over nominal 20 mm drained cavity

0 - 6

- a) Timber weatherboards - all types
- b) Fibre cement weatherboards
- c) Vertical profiled metal <sup>(2)</sup> - corrugated and symmetrical
- d) Fibre cement sheet <sup>(2)</sup>
- e) Plywood sheet
- f) EIFS

a) Masonry veneer <sup>(2)</sup>

- b) Stucco
- c) Horizontal profiled metal <sup>(2)</sup> - corrugated and trapezoidal only

7 - 12

- a) Bevel-back timber weatherboards
- b) Vertical timber board and batten
- c) Vertical profiled metal <sup>(2)</sup> - corrugated only

- a) Masonry veneer <sup>(2)</sup>
- b) Stucco
- c) Horizontal profiled metal - corrugated and trapezoidal only
- d) Rusticated weatherboards
- e) Fibre cement weatherboards
- f) Fibre cement sheet
- g) Plywood sheet
- h) EIFS

13 - 20

- a) Vertical profiled metal <sup>(2)</sup> - corrugated only

- a) Masonry veneer <sup>(2)</sup>
- b) Stucco
- c) Horizontal profiled metal - corrugated and trapezoidal only
- d) Rusticated weatherboards
- e) Fibre cement weatherboards
- f) Fibre cement sheet
- g) Plywood sheet
- h) EIFS
- i) Bevel-back weatherboards

Over 20

- a) Redesign the building to achieve a lower score, or
- b) Specific design
  - The design may need changing to reduce the risk
  - The building consent authority may require more comprehensive details and documentation providing evidence of weathertightness
  - The building consent authority, designer or owner may require more inspections
  - A third party audit of the design may be required.

NOTES: (1) The wall claddings in this table are limited to those covered in this Acceptable Solution.

(2) Traditional masonry veneer as per SNZ HB 4236, with minimum 40 mm cavity.

(3) Refer Figure 38 for profiles.

(4) Except stucco over a fibre cement backing.

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005



Table 1: Definitions of risk  
Paragraph 3.1.1.1

E2/AS1 D

A: Wind zone	Low risk	Low wind zone as described by NZS 3604
	Medium risk	Medium wind zone as described by NZS 3604
	<u>High risk</u>	High wind zone as described by NZS 3604
	Very high risk	Very high wind zone as described by NZS 3604
B: Number of storeys	<u>Low risk</u>	One storey
	Medium risk	Two storeys in part
	High risk	Two storeys
	Very high risk	More than two storeys
C: Roof/wall intersection design	<u>Low risk</u>	Roof-to-wall intersection fully protected (e.g. hip and gable roof with eaves)
	Medium risk	Roof-to-wall intersection partly exposed (e.g. hip and gable roof with no eaves)
	High risk	Roof-to-wall intersection fully exposed (e.g. parapets, enclosed balustrades or eaves at greater than 90° to vertical with soffit lining)
	Very high risk	Roof elements finishing within the boundaries formed by the exterior walls (e.g. lower ends of aprons, chimneys, dormers etc)
D: Eaves width <sup>(1)(2)</sup>	Low risk	Greater than 600 mm for single storey
	<u>Medium risk</u>	451 – 600 mm for single storey, or over 600 mm for two storey
	High risk	101 – 450 mm for single storey, or 451 – 600 mm for two storey, or greater than 600 mm above two storey
	Very high risk	0 – 100 mm for single storey, or 0 – 450 mm for two storey, or less than 600 mm above two storey
E: Envelope complexity	Low risk	Simple rectangular, L, T or boomerang shape, with single cladding type
	<u>Medium risk</u>	Moderately complex, angular or curved shapes (e.g. Y or arrowhead) with no more than two cladding types
	High risk	Complex, angular or curved shapes (e.g. Y or arrowhead) with multiple cladding types
	Very high risk	As for High risk, but with junctions not covered in C or F of this table (e.g. box windows, pergolas, multi-storey re-entrant shapes etc)
F: Deck design <sup>(3)</sup>	<u>Low risk</u>	None, timber slat deck or porch at ground floor level
	Medium risk	Fully covered in plan by roof, or timber slat deck attached at first or second floor level
	High risk	Enclosed deck exposed in plan or cantilevered at first floor level
	Very high risk	Enclosed deck exposed in plan or cantilevered at second floor level or above

## NOTES:

Amend 2  
Jul 2005

(1) Eaves width measured horizontally from external face of wall cladding to outer edge of overhang, including gutters and fascias.

Amend 2  
Jul 2005

(2) Balustrades and parapets count as 0 mm eaves.

(3) The term deck includes balconies, as described in the Definitions.

Amend 2  
Jul 2005Amend 2  
Jul 2005Amend 2  
Jul 2005Amend 2  
Jul 2005

Table 2: Building envelope risk matrix  
Paragraphs 3.1.2, Figure 1

Elevation D

Risk factor	Risk severity				Subtotals for each risk factor
	LOW	MEDIUM	HIGH	VERY HIGH	
Wind zone (per NZS 3604)	0	0	1	2	100
Number of storeys	0	1	2	4	
Roof/wall intersection design	0	1	3	5	
Eaves width	0	1	2	5	
Envelope complexity	0	1	3	6	
Deck design	0	2	4	6	
Total risk score:					100

(Enter the appropriate risk severity score for each risk factor in the score columns. Transfer these figures across to the right-hand column. Finally, add up the figures in the right-hand column to get the total risk score.)

Table 3: Suitable wall claddings

Paragraphs 3.1.2, 3.4.1, 3.4.2, 3.4.3, 3.4.4, 3.4.5, 3.4.6, 3.4.7, 3.4.8, 3.4.9, 3.4.10, 3.4.11, 3.4.12, 3.4.13, 3.4.14, 3.4.15, 3.4.16, Figure 1

Risk  
Score

Suitable wall claddings<sup>(1)</sup>

Direct fixed to framing

Over nominal 20 mm drained cavity

0 - 6

- a) Timber weatherboards - all types
- b) Fibre cement weatherboards
- c) Vertical profiled metal <sup>(2)</sup> - corrugated and symmetrical
- d) Fibre cement sheet <sup>(2)</sup>
- e) Plywood sheet
- f) EIFS

a) Masonry veneer <sup>(3)</sup>

- b) Stucco
- c) Horizontal profiled metal <sup>(2)</sup> - corrugated and trapezoidal only

7 - 12

- a) Bevel-back timber weatherboards
- b) Vertical timber board and batten
- c) Vertical profiled metal <sup>(2)</sup> - corrugated only

- a) Masonry veneer <sup>(2)</sup>
- b) Stucco
- c) Horizontal profiled metal - corrugated and trapezoidal only
- d) Rusticated weatherboards
- e) Fibre cement weatherboards
- f) Fibre cement sheet
- g) Plywood sheet
- h) EIFS

13 - 20

- a) Vertical profiled metal <sup>(2)</sup> - corrugated only

- a) Masonry veneer <sup>(2)</sup>
- b) Stucco
- c) Horizontal profiled metal - corrugated and trapezoidal only
- d) Rusticated weatherboards
- e) Fibre cement weatherboards
- f) Fibre cement sheet
- g) Plywood sheet
- h) EIFS
- i) Bevel-back weatherboards

- Over 20 a) Redesign the building to achieve a lower score, or  
b) Specific design

- The design may need changing to reduce the risk
- The building consent authority may require more comprehensive details and documentation providing evidence of weathertightness
- The building consent authority, designer or owner may require more inspections
- A third party audit of the design may be required.

NOTES: (1) The wall claddings in this table are limited to those covered in this Acceptable Solution.

(2) Traditional masonry veneer as per SNZ HB 4236, with minimum 40 mm cavity.

(3) Refer Figure 38 for profiles.

(4) Except stucco over a fibre cement backing.

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Table 1: Definitions of risk  
Paragraph 9.1.1, Figure 1

Elevation E

A: Wind zone	Low risk	Low wind zone as described by NZS 3604
	Medium risk	Medium wind zone as described by NZS 3604
	<u>High risk</u>	High wind zone as described by NZS 3604
	Very high risk	Very high wind zone as described by NZS 3604
B: Number of storeys	<u>Low risk</u>	One storey
	Medium risk	Two storeys in part
	High risk	Two storeys
	Very high risk	More than two storeys
C: Roof/wall intersection design	<u>Low risk</u>	Roof-to-wall intersection fully protected (e.g. hip and gable roof with eaves)
	Medium risk	Roof-to-wall intersection partly exposed (e.g. hip and gable roof with no eaves)
	High risk	Roof-to-wall intersection fully exposed (e.g. parapets, enclosed balustrades or eaves at greater than 90° to vertical with soffit lining)
	Very high risk	Roof elements finishing within the boundaries formed by the exterior walls (e.g. lower ends of aprons, chimneys, dormers etc)
D: Eaves width <sup>(1)(2)</sup>	Low risk	Greater than 600 mm for single storey
	<u>Medium risk</u>	451 – 600 mm for single storey, or over 600 mm for two storey
	High risk	101 – 450 mm for single storey, or 451 – 600 mm for two storey, or greater than 600 mm above two storey
	Very high risk	0 – 100 mm for single storey, or 0 – 450 mm for two storey, or less than 600 mm above two storey
E: Envelope complexity	Low risk	Simple rectangular, L, T or boomerang shape, with single cladding type
	<u>Medium risk</u>	Moderately complex, angular or curved shapes (e.g. Y or arrowhead) with no more than two cladding types
	High risk	Complex, angular or curved shapes (e.g. Y or arrowhead) with multiple cladding types
	Very high risk	As for High risk, but with junctions not covered in C or F of this table (e.g. box windows, pergolas, multi-storey re-entrant shapes etc)
F: Deck design <sup>(3)</sup>	<u>Low risk</u>	None, timber slat deck or porch at ground floor level
	Medium risk	Fully covered in plan by roof, or timber slat deck attached at first or second floor level
	High risk	Enclosed deck exposed in plan or cantilevered at first floor level
	Very high risk	Enclosed deck exposed in plan or cantilevered at second floor level or above

## NOTES:

- Amend 2 Jul 2005 | (1) Eaves width measured horizontally from external face of wall cladding to outer edge of overhang, including gutters and fascias.
- Amend 2 Jul 2005 | (2) Balustrades and parapets count as 0 mm eaves.
- Amend 2 Jul 2005 | (3) The term deck includes balconies, as described in the Definitions.

Table 2: Building envelope risk matrix  
Paragraphs 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7, 3.1.8, 3.1.9, 3.1.10, 3.1.11, 3.1.12, 3.1.13, 3.1.14, 3.1.15, 3.1.16, 3.1.17, 3.1.18, 3.1.19, 3.1.20, 3.1.21, 3.1.22, 3.1.23, 3.1.24, 3.1.25, 3.1.26, 3.1.27, 3.1.28, 3.1.29, 3.1.30, 3.1.31, 3.1.32, 3.1.33, 3.1.34, 3.1.35, 3.1.36, 3.1.37, 3.1.38, 3.1.39, 3.1.40, 3.1.41, 3.1.42, 3.1.43, 3.1.44, 3.1.45, 3.1.46, 3.1.47, 3.1.48, 3.1.49, 3.1.50, 3.1.51, 3.1.52, 3.1.53, 3.1.54, 3.1.55, 3.1.56, 3.1.57, 3.1.58, 3.1.59, 3.1.60, 3.1.61, 3.1.62, 3.1.63, 3.1.64, 3.1.65, 3.1.66, 3.1.67, 3.1.68, 3.1.69, 3.1.70, 3.1.71, 3.1.72, 3.1.73, 3.1.74, 3.1.75, 3.1.76, 3.1.77, 3.1.78, 3.1.79, 3.1.80, 3.1.81, 3.1.82, 3.1.83, 3.1.84, 3.1.85, 3.1.86, 3.1.87, 3.1.88, 3.1.89, 3.1.90, 3.1.91, 3.1.92, 3.1.93, 3.1.94, 3.1.95, 3.1.96, 3.1.97, 3.1.98, 3.1.99, 3.1.100

Elevation E

Risk factor	Risk severity				Subtotals for each risk factor
	LOW	MEDIUM	HIGH	VERY HIGH	
Wind zone (per NZS 3604)	0	0	1	2	1-00
Number of storeys	0	1	2	4	
Roof/wall intersection design	0	1	3	5	
Eaves width	0	1	2	5	
Envelope complexity	0	1	3	6	
Deck design	0	2	4	6	
Total risk score:					3

(Enter the appropriate risk severity score for each risk factor in the score columns. Transfer these figures across to the right-hand column. Finally, add up the figures in the right-hand column to get the total risk score.)

Table 3: Suitable wall claddings  
Paragraphs 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7, 3.1.8, 3.1.9, 3.1.10, 3.1.11, 3.1.12, 3.1.13, 3.1.14, 3.1.15, 3.1.16, 3.1.17, 3.1.18, 3.1.19, 3.1.20, 3.1.21, 3.1.22, 3.1.23, 3.1.24, 3.1.25, 3.1.26, 3.1.27, 3.1.28, 3.1.29, 3.1.30, 3.1.31, 3.1.32, 3.1.33, 3.1.34, 3.1.35, 3.1.36, 3.1.37, 3.1.38, 3.1.39, 3.1.40, 3.1.41, 3.1.42, 3.1.43, 3.1.44, 3.1.45, 3.1.46, 3.1.47, 3.1.48, 3.1.49, 3.1.50, 3.1.51, 3.1.52, 3.1.53, 3.1.54, 3.1.55, 3.1.56, 3.1.57, 3.1.58, 3.1.59, 3.1.60, 3.1.61, 3.1.62, 3.1.63, 3.1.64, 3.1.65, 3.1.66, 3.1.67, 3.1.68, 3.1.69, 3.1.70, 3.1.71, 3.1.72, 3.1.73, 3.1.74, 3.1.75, 3.1.76, 3.1.77, 3.1.78, 3.1.79, 3.1.80, 3.1.81, 3.1.82, 3.1.83, 3.1.84, 3.1.85, 3.1.86, 3.1.87, 3.1.88, 3.1.89, 3.1.90, 3.1.91, 3.1.92, 3.1.93, 3.1.94, 3.1.95, 3.1.96, 3.1.97, 3.1.98, 3.1.99, 3.1.100

Risk Score	Suitable wall claddings <sup>(1)</sup>	
	Direct fixed to framing	Over nominal 20 mm drained cavity
0 - 6	a) Timber weatherboards - all types b) Fibre cement weatherboards c) Vertical profiled metal <sup>(2)</sup> - corrugated and symmetrical d) Fibre cement sheet <sup>(3)</sup> e) Plywood sheet f) EIFS	a) Masonry veneer <sup>(4)</sup> b) Stucco c) Horizontal profiled metal <sup>(2)</sup> - corrugated and trapezoidal only
7 - 12	a) Bevel-back timber weatherboards b) Vertical timber board and batten c) Vertical profiled metal <sup>(2)</sup> - corrugated only	a) Masonry veneer <sup>(4)</sup> b) Stucco c) Horizontal profiled metal - corrugated and trapezoidal only d) Rusticated weatherboards e) Fibre cement weatherboards f) Fibre cement sheet g) Plywood sheet h) EIFS
13 - 20	a) Vertical profiled metal <sup>(2)</sup> - corrugated only	a) Masonry veneer <sup>(4)</sup> b) Stucco c) Horizontal profiled metal - corrugated and trapezoidal only d) Rusticated weatherboards e) Fibre cement weatherboards f) Fibre cement sheet g) Plywood sheet h) EIFS i) Bevel-back weatherboards
Over 20	a) Redesign the building to achieve a lower score, or b) Specific design <ul style="list-style-type: none"> <li>- The design may need changing to reduce the risk</li> <li>- The building consent authority may require more comprehensive details and documentation providing evidence of weathertightness</li> <li>- The building consent authority, designer or owner may require more inspections</li> <li>- A third party audit of the design may be required.</li> </ul>	

NOTES: (1) The wall claddings in this table are limited to those covered in this Acceptable Solution.

(2) Traditional masonry veneer as per SNZ HB 4236, with minimum 40 mm cavity.

(3) Refer Figure 38 for profiles.

(4) Except stucco over a fibre cement backing.

Table 1: Definitions of risk

Paragraph	Table 1: Definitions of risk	Table 1: Definitions of risk
<b>Elevation F</b>		
A: Wind zone	Low risk	Low wind zone as described by NZS 3604
	Medium risk	Medium wind zone as described by NZS 3604
	<u>High risk</u>	High wind zone as described by NZS 3604
	Very high risk	Very high wind zone as described by NZS 3604
B: Number of storeys	<u>Low risk</u>	One storey
	Medium risk	Two storeys in part
	High risk	Two storeys
	Very high risk	More than two storeys
C: Roof/wall intersection design	Low risk	Roof-to-wall intersection fully protected (e.g. hip and gable roof with eaves)
	Medium risk	Roof-to-wall intersection partly exposed (e.g. hip and gable roof with no eaves)
	High risk	Roof-to-wall intersection fully exposed (e.g. parapets, enclosed balustrades or eaves at greater than 90° to vertical with soffit lining)
	<u>Very high risk</u>	Roof elements finishing within the boundaries formed by the exterior walls (e.g. lower ends of aprons, chimneys, dormers etc)
D: Eaves width <sup>(1)(2)</sup>	Low risk	Greater than 600 mm for single storey
	<u>Medium risk</u>	451 – 600 mm for single storey, or over 600 mm for two storey
	High risk	101 – 450 mm for single storey, or 451 – 600 mm for two storey, or greater than 600 mm above two storey
	Very high risk	0 – 100 mm for single storey, or 0 – 450 mm for two storey, or less than 600 mm above two storey
E: Envelope complexity	Low risk	Simple rectangular, L, T or boomerang shape, with single cladding type
	<u>Medium risk</u>	Moderately complex, angular or curved shapes (e.g. Y or arrowhead) with no more than two cladding types
	High risk	Complex, angular or curved shapes (e.g. Y or arrowhead) with multiple cladding types
	Very high risk	As for High risk, but with junctions not covered in C or F of this table (e.g. box windows, pergolas, multi-storey re-entrant shapes etc)
F: Deck design <sup>(3)</sup>	<u>Low risk</u>	None, timber slat deck or porch at ground floor level
	Medium risk	Fully covered in plan by roof, or timber slat deck attached at first or second floor level
	High risk	Enclosed deck exposed in plan or cantilevered at first floor level
	Very high risk	Enclosed deck exposed in plan or cantilevered at second floor level or above

## NOTES:

Amend 2  
Jul 2005

(1) Eaves width measured horizontally from external face of wall cladding to outer edge of overhang, including gutters and fascias.

Amend 2  
Jul 2005

(2) Balustrades and parapets count as 0 mm eaves.

(3) The term deck includes balconies, as described in the Definitions.

Amend 2  
Jul 2005Amend 2  
Jul 2005Amend 2  
Jul 2005Amend 2  
Jul 2005

Table 2: Building envelope risk matrix  
Paragraphs 3.1.2, 3.1.3, 3.1.4

*Eleochar F*

Risk factor	Risk severity				Subtotals for each risk factor
	LOW	MEDIUM	HIGH	VERY HIGH	
Wind zone (per NZS 3604)	0	0	1	2	1
Number of storeys	0	1	2	4	0
Roof/wall intersection design	0	1	3	5	0
Eaves width	0	1	2	5	1
Envelope complexity	0	1	3	6	0
Deck design	0	2	4	6	0
Total risk score:					8

(Enter the appropriate risk severity score for each risk factor in the score columns. Transfer these figures across to the right-hand column. Finally, add up the figures in the right-hand column to get the total risk score.)

Table 3: Suitable wall claddings

Paragraphs 3.1.2, 3.4.1.1, 3.4.2.1, 3.4.2.2, 3.4.3.2, 9.1.1, 9.4.1.2, 9.4.1.3, 9.6, Figure 1

Risk  
Score

Suitable wall claddings<sup>(1)</sup>

Direct fixed to framing

Over nominal 20 mm drained cavity

- 0 – 6
- a) Timber weatherboards – all types
  - b) Fibre cement weatherboards
  - c) Vertical profiled metal <sup>(2)</sup> – corrugated and symmetrical
  - d) Fibre cement sheet <sup>(2)</sup>
  - e) Plywood sheet
  - f) EIFS

- a) Masonry veneer <sup>(2)</sup>
- b) Stucco
- c) Horizontal profiled metal <sup>(2)</sup> – corrugated and trapezoidal only

- 7 – 12
- a) Bevel-back timber weatherboards
  - b) Vertical timber board and batten
  - c) Vertical profiled metal <sup>(2)</sup> – corrugated only

- a) Masonry veneer <sup>(2)</sup>
- b) Stucco
- c) Horizontal profiled metal – corrugated and trapezoidal only
- d) Rusticated weatherboards
- e) Fibre cement weatherboards
- f) Fibre cement sheet
- g) Plywood sheet
- h) EIFS

- 13 – 20
- a) Vertical profiled metal <sup>(2)</sup> – corrugated only

- a) Masonry veneer <sup>(2)</sup>
- b) Stucco
- c) Horizontal profiled metal – corrugated and trapezoidal only
- d) Rusticated weatherboards
- e) Fibre cement weatherboards
- f) Fibre cement sheet
- g) Plywood sheet
- h) EIFS
- i) Bevel-back weatherboards

- Over 20
- a) Redesign the building to achieve a lower score, or
  - b) Specific design

- The design may need changing to reduce the risk
- The building consent authority may require more comprehensive details and documentation providing evidence of weathertightness
- The building consent authority, designer or owner may require more inspections
- A third party audit of the design may be required.

NOTES: (1) The wall claddings in this table are limited to those covered in this Acceptable Solution.

(2) Traditional masonry veneer as per SNZ HB 4236, with minimum 40 mm cavity.

(3) Refer Figure 38 for profiles.

(4) Except stucco over a fibre cement backing.

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005

Amend 2  
Jul 2005



Revised 17/3/08.

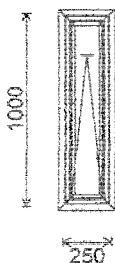
080258

Quote No. : -14817- Ver 11  
Quote Date: 22/02/2008  
Modified Date : 22/02/2008

11

**W11 BEDROOM 3**

1



FRAME COLOUR : To Be Advised FAB20  
FRAME TYPE : WeatherTight Series  
WIND ZONE : High  
LINER : H3 Clear Pine 25mm Architraved Mitre Cut  
GLASS : Clear Float Double Glazed  
HEIGHT FROM FLOOR : 1050  
WALL THICKNESS : 170  
SILL LINER : TRUE

FLASHING : NO Flashing  
TRIM SIZE : 1030mm x 280mm

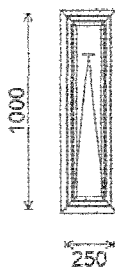
**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

12

**W12 BEDROOM 3**

1



FRAME COLOUR : To Be Advised FAB20  
FRAME TYPE : WeatherTight Series  
WIND ZONE : High  
LINER : H3 Clear Pine 25mm Architraved Mitre Cut  
GLASS : Clear Float Double Glazed  
HEIGHT FROM FLOOR : 1050  
WALL THICKNESS : 170  
SILL LINER : TRUE

FLASHING : NO Flashing  
TRIM SIZE : 1030mm x 280mm

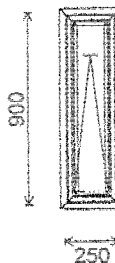
**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

13

**W13 ENSUITE CLEAR Safety**

1



FRAME COLOUR : To Be Advised FAB20  
FRAME TYPE : WeatherTight Series  
WIND ZONE : High  
LINER : H3 Clear Pine 25mm Architraved Mitre Cut  
GLASS : T4F/A4F  
HEIGHT FROM FLOOR : 1100  
WALL THICKNESS : 170  
SILL LINER : TRUE

FLASHING : NO Flashing  
TRIM SIZE : 930mm x 280mm

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

14

**W14 ENSUITE CLEAR SAFETY**

1

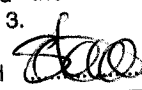


FRAME COLOUR : To Be Advised FAB20  
FRAME TYPE : WeatherTight Series  
WIND ZONE : High  
LINER : H3 Clear Pine 25mm Architraved Mitre Cut  
GLASS : T4F/A4F  
HEIGHT FROM FLOOR : 1100  
WALL THICKNESS : 170  
SILL LINER : TRUE

FLASHING : NO Flashing  
TRIM SIZE : 930mm x 280mm

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

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**GIB® Wall Bracing Calculation Sheet A**

single storey

V85A

GIB® EzyBrace™

GIB® Bracing Systems, 2006

**Job Details**

Name	Buildbest Construction Limited	(BEDROOM BLOCK)
Street and Number	685 Depot Road	
Lot and DP Number	Lot 8 part of Lot 2 DP 59418	
City/Town/District	Oxford	
Designer and date	M D McDowell	17-Mar-08
Company Name	Buildbest Construction	

**Building Specification**

Location of Storey	single	◆◆	
Floor Loading	2 kPa	◆◆	
Foundation Type	slab	◆◆	
Building Height to Apex (m)	6	◆◆	
Roof Height above Eaves (m)	3	◆◆	
Stud Height (m)	2.4	◆◆	
Cladding Weight (top or single)	heavy	◆◆	
Cladding Weight (lower)	heavy	◆◆	not applicable (single storey building)
Cladding Weight (subfloor)	light	◆◆	not applicable (slab)
Roof Weight	light	◆◆	
Roof Pitch (degrees)	0-25	◆◆	
Room in Roof Space	no	◆◆	
Building Length (m)	10.5		
Building Width (m)	7.3		
Gross Building Plan Area (m2)	72		

**Building Location**

<b>Wind Zone</b>	<b>High</b>		<b>Earthquake Zone</b>	
Region	R1	◆◆	B	◆◆
Terrain	Inland	◆◆		
Exposure	Exposed	◆◆		
Topography	Moderate	◆◆		

**Bracing Units required for Wind**

<b>per m</b>	<b>subfloor</b>	<b>walls</b>
W along	n/a	78 BUs/m
W across	n/a	78 BUs/m
<b>Totals</b>	<b>subfloor</b>	<b>walls</b>
W along	n/a	569 BUs
W across	n/a	819 BUs

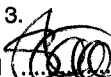
**Bracing Units required for Earthquake**

<b>per m2</b>	<b>subfloor</b>	<b>walls</b>
E	n/a	3.9 BUs/m2
<b>Totals</b>	<b>subfloor</b>	<b>walls</b>
E along	n/a	281 BUs
E across	n/a	281 BUs

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**GIB® Wall Bracing Calculation Sheet B**

single storey

V85A

GIB® EzyBrace™

GIB® Bracing Systems, 2006

Along		Bracing Elements provided						Wind	Earthq.
1	2	3	4	5	7	8	6	9W	10EQ
Line Label	Minimum BUs Req/Ach	Bracing Element No.	Supplier	Bracing Type	Element Length L (m)	Element Height H (m)	Angle to Bracing line (degrees)	BUs Achieved	BUs Achieved
<b>A</b>	enter	1	GIB®	GS1a	2.7	2.4		203	176
		2							
line totals		3							
W	203	4							
EQ	176	5							
<b>B</b>	enter	1	GIB®	GS1a	2.4	2.4		180	156
		2							
line totals		3							
W	180	4							
EQ	156	5							
<b>C</b>	enter	1	GIB®	GS1a	1.8	2.4		117	99
		2							
line totals		3							
W	117	4							
EQ	99	5							
<b>D</b>	enter	1	GIB®	GS1a	1.8	2.4		117	99
		2							
line totals		3							
W	117	4							
EQ	99	5							
<b>E</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>F</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>G</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>H</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							


Wind Earthq.

Totals Achieved 617 530

OK OK

Totals Required (from Sheet A) 569 281

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**GIB® Wall Bracing Calculation Sheet B**

single storey

V85A

GIB® EzyBrace™

GIB® Bracing Systems, 2006

Across									
Wall or Bracing Line		Bracing Elements provided						Wind	Earthq.
1	2	3	4	5	7	8	6	9W	10EQ
Line Label	Minimum BUs Req/Ach	Bracing Element No.	Supplier	Bracing Type	Element Length L (m)	Element Height H (m)	Angle to Bracing line (degrees)	BUs Achieved	BUs Achieved
<b>M</b>	enter	1	GIB®	GS1a	2.3	2.4		150	127
		2							
line totals		3							
W	150	4							
EQ	127	5							
<b>N</b>	enter	1	GIB®	GS2	3.2	2.4		288	256
		2							
line totals		3							
W	288	4							
EQ	256	5							
<b>O</b>	enter	1	GIB®	GS1a	1.8	2.4		117	99
		2							
line totals		3							
W	117	4							
EQ	99	5							
<b>P</b>	enter	1	GIB®	GS2	3.4	2.4		306	272
		2							
line totals		3							
W	306	4							
EQ	272	5							
<b>Q</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>R</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>S</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>T</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							

Wind Earthq.

Totals Achieved								861	754
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Totals Required (from Sheet A)									
--------------------------------	--	--	--	--	--	--	--	--	--

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**GIB® Wall Bracing Calculation Sheet A**

single storey

V85A

GIB® EzyBrace™

GIB® Bracing Systems, 2006

**Job Details**

Name	Buildbest Construction Limited	(GARAGE BLOCK)
Street and Number	685 Depot Road	
Lot and DP Number	Lot 8 part of Lot 2 DP 59418	
City/Town/District	Oxford	
Designer and date	M D McDowell	17-Mar-08
Company Name	Buildbest Construction	

**Building Specification**

Location of Storey	single	◆◆	
Floor Loading	2 kPa	◆◆	
Foundation Type	slab	◆◆	
Building Height to Apex (m)	6	◆◆	
Roof Height above Eaves (m)	3	◆◆	
Stud Height (m)	2.4	◆◆	
Cladding Weight (top or single)	heavy	◆◆	
Cladding Weight (lower)	heavy	◆◆	not applicable (single storey building)
Cladding Weight (subfloor)	light	◆◆	not applicable (slab)
Roof Weight	light	◆◆	
Roof Pitch (degrees)	0-25	◆◆	
Room in Roof Space	no	◆◆	
Building Length (m)	14		
Building Width (m)	6.7		
Gross Building Plan Area (m2)	100		

**Building Location**

<b>Wind Zone</b>	<b>High</b>		<b>Earthquake Zone</b>	
Region	R1	◆◆	B	◆◆
Terrain	Inland	◆◆		
Exposure	Exposed	◆◆		
Topography	Moderate	◆◆		

**Bracing Units required for Wind**

<b>per m</b>	<b>subfloor</b>	<b>walls</b>
W along	n/a	78 BUs/m
W across	n/a	78 BUs/m
<b>Totals</b>	<b>subfloor</b>	<b>walls</b>
W along	n/a	523 BUs
W across	n/a	1092 BUs

**Bracing Units required for Earthquake**

<b>per m2</b>	<b>subfloor</b>	<b>walls</b>
E	n/a	3.9 BUs/m2
<b>Totals</b>	<b>subfloor</b>	<b>walls</b>
E along	n/a	390 BUs
E across	n/a	390 BUs

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## GIB® Wall Bracing Calculation Sheet B

single storey

V85A

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Along									
Wall or Bracing Line		Bracing Elements provided						Wind	Earthq.
1	2	3	4	5	7	8	6	9W	10EQ
Line Label	Minimum BUs Req/Ach	Bracing Element No.	Supplier	Bracing Type	Element Length L (m)	Element Height H (m)	Angle to Bracing line (degrees)	BUs Achieved	BUs Achieved
<b>A</b>	enter	1	GIB®	GS1a	1.8	2.4		117	99
		2	GIB®	GS1a	2.7	2.4		203	176
line totals		3							
W	320	4							
EQ	275	5							
<b>B</b>	enter	1	GIB®	GS1a	1.8	2.4		117	99
		2							
line totals		3							
W	117	4							
EQ	99	5							
<b>C</b>	enter	1	GIB®	GS1a	1.8	2.4		117	99
		2	GIB®	BL1	0.9	2.4		113	104
line totals		3							
W	230	4							
EQ	203	5							
<b>D</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>E</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>F</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>G</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>H</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							

Wind Earthq.

