

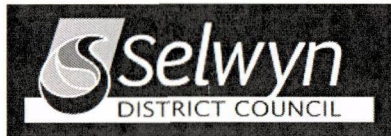
BUILDING CONSENT (in addition to the above application information)		Supplied	N/A	Council
Project Information Memorandum (if already issued) plus all attached forms		/		/
Building Code Assessment showing means of compliance, e.g. AS1, AS2, Alternative solution		/		/
Fully Detailed Foundation Plans <i>ribract</i>		/		/
Levels <ul style="list-style-type: none"> proposed & existing site levels existing & proposed contours drive gradients and pedestrian access floor levels and finished paving levels 		/		/
Drainage Plans: full design details for both foul water and storm water to approved outfalls		/		/
Detailed Floor Plans drawn to scale, fully dimensioned and annotated showing location of smoke alarms with rooms identified		/		/
Detailed Elevations including door and windows showing opening sashes		/		/
Hazardous Substances: storage location and capacity (ie LPG, diesel, home heating oil etc)		/	/	/
Cross Sections: show all relevant construction details, particularly for complex sections of the construction		/		/
Timber Treatment: the species, grading and treatment of all timber specific to the project is to be specified on the drawings , ideally on the cross section, in addition to any specification references		/		/
Insulation: R-values on drawings, method of compliance identified (Schedule / Calculation / Modelling)		/		/
Electrical Plan showing all lighting and electrical outlets including fitting types		/		/
Framing Details including floor joist layout plans if applicable		/		/
Construction Details with all materials, fixings etc noted		/		/
Weathertightness Details including a risk assessment matrix for all walls and flashings		/		/
Internal Waterproofing Details including all wet areas and surface finishes		/		/
Plumbing Details including layout plan with full schematics of water supply, including HWC location, valving and all associated systems connected to the HWC (e.g. solar, wetback etc.) plus water supply details		/		/
Specifications: Information limited to and relevant to the project only		/		X
Bracing Design: calculations, schedule and layout plans showing specific locations in building		/		/
Roof Truss Design including layout plan, all fixings and specific design for lintels where required		/		/
Ground Conditions report: this will be either a report to verify that the ground is "good ground" according to the Building Code, or a specific ground assessment and foundation design by a Chartered engineer or qualified Geotechnical Engineer		/		/
Engineers Details and Design Calculations: where any specific design has been carried out (e.g. steel beams) <i>PSI ✓ LBP ✓</i>		/		/
Approvals from Other Authorities: Approvals for discharges to land, air, or water from ECAN			/	/
Heating Appliance <ul style="list-style-type: none"> floor plan (as above) installation details including clearances, hold down details, flue installation (new or existing), flue height (approx.) and flashing type (and age if existing). ceiling type – flat or sloping plumbing schematic for wetback installation and location of hot water cylinder (if applicable) 			/	/
Solar Water Heating: product specifications, elevations, plumbing schematic floor plan (as above)			/	/
Swimming/Spa Pool: site plan (as per Page 1), ground condition report (as above), details of construction, fencing, gate latch and opening, backflow, discharge of pool water, hydrostatic relief valve (if applicable)			/	/

For BCA Use Only:

This application is accepted / declined as all relevant information has / has not been supplied

- Name: Jenny Liley Signed: Re

- Supervised by (if applicable): Name: _____ Signed: _____



**Residential PIM / Building Consent
Application Checklist Form 2 (R)**
(in conjunction with Form 2)

PROJECT NO:

121562

COMPLEXITY:

22

DATE RECEIVED:

29/8/12

Project address: _____

NB: The following is required on application in sufficient detail to show compliance with aspects of the District Plan and the New Zealand Building Code. Please complete this checklist in FULL. Additional information may be requested during processing of the application.	Supplied	N/A	Council
PIM			
Application Form 2: COMPLETED and signed (ensure mandatory fields are completed)			✓
Plans and specifications: <ul style="list-style-type: none">• 2 copies of plans and specifications• 3 copies of relevant plans and specifications for amendments• PIM only - 1 copy only of: Site plan, floor plan and elevations	✓		
Application fee: (GST Incl) <ul style="list-style-type: none">• \$ 200.00 for PIM only (<i>additional \$15.00 for title search if required</i>) Deposit: <ul style="list-style-type: none">• \$1,200.00 (combined PIM and Building Consent application)• \$1,000.00 for projects over \$15,000.00• \$ 200.00 for amendment Fixed fees: - (to be paid at time of lodgement) <ul style="list-style-type: none">• \$ 350.00 for Solid Fuel Heater freestanding (<i>1 inspection only</i>)• \$ 500.00 for Solid Fuel Heater inbuilt (<i>2 inspections only</i>)• \$ 550.00 minor works up to \$5,000.00 (e.g. solar water, sewer connection, demolition, minor alterations - <i>1 inspection only and no PIM</i>) (<i>additional \$15.00 for title search if required</i>)• \$ 680.00 minor works between \$5,000.00 - \$15,000.00 (e.g. farm buildings, garages, decks - <i>2 inspections only and no PIM</i>) (<i>additional \$15.00 for title search if required</i>) <i>Fixed fees: If the amount of staff time allocated is exceeded by more than 30%, the excess time and cost will be charged.</i>	✓		✓
Certificate of Title: <ul style="list-style-type: none">• Recent search copy less than 6 months old, or a sale and purchase agreement if title is not in the applicant's name. A subdivision scheme plan is required for a new site where title is not yet available (<i>if searched by SDC, a \$15.00 title search charge will apply</i>)	✓		✓
Site Plan: – showing: <ul style="list-style-type: none">• All new and existing buildings and swimming pools in relation to all buildings and boundaries• Legal and notional boundaries (existing and proposed), easements, waterways, shared access ways / other areas with building setbacks dimensioned• Any heritage buildings / trees or archaeological site information known• Building and site areas (including floor areas (m²) for all floors)• Vehicle access, crossing location, manoeuvre, parking area• Any hard-standing (sealed or concrete) areas with proposed drainage• Any significant trees on the site	✓	✓	✓
Outline Floor plans (for all floors)	✓		
Outline Elevations	✓		
Outline Cross Sections: (if required to show recession plane / daylight plane and height compliance)	✓		

----- STOP HERE IF THIS IS A PIM ONLY APPLICATION -----

SEE PAGE 2 FOR BUILDING CONSENT

(in addition to the above application information)

For BCA Use only: (Please complete if PIM only, otherwise BCA staff to sign page 2)

This application is accepted / declined as all relevant information has / has not been supplied

Signed: _____

Name: _____

14 September 2012

Horncastle Homes
PO Box 8255
Riccarton
Christchurch 8440

Dear Sir/Madam,

RE: Building Consent Application No. 121562
Domestic Dwelling
16 Goldney Close, Lincoln

I have completed processing your building consent application and need to request additional information/clarification of some points to ensure compliance with the building code is demonstrated. Your consent application has been temporarily put on hold awaiting this information.

B1 Structure

1. We (SDC) will require the Engineer to undertake an inspection of the foundation excavations prior to the placement of the granular base to confirm good ground bearing for this engineered foundation. This will need to be confirmed by the Engineer on an amended schedule of inspections.

Amended Inspection sheet from engineer attached.

D1 Access Routes

2. The door from the entry into the garage does not comply with the acceptable solution (as nominated on the compliance document) with the door swing in the direction of the step down into the garage. Compliance would require the door to swing into the entry area or a landing formed in the garage.

Door swing as been updated. Refer to attached pages.

G13 Foul Water

3. A drainage section should be included in the specification to confirm compliance.

Specification has been reprinted including the drainage section. See attached.
Drainage is now pages 5 and 6

When responding to further information requested please ensure:

- Drawing amendments are clearly identified;



121562

17 SEP 2012

- 2 copies of additional information are provided;
- A copy of this letter outlining your responses and referencing document changes, is enclosed;
- All information is supplied within 28 days (or the application may be refused). Please keep us informed if additional time is required.

If emailing:

- Send information to bca@selwyn.govt.nz (not to the individual staff member);
- Maximum document size for printing is A3. (Any associated printing costs will be charged to the building consent);
- Ensure documents are printable at the correct scale.

Yours faithfully,

Carl Petersen
Consent Processing Officer

FILE COPY 121562

17 SEP 2012

14 September 2012 Emailed.

Horncastle Homes
PO Box 8255
Riccarton
Christchurch 8440

Dear Sir/Madam,

**RE: Building Consent Application No. 121562
Domestic Dwelling
16 Goldney Close, Lincoln**

I have completed processing your building consent application and need to request additional information/clarification of some points to ensure compliance with the building code is demonstrated. Your consent application has been temporarily put on hold awaiting this information.

B1 Structure

- 19 SEP 2012
1. We (SDC) will require the Engineer to undertake an inspection of the foundation excavations prior to the placement of the granular base to confirm good ground bearing for this engineered foundation. This will need to be confirmed by the Engineer on an amended schedule of inspections.
[Please Enter Applicants Response Here]

D1 Access Routes

- 19 SEP 2012
2. The door from the entry into the garage does not comply with the acceptable solution (as nominated on the compliance document) with the door swing in the direction of the step down into the garage. Compliance would require the door to swing into the entry area or a landing formed in the garage.
[Please Enter Applicants Response Here]

G13 Foul Water

- 19 SEP 2012
3. A drainage section should be included in the specification to confirm compliance.
[Please Enter Applicants Response Here]


When responding to further information requested please ensure:

- Drawing amendments are clearly identified;
- 2 copies of additional information are provided;
- A copy of this letter outlining your responses and referencing document changes, is enclosed;

- All information is supplied within 28 days (or the application may be refused). Please keep us informed if additional time is required.

If emailing:

- Send information to bca@selwyn.govt.nz (not to the individual staff member);
- Maximum document size for printing is A3. (Any associated printing costs will be charged to the building consent);
- Ensure documents are printable at the correct scale.



Yours faithfully,

Carl Petersen
Consent Processing Officer

One Storey Dwelling Processing Sheet

Property File Information Considered:					YES / <u>NO</u>
PIM Information Considered:					<u>YES</u> / NO
EQ: <u>2</u>		SNOW: <u>0.9Kpa</u>		WIND: <u>4</u>	CORROSION: <u>c</u>
GROUND: <u>TC2</u>		<u>Lewis & Barron (Aurecon)</u>		ALTITUDE: <u>10m AMSL</u>	
BC No. <u>121562</u>					
Clause	Non	Compliant	Compliant	N/A	Means of compliance
Design memorandum from designer & engineer.					
Comments					
Building Act 2004 Sections					
28 Cases Involving Bans				✓	
46(3) NZ Fire Service Commision				✓	
67 Waivers or Modifications				✓	
71-74 Building on Land Subject to Natural Hazards				✓	
75 Building on Two or More Allotments				✓	
112 Alterations to Existing Buildings				✓	
113 Specified intended life			✓		NZBC
114 Change of use				✓	Indefinite - not less than 50 years
118 Access & Facilities for persons with disabilities to and within Buildings				✓	Engineers inspection of excavated ground prior to landfill will need to be conducted.
New Zealand Building Code Handbook					
A1 Classified Use			✓		NZBC
B1 Structure			✓		Detached Dwelling
Foundations			✓		SED
Slab			✓		Earth Rib raft design by Matt Guzel CPEng. The Engineering Co. Scaped site to bearing - sand blinding - APN - 100mm slab 500S profile mesh.
Slab Thickenings (see truss design)				✓	None shown.
Piles (Incl bracing)				✓	
Bearers				✓	Step down has been engineer verified by John Snook.
Floor Joists				✓	constant feature in Hornscliffe houses.
Load Bearing Walls			✓		External walls 90x45 SG8 @ 400cs Internal @ 600cs.
Stud centres GL			✓		" " "
Long Studs				✓	
Lintels			✓		NZS:3604:2011
Bracing GL			✓		Checked to table 8.9.
Brace calculations			✓		Bracing to external & internal walls.
Brace distribution			✓		calculations to NZS:3604
Cladding (Type)			✓		Distributed evenly throughout.
Support Beams				✓	Brick veneer (heavy)
Garage Lintel			✓		300x90 Hx90 by truss manufacturer.
Trusses			✓		Truss plan provided.
Truss Point loads			✓		To external & selected WSW internally.
Truss Fixings			✓		Fixings list provided.
Roof Framing			✓		25x45 purlins @ 900cs
Roof Bracing			✓		Diagonal strap bracing to gable end.

B1 Structure contd..					
				NZS 3604: 2011.	
Ceiling		✓			75 x 35 battens @ 400 cs. fixed to truss underside.
Battens/Restraints					
Entry Columns /					
Beams			✓		10mm gib to ceiling & walls.
Verandah			✓		
Deck Construction			✓		
Solid fuel Heater			✓		
PRODUCER					
STATEMENT		✓		PS1.	Millar Cusick, Engineering Co. CRANG 161 S09. Rib Raft.
B2 Durability		✓		AS1.	
Durability evaluation		✓			Low risk house. 600mm soffits apart from garage.
Durability applications					
(Brick)		✓			clay bricks - 70 series. in service history. 15 years.
Generic materials			✓		
Timber Treatments		✓			H1.2. framing throughout. H3.2 ply to balcony roof.
C1 Outbreak of Fire		✓	✓		
Solid Fuel Heater					
(Heat Transfer)		✓	✓		
C2 Means of Escape		✓			
				PS1.	
Escape Path					
Lengths.(24m max)		✓			Visual check of floor plan - DEOP less than 24ms.
C3 Spread of Fire		✓		AS1.	
Distance off boundary					
(1m)		✓			1.8m to nearest boundary. soffit clearance OK.
C4 Structural...			✓		
D1 Access Routes	✓			AS1.	
Slip Resistance	✓				Exposed ag to entrances. surfaces to table 2 AS/1
Ramps			✓		Garage access step down.
D2 Mechanical...			✓		
E1 Surface Water				AS1.	
Minimum floor levels		✓			F.F.L 225mm above F.G.L. 300mm above Datum.
Down pipes		✓			5x D/P 65mm 50m² roof area served.
Gutters		✓			6850mm² x sectional area 50m² roof area served.
Protection from					
flooding			✓		
Soak pit or other			✓		To reticulated as per P.M.
E2 External					
Moisture		✓		AS1.	
Weather tightness					
risk factors		✓			Risk matrix score 6. max appropriate cladding brick veneer
Floors		✓			30mm rebate - 50mm overhang, brick cavity.
Cladding Systems		✓			Window/hood/sill/jamb details provided to AS/1.
Roofing systems		✓			Ridge/valley change of pitch, hip flashings.
E3 Internal Moisture		✓			
				AS1.	
Surface Finishes		✓			Semi-gloss paint finish. - Formica benchtop. easily cleaned.
Prevention of fungal					impeable.
growth		✓			Adequate insulation & ventilation.
Overflow			✓		single dwelling.
Water splash		✓			Tiled splashback. to fixtures. sealed to walls.
Wet Area Shower		✓			Acrylic based enclosed showers.
F1 Haz Agents		✓			PLG1 supports no hazardous agents.

F2 Hazardous Bldg Materials					
Glazing		✓		125: 4223.	Toughened glass to showers door. Grade A safety glazing as per deviations.
F3 Haz Substances			✓		
F4 Safety from...		✓		ASI.	
Opening windows		✓			Safety stays to bathroom window opening
Barriers		✓			< 760mm sill to finish floor level.
F5 Construction		✓		ALT.	Fencing to site.
F6 Visibility in escape routes			✓		
F7 Warning Systems		✓		ASI.	
Location		✓			Smoke detectors located to cover bedrooms.
F8 Signs			✓		
G1 Personal Hygiene		✓		ASI.	
Number of sanitary fixtures		✓			W/C, basins, showers located & installed to
Location		✓			ASI requirements.
G2 Laundering		✓		ASI.	
Laundering Facilities		✓			Services provided, Tub in garage, step down to garage contain any overflows.
G3 Food Preparation and Prevention of Contamination		✓		ASI.	
Appliances & Facilities		✓			Services provided, sink, fridge, 1300mm between benchtops.
G4 Ventilation		✓		ASI.	
Ventilation		✓			Visual assessment 5% operable window to floor area achieved. PDL 230m ³ max in-line fan.
Ventilation rate		✓			
G5 Interior Environment			✓		
Temperature control & Space			✓		
G6 Airborne...			✓		
G7 Natural Light		✓		ASI.	
Vertical window in external walls		✓			Visual assessment 10% window to floor area achieved.
Awareness of outside environment		✓			50% clear glazing to visual awareness zone 900-2000mm.
G8 Artificial Light		✓		ASI.	
Illuminance		✓			Electrical plan supports 20 lux at floor level.
G9 Electricity		✓		ASI.	
Electrical installation		✓			Electrical certificate provided upon CCC application.
G10 Piped Services			✓		
G11 Gas...			✓		
G12 Water Supply		✓		ASI.	
Water supply system		✓			Mains water supply, Town supply.
Requirements for hot water system		✓			Hot water cylinder plumbing schematic, tempering valve, pressure relief valve to ASI requirements.
Materials and installation		✓			As per manufacturers specifications.
G13 Foul Water		✓		ASI/AS2.	
Effluent Disposal System (EDS)			✓		Main sewer reticulated.
Bedroom Numbers			✓		No drainage in specifications.
EDS Tank Size			✓		
EDS Daily Flow			✓		Stop loss gully trap for rib raft.
Gully traps		✓			UPVC gully traps, provided for fixture discharge pipes.
Pipe materials		✓			UPVC, polybutylene.

G13 Foul Water contd..				AG1/AS3.	
Support & Thermal movement		✓			Expansion joints ALL slip pipe through rib-reft.
Discharge pipes		✓			Discharge pipes serving fixtures to main drain.
Drain ventilation materials of pipes & joints		✓			Terminal vent 80mm ^ø UPVC pipes
Vent pipes		✓			A.O.V to discharge pipes 73.5m
Pipe gradient		✓			1:40 discharge pipes, 1:60 sewer.
Sanitary Plumbing		✓			Fixtures discharging to main drain & gully traps.
Bedding & backfill		✓			3/I to inspect on site.
Drains under buildings			✓		
G14 Industrial			✓		
G15 Solid Waste			✓		
H1 Energy Efficiency		✓		NZS:4218.	Schedule method - Glazing 30% < total wall area.
Thermal envelope		✓			Walls R:2.6 Ceiling R:3.6 Floor R:1.3.
Hot water system		✓			located in thermal envelope.

Any additional comments should be recorded on the Additional Comments form (T-03 - PS-07)), which complements the T-03 - PS series of processing sheets. Sufficient detail must be given on the Additional Comments form to enable cross-reference between this processing sheet and the additional comment provided, including the date, building consent number and clause item referred to.

If extra pages are used to record additional comments, state the number of extra pages here: _____

Ok to proceed with further information requested

signed: 14/9/12.

Ok to proceed with issuing building consent

signed: / /

Reviewed / Supervision

signed: 14/9/12.

BUILDING CONSENT AUTHORITY BC CIRCULATION SHEET

OWNER: Horncastle Homes

CONSENT NO: 121562

AGENT: _____

COMPLEXITY: R2

	PLANNING REVIEW COMPLETE	BUILDING CONSENT ON HOLD FOR F.I.	BUILDING CONSENT OK TO ISSUE	BUILDING CONSENT REFUSED	STAT DAYS AT ISSUE (to be completed by processor*)	FORMALLY RECEIVED DATE
DEADLINE DATE	25.9.12		21.9.12.		13 Days.	30/8/12.
INITIAL & DATE	12.9.12 AM	4.9.12	19.9.12.		If 18+ days processor to hand to Customer Services for invoicing	

TYPE OF WORK (Intended use): Domestic Dwelling

	INITIAL	&	DATE
PREVIEWED BY:	JL		29/8/12.
LOADED BY:	JM		5.9.12.
BC COPIED & COMPILED BY: (Including attachments)			

COMPLIANCE SCHEDULE NO: R _____
(if applicable)

*Reason for statutory timeframe not being met – to be completed by processor (if applicable)

CHECKSHEET, FURTHER INFORMATION & FILE NOTES TO BE ATTACHED TO THIS PAGE.

Building Consent**121562****Section 51, Building Act 2004**

Street address of building:	16 Goldney Close, Lincoln
Legal description:	Lot 54 DP 451072
Valuation number:	2404169054
Rapid number:	
Building name:	
Building location on site:	
Level/unit number:	

Name of Owner:	Horncastle Homes
----------------	------------------

Applicant/Agent:	Horncastle Homes
Contact person:	Nathan Veevers
Mailing address:	PO Box 8255, Riccarton, Christchurch 8440
Street address/registered office:	38 Lower Street, Riccarton, Christchurch
Phone number:	
Landline:	(03) 348 8905
Mobile:	
Daytime:	
After hours:	
Facsimile number:	(03) 348 8906
Email address:	nathan@horncastle.co.nz
Website:	

The following building work is authorised by this building consent:

Description:	Domestic Dwelling
Intended Use:	4 Bedroom Domestic Dwelling with attached Double Garage - 180sqm
Estimated Value:	\$216,096

Building Consent 121562

This building consent is issued under section 51 of the Building Act 2004. This building consent does not relieve the owner of the building (or proposed building) of any duty or responsibility under any other Act relating to or affecting the building (or proposed building).

This building consent also does not permit the construction, alteration, demolition, or removal of the building (or proposed building) if that construction, alteration, demolition, or removal would be in breach of any other Act.

This Building consent is invalid unless work has commenced within 12 months from the date of issue (section 52 of Building Act 2004).

A Code Compliance Certificate must be applied for as soon as building work is completed (section 92 of Building Act 2004).

Note:- Where conflict may occur between plan/specification information and/or any other specific instruction in application documentation, the applicant and/or designer is to note that the Schedule confirming the method of compliance with the NZ Building Code **will always be the prime default control for Council.**

Any amendment to this Approved Building Consent will require approval prior to the work being carried out. This will require an Amended Building Consent application to be made.

Booking Inspections

1. The Building Consent Authority, is to be advised that the work is ready for inspection at least 1 clear working day before that inspection is required. Please note this may not guarantee an inspection at the desired time if an inspector is not available at that time.
2. All inspections are to be booked by phoning 03 347 2839 between the hours of 8:30am and 5:00pm.
3. The complete set of Approved Building Consent documents (including stamped plans and specifications) **MUST** be available on site for the Officer carrying out the inspection. No inspection will be undertaken if the approved documentation is not available.



This building consent is subject to the following:-

Engineers Inspection

The Engineer will carry out inspections as follows as confirmed on 21 August 2012 Contact The Engineering Company Ltd directly to arrange these inspections. When these inspections have been carried out, a copy of the engineers site reports must be left on site with the Approved Documents for subsequent inspections.

- Foundation excavation to check ground bearing
- Waffle slab pre pour to check reinforcing and pod placement

Selwyn District Council Building Consent Authority Officers will carry out the following inspections:

Waste Pipes/Waffle Slab

Single pour waffle slab to check DPC, waste pipes before concrete is poured.

Pre Wrap

An 'as built' truss layout, showing truss and top plate connectors, along with design verification data and lintel sizes outside the scope of NZS 3604 must be submitted to the Selwyn District Council Building Consent Authority for approval prior to the pre-wrap inspection being booked.

Structural framing and fixings prior to building wrap, soffit, and roofing installation.

Control joints and saw cuts to floor slab have been completed.

Valley and secret gutter flashings prior to roofing installation.

Pre Clad

Inspection of building wrap, DPM, and flashings prior to veneer construction.

Cavity battens and flashings in place, prior to cladding being fixed.

Roofing substrate prior to membrane roof being applied (front entrance).

Half High

Veneer mid height inspection for cavity width, tie fixing, and check for mortar droppings.

Pre Line

NOTE: A weathertight exterior is required before a preline inspection occurs.

Plumbing pipe work prior to fixing of internal linings.

Preline moisture test and structural framing check including confirmation of treated timber where required.

Bracing elements prior to fixing of internal linings.

Completeness of insulation prior to fixing of internal linings.
Window installation to check ventilation, air seals, and glazing.

Drainage

NOTE:- All drainage work must be inspected prior to backfilling and a fully dimensioned 'as-built' drainage plan for Council records must be available when the Inspector visits the site.

Inspection and testing of sanitary sewer.
Connection to sewer lateral.
Stormwater disposal connection to street lateral.
Spouting including rain water heads, overflows and downpipes.

Post Line

Check nailing off of bracing panels before stopping work is carried out.

Practical Completion

Smoke alarm installation.
Slip resistant surfaces.
Safety glass where appropriate.
Sealed driveway/surfaces including associated drainage.
Domestic mechanical ventilation.
Hot water reticulation valving.
Check temperature of hot water.
Seismic restraints to hot water cylinder and storage tanks.

Upon completion of the building work Energy Work Certificates for the following items shall be provided to the owner to submit with their documentation for Code Compliance Certificate application, for the following:-

- ☐ Electrical work

Upon completion of the building work the Plumber shall provide a Pressure Test Certificate to the owner to submit with their documentation for Code Compliance Certificate application.

When the final inspection has been carried out and all building work approved, the Code Compliance Certificate can be applied for (The Code Compliance Certificate is invoiced separately with any additional costs if applicable).



Building Consent 121562

Compliance schedule

A compliance schedule is not required for this project.

Attachments

Copies of the following documents are attached to this building consent:

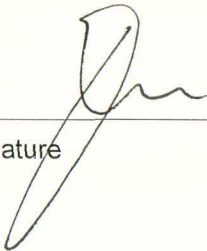
NIL

Other Approvals Required

The following other approvals/authorisations are required:

None Known

Signature



21/9/12
Date of Issue/Granting

Carl Petersen

Building Control Officer

On behalf of: Selwyn District Council



Horncastle Homes
PO Box 8255
Riccarton
Christchurch 8440

Attn: Nathan Veevers

GST Number: 53-113-451

Invoice Date: 20/09/12

Customer No: BC121562

Order No.

Tax Invoice 28168

Quantity	Description	Rate	Amount
	121562 : 16 Goldney Close, Lincoln Domestic Dwelling Owner: Horncastle Homes		
	** BRANZ LEVY (Zero GST)		217.00 0G
	** DBH LEVY		436.17 *
	Administration		228.00 *
	Processing		672.00 *
	Inspections (Incl Travel)		1,444.08 *
	Producer Statement Assessment		29.00 *
	BEFORE GST		2,659.83
	(* Includes GST) GST		366.42
	Cash Received		1,000.00CR

Total incl. GST \$2,026.25

Once we have received the balance of the fees owing on this consent, it may then be uplifted or mailed as requested.
Building consent is not valid until fees are paid in full.

**** These levies are collected on behalf of these agencies ****

(Please detach and return this portion with your payment)

REMITTANCE ADVICE

Horncastle Homes
PO Box 8255
Riccarton
Christchurch 8440

Customer No.: BC121562
Invoice No.: 28168
Total Due: \$2,026.25

Amount Enclosed:

Payment can be made by internet banking to the following account: 03 1587 0050000 00.

Please enter your invoice number in the particulars field, and your customer number in the code field.





120829029



For Official use

Project Number:

121562

Date Received:

29/8/12

Application for Project Information Memorandum and/or Building Consent (Form 2) Section 33 or section 45, Building Act 2004

Items marked * are mandatory for all applications. Complete this form in BLOCK CAPITALS using BLACK or BLUE ink.

1. Type of Application

I request that you issue a*: ☐ Project Information Memorandum (PIM) only

(Tick one box only)

for the building work
described in this
application☐ Building Consent only OR ☐ Amendment to Building Consent:☒ Building Consent including PIM☐ Exemption from the need for Building Consent (e.g. Marquee. Refer Schedule 1 of BA04)

2. The Building

Valuation Roll Number:

24041 69054

Street Address*:

Lot 54, Goldney Close, Rosemerry
Lincoln
Christchurch

Legal Description*: Lot:

54

DP:

451072

Building Name (if applicable):

Number of Levels:

Single

Level/Unit Number:

Number of Occupants*:

Floor Area* (all floors incl.):

Existing:

m²

Additional:

180.08

m²

Current lawfully authorised use:

(refer NZBC A1 "Classified Use")

Approx year building first constructed:

(if an addition or alteration)

3. The Owner [include preferred form of address, eg, Mr, Miss, Dr, if an individual]

Owner's Name*:

Horncastle Homes Limited

Contact Person:

(if owner is a company)

Mailing/
Billing Address*:P.O. Box 8255
Riccarton
ChristchurchStreet Address/
Registered Office:

Phone Number:

Cell Phone:

Fax:

e-mail:

website:

4. The Agent (if applicable) The Agent will be the first point of contact for communications with the Council / Building Consent Authority regarding this application / building work and will receive all correspondence including all invoices.

Agent's Name:

Horncastle Homes Limited

Contact Person:

(if agent is a company)

Nathan Veivers

Mailing/
Billing Address:P.O. Box 8255
Riccarton
ChristchurchStreet Address/
Registered Office:38 Lower Street
Riccarton
Christchurch

Phone Number:

(03) 348 8905

Cell Phone:

Fax:

(03) 348 8906

e-mail:

nathan@horncastle.co.nz

website:

www.horncastle.co.nz

FILE COPY

Form 2 - Version 8

Issued: 24 July 2012

Page 1 of 7

121562

5. Fencing of Swimming Pools Act 1987

Is a Swimming Pool, or Spa Pool, on this Site or associated with this Project*?