Totals Achieved								666	576
-----------------	--	--	--	--	--	--	--	-----	-----

OK OK

Totals Required (from Sheet A)								523	390
--------------------------------	--	--	--	--	--	--	--	-----	-----

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**GIB® Wall Bracing Calculation Sheet B**

single storey

V85A

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Across									
Wall or Bracing Line		Bracing Elements provided						Wind	Earthq.
1	2	3	4	5	7	8	6	9W	10EQ
Line Label	Minimum BUs Req/Ach	Bracing Element No.	Supplier	Bracing Type	Element Length L (m)	Element Height H (m)	Angle to Bracing line (degrees)	BUs Achieved	BUs Achieved
<b>M</b>	enter	1	GIB®	GS1a	1.8	2.4		117	99
		2							
line totals		3							
W	117	4							
EQ	99	5							
<b>N</b>	enter	1	GIB®	BL1	1.1	2.4		138	127
		2	GIB®	GS2	1.6	2.4	45	79	68
line totals		3	GIB®	GS2	1.2	2.4		84	72
W	301	4							
EQ	266	5							
<b>O</b>	enter	1	GIB®	GS2	4.8	2.4		432	384
		2							
line totals		3							
W	432	4							
EQ	384	5							
<b>P</b>	enter	1	GIB®	GS1a	3.6	2.4		270	234
		2							
line totals		3							
W	270	4							
EQ	234	5							
<b>Q</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>R</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>S</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							
<b>T</b>	enter	1							
		2							
line totals		3							
W		4							
EQ		5							

								Wind	Earthq.
Totals Achieved								1120	983

								OK	OK
Totals Required (from Sheet A)								1092	990

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**Figure 40: Profiled metal stopends**  
Paragraph 8.4.13, Figure 7

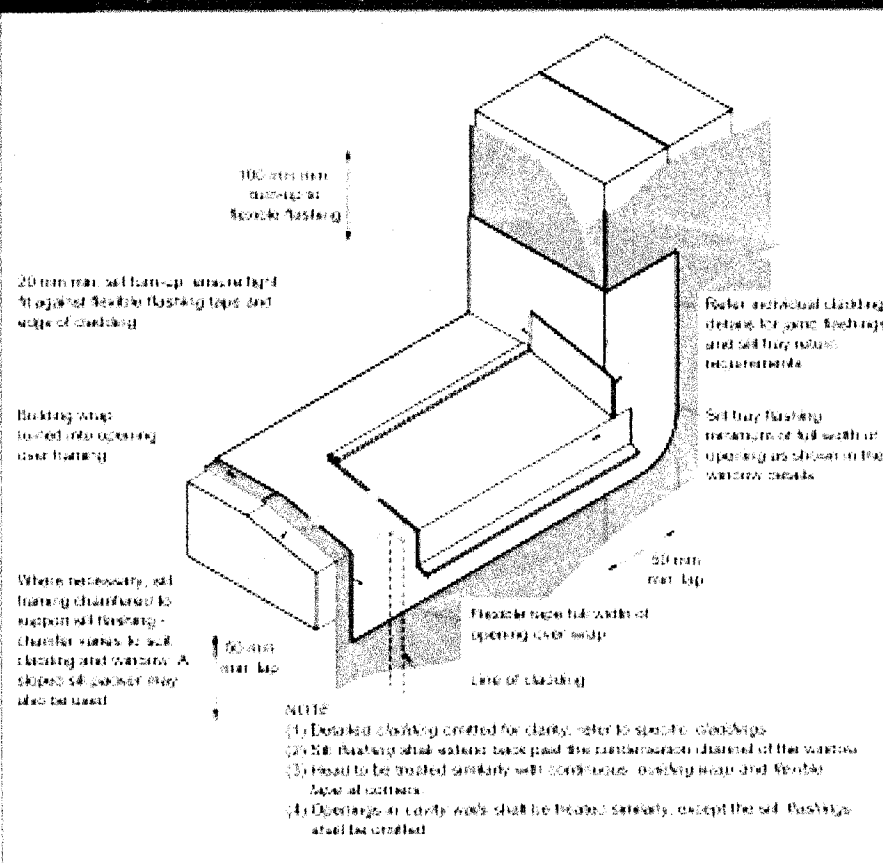
Fast up kerbs using  
purpose specific tool



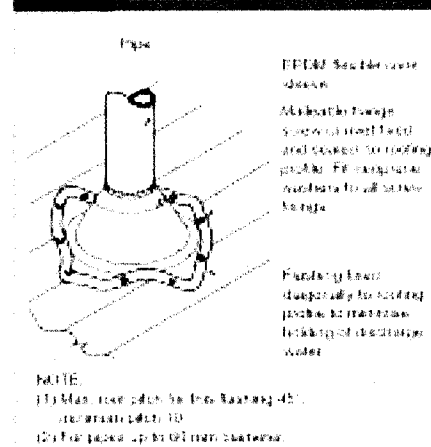
NO CORRUGATED PROFILE



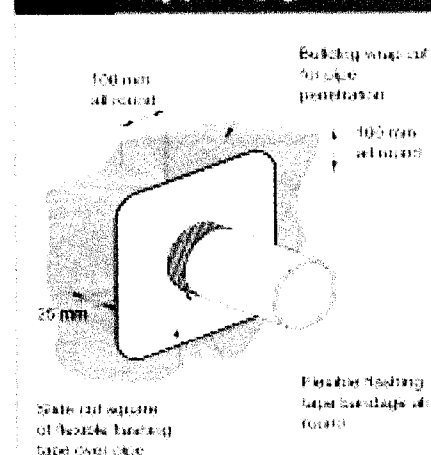
**Figure 72: General window opening**  
Paragraphs 9.1.5 and 9.1.10.2, Figures 78, 81-85, 90, 91, 95, 99, 115, 116, 127 and 128



**Figure 53: Flashing for small pipes**  
Paragraphs 8.3.10, 8.4.17 a), 9.6.8.5  
and 9.6.9.6



**Figure 62: General pipe penetration**  
Paragraph 9.1.9.3, Figure 125



080258

HOMES DIRECT  
P.O.Box 43  
OXFORD  
0274 375 275

Client:  
BUILDBEST CONSTRUCTION LIMITED

Builder:  
BUILDBEST CONSTRUCTION LIMITED

Drawing:  
Miscellaneous details

Scales: NTS

Area:

Drawn: MMD

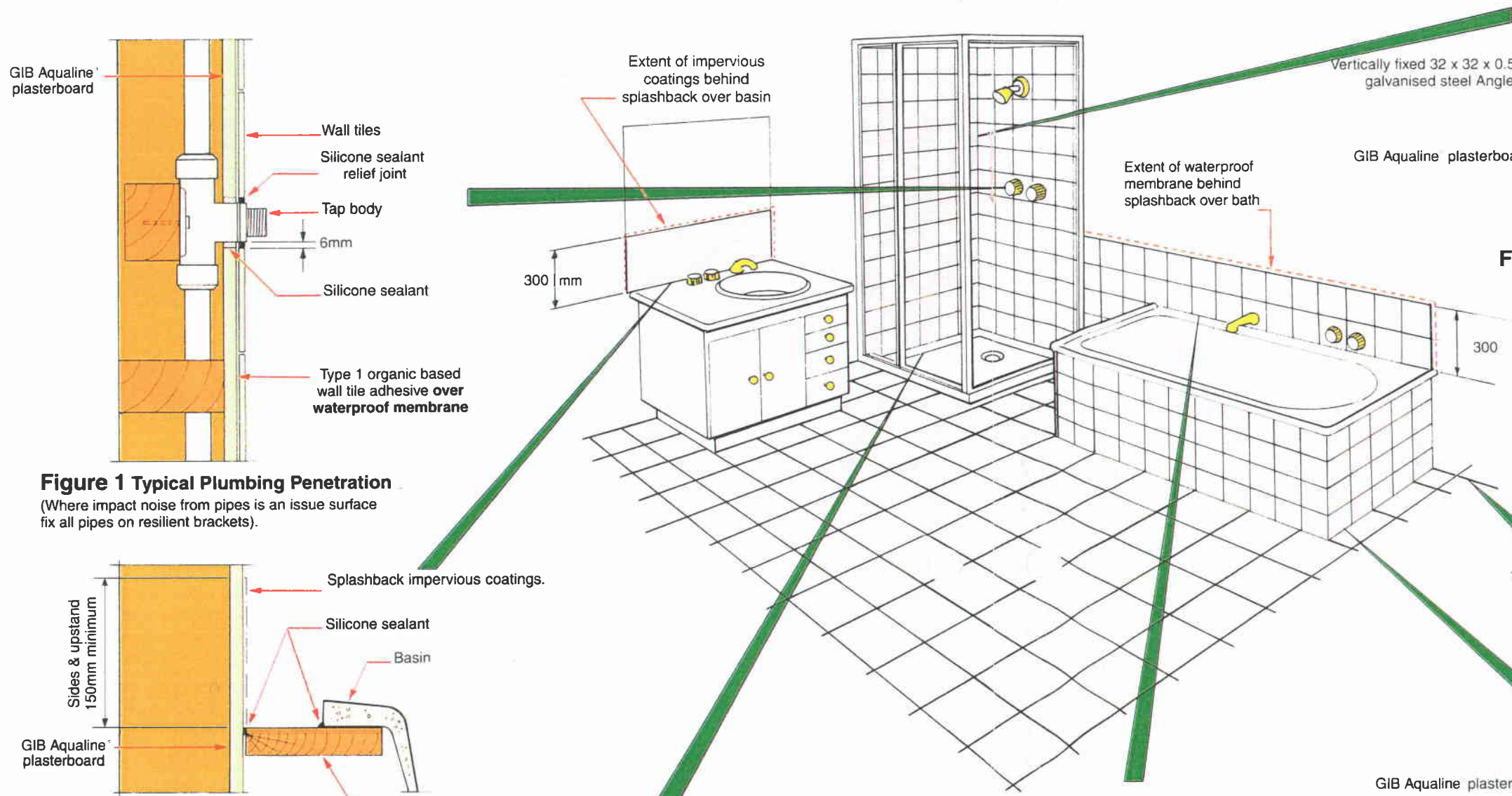
Date: 18 feb 08

Designer: MMD

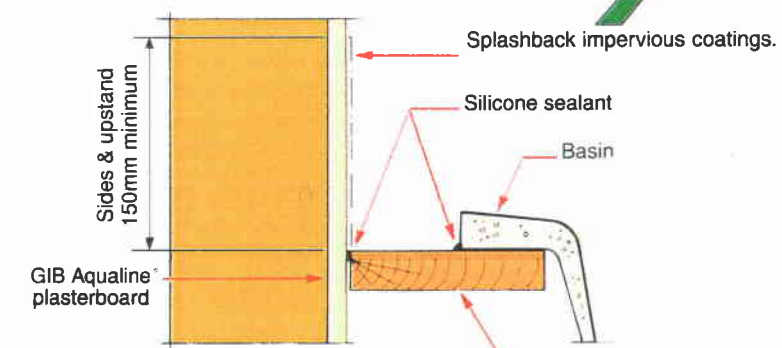
Sheet: 14

Of: 14

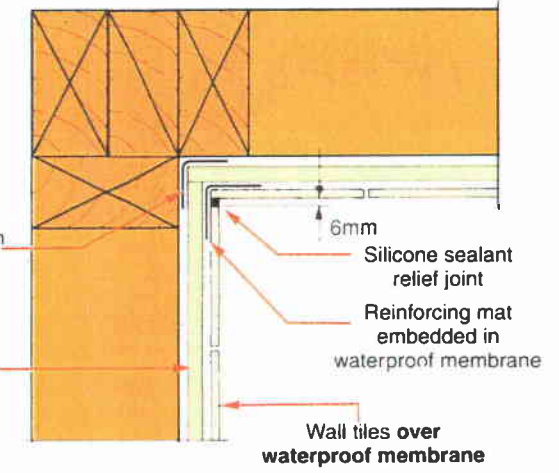
# Typical Wet Area Details – Timber Frame



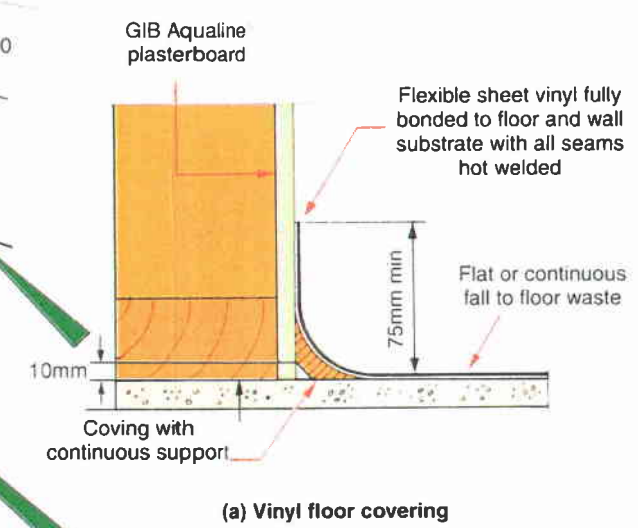
**Figure 1 Typical Plumbing Penetration**  
(Where impact noise from pipes is an issue surface fix all pipes on resilient brackets).



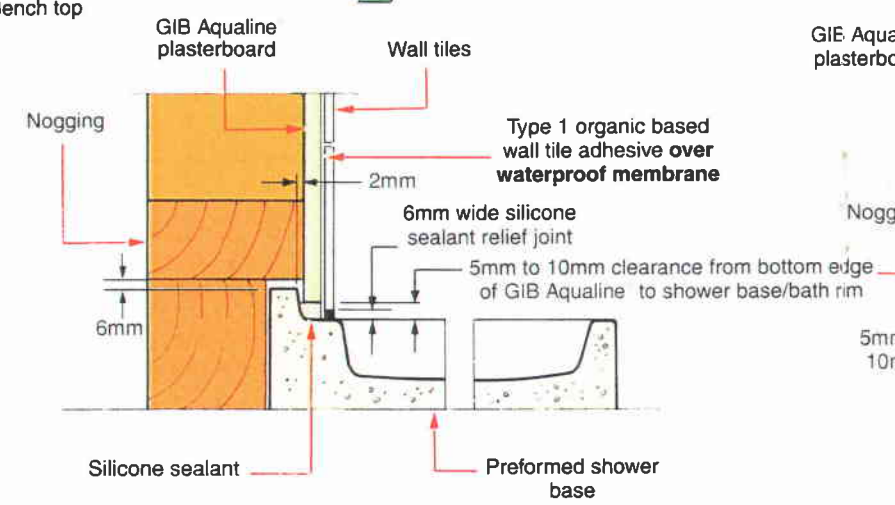
**Figure 2 Tub, sink and basin**



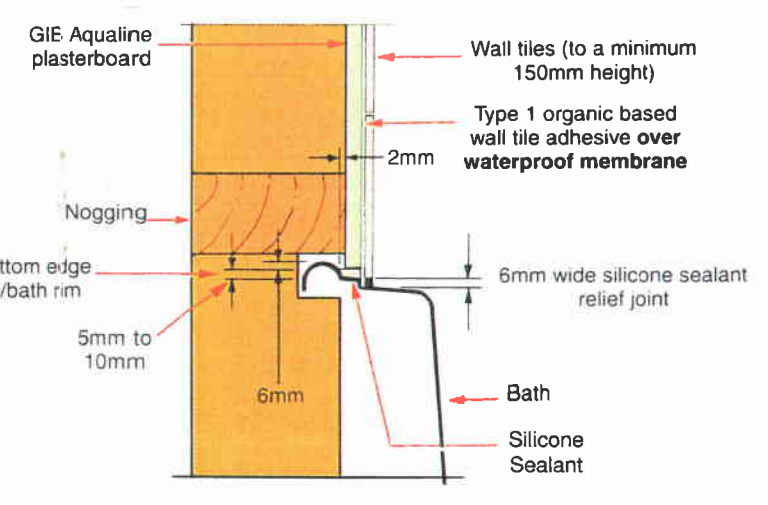
**Figure 6 Tiled Shower – Internal Corner Detail**



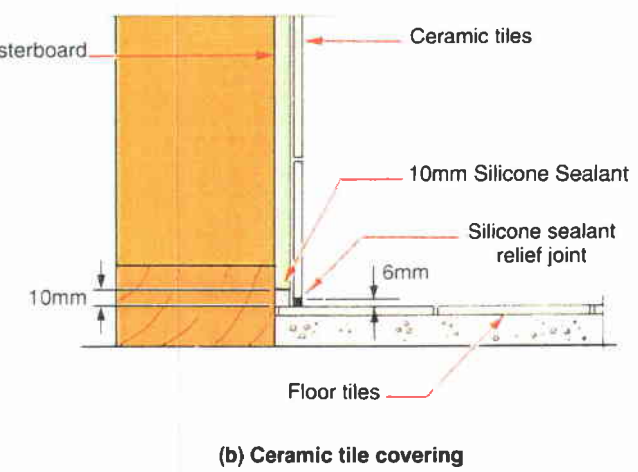
**(a) Vinyl floor covering**



**Figure 3 Preformed Shower Base Wall Junction**  
(Suitable where fire and sound ratings are not critical)



**Figure 4 Bath Wall Junction Detail**  
(This detail is not permitted in Fire Rated or Noise Controlled areas)



**(b) Ceramic tile covering**

**Figure 5 Wall to Floor Junctions**

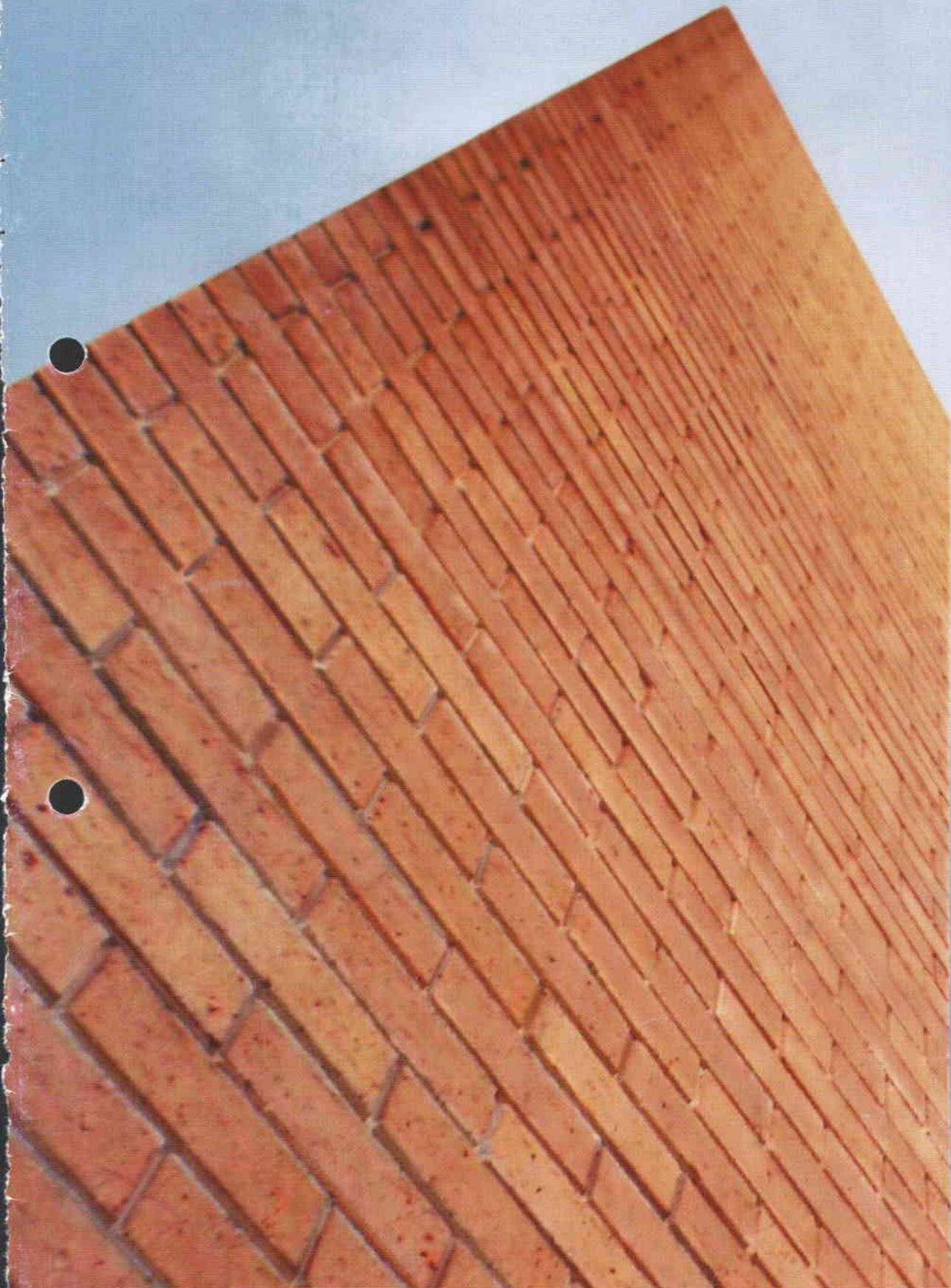
Bathrooms, Kitchens and Laundries

- Notes:**
- Silicone sealants shall be of the mould inhibited type.
  - For details on Fire Rated and/or Noise Control systems, refer pages 16, 17.

Waimakariri District Council  
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, clause 3.  
Signed 28/3/08



# TWO STORY BRICK VENEER SYSTEM TECHNICAL SPECIFICATION



BRANZ  
Appraisal  
Certificate  
No. 521  
(2006)

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## **1.0 General Information**

### **1.1 Introduction**

The Two Storey Brick Veneer System is a 70, 76, 80 or 90 mm natural clay brick veneer external wall cladding system for two storey residential and light commercial type buildings where domestic construction techniques are used.

The Two Storey Brick Veneer System allows brick veneer cladding to be erected to a height greater than that specified by NZS 3604 by incorporating a slip joint system that effectively structurally separates the veneer at an intermediate height. This separation then allows the top and bottom panels to move independently should a major earthquake event occur, thereby minimising the likelihood of structural damage to the veneer.

This technical specification gives guidance to designers on how to construct two storey brick veneer houses without having to consult a structural engineer for a specific design.

### **1.2 BRANZ Appraisal**

The Two Storey Brick Veneer System has been appraised by BRANZ. Refer to Appraisal Certificate No. 521 (2006).



# GALINTEL<sup>®</sup>

## New Multi-Ribbed Section Angle

080258

**Galintel<sup>®</sup> PTY LTD** has developed a New Multi-Ribbed Section (MRS) Angle suitable for door and window openings. This new light weight, structurally superior lintel provides an excellent surface for rendering. A wide range of spans are available.

### Features & Benefits

- Cost effective and light weight
- Easy and quick to install
- Life long protection against corrosion
- Superior strength through composite action
- Unique Multi-Ribbed section bonding to brick and mortar mix.

### Superior Structural Rigidity

The ribs on the upper side of the Galintel<sup>®</sup> MRS Angle, the mortar and brickwork above, bond to form a composite beam of superior structural rigidity.

### Fully Hot Dip Galvanised

Each Galintel<sup>®</sup> MRS Angle is hot-dip galvanised to Australian/New Zealand Standard AS/NZS 4680-1999 to ensure that all surfaces of the lintel are fully protected.

### Compliance with Building Codes

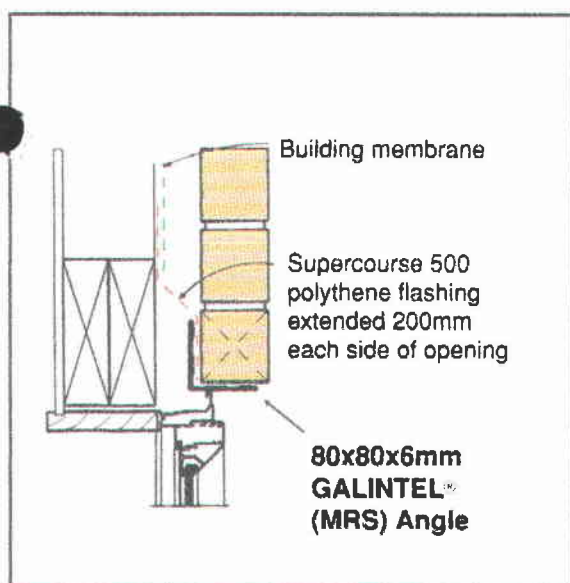
Galintel<sup>®</sup> MRS Angles have been thoroughly tested for strength and structural adequacy to ensure compliance with all relevant Australian and New Zealand building codes by Unisearch Limited, the research and development company of the University of New South Wales, Australia.

### Propping

Galintel<sup>®</sup> MRS Angles must be propped until the mortar is cured to ensure level alignment in accordance with common practice.

### Guaranteed

All Galintel<sup>®</sup> MRS Angles are guaranteed to be free from defects in material and workmanship.



### GALINTEL MRS Angles 80x80x6

#### THICKNESS OF BRICK VENEER (mm)

Maximum lintel span (mm) up to	Maximum height of veneer supported (mm)					
	70			90		
	350	700	2000	350	700	2000
2000	80x80x6	80x80x6	80x80x6	80x80x6	80x80x6	80x80x6
2200	80x80x6	80x80x6	80x80x6	80x80x6	80x80x6	100x100x6
2400	80x80x6	80x80x6	100x100x6	80x80x6	80x80x6	100x100x6
2800	80x80x6	80x80x6	N/A	80x80x6	80x80x6	N/A
3000	80x80x6	80x80x6	N/A	80x80x6	100x100x6	N/A
3600	80x80x6	100x100x6	N/A	100x100x6	N/A	N/A

NOTE: Seating each side: Span less than 1000mm - 100mm  
(End bearing) Span more than 1000mm - 150mm



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### 1.3 Approved Clay Bricks

The Two Storey Brick Veneer System uses natural clay bricks from the following manufacturers:

#### Austral Brick Company Pty. Ltd:

- Type A - 230 x 76 x 70 mm
- Type B - 230 x 119 x 70 mm
- Type C - 230 x 162 x 70 mm
- Type D - 290 x 162 x 70 mm
- Type E - 230 x 110 x 76 mm
- Type F - 290 x 162 x 90 mm

#### Canterbury Clay Bricks:

- Type A - 230 x 76 x 70 mm
- Type B - 230 x 115 x 70 mm
- Type C - 230 x 156 x 70 mm
- Type D - 290 x 160 x 76 mm

#### Clay Bricks Ltd:

- Type A - 230 x 78 x 70 mm
- Type B - 230 x 156 x 70 mm
- Type C - 350 x 200 x 70 mm
- Type D - 350 x 156 x 70 mm
- Type E - 350 x 78 x 70 mm
- Type F - 350 x 78 x 80 mm
- Type G - 350 x 156 x 80 mm
- Type H - 350 x 200 x 80 mm

#### Midland Brick Company:

- Type A - 230 x 76 x 70 mm
- Type B - 230 x 112 x 70 mm
- Type C - 230 x 119 x 70 mm
- Type D - 230 x 162 x 70 mm
- Type E - 290 x 119 x 90 mm
- Type F - 290 x 162 x 90 mm
- Type G - 305 x 162 x 70 mm
- Type H - 305 x 162 x 90 mm

#### South Tile Limited:

- Type A - 230 x 76 x 70 mm
- Type B - 230 x 152 x 70 mm
- Type C - 230 x 162 x 70 mm
- Type D - 230 x 76 x 90 mm
- Type E - 230 x 119 x 90 mm
- Type F - 230 x 162 x 90 mm

**Note:** If brick product other than listed above is to be used, this technical specification and the BRANZ Appraisal become null and void.

Building Consent documents must clearly be marked with the selected brick veneer when specifying the Two Storey Brick Veneer Systems.

### 1.4 Veneer Weights

The approximate weights for the various veneer depths are as follows:

- |  |  |
|--|--|
| ■ 70 mm veneer - 140 kg/m <sup>2</sup> | ■ 76 mm veneer - 152 kg/m <sup>2</sup> |
| ■ 80 mm veneer - 160 kg/m <sup>2</sup> | ■ 90 mm veneer - 180 kg/m <sup>2</sup> |

### 1.5 Packaging, Handling and Storage

Bricks are either packaged in plastic and delivered on pallets or delivered as strapped packs. They must be handled with care to avoid physical damage, particularly to corners and edges, and must be stored so that they are protected from the weather.

Components such as brick ties, lintels and shelf angles must be handled so as to avoid damage. They must also be stored in dry locations protected from the weather.

## 2.0 Design Information

### 2.1 Design Responsibility

The Specifier for the project must ensure that the details in this literature are suitable for the intended application and that additional detailing is provided for specific design or any areas that fall outside the scope and specifications of this literature.

### 2.2 Scope

This technical specification covers the use of the Two Storey Brick Veneer System as an external wall cladding for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1 Paragraph 1.1 in terms of floor area, and with a maximum of two stories; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1 Table 2; and,
- with timber framing constructed on slab-on-ground in accordance with NZS 3604 and/or concrete masonry constructed in accordance with NZS 4229; and,
- with a maximum veneer height of 7 m above the supporting foundation, except that at gable ends this height is measured to the mid-point of the gable, and a maximum height of 2.4 m above a roof line; and,
- with a depth of cavity of between 40 mm and 60 mm; and,
- with a minimum plan veneer length of 300 mm; and,
- situated in NZS 3604 Building Wind Zones up to and including 'Very High'.

The Two Storey Brick Veneer System must only be installed on vertical surfaces.

The Two Storey Brick Veneer System is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *(The Two Storey Brick Veneer System relies on the joinery meeting the requirements of NZS 4211 for the relevant Building Wind Zone).*

For applications which are outside the scope of this literature and details which are not in this literature the specifier must ensure that the design meets the relevant performance requirements of the NZBC.

It is recommended that professional design advice is sought in these circumstances.

## 2.3 Building Regulations

The Two Storey Brick Veneer System if designed, used and installed in accordance with the statements and conditions of this literature and the supporting BRANZ Appraisal, will meet the following provisions of the New Zealand Building Code:

- Clause B1 Structure
- Clause B2 Durability
- Clause C3 Spread of Fire
- Clause E2 External Moisture
- Clause F2 Hazardous Building Materials

## 2.4 Foundations

Foundations supporting the Two Storey Brick Veneer System shall consist of concrete slab-on-ground systems complying with either NZS 3604 or NZS 4229, or be to specific design in accordance with NZS 4203.

The foundation recess shall have a minimum depth of 50 mm. The width of the ledge on which the brick veneer sits shall be minimum 110 mm for 70 mm bricks and minimum 130 mm for 80 and 90 mm bricks to permit a minimum 40 mm cavity between the veneer and the wall frame. Where required, bricks may overhang the face of the foundation by 10 mm maximum.

Refer to Detail No. 1 for further guidance on the installation of the Two Storey Brick Veneer System at foundation level.

## 2.5 Structure and Framing

Timber framing must comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604. Buildings or parts of buildings outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and NZS 4203. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. Use of timber framing must be in accordance with framing manufacturer's specifications.

All timber framing, including studs, floor joists and lintels must be kiln dried to a maximum of 18% moisture content and must be treated to a minimum of H1.2 as defined in NZS 3602:2003 Timber and wood-based products for use in building.

Walls to which the veneer is attached must be constructed from actual minimum dried size 90 x 45 mm, VSG8 or MSG8, or better, timber framing. Studs must be at maximum 400 mm centres.

**Note:** *Ensure that timber framing is kept as dry as possible during all stages of the construction. Water should not be allowed to pond on floors for any length of time.*

### 2.5.1 Structural Beams

Where the Two Storey Brick Veneer System is not continuous down to the foundation and is supported on a structural beam, a Chartered Professional Engineer shall specifically design the beam. It is recommended that for beam spans of more than 1 metre, the beam is designed in steel to reduce creep deflections. Long term deflections of the beam shall be limited to span/500.

## 2.6 Framing Tolerances

In order to achieve an acceptable wall finish, it is imperative that framing is straight and true. Framing tolerances must comply with the requirements of NZS 3604:1999.



## 2.7 Veneer Lintel Angles

Veneer lintel angles are required wherever the Two Storey Brick Veneer System continues above an opening in the exterior wall, e.g. a window or door.

Veneer lintel angles must comply with the durability requirements of AS/NZS 2699.3:2002

*Built-in components for masonry construction - Lintels and shelf angles (durability requirements).*

Lintel angles shall be sized in accordance with Tables 1, 2, 3 and 4. Tables 1 and 2 shall be used where there is continuous clay brick veneer above an opening, and Tables 3 and 4 shall be used where there are openings in the veneer over a lower opening.

**Note:** The maximum height of clay brick veneer above a lintel opening is 3 m.

Table 1: Veneer lintel angles for 70 mm bricks where the brick over the opening is continuous

Max clear width between brick – lintel span	Size of lintel	Maximum height supported
<1.8m	60 x 60 x 6	3.0m
<2.4m	80 x 80 x 6	3.0m
<3.0m	125 x 75 x 8	3.0m
>3.0m	SED	-

**Note:** The 125 x 75 x 8 lintel shall be installed with the long leg vertical.

SED = Specific Engineering Design

Table 2: Veneer lintel angles for 90 mm bricks where the brick over the opening is continuous

Max clear width between brick – lintel span	Size of lintel	Maximum height supported
<1.6m	60 x 60 x 6	3.0m
<2.2m	80 x 80 x 6	3.0m
<3.0m	125 x 75 x 8	3.0m
>3.0m	SED	-

**Note:** The 125 x 75 x 8 lintel shall be installed with the long leg vertical.

SED = Specific Engineering Design

Table 3: Veneer lintel angles for 70 mm bricks where the brick over the opening is NOT continuous

Max clear width between brick – lintel span	Size of lintel	Maximum height supported
<1.2m	60 x 60 x 6	3.0m
<2.0m	80 x 80 x 6	3.0m
<2.5m	125 x 75 x 8	3.0m
<2.8m	125 x 75 x 8	2.4m
<3.0m	125 x 75 x 8	2.0m

**Note:** The 125 x 75 x 8 lintel shall be installed with the long leg vertical.

Table 4: Veneer lintel angles for 90 mm bricks where the brick over the opening is NOT continuous

Max clear width between brick – lintel span	Size of lintel	Maximum height supported
<1.2m	60 x 60 x 6	2.4m
<2.0m	80 x 80 x 6	2.4m
<2.5m	125 x 75 x 8	3.0m
<2.8m	125 x 75 x 8	2.4m
<3.0m	125 x 75 x 8	2.0m

**Note:** The 125 x 75 x 8 lintel shall be installed with the long leg vertical.

The seating of veneer lintel angles for the Two Storey Brick Veneer System shall be in accordance with Table 5.

Table 5: Lintel angle seating

Span of opening	Seating mm
≤ 2m	100mm
> 2m	200mm

## 2.8 Shelf Angles

Where the Two Storey Brick Veneer System continues above a roof line (as will typically occur in two storey construction), they will either be supported on a horizontal shelf angle with a skirt roof below, or on a sloping shelf angle adjacent to the sloping roof plane (Refer to Detail No's. 2, 3, 4 and 5). Other situations where a shelf angle will be required include:

- Veneer being supported above a large opening outside the scope of Tables 1, 2, 3 and 4

Shelf angles must comply with the durability requirements of AS/NZS 2699.3:2002. *Built-in components for masonry construction - Lintels and shelf angles (durability requirements).*

The maximum allowable height of brick veneer with a mass of 140 kg/m<sup>2</sup> above a shelf angle is 2.4 m. The maximum allowable height of brick veneer with a mass of 180 kg/m<sup>2</sup> above a shelf angle is 1.8 m when the studs are at 400 mm centres, or 2.4 m when the studs are at 300 mm centres.