☐ YES

☒ NO

6. The Project

Description of the building work*

Construction of single level residential dwelling with ~~attached~~ 4 bedrooms and attached garage.

Will the building work result in a change of use of the building? *

☐ YES

→ Provide details of the new use:
(Refer NZBC A1 Classified Uses)

☒ NO

Intended life of the building*

☒

Indefinite but not less than 50 years,

OR ☐

Specified as:

Years (if less than 50 years)

List building consents (BC) previously issued for this project (if any):

BC Number:	Description:
<input type="text"/>	<input type="text"/>

Estimated value of the building work on which the building levy will be calculated*

(including goods and services tax) [state estimated value as defined in section 7 of the Building Act 2004]

\$216,096.00

Restricted Building Work*

Will the building work include any restricted building work? ☒ YES ☐ NO

If Yes, provide the following details of all licenced building practitioners who will be involved in carrying out or supervising the restricted building work (continue on another page is necessary). If these details are unknown at the time of the application, they must be supplied before the work begins. Include LBP number or registration number if treated as being licenced under section 291 of the Building Act 2004

Name: Horncastle Homes Limited - Designer

LBP Number: Refer to attached LBP

Licencing Class:

Mailing Address: P.O. Box 8255, Riccarton, Christchurch 8140

Phone (day): (03) 348 8905

Name:

LBP Number:

Licencing Class:

Mailing Address:

Phone (day):

Name:

LBP Number:

Licencing Class:

Mailing Address:

Phone (day):

Name:

LBP Number:

Licencing Class:

Mailing Address:

Phone (day):

Name:

LBP Number:

Licencing Class:

Mailing Address:

Phone (day):

Name:

LBP Number:

Licencing Class:

Mailing Address:

Phone (day):

Name:

LBP Number:

Licencing Class:

Mailing Address:

Phone (day):

Name:

LBP Number:

Licencing Class:

Mailing Address:

Phone (day):

Name:

LBP Number:

Licencing Class:

Mailing Address:

Phone (day):

Name:

LBP Number:

Licencing Class:

Mailing Address:

Phone (day):

FILE COPY

121562

8. Project Information Memorandum (Applicable only if applying for a PIM or combined PIM & Building Consent)

The following matters are involved in the project:

- ☐ Subdivision
- ☐ Alterations to land contours
- ☐ New or altered connections to public utilities
- ☐ New or altered locations and/or external dimensions of buildings
- ☐ New or altered access for vehicles
- ☒ Building work over or adjacent to any road or public place
- ☒ Disposal of stormwater and wastewater
- ☐ Building work over any existing drains or sewers or in close proximity to wells or water mains
- ☐ Other matters known to the applicant that may require authorisations from the territorial authority: [specify] (use additional sheets if required)

9. Building consent (Not applicable if applying for Project Information Memorandum (PIM) only)

The following plans, specifications and supporting documents are attached to this application*:

[All plans and specifications must meet the minimum requirements set out in the regulations or required by the building consent authority.]

Full consent Plans - Lot 54 Rosemerryn - J3634

Application form

Council Specification

Schedule of materials

Hail form

Checklist.



FORM PLG 1

National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health

Every applicant must answer the questions contained within Table One. *For assistance in answering these questions please refer to the attached information sheet (PLG 1A).*

Please note that any inaccuracies may result in the applicant being in breach of the Resource Management Act 1991 and/or exposed to liability if the site is subsequently found to be contaminated, including being liable for remedial works.

Table One (compulsory)

Is the building work and all associated activities:

Changing the use of the land?

(Please note that "changing the use of the land" includes erecting a dwelling on an area of land which previously had no dwelling erected upon it.)

Yes ☒ No ☐

Disturbing soil? (more than 25m³ per 500m² of land) or removing soil? (more than 5m³ per 500m² of land) *(eg foundations, on-site effluent treatment and disposal systems, wells or bores)*

Yes ☐ No ☒

Removing or replacing a fuel storage system or parts of it?

Yes ☐ No ☒

Sampling soil?

Yes ☐ No ☒

Subdividing land?

Yes ☐ No ☒

If all of the answers to the questions in Table One are "no" then you may stop here, however you must sign and date the bottom of Page 2 of this form.

If you answered "yes" to any of the questions in Table One, complete Table Two.

Table Two

Is the land currently being used, has been used in the past, or is likely to have been used for an activity described on the HAIL? *(refer to attached information sheet (PLG 1A) for the HAIL list.)*

Yes ☐ No ☒

If the answer to the question in Table Two is "no" then you may stop here, however you must sign and date the bottom of this form.

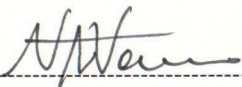
If you answered "yes" to the question in Table Two, you are required to undertake an assessment in accordance with the NES for Assessing and Managing Contaminants in Soil to Protect Human Health. Until such time as a satisfactory NES assessment has been undertaken, no building work will be permitted to commence. Please complete Table Three.

For more information on this process please contact the Duty Planner on 347 2868 or go the Ministry for the Environment website <http://www.mfe.govt.nz/laws/standards/contaminants-in-soil/>

Table Three

<input type="checkbox"/> Assessment under the NES is attached
<input type="checkbox"/> The NES assessment work is to be undertaken. Anticipated completion date _____

Full name Nathan Veivers

Signature 

Date 27-8-2012

The developer 'Fulton Hogan' are having a test carried out but have confirmed that the Selwyn Council have agreed that stage 2 Rosemerry is not a Hail site.

9. Means of Compliance with the New Zealand Building Code

(Not applicable if applying for Project Information Memorandum (PIM) only)

The building work will comply with the building code as follows* (use additional sheets if required):

NZBC Clause	Means of compliance [‡]		Waiver/modification required [‡]	
	Acceptable Solution (eg. AS1, AS2 etc)	Alternative Solution		
B1 (Structure)	B1 | AS1		No	B1
B2 (Durability)	B2 | AS1		No	B2
C1 (Outbreak of Fire)				C1
C2 (Means of Escape from Fire)	C2 | AS1		No	C2
C3 (Spread of Fire)	C3 | AS1		No	C3
C4 (Structural Stability during Fire)	C4 | AS1		No	C4
D1 (Access Routes)	D1 | AS1		No	D1
D2 (Mechanical Installations for Access)				D2
E1 (Surface Water)	E1 | AS1		No	E1
E2 (External Moisture)	E2 | AS1		No	E2
E3 (Internal Moisture)	E3 | AS1		No	E3
F1 (Hazardous agents on site)	F1 | AS1		No	F1
F2 (Hazardous building materials)	F2 | AS1		No	F2
F3 (Hazardous substances and processes)				F3
F4 (Safety from falling)	F4 | AS1		No	F4
F5 (Construction and demolition hazards)		See attached	Yes	F5
F6 (Lighting for emergency)				F6
F7 (Warning systems)	F7 | AS1			F7
F8 (Signs)				F8
G1 (Personal hygiene)	G1 | AS1			G1
G2 (Laundering)	G2 | AS1			G2
G3 (Food prep. and prevention of contamination)	G3 | AS1			G3
G4 (Ventilation)	G4 | AS1			G4
G5 (Interior environment)	G5 | AS1			G5
G6 (Airborne and impact sound)				G6
G7 (Natural light)	G7 | AS1			G7
G8 (Artificial light)	G8 | AS1			G8
G9 (Electricity)	G9 | AS1			G9
G10 (Piped services)				G10
G11 (Gas as an energy source)				G11
G12 (Water supplies)	G12 | AS1			G12
G13 (Foul water)	G13 | AS1, G13 | AS2			G13
G14 (Industrial liquid waste)				G14
G15 (Solid waste)				G15
H1 (Energy efficiency provisions)	H1 | AS1			H1

* Provide reference to the relevant compliance document(s) or detail of alternative solution in the plans and specifications.

‡ State nature of waiver or modification of building code required.

FILE COPY
121562

11. Compliance schedule (Not applicable if applying for Project Information Memorandum (PIM) only)

Are there any specified systems associated with this project? *

- ☐ YES, the following specified systems are being altered, added to, or removed in the course of the building work: *(specified systems are defined in regulations)*
- ☒ NO, there are no specified systems associated with this project. [Go to Section 12]

	Existing	New	Modified	Removed	
SS1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Automatic systems for fire suppression (for example, sprinkler systems)
SS2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Automatic or manual emergency warning systems for fire or other dangers (other than a warning system for fire that is entirely within a household unit & serves only that unit).
SS3/1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Electromagnetic or automatic doors or windows (for example, ones that close on fire alarm activation)
SS3/2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Access Controlled Doors
SS3/3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Interfaced fire or smoke doors or windows
SS4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Emergency lighting systems
SS5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Escape route pressurisation systems
SS6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Riser mains for fire service use
SS7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Automatic back-flow preventers connected to a potable water supply
SS8/1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Passenger Carrying lifts
SS8/2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Service Lifts
SS8/3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Escalators and moving walks
SS9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Mechanical ventilation or air conditioning systems
SS10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Building maintenance units for providing access to the exterior and interior walls of buildings
SS11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Laboratory fume cupboards
SS12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Audio loops or other assistive listening systems
SS13/1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Mechanical Smoke Control
SS13/2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Natural Smoke Control
SS13/3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Smoke Curtains
SS14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Emergency power systems for, or signs relating to, a system or feature specified in any of the clauses SS1 to SS13
SS14/1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Emergency Power Systems for a system or feature specified in any of the clauses SS1 to SS13
SS14/2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Signs relating to Specified Systems SS1 to SS13
SS15/1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Systems for communicating spoken information intended to facilitate evacuation
SS15/2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Final exit (as defined by A2 of the Building Code; and
SS15/3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Fire separations
SS15/4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Signs for communicating information intended to facilitate evacuation
SS15/5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Smoke separations
SS16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Cable Cars

Purpose Group:

Fire Hazard Category:

Max Occupant Load:

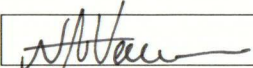
2. Attachments

The following documents are attached to this application:

- | | |
|---|---|
| <input checked="" type="checkbox"/> Plans and specifications* (refer to list at section 8)
2 copies for Residential
3 copies for Commercial / Industrial
PIM only – 1 copy only of: Site plan, floor plan and elevations | <input checked="" type="checkbox"/> Compliance Schedule (for items identified at Section 10) |
| <input type="checkbox"/> Project information memorandum | <input checked="" type="checkbox"/> Evidence of ownership* (Certificate of Title or Sale & Purchase Agreement) |
| <input type="checkbox"/> Development contribution notice | <input checked="" type="checkbox"/> Building Consent Application Checklist*
(Form 2R for Residential or Form 2C for Commercial work) |
| <input type="checkbox"/> Certificate attached to project information memorandum | |
| <input checked="" type="checkbox"/> Memoranda (Certificate of Design Work) from licenced building practitioner who carried out or supervised the design work that is restricted building work* | |
| <input checked="" type="checkbox"/> National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health (Planning Form PLG1)* | |
| <input checked="" type="checkbox"/> Application Fee/Deposit*
(refer Form 2R or Form 2C) | \$ 1200.00 |

13. Other notes or comments which you as the applicant may wish to add

14. Signature

Signed by*: 

FULL NAME*: Nathan Veivers

Date*: 27-8-2012

I am the*: ☐ Owner ☒ Agent on behalf of, and with the authority of, the owner.

Note: The Agent, if nominated, will be the first point of contact for communications with the Council / Building Consent Authority regarding this application / building work and will receive all correspondence including all invoices.

FILE COPY
121502

Memorandum from licensed building practitioner: Certificate of design work

Section 45 and section 30c, Building Act 2004

Please fill in the form as fully and correctly as possible.

If there is insufficient room on the form for requested details, please continue on another sheet and attach the additional sheet(s) to this form.

THE BUILDING

Street address: LOT 54 - STAGE 2, ROSEMERRY, GOLDNEY CLOSE

Suburb: LINCOLN

Town/City: CHRISTCHURCH

Postcode:

THE OWNER(S)

Name(s): HORNCastle HOMES LIMITED

Mailing address: 38 LOWE STREET

Suburb: RICCARTON

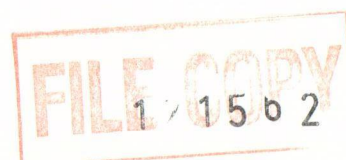
PO Box/Private Bag: 8255

Town/City: RICCARTON

Postcode: 8440

Phone number: (03) 348 8905

Email address: nathan@horncastle.co.nz



121562

IDENTIFICATION OF DESIGN WORK THAT IS RESTRICTED BUILDING WORK

I Nathan Veevers carried out/supervised the following design work that is restricted building work

PRIMARY STRUCTURE

Design work that is restricted building work	Description of restricted building work	Carried out or supervised	Reference to plans and specifications
Tick <input checked="" type="checkbox"/>	If appropriate, provide details of the restricted building work	Tick <input checked="" type="checkbox"/> whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
Foundations and subfloor framing <input type="checkbox"/>	Engineered Rib Raft Foundations	<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised	
Walls <input checked="" type="checkbox"/>	Brick Veneer, cavity on building paper on H1.2 treated timber framing. Linear feature cladding 20mm battened cavity over building paper on H1.2 treated timber framing	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to pages - Elevations- A3.0 Sections - A4.0-A4.1 Details - A5.1,A5.4-A5.6
Roof <input checked="" type="checkbox"/>	Coloursteel Plumbdek roofing on H1.2 75x45 purlins @ 900 c/s max with building paper. Trusses manufactured by carters to comply with NZS:3604.	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to pages - Elevations -A3.0 Sections - A4.0 - A4.1 Details - A5.2 Supporting documents
Columns and beams <input checked="" type="checkbox"/>	Beams and lintels designed by manufacturing company to comply with NZS:3604	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to pages - Floor Plan - A2.4 Supporting documents
Bracing <input checked="" type="checkbox"/>	Bracing designed to comply with NZS:3604. Plywood and GIB bracing systems	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to pages - Bracing plan - A2.2 Framing plan - A5.1
Other <input type="checkbox"/>		<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised	

EXTERNAL MOISTURE MANAGEMENT SYSTEMS			
Design work that is restricted building work	Description of restricted building work	Carried out or supervised	Reference to plans and specifications
Tick	If appropriate, provide details of the restricted building work	Tick whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
Damp proofing <input checked="" type="checkbox"/>	All damp proofing to comply with E2/AS1. (Foundations, Walls and Roof)	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to pages - Sections - A4.0 -A4.1 Details - A5.0,A5.2,A5.4-A5.6
Roof cladding or roof cladding system <input checked="" type="checkbox"/>	Roofing cladding to comply with Section 5 & 8 of building code E2/AS1	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to pages - Elevations - A3.0 Sections -A4.0 - A4.1 Details- A5.2,A5.4-A5.6 Supporting documents
Ventilation system (for example, subfloor or cavity) <input checked="" type="checkbox"/>	Brick Veneer cavity to comply with E2/AS1 and mechanical ventilation to toilets, showers, laundry, range hood to comply with G4/AS1	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to pages - Insulation plan - A2.3 Floor plan - A2.4 Details - A5.1 - A5.6 Supporting documents
Wall cladding or wall cladding system <input checked="" type="checkbox"/>	Wall cladding to comply with E2/AS1 in all sections and wall framing to comply with NZS:3604	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to pages - Elevations - A3.0 Sections - A4.0 - A4.1 Details - A5.1,A5.4-A5.6 Supporting documents
Waterproofing <input checked="" type="checkbox"/>	All damp proofing to comply with E2/AS1.	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to pages - Sections - A4.0 -A4.1 Details - A5.0,A5.1,A5.2,A5.4-A5.6 Supporting documents
Other <input type="checkbox"/>		<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised	

FILE COPY

FIRE SAFETY SYSTEMS			
Design work that is restricted building work	Description of restricted building work	Carried out or supervised	Reference to plans and specifications
Tick <input type="checkbox"/> if appropriate	If appropriate, provide details of the restricted building work	Tick <input type="checkbox"/> whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
Emergency warning systems <input checked="" type="checkbox"/> Evacuation and fire-service operation systems Suppression or control systems Other	Warning systems to comply with F7/AS1. Smoke alarms to AS1670.6 requirements. Equipment to comply with one of AS3786 or BS 5446: PART 1	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to pages - Site plan - A1.0 Electrical plan - A2.3 Floor Plan - A2.4 Supporting documents
Note: The design of fire safety systems is only restricted building work when it involves small-to-medium apartment buildings as defined by the Building (Definition of Restricted Building Work) Order 2011.			