Shelf angles shall be sized in accordance with Table 6 and shall be fixed to the timber framing studs with 90 x 10 mm galvanised or stainless steel coach screws (depending on the durability requirements) to each stud.

**Holes drilled in the shelf angles for the coach screw fixings shall be 11 mm in diameter and be located 25 mm down from the top of the angle to the centre of the hole.** Where the coach screw is required to penetrate through plywood sheathing or similar, the length of the screw shall be increased by the thickness of the sheathing. It is recommended that the holes drilled through the shelf angle are coated with metal primer or cold galvanising paint.

Where wall framing supporting brick veneer above shelf angles is not directly supported by walls on foundations or slab thickenings, a Chartered Professional Engineer shall specifically design the support structure to carry the load of the clay brick veneer. It is recommended that for beam spans of more than 1 metre, the beam is designed in steel to reduce creep deflections. Long term deflections of the beam shall be limited to span/500.

*Note: The maximum height of clay brick veneer above a shelf angle is 2.4 m.*

Table 6: Shelf angles

Brick Veneer	Shelf Angle Size
70 mm	100 x 75 x 8 mm
90 mm	125 x 75 x 8 mm

## 2.9 Brick Ties and Fixings

Brick ties and fixings shall be Lumberlock or Eagle (minimum EM Classification) screw ties complying with AS/NZS 2699.1 for 70 or 90 series bricks as appropriate. Ties shall be either hot-dip galvanised or Grade 316 stainless steel to comply with the durability requirements of NZS 4210 Table 2.E1. Screws shall be either hot-dip galvanised or Grade 316 stainless steel, 35 mm x 12g Type 17 hex head screws for timber.

Brick ties may be 'dry bonded', i.e. they may be laid on the top of the brick and then covered with mortar. There is no requirement for the ties to be laid in the middle of the mortar course as required by NZS 3604:1999 Timber Framed Buildings.

Brick ties shall be installed with a 5° down slope away from the wall frame to the brick veneer.

### 2.9.1 Brick Tie Spacing

Brick ties shall comply with the requirements of NZS 4230:2004. *Design of reinforced concrete masonry structures*, NZS 4210:2001 *Masonry Construction: Materials and workmanship*, AS/NZS 2699.1:2000 *Built-in components for masonry construction - Wall ties*, and as noted below. Specific criteria for the maximum spacings of wall ties for the various situations of brick are:

### 2.9.1.1 Clay Brick Veneer up to 4 m in Height

For veneer up to 4 m in height above the foundation, ties shall be located at evenly distributed centres such that the contributory face area of wall to each tie does not exceed 0.2 m<sup>2</sup>. Ties shall be located at stud spacings and number of courses as specified in Table 7.

Table 7: Brick tie spacing for a uniform wall of brick veneer for heights of veneer up to 4m

Vertical dimension of Brick	Height of Brick Veneer Wall	Brick Tie Location
76 mm	< 4m	Every fourth course
119 mm	< 4m	Every third course
162 mm	< 4m	Every second course

### 2.9.1.2 Clay Brick Veneer Above 4m Height

For veneer above 4 m in height above the foundation, ties shall be located at evenly distributed centres such that the contributory face area of wall to each tie does not exceed 0.1 m<sup>2</sup>. Ties shall be located at stud spacings and number of courses as specified in Table 8.

Table 8: Brick tie spacing for a uniform wall of brick veneer for heights of veneer greater than 4m

Vertical dimension of Brick	Height of Brick Veneer Wall	Brick Tie Location
76 mm	> 4m	Every third course
119 mm	> 4m	Every second course
162 mm	> 4m	Every course

### 2.9.2 Openings

Brick ties shall be located at not more than one course from the top and bottom of any opening. Ties shall be located immediately adjacent to the sides of an opening.

### 2.9.3 Corners, Ends, Edges

Ties shall be located immediately adjacent to corners and ends of walls.

### 2.9.4 Gables

In gable areas the brick tie spacing shall be decreased to one half the standard spacing for a raking band width of 800 mm following the top of the veneer.

## 2.10 Weepholes and Ventilation

Clay brick veneer by its nature permits the entry of water into the cavity behind the veneer. Weepholes shall therefore be installed at the bottom of all veneer cavities to allow water to drain. Weepholes shall be installed to provide a minimum 1000 mm<sup>2</sup> per lineal metre of wall. This equates to approximately one 75 mm high by 10 mm wide perpend every 800 mm of wall. The top of the brick veneer wall requires ventilation openings to allow air movement within the cavity to assist the removal of moisture. Sufficient ventilation openings shall be created to provide a minimum of 1000 mm<sup>2</sup> per lineal metre of wall.

## 2.11 Slip Joints

The 2 Storey Brick Veneer System incorporates slip joints along a course of the brick to create a weak point to allow for movement in the event of an earthquake. The slip joint should continue at a constant height around the building.

Slip joints in the Two Storey Brick Veneer System are required at the intermediate floor level and/or 3.0 m in height, whichever is lower.

For gable end walls, more than one slip joint may be required. Where required, the additional slip joint in gable end walls should be located in line with the start of the rake.

Refer to Detail No. 6 for requirements for the construction of slip joints.

## 2.12 Mortar Joints

The mortar used with the Two Storey Brick Veneer System must comply with NZS 4210:2001 *Masonry Construction: Materials and Workmanship*, Section 2.2.

Mortar joints shall be completely filled with mortar, raked out and tooled smooth to a depth of up to but not exceeding 6 mm.

## 2.13 Wall Bracing

Bracing may be calculated using the prescribed tables in NZS 3604:1999 *Timber framed buildings* for installation where the veneer height does not exceed 4 m. For installations with veneer height greater than 4 m, wall bracing for seismic loads shall be calculated in accordance with Table 9.

Minimum values of bracing demand per metre of exterior clay brick veneer wall length shall be calculated in accordance with Table 10.

Table 9: Wall bracing for 2kPa floor load and Clay Brick Veneer wall cladding

Roof Cladding	Roof Pitch (Degrees)	Minimum number of bracing units per square metre for the structure set out below in earthquake zones A, B & C					
		TWO STOREY BUILDINGS					
		Bottom Storey Earthquake Zone			Top Storey Earthquake Zone		
		A	B	C	A	B	C
Light	0-25	22.6	17.0	11.3	13.3	10.0	6.6
	26-45	23.3	17.5	11.7	14.1	10.6	7.1
	46-60	24.6	18.5	12.3	15.7	11.8	7.8
Heavy	0-25	25.5	19.1	12.8	16.7	12.5	8.4
	26-45	27.1	20.3	13.5	18.4	13.8	9.2
	46-60	29.9	22.5	15.0	21.6	16.2	10.8

Table 10: Minimum bracing demand / m of wall length

Height of veneer	Min BU/m length of wall
<3m	10 BU/m
<4m	12 BU/m
<5m	14 BU/m
<6m	16 BU/m

## **2.14 Fire Resistance**

The Two Storey Brick Veneer System has been tested and shown to have a fire resistance rating of greater than 30/30/30 when the internal face of the wall is lined with 13 mm Standard Gib Plasterboard. For further information, contact your brick company.

The Two Storey Brick Veneer System is suitable for use as an external wall cladding on all buildings in accordance with NZBC Acceptable Solution C/AS1 Part 7, Paragraph 7.11.2(a).

## **2.15 Control Joints**

Vertical movement control joints are unnecessary under normal building conditions when using the Two Storey Brick Veneer System. However, there may be situations where vertical control joints are recommended. These are:

- Where the building under consideration is to be built on expansive soils as defined by AS 2870.
- Where the geometry of the brick veneer wall and/or loading pattern onto the house structure may result in differential movement.

In either case the advice of a Chartered Professional Engineer should be obtained.

## **2.16 Window and Door Joinery Flashings**

The head of all window and door joinery shall be flashed with powder coated aluminium head flashings as supplied by the joinery manufacturer or contractor. The head flashing shall span the cavity, be installed with a 15° slope to the exterior and shall overhang the aluminium joinery profile by minimum 10 mm.

Where a steel lintel is being used to support the bricks above the joinery, an additional 200 mm wide flexible flashing shall be installed spanning from the framing across the cavity into the back of the angle. The flashing shall extend 200 mm either side of the opening.

The jambs of all window and door joinery shall be flashed using a 200 mm wide polyethylene flashing. The flashing is to be tucked around and into the edge of the aluminium joinery profile to protect the timber wall frame. The flashing shall be fixed to the timber frame with clouts.

Refer to Details 7, 8 and 9.

## **2.17 Pipe Penetrations**

Pipes and other services may pass across the cavity and through the brick veneer. They are not however, permitted to travel horizontally along the length of the cavity. Pipes and other services should be installed on a 5° down slope towards the veneer and where they penetrate the veneer a flexible sealant is to be installed between the penetration and the brick. Penetrations through the veneer must be kept to a minimum.

Refer to Detail 11.

## **2.18 Other System Components and Accessories**

### **2.18.1 Building Wrap**

The 2 Storey Brick Veneer System must be installed over building paper or wrap complying with NZBC Acceptable Solution E2/AS1, Table 23, or other BRANZ Appraised breather-type membranes.

All buildings must have barriers to airflow in the form of interior linings with all joints stopped, or alternatively unlined gables and walls must incorporate a rigid sheathing or an air barrier fixed to the framing, which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. Non-rigid air barriers must have an air resistance of  $\geq 0.1 \text{ MN s/m}^3$ . Where rigid sheathings are used, the brick tie fixing length must be increased by a minimum of the thickness of the sheathing.

## **2.18.2 Flexible Flashing Tapes**

Flexible sill and jamb flashing tapes shall be installed around all penetration openings in the structural frame. Flexible flashing tapes shall comply with NZBC Acceptable Solution E2/AS1 Paragraph 4.3.11, or be covered by a valid BRANZ Appraisal Certificate for use around window and door joinery openings.

## **2.18.3 Airseals**

Air seals shall be installed in the gap between the joinery reveal and the opening framing. The air seal shall comply with NZBC Acceptable Solution E2/AS1 Paragraph 9.1.6, or be a self-expanding, moisture cure polyurethane foam air seal covered by a valid BRANZ Appraisal Certificate for use around window, door and other wall penetration openings.

## **2.18.4 Sealant**

Where shown in the installation details, gaps between penetrations and the brick veneer shall be sealed with a sealant complying with NZBC Acceptable Solution E2/AS1, or a sealant covered by a valid BRANZ Appraisal Certificate for use as a weather sealing sealant for exterior use. Correct sealant joint principles must be followed.

# **3.0 Installation Information**

## **3.1 System Installation**

This section of the specification should be read in conjunction with the installation details.

### **3.1.1 Building Wrap and Flashing Tapes**

The selected building wrap and flexible sill and jamb tape system must be installed in accordance with the manufacturer's instructions. The building wrap must be installed horizontally and be continuous around corners. Wrap must be lapped 75 mm minimum at horizontal joints and 150 mm minimum over studs at vertical joints. Particular attention must be paid to the installation of the building wrap and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed timber wall framing in the opening is protected. All penetrations through the building wrap must be sealed and joints sealed or lapped 150 mm.

### **3.1.1 Aluminium Joinery Installation**

Aluminium joinery and associated head flashings must be installed in accordance with the window manufacturer's instructions. A 7.5 - 10 mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6 after the joinery has been secured in place.

### **3.1.2 Brick Veneer System Installation**

If possible, bricks should be of one single batch. If this is not possible, bricks from two batches should be thoroughly mixed to avoid obvious colour variations. It is recommended that bricks be selected from at least 3 different pallets or packs simultaneously.

Pallets or packs should always be kept covered so that bricks are laid dry. If rain is likely during construction, the top course and cavity should be covered to reduce the likelihood of efflorescence occurring on the surface of the bricks.

Brickwork should be cleaned thoroughly as construction progresses, as mortar stains can be difficult to remove later. If acid is used for cleaning, industry guidelines must be followed with respect to methods of use and disposal.

Mortar joints should be between 7 and 13 mm thick, with the recommended thickness being 10 mm. Joints can be raked 6 mm and should be tooled to provide a hard smooth surface to reduce water absorption.

### **3.1.3 Over-Roof Support Installation**

The shelf angles should not be fixed to the framing until the veneer below has reached its full height so that the shelf angle can be correctly aligned with the veneer.

Where the shelf angle is fixed above a roof, it is recommended that temporary timber blocks are cut to the slope of the roof below and the correct height to provide temporary support until the steel angle is permanently fixed.

Where the shelf angle is installed on a slope, bricks must be cut to the angle at which the angle slopes, and be laid on a 10 mm thick mortar bed.

Where shelf angles are required, they should be ordered from the fabricator and clearly marked with a marking pen so that their location according to the construction documents is uniquely identified.

Holes should be drilled 11 mm diameter at 25 mm down from the top of the vertical flange, sharp edges filed, and bare metal surfaces painted as soon as possible with 2 coats of zinc rich primer if the angle is hot dip galvanised. To ensure quality is maintained, drilling and painting is best carried out in a fabricator's workshop.

When fixing shelf angles to the timber framing, 6 mm pilot holes must first be drilled into the studs to take the coach screws.

### **3.1.4 Slip Joint Installation**

The slip joint material must be laid directly on to the brickwork at heights specified in Section 2.11.

The slip joint material must then be covered with mortar, and the brick laying continued above the joint.

### **3.1.5 General**

During and after the brick veneer installation it is recommended that internal linings be attached to timber frames by screwing rather than nailing in order to avoid vibration to the veneer that could produce hairline cracks in the mortar.

### **3.1.6 Points to Note:**

During installation of the Two Storey Brick Veneer System, be aware of the following as the weathertightness performance of the system may be affected if any of the following is ignored:

- Do not cover or block ventilation openings and/or drainage paths (weep holes); and,
- Do not allow mortar droppings to build up in the base of the cavity. Ensure all mortar droppings are cleaned out prior to completion of the job; and,
- Do not allow mortar joints to protrude more than 5 mm into the veneer cavity; and,
- Do not puncture the building wrap (notify the builder if the wrap does get inadvertently punctured during installation of the veneer and do not proceed further until it has been repaired); and,
- Ensure the brick ties slope away from the building wrap.

## **4.0 Maintenance**

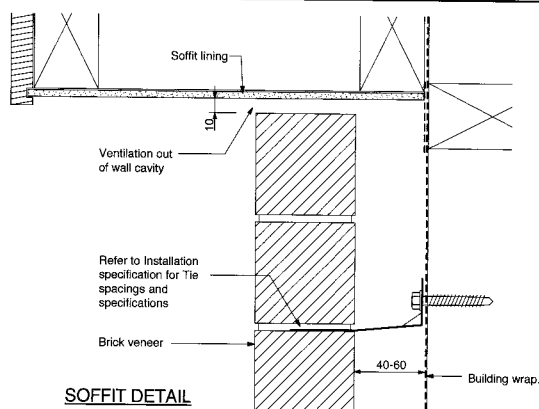
Building owners are responsible for the maintenance of the Two Storey Brick Veneer System.

Annual inspections must be made to ensure that all aspects of the cladding system, including flashings remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress, must be repaired immediately. Weep holes must be kept clear of dust, dirt, spider webs and the like to ensure that moisture can continue to drain from the cavity.

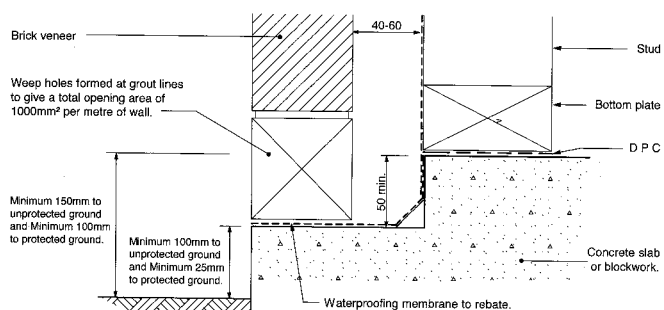
## **5.0 Health & Safety**

Cutting of clay bricks with power tools should be carried out in well ventilated areas. A dust mask and eye protection should be worn.



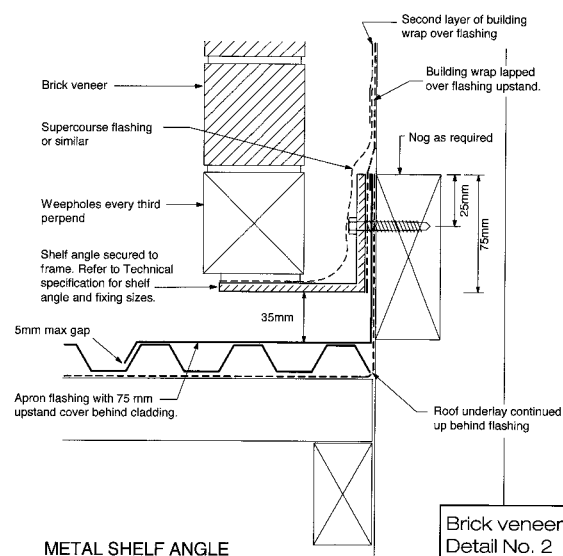


**SOFFIT DETAIL**



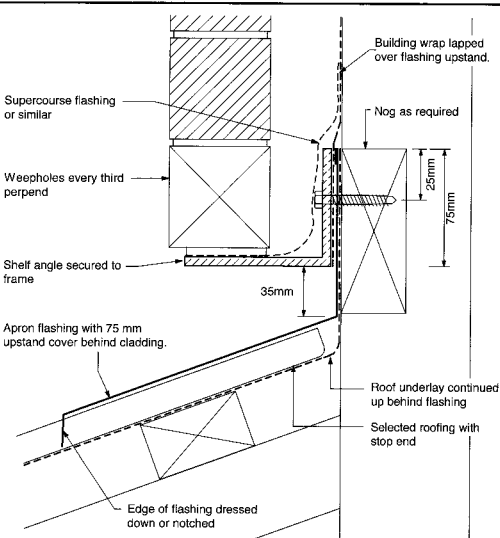
**FOUNDATION DETAIL**

Brick veneer details  
Detail No. 1  
Date 8 August 2006



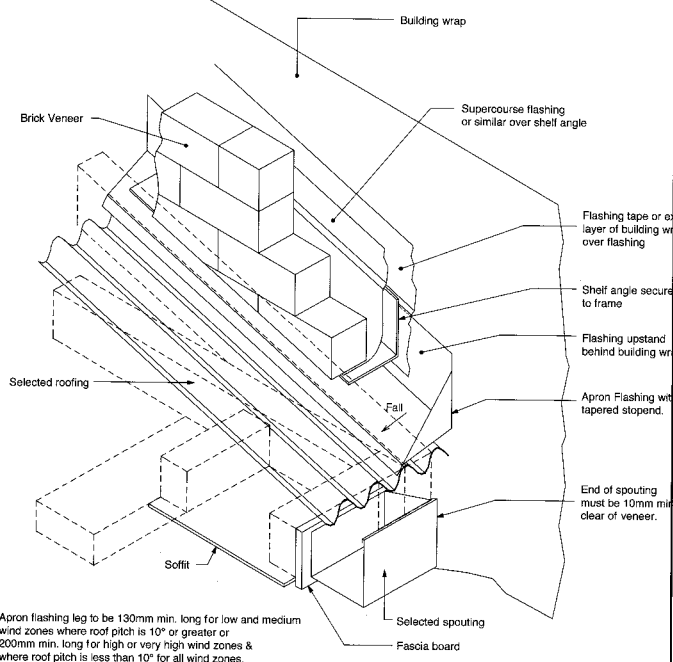
**METAL SHELF ANGLE**

Brick veneer details  
Detail No. 2  
Date 8 August 2006



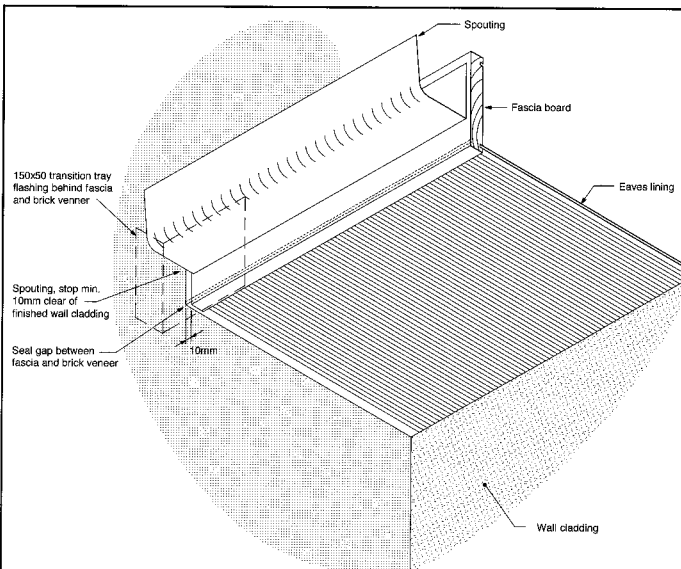
**METAL SHELF ANGLE**

Brick veneer details  
Detail No. 3  
Date 8 August 2006



**GUTTER / WALL JUNCTION**

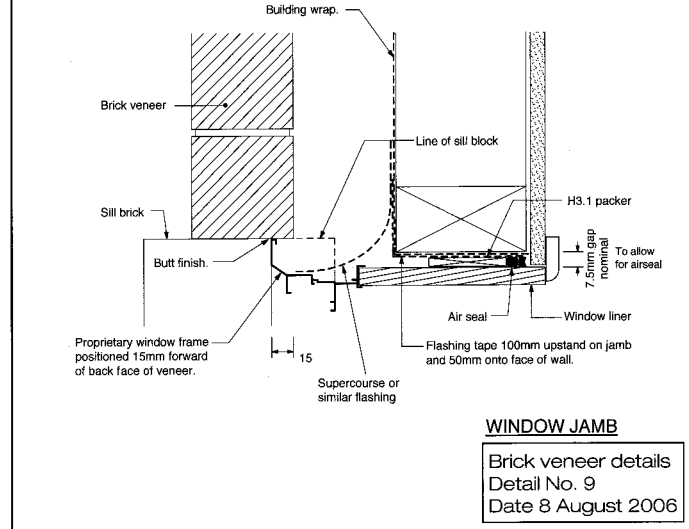
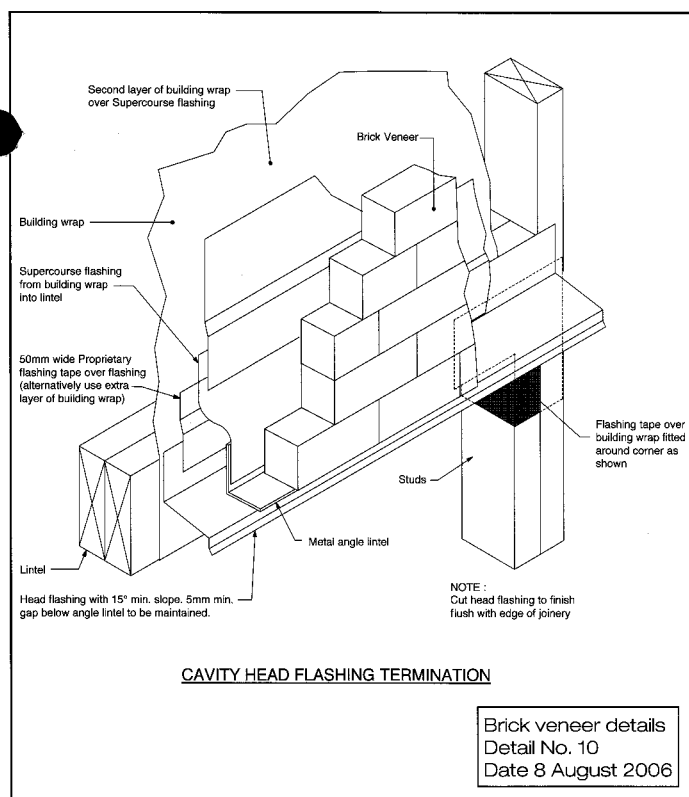
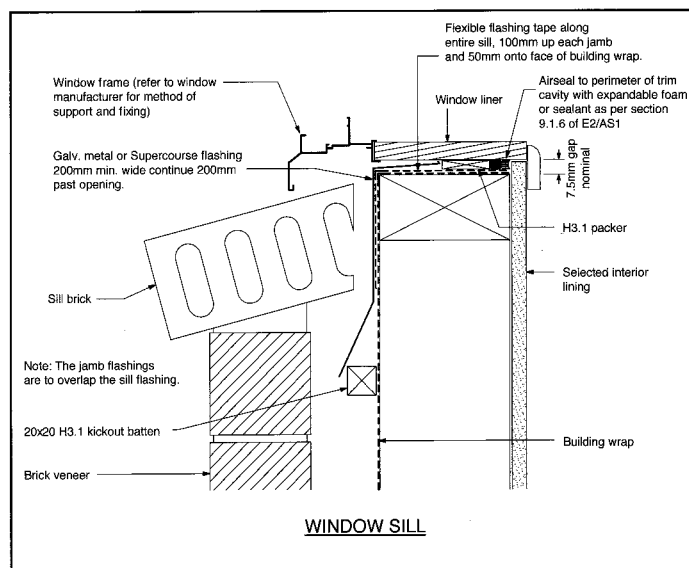
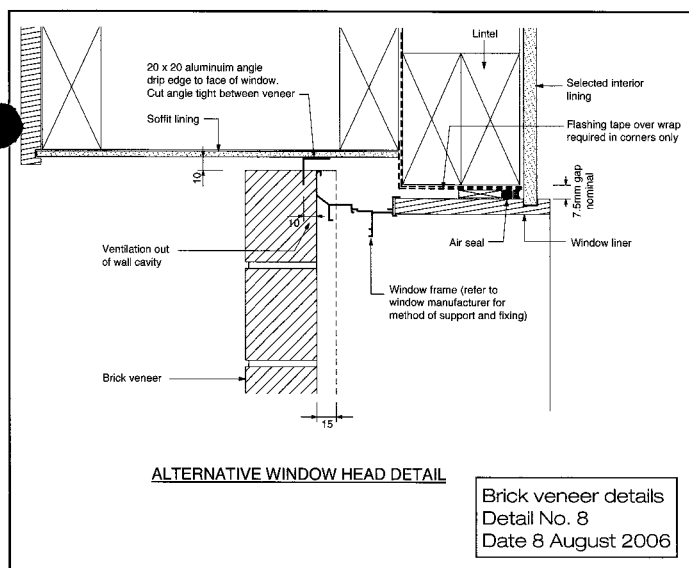
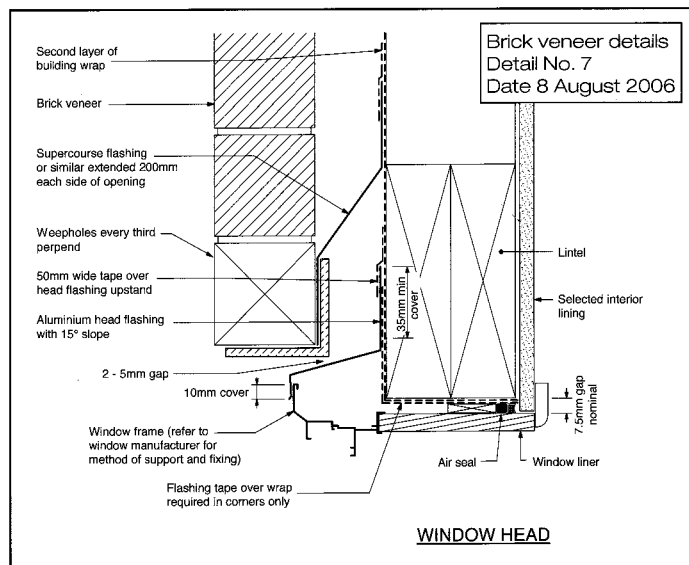
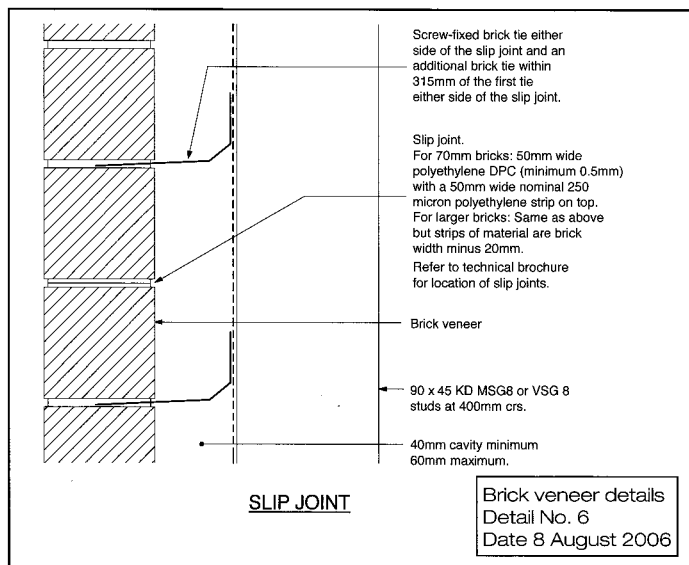
Brick veneer details  
Detail No. 4  
Date 8 August 2006

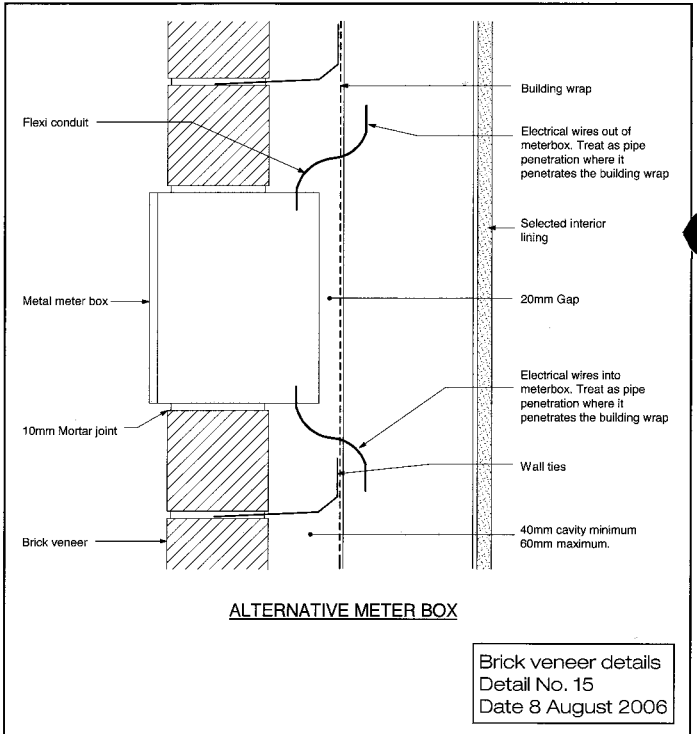
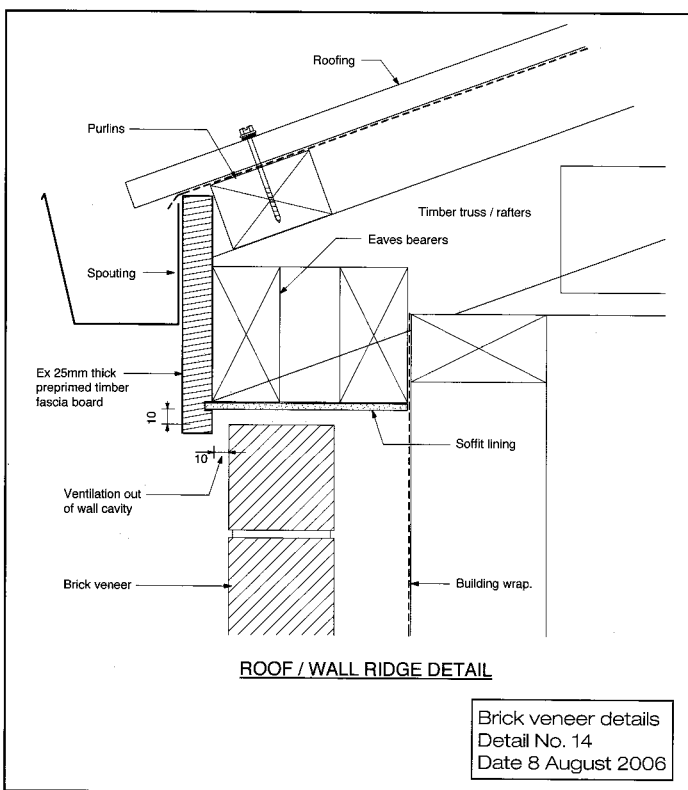
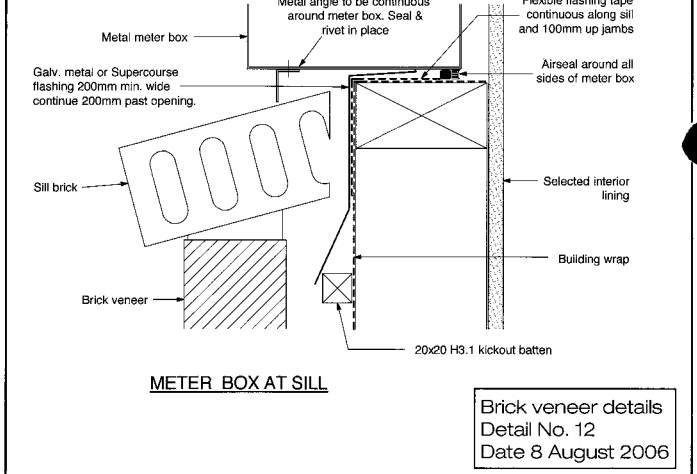
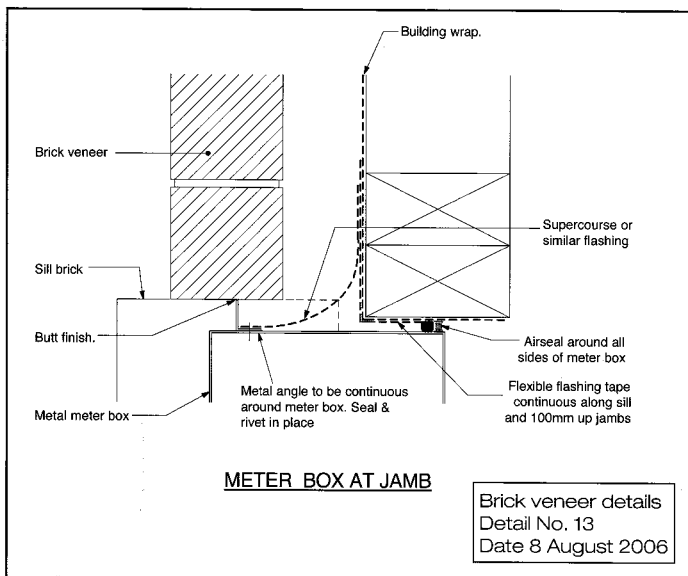
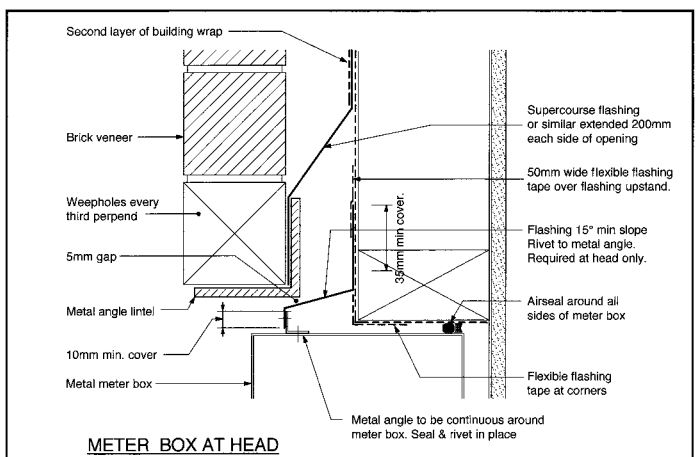
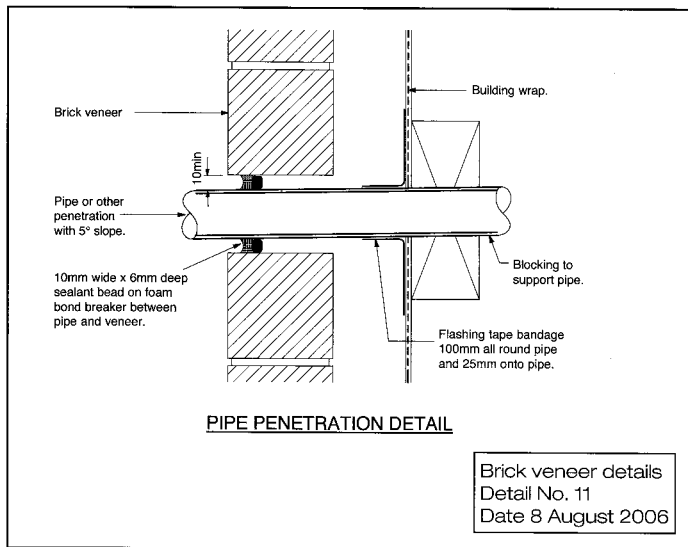


**GUTTER / WALL JUNCTION**

VIEW FROM BELOW

Brick veneer details  
Detail No. 5  
Date 8 August 2006







**BRANZ**  
**APPRAISED**

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**SPECIFY WITH  
CONFIDENCE**

**BRANZ  
APPRAISAL  
CERTIFICATE  
No.521 (2006)**

**TWO STOREY  
BRICK VENEER  
SYSTEM**

[www.branz.co.nz](http://www.branz.co.nz)



Readers are advised to check the validity of this Certificate by referring to the Valid Certificates listing on the BRANZ website, or by contacting BRANZ.

For further information,  
please contact any of the following companies:



Midland Brick Company,

Tel: 0508 MIDLAND (0508 643 5263)  
[www.midlandbrick.co.nz](http://www.midlandbrick.co.nz)



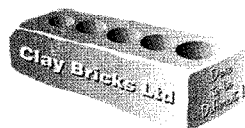
Southtile Limited, 654 North Road,  
Waikiwi, Invercargill

Tel: 03 215 9179 Fax: 03 215 9178



Austral Bricks, Unit 1-99 Sawyers Arms Road,  
Papanui, Christchurch

Tel: 0800 287 8725 Fax: 03 354 0226



Clay Bricks Ltd, 50 Tregoweth Lane, Huntly

Tel: 07 828 9919 Fax: 07 828 9913



Canterbury **ClayBricks**

Canterbury Clay Bricks, Main West Road, Darfield

Tel: 03 318 8203 Fax: 03 318 8171

# SPECIFICATION

of work shown on the accompanying drawings

at

Proposed Lot 8 DP 383229  
685 DEPOT ROAD  
OXFORD

Job number: ***BBCL 2557***

Date: ***7 FEB 2008***

## 11 GENERAL REQUIREMENTS

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### 11.1 THE WORKS

The works are as described in this specification and shown on the drawings.

### 11.2 PERSONNEL

Owner: The person defined as "owner" in the New Zealand Building Code.

Contractor: The person contracted by the owner to carry out the contract.

### 11.3 THE SITE

The site of the works, the site address and the legal description are listed under PROJECT INFORMATION. Confine access and work to the area of site indicated on the drawings.

### 11.4 SPECIFICATION SECTIONS

Sections are for reference and convenience only and do not constitute individual trade sections or work elements.

Read all sections together and read 11 GENERAL REQUIREMENTS with all other sections.

### 11.5 INTERPRETATIONS

Required:	Required by the documents, or by a statutory authority.
Proprietary:	Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
Approval:	Approval in writing.
Direction:	Direction in writing.
Notified:	Notified in writing.

### 11.6 INCONSISTENCIES

If there are any inconsistencies, errors or omissions in or between documents, the contractor must seek direction in resolving it. Figured dimensions take precedence over scaled dimensions; drawings to a larger scale take precedence over drawings to a smaller scale and drawings take precedence over specification.

### 11.7 SUBSTITUTIONS

A substitution may be proposed where specified products are not available, or if substitute products are brought to the attention of and are considered by the owner as equivalent or superior to those specified. Except where a specified product is not available, the owner is not bound to accept any substitutions.

Notify proposed substitution of specified products. Include sufficient information to allow the owner to confirm that the substitution is equivalent or superior to that specified. Advise the owner whether an amendment will or may be required to the Building Consent and the expected costs of such amendment.

### 11.8 THE WORDS "PROVIDE" OR "FIX"

The words "provide" (or "supply") or "fix" if used separately mean "provide and fix" unless explicitly stated otherwise.

### 11.9 MANUFACTURERS AND SUPPLIERS

Manufacturers and suppliers requirements, instructions, specifications or details are those issued by them for their particular material, product or component and are the latest edition.

### 11.10 REFERENCED DOCUMENTS

Reference is made to various New Zealand Building Code (NZBC) acceptable solutions (AS) and verification methods (VM) for criteria and/or methods used to establish compliance with the Building Act 2004. Reference is also made to various Standards produced by Standards New Zealand (NZS, AS/NZS) and to listed Acts, Regulations and various industry codes of practice and practice guides. The latest edition (including amendments and provisional editions) at the date of this specification applies unless stated otherwise. Documents cited both directly and within other cited publications are part of this specification.

### 11.11 PRECEDENCE OF REFERENCED DOCUMENTS

This specification takes precedence in the event of it being at variance with and requiring a higher standard than, the cited documents. Resolution of any variance must be confirmed in writing and where Building Consent is affected, the change notified to the Building Consent Authority.

### 11.12 BUILDING CONSENT COMPLIANCE

It is an offence under the Building Act 2004 to carry out any work not in accordance with the Building Consent. Refer the resolution of matters concerning compliance to the owner for a direction. Where Building Consent is affected refer any change to the Building Consent Authority.

### 11.13 STATUTORY OBLIGATIONS

Comply with all statutory obligations and regulations of regulatory bodies controlling execution of the works.

### 11.14 BUILDING CONSENT

Obtain the original or copies of the Building Consent form and documents from the owner and keep on site. Liaise with the Building Consent Authority and/or the building certifier for all required notices and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

### 11.15 INSPECTIONS

Do not proceed with work noted on the Building Consent for inspection until it has been inspected and passed by the Building Consent Authority inspector.

### 11.16 PRODUCER STATEMENTS

When producer statements verifying construction are required, provide copies to both the Building Consent Authority and the owner. Provide producer statements in the form required by the Building Consent Authority.

### 11.17 TRADE GUARANTEES AND WARRANTIES

Where specific trade guarantees/warranties are offered covering materials and/or execution of proprietary products or complete installations, provide copies of all guarantees/warranties to the owner.



#### **11.18 SITE ACCOMMODATION**

Provide, erect and maintain scaffolding, sheds, toilets, water, power and hoardings. Allow for cartage, craneage, plant hire and storage. Arrange for temporary works and services necessary for the completion of the works.

#### **11.19 HEALTH AND SAFETY**

Make the works safe and provide and maintain a safe working environment. Ensure that all those working on or visiting the site are aware of the rules governing site safety, are properly supervised and are not unnecessarily exposed to hazards.

#### **11.20 PROTECT THE WORKS**

Protect parts of the work liable to damage until completion of the works. Take all precautions necessary to protect the works from damage by unauthorised entry or inclement weather. Brace and support all parts of the works against damage during construction.

#### **11.21 STORAGE AND PROTECTION**

Provide temporary storage areas and protective covers and screens. Fillet stack and protect all framing and structural members from moisture and contamination. Completely protect finishing materials from the weather and damage and store in accordance with the manufacturer's requirements. Protect fabricated elements from the weather and damage, and store in accordance with suppliers requirements.

#### **11.22 ANTIQUITIES AND ITEMS OF VALUE AND INTEREST**

Report immediately the finding of any fossils, antiquities, or objects of value. Ensure they remain undisturbed until approval is given for their removal.

#### **11.23 MEANS OF COMMUNICATION**

All directions and approvals in writing.

#### **11.24 PROGRAMME**

Provide a programme for the contract works, including the work of separate contractors being carried out concurrently with this contract. Form of programme: A dated bar chart, identifying the contract work's critical path and all key dates for the provision of labour, materials and elements. Supply a copy of the programme, and any updates to the owner.

#### **11.25 WORKING HOURS**

Work on site is restricted to between 8.00am to 6.00pm, Monday to Friday, excluding statutory holidays. Work outside these hours may be permitted, with prior approval in writing by the owner.

#### **11.26 RESTRICTIONS**

Do not:

- smoke on site
- light rubbish fires on the sit

#### **11.27 QUALITY ASSURANCE**

Carry out and record regular checks of material quality and accuracy. Provide all necessary materials, equipment, plant, attendances, supervision, inspections and programming to ensure required standards are met.

#### **11.28 DAMAGE AND NUISANCE**

Prevent damage and nuisance from water, fire, smoke, vehicles, dust, rubbish, noise and other causes resulting from the contract works. Comply with the requirements of the territorial authority and relevant Acts and Standards.

#### **11.29 SET-OUT AND DATUM**

Set out the works to conform with the drawings. Establish a permanent site datum to confirm the existing ground floor level and its relationship to other existing and new building levels.

#### **11.30 EXECUTION OF THE WORK**

Conform to the requirements of this specification. Ensure work is level, plumb, and true to line and face. Employ only experienced workers familiar with the materials and techniques specified.

#### **11.31 MATERIALS AND PRODUCTS**

Use only new materials and products, unless stated otherwise, of the specified quality and complying with cited documents.

#### **11.32 COMPATIBILITY**

Ensure all parts of a construction or finish are compatible and their individual use approved by the manufacturers and suppliers of other parts of the system. Source all parts of a system from a single manufacturer or supplier.

#### **11.33 COMPLETE ALL SERVICES**

Ensure completed building services are operational, with temporary labelling removed, required labelling fixed and service instructions provided.

#### **11.34 CLEAR AWAY**

Regularly clear away trade debris, unused materials and elements from the site. On completion of the work leave the building clean and ready for occupancy, with all services operating and mechanical parts in good working order. Remove temporary markings, coverings and protective wrappings.

#### **11.35 CLEAN**

Clean and wash down external surfaces to remove dirt, debris and marking. Clean interior surfaces including floors, glass, cabinetwork, joinery, sanitary and hardware items.

## 22 PREPARATION

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

- 22.1 **SITE SAFETY**  
Provide proper support for excavations. Cover holes and fence off open trenches and banks.
- 22.2 **EXCAVATION GUIDELINES**  
Carry out excavation to the guidelines set in OSH Approved Code of Practice for Safety in Excavation and Shafts for Foundations.
- 22.3 **PROTECT EXISTING**  
Protect from damage existing buildings, structures, roads, paving and services nominated on the drawings as being retained, throughout the course of the work.
- 22.4 **PROTECT TREES**  
Protect from damage all trees, shrubs, natural site features and existing landscaped areas nominated on the drawings as being retained, throughout the course of the work.
- 22.5 **SURFACE PREPARATION**  
Conforming with NZS 3604, 3.5 Site preparation, remove all turf, vegetation, trees, topsoil, stumps and rubbish from the area being built on.
- 22.6 **UNDERGROUND ELEMENTS AND SERVICES**  
Break out and remove underground elements and redundant services. Report for instructions when unexpected voids, made-up ground or services are encountered. Seal off the ends of drains or remove to utility operator approval.
- 22.7 **STOCKPILE TOPSOIL**  
Stockpile excavated topsoil on site where directed. Keep separate from other excavated materials. Spread and level where directed before completion of the works.
- 22.8 **GENERAL EXCAVATION**  
Trim ground to required profiles, batters, falls and levels. Remove loose material. Protect cut faces from collapse. Keep excavations free from water.
- 22.9 **EXCAVATION FOR FOUNDATIONS**  
Take foundation excavations to depths shown. Keep trenches plumb and straight, bottoms level and solid, stepped as detailed and clean and free of water.
- 22.10 **INADEQUATE BEARING**  
If bearing is inadequate then excavate further and backfill with material as follows:  

Below slabs on grade:	Hardfill
Below footings:	10 MPa concrete
Service trenches:	Hardfill

  
If excavation exceeds the required depths, backfill and compact to the correct level with listed material.
- 22.11 **GRANULAR BASE FOR SLABS**  
To NZS 3604, 7.5.3 Granular base. Consolidate with a vibrating roller. Blind the surface with coarse sand or sand/cement and roll ready to receive a dampproof membrane.
- 22.12 **GENERAL BACKFILLING**  
Compact backfilling in 150 mm layers, with the last 200 mm in clean topsoil, lightly compacted and neatly finished off

## 31 CONCRETE

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

- 31.1 **REINFORCEMENT**  
Bars to AS/NZS 4671, grade 300 deformed. Welded reinforcing mesh to AS/NZS 4671. Mild drawn steel tying wire not less than 1.2 mm diameter.
- 31.2 **SPACERS AND CHAIRS**  
Precast concrete or purpose made moulded PVC. Use concrete spacer blocks only where the concrete surface is not exposed in the finished work.
- 31.3 **CONCRETE**  
Strength as selected. Ready-mix normal grade, maximum aggregate size 19 mm to NZS 3104. Site mixed prescribed grade, using either separate batching of sand and coarse aggregate, or builder's mix, to NZS 3104.
- 31.4 **HANDLE AND STORE REINFORCING**  
Handle and store reinforcing steel and accessories without damage or contamination. Ensure reinforcement is clean and remains clean and free of contamination that may reduce bonding capacity.
- 31.5 **FALSEWORK AND FORMWORK**  
Use falsework and formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality.

- 31.6 CUT AND BEND**  
Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109. Do not rebend bars without written approval. Bend main reinforcing bars, stirrups and ties to the former pin diameters as given in NZS 3109, figure 3.1.
- 31.7 SECURE REINFORCEMENT**  
Secure reinforcement adequately with tying wire and place, support and secure against displacement when concreting. Bend tying wire back well clear of the formwork. Spacing as dimensioned, or if not shown, to the clear distance minimums laid down in NZS 3109, clause 3.3.
- 31.8 LAPPED SPLICES**  
Set length of laps, where not dimensioned on the drawings, in accordance with NZS 3109: 3.7. Increase laps of plain round steel by 100%.
- 31.9 COVER**  
Minimum cover to reinforcing as shown on the drawings and to NZS 3109, clause 2.7. Fix chairs for top reinforcement in slabs at 1.0 metre centres. Cover tolerances to NZS 3109, clause 3.8.
- 31.10 SURFACE FINISHES**  
To comply with NZS 3114, section 105, or as denoted on the drawings. Formwork linings and surface finishes as nominated for both fair face and concealed or exposed surfaces. Surface tolerances to comply with NZS 3114, sections 104 and clause 105.3.2.
- 31.11 DAMPPROOF MEMBRANE**  
Apply membrane to prepared basecourse with 150 mm laps between sheets. Tape seal laps and penetrations with 50 mm wide pressure sensitive plastic tape. Refer to drawings for perimeter details.
- 31.12 CASTING IN**  
Build in grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required. Form pockets, chases and flashing grooves as required. No grounds exceeding 100 mm in length. Minimum cover on conduits 40 mm. Do not encase aluminium items in concrete. Do not paint steel embedded items more than 25 mm into the concrete encasement. Cut back form ties to specified cover and fill the cavities with mortar. Wrap all pipes embedded in concrete with tape to break the bond and to allow for expansion.
- 31.13 CONSTRUCT FLOOR SLABS**  
Construct in accordance with NZS 3604, 7.5 Concrete slab-on-ground floors for timber buildings. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3 mm gradual deviation over a 3 metre straight-edge, to the requirements of NZS 3114, section 104.
- 31.14 SAW CUTS**  
Pour floor slabs cast on the ground in areas no greater than 25 square metres, with a maximum ratio of length to breadth of 1:2. Cut slabs where indicated on the drawings and as required to control shrinkage cracking. Carry out cutting as soon as possible, without causing tear-out of aggregate and before shrinkage cracking has occurred, generally within 24 hours of pouring. Where saw cuts are made, cut out 100 mm of every second wire of the mesh for a length of 50 mm each side of the saw cut position. Saw cuts:  $\frac{1}{3}$ <sup>rd</sup> slab depth, or 30 mm minimum.
- 31.15 CURING OF CONCRETE**  
Keep damp for not less than seven days. Ensure curing of slabs commences as soon as possible after final finishing, by the use of continuous water sprays, or ponding. Alternately, apply a curing membrane. Ensure any membrane used will not affect subsequent applied finishes.
- 31.16 STRIKE FORMWORK**  
Strike formwork without damaging or overloading structure.
- 31.17 CLEAN OUT**  
Clean out saw cuts. Fill with cement grout where the floor will be covered with carpet or vinyl.

## **33 CARPENTRY**

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

- 33.1 TIMBER FRAMING GENERALLY**  
Species, grade and level of treatment to NZS 3602, tables 1 to 3 Requirements for wood-based building components..., and moisture content to NZS 3602, table 4 Allowable moisture content..... Grading to NZS 3631. Mechanical stress grading acceptable as an alternative to visual grading.
- 33.2 TIMBER FRAMING DRY, CHEMICAL FREE, MECHANICALLY STRESS GRADED**  
Species and grade to NZS 3602, tables 1 to 3 Requirements for wood-based building components..., with an average moisture content at supply of 16% or less. Machine stress graded to AS/NZS 1748.
- 33.3 TIMBER FRAMING DRY, TREATED**  
Species, grade and level of treatment to NZS 3602, tables 1 to 3 Requirements for wood-based building components..., and moisture content to NZS 3602, table 4 Allowable moisture content. Either mechanically stress graded to AS/NZS 1748, or visual grading to NZS 3631.
- 33.4 STRUCTURAL LVL**  
Structural laminated veneer lumber (LVL) to AS/NZS 4357 with an average moisture content at supply of 16% or less.
- 33.5 FINISHING TIMBER**  
As selected.

### 33.6 INSULATION

To comply with H1/VM1, zone 3, October 2007 requirements; Refer ALF calculation report annexed for means of code compliance, placement, ratings and performance of chosen insulation.

### 33.7 ACCESSORIES

Building wrap:	Extra Heavy duty Breather type, waterproof Roofing underlay
Damp proof course:	2-ply/3-ply kraft felt strip saturated and coated with bitumen.
Nails, bolts and screws:	Steel, stainless steel, galvanized steel of pattern to suit the location and to BRANZ Bulletin 453: Fasteners selection. To NZS 3604, section 4 Durability, for durability.
Nail plates connectors:	Stainless steel and/or galvanized steel toothed or nailed plates to the plate manufacturer's design for the particular locations as shown on the drawings and to NZS 3604, section 4 Durability, for durability. Galvanized steel and stainless steel connectors and brackets to the connector manufacturer's design for locations shown on drawings and to NZS 3604, section 4 Durability, for durability.

### 33.8 ATTENDANCE

Provide and fix blocks, nogs, openings and other items as required by others.

### 33.9 MOISTURE CONTENT

Maximum allowable moisture content to NZS 3602, table 4 Allowable moisture content..., for framing supporting interior linings:

- Framing at erection	24%
- Framing at enclosure	20%
- Framing at lining	16%

### 33.10 EXECUTION GENERALLY

To NZS 3604 except as varied in this specification. To include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs). Set out framing in accordance with the requirements of NZS 3604 and as required to support sheet linings and claddings.

### 33.11 INSTALL WALL AND ROOF FRAMING

Frame walls to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604, section 8 Walls. Frame roof to required loading and bracing complete with valley boards, ridge boards and purlins to NZS 3604, section 10 Roof framing. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604, section 10 Roof framing.

### 33.12 INSTALL LINING BATTENS

Fasten ceiling battens in accordance with NZS 3604, section 13 Ceilings.

### 33.13 INSTALL INSULATION

Fit insulation as detailed, to the insulation manufacturer's requirements, and to the requirements of BRANZ Bulletin 357: Thermal insulation of houses.

## 41 WALL CLADDING

Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

### 41.1 TIMBER FASCIAS AND BARGE BOARDS

Radiata pine to NZS 3631 for grading and to NZS 3602, table 2 Requirements for wood-based building components ..., for selection and treatment.

### 41.2 EXTERIOR FINISHING TIMBER

As selected.

### 41.3 ACCESSORIES

As selected and to the following details:

Building wrap:	Extra Heavy duty Breather type, waterproof Roofing underlay.
Nails, screws, fastenings:	Metal, size and pattern, to cladding manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4: Durability.

### 41.4 METAL FLASHINGS

As selected.

### 41.5 MOISTURE CONTENT

Maximum allowable moisture content to NZS 3602, table 4 Allowable moisture content....

### 41.6 EXECUTION GENERALLY

To NZBC E2/AS1 except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

### 41.7 INSTALL WALL WRAP

Fix wall wrap as detailed and to the cladding manufacturer's requirements.

### 41.8 INSTALL EXTERIOR TIMBER FINISHINGS

Install timber fascias, barge boards, facings, beads, trim and enclosures level, true to line and face, with all end grain sealed and joints mitred.

#### 41.9 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to NZBC E2/AS1, 4.0 Flashings.

#### 41.10 USE OF SEALANTS

Selection and use of sealants to follow BRANZ Bulletin 441: Sealed joints in external claddings - 2. Sealants.

#### 41.11 COMPLETE

Complete all flashings, finishings and trim so the cladding system is completely weathertight.

## 42 BRICK VENEER CLADDING

Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

#### 42.1 QUALIFICATIONS

Carry out brickwork with persons competent and experienced in the trade.

#### 42.2 BRICKS

As selected.

#### 42.3 ACCESSORIES

Lintels:

To NZS 3604, table 11.4 Veneer lintels, for size and NZS 3604, 4.5 Brick veneer ties and lintels, for durability. Design to conform with AS/NZS 2699.3: 2002, as modified by NZBC B1/AS1, 3.1 (NZS 3604).

Vermin stop:

Galvanized steel wire netting strip with reinforced edges and galvanized staples for fixing.

Dampproofing:

Heavy kraft strip laminates saturated and coated with bitumen, or bituminous brush-applied liquid membrane to suit location and detail.

Ties:

To NZS 3604, 4.5 Brick veneer ties and lintels. Design to conform with AS/NZS 2699.1: 2002, as modified by NZBC B1/AS1, 3.1 (NZS 3604).

Sand for mortar:

To NZS 3103. Chloride levels to not exceed 0.04% by dry weight of sand.

Water:

From local authority supply.

#### 42.4 MORTAR

Composed of Portland cement, sand and water with an admixture to the provisions of NZS 4210, clause 2.2. Obtain written approval if intending to use cement mortar as a damp proof course and where or if intending to use hydrated lime in the mortar.

#### 42.5 MORTAR COLOUR

Add mineral oxide pigment to the requirements of NZS 4210, clause 2.2.2.2 (f).

#### 42.6 STORAGE

Store bricks and other materials clear of the ground, under cover and well ventilated until placed in the work.

#### 42.7 VENEER WORK GENERALLY

Comply with NZS 3604, 11.7 masonry veneer wall cladding, NZS 4210:2001, section 2.2 and BRANZ Bulletin 521 (2006): Two Storey Brick Veneer System. Where not otherwise detailed on the drawings or covered in the documents listed, carry out veneer construction to the details required by BRANZ Bulletin 521 (2006): Two Storey Brick Veneer System

#### 42.8 LAYING GENERALLY

To NZS 4210. Ensure bricks are dry when laid. Use bricks equally off all pallets as work proceeds. Distribute facing bricks of varying colour randomly throughout so no patches or striping appears.

#### 42.9 BOND

Stretcher bond, single width unless detailed or stated otherwise.

#### 42.10 INSTALLING WALL TIES

Screw fix to face of studs without otherwise piercing or damaging the building wrap. Ties placed and spaced to NZS 4210, section 2.9, as modified by NZBC B1/AS1, 3.1. Install ties to NZS 3604, 11.7.5, Wall ties, subclause 11.7.5.3.

#### 42.11 MORTARING

To maximum practical density. Mortar fully laid, firmly placed, correctly cured and not re-tempered. Discard any mortar not used within 1½ hours of mixing. Joint thickness 10 mm plus or minus 2 mm.

#### 42.12 RAKE OUT

Rake out joints as work proceeds, for pointing as detailed. Maximum depth of rake 6 mm.

#### 42.13 POINTING

Joints tooled concave after initial stiffening.

#### 42.14 WEEPHOLES

Rake out every third perpend where weep holes are required, and vent veneer to NZS 3604, 11.7.4 Cavities, subclause 11.7.4.3 and to BRANZ Bulletin 521: (2006) Two Storey Brick Veneer System.

#### 42.15 CO-ORDINATE

Co-ordinate the building-in of exterior joinery and items required for fitting as the work proceeds. Rake out for or build in flashings as required.

#### 42.16 KEEP CAVITY AND TIES CLEAR

Keep cavity and ties clear of mortar droppings and clean the brickwork face of any marking as the work proceeds. Repair damage to building wrap immediately it occurs.

#### 42.17 BASE OF CAVITY

Flaunch base of cavity and either:

- apply bituminous brush-on liquid applied membrane as a primer and 2 coats, or
- lay bitumen laminate sheet, lapped and adhered, to drain water effectively out of the cavity.

#### 42.18 CLEAN DOWN

Clean down brickwork to remove stains. Remove efflorescence with a stiff bristle broom, blot with a damp sponge and wash walls with a plentiful supply of clean water during fine weather

## 44 ROOF CLADDING

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

#### 44.1 QUALIFICATIONS

Use experienced competent roofers familiar with the materials and techniques specified.

#### 44.2 WIND AND EARTHQUAKE LOADINGS

Use fixings and methods capable of sustaining the loads appropriate to the area as set out in NZS 3604, section 5 Bracing design, and confirmed under COMPLIANCE INFORMATION.

#### 44.3 PROFILED METAL

Profile, metal and finish as selected. Accessories, cappings, flashings and fixings to match and to the roofing manufacturer's requirements.

#### 44.6 ACCESSORIES

Roof underlays: As selected.

Nails, screws, fastenings: Metal, size and pattern, to roofing manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4 Durability.

Flashings: As selected.

#### 44.7 STORAGE

Stack roofing and accessories on clean, level areas of the site. Cover and protect from damage and from weather until ready to fix in place.

#### 44.8 SET-OUT

Set out the planned layout before fixing commences, to ensure true lines and the correct relationship to module, grid and roof features. Overlaps to face away from prevailing wind direction.

#### 44.9 LAY ROOF UNDERLAY

Lay and fix to NZBC E2/AS1, 8.1.5 Underlays, and to NZS 3604, 11.2 Roof cladding underlays.

#### 44.10 TAKE CARE

Take care to avoid damaging pre-finished roofing both during and after fixing. Mark only with chalk or spirit-based pen. Wear only soft-soled shoes on the finished surface. Remove metal filings daily.

#### 44.11 INSTALL PROFILED METAL

Use cutting tools recommended by the roofing manufacturer. Fold ends and seal cut edges to the roofing manufacturer's requirements. Fix complete with matching accessories, flashed to roof features and penetrations; all in accordance with the New Zealand Metal Roofing Manufacturers Inc. publication "NZ metal roof and wall cladding code of practice".

#### 44.16 FIXINGS AND SEALANTS

Refer to the roofing manufacturer's literature for fixing details and to NZS 3604 for fixings durability requirements. Select and use sealants only as recommended by the roofing manufacturer.

#### 44.17 INSTALL COVERS AND FLASHINGS

Provide apron, verge and ridge flashings. Install and fix as detailed and to the roofing manufacturer's details and to comply with NZBC E2/AS1, 4.0 Flashings, 5.0 Roof/wall junctions, and 6.0 Parapets.

#### 44.18 PENETRATIONS

Flash and overflash penetrations through the roof. Fit proprietary boots to pipework penetrations.

#### 44.19 COMPLETE

Ensure the work is complete with flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.

#### 44.20 CLEAR

Clear trade debris and unused materials from the roof and surrounds regularly during the work and at completion. Sweep down the completed roof and flush out spoutings, gutters and rainwater pipes.

## 46 RAINWATER SYSTEM

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

#### 46.6 ALUMINIUM/ZINC ALLOY PRE-PAINTED SHEET STEEL

0.55 mm sheet steel, aluminium/zinc alloy coated, pre-painted.

- 46.7 ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL SPOUTING  
Profile, jointing, brackets and fittings brand matched and complete to the spouting manufacturer's specifications.
- 46.8 ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL DOWNPIPES  
Seam jointed and complete with stand-off brackets, galvanized screw fixed.
- 46.13 FLASHINGS GENERALLY  
Aluminium/zinc coated steel, copperised pure lead, 0.5 mm copper sheet, or proprietary rubberised perforated aluminium strip, all to location, compatibility and requirements NZBC E2/AS1, 4.0 Flashings.
- 46.15 ELECTROLYTIC ACTION  
Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.
- 46.16 LIAISON  
Ensure liaison with associated installations to ensure material selections are compatible and required flashing work is completed.
- 46.19 INSTALL ALUMINIUM/ZINC ALLOY COATED STEEL PRE-PAINTED SPOUTING AND DOWNPIPES  
Screw fix brackets, set to falls to outlets, with spouting joints silicone sealed and pop-riveted to the spouting manufacturer's requirements. Screw fix stand off brackets, set pipes plumb and clear of the wall, with joints silicone sealed. Discharge into stormwater bends.
- 46.21 INSTALL FLASHINGS  
Scribe fit, fold, lap, seam, or run solder as required by the metal, to flash all roof penetrations, roofing and exterior joinery to prevent weather penetration. Except at expansion joints, allow for 2 rows of rivets to overlapping sheet joints. Install and fix flashings and flashing joints to NZBC E2/AS1, 4.0 Flashings.
- 46.24 ENSURE  
Ensure rainwater services are operational, flashings complete and the building weathertight.

## 47 TIMBER DOORS

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

- 47.1 COMPLIANCE  
External frames, sashes and doors to comply with the performance requirements of NZBC E2/VM1 and the listed site data.
- 47.2 TIMBER  
As selected and to NZS 3602.
- 47.9 FLASHINGS  
As selected or as detailed.
- 47.10 CONFIRM OPENINGS  
Confirm framing openings on site for dimension, plumb and straightness prior to fabrication or ordering of timber joinery.
- 47.11 EXECUTION GENERALLY  
To include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).
- 47.12 OPENING PREPARATION  
Confirm framing openings on site for dimension, plumb and straightness prior to fabrication.
- 47.14 INSTALL GARAGE DOORS  
Check that the trimmed and lined openings are formed and constructed to suit the required door units. Do not proceed until openings are properly formed. Install and fix the garage door installations, complete with specified operating systems and hardware, all strictly in accordance with the door manufacturer's requirements and installation instructions.

## 48 ALUMINIUM WINDOWS AND DOORS

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

- 48.1 CERTIFICATION  
Provide a certificate from a laboratory accredited by International Accreditation of New Zealand that the windows and doors offered comply with the performance requirements of NZBC E2/VM1 and the listed project site data. Fabrication by a member of the Window Association of New Zealand.
- 48.2 WINDOWS AND DOORS  
Brand, finish and type as selected.
- 48.3 WINDOW AND DOOR REVEALS  
As selected with timber jamb liners to NZS 3602.
- 48.4 GLASS  
As selected, with glass details to 47 GLAZING and complying with NZS 4223.
- 48.5 FLASHINGS  
As selected.