WAIVERS AND MODIFICATIONS

Waivers or modifications of the Building Code are required. ☒ Yes ☐ No

If Yes, provide details of the waivers or modifications below:

Clause	Waiver/modification required
List relevant clause numbers of building code	Specify nature of waiver or modification of building code required
Clause 1.1 site fences and hoardings of F5/AS1	Please refer to attached alternative solution provided with the application form.

ISSUED BY

Name and contact details of the licensed building practitioner who is licensed to carry out or supervise design work that is restricted building work.

Name: **Nathan Veevers**

LBP or Registration number: **104214**

The practitioner is a: ☒ Design LBP ☐ Registered architect ☐ Chartered professional engineer

Mailing address (if different from below):

Street address/Registered office: **38 LOWE ST**

Suburb: **ADDINGTON**

Town/City: **CHRISTCHURCH**

PO Box/Private Bag: **PO BOX 8255**

Postcode: **8440**

Phone number: **03 348 8905**

Mobile:

After hours:

Fax: **03 348 8906**

Email address: **nathan@horncastle.co.nz**

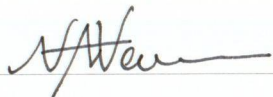
Website: **www.horncastle.co.nz**

DECLARATION

I **Nathan Veevers** certify that the design work that is restricted building work identified on this form:

- Complies with the building code, or
- Complies with the building code subject to any waiver or modification of the building code recorded on this form

Signature:



Date:

27-8-2012

FILE COPY
121562

Horncastle HOMES

Telephone (03) 348 8905 Fax (03) 348 8906. PO Box 8255 Riccarton. Christchurch
Website www.horncastle.co.nz

To: Selwyn District Council
P.O. Box 90
Rolleston, 7643
Christchurch

Date: 28 August 2012

From: Shiaz Beg

Reference: J3634 LOT 54- ROSEMERRY, GOLDNEY CLOSE, LINCOLN

Alternative Solution

Clauses of the building code affected:

F5/AS1- Construction and Demolition Hazards (Site Fencing)

Proposal:

All internal boundaries or boundaries not accessible to the public are to be permanently fenced, with 1.8m high timber paling fence. Boundary side/s accessible to the public are to be fenced with Link-mesh temporary construction fencing, at 1.8m high with double lock to entry gate at site access point. *Refer to location plan on page A1.1 for fence location.*

Regards,

Shiaz Beg
Architectural Designer

Horncastle Homes Ltd | PO Box 8255 | Riccarton | Christchurch
P + 64-3-348-8905 | F + 64-3-348-8906
E shiaz@horncastle.co.nz
W www.horncastle.co.nz

121502
FILE COPY

Horncastle HOMES



P O Box 8255, Riccarton, Christchurch 8440, New Zealand.

Ph: +64 3 348 8905, Fax: +64 3 348 8906

Web: www.horncastle.co.nz

We call Canterbury home

To: Selwyn District Council
Attention: Jenny Lilley
Date: 30 August 2012
From: Shiaz Beg
Reference: BC 121562

Hi,

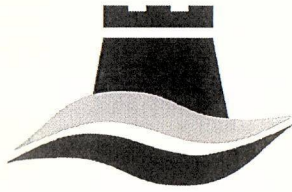
In regards to your RFI dated 30 August 2012; please find our explanation below, along with the attached required documentation.

1. – Council Specification

Any concerns or further questions, please do not hesitate to contact me
Thank you,

Shiaz Beg
Architectural Designer





HORNCASTLE HOMES

Specification

of work shown on the accompanying drawings

Date: 28 August 2012

Customer: Horncastle Homes Limited

At: Lot 54, Rosemerryn, Goldney Close, Lincoln

Location: Rosemerryn, Lincoln

Job No.: J3634

Constructed By: Horncastle Homes Limited



121562

17 SEP 2012



HORNCASTLE HOMES

Specification

of work shown on the accompanying drawings

Date: 28 August 2012

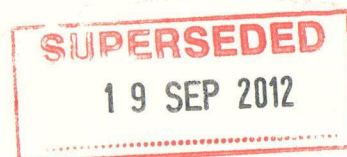
Customer Horncastle Homes Limited

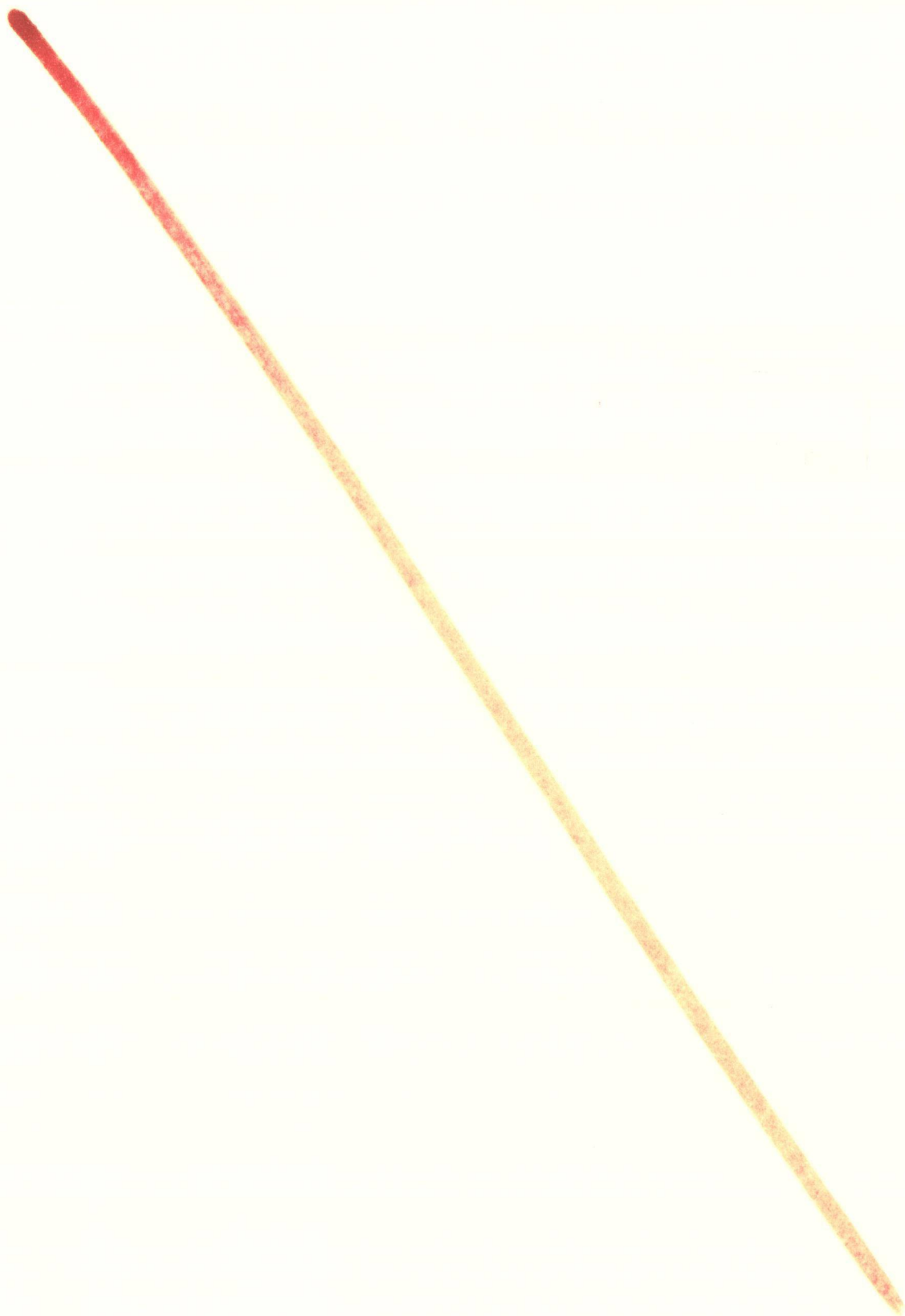
At Lot 54, Rosemerryn, Goldney Close, Lincoln

Location Rosemerryn, Lincoln

Job No. J3634

Constructed By: Horncastle Homes Limited





Project Information

Horncastle Homes Specification Printed 17/09/12

Owner

Name Horncastle Homes Limited
Mailing Address PO Box 8255, Riccarton, Christchurch
Phone 341-3693

Builder

Name Horncastle Homes Limited
Mailing Address PO Box 8255, Riccarton, Christchurch
Phone 348-8905
Fax 348-8906

Designer

Name Horncastle Homes Limited
Mailing Address PO Box 8255, Riccarton, Christchurch
Phone 341-3693
Fax 348-8906

Project Location

Street Address Lot 54, Rosemerryn, Goldney Close, Lincoln
Legal Description Lot 54
DP 451072

Project Description

Type New building
Intended Use: Single residential building
Intended Life: Indefinite but not less than 50 years.

Compliance Information

SITE DATA

Soil Type (NZS 3604, Clause 3.2)
Exposure/corrosion zone (NZS 3604, figures 4.1, 4.2)
Wind region (NZS 3604, figure 5.1)
Topographical class (NZS 3604, tables 5.3, 5.4)
Wind zone (NZS 3604, tables 5.1 and 5.2)
Earthquake zone (NZS 3604, figure 5.4)

BUILDING DATA

Building classification (NZS 3604, table 1.1)
Floor live load (NZS 3604, table 1.2)
Overall height of building (in metres) 4.97m

Product Information



Owner

Name Horncastle Homes Limited
Mailing Address PO Box 8255, Riccarton, Christchurch
Phone 341-3693

Builder

Name Horncastle Homes Limited
Mailing Address PO Box 8255, Riccarton, Christchurch
Phone 348-8905
Fax 348-8906

Designer

Name Horncastle Homes Limited
Mailing Address PO Box 8255, Riccarton, Christchurch
Phone 341-3693
Fax 348-8906

Project Location

Street Address Lot 54, Rosemerryn, Goldney Close, Lincoln
Legal Description Lot 54
DP 451072

Project Description

Type New building
Intended Use: Single residential building
Intended Life: Indefinite but not less than 50 years.

Compliance Information

SITE DATA

Soil Type (NZS 3604, Clause 3.2)
Exposure/corrosion zone (NZS 3604, figures 4.1, 4.2)
Wind region (NZS 3604, figure 5.1)
Topographical class (NZS 3604, tables 5.3, 5.4)
Wind zone (NZS 3604, tables 5.1 and 5.2)
Earthquake zone (NZS 3604, figure 5.4)

BUILDING DATA

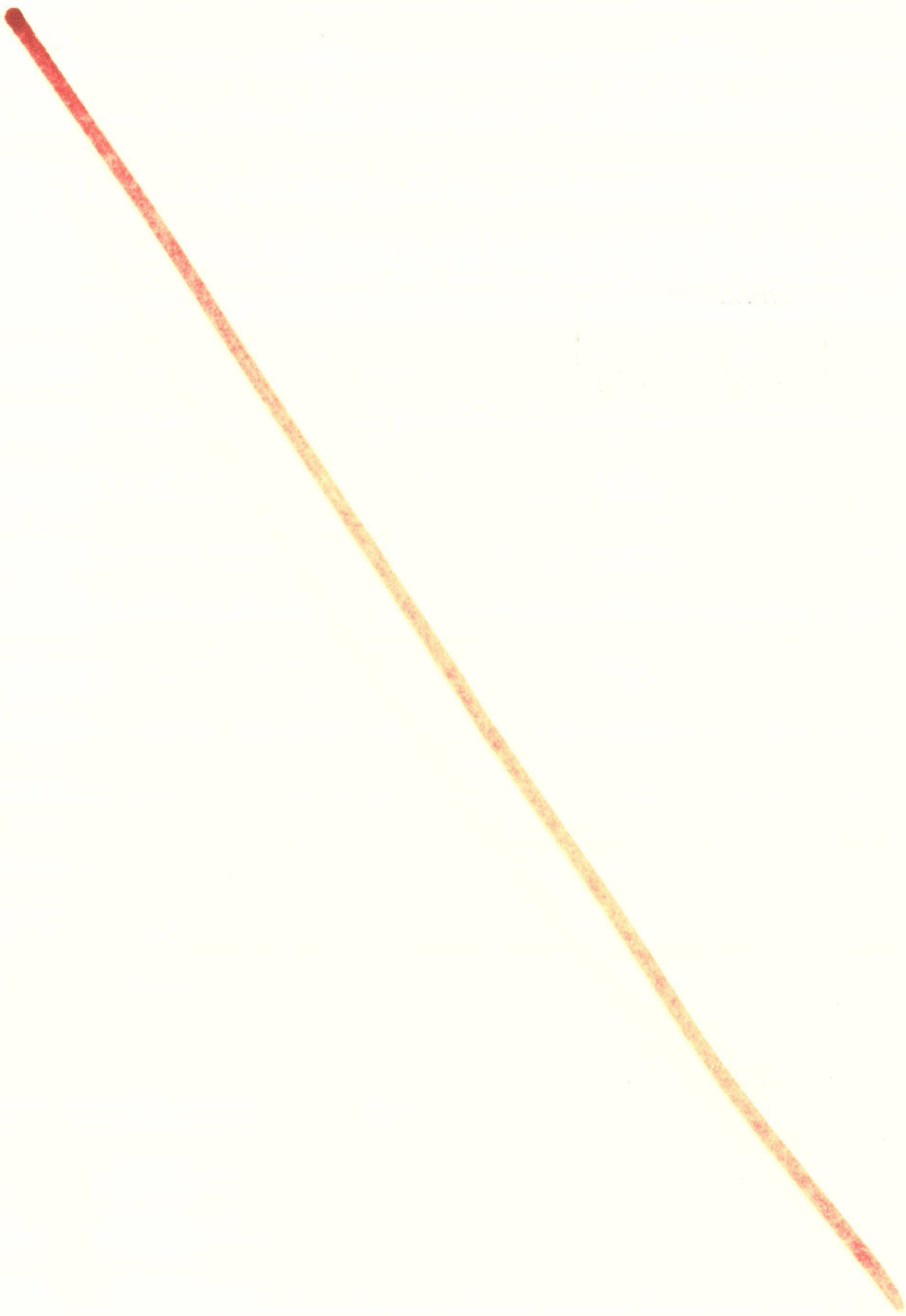
Building classification (NZS 3604, table 1.1)
Floor live load (NZS 3604, table 1.2)
Overall height of building (in metres) 4.97m