- 48.6 ORGANIC POWDER COATING FINISH**  
To the Window Association of New Zealand's "Specification for powder coatings on architectural aluminium products". All finished surfaces to show uniformity of gloss and colour (to match sample) free of all coating defects.
- 48.7 HARDWARE**  
As selected.
- 48.8 SEALANT, GLAZING TAPE AND GASKETS**  
To the window manufacturer's requirements.
- 48.9 FIXINGS**  
Ensure fixings and bracketing are compatible with aluminium. Do not use electroplated zinc fasteners or brass fastenings.
- 48.10 OPENING PREPARATION**  
Confirm framing openings on site for dimension, plumb and straightness prior to fabrication or ordering of aluminium joinery. Prepare and trim to WANZ WIST<sup>TM</sup> Pre Cladding Trim Preparation requirements.
- 48.11 EXECUTION GENERALLY**  
To NZBC E2/VM1, WANZ "Aluminium Window Handbook" and "Installation code for aluminium joinery products". Install to WANZ WIST<sup>TM</sup> Window installation System requirements.
- 48.12 HANDLING**  
Avoid distortion of elements during transit, handling and storage. Prevent pre-finished surfaces from rubbing together. Prevent contact with mud, plaster and cement. Do not deliver to site any elements which cannot be immediately unloaded into suitable conditions of storage.
- 48.13 CORROSION PROTECTION**  
Seal or suitably coat cut ends and holes drilled in aluminium before the frames are installed. Before fixing, apply bituminous coatings, slips or underlays between dissimilar metals in contact, or aluminium in contact with concrete.
- 48.14 FIX FRAMES**  
Fix frames rigidly in place without distortion, to the window manufacturer's and the Window Association of New Zealand's "Aluminium Window Handbook" requirements, plumb, true to line and face, weathertight and with all openings operating freely.
- 48.15 DRAINAGE**  
Anti-condensation channels to sills. All sills to sashes and fixed lights to incorporate positive drainage to the exterior.
- 48.16 GLAZING INSTALLATION**  
All glass held in aluminium beads and black PVC gaskets.
- 48.17 SAFETY GLASS INSTALLATION**  
Use in doors, sidelight panels, low level windows and all other locations to comply with NZS 4223, part 3, as modified by NZBC F2/AS1, 1.0 Glazing.
- 48.18 INSTALL FLASHINGS**  
Install flashings to heads, jambs and sills of frames as supplied and required by the window manufacturer and as detailed on the drawings. Finish on head and cill flashings to match window finish.
- 48.19 SEAL FRAMES ON SITE**  
Seal frames to each other and to adjoining structure and finishes, all as required by the window manufacturer and to make the installation weathertight.
- 48.20 SAFETY**  
Indicate the presence of transparent glasses for the remainder of the contract period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface. Permanent manifestations to comply with NZS 4223, part 3, 303.1.
- 48.21 CLEAN GLASS AND FRAMES**  
Clean off or remove glass indicators at completion of the building. Clean glass inside and out to a shining finish. Clean down both sides of window and door frames using the methods required by the window and door manufacturer.

## **49 GLAZING**

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

- 49.2 GLASS THICKNESS**  
As selected and to NZS 4223, parts 1 and 3.
- 49.3 FLOAT GLASS**  
To NZS 4223, part 1, clause 101.2.2.2: Glazing quality (selection G). Thickness as required by NZS 4223, part 1.
- 49.5 LAMINATED GLASS**  
Grade A safety glazing material with PVB or CIP resin interlayer.
- 49.6 TOUGHENED GLASS**  
Grade A safety glazing material.
- 49.9 SETTING BLOCKS**  
Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, at the base of glass panes.

- 49.11 MIRROR GLASS**  
Float plate mirror glass to NZS 4223, part 1, clause 101.2.2.2: Silvering quality (selection S), with silver and copper plating and 2 coats of protective paint.
- 49.12 MIRROR ADHESIVE**  
Use both mirror-mastic adhesive and double-sided adhesive tape.
- 49.13 EXECUTION GENERALLY**  
To NZS 4223, part 1, and for human impact safety glazing to NZS 4223, part 3.
- 49.15 INSTALL GLASS, EXTERIOR TIMBER DOORS**  
Remove temporarily pinned beads; prime, clear seal rebates and beads, back putty, sprig in glass, front putty and neatly replace beads.
- 49.17 SAFETY GLASS INSTALLATION**  
Use in doors, sidelight panels, low level windows and all other locations to comply with NZS 4223, part 3, as modified by NZBC F2/AS1, 1.0 Glazing.
- 49.18 MIRRORS, SCREW FIXED**  
Fix with proprietary zinc-plated steel countersunk-head screws, fitted with black neoprene washers with fine-threaded upstands to receive chrome plated dome screw covers.
- 49.21 INSTALL MIRROR DE-MISTER**  
Installed to the de-mister manufacturer's requirements.
- 49.23 SAFETY**  
Indicate the presence of transparent glasses, with whiting, tape or signs compatible with the glass type. Do not apply indicators other than whiting to the glass surface. Permanent manifestations to comply with NZS 4223, part 3, 303.1.
- 49.24 CLEAN**  
Clean off or remove indicators at completion of the building. Clean glass inside and out to a shining finish.

## 51 INTERIOR PARTITIONS AND DOORS

Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

- 51.1 FRAMING MOISTURE CONTENT**  
Maximum allowable moisture content to NZS 3602, table 4 Allowable moisture content.....
- 51.2 PROTECT**  
Protect joinery, fittings and finishes already in place from water staining or damage from lining installation. Ensure building is weatherproof before lining work commences.
- 51.3 PLASTERBOARD**  
As selected. Gypsum plaster core encased in a durable face and backing paper formed for standard use, bracing use, fire rated use and water resistance use.
- 51.4 GALVANIZED STEEL CEILING BATTENS**  
As selected.
- 51.5 PLASTERBOARD ACCESSORIES**
- |                                 |  |
|---------------------------------|--|
| External angles:                | Slim type 0.5 mm galvanized steel.                                   |
| Casing bead:                    | Slim type 0.5 mm galvanized steel or PVC.                            |
| Cornice:                        | Plasterboard scotia type.  |
| Nails:                          | Galvanized clouts 40 mm x 2.5 mm.                                    |
| Screws:                         | 40 mm x 6 gauge zinc electro-plated bugle head gypsum drywall screws |
| Jointing compound & paper tape: | To the board manufacturer's requirements.                            |
| Adhesive:                       | Multi-purpose water based wallboard adhesive.                        |
- 51.6 TIMBER BOARDING**  
As selected and to NZS 3602, table 3 Requirements for wood-based building components....
- 51.11 DOORS GENERALLY**  
As selected.
- 51.14 INTERIOR CAVITY SLIDERS**  
Hollow core door within a proprietary cavity slider frame, with brand-matched sliding door gear.
- 51.15 DOOR HINGES**
- |           |                             |
|-----------|-----------------------------|
| Type:     | loose-pin zinc-plated steel |
| Size:     | 89 mm                       |
| Material: | zinc-plated steel           |
| Number:   | 3 hinges per door           |
- 51.16 INTERIOR SLIDING DOOR GEAR**  
To suit door size and weight and as detailed.
- 51.18 DOOR HARDWARE**  
As selected.
- 51.19 NAILS**  
Zinc-plated steel, stainless steel and galvanized steel of pattern to suit location and to BRANZ Bulletin 453: Fasteners selection.

#### **51.20 INTERIOR FINISHING TRIM**

Timber selection to NZS 3602, table 3 Requirements for wood-based building components.... Profile as detailed, or to match existing. Jointer profiles to suit location.

#### **51.21 INTERNAL JOINERY FRAMES**

Fabricate as detailed. Wedge and rigidly fix in place without distortion, plumb, and true to line and face.

#### **51.23 INTERNAL DOOR LINERS**

Heads and jambs finished minimum 18 mm, with 10 mm planted door stops. Width to match width of lined walls. Hang doors on hinges, sliding, or sliding-folding gear to the door manufacturer's requirements and to operate freely.

#### **51.25 INTERNAL CAVITY SLIDERS**

Install in accordance with the door manufacturer's requirements.

#### **51.26 SUBSTRATE**

To NZS 3604, section 8 Walls, section 10 Roof framing, section 12 Interior linings, section 13 Ceilings, and the standard required by the lining manufacturer's requirements. Ensure moisture content of timber framing is at or below specified levels.

#### **51.27 CONFIRM LEVELS OF FINISH**

Before commencing work, confirm the surface finish assessment procedures necessary to ensure the specified levels of finish will be obtained. Provide levels of finish as laid down in AS/NZS 2589.

#### **51.28 LINE PLASTERBOARD CEILINGS AND WALLS**

Line ceilings with plasterboard sheets, fastened to the plasterboard manufacturer's requirements. Line walls that are up to 2400 mm high by the horizontal method and walls above 2400 mm high by the vertical method, with plasterboard sheets.

#### **51.29 SPECIAL PLASTERBOARD LININGS**

Line bathroom, ensuite, & laundry walls with water resistant plasterboard sheets using adhesive and nail fixing to studs at centres to suit the surface finish. Form bracing panels using high density plasterboard sheets fixed with clout-washers and clouts and to conform to NZS 3604, 5.5 Wall bracing design.

#### **51.31 FIX PLASTERBOARD CORNICE**

Fix with adhesive and with joints scribe-fitted to the plasterboard manufacturer's requirements.

#### **51.32 PLASTERBOARD JOINTING AND STOPPING**

Fill joint recess with bedding compound, centre the paper tape, apply second coat of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off. Fill nail holes and flush up external angles with two successive coats of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off. All to the plasterboard manufacturer's requirements.

#### **51.33 LEVELS OF FINISH**

Provide levels of finish to standards laid down by AS/NZS 2589 as follows:

Level 4: surfaces receiving light texture or wall covering finishes

Level 5: surfaces receiving thin coating finishes.

#### **51.37 INSTALL TRIM**

Scribe and fit reveal linings to exterior timber joinery, architraves to interior joinery, skirtings to walls and timber beads to wall/ceiling junctions.

#### **51.38 FIT HARDWARE**

Fit hardware selected and provided, all in accordance with the hardware manufacturer's requirements.

#### **51.39 CHECK**

Check and adjust operation of doors sets, hardware and furniture.

## **52 JOINERY FIXTURES AND FITTINGS**

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

#### **52.1 TIMBER BOARDS AND FRAMES**

As selected. Carefully sawn to minimise the inherent warping, twisting and bowing of the selected species and to give a finish suitable for clear finishing.

## **61 TILING**

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

#### **61.1 QUALIFICATIONS**

Use tilers experienced with the materials and techniques specified.

#### **61.2 ADHESIVES COMPATIBILITY**

On proprietary substrates or waterproof membranes use only adhesives with documented compatibility approval from the respective manufacturers.

#### **61.3 SLIP RESISTANCE**

Slip resistance to NZBC D1/AS1, 2.1 Slip resistance.

#### **61.4 TILES**

As selected.

## 61.5 ACCESSORIES

Underlays, waterproofing membranes:	Not required
Cement-based screed:	Mix of 3:1 Portland cement, wash-mix sand, gauged with liquid polymer additive to the tile manufacturer's requirements.
Tile adhesive:	To the tile manufacturer's requirements.
Grout:	Cement based, compressible and to suit the particular location and use.
Control joint sealant:	To BRANZ Good practice guide: Tiling, section 5.0.

## 61.6 HANDLING AND STORAGE

Handle tiles with care to avoid chipping, soiling and damage. Store on hard, level standings in non-traffic, non-work areas that are enclosed, clean and dry. Reject all damaged tiles.

## 61.7 SUBSTRATE

Ensure all services and accessories are in place, located to suit the tile layout, with the substrate required for tiling work.

## 61.8 TEMPERATURE

Do not carry out tiling where the ambient temperature is below 5°C, or onto a substrate with a temperature higher than 40°C.

## 61.9 LAYOUT

Obtain confirmation of the proposed layout of tiles, expansion joints and other visual considerations.

## 61.10 EXECUTION GENERALLY

**Prepare surfaces and carry out the tiling work in accordance with BRANZ Good practice guide: Tiling.**

## 61.11 SURFACE PREPARATION

To BRANZ Good practice guide: Tiling, section 4.0.

## 61.12 LAY CEMENT SCREED

Apply a proprietary cement slurry bond coat over the whole of the floor. Mix and place a 40 mm thick mortar bed over the bond coat and firmly tamp, screed and compact to the required level. In waterproofed areas where the cement screed has been laid over the waterproofing membrane, prepare the screed surface by applying a further waterproof coating before laying tiles.

## 61.16 TILE FIXING, CONCRETE, CEMENT-BASED ADHESIVE

Apply and float thin (thick) bed cement-based adhesive to a minimum 3 mm (6 mm) bed thickness to the tile manufacturer's requirements. Rib surface with a notched trowel, press the tile and beat it into place with 3 mm joints, and to obtain required coverage of adhesive on the back of each tile.

## 61.19 GROUTING

Remove spacers. Prepare joints, mix and apply proprietary grout and finish off the grout uniform in colour, smooth and without voids, pinholes or low spots.

## 61.21 CLEAN

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave clean and free of blemish. Finally polish tiles with a clean, dry cloth.

# 62 PAINTING AND PAPERHANGING

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

## 62.1 QUALIFICATIONS

Carry out work using competent and experienced painters and paperhangers.

## 62.2 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety in Employment Act 1992 and if elimination or isolation is not possible, then minimise the hazards in this work. Refer to OSH publication, Repainting lead based paints, for the required procedures and precautions when treating or removing lead based paint, burning or sanding off paint, or using solvent based paint removers.

## 62.3 PAINT

As selected and to the paint manufacturer's standards for exterior and/or interior primers, undercoats, sealers, stains, clear coatings, solvent-borne and water-borne paints.

## 62.4 GAP FILLERS

Linseed oil, putty, plastic wood, wood filler or plastic filler, to suit and to match the surface being prepared.

## 62.5 INSPECT SURFACES

Inspect surfaces being painted and report to the owner any that will not, after the preparatory work laid down by the paint manufacturer, allow work of the required standard. Confirm that all areas have adequate lighting and are sufficiently free of other construction activities to enable painting and/or paperhanging work to proceed.

## 62.6 PROTECT

Cover up adjoining surfaces and areas liable to damage or over-painting.

## 62.7 REMOVE HARDWARE

Remove hardware and door/window furniture and replace on completion. Do not paint over permanently attached hinges, or any hardware items which cannot be removed.

## 62.8 PRIMING AND SEALING

Ensure that priming and sealing work needed before or during construction is carried out when required.

## 62.9 ENVIRONMENTAL CONDITIONS

Carry out work within acceptable temperature and humidity limits, with timber dry, all to the requirements of the paint manufacturer.

## 62.10 SELECTIONS

Confirm all selections, colours and finishes for both paint and wallpaper with the owner.

## 62.11 SHARP EDGES, CRACKS AND HOLES

Repair as required by the paint manufacturer.

## 62.12 PREPARE SURFACES

Prepare surfaces as required by the paint manufacturer. Make good all damage and defects.

## 62.13 PAINT APPLICATION

Apply paint by brush and/or roller to suit the location of the coating and to the paint manufacturer's requirements. Do not spray on site without express permission.

## 62.14 MANUFACTURER'S MANUALS

Refer to the paint manufacturers' manuals and follow their preparation, sequence and application requirements applying to each system. Ensure all paint coats in any system are supplied by the same manufacturer.

## 62.15 SCUFF BETWEEN COATS

Scuff between all coats to remove any dust pick-up, protruding fibres and coarse particles.

## 62.16 FINISHED PAINT SURFACES

Finished paint surfaces to show uniformity of gloss and colour, with the correct thickness for each coat, and freedom from painting defects. Ensure finished work is clean and free of any disfigurement.

## 62.19 CLEAN

Clean adjoining surfaces, glass and fittings of any paint contamination.

## 62.20 REPLACE

Replace hardware without damage to the hardware or the adjoining surfaces.

# 71 WATER SYSTEMS

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

## 71.1 QUALIFICATIONS

Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 1976.

## 71.3 POLYBUTYLENE WATER PIPE

Polybutylene tubing complete with fittings and accessories brand-matched.

## 71.5 INSULATION FOR HOT WATER PIPES

As selected.

## 71.6 EXPOSED PIPES

As selected and to the following details:

- chrome plated copper pipe with chrome plated brass nuts and fittings
- pipework finish to include escutcheon plates and bends and elbows protruding from walls or fittings.

## 71.7 GATE VALVES

De-zincified brass with screwed ends.

## 71.9 ELECTRIC HOT WATER CYLINDER, LOW PRESSURE

Copper thermal storage cylinder insulated and complete with pressure reducing valve and fittings required for installation by the manufacturer.

## 71.11 VALVES, TAPS AND FAUCETS

As selected.

## 71.12 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

## 71.13 EXECUTION GENERALLY

Generally carry out the whole of this work and tests to NZBC G12/AS1.

## 71.15 INSTALL POLYBUTYLENE/POLYETHYLENE WATER SUPPLY

Size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Run pipes complete with all fittings, support and fixing, and jointed to the pipe manufacturer's specifications, all to NZBC G12/AS1, 5.0 Water supply. Conceal pipework and pressure test before wall linings are fixed.

## 71.16 OUTLET LOCATIONS

Ensure wall outlets for exposed pipes are level and centred on the fixture to ensure the neat installation of exposed pipework.

## 71.17 INSTALL HOT WATER PIPE INSULATION

Insulate hot water pipes in accordance with the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of steel studs.

## 71.18 INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and NZBC G12/AS1, 6.10 Water heater installation.

## 71.19 PENETRATIONS

Provide and fit collars and escutcheon plates to match pipework at penetrations through constructions.

### 71.20 INSTALL TAPWARE

Install tapware in accordance with the tap manufacturer's requirements. Flush out on completion. Check that washers or ceramic discs are operating correctly.

### 71.21 COMPLETION

Pressure test to ensure no leakage and leave in proper working order. Clean tapware and fittings.

## 72 SANITARY PLUMBING, SANITARYWARE AND ACCESSORIES

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

### 72.1 QUALIFICATIONS

Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 1976.

### 72.3 UPVC WASTE, SOIL AND VENT PIPES

uPVC pipe, complete with fittings brand-matched to the pipe manufacturer's requirements.

### 72.4 EXPOSED PIPES AND TRAPS

As selected and to the following details:

- chrome plate on copper pipes and associated copper and brass fitting.

### 72.5 SANITARYWARE

As selected.

### 72.6 SANITARY ACCESSORIES

As selected.

### 72.7 EXECUTION GENERALLY

**Carry out this work and complete all tests to NZBC G13/AS1**

### 72.8 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

### 72.9 INSTALL SANITARYWARE

Fit and install sanitaryware and associated screens, elements and hardware, plumb, true to line and rigid, to the fixture manufacturer's requirements. Supply standard chrome plated brass wastes and plastic plugs on chrome plated chains with all basins, tubs and baths.

### 72.10 INSTALL TRAPS, WASTE AND VENT PIPES

**Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to NZBC G13/AS1. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to roof vents and vermin proof mesh to untrapped waste pipes.**

### 72.11 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

### 72.12 INSTALL SANITARY ACCESSORIES

Install the selected sanitary accessories.

### 72.13 TEST

Test soil and waste disposal systems to ensure no leakage exists and leave in working order.

### 72.14 ENSURE

Ensure all sanitary plumbing fittings and pipework are complete and operational.

## 74 DRAINAGE

---

Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

### 74.1 QUALIFICATIONS

Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 1976.

### 74.2 MATERIALS

Concrete:

17.5 MPa prescribed grade.

Reinforcement:

Grade 300 deformed bars.

uPVC pipes:

uPVC pipes bends, junctions, fittings and joints.

Drainage/filling materials

Granular fill:

Clean gravel or crushed stone or a blend of these. Particle size from minimum 7 mm to maximum 20 mm.

Selected fill:

Fine grain soil or granular material suitable for bedding, excluding topsoil.

Ordinary fill:

Top soil or other excavated materials.

### 74.3 FITTINGS

Gully traps:

To NZBC G13/AS2, 3.3 Gully traps, complete with grating.

### 74.4 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs.

### 74.5 MANUFACTURER'S REQUIREMENTS

All drainage installations to the pipe and fitting manufacturer's requirements.

#### **74.6 EXCAVATION GENERALLY**

Carry out drainage work to NZBC G13/AS1 (sanitary plumbing and drainage) and G13/AS1 (stormwater drainage) as modified by NZBC B1/AS1, 6.0 Drains.

#### **74.7 LAY WASTEWATER DRAINS**

Lay drains in straight runs to correct gradients, to discharge into the septic tank waste water treatment plant. Set inspection fittings on a concrete base.

#### **74.8 INSTALL GULLY TRAPS**

Set on concrete 50 mm above surrounding ground or paving and brought up to protect the top of the fitting. Trowel off.

#### **74.9 LAY STORMWATER DRAINS**

Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to discharge into onsite soak holes. Soak Holes to be as drawn in plans attached.

#### **74.10 SOAK PITS**

Calculations for soak hole sizing to be in accordance with NZBC E1/VM1 section 9, fig 13.

#### **74.15 FIELD TEST**

Field test drains for watertightness to the satisfaction of the Building Consent Authority inspector.

#### **74.16 BACKFILL**

Backfill drain lines in 150 mm layers, well tamped but without disturbing the drains. Finish off with 150 mm of topsoil, slightly mounded above the finished ground line.

#### **74.17 AS-BUILT DRAWINGS**

Supply a 1:100 as-built drawing to the Building Consent Authority and the owner on completion.

### **75 ELECTRICAL**

Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

#### **75.1 COMPLY**

Comply with the Electricity Regulations 1997, AS/NZS 3000 and the New Zealand Electrical Codes of Practice for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

#### **75.2 QUALIFICATIONS**

Carry out work by or under the direct supervision of a holder of a practising certificate under the Electricity Regulations 1997.

#### **75.3 CERTIFICATE OF COMPLIANCE**

Supply a certificate of compliance to the owner, as required by the Electricity Regulations 1997. Allow the network utility operator to view before the meter installation, listed work inspection, polarity check and livening of supply.

#### **75.4 METER BOARD / DISTRIBUTION BOARD / SUB BOARD**

Proprietary manufactured meter board complete with flashing kit. Proprietary manufactured distribution board, zinc plated powder coated, or heavy duty plastic, fire resistant enclosed construction, complete with neutral and earth busbars, MCB's, RCD's and main switch. All protective devices: 6kA MCB's of the appropriate rating. Fit to board manufacturer's requirements where detailed. Recess into wall and ensure fire containment properties of the enclosure are maintained.

#### **75.5 CABLES**

Tough plastic sheathed copper conductors. Minimum sizes are indicated below. Increase these as necessary due to method of installation, cable length or load.

Lighting circuits:	1.5 mm <sup>2</sup> on 16 amp MCBs.
Power circuits:	1.5 mm <sup>2</sup> on 16 amp MCBs for domestic construction
Power circuits:	2.5 mm <sup>2</sup> on 16 amp MCBs for domestic insulated construction

#### **75.6 ELECTRICAL ACCESSORIES**

As selected and to the following details:

Wall boxes:	Standard size in plastic, with 2 or more gang size in metal, all screw fixed.
Switch units:	16 amp, 230 volt flush polycarbonate units. For number of switches per unit, dimmer units, neon (indicator or toggle) units, locator units and 2-way units refer to the electrical drawings.
Hot water system switch:	One way 20 amp switch complete with clamp for flexible PVC conduit.
Switched socket units:	10 amp, 230 volt flush polycarbonate 3 pin combined switch units.
Ceiling roses:	White plastic mounting base with screwed cover. Terminal type.
Batten holders:	Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

#### **75.7 LIGHT FITTINGS/ ELECTRIC-POWERED FITTINGS AND EQUIPMENT**

As selected.

#### **75.9 CABLING**

Install with a maximum of 10 light outlet units or 6 switched socket units on any circuit. Separate circuits for all electric heating appliances. All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member.



**75.10 INSTALL SWITCH AND SOCKET UNITS**

Fit single and double switch units and socket units level and plumb where shown on the drawings. Install at the following heights (to the centre of the unit) unless shown otherwise on the drawings.

Switch Units: 1000 mm.

Socket Units: 150 mm above work benches. 400 mm elsewhere.

Mount switches vertically and socket units horizontally. Label switch units which control electrical equipment by engraving on the rocker switch.

**75.11 INSTALL LIGHT FITTINGS**

Install selected light fittings in the locations and heights shown on the drawings and in accordance with the fitting manufacturer's requirements.

**75.12 ELECTRIC HOT WATER SYSTEM**

Wire as a separate circuit through a wall-mounted isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end.

**75.15 WIRE FOR PLUMBING FITTINGS**

Wire for fittings to the Electricity Regulations 1997 and to the fitting manufacturer's requirements.

**75.16 INSTALL SMOKE DETECTORS**

Install detectors to NZBC F7/AS1, 3.3 Location of smoke alarms, and to manufacturer's requirements, fitted neatly and without damage to the surrounding finish.

**75.17 ELECTRIC POWERED FITTINGS AND EQUIPMENT**

Install and wire selected fittings and equipment to the Electricity Regulations 1997 and the individual fittings and equipment manufacturer's requirements. Refer to the drawings for required layouts and locations for equipment.

**75.18 COMPLETION**

Leave all fittings, lamps and tubes operational, with equipment and diffusers clean.

## **ADDITIONAL ITEMS**

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Refer to SELECTIONS/drawings for specific product, material, accessories and finish selections.

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# ALF Calculation Report

## Project Description

Project: BUILDBEST HOME 1

Current Design: BBCL HOME 1 MACS RD  
NEW HOME OFF MACPHEDRENS ROAD

Date: 25 FEB 2008

Designed by: MURRAY MCDOWELL

Address:

Owner Name: BUILDBEST CONSTRUCTION LIMITED  
Street: 685 DEPOT ROAD, OXFORD  
City: NORTH CANTERBURY  
Phone No.: 3123452  
Lot No.: Proposed Lot 8 of Lot 2  
DP No.: 383229

## NZ Building Code Compliance

In order to comply with the Energy Efficiency Clause H1 (2000) of the New Zealand Building Code a building has to have a BPI of less than 0.13 kWh/m<sup>2</sup>/Degree Days if it is in a warm location and less than 0.12 kWh/m<sup>2</sup>/Degree Days if it is in a cool location. Warm locations are locations with an average number of winter (May to August) degree days of less than 920. Cool locations are locations with 920 degree days or more. The currently selected location (Rangiora) is a cool location. The target BPI is therefore 0.12.

Alternatively, the building complies if it is built to NZS 4218:1996. This standard has three different methods to show compliance: the Schedule Method, the Calculation Method and the Modeling Method.

ALF checks the designed building for a BPI and for the NZS 4218:1996 Schedule and Calculation Methods.

The currently selected NZS 4218 target R-values are for a "non-solid construction".

The current design rates are:

BPI = 0.106	H1 pass
NZS 4218 (Schedule)	H1 pass
NZS 4218 (Calculation)	H1 pass

**The current building design complies with Clause H1 of the NZBC because it complies with at least one of the H1 compliance methods. However, in order to comply with the NZBC it also has to comply with Clause E3 (Moisture) of the NZBC.**

The acceptable solution of Clause E3 of the NZBC requires that R-values for walls, roofs and ceilings shall be no less than:

- a) For light timber frame wall or other framed wall constructions with cavities, 1.5.
- b) For single skin normal weight masonry based wall construction without a cavity, 0.6.
- c) For solid timber wall systems no less than 60 mm thick, 0.6.
- d) For roof and ceilings of any construction, 1.5.

### Details of H1 Compliance

BPI                      Maximum: 0.12                      Achieved: 0.106

NZS 4218 (Schedule)

	Minimum	Minimum achieved
Floor:	1.3	1.33 (excl. carpet)
Wall:	1.9	2.00
Roof:	2.5	3.35

NZS 4218 (Calculation)

Maximum acceptable heat loss:	399 W/°C
Achieved heat loss:	393 W/°C

For the individual components also applies that the average R-values must also be larger than 60% of those in the Schedule:

	Minimum	Average achieved
Floor:	0.8	1.33 (excl. carpet)
Wall:	1.1	2.00
Roof:	1.5	3.35

Copyright of the standard is property of Standards New Zealand and is protected as described in the NZS 4218:1996 document.

## Energy

This section gives you an overview of all the heat flows in and out of the designed building. It allows you to evaluate the importance of the thermal performance of individual building components - for example, of particular windows.

	Area m <sup>2</sup>	Loss		Gain		Net Gain
		kWh/ year	%	kWh/ year	%	kWh/ year
* Slab Floor:	128.0m <sup>2</sup>	1679	11.3%			
* Wall A(NW):	17.7m <sup>2</sup>	155	1.0%			
* Window A0:	3.7m <sup>2</sup>	431	2.9%	842	15.0%	412
* Window A1:	1.0m <sup>2</sup>	120	0.8%	234	4.2%	114
* Window A2:	1.0m <sup>2</sup>	120	0.8%	234	4.2%	114
* Window A3:	1.1m <sup>2</sup>	126	0.9%	246	4.4%	120
* Wall B(NE):	19.9m <sup>2</sup>	174	1.2%			
* Window B0:	1.6m <sup>2</sup>	191	1.3%	201	3.6%	10
* Window B1:	1.9m <sup>2</sup>	219	1.5%	230	4.1%	11
* Window B2:	0.5m <sup>2</sup>	63	0.4%	66	1.2%	3
* Wall C(E):	21.5m <sup>2</sup>	188	1.3%			
* Window C0:	0.5m <sup>2</sup>	30	0.2%	36	0.6%	6
* Window C1:	1.8m <sup>2</sup>	124	0.8%	149	2.6%	24
* Window C2:	0.5m <sup>2</sup>	30	0.2%	36	0.6%	6
* Window C3:	0.2m <sup>2</sup>	15	0.1%	18	0.3%	3
* Window C4:	0.2m <sup>2</sup>	15	0.1%	18	0.3%	3
* Wall D(SE):	17.4m <sup>2</sup>	152	1.0%			
* Window D0:	1.8m <sup>2</sup>	215	1.5%	146	2.6%	-69
* Wall E(S):	17.8m <sup>2</sup>	156	1.1%			
* Window E0:	0.3m <sup>2</sup>	29	0.2%	18	0.3%	-11
* Window E1:	0.3m <sup>2</sup>	29	0.2%	18	0.3%	-11
* Window E2:	0.2m <sup>2</sup>	15	0.1%	14	0.3%	-1
* Window E3:	0.2m <sup>2</sup>	15	0.1%	14	0.3%	-1
* Window E4:	0.2m <sup>2</sup>	15	0.1%	14	0.3%	-1
* Wall F(W):	22.6m <sup>2</sup>	198	1.3%			
* Window F1:	1.0m <sup>2</sup>	120	0.8%	171	3.0%	52
* Window F2:	2.1m <sup>2</sup>	242	1.6%	346	6.2%	105
* Window F3:	2.1m <sup>2</sup>	242	1.6%	346	6.2%	105
* Window F4:	3.7m <sup>2</sup>	431	2.9%	617	11.0%	187
* Wall G(SW):	15.7m <sup>2</sup>	138	0.9%			
* Window G0:	1.4m <sup>2</sup>	158	1.1%	124	2.2%	-34
* Window G1:	0.9m <sup>2</sup>	107	0.7%	84	1.5%	-23
* Roof A:	15.1m <sup>2</sup>	79	0.5%			
* Roof C:	71.1m <sup>2</sup>	371	2.5%			
* Roof D:	94.8m <sup>2</sup>	495	3.3%			
* Air Leakage:	307.2m <sup>2</sup>	1135	7.7%			
* Warm-up:		6796	45.9%			
* Internal Gain:				1399	24.9%	
Total:		14818	100.0%	5626	100.0%	

Floor Loss:	1679 kWh/year
Wall Loss:	1161 kWh/year
Window Loss:	3101 kWh/year
Roof Loss:	946 kWh/year
Air Leakage:	1135 kWh/year
Warm-up:	6796 kWh/year
<u>Total Load:</u>	<u>14818 kWh/year</u>

Solar Gain:	4227 kWh/year
Internal Gain:	1399 kWh/year (4 occupants)
<u>Total Gain:</u>	<u>5626 kWh/year</u>

Gain Load Ratio: 38%

Effective Thermal Mass Density (per m<sup>2</sup> total floor area): 3.03 W/m<sup>2</sup> °C

Specific Heat Loss Density (per m<sup>2</sup> total floor area): 3.6 W/m<sup>2</sup> °C

Usefulness of Gains: 73%

Useful Gains: 4115 kWh/year

**Required Heating Energy: 10703 kWh/year**

## **Economic Analysis**

This section shows the results of the comparison between the current design and the base design.

**Current Design: BBCL HOME 1 MACS RD**

*NEW HOME OFF MACPHEDRENS ROAD*

**Base Design: NZS 4218 (default)**

*Areas of floors, walls and roofs are the same as in the current building design.*

Total window area as in the current design (including the skylights); however, one eighth of the total window area is facing each of the 8 major compass orientations (no skylights). The R-value is 0.19, the SHGC 0.83 (clear single glazing) and the Shading is 20%.

R-values: floors:R 1.33, walls:R 2.00, roofs:R 3.35 and windows:R 0.2 (single glazed windows with aluminum frames).

Local Air Leakage Rate: 1 ac/h.

Carpeted floors, external and internal walls: lightweight timber. Ceiling and furniture thermal mass as in the current design.

Internal gains as for the current design.

The same climate and heating conditions apply as in the current design.

Analysis period: 30 years

Average mortgage rate: 8 %

Modification cost between the base design and the current design: \$0

Marginal heating energy cost: 9 c/kWh

## **Result:**

The current design ('BBCL HOME 1 MACS RD') uses **450 kWh/year less** heating energy than the base design ('NZS 4218 (default)'), and its cost over a lifetime of 30 years is **\$626 less** than the cost of the base design. This includes the cost of the modification to achieve the energy savings.