Product Information

SUPERSEDED

19 SEP 2012

FILE COPY



- 010 010 100GENERAL REQUIREMENTS.....
- 010 010 101 THE WORKS
The works are as described in this specification and shown on the drawings.
- 010 010 102 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.
- 010 010 103 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
- 010 010 104 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 010 010 100 GENERAL REQUIREMENTS with all other sections.
- 010 010 105 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.
- 010 010 106 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.
- 010 010 107 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.
- 010 010 108 THE WORDS "PROVIDE" OR "FIX"
The words "provide" (or "supply") or "fix" if used separately mean "provide and fix" unless explicitly stated otherwise.
- 010 010 109 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.
- 010 010 110 REFERENCED DOCUMENTS
Reference is made to various New Zealand Building Code (NZBC) acceptable solutions and verification methods 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, NZMP, 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.
- 010 010 111 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 approval is affected, the change notified to the territorial authority.
- 010 010 112 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 approval is affected refer any change to the territorial authority
- 010 010 113 STATUTORY OBLIGATIONS
Comply with all statutory obligations and regulations of regulatory bodies controlling execution of the works.
- 010 010 114 BUILDING CONSENT
Obtain the original or copies of the building consent form and documents from Horncastle Homes Limited and keep on site. Liaise with the territorial 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 Horncastle Homes Limited on completion.
- 010 010 115 INSPECTIONS
Do not proceed with work noted on the Building Consent for inspection until it has been inspected and passed by the territorial authority inspector.
- 010 010 116 PRODUCER STATEMENTS
When producer statements verifying construction are required, provide copies to both the territorial authority and the owner. Provide producer statements in the form required by the Building Act 2004.

- 010 010 101 **THE WORKS**
The works are as described in this specification and shown on the drawings.
- 010 010 102 **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.
- 010 010 103 **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
- 010 010 104 **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 010 010 100 GENERAL REQUIREMENTS with all other sections.
- 010 010 105 **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.
- 010 010 106 **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.
- 010 010 107 **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.
- 010 010 108 **THE WORDS "PROVIDE" OR "FIX"**
The words "provide" (or "supply") or "fix" if used separately mean "provide and fix" unless explicitly stated otherwise.
- 010 010 109 **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.
- 010 010 110 **REFERENCED DOCUMENTS**
Reference is made to various New Zealand Building Code (NZBC) acceptable solutions and verification methods 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, NZMP, 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.
- 010 010 111 **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 approval is affected, the change notified to the territorial authority.
- 010 010 112 **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 approval is affected refer any change to the territorial authority
- 010 010 113 **STATUTORY OBLIGATIONS**
Comply with all statutory obligations and regulations of regulatory bodies controlling execution of the works.
- 010 010 114 **BUILDING CONSENT**
Obtain the original or copies of the building consent form and documents from Horncastle Homes Limited and keep on site. Liaise with the territorial 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 Horncastle Homes Limited on completion.
- 010 010 115 **INSPECTIONS**
Do not proceed with work noted on the Building Consent for inspection until it has been inspected and passed by the territorial authority inspector.
- 010 010 116 **PRODUCER STATEMENTS**
When producer statements verifying construction are required, provide copies to both the territorial authority and the owner. Provide producer statements in the form required by the Building Act 2004.
- 010 010 117 **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 Horncastle Homes Limited

SUPERSEDED
19 SEP 2012

FILE COPY

010 010 119	<p>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. Ensure the Horncastle Homes site safety sign is erected on the front boundary and is visible to the public at all times. Health & Safety site sign is to have the following wording: "Authorised personal only beyond this point. Please report to site foreman".</p>
010 010 120	<p>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.</p>
010 010 121	<p>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 manufacturers requirements. Protect fabricated elements from the weather and damage, and store in accordance with suppliers requirements.</p>
010 010 122	<p>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.</p>
010 010 123	<p>MEANS OF COMMUNICATION All directions and approvals in writing.</p>
010 010 124	<p>PROGRAMME Provide a programme for the contract works, including the work of separate contractors being carried out concurrent 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 Horncastle Homes Limited.</p>
010 010 125	<p>WORKING HOURS Work on site is restricted to 7:30am to 6:00pm, Monday to Friday, excluding statutory holidays. Work outside these hours may be permitted, with prior approval in writing by Horncastle Homes Limited.</p>
010 010 126	<p>RESTRICTIONS Do not:</p> <ul style="list-style-type: none"> - smoke on site - light rubbish fires on the site - bring dogs on to or near the site
010 010 127	<p>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.</p>
010 010 128	<p>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.</p>
010 010 129	<p>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.</p>
010 010 130	<p>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.</p>
010 010 131	<p>MATERIALS AND PRODUCTS Use only new materials and products, unless stated otherwise, of the specified quality and complying with cited documents.</p>
010 010 132	<p>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.</p>
010 010 133	<p>COMPLETE ALL SERVICES Ensure completed building services are operational, with temporary labelling removed, required labelling fixed and service instructions provided.</p>
010 010 134	<p>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.</p>
010 010 135	<p>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.</p>
010 090	
012 090	
040 010 100	.....EXCAVATION & FILL.....

010 010 135

CLEAN

Horncastle Homes Specification Printed 17/09/12

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

010 090

012 090

040 010 100

.....EXCAVATION & FILL.....

SITE SAFETY

040 010 101

Provide proper support for excavations. Cover holes and fence off open trenches and banks.

040 010 102

Washed rounds 20-40mm

EXCAVATION GUIDELINES

040 010 103

Carry out excavation to the guidelines set by the Occupational Safety and Health Service (OSH) publication: "Approved Code of Practice for Safety in Excavation and Shafts for Foundations".

PROTECT EXISTING

040 010 104

Protect from damage existing buildings, structures, roads, paving and services nominated on the drawings as being retained, throughout the course of the work.

PROTECT TREES

040 010 105

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.

SURFACE PREPARATION

040 010 106

Conforming with NZS 3604:2011, section 3.5, remove all turf, vegetation, trees, topsoil, stumps and rubbish from the area being built on.

040 010 107

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 territorial authority approval.

040 010 109

GENERAL EXCAVATION

Trim ground to required profiles, batters, falls and levels. Remove loose material. Protect cut faces from collapse. Keep excavations free from water.

040 010 110

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.

040 010 111

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.

040 010 112

GRANULAR BASE FOR SLABS

To NZS 3604:2011, section 7.5.3.

040 010 113

GENERAL BACKFILLING

Compact backfilling in 150 mm layers, with the last 200 mm in clean topsoil, lightly compacted and neatly finished off.

040 090

060 010 100

060 010 101

.....DRAINAGE.....

QUALIFICATIONS

Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 2006.

060 010 102

MATERIALS

Concrete: 17.5 MPa ordinary grade.

Reinforcement: Grade 300 deformed bars.

uPVC pipes: uPVC pipes bends, junctions, fittings and joints. Pipes to comply with AS/NZS 1260.

Field drains: Plastic pipes for field drains perforated and coiled with filter fabric over.

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.

060 010 103

FITTINGS

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

Surface water sump gratings: Cast iron frame with lift-up grating.

Strip drain channel: Proprietary, modular, variable invert, uPVC or precast concrete drainage channel sections and drainage sump, embedded in site concrete and fitted with selected metal gratings.

Inspection covers: Cast iron frame with screw-down cover.

060 010 104

EXCAVATE

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

060 010 105

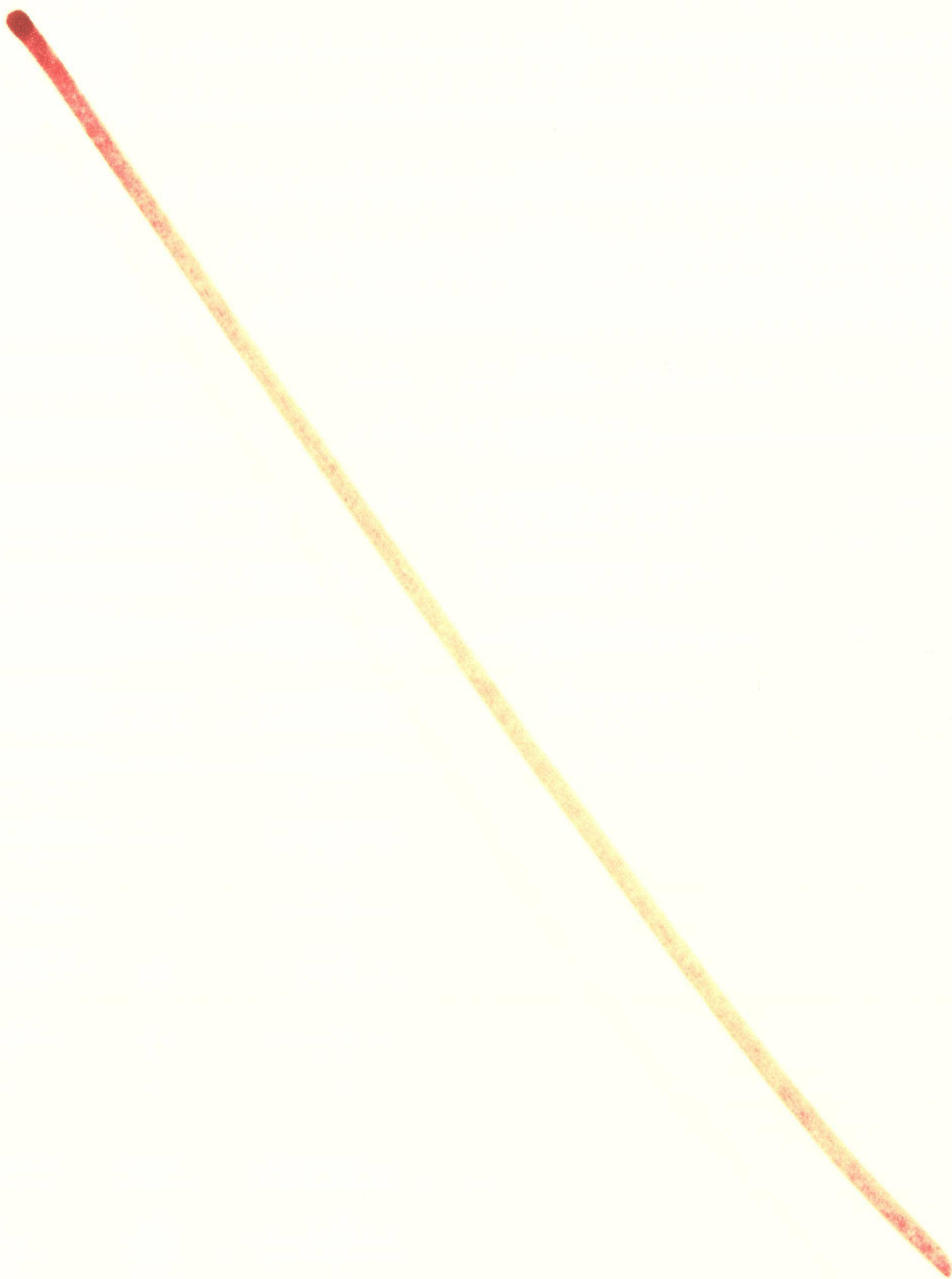
MANUFACTURER'S REQUIREMENTS

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

FILE COPY

040 010 101	SITE SAFETY Provide proper support for excavations. Cover holes and fence off open trenches and banks.
040 010 102	Washed rounds 20-40mm EXCAVATION GUIDELINES Carry out excavation to the guidelines set by the Occupational Safety and Health Service (OSH) publication: "Approved Code of Practice for Safety in Excavation and Shafts for Foundations".
040 010 103	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.
040 010 104	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.
040 010 105	SURFACE PREPARATION Conforming with NZS 3604:2011, section 3.5, remove all turf, vegetation, trees, topsoil, stumps and rubbish from the area being built on.
040 010 106	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 territorial authority approval.
040 010 107	GENERAL EXCAVATION Trim ground to required profiles, batters, falls and levels. Remove loose material. Protect cut faces from collapse. Keep excavations free from water.
040 010 109	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.
040 010 110	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.
040 010 111	GRANULAR BASE FOR SLABS To NZS 3604:2011, section 7.5.3.
040 010 112	GENERAL BACKFILLING Compact backfilling in 150 mm layers, with the last 200 mm in clean topsoil, lightly compacted and neatly finished off.
040 090	
060 090	
070 010 100	.....FOUNDATIONS EXECUTION GENERALLY Comply with NZS 3604:2011 except as varied by 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).
070 010 107	REINFORCEMENT All reinforcement and welded reinforcing mesh shall comply with AS/NZS 4671. Mild drawn steel tying wire not less than 1.2 mm diameter.
070 010 113	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.
070 010 114	CONCRETE 20MPa. Ready-mix ordinary grade, maximum aggregate size 19 mm.
070 010 115	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.
070 010 116	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.
070 010 117	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, table 3.1.
070 010 118	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 3.6.
070 010 119	LAPPED SPLICES Set length of laps, where not dimensioned on the drawings, in accordance with NZS 3109, clause 3.7. Increase laps of plain round steel by 100%.
070 010 120	

SUPERSEDED**19 SEP 2012****FILE COPY**
1215 b 2



060 010 106

EXCAVATION GENERALLY

Horncastle Homes Specification Printed 17/09/12

Carry out drainage work to G13/AS2 (foul water) and E1/AS1 (stormwater)

060 010 107

LAY FOUL WATER DRAINS

Lay drains in straight runs to correct gradients, to discharge into the network utility operators sewer. Set inspection fittings on a concrete base.

060 010 108

INSTALL GULLY TRAPS

Set on concrete 25 mm above surrounding paving or 100mm above unpaved ground and brought up to protect the top of the fitting. Trowel off.

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 the network utility operator's stormwater system.

060 010 109

060 010 111

FIELD TEST

Field test drains for watertightness to the satisfaction of the territorial authority inspector.

060 010 112

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.

060 010 113

AS-BUILT DRAWINGS

Supply a 1:100 as-built drawing to the territorial authority and the owner on completion.

060 090

070 010 100

070 010 107

.....FOUNDATIONS.....

EXECUTION GENERALLY

Comply with NZS 3604:2011 except as varied by 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).

070 010 113

REINFORCEMENT

All reinforcement and welded reinforcing mesh shall comply with AS/NZS 4671. Mild drawn steel tying wire not less than 1.2 mm diameter.

070 010 114

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.

070 010 115

CONCRETE

20MPa. Ready-mix ordinary grade, maximum aggregate size 19 mm.

070 010 116

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.

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.

070 010 117

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, table 3.1.

070 010 118

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 3.6.

070 010 119

LAPPED SPLICES

Set length of laps, where not dimensioned on the drawings, in accordance with NZS 3109, clause 3.7.

070 010 120

Increase laps of plain round steel by 100%.

COVER

Minimum cover to reinforcing as shown on the drawings and to NZS 3109, clause 3.8. Fix chairs for top reinforcement in slabs at 1.0 metre centres. Cover tolerances to NZS 3109, clause 3.9.

070 010 121

070 010 122

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.

070 010 123

DAMPPROOF MEMBRANE

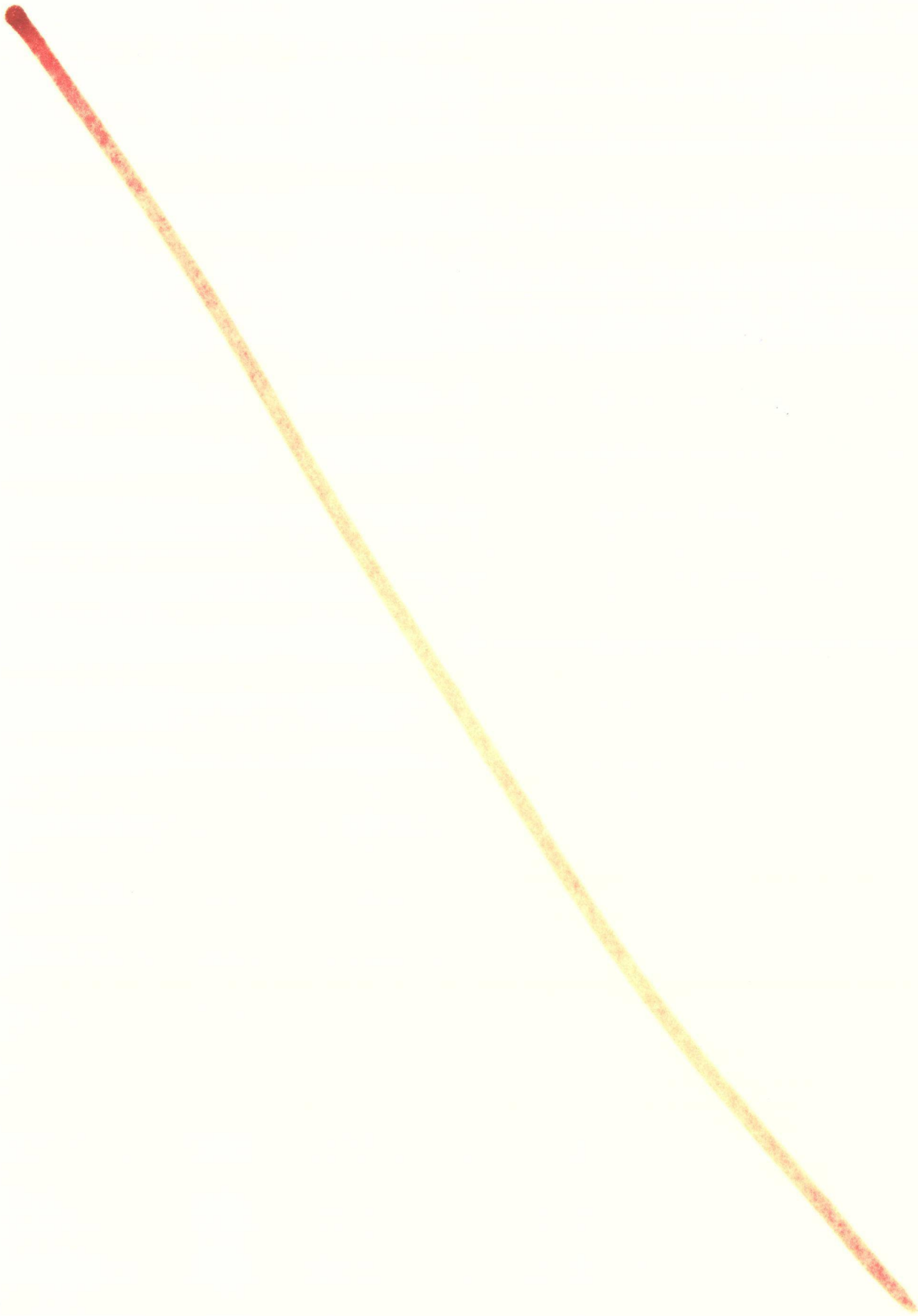
Apply membrane to prepared basecourse with 150 mm laps between sheets. Tape seal laps and penetrations with 50 mm wide pressure sensitive plastic tape. Refer to drawings for perimeter details. Polythene, Black 250 micron

070 010 124

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.

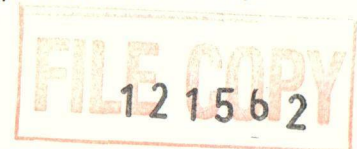
070 010 121	COVER Minimum cover to reinforcing as shown on the drawings and to NZS 3109, clause 3.8. Fix chairs for top reinforcement in slabs at 1.0 metre centres. Cover tolerances to NZS 3109, clause 3.9.
070 010 122	SURFACE FINISHES To comply with NZS 3114, section 105, or as denoted on the drawings. 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.
070 010 123	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. Polythene, Black 250 micron
070 010 124	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.
070 010 125	CONSTRUCT FLOOR SLABS Construct in accordance with NZS 3604:2011, section 7.5. 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 3109.
070 010 126	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 1:1.5. 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: 1/3rd slab depth, or 30 mm minimum.
070 010 127	SURFACE REPAIRS Make good surface defects as soon as forms are stripped. Make good hollows or bony areas with 1:2 mortar, finished to the same tolerances as the parent concrete. Fill tie rod holes with 1:2 mortar.
070 010 128	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.
070 010 129	STRIKE FORMWORK Strike formwork without damaging or overloading structure.
070 010 130	CLEAN OUT Clean out saw cuts. Fill with cement grout where the floor will be covered with carpet or vinyl.
070 010 131	VIBRATION - All concrete shall be thoroughly vibrated when placed with a mechanical vibrator
070 090	
080 010 100	.....FRAMING & TRUSSES.....
080 010 101	TIMBER FRAMING GENERALLY Species, grade and level of treatment as selected and as set out in NZS 3602:2003. Grading to NZS 3631 and treated to NZS 3640. Mechanical stress grading acceptable as an alternative to visual grading.
	TIMBER FRAMING DRY, CHEMICAL FREE, MECHANICALLY STRESS GRADED Species, grade and moisture content in service as selected and as set out in NZS 3602:2003. Machine stress graded to AS/NZS 1748, with an average moisture content at supply of 16% or less.
080 010 102	TIMBER FRAMING DRY, TREATED Species, grade and moisture content in service as selected and as set out in NZS 3602:2003. Please refer to the timber treatment schedule on the drawings for treatment levels for this Job. Treated level to comply with NZS 3640, with an average moisture content at supply of 16% or less. Either mechanically stress graded to AS/NZS 1748, or visual grading to NZS 3631.
080 010 103	FINISHING TIMBER
080 010 105	As selected.
080 010 106	INSULATION
	As selected.
080 010 107	ACCESSORIES Building wrap: Breather type, waterproof. Damp proof course: 2-ply/3-ply kraft felt strip saturated and coated with bitumen. Nails, bolts and screws: Steel, stainless steel, galvanised steel of pattern to suit the location and to BRANZ Bulletin 519 "Fasteners selection". To NZS 3604:2011, section 4 for durability. Nail plates connectors: Stainless steel and/or galvanised steel toothed or nailed plates to the plate manufacturer's design for the particular locations as shown on the drawings and to NZS 3604:2011, section 4 for durability. Galvanised steel and stainless steel connectors and brackets to the connector manufacturer's design for locations shown on drawings and to NZS 3604:2011, section 4 for durability.
080 010 108	ATTENDANCE Provide and fix blocks, nogs, openings and other items as required by others.



080 010 109	MOISTURE CONTENT Maximum allowable moisture content in accordance with NZS 3602:2003 for framing supporting interior linings: <ul style="list-style-type: none"> - Framing at erection 24% - Framing at enclosure 20% - Framing at lining 16%
080 010 110	EXECUTION GENERALLY To NZS 3604:2011 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 3604:2011 and as required to support sheet linings and claddings.
080 010 112	INSTALL WALL AND ROOF FRAMING Frame walls to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604:2011, section 8. Frame roof to required loading and bracing complete with valley boards, ridge boards and purlins. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604:2011, section 9 and 10.
080 010 113	INSTALL BATTENS Fabricate and fasten wall battens to suit the selected wall cladding or lining. Fasten ceiling battens in accordance with NZS 3604:2011, section 13.
080 010 115	INSTALL INSULATION Fit insulation as detailed, to the insulation manufacturer's requirements, and to the requirements of BRANZ Bulletin 494 "Thermal insulation of new houses".
080 090	
090 010 100	.....ROOFING
090 010 101	QUALIFICATIONS Use experienced, competent roofers familiar with the materials and techniques specified.
090 010 102	WIND AND EARTHQUAKE LOADINGS Use fixings and methods capable of sustaining the loads appropriate to the area as set out in NZS 3604:2011, section 5 and confirmed under COMPLIANCE INFORMATION.
090 010 103	PROFILED METAL Profile, metal and finish as selected. Accessories, cappings, flashings and fixings to match and to the roofing manufacturer's requirements.
090 010 106	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 3604:2011, section 4: Durability. Flashings: As selected.
090 010 108	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.
090 010 109	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.
090 010 110	LAY ROOF UNDERLAY Lay and fix to NZBC acceptable solution E2/AS1
090 010 111	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.
090 010 112	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 and Cladding Manufacturers' Association Inc. publication "Profiled metal roofing design and installation handbook".
090 010 117	FIXINGS AND SEALANTS Refer to the roofing manufacturer's literature for fixing details and to NZS 3604:2011 for fixings durability requirements. Select and use sealants only as recommended by the roofing manufacturer.
090 010 118	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 acceptable solution E2/AS1, 4.0.
090 010 119	PENETRATIONS Flash and overflash penetrations through the roof. Fit proprietary boots to pipework penetrations.
090 010 120	COMPLETE Ensure the work is complete with flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.
090 010 121	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.
090 090	
091 010 100	.....RAINWATER SYSTEM

091 010 101	ALUMINIUM/ZINC ALLOY COATED STEEL SPOUTING Profile, jointing, brackets and fittings brand-matched and complete to the spouting manufacturer's specifications.
091 010 102	UPVC DOWNPIPES Tubes, stand-off brackets and fittings brand matched and complete to the manufacturers specifications.
	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 design requirements of BRANZ Bulletin 467 "Principles of flashing design".
091 010 104	ELECTROLYTIC ACTION Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.
091 010 105	LIAISON Ensure liaison with associated installations to ensure material selections are compatible and required flashing work is completed.
091 010 106	ENSURE Ensure rainwater services are operational, flashings complete and the building weathertight.
091 010 107	
091 090	
100 010 100	.....ALUMINIUM JOINERY.....
100 010 101	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 NZS 4211 and the listed project site data. Fabrication by a member of the Window Association of New Zealand.
100 010 102	WINDOWS AND DOORS Brand, finish and type as selected.
100 010 103	WINDOW AND DOOR REVEALS As selected.
100 010 104	GLASS As selected, with glass details to 45 GLAZING and complying with NZS 4223.
100 010 105	FLASHINGS As selected.
100 010 106	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.
100 010 107	HARDWARE As selected.
100 010 108	SEALANT, GLAZING TAPE AND GASKETS To the window manufacturer's requirements.
100 010 109	FIXINGS Ensure fixings and bracketing are compatible with aluminium. Do not use electroplated zinc fasteners or brass fastenings.
100 010 110	CONFIRM OPENINGS Obtain confirmation of all framing openings on site for dimension, plumb and straightness prior to fabrication or ordering of timber joinery.
100 010 111	EXECUTION GENERALLY In accordance with the requirements of NZS 4211 and the Window Association of New Zealand's "Aluminium Window Handbook" and "Installation code for aluminium joinery products".
100 010 112	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.
100 010 113	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.
100 010 114	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.
100 010 115	DRAINAGE Anti-condensation channels to sills. All sills to sashes and fixed lights to incorporate positive drainage to the exterior.
100 010 116	GLAZING INSTALLATION All glass held in aluminium beads and black PVC gaskets.
100 010 117	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 acceptable solution F2/AS1.
100 010 118	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 flashings to match window finish.