## Modeling Assumptions

This section lists the modeling assumptions concerning the building design, climate and heating.

### Building Design

#### *General:*

Total Floor Area: 128 m<sup>2</sup>

Number of Occupants: 4

#### *Slab Floor:*

Floor Area: 128 m<sup>2</sup>

Perimeter Length: 63 m

External Wall Thickness: 0.21 m

Soil Conductivity: 1.2 W/m°C

Under Floor R-value: 0 m<sup>2</sup>°C/W

Edge Insulation Width: 0 m

Slab and Ground R-value: 1.333743 m<sup>2</sup>°C/W

Floor Covering R-value: 0 m<sup>2</sup>°C/W

Total Slab Floor R-value: 1.33 m<sup>2</sup>°C/W

#### *Walls:*

##### *Type 1:*

Timber Framed Wall, Brick/Block Veneer, Insulation Within Framing - 100 mm Framing

2 Dwargs, Studs 600 mm ctr., Blanket and Segment Insulants

Insulation R-value: 2.2 m<sup>2</sup>°C/W

Construction R-value: 2 m<sup>2</sup>°C/W

Name	Orientation	Length	Height	Net Area	Window Area
		m	m	m <sup>2</sup>	m <sup>2</sup>
Wall A	Northwest	10.2	2.4	17.7	6.82
Wall B	Northeast	10	2.4	19.9	4.061
Wall C	East	10.3	2.4	21.5	3.195
Wall D	Southeast	7.7	2.5	17.4	1.845
Wall E	South	7.9	2.4	17.8	1.175
Wall F	West	13.1	2.4	22.6	8.855
Wall G	Southwest	7.2	2.5	15.7	2.27

#### *Roofs:*

##### *Type 1:*

Pitched Timber Framed Roof, Metal Clad, Flat Ceiling

Truss 94x47 900ctr., Batten 35x69 <600ctr., Blanket and Segment Insulants\*

Insulation R-value: 3.2 m<sup>2</sup>°C/W

Construction R-value: 3.35 m<sup>2</sup>°C/W

Name	Length	Width	Net Area	Window Area
	m	m	m <sup>2</sup>	m <sup>2</sup>
Roof A	2.8	5.4	15.1	0
Roof B	0	0	0.0	0
Roof C	7.9	9	71.1	0
Roof D	7.9	12	94.8	0

### Windows and Skylights:

#### Type 1:

Glass: Single, clear

Frame: Aluminum frame (no thermal break)

R-value: 0.15 m<sup>2</sup> °C/W

Solar Heat Gain Coefficient: 70 %

Number	Wall/ Roof	Orientation	Width	Height	Net Area	Shading
			m	m	m <sup>2</sup>	%
Wind. 1	Wall A	Northwest	1.8	2.05	3.69	0
Wind. 2	Wall A	Northwest	0.5	2.05	1.025	0
Wind. 3	Wall A	Northwest	0.5	2.05	1.025	0
Wind. 4	Wall A	Northwest	1.2	0.9	1.08	0
Wind. 1	Wall B	Northeast	0.8	2.05	1.64	0
Wind. 2	Wall B	Northeast	0.9	2.09	1.881	0
Wind. 3	Wall B	Northeast	0.6	0.9	0.54	0
Wind. 4	Wall B	Northeast	0	0	0	0
Wind. 1	Wall D	Southeast	0.9	2.05	1.845	0
Wind. 1	Wall E	South	0.25	1	0.25	0
Wind. 2	Wall E	South	0.25	1	0.25	0
Wind. 1	Wall F	West	0	0	0	0
Wind. 2	Wall F	West	0.5	2.05	1.025	0
Wind. 3	Wall F	West	1.8	1.15	2.07	0
Wind. 4	Wall F	West	1.8	1.15	2.07	0
Wind. 5	Wall F	West	1.8	2.05	3.69	0
Wind. 1	Wall G	Southwest	1.5	0.9	1.35	0
Wind. 2	Wall G	Southwest	0.8	1.15	0.92	0

#### Type 2:

Glass: Double, clear

Frame: Aluminum frame (no thermal break)

R-value: 0.26 m<sup>2</sup> °C/W

Solar Heat Gain Coefficient: 61 %

Number	Wall/ Roof	Orientation	Width	Height	Net Area	Shading
			m	m	m <sup>2</sup>	%
Wind. 1	Wall C	East	0.5	0.9	0.45	0
Wind. 2	Wall C	East	0.9	2.05	1.845	0
Wind. 3	Wall C	East	0.5	0.9	0.45	0
Wind. 4	Wall C	East	0.25	0.9	0.225	0
Wind. 5	Wall C	East	0.25	0.9	0.225	0
Wind. 3	Wall E	South	0.25	0.9	0.225	0
Wind. 4	Wall E	South	0.25	0.9	0.225	0
Wind. 5	Wall E	South	0.25	0.9	0.225	0

### Air Leakage:

Basic Air tightness: airtight

No. of Open Fires without Flue Restrictors: 0

No. of Open Fires with Flue Restrictors: 1

Area of Large Gaps: 53021 mm<sup>2</sup>

The house has no passive vents.

The location-independent Air Leakage Rate is 0.62 ac/h.

Site Exposure: exposed

Wind Zone Factor: 0.8

Local Air Leakage Rate: 0.64 ac/h

House Volume: 307 m<sup>3</sup>



#### *Thermal Mass:*

Timber Floor: .0 m<sub>2</sub>, Carpet and underlay ( Wh/m<sub>2</sub> °C)  
Thermal Mass: 0 kWh/°C  
Concrete Floor: 128.0 m<sub>2</sub>, without insulation (300 Wh/m<sub>2</sub> °C)  
Thermal Mass: 38400 kWh/°C  
External Walls: 133.0 m<sub>2</sub>, any internally lined construction (9 Wh/m<sub>2</sub> °C)  
Thermal Mass: 1197 kWh/°C  
Internal Walls: .0 m<sub>2</sub>, Timber or steel frame ( Wh/m<sub>2</sub> °C)  
Thermal Mass: 0 kWh/°C  
Total Floor Area (used for Furniture and Ceiling): 128.0 m<sub>2</sub> (4.5 Wh/m<sub>2</sub> °C + 2.5 Wh/m<sub>2</sub> °C)  
Thermal Mass: 896 kWh/°C  
Total Thermal Mass: 40493 kWh/°C  
Effective Thermal Mass: 388.4 W/°C

#### Climate

Location: Rangiora in the Upper South Island

Heating Season: May to October

Annual Loss Factor: 17.5

Annual Gain Factors:

N	NE	E	SE	S	SW	W	NW	H
282	175	132	113	105	131	239	326	252

Internal Gain Multiplier: 1.46

Wind Zone Factor: 0.8

H1 Climate Location: cool , BPI Target: 0.12

NZS 4218:1996 Climate Zone: 3

#### Heating

Heating Schedule : Morning and Evening Heating (7:00-9:00 and 17:00-23:00)

Heating Level: 20°C

Calculation Date: 26 February 2008, 3:43 PM

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**GIB® Bracing Systems, 2006**

For full construction details see literature  
**GIB® Bracing Systems, 2006**

Supplier	System	Minimum Length (m)	BU's W/m	BU's EQ/m
	none			
GIB®	GS1a	1.8	65	55
		2.4	75	65
GIB®	GS2	1.2	70	60
		1.8	80	70
		2.4	90	80
GIB®	BL1	0.4	120	115
		0.6	125	115
GIB®	BL1a	1.8	130	115
GIB®	BLP	0.6	145	135
		0.9	145	145
GIB®	BLG	0.6	145	130
		1.2	150	130
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			
Custom	Custom			

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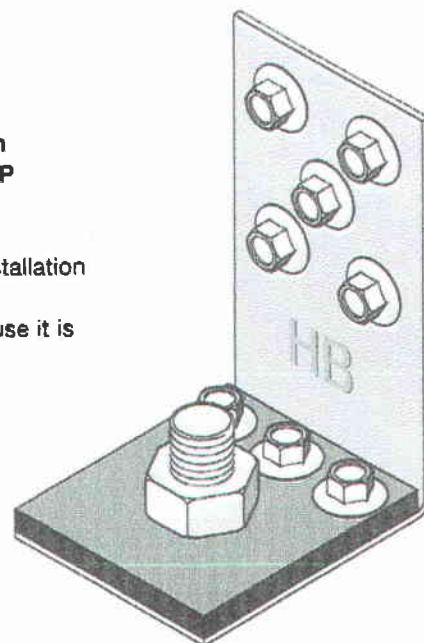
All rights reserved

# GIB® HandiBrac™

## Panel Hold-Down Bracket

Developed in conjunction with MiTek™, the GIB® HandiBrac™ has been designed and tested for use as a hold-down bracket in GIB® BL and UP bracing elements.

- The GIB® HandiBrac™ registered design provides for quick and easy installation
- The GIB® HandiBrac™ provides a flush surface for the wall linings because it is fitted inside the framing. There is no need to check in the framing as recommended with conventional straps
- The GIB® HandiBrac™ is suitable for both new and retrofit construction
- The design also allows for installation and inspection at any stage prior to fitting internal linings



### Components

GIB® HandiBrac™ is available in boxes of 10, each containing 5 pairs.

Components per paired pack include:

- 2 x GIB® HandiBrac™ Brackets
- 2 x Washers
- 16 x Tek Screws (8mm AF)

NB: Bolt purchased separately

### GIB® Bracing Elements

The GIB® HandiBrac™ is a proprietary product that has been tested in, and is suitable only for the following GIB® Bracing systems; GIB Braceline® bracing elements (BL1, BL1a, BLP, BLG) and GIB Ultraline® PLUS Lining Systems bracing elements (UP1, UP1a, UPP, UP2) all have panel hold-down connections at each end of the bracing element.

### GIB® Bracing Panel Hold-down Fixings

Panel hold-down fixings are required at both ends of the following bracing elements.

- GIB® Bracing Systems 2006; Bracing elements BL1, BL1a, BLP, BLG
- GIB Ultraline® PLUS Lining System 2006; Bracing elements UP1, UP1a, UPP, UP2.
- The washer is an integral part of the GIB® HandiBrac™ design and is supplied as part of the pack. It does not need to be acquired separately.

#### Fixing to timber framed floors

Bolt fixing to a timber framed floor is with a 150 mm long by 12 mm diameter galvanised coach screw installed in accordance with NZS 3603:1993, Clause 4.5.

#### Fixing to concrete slabs

The bottom plate at both ends of the bracing element is fixed using an M12 galvanised bolt set not less than 75 mm into concrete and projecting sufficiently to allow a fully threaded nut above the washer. Alternatively, a proprietary fixing with equivalent capacity may be used.

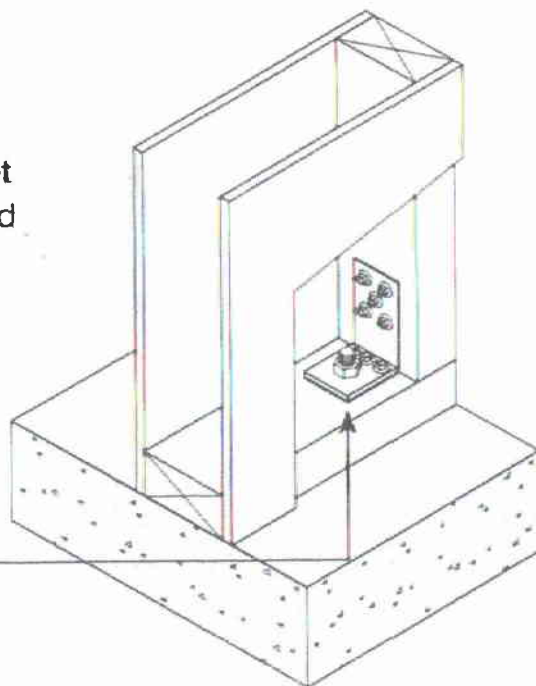
## Panel Hold-down Details

### Concrete Floor - Internal Wall

Bottom plate is fixed using M12 galvanised bolt set not less than 75mm into concrete and projecting sufficiently to allow for the washer and fully-threaded nut above the timber.

Locate the GIB®  
HandiBrac™ bracket  
centrally on the stud

GIB®  
HandiBrac™  
bracket

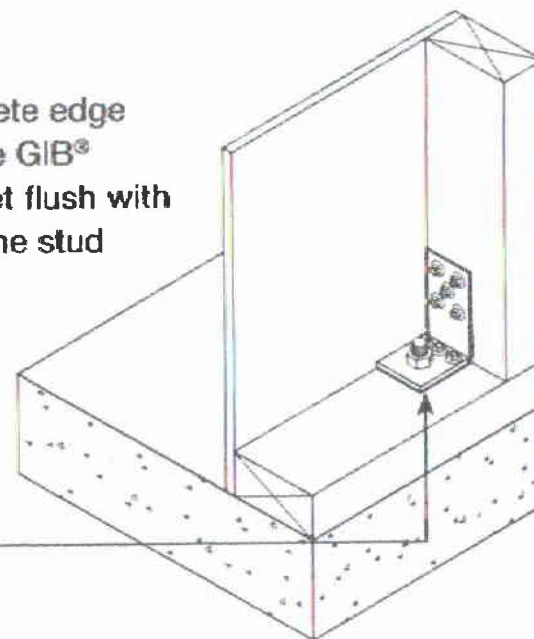


### Concrete Floor - External Wall

Bottom plate is fixed using M12 galvanised bolt set not less than 75mm into concrete and projecting sufficiently to allow for the washer and fully-threaded nut above the timber.

To maximise concrete edge  
distance, locate the GIB®  
HandiBrac™ bracket flush with  
the inside face of the stud

GIB®  
HandiBrac™  
bracket



080258

# GIB® BRACING SYSTEMS – CONSTRUCTION

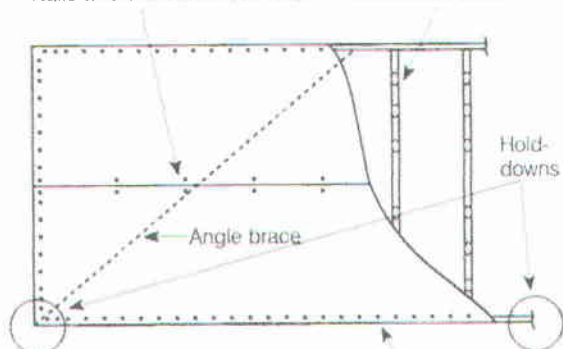


## Fastener Layouts – GIB Braceline® Bracing Elements

MARCH 2006

**For 10mm GIB Braceline®, 10mm and 13mm GIB Noiseline® and 13mm GIB Toughline®**

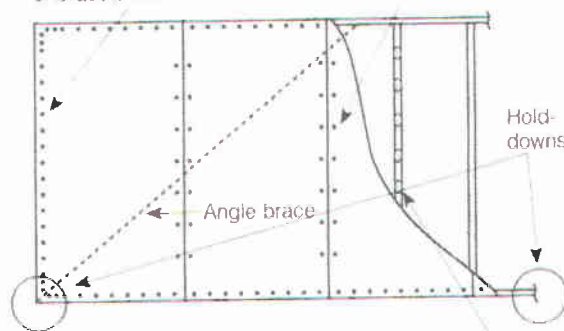
32mm x 6g GIB® Grabber® Drywall Screws or 30mm GIB® Nails where sheets cross studs  
Daub of GIBFix® adhesive at 300mm centres to intermediate studs



**BL1a (lined one side)  
(Horizontal Fixing)**

32mm GIB Braceline® screws or 35mm GIB Braceline® nails at 150mm centres to perimeter of braced element

32mm GIB Braceline® Screws or 35mm GIB Braceline® Nails at 150mm centres to perimeter of braced element

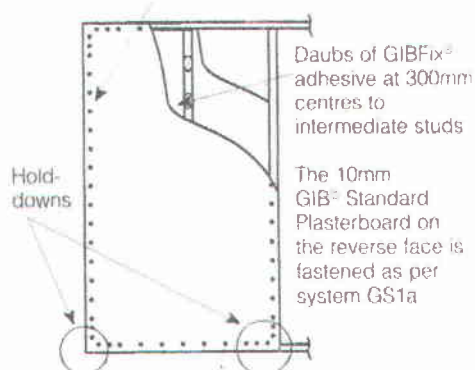


**BL1a (lined one side)  
(Vertical Fixing)**

32mm x 6g GIB® Grabber® Drywall Screws or 30mm GIB® Nails at 300mm centres

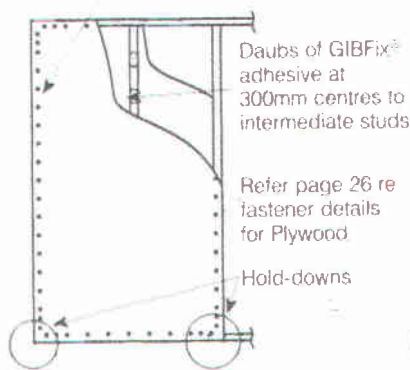
Daub of GIBFix® adhesive at 300mm centres to intermediate studs and nogs

32mm GIB Braceline® Screws or 35mm GIB Braceline® Nails at 150mm centres to perimeter of braced element



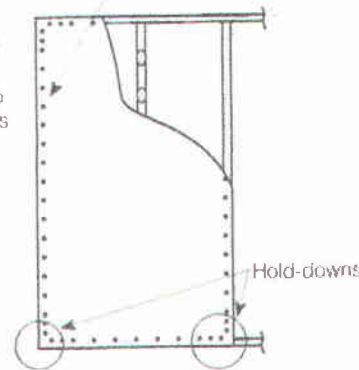
**BLG (lined both sides)**

32mm GIB Braceline® Screws or 35mm GIB Braceline® Nails at 150mm centres to perimeter of braced element



**BLP (lined both sides)**

32mm GIB Braceline® Screws or 35mm GIB Braceline® Nails at 150mm centres to perimeter of braced element



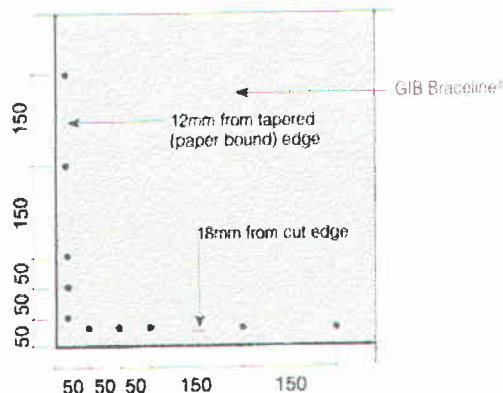
**BL1 (lined one side)**

### Fixing the perimeter of a GIB Braceline® bracing element

Fasteners are placed no closer than 12mm to the tapered (paper bound) machine edge of the GIB® plasterboard sheets. Fasteners are placed no closer than 18mm to a sheet end or a cut sheet edge.

For GIB Braceline® systems, fasteners are placed at 150mm centres around the bracing element perimeter, starting at 50, 100 and 150mm from the sheet corners.

### Fastening pattern for GIB Braceline® bracing elements



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow system specifications.

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FOR FURTHER INFORMATION VISIT WWW.GIB.CO.NZ



# GIB® BRACING SYSTEMS – CONSTRUCTION



## Fastener Layouts – GIB® Standard Bracing Elements

MARCH 2006

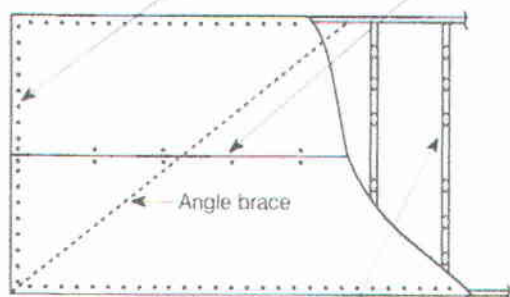
### For 10mm GIB® Standard Plasterboard and any other 10mm and 13mm GIB® plasterboard

32mm x 6g GIB® Grabber® Drywall Screws or 30mm GIB® Nails at 150mm centres to perimeter of bracing element

Single 32mm x 6g GIB® Grabber® Drywall Screws or 30mm GIB® Nails where sheets cross studs

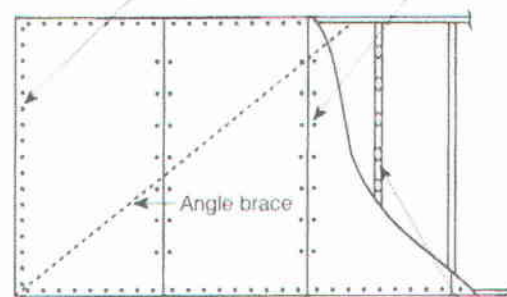
32mm x 6g GIB® Grabber® Drywall Screws or 30mm GIB® Nails at 150mm centres to perimeter of bracing element

Single 32mm x 6g GIB® Grabber® Drywall Screws or 30mm GIB® Nails at 300mm centres



**GS1a (lined one side)  
(Horizontal Fixing)**

Daub of GIBFix® adhesive at 300mm centres to intermediate studs



**GS1a (lined one side)  
(Vertical Fixing)**

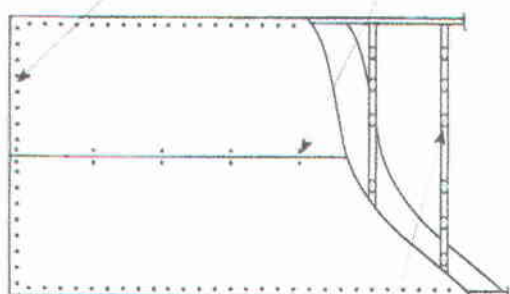
Daub of GIBFix® adhesive at 300mm centres to intermediate studs and nogs

32mm x 6g GIB® Grabber® Drywall Screws or 30mm GIB® Nails at 150mm centres to perimeter of bracing element

Single 32mm x 6g GIB® Grabber® Drywall Screws or 30mm GIB® Nails where sheets cross studs

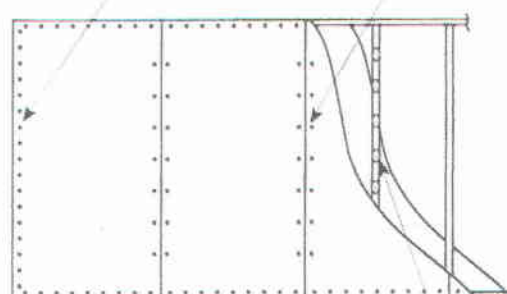
32mm x 6g GIB® Grabber® Drywall Screws or 30mm GIB® Nails at 150mm centres to perimeter of bracing element

Single 32mm x 6g GIB® Grabber® Drywall Screws or 30mm GIB® Nails at 300mm centres



**GS2 (lined both sides)  
(Horizontal Fixing)**

Daub of GIBFix® adhesive at 300mm centres to intermediate studs



**GS2 (lined both sides)  
(Vertical Fixing)**

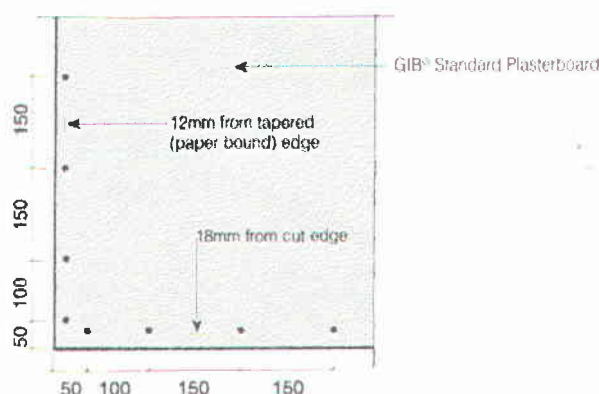
Daub of GIBFix® adhesive at 300mm centres to intermediate studs and nogs

### Fixing the perimeter of a GIB® Standard Plasterboard bracing element

Fasteners are placed no closer than 12mm to the tapered (paper bound) machine edge of the GIB® plasterboard sheets. Fasteners are placed no closer than 18mm to a sheet end or a cut sheet edge.

For GIB® Standard bracing elements fasteners are placed at 150mm centres around the bracing element perimeter, starting at 50 and 150mm from the sheet corners.

### Fastening pattern for GIB® Standard bracing elements



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow system specifications.

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# GIB® BRACING SYSTEMS – CONSTRUCTION

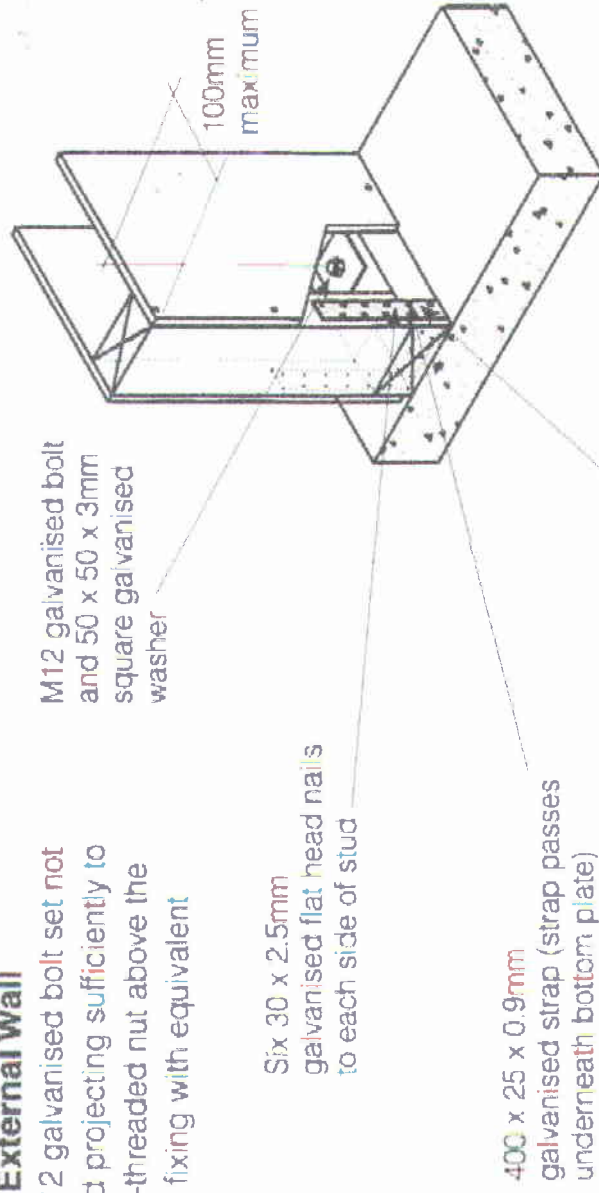


## Panel Hold-down Details

MARCH 2006

### Concrete Floor – Internal / External Wall

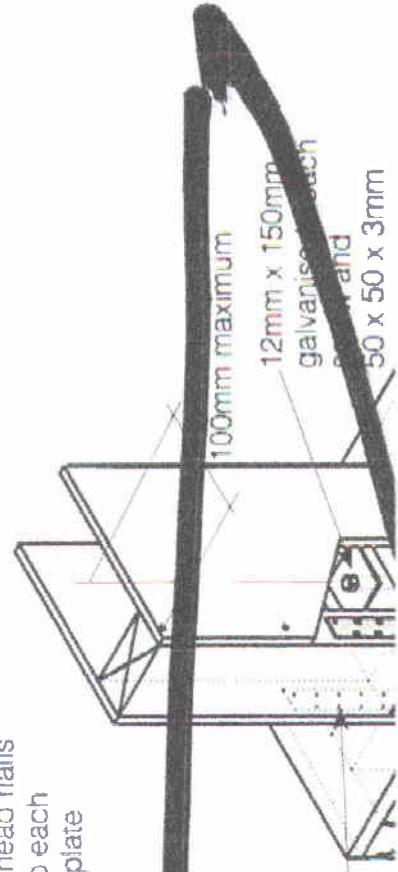
Bottom plate is fixed using an M12 galvanised bolt set not less than 75mm into concrete and projecting sufficiently to allow for a 3mm washer and fully-threaded nut above the timber. Alternatively a proprietary fixing with equivalent capacity may be used.



Three 30 x 2.5mm galvanised flat head nails (30 x 2.5mm) to each side of bottom plate

### Timber Floor – Internal Wall

Bottom plate is fixed using a 12mm diameter minimum 150mm long galvanised coach screws.



Six 30 x 2.5mm galvanised flat head nails to each side of stud

080256



## Introduction

GIB Aqualine® is an internal lining material designed for use in wet areas such as bathrooms, kitchens, laundries and toilets.

When installed in wet areas, directly exposed to liquid water, that is a shower cubicle or shower over bath situation, the GIB Aqualine® must be faced with ceramic tiles complete with a waterproof membrane.

Alternatively, GIB Aqualine® may be clad with a suitable flexible sheet vinyl, fully bonded and with all seams heat welded.

Outside of areas directly exposed to liquid water, GIB Aqualine® is ideal for the application of paint and wallpaper finishes.

### Product Description

GIB Aqualine® features a wax modified water resistant core. The board resists both water vapour penetrating to the cavity of the wall and moisture travelling up the core.

The board is manufactured with tapered edges allowing conventional jointing techniques.

### Compliance with the New Zealand Building Code (NZBC)

#### Structure – Clause B1

The design and material specification for steel and timber framing used in GIB Aqualine® systems must be in accordance with the performance requirements of NZBC Clause B1 (Structure).

NZBC Clauses B1 (Structure) and B2 (Durability) require that bracing elements have a durability of 50 years. GIB® Bracing Systems must not be specified in areas where a 15 year durability applies and where linings are subject to direct water pressure. Examples are a shower cubicle or shower over bath situations. Otherwise GIB Aqualine® may be used as a substitute for the equivalent thickness GIB® Standard plasterboard in bracing systems GIB1, 2, 3, 10 and 11.

#### Durability – Clause B2

When installed and maintained in accordance with this literature, GIB Aqualine® tiled or vinyl covered systems have a serviceable life of at least 15 years. They comply with the requirements of NZBC Clause B2 (Durability), for use in wet areas directly exposed to liquid water, e.g. showers, showers over baths and splash backs.

When used as a general wet area lining, and maintained under normal dry internal conditions, GIB Aqualine® systems have a serviceable life of at least 50 years and comply with NZBC Clause B2 (Durability) for use within toilets, kitchens, bathrooms and laundries not directly exposed to liquid water.

#### Spread of Fire – Clause C3

GIB® Fire Rated Systems provide passive fire protection in accordance with the requirements of NZBC Clause C3 (Spread of Fire). When GIB Aqualine® is substituted into fire rated systems in place of the equivalent thickness GIB Fyrelite®, the Fire Resistance Rating (FRR) of that system will be maintained.

#### Internal Moisture – Clause E3

When installed in accordance with this literature, tiled or vinyl covered GIB Aqualine® systems may be used in areas directly exposed to liquid water such as showers to provide an impervious and easily cleaned wall surface. These systems comply with the requirements of NZBC Clause E3 (Internal Moisture).

#### Hazardous Building Materials – Clause F2

At no stage during handling, installation, or serviceable life does GIB Aqualine® constitute a health hazard. It therefore meets the provisions of NZBC Clause F2 (Hazardous Building Materials). Dust resulting from the sanding of stopping compounds may be a respiratory irritant and the use of a suitable facemask is recommended.

#### Ventilation – Clause G4

NZBC Clause G4 (Ventilation) requires buildings to have a means of collecting or otherwise removing steam generated from laundering, utensil washing, bathing or showering. To prolong the life of interior linings and surface finishes, and to minimise the risk of moisture related problems such as condensation and mould growth, GIB® recommends that adequate heating and mechanical ventilation is provided in kitchens, bathrooms and laundries.

#### Airborne and Impact sound – Clause G6

GIB Noise Control® Systems can be used to provide ratings for Sound Transmission Class (STC) and Impact Insulation Class (IIC) in accordance with the requirements of NZBC Clause G6 (Airborne and Impact Sound). When GIB Aqualine® is substituted into GIB Noise Control® systems in place of the equivalent thickness GIB® Standard or GIB Fyrelite®, the STC and IIC rating of that system will be maintained. When GIB Aqualine® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur. For further information contact the GIB® Helpline 0800 100 442.

## Framing and Lining Installation – Paint and Wallpaper Finishes

### Walls - Paint and Wallpaper Finishes Outside of Shower Areas (Refer to associated GIB® Publications for Fire Rated or Noise Control Construction)

#### Framing

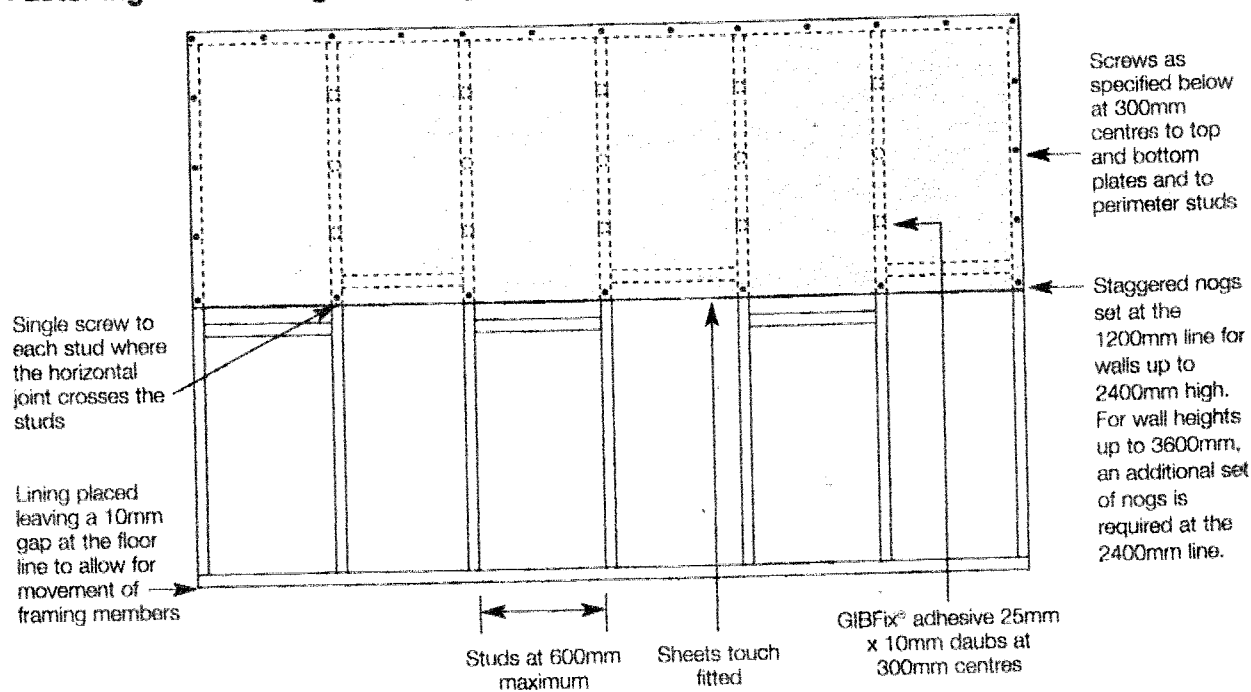
The moisture content of timber framing shall be between 12-16% at the time of lining.