100 010 119	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.
100 010 120	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.
100 010 121	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.
100 090	
120 090	
150 010 100	.....PLUMBING.....
150 010 101	QUALIFICATIONS Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 2006.
150 010 102	POLYBUTYLENE WATER PIPE Polybutylene tubing complete with fittings and accessories brand-matched.
150 010 103	INSULATION FOR HOT WATER PIPES As selected.
150 010 104	EXPOSED PIPES As selected and to the following details: - chrome plated copper pipe with chrome plated brass nuts and fittings - white polyethylene composite pipe with white nuts and accessories - pipework finish to include escutcheon plates and bends and elbows protruding from walls or fittings.
150 010 105	ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE Ceramic-coated steel thermal storage cylinder, insulated and complete with fittings required for installation by the manufacturer.
150 010 108	VALVES, TAPS AND FAUCETS As selected.
150 010 109	ELECTROLYTIC ACTION Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.
150 010 110	EXECUTION GENERALLY Generally carry out the whole of this work and tests to NZBC acceptable solution G12/AS1.
150 010 111	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 acceptable solution G12/AS1. Conceal pipework and pressure test before wall linings are fixed.
	OUTLET LOCATIONS Ensure wall outlets for exposed pipes are level and centred on the fixture to ensure the neat installation of exposed pipework.
150 010 112	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. Where hair felt is used, wrap around pipes in two layers in opposite directions and secure with galvanised steel wire ties.
150 010 113	
150 010 114	INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC acceptable solution G12/AS1, 6.11.
	PENETRATIONS Provide and fit collars and escutcheon plates to match pipework at penetrations through constructions.
150 010 115	
	INSTALL TAPS AND FAUCETS Install taps and faucets in accordance with the tap manufacturer's requirements. Flush out on completion.
150 010 116	Check that washers or ceramic discs are operating correctly.
	COMPLETION Pressure test to ensure no leakage and leave in proper working order. Clean tapware and fittings.
150 010 117	UPVC WASTE, SOIL AND VENT PIPES UPVC pipe, complete with fittings brand-matched to the pipe manufacturer's requirements.
150 010 118	SANITARY FIXTURES As selected.
150 010 119	SANITARY ACCESSORIES As selected.
150 010 120	EXECUTION GENERALLY Carry out this work and complete all tests to G12/G13 (NZBC).
150 010 121	INSTALL SANITARY FIXTURES Fit and install sanitary fixtures 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.
150 010 122	



- 150 010 123 **INSTALL TRAPS, WASTE AND VENT PIPES**
Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to G12/G13 (NZBC). 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.
- 150 010 124 **TEST**
Test soil and waste disposal systems to ensure no leakage exists and leave in working order.
- 150 010 125 **ENSURE**
Ensure all sanitary plumbing fittings and pipework are complete and operational.
- 150 090
160 010 100**TILING**.....
160 010 101 **QUALIFICATIONS**
Use tilers experienced with the materials and techniques specified.
- 160 010 102 **ADHESIVES COMPATIBILITY**
On proprietary substrates or waterproof membranes use only adhesives with documented compatibility approval from the respective manufacturers.
- 160 010 103 **SLIP RESISTANCE**
Slip resistance to comply with NZBC acceptable solution D1/AS1, clause 2.1.
- 160 010 104 **TILES**
As selected.
- 160 010 105 **ACCESSORIES**
Underlays, waterproofing membranes: As selected.
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 Tiling Practice", section 8.0.
- 160 010 106 **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.
- 160 010 107 **SUBSTRATE**
Ensure all services and accessories are in place, located to suit the tile layout, with the substrate required for tiling work.
- 160 010 108 **TEMPERATURE**
Do not carry out tiling where the ambient temperature is below 5 degrees C, or onto a substrate with a temperature higher than 40 degrees C.
- 160 010 109 **LAYOUT**
Obtain confirmation of the proposed layout of tiles, expansion joints and other visual considerations.
- 160 010 110 **EXECUTION GENERALLY**
Prepare surfaces and carry out the tiling work in accordance with BRANZ "Good Tiling Practice".
- 160 010 111 **SURFACE PREPARATION**
To BRANZ "Good Tiling Practice", section 3.0.
- 160 010 112 **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.
- 160 010 113 **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.
- 160 010 114 **MOVEMENT CONTROL JOINTS**
Minimum width of 6 mm, carried through tile and bedding. Where substantial movement is anticipated, carry through the rigid sheet to the structure. Ensure joints are clean, formed, filled, and the sealant inserted to the sealant manufacturer's requirements.
- 160 010 114
160 090
170 010 100**ELECTRICAL**.....
COMPLY
Comply with the Electricity Regulations 1997, AS/NZS 3000:2007 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.
- 170 010 101 **QUALIFICATIONS**
Carry out work by or under the direct supervision of a holder of a practising certificate under the Electricity Regulations 1997.
- 170 010 103 **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.
- 170 010 104 **DISTRIBUTION BOARD / SUB BOARD**
Proprietary manufactured, zinc plated powder coated, or heavy duty plastic, fire resistant enclosed construction, complete with neutral and earth busbars, MCB'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 is maintained.

- 170 010 105 **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 mm² on 16 amp MCBs.
Power circuits (domestic): 1.5 mm² on 16 amp MCBs.
Power circuits (domestic
- insulated construction): 2.5 mm² on 16 amp MCBs.
- 170 010 106 **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.
Shaver/earth leakage
protected socket outlets: Earth leakage protected 110/230 volt multiple plug configuration and residual current protected socket outlets, tripping at 30 mA.
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.
- 170 010 107 **LIGHT FITTINGS**
As selected.
- 170 010 108 **ELECTRIC-POWERED FITTINGS AND EQUIPMENT**
As selected.
- 170 010 109 **CABLING**
Install with a maximum of 8 light outlet units or 4 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.
- 170 010 110 **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.
- 170 010 111 **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.
- 170 010 112 **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.
- 170 010 114 **WIRE FOR PLUMBING FITTINGS**
Wire for fittings to the Electricity Regulations 1997 and to the fitting manufacturer's requirements.
- 170 010 115 **INSTALL SMOKE DETECTORS**
Install detectors to the detector manufacturer's requirements, fitted neatly and without damage to the surrounding finish.
- 170 010 116 **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.
- 170 010 117 **COMPLETION**
Leave all fittings, lamps and tubes operational, with equipment and diffusers clean.
- 170 090
- 200 010 100BRICKWORK.....
QUALIFICATIONS
Carry out brickwork with persons competent and experienced in the trade.
- 200 010 101 **BRICKS**
As selected.
- 200 010 103 **ACCESSORIES**
Lintels: To NZBC E2 table 18E and B2 table 1 for durability.
Vermin stop: Galvanised steel wire netting strip with reinforced edges and galvanised 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: Pressed mild steel, galvanised after fabrication, or as required by NZBC E2 table 18C. Design to conform with AS/NZS 2699.1, as modified by NZBC acceptable solution B1/AS1.
Sand for mortar: Sand to comply with NZS 3103. Chloride levels to not exceed 0.04% by dry weight of sand.
Water: From local authority supply.

200 010 104	<p>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.</p> <p>STORAGE Store bricks and other materials clear of the ground, under cover and well ventilated until placed in the work.</p>
200 010 106	
200 010 107	<p>VENEER WORK GENERALLY Comply with NZBC E2 AS1, NZS 4210, section 2.9 and "Good Practice Guide - Masonry veneer". Where not otherwise detailed on the drawings or covered in the documents listed, carry out veneer construction to the details required by "Good Practice Guide - Masonry veneer".</p>
200 010 108	<p>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.</p>
200 010 109	<p>BOND Stretcher bond, single width unless detailed or stated otherwise.</p>
200 010 110	<p>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 acceptable solution B1/AS1.</p>
200 010 111	<p>MORTARING To maximum practical density. Mortar fully laid, firmly placed, correctly cured and not re-tempered. Discard any mortar not used within 1-1/2 hours of mixing. Joint thickness 10 mm plus or minus 2 mm.</p>
200 010 112	<p>RAKE OUT Rake out joints as work proceeds, for pointing as detailed. Maximum depth of rake 6 mm.</p>
200 010 113	<p>POINTING Joints tooled concave after initial stiffening.</p>
200 010 114	<p>WEEPHOLES Rake out every third perpend where weep holes are required, and vent veneer as per NZBC E2 clause 9.2.6 parts c,d, and e and to "Good Practice Guide - Masonry veneer".</p>
200 010 115	<p>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.</p>
200 010 116	<p>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.</p>
200 010 117	<p>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.</p>
200 010 118	<p>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.</p>
200 090	
210 010 100	<p>.....EXTERNAL CLADDING.....</p> <p>PLYWOOD BRACING Structural plywood to AS/NZS 2269. Bracing unit ratings for an extended range of plywood wall bracing systems have been derived from tests according to clauses 6.9.1.1 and 6.9.3.1 of N.Z.S. 3604 for walls. Structural plywood is the only sheet brace material with properties defined in a published New Zealand engineering design code, N.Z.S. 3603, "Timber Structures", and so can be designed in compliance with verification method B1/VM1 under clause 6.0. Structural plywood is manufactured under a third-party-audited, product quality control programme to joint Australian/New Zealand Standard AS/NZS 2269 "Plywood – Structural".</p>
210 010 101	
210 010 102	<p>TIMBER WEATHERBOARD As selected, or radiata pine to NZS 3631 for grading, NZS 3602:2003 for selection and NZS 3640 for treatment.</p>
210 010 103	<p>FIBRE CEMENT SHEET CLADDING Cellulose cement autoclaved sheets.</p>
210 010 104	<p>FIBRE CEMENT SOFFIT LINING Cellulose cement autoclaved sheets.</p>
210 010 106	<p>EXTERIOR FINISHING TIMBER As selected.</p>
210 010 107	<p>ACCESSORIES As selected and to the following details: Building wrap: Breather type, waterproof. PVC jointers: To suit sheet thickness. Nails, screws, fastenings: Metal, size and pattern, to cladding manufacturer's requirements and complying with the relevant aspects of NZS 3604:2011, section 4: Durability.</p>
210 010 108	<p>METAL FLASHINGS As selected.</p>

	MOISTURE CONTENT
210 010 109	Maximum allowable moisture content in accordance with NZS 3602:2003.
210 010 110	EXECUTION GENERALLY To NZS 3604:2011 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).
	INSTALL WALL WRAP
210 010 111	Fix wall wrap as detailed and to the cladding manufacturer's requirements.
	INSTALL PLYWOOD
210 010 112	Install to the plywood manufacturer's requirements. Refer to the plywood manufacturer's literature for fixing details, NZS 3604:2011 for fixings durability requirements and to BRANZ Bulletin 407 "Walls on exposed sites" for specific provisions.
	PRIME OR SEAL
210 010 113	Prime (for opaque finish) or seal (for clear finish) front and back faces, edges and end grain (minimum 2 coats) before fixing weatherboards and exterior trim.
	INSTALL TIMBER WEATHERBOARDS
210 010 114	Install level, true to line and face, to NZBC acceptable solution E2/AS1, 9.4. Refer to NZS 3604:2011 for fixings durability requirements and to BRANZ Bulletin 407 "Walls on exposed sites" for specific provisions.
210 010 115	INSTALL FIBRE CEMENT SHEET CLADDING
	Install to detail and to the cladding manufacturer's requirements. Refer to the cladding manufacturer's literature for fixing details, NZS 3604:2011 for fixings durability requirements and to BRANZ Bulletin 407 "Walls on exposed sites" for specific provisions.
210 010 116	INSTALL FIBRE CEMENT SOFFITS
	Cut sheets dry and scribe fit to fully support all edges and joints. Nail and drill for and insert fasteners to the sheet manufacturer's requirements. Fit complete with jointers and capping moulds. Refer to the cladding manufacturer's literature for fixing details, NZS 3604:2011 for fixings durability requirements and to BRANZ Bulletin 407 "Walls on exposed sites" and Bulletin 408 "Roofs on exposed sites" for specific provisions.
210 010 118	INSTALL FLASHINGS
	Install flashings, covers and soakers as detailed on the drawings and to BRANZ Bulletins 467 "Principles of flashing design" and 465 "Domestic flashing installation".
210 010 119	USE OF SEALANTS
	Selection and use of sealants to follow BRANZ Bulletin 441 "Sealed joints in external claddings - 2. Sealants".
210 010 124	COMPLETE
	Complete all flashings, finishings and trim so the cladding system is completely weathertight.
210 090	
230 090	
240 010 100	.....LINEA WEATHERBOARD.....
240 010 101	180mm James Hardie Linea Weatherboard - See James Hardie Specification for further details
240 090	
280 010 100	.....PLASTERBOARD LININGS.....
280 010 101	FRAMING MOISTURE CONTENT
	Maximum allowable moisture content in accordance with NZS 3602:2003.
280 010 102	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.
280 010 103	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.
280 010 104	PLASTERBOARD ACCESSORIES
	External angles: Slim type 0.5 mm galvanised steel. Casing bead: Slim type 0.5 mm galvanised steel or PVC. Cornice: Plasterboard scotia type. Nails: Galvanised clouts 40 mm x 2.5 mm. Screws: 40 mm x 6 gauge zinc electro-plated bugle head gypsum drywall screws Jointing compound and paper tape: To the board manufacturer's requirements. Adhesive: Multi-purpose water based wallboard adhesive.
280 010 106	NAILS
	Zinc-plated steel, stainless steel and galvanised steel of pattern to suit location and to BRANZ Bulletin 519 "Fasteners selection".
	INTERIOR FINISHING TRIM
280 010 107	Timber selection to NZS 3602:2003. Profile as detailed, or to match existing. Jointer profiles to suit location.
	SUBSTRATE
280 010 108	To NZS 3604:2011, sections 8, 10, 12, 13 and the standard required by the lining manufacturer's requirements. Ensure moisture content of timber framing is at or below specified levels.

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: 2007.

280 010 109

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.

280 010 110

SPECIAL PLASTERBOARD LININGS

Line wet area 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 with NZS 3604:2011, sections 5.8 and 13.5. Form sound rated panels following the sheet manufacturer's specifications and details for the required sound rating. Form fire rated panels following the sheet manufacturer's specifications and details for the required fire rating.

280 010 111

FIX PLASTERBOARD EXTERNAL ANGLES

280 010 112

Fix full length to external corners, with clouts at 100 mm each side staggered.

280 010 114

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.

280 010 115

LEVELS OF FINISH

Provide levels of finish to standards laid down by AS/NZS 2589: 2007. as follows:

Level 4: surfaces receiving light texture or wall covering finishes

Level 5: surfaces receiving thin coating finishes.

280 010 116

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.

280 090

290 010 100

.....GLAZING.....

290 010 101

MIRRORS, ADHESIVE FIXED

Fix with adhesive mirror-mastic and double-sided adhesive tape. Adhesive mastic area 0.25 square metres per 1 square metre of mirror.

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.

290 010 102

CLEAN

Clean off or remove indicators at completion of the building. Clean glass inside and out to a shining finish.

290 010 103

290 090

300 010 100

.....PAINTING & PAPERHANGING.....**QUALIFICATIONS**

300 010 101

Carry out work using competent and experienced painters and paperhangers.

300 010 102

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 BRANZ Bulletin 314 "Removing paint coatings from houses" for the required procedures and precautions when treating or removing lead based paint, burning or sanding off paint, or using solvent based paint removers.

300 010 103

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.

300 010 104

GAP FILLERS

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

300 010 105

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.

PROTECT

300 010 106

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

300 010 107

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.