- Studs shall be spaced at 600mm centres maximum.
- Nogs
  - For wall heights up to 2400mm, staggered nogs are to be set alternately 150mm above and below the 1200mm line.
  - For wall heights up to 3600mm an additional set of nogs is required at the 2400mm line.
- Steel stud systems do not generally incorporate nogs except as required below.

**Note:** Additional nogs are required as follows:-

- Adjacent to each pipe penetration
- Between all studs above bath flanges and preformed shower bases
- Behind sink and tub flashings
- To support towel rails, grab rails and wall basin brackets

#### Fastening and Jointing the Linings – Horizontal Fixing\*



\* For vertical fixing, two evenly spaced rows of nogs are required.

#### Fasteners

- 10mm GIB Aqualine® – 25mm x 6g GIB® Grabber™ High Thread Drywall screws
- 13mm GIB Aqualine® – 32mm x 6g screws as above

#### Fastener Centres

- 300mm centres to top and bottom plates and to perimeter studs
- Single screws to each stud where the horizontal joint crosses the studs

#### Lining

- 25mm x 10mm daubs of GIBFix® adhesive at 300mm centres to intermediate studs
- Lay the sheets horizontally leaving a 10mm gap at the floor line to allow for movement of framing members. Sheets to be touch fitted.

#### Jointing

- Jointing shall be carried out in accordance with instructions contained in the publication "GIB Living Solutions® Site Guide"

**Note:** The above specification also applies to flexible sheet vinyl finishes, except that the lining gap at the floor should be reduced to 5mm when a pencil cove detail is used.  
See "Flexible Sheet Vinyl", Page 8.

## Framing and Lining Installation – Tiled Walls

### Tiled Walls – Showers and Other Wet Areas

(Refer to associated GIB® Publications for Fire Rated or Noise Control construction)

#### Framing

- The moisture content of timber framing shall be between 12-16% at the time of lining.
  - **10mm GIB Aqualine® faced with ceramic tiles (tile weight up to 12.5kg/m²)** studs shall be spaced at 600mm centres with nogs set at 600mm centres. (Centre row of nogs can be staggered 150mm either side of the centre line for horizontal fixing).
  - **Note:** Where double layer linings occur, the studs may be set at 600mm centres.
  - **13mm GIB Aqualine® faced with ceramic tiles (tile weight up to 32kg/m²)** studs shall be spaced at 600mm centres maximum.
- Nogs
- For wall heights up to 2400mm, staggered nogs are to be set alternately 150mm above and below the 1200mm line
  - For wall heights up to 3600mm an additional set of nogs is required at 2400mm line
- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum 32 x 32 x 0.55mm galvanised metal angle. Each side of the angle shall be fastened to the framing with 30mm galvanised clouts at 300mm centres (see illustrations, page 11, 13)
  - Steel stud systems do not generally incorporate nogs except as required below.
  - Additional nogs are required as follows:-
    - Adjacent to each pipe penetration
    - Between all studs above bath flanges and preformed shower bases
    - Behind sink and tub flashings
    - To support towel rails, grab rails and wall basin brackets.

- Fasteners**
- **10mm GIB Aqualine®, tile weight up to 12.5kg/m²**  
25mm x 6g GIB® Grabber™ High Thread Drywall screws at 150mm centres to studs, top and bottom plates and single screws to the centre of each nog
  - **13mm GIB Aqualine®, tile weight up to 32kg/m²**  
32mm x 6g screws as above at 100mm centres to studs, nogs and top and bottom plates

**Note: Adhesive fixing is not permitted in tiled areas**

- Lining**
- Lay the sheets horizontally leaving a 10mm gap at the floor line to allow for movement of framing members.  
Provide a 5-10mm gap between the bottom edge of the lining and the bath rim, any upstand or the preformed shower base (allows placement of sealant)  
Sheets shall be touch fitted

- Jointing**
- Jointing shall be carried out in accordance with instructions contained in the publication "GIB Living Solutions® Site Guide"

**Do not use topping compound in tiled areas**

Use only chemical setting compounds such as GIB Tradeset® or GIB® Bedding compound, flushed out and reinforced only with paper tape.

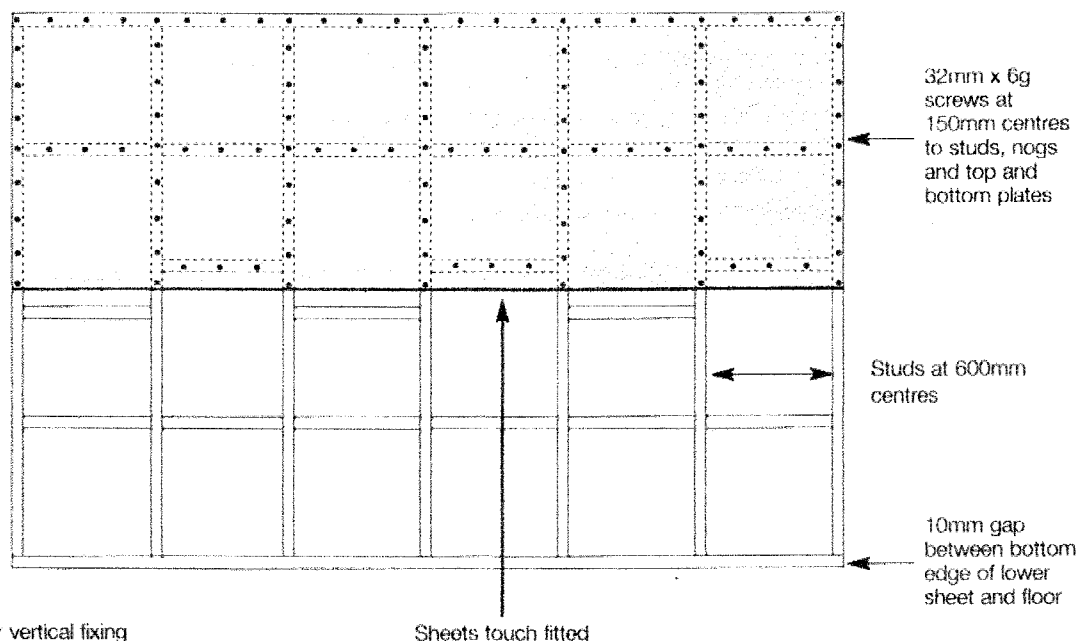
#### Notes

- Where the framing or fastener centres required for tiled GIB Aqualine® are closer than those specified for GIB® FRR and Noise Control Systems, the GIB Aqualine® specification shall prevail.
- Where single layer linings occur on steel framing the minimum lining thickness shall be 13mm.
- See "Waterproof Membranes" page 9 re tiled finishes in shower areas.

## Framing and Lining Installation – Tiled Walls

### Fastening and Jointing the Lining in Tiled Areas – Horizontal Fixing\*

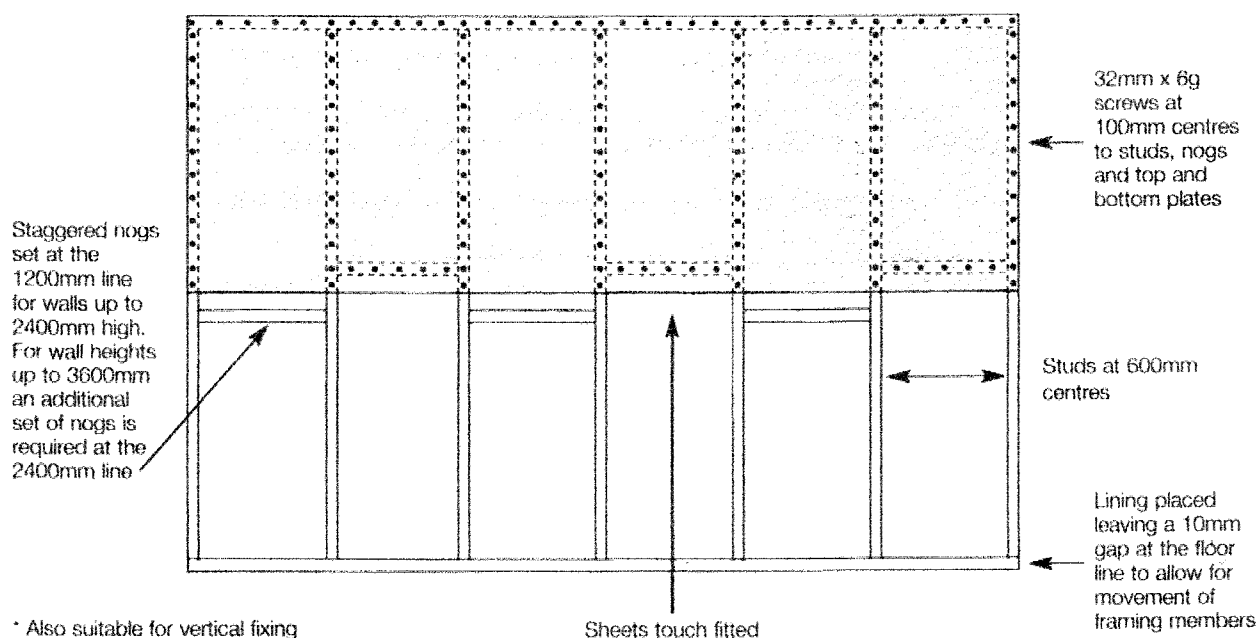
10mm GIB Aqualine® – Tiles up to 12.5kg/m<sup>2</sup>



\* Also suitable for vertical fixing

### Fastening and Jointing the Lining in Tiled Areas – Horizontal Fixing\*

13mm GIB Aqualine® – Tiles up to 32kg/m<sup>2</sup>



\* Also suitable for vertical fixing

## Ceilings

Battens or ceiling joists shall be spaced at 450mm centres maximum for 10mm GIB Aqualine® and 600mm centres maximum for 13mm board.

Fixing and jointing as for standard GIB® detailed in the publication "GIB Living Solutions® Site Guide".

Tiling is not recommended on GIB® Plasterboard soffits and ceilings.

**NU-LOOK CANTERBURY**

Phone : (03) 389 6466

Fax : (03) 389 6076

Quote No. : -14817- Ver 11  
Quote Date: 22/02/2008  
Modified Date: 22/02/2008

11 HENRY ST  
P.O. Box 33321  
Christchurch

Contact : **PAUL**  
Mobile : 029 982-5162  
E-Mail :

E-mail : [nulook@paradise.net.nz](mailto:nulook@paradise.net.nz)

**TRADE**

Project Title : **MURRAY McDOWELL  
NEW HOUSE OXFORD**

Site Contact :

Deliver to : **685 DEPOT OXFORD ROAD**

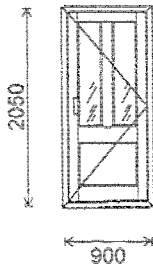
Mobile :

Phone :

Fax :

Items :

Item	Description	Quantity
1	<b>W1 ENTRY DOOR FRAME</b> <b>FRAME COLOUR :</b> To Be Advised FAB20 <b>FRAME TYPE :</b> WeatherTight Series <b>WIND ZONE :</b> High <b>LINER :</b> H3 Clear Pine 25mm Architraved Mitre Cut <b>GLASS :</b> Clear Float Double Glazed <b>OPEN :</b> OPENIN <b>HEIGHT FROM FLOOR :</b> 0 <b>WALL THICKNESS :</b> 170 <b>SILL LINER :</b> TRUE <b>FLASHING :</b> NO Flashing <b>TRIM SIZE :</b> 2080mm x 930mm	1

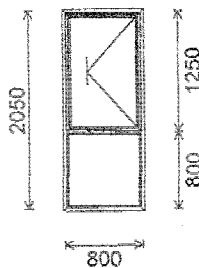


**COMMENTS:**

1 x Comp30 2 B Aria LCL 4-point short-throw K/T -

- 1.1 INCLUDING STELLAR SR10 DOOR.  
STANDARD POWDER COAT COLOUR ONLY WITH CLEAR FLOAT DOUBLE GLAZING.

2	<b>W2 LOUNGE</b> <b>FRAME COLOUR :</b> To Be Advised FAB20 <b>FRAME TYPE :</b> WeatherTight Series <b>WIND ZONE :</b> High <b>LINER :</b> H3 Clear Pine 25mm Architraved Mitre Cut <b>GLASS :</b> Clear Float Double Glazed <b>HEIGHT FROM FLOOR :</b> 0 <b>WALL THICKNESS :</b> 170 <b>SILL LINER :</b> TRUE <b>FLASHING :</b> NO Flashing <b>TRIM SIZE :</b> 2080mm x 830mm	1
---	---	---

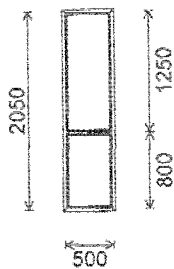


**COMMENTS:**

2 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

3

**W3 LOUNGE**

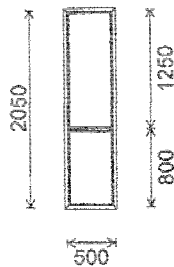


**FRAME COLOUR :** To Be Advised FAB20  
**FRAME TYPE :** WeatherTight Series  
**WIND ZONE :** High  
**GLASS :** Clear Float Double Glazed  
**HEIGHT FROM FLOOR :** 0  
**WALL THICKNESS :** 170  
**SILL LINER :** TRUE  
**FLASHING :** 71mm Head Flashing  
**TRIM SIZE :** 2080mm x 530mm  
**LINER :** H3 Clear Pine 25mm Architraved Mitre Cut

**COMMENTS:**

4

**W4 LOUNGE**

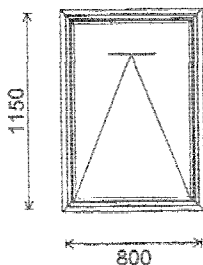


**FRAME COLOUR :** To Be Advised FAB20  
**FRAME TYPE :** WeatherTight Series  
**WIND ZONE :** High  
**GLASS :** Clear Float Double Glazed  
**HEIGHT FROM FLOOR :** 0  
**WALL THICKNESS :** 170  
**SILL LINER :** TRUE  
**FLASHING :** 71mm Head Flashing  
**TRIM SIZE :** 2080mm x 530mm  
**LINER :** H3 Clear Pine 25mm Architraved Mitre Cut

**COMMENTS:**

5

**W5 LOUNGE**



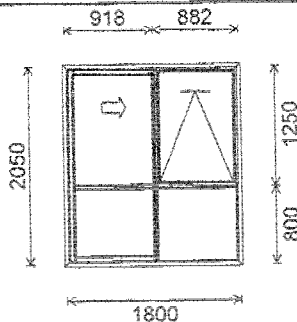
**FRAME COLOUR :** To Be Advised FAB20  
**FRAME TYPE :** WeatherTight Series  
**WIND ZONE :** High  
**GLASS :** Clear Float Double Glazed  
**HEIGHT FROM FLOOR :** 900  
**WALL THICKNESS :** 170  
**SILL LINER :** TRUE  
**FLASHING :** NO Flashing  
**TRIM SIZE :** 1180mm x 830mm  
**LINER :** H3 Clear Pine 25mm Architraved Mitre Cut

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -  
 1 x Comp30 2 B Aria Wedgeless High Profile Face Fix LH -

6

**W6 LIVING SLIDER**



**FRAME COLOUR :** To Be Advised FAB20  
**FRAME TYPE :** WeatherTight Series  
**WIND ZONE :** High  
**GLASS :** Clear Float Double Glazed  
**BEADED PANEL :** TRUE  
**HEIGHT FROM FLOOR :** 0  
**WALL THICKNESS :** 170  
**SILL LINER :** TRUE  
**FLASHING :** NO Flashing  
**TRIM SIZE :** 2080mm x 1830mm  
**LINER :** H3 Clear Pine 25mm Architraved Mitre Cut

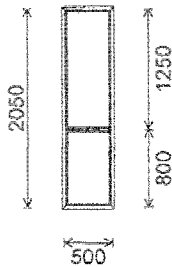
**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless Low Profile Face Fix RH -  
 1 x Comp30 2 B Aria Wedgeless Low Profile Face Fix LH -  
 1 x Comp30 2 B ALBANY LOCKING COLOURS

7

**W7 LIVING**

1



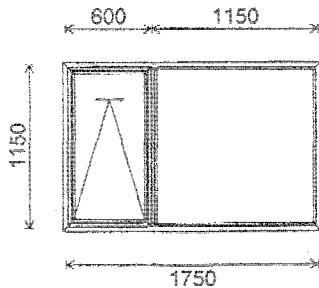
**FRAME COLOUR** : To Be Advised FAB20  
**FRAME TYPE** : WeatherTight Series  
**WIND ZONE** : High  
**GLASS** : Clear Float Double Glazed  
**HEIGHT FROM FLOOR** : 0  
**WALL THICKNESS** : 170  
**SILL LINER** : TRUE  
**FLASHING** : NO Flashing  
**TRIM SIZE** : 2080mm x 530mm  
**LINER** : H3 Clear Pine 25mm Architraved Mitre Cut

**COMMENTS:**

8

**W8 BEDROOM 1**

1



**FRAME COLOUR** : To Be Advised FAB20  
**FRAME TYPE** : WeatherTight Series  
**WIND ZONE** : High  
**GLASS** : Clear Float Double Glazed  
**HEIGHT FROM FLOOR** : 900  
**WALL THICKNESS** : 170  
**SILL LINER** : TRUE  
**FLASHING** : NO Flashing  
**TRIM SIZE** : 1180mm x 1780mm  
**LINER** : H3 Clear Pine 25mm Architraved Mitre Cut

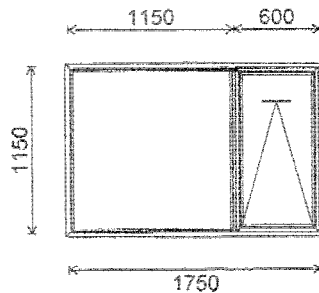
**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

9

**W9 BEDROOM 2**

1



**FRAME COLOUR** : To Be Advised FAB20  
**FRAME TYPE** : WeatherTight Series  
**WIND ZONE** : High  
**GLASS** : Clear Float Double Glazed  
**HEIGHT FROM FLOOR** : 900  
**WALL THICKNESS** : 170  
**SILL LINER** : TRUE  
**FLASHING** : NO Flashing  
**TRIM SIZE** : 1180mm x 1780mm  
**LINER** : H3 Clear Pine 25mm Architraved Mitre Cut

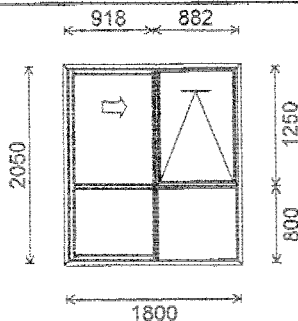
**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

10

**W10 BEDROOM 3**

1



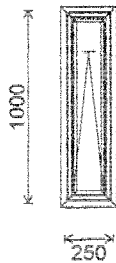
**FRAME COLOUR** : To Be Advised FAB20  
**FRAME TYPE** : WeatherTight Series  
**WIND ZONE** : High  
**GLASS** : Clear Float Double Glazed  
**BEADED PANEL** : TRUE  
**HEIGHT FROM FLOOR** : 0  
**WALL THICKNESS** : 170  
**SILL LINER** : TRUE  
**FLASHING** : NO Flashing  
**TRIM SIZE** : 2080mm x 1830mm  
**LINER** : H3 Clear Pine 25mm Architraved Mitre Cut

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless Low Profile Face Fix RH -  
 1 x Comp30 2 B Aria Wedgeless Low Profile Face Fix LH -  
 1 x Comp30 2 B ALBANY LOCKING COLOURS



11



**W11 BEDROOM 3**

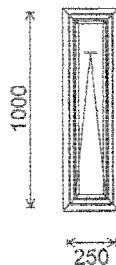
FRAME COLOUR : To Be Advised FAB20  
FRAME TYPE : WeatherTight Series  
WIND ZONE : High  
LINER : H3 Clear Pine 25mm Architraved Mitre Cut  
GLASS : Clear Float Double Glazed  
HEIGHT FROM FLOOR : 1050  
WALL THICKNESS : 170  
SILL LINER : TRUE

FLASHING : NO Flashing  
TRIM SIZE : 1030mm x 280mm

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

12



**W12 BEDROOM 3**

FRAME COLOUR : To Be Advised FAB20  
FRAME TYPE : WeatherTight Series  
WIND ZONE : High  
LINER : H3 Clear Pine 25mm Architraved Mitre Cut  
GLASS : Clear Float Double Glazed  
HEIGHT FROM FLOOR : 1050  
WALL THICKNESS : 170  
SILL LINER : TRUE

FLASHING : NO Flashing  
TRIM SIZE : 1030mm x 280mm

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

13



**W13 ENSUITE CLEAR**

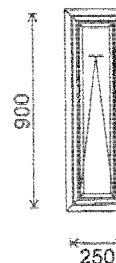
FRAME COLOUR : To Be Advised FAB20  
FRAME TYPE : WeatherTight Series  
WIND ZONE : High  
LINER : H3 Clear Pine 25mm Architraved Mitre Cut  
GLASS : T4F/A4F  
HEIGHT FROM FLOOR : 1100  
WALL THICKNESS : 170  
SILL LINER : TRUE

FLASHING : NO Flashing  
TRIM SIZE : 930mm x 280mm

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

14



**W14 ENSUITE CLEAR SAFETY**

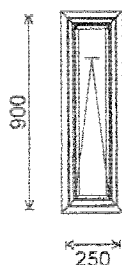
FRAME COLOUR : To Be Advised FAB20  
FRAME TYPE : WeatherTight Series  
WIND ZONE : High  
LINER : H3 Clear Pine 25mm Architraved Mitre Cut  
GLASS : T4F/A4F  
HEIGHT FROM FLOOR : 1100  
WALL THICKNESS : 170  
SILL LINER : TRUE

FLASHING : NO Flashing  
TRIM SIZE : 930mm x 280mm

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

15



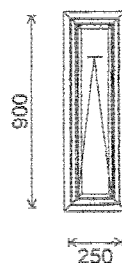
**W15 WIR**

**FRAME COLOUR** : To Be Advised FAB20  
**FRAME TYPE** : WeatherTight Series  
**WIND ZONE** : High  
**GLASS** : Clear Float Double Glazed  
**HEIGHT FROM FLOOR** : 1100  
**WALL THICKNESS** : 170  
**SILL LINER** : TRUE  
**FLASHING** : NO Flashing  
**TRIM SIZE** : 930mm x 280mm  
**LINER** : H3 Clear Pine 25mm Architraved Mitre Cut

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

16



**W16 BATHROOM CLEAR SAFETY**

**FRAME COLOUR** : To Be Advised FAB20  
**FRAME TYPE** : WeatherTight Series  
**WIND ZONE** : High  
**GLASS** : T4F/A4F  
**HEIGHT FROM FLOOR** : 1100  
**WALL THICKNESS** : 170  
**SILL LINER** : TRUE  
**FLASHING** : NO Flashing  
**TRIM SIZE** : 930mm x 280mm  
**LINER** : H3 Clear Pine 25mm Architraved Mitre Cut

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

17



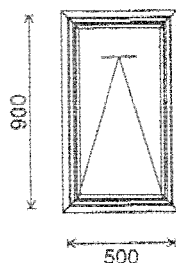
**W17 CLEAR SAFETY.**

**FRAME COLOUR** : To Be Advised FAB20  
**FRAME TYPE** : WeatherTight Series  
**WIND ZONE** : High  
**GLASS** : T4F/A4F  
**HEIGHT FROM FLOOR** : 1100  
**WALL THICKNESS** : 170  
**SILL LINER** : TRUE  
**FLASHING** : NO Flashing  
**TRIM SIZE** : 930mm x 280mm  
**LINER** : H3 Clear Pine 25mm Architraved Mitre Cut

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

18



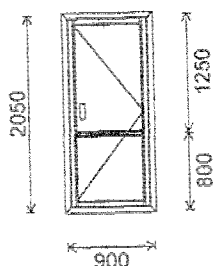
**W18 WC CLEAR SAFETY**

**FRAME COLOUR** : To Be Advised FAB20  
**FRAME TYPE** : WeatherTight Series  
**WIND ZONE** : High  
**GLASS** : T4F/A4F  
**HEIGHT FROM FLOOR** : 1100  
**WALL THICKNESS** : 170  
**SILL LINER** : TRUE  
**FLASHING** : NO Flashing  
**TRIM SIZE** : 930mm x 530mm  
**LINER** : H3 Clear Pine 25mm Architraved Mitre Cut

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

19



### LAUNDRY DOOR

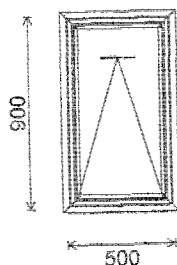
FRAME COLOUR : To Be Advised FAB20  
 FRAME TYPE : WeatherTight Series  
 WIND ZONE : High  
 LINER : H3 Clear Pine 25mm Architraved Mitre Cut  
 GLASS : Clear Float Double Glazed  
 OPEN : OPENIN  
 HEIGHT FROM FLOOR : 0  
 WALL THICKNESS : 170  
 SILL LINER : TRUE

FLASHING : NO Flashing  
 TRIM SIZE : 2080mm x 930mm

#### COMMENTS:

1 x Comp30 2 B Aria LCL 4-point short-throw K/T -

20



### W20 LAUNDRY

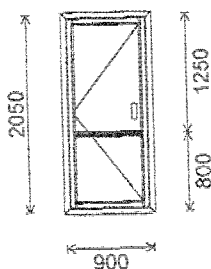
FRAME COLOUR : To Be Advised FAB20  
 FRAME TYPE : WeatherTight Series  
 WIND ZONE : High  
 LINER : H3 Clear Pine 25mm Architraved Mitre Cut  
 GLASS : Clear Float Double Glazed  
 HEIGHT FROM FLOOR : 1100  
 WALL THICKNESS : 170  
 SILL LINER : TRUE

FLASHING : NO Flashing  
 TRIM SIZE : 930mm x 530mm

#### COMMENTS:

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

21



### W21 GARAGE DOOR SINGLE

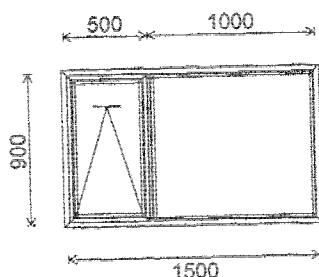
FRAME COLOUR : To Be Advised FAB20  
 FRAME TYPE : WeatherTight Series  
 WIND ZONE : High  
 LINER : H3 Clear Pine 25mm Architraved Mitre Cut  
 GLASS : A5F, T4F  
 OPEN : OPENIN  
 HEIGHT FROM FLOOR : 0  
 WALL THICKNESS : 170  
 SILL LINER : TRUE

FLASHING : NO Flashing  
 TRIM SIZE : 2080mm x 930mm

#### COMMENTS:

1 x Comp30 2 B Aria LCL 4-point short-throw K/T -

22



### W22 GARAGE SINGLE GLAZED

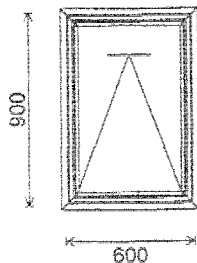
FRAME COLOUR : To Be Advised FAB20  
 FRAME TYPE : WeatherTight Series  
 WIND ZONE : High  
 LINER : H3 Clear Pine 25mm Architraved Mitre Cut  
 GLASS : Clear Float  
 HEIGHT FROM FLOOR : 1200  
 WALL THICKNESS : 170  
 SILL LINER : TRUE

FLASHING : NO Flashing  
 TRIM SIZE : 930mm x 1530mm

#### COMMENTS:

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

23



**W23 KITCHEN**

FRAME COLOUR : To Be Advised FAB20

FRAME TYPE : WeatherTight Series

WIND ZONE : High

LINER : H3 Clear Pine 25mm

GLASS : Clear Float Double Glazed

HEIGHT FROM FLOOR : 1200

WALL THICKNESS : 170

SILL LINER : TRUE

FLASHING : NO Flashing

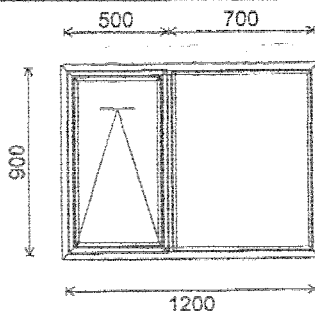
TRIM SIZE : 930mm x 630mm

Architraved Mitre Cut

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

24



**W24 KITCHEN**

FRAME COLOUR : To Be Advised FAB20

FRAME TYPE : WeatherTight Series

WIND ZONE : High

LINER : H3 Clear Pine 25mm

GLASS : Clear Float Double Glazed

HEIGHT FROM FLOOR : 1100

WALL THICKNESS : 170

SILL LINER : TRUE

FLASHING : NO Flashing

TRIM SIZE : 930mm x 1230mm

Architraved Mitre Cut

**COMMENTS:**

1 x Comp30 2 B Aria Wedgeless High Profile Face Fix RH -

25 DELIVERY.  
ONE DELIVERY TRIP ONLY INCLUDED.

26 INSTALLATION.  
NO INSTALLATION OR FLASHINGS INCLUDED. NO WANZ PANS, CAVITY CLOSER OR SUPPORT BARS INCLUDED.

27 COLOUR.  
STANDARD POWDER COAT COLOUR ONLY WITH MATCHING COLOURED HARDWARE.

28 REVEALS.  
25 mm GROOVED PAINT GRADE REVEALS.

29 GLAZING:  
ALL CLEAR DOUBLE GLAZED EXCEPT GARAGE CLEAR SINGLE GLAZED.

Quote Comments

Number of Units = 24

I hereby accept this quotation for Aluminium Joinery as detailed above. I agree that the joinery is subject to the Conditions of sale which are printed on the reverse of this quotation and that these Terms & Conditions form the basis of the contract for supply between you and us. I also agree to settle my account in full.

**THIS QUOTATION IS PROVIDED UNDER THE TERMS OF THE CONSTRUCTION CONTRACTS DELIVERY OR BY PRIOR ARRANGEMENT. PLEASE CHECK CAREFULLY. PRICE SUBJECT TO CLEAN ONLY. TIMBER PANELS ALL CARE NO RESPONSIBILITY.**

Signed \_\_\_\_\_ Dated: \_\_\_\_/\_\_\_\_/\_\_\_\_

All Units are viewed from the outside.

This quotation is valid until 24 March 2008

# MAINLAND PRENAIL LTD

PO BOX 16-323  
16 YUKON PLACE  
HORNBY, CHRISTCHURCH  
PH-(03) 349 4354  
FAX-(03) 349-4354  
EMAIL-mainlandprenail@xtra.co.nz

DATE: 13/2/08

JOB NAME: 685 Depot Road (mp 71101)

BUILDING CONCENT NO: \_\_\_\_\_

(Provided by relevant Consenting Authority at time of Consents application).

Attention: Territorial Authority  
Environmental Services Unit

We have been engaged to provide the trusses and /or frames for the above project. To allow completion of the consent application we have supplied the following information:

- (a) Truss layout and Producer Statement.
- (b) Any slab thickening requirements detailed.
- (c) All truss loaded lintels that are either inside or outside the requirements of NZS3604:1999
- (d) All roof bracing details as required by NZS3604:1999.

On advice from the building project owner, the structure will be designed under the following parameters:

Wind Zone Very high Snow Load 0.575 kpa (ZONE 4)  
Earthquake Zone Oxford Roof Material - \_\_\_\_\_

Treatment Definition: External Walls H1.2 msgr Roof Trusses CF msgr  
Internal Walls H1.2 msgr Bottom plates 90x45x13 msgr.

We can advise that the following will be provided at the time of truss manufacture to both the building owner and your office;

- (1) A Full "as built" layout and producer statement
- (2) Specific truss/truss fixing done as per NZS3604:1999, Clause 10.2.2.6.1
- (3) Specific top plate to stud fixing that comply with NZS3604:1999, table 8.18
- (4) Specific lintel fixing outside NZS3604:1999.

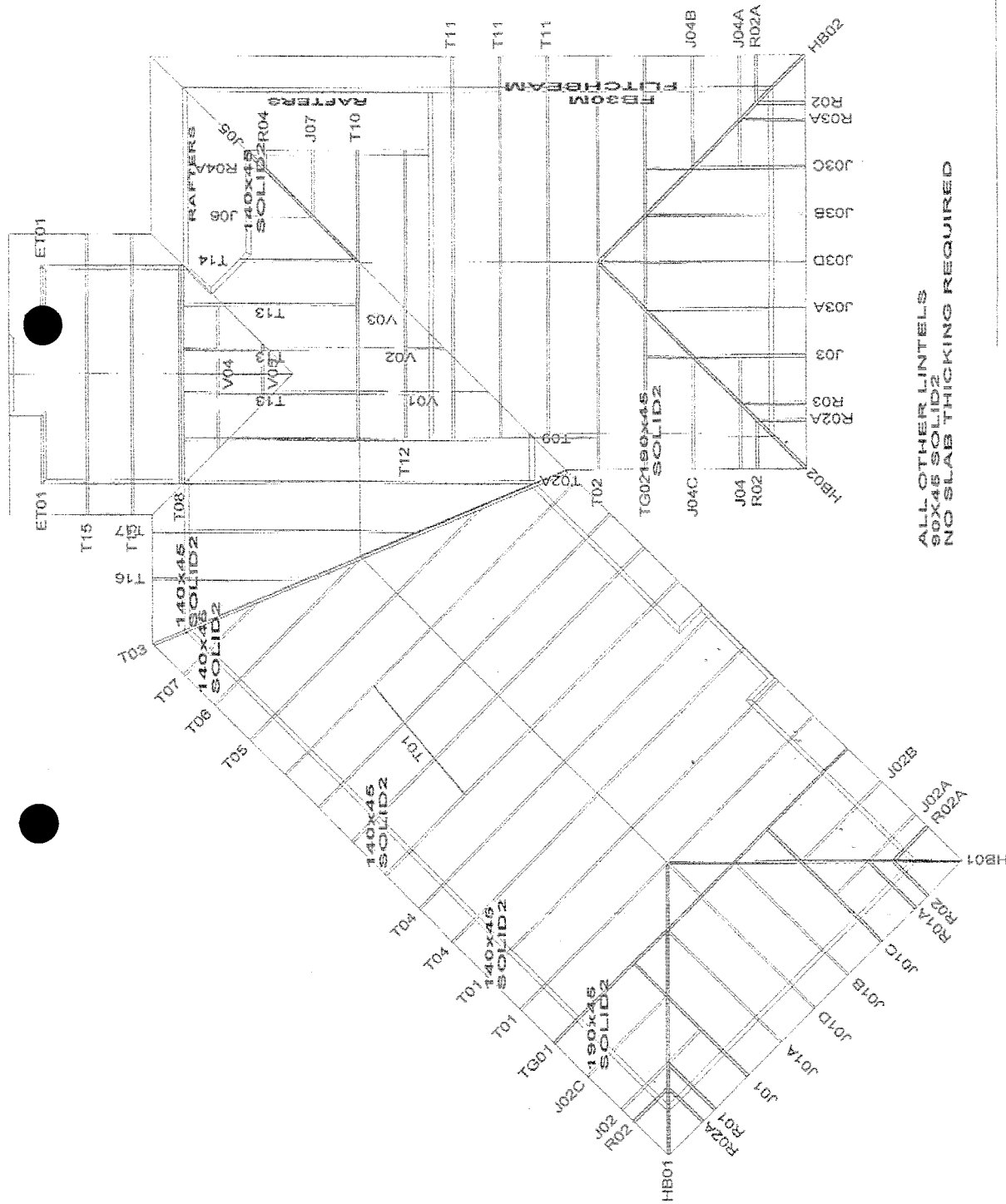
It should be noted that the details provided have been designed to comply with the Building Code and the relevant Standards. Any increase above these standards is only at the preference and request of the building owner.

Acknowledgement of this letter, along with the Building Consent number, is required by our company as soon as available.

Yours Faithfully



A. Orange  
MAINLAND PRENAIL MANAGER



ALL OTHER LINTELS  
90x45 SOLID2  
NO SLAB THICKING REQUIRED

# Joos Details:

<p>Zone 4</p>	<p>Very High</p>	<p>Snow Altitude: 50.0 m/s</p>	<p>Design Wind Speed: 400 mm</p>
<p>900 mm</p>	<p>BC Restraints:</p>	<p>Cover: 5mm</p>	<p>Ceiling Material: Standard</p>
<p>0.250 kPa</p>	<p>Snow Load:</p>	<p>27,500 deg</p>	<p>Mass Centres: 500 mm</p>
<p>Snow Zone:</p>	<p>Wind Area:</p>	<p>10 Restraints:</p>	<p>Roof Pitch:</p>
<p>Roof Use Area:</p>	<p>Roof Pitch:</p>	<p>Roof Pitch:</p>	<p>Roof Pitch:</p>

Marlene Pencil Ltd

16 Yacon Place  
Hornby  
Christchurch  
New Zealand  
Telephone: Ph: 03 349 4354  
Fax:

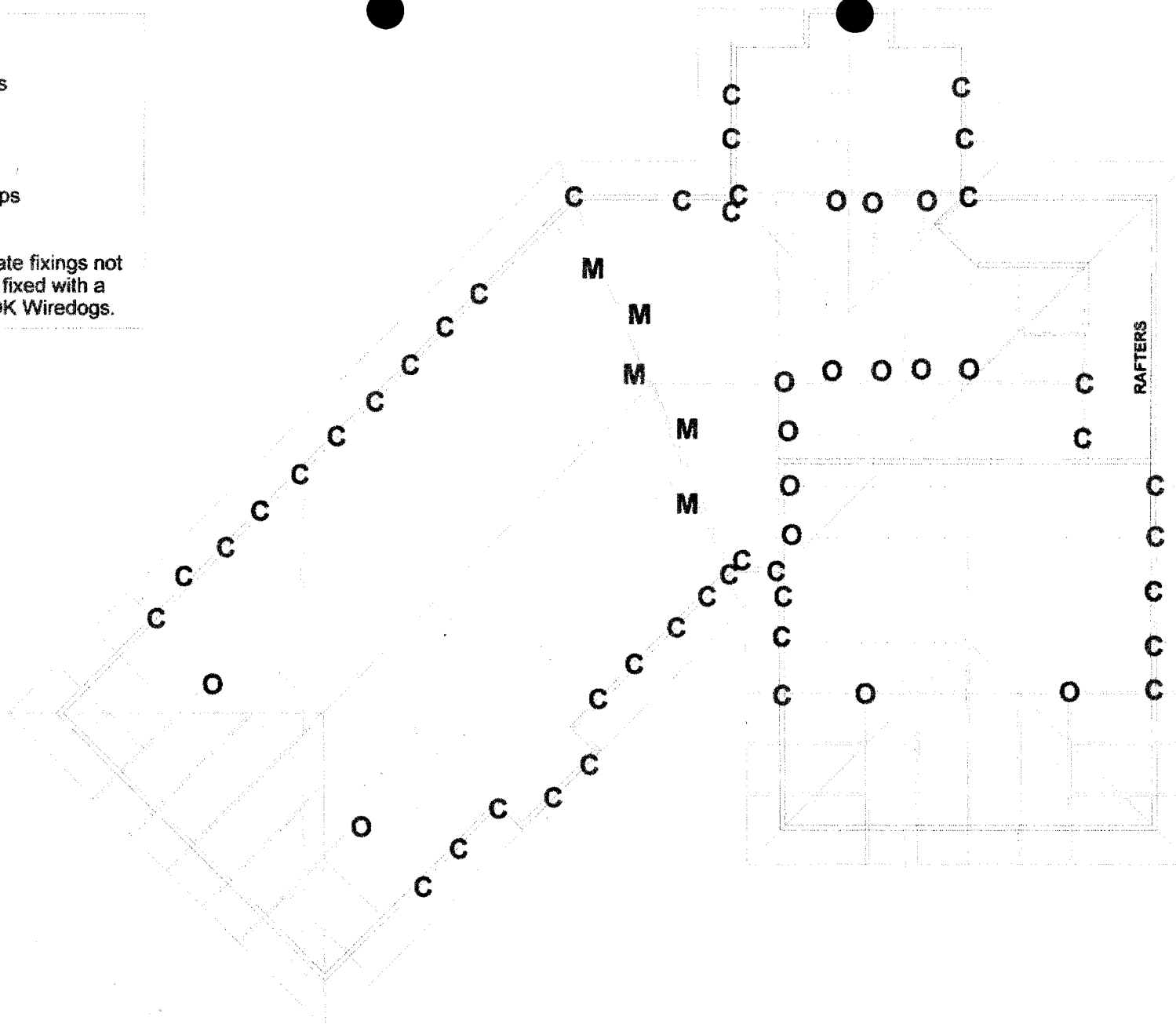
Marlene Pencil Ltd  
Building Consent No.:  
M-7110  
Scale: 1:120  
Date: 28/01/2008  
Drawn By: Richard Cane

Name: Bulldozer Construction  
Address: 685 Devo Rd  
Oxford  
Telephone:

# Key

C - Pair of CT200's  
 \ - CT600  
 O - JH 47 x 90  
 V - JH 47 x 120  
 # - JH 95 x 165  
 M - Pair of Multigrips  
 X - Pair CPC80s

All Truss to Top Plate fixings not indicated are to be fixed with a pair of LUMBERLOK Wiredogs.



A4

Mainland Prenail  
 16 Yukon Pl  
 Hornby  
 Christchurch  
 Ph 03 349 4354

Job Title :

685 Depot Rd Oxford

Sheet Title :

Truss Fixing

Date : 13-2-08

Scale : NTS

Designed RC

Drawn RC

Checked :

Certified :

PineCAD V4.3

Drawing Number :

MP71101

Sheet :

1/1



Job: MP71101

Client: Buildbest Constuction  
Phone:Site: Broken River Trust  
685 Depot Rd  
OxfordDescription:  
Building Consent No.:

MiTek 20/20 - Engineering 4.4 Gamma1.5 (build 1597-53)

MiTek New Zealand Ltd.

Phone:

Printed: 12/25/06 12 Feb 2008

**PRODUCER STATEMENT**  
**MiTek 20/20™ TRUSS DESIGN PROGRAM****Certification of MiTek 20/20™ Truss Design Program**

The MiTek 20/20™ truss design program has been developed by MiTek New Zealand Ltd for the design of GANG-NAIL timber roof, floor and attic trusses in New Zealand. The truss designs computed by this program are prepared using sound and widely accepted engineering principles, and in accordance with NZS 4203, NZS 3603 and NZS 3604 as verification methods and acceptable solutions of the approved documents of the New Zealand Building Code to satisfy the requirements of the Building Regulations 1992: Clause B1 - Structure. This computer design for the proposed building complies with the relevant provisions of the NZ Building Code. This is subject to all proprietary products meeting their performance specification requirements, the provision of adequate bracing, fixings and the correct input of design data carried out by suitably trained personnel.

**Summary of MiTek 20/20™ Truss Design Data and Output**

The MiTek 20/20™ computer design output for this job titled and located at the site identified on the top of this page is based on the following parameters entered into the program. The owner must ensure that the following job details below are current and relevant to the project before fabrication and erection of the GANG-NAIL trusses.

**Job Details****Roof Truss**Timber Group:  
Roof

MSGx45

Pitch: 27.500 deg  
Ceiling

Material: Galv Iron .5mm

Material: Standard

Dead Load: 0.210 kPa

Dead Load: 0.200 kPa

Restraints: 900 mm centres

Restraints: 400 mm centres

Live Load: Q<sub>ur</sub> = 0.250 kPaQ<sub>c</sub> = 1.000 kN

Std Overhang: 600 mm

Wind

Area: Very High (50.0 m/s)

Pressure Coeff: C<sub>pe</sub> = varies; C<sub>pi</sub> = -0.30, 0.20

Snow

Location: Zone 4 at 110 m

Open Ground Load: 0.575 kPa

Basic Roof Load: 0.575 kPa

These trusses must be fabricated and erected in accordance with the GANG-NAIL manual. Proper erection bracing must be installed to hold the components true and plumb and in a safe condition until permanent bracing is fixed. All permanent bracing and fixing must be installed before any loads are applied. The specifications for timber shall be as shown on the output. The timber shall be standard gauged and treated to the requirements of NZS 3640:2003. Unless otherwise noted, this design assumes that the steel fixings and timber connectors are situated in a closed environment, as defined by NZS3604:1999 Section 4.

**Truss List**

Legend: \* = detail only, ? = input only, Txx = failed design, Unmarked trusses = designed successfully, LB = lateral bracing required

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
J05	1	2974	20.208	900	J01B	1	2428	27.500	900	R04A	1	363	27.499	900
T01	6	6700	27.500	900	J01C	1	2428	27.500	900	T06	1	3308	27.500	900
T02	1	6680	27.500	900	J01D	1	2428	27.500	900	T07	1	1366	27.500	900
T02A	1	6680	27.500	900	J02	1	1528	27.500	900	T13	3	3295	27.500	839
T03	1	7233	25.685	900	J02A	1	1528	27.500	900	T14	1	2293	27.500	839
T04	2	6592	27.500	900	J02B	1	1528	27.500	900	T16	1	2393	27.500	900
T05	1	5635	27.500	900	J02C	1	1528	27.500	900	V01	1	2456	27.500	900
T08	1D	4160	27.500	900	J03	1	2417	27.500	900	V02	1	1617	27.500	900
T09	1	6680	27.500	900	J03A	1	2417	27.500	900	V03	1	913	27.500	900
T10	1	5488	27.500	900	J03B	1	2417	27.500	900	V04	1	2810	27.500	900
T11	3	6680	27.500	910	J03C	1	2417	27.500	900	V05	1	1100	27.500	900
T12	1	5488	27.500	910	J03D	1	2417	27.500	900	*HB01	2	5554	20.208	900
T13	2	4160	27.500	855	J04	1	1517	27.500	900	*HB02	2	5540	20.208	900
T17	1	4566	27.500	900	J04A	1	1517	27.500	900	*R01	1	1241	27.500	900
TG01	1	6700	27.500	900	J04B	1	1517	27.500	900	*R01A	1	1241	27.500	900
TG02	1	6680	27.500	900	J04C	1	1517	27.500	900	*R02	4	913	27.500	900
ET01	2	1290	27.500	900	J06	1	1263	27.500	900	*R02A	4	913	27.500	900
J01	1	2428	27.500	900	J07	1	1261	27.500	900	*R03	1	1230	27.500	900
J01A	1	2428	27.500	900	R04	1	361	27.500	900	*R03A	1	1230	27.500	900

Total quantity : 77

# Mainland Prenail Ltd

Producer Statement : Page

Job: MP71101

Client: Buildbest Constuction  
Phone:

Site: Broken River Trust  
685 Depot Rd  
Oxford

Description:  
Building Consent No.:

Mittek 20/20 - Engineering 4.4 Gamma1.5 (build 1597-53)

Mittek New Zealand Ltd

Phone:

Printed: 12/26/06 12 Feb 200

The computer design input has been carried out by:

Signed: [Signature]

Date: 13/2/08

Name of Computer Operator: Richard Cane

Qualifications and Title: Detailer

Company: Mainland Prenail Ltd

## Verification / Acceptance of Input Data:

I have checked the input data against the construction drawings and specifications and verify that they are correct and suitable for this job.

Signed: .....

Date: .....

Name: .....

Company: .....



A division of Terry Young Ltd, New Zealand

## INSTALLATION INSTRUCTIONS for WEGJ 2000 FREESTANDING WOODBURNER

APRIL 2007

TESTED in compliance with AS/NZS 2918: 2001

- A. Yunca recommends that competent trades persons carry out all installations (e.g. NZHHA Registered Installer), to obtain maximum performance and safe, efficient heating.
- B. A permit is required and we suggest you check with local building inspectors as by-laws do vary from area to area.  
Also notify your Insurance Company that a solid fuel heater has been installed.
- C. Floor Protector –
1. Must extend a minimum of 300mm in front of the door aperture.
  2. Must extend at least 100mm from each side of the heater.
  3. Ash Floor Protector must be constructed of non-combustible materials, with a minimum thickness of 12mm.
- D. Seismic restraint – Heater must be restrained from seismic movement as required by NZS 7421, 10mm diameter bolting holes in the rear corners allow restraint.
- E. Manufacturers recommended tested minimum clearances from combustible walls.

Tested to AS/NZS 2918 : 2001 by APPLIED RESEARCH SERVICES		Clearance
Rear Clearance (with YUNCA flue shield fitted)		100mm
Side Clearance (with YUNCA flue shield fitted)		200mm
Corner Clearance (with YUNCA flue shield fitted)		30mm
Rear Clearance (without YUNCA flue shield)		350mm
Side Clearance (without YUNCA flue shield)		200mm
Corner Clearance (without YUNCA flue shield)		140mm

F. YUNCA Flue Kit (Tested to AS/NZS 2918:2001 Appendix F): FIG A, B & E

1. 4.2m x 150mm stainless steel flue.
2. 2.4m x 250mm galvanised liner.
3. 1 x ceiling tile.
4. 1 x insulation boundary shield.
5. 3 x spider brackets.
6. 1 x weather cap & cowl.

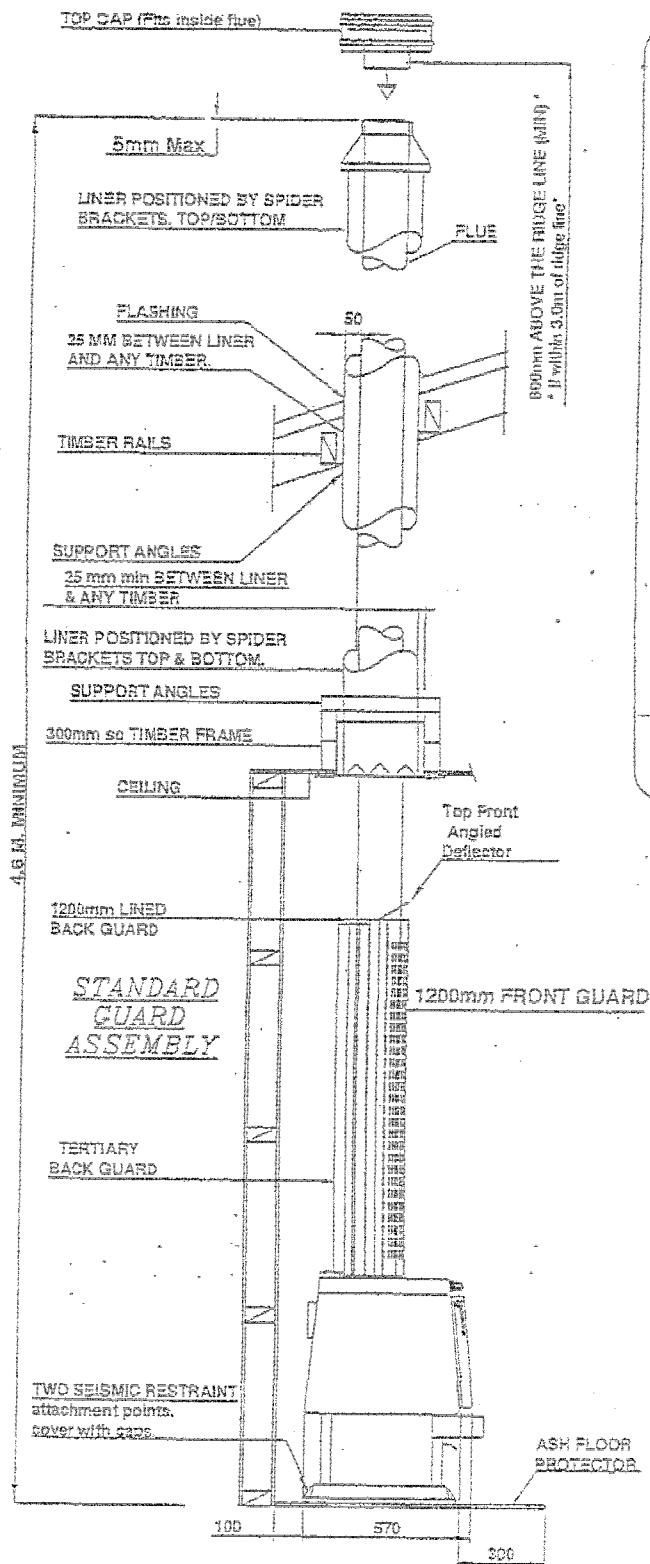
Please Note: All joints must be sealed with flue sealing compound. Use stainless steel screws or rivets to join the flue pipe (three equally spaced places at each joint). The first length of flue pipe must be screwed to flue spigot. The required minimum flue termination height is 4.6 m above the floor protector.

G. WEGJ Flue Mounted Shield (Flue Guard) Kit (Tested to AS/NZS 2918:2001): FIG A

- 1 x 1200mm length lined back guard, plus an optional adjustable 900mm extension.
- 1 x 1200mm length perforated front guard.
- 1 x 1200mm length tertiary back guard with spacers.
- 1 x top front deflector shield (half round shaped, angled when installed).

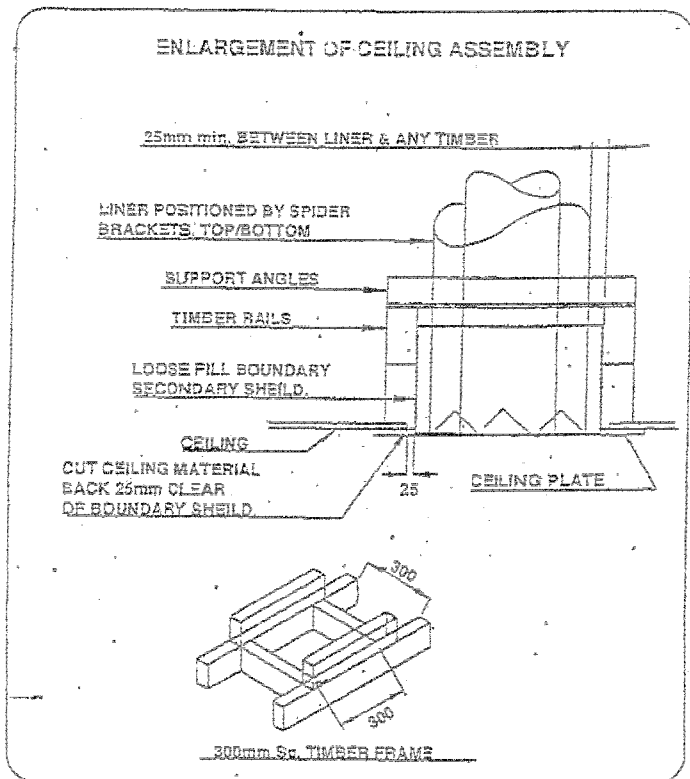
Please Note: The minimum Flue Guard Height is 1200mm.

WEGJ - TYPICAL FLUE INSTALLATION (drawings on the following pages are not to scale)  
FIG A



Note: All Dimensions are in millimetres.

FIG B



CONDITIONS FOR FLUES (Refer Fig. E)

1. The FLUE shall extend to:

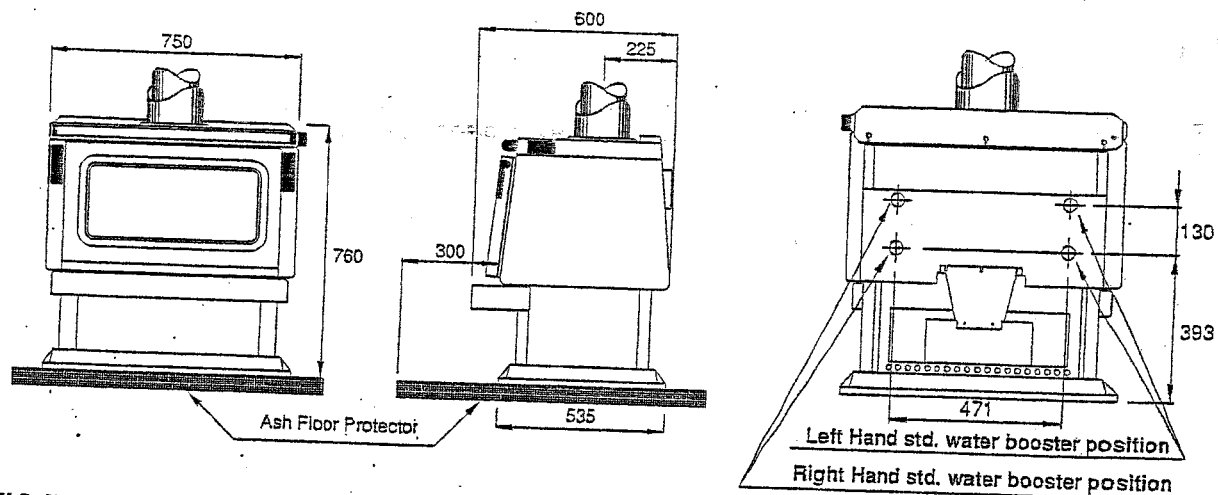
Not less than 600mm above the highest point on the roof if within 3.0m of that point.

Not less than 1000mm above the intersection point with the roof and not lower than any point of the roof within 3.0m.

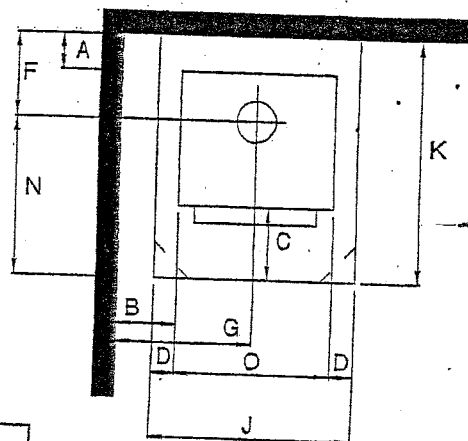
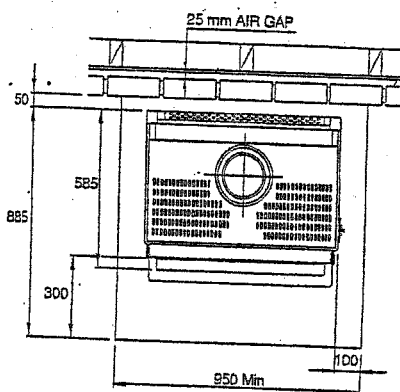
In any case the length of the flue shall not be less than 4.8m from the ash floor protector. In some situations the Local Council may vary the above requirements.

2. All parts of the chimney exposed to the outside air shall be suitably insulated in accordance with the manufacturers' recommendations. When loose-fill insulation is used in the adjacent ceiling space, maintain clearance between the secondary shield and the loose-fill insulation by provision of a boundary extending 200mm above the ceiling top surface. This non-combustible boundary shield shall be capable of preventing accidental migration of the loose-fill by any action of wind or by persons moving in the ceiling space.

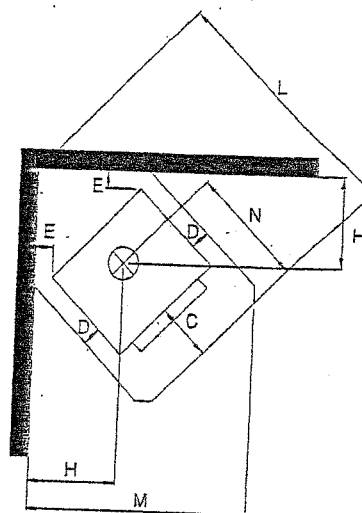
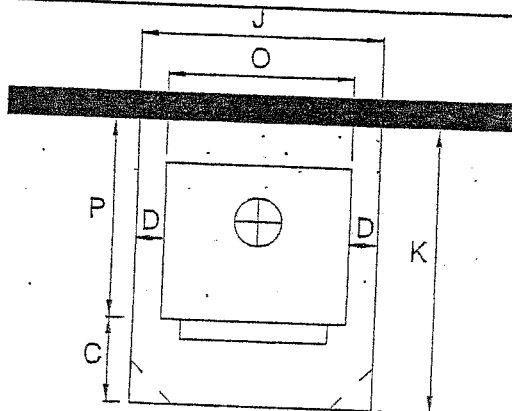
**FIG.C: WEGJ HEATER DIMENSIONS AND WATER BOOSTER POSITIONS** (not to scale)



**FIG.D: HEATER POSITION** (not to scale)



**Above: Non combustible wall clearances.** Brick lining from floor to within 25mm of ceiling. Leave air vents at the bottom to allow airflow in the cavity. If Yunca flue mounted shield is fitted, brickwork may be 1200mm high as long as all vertical joints in top and bottom of brickwork are left out to allow airflow when brickwork is capped.



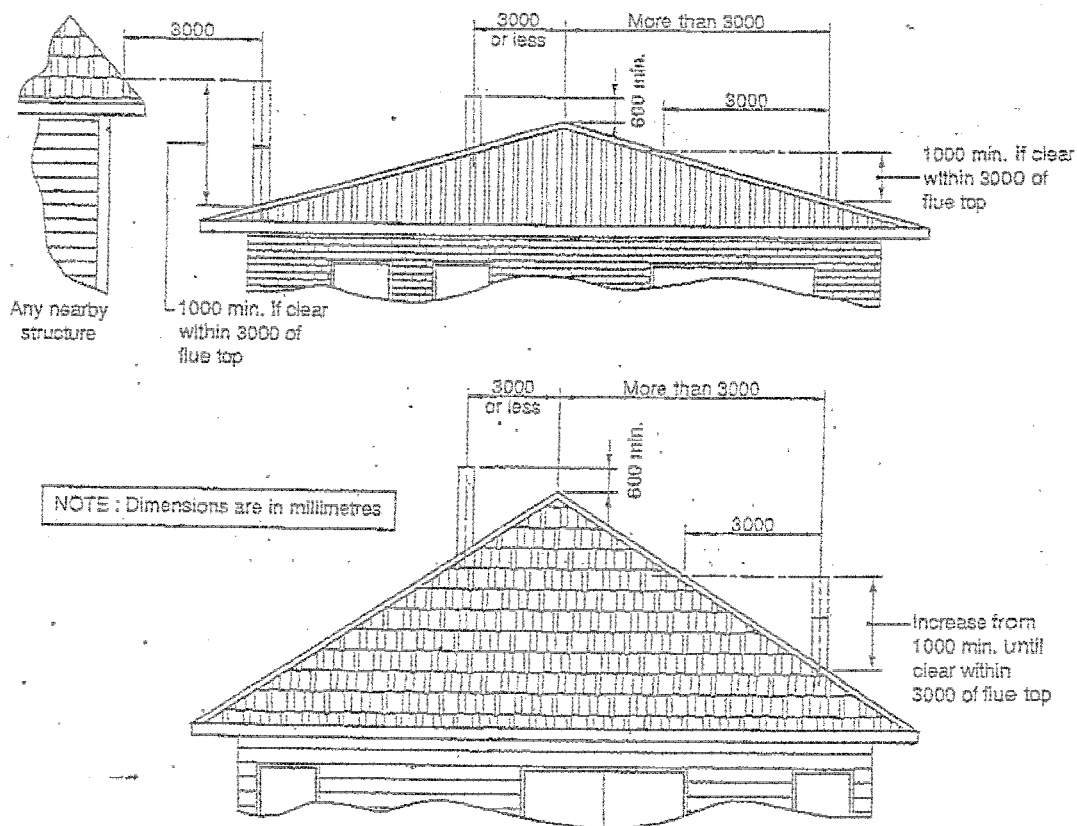
**FIG D: MINIMUM FIRE TO COMBUSTABLE WALL CLEARANCES - WEGJ**  
(WITH YUNCA FLUE MOUNTED SHIELD FITTED). Measurements in millimetres.

A	B	E	F	G	H
100	200	30	325	575	454

**FIG D: MINIMUM FLOOR PROTECTION MEASUREMENTS**  
(WITH YUNCA FLUE MOUNTED SHIELD FITTED). Measurements in millimetres.

C	D	J	K	L	M	N	O	P
300	100	950	935	1247	1147	610	750	635

**FIG E: FLUE SYSTEM REQUIREMENTS** (not to scale)



### MINIMUM HEIGHT OF FLUE SYSTEM EXIT

### IMPORTANT INFORMATION

- A. The appliance and flue system shall be installed in compliance with AS/NZS 2918 and the appropriate requirements of the relevant building code or codes.
- B. Appliances installed in accordance with this standard shall comply with the requirements of AS/NZS 4013 where required by the regulatory authority i.e. the appliance shall be identifiable by a compliance plate with the marking "TESTED TO AS/NZS 4013"
- C. Any modification of the appliance that has not been approved in writing by the testing authority is considered to be in breach of the approval granted for compliance with AS/NZS 4013
- D. Mixing of appliance or flue system components from different sources or modifying the dimensional specification of components may result in hazardous conditions. Where such action is considered, the manufacturer should be consulted in the first instance.
- E. Cracked and broken components e.g. glass panels or fire bricks, may render the installation unsafe.

#### IF A WATERBOOSTER IS FITTED:

**Note:** A water booster cannot be fitted in some Clean Air zones (check local council regulations)

- A. Do not connect to an unvented hot water system
- B. Install in accordance with AS 3500.4.1 or NZS 4603 and the appropriate requirements of the relevant building codes.

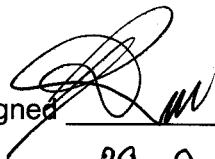
#### Seismic Restraint

Secure the heater base to the hearth or sub-framing with Dynabolts or similar.  
Follow local Council's Specifications.

## File Stripping Check Sheet

BC 080258

- ☒ All Correspondence
- ☒ Audit Check Sheets
- ☒ CCC – Signed
- ☒ Working File Cover
- ☒ Entire Contents inside the Working File Cover
- ☒ As Built Plans
- ☒ Drainage Plans (both onsite & scaled Drawings)
- ☒ Specifications if any changes (see Working File Cover)
- ☒ All White Inspection Notices (as they may have been written on, see below for process of white Inspection Notices)
- ☒ All site photos
- ☒ All Processing Check sheets & Correspondence
- ☒ All Amendments
- ☒ If in doubt – INCLUDE IT
- ☒ All relevant information has been included
- ☒ Completed file stripping check sheet attached

Signed  \_\_\_\_\_  
29- 9- 11