300 010 108

PRIMING AND SEALING

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

300 010 109	ENVIRONMENTAL CONDITIONS Carry out work within acceptable temperature and humidity limits, with timber dry, all to the requirements of the paint manufacturer.
300 010 110	SELECTIONS Confirm all selections, colours and finishes for both paint and wallpaper with the owner.
300 010 111	SHARP EDGES, CRACKS AND HOLES Repair as required by the paint manufacturer.
300 010 112	PREPARE SURFACES Prepare surfaces as required by the paint manufacturer. Make good all damage and defects. 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.
300 010 113	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.
300 010 114	SCUFF BETWEEN COATS Scuff between all coats to remove any dust pick-up, protruding fibres and coarse particles.
300 010 115	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.
300 010 116	CLEAN Clean adjoining surfaces, glass and fittings of any paint contamination.
300 010 119	REPLACE Replace hardware without damage to the hardware or the adjoining surfaces.
300 090	.....FITTINGS / JOINERY.....
350 010 100	MEDIUM DENSITY FIBRE BOARD Urea-formaldehyde resin bonded wood fibre sheet. Printed finish: a dry stamping foil of polyester film with barrier and adhesive layers impregnated with a decorated photogravure print. Melamine veneer: veneered both sides with melamine sheet. Wood veneer: veneered with selected wood veneer.
350 010 103	BENCHTOPS Construction as detailed on the drawings. Finish to be a material (ie high pressure laminate) in accordance with G3/AS1 (1.1)
350 010 104	HARDWARE Carcase connectors: One-piece steel, straight deep-cut thread, fibre board screws with press fit plastic trim cap. Carcase fasteners: Knock down type centric sphere zinc alloy connectors with connecting bolts, sleeves and dowels, to suit each particular fastening location. Hinges: Butt, broad butt, flush butt or overlay, steel, zinc-plated steel, stainless steel, or brass, to suit the location, or as detailed. Concealed hinges: All-metal zinc alloy, automatic spring and screw-fixed. Plastic button stops. Drawer runners: Groove mounting type, precision running ball-mounted single-stage extension, bright steel finish system.
350 010 105	GLUES AND ADHESIVES As approved by the manufacturer for the timber, timber product, or pre-finished timber product joint.
350 010 106	EXECUTION GENERALLY To include those methods, practices and processes contained in the current syllabus for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).
350 010 107	TRANSIT AND DELIVERY Load, transport and unload fittings without distortion or damage and keep covered to protect from the weather. Do not deliver fittings until floor, wall and ceiling surfaces are in place and the fittings can be placed in their final location.
350 010 108	FABRICATION QUALITY Check site dimensions. Carry out machining within the practices required for the particular timber or wood product being used. Machine drill and cut holes and recesses and form joints to the componentry manufacturer's requirements. Work accurate, square and true to line and face.
350 010 109	FABRICATE JOINERY FITTINGS Carry out jointing, dowelling and other operations necessary for the proper assembly of the fittings as detailed, with fixings concealed unless otherwise detailed. Use glue joints where provision for shrinkage is not required, with contact surfaces, glueing and pressure all applied to the glue manufacturer's requirements. Locate and drive connectors and fasteners to the bolt manufacturer's requirements. Scribe fit adjustable shelves with 4 shelf pins and locate force fit pin holes at 50 mm maximum centres in solid cheeks. Hang doors on concealed hinges.
350 010 110	FABRICATE DRAWERS Construct drawers as detailed, using proprietary metal section drawer runners. Fit drawers with 3 mm clearance into the drawer space.
350 010 111	INSTALL JOINERY FITTINGS Scribe fit on site and install level, square, plumb and true to line and face.
350 010 112	.....REFERENCES.....
350 090	
990 010 100	

990 010 101	Documents listed below are, when referred to in the text, part of this specification. However, this specification takes precedence in the event of it being at variance with and requiring a higher standard than any cited document.
990 010 102	Acts and Regulations
990 010 104	Health and Safety in Employment Act 1992 Electricity Regulations 1997
990 010 105	Plumbers, Gasfitters and Drainlayers Act 2006 New Zealand Electrical Codes of Practice (ECP)
990 010 106	New Zealand Building Code acceptable solutions
990 010 107	B1/AS1 Structure - general, F2/AS1 Hazardous building materials - As Applicable
990 010 109	E1/AS1 Surface water, G12/AS1 Water supplies
990 010 110	E2/AS1 External moisture, G13/AS2 Foul Water - drainage
990 010 111	New Zealand Standards
990 010 112	AS/NZS 1748 Mechanically stress-graded timber
990 010 113	AS/NZS 2269 Plywood - Structural
990 010 114	AS/NZS 2589: 2007. Gypsum linings - Application and finishing
990 010 115	2589.1 Gypsum plasterboard
990 010 118	AS/NZS 3000:2007 Electrical Regulations - Buildings, structures and premises
990 010 119	NZS 3103 Sands for mortars and plasters
990 010 120	NZS 3109 Concrete construction
990 010 121	NZS 3114 Concrete surface finishes
990 010 122	AS/NZS 4671: 2001 Steel reinforcing materials
990 010 123	AS/NZS 4671: 2001 Steel reinforcing materials
990 010 124	G12/G13 (NZBC) National plumbing and drainage code
990 010 125	Part 2.2 Sanitary plumbing and drainage - Acceptable solutions
990 010 126	Part 3.2 Stormwater drainage - Acceptable solutions
990 010 127	NZS 3602:2003 Timber and wood-based products for use in building
990 010 128	NZS 3604:2011 Timber framed buildings
990 010 129	NZS 3631 New Zealand national timber grading rules
990 010 130	NZS 3640 Chemical preservation of round and sawn timber.
990 010 132	NZS 4211 Performance of windows
990 010 133	NZS 4223 Glazing in buildings
990 010 134	Part 1: The selection and installation of glass in buildings
990 010 135	Part 3: Human impact safety requirements
990 010 137	NZS 4251 Solid plastering
990 010 138	Part 1: Cement plasters for walls, ceilings and soffits
990 010 141	NZS 6803 Acoustics - Construction noise
990 010 142	Building Research Association of New Zealand
990 010 143	"Good Tiling Practice"
990 010 145	Bulletin 441: Sealed joints in external claddings - 2. Sealants
990 010 146	Bulletin 467 : Principles of flashing design
990 010 147	Bulletin 465: Domestic flashing installation
990 010 148	Bulletin 314: Removing paint coatings from houses
990 010 149	Bulletin 519: Selection and use of fasteners
990 010 150	Bulletin 494 & 496: Thermal insulation of new houses
990 010 152	Bulletin 407: Walls on exposed sites
990 010 153	Department of Labour
990 010 155	OSH Publication: "Approved Code of practice for Safety in Excavation and Shafts for Foundations"
990 010 156	New Zealand Metal Roofing and Cladding Manufacturers' Association Inc
990 010 157	Profiled metal roofing design and installation handbook
990 010 158	Window Association of New Zealand
990 010 159	Aluminium Window Handbook
990 010 160	Specification for powder coatings on architectural aluminium products
990 010 161	Installation code for aluminium joinery products
990 090	

1215b2
FILE COPY



Shiaz Beg
Designer

P O Box 8255, Riccarton, Christchurch 8440, New Zealand.

Ph: **+64 3 348 8905**, Fax: **+64 3 348 8906**

Web: www.horncastle.co.nz

We call Canterbury home



121502

NOTE: This message is confidential and may be legally privileged. If you are not the intended recipient please notify us immediately by return email and then destroy this email. Thank you

FILE COPY 121562

AGREEMENT FOR SALE AND PURCHASE OF REAL ESTATE

This form is approved by the Real Estate Institute of New Zealand Incorporated and by Auckland District Law Society Incorporated.

DATE:

22/3/2012

VENDOR:

Fulton Hogan Land Development Limited

PURCHASER:

Horncastle Homes Limited

PROPERTY

Address: Lot 5 Rosemerryn Subdivision (Stage 2)

Estate:

FEE SIMPLE

LEASEHOLD

CROSSLEASE (FEE SIMPLE)

CROSSLEASE (LEASEHOLD)

STRATUM IN FREEHOLD

STRATUM IN LEASEHOLD

(if none is deleted fee simple)

Legal Description:

Area (more or less):

Lot/Flat/Unit:

DP:

Unique Identifier or CT:

Lot 5 being approximately 634 m2 as shown on the plan attached hereto being part of a subdivision of Lot 200 DP 441834

PAYMENT OF PURCHASE PRICE

Purchase price: \$164,343.00

Deposit (clause 2.0): \$7,145.25

Balance of purchase price to be paid or satisfied as follows:

(1) By payment in cleared funds on the settlement date which is 10 working days after the date of issue of title

OR

(2) In the manner described in the Further Terms of Sale.

Plus GST (if any) OR Inclusive of GST (if any).
If neither is deleted the purchase price includes GST (if any).

GST date (refer clause 13.0): 2 months from the date the Vendor is required to account to the IRD for the GST

Interest rate for late settlement: 14 % p.a.

POSSESSION

Possession date (clause 3.0):

The date at which all necessary earthworks, roading and other development requirements are completed to a standard acceptable to the Vendor and the Vendor at its sole discretion approves the Property for possession

CONDITIONS (clause 9.0)

Finance condition

LIM required:

Yes/No

Lender:

Amount required:

OIA Consent required: Yes/No

Finance date:

Land Act/OIA date:

TENANCIES (if any)

Name of tenant:

Bond:

Rent:

Term:

Right of renewal:

SALE BY:

Private Treaty

Licensed Real Estate Agent

It is agreed that the vendor sells, and the purchaser purchases the property, and the chattels listed in Schedule 4, on the terms set out above and in the General Terms of Sale and any Further Terms of Sale, and the General Terms of Sale set out in the ADLS/REINZ Agreement for Sale and Purchase of Real Estate Eighth Edition 2006(4), as if those General Terms of Sale were set out in full in this Agreement.

FILE COPY
121562



3 May 2012

Unit 8, 357 Madras Street
Christchurch, New Zealand
P.O. Box 13-282
Armagh, Christchurch 8141
New Zealand
Telephone (03) 366-4320
Fax (03) 365-7069
Email eng@lewisandbarrow.co.nz
www.lewisandbarrow.co.nz

Horncastle Homes Limited
PO Box 8255
Riccarton
Christchurch 8440

File No. 20172

Attention: Nathan Veevers

Your Reference: J3631 to J3635

Dear Sir

Re: Geotechnical Report – Shallow Investigation – Lots 51 to 55, Goldney Close, Stage 2 Rosemerryn Subdivision, Lincoln.

1. Introduction

Lewis & Barrow Ltd has carried out a Geotechnical Investigation and prepared this report at the request of Horncastle Homes Limited, to determine the type of foundation required for single storey dwellings to each of the five Lots.

The investigation included the following:

- Confirm the Geology of the sites.
- Five Scala Penetrometer Tests to a max depth of 1.55m.
- Five 50mm diameter hand auger boreholes down to a maximum depth of 2.7m.
- Evaluation of shallow liquefaction potential of this site.

2. Site

This report pertains to five adjacent lots within Stage 2 of the Rosemerryn Subdivision in Lincoln. The lots are predominantly level sites. Lot 51 is approximately 630 m² in area, Lot 52 is approximately 665713m² in area, Lot 53 is approximately 630 m² in area, Lot 54 is approximately 639m² in area and Lot 55 is approximately 706m² in area.

The area of Lots 51 to 55 is currently classified as "Green Zone – Technical Category Not Applicable – Urban Non-residential" by the Canterbury Earthquake Recovery Authority (CERA) indicating no specific CERA agency liquefaction assessment has been undertaken in this area.

A Geotechnical Completion Report issued to the developer by Aurecon N Z Ltd dated 28 February 2012 refers to stage 1A of the Rosemerryn Farm Subdivision and concluded that Lots 25 to 50 have been categorised as Technical Category 2 based on the prescribed deformation limits of the Department of Building Housing (DBH) 'Revised guidance on repairing and rebuilding houses affected by the Canterbury earthquake sequence' document based on site specific geotechnical testing and evaluation. Lots 25 to 50 surround the Lots 51 to 55 being investigated by this report.

This report has been prepared solely for the benefit of our Client with respect to the brief. The reliance by other parties on the information or opinions contained in this report, shall without our prior review and agreement in writing, be at such other parties sole risk.

Geotech Report

Reviewed	
Checked By	

FILE COPY
121562

3. Geology

The GNS publication "Geology of the Christchurch Urban Area" 1992 shows that the site is underlain by the Halkett Member of the Springston formation which comprises grey river alluvium below plains.

Environment Canterbury's Database of wells shows that there are two wells within 400m of these sites.

Well M36/8672 is 190m east south east of the site and shows silts and sandy silts to 6.0m below ground level where the well log is terminated.

Well M36/8678 is 430m north of the sites and shows gravel material commencing at 1.0m below ground level and extending to 5.2m where the log is terminated.

Well M36/0520 is 350m south west of the site and shows clay to 3.7m overlying gravel to 18.3m, clay and sand to 36.6m and shingle to the extent of testing at 40.2m.

4. Results of Site Tests

Attached is a site plan and separate sheets for each penetrometer test/auger hole. The penetrometer tests have been graphed to show the ultimate bearing strength of each depth alongside the soil types.

The site testing showed there to be firm bearing silts at 300mm below ground level with an available Ultimate bearing capacity of 300kPa.

5. Groundwater

An average natural groundwater table depth of 1.7m as measured in onsite testing is shown on the plots of the auger holes. This is similar to what we would expect on this site for this time of the year. Groundwater is usually highest about October and lowest about April each year.

6. Liquefaction

Liquefaction requires 3 conditions:

1. Loose, uniform silts and sands.
2. Groundwater levels causing saturation of the soils.
3. Earthquake induced shaking of sufficient intensity and load cycles.

On this site the silts and sands have been shown to be dense where above the water table level but were shown to be loose approaching the water table depth.

The 23/2/11 Google Earth image of the site shows no indication of surface manifestation of liquefaction silt ejecta to the site or surrounding area from any of the preceding Canterbury earthquake sequence events.

A Geotechnical Completion Report by Aurecon N Z Ltd dated 28 February 2012 refers to stage 1A of the Rosemerry Farm Subdivision and concluded that Lots 25 to 50 have been categorised as Technical Category 2 based on the prescribed deformation limits of the DBH 'Revised guidance on repairing and rebuilding houses affected by the Canterbury earthquake sequence' document based on site specific geotechnical testing and evaluation. Lots 25 to 50 surround the Lots 51 to 55 being investigated by this report.

Due to the above indications a deeper and more extensive geotechnical investigation is not considered warranted for these sites. A system to mitigate for liquefaction related settlements is considered necessary for these five lots.

7. Lateral Spreading

Lateral spreading is the post liquefaction movement of liquefied soils towards a free edge such as a water course or slope.

There were no free edges observed within proximity of the site that would be likely to allow lateral spreading.

8. Foundation Recommendations

The sites surrounding Lots 51 to 55 have been assigned a Technical Category 2 designation by Aurecon NZ Ltd indicating minor to moderate liquefaction related ground damage is possible in future seismic events and a similar designation is considered appropriate for Lots 51 to 55 given the reduced silt density at the groundwater table level.

A surface structure foundation system in accordance with one of options 2, 3 or 4 of the DBH 'Revised guidance on repairing and rebuilding houses affected by the Canterbury earthquake sequence' document are appropriate for the dwellings proposed for Lots 51 to 55. An ultimate bearing capacity of 300kPa is available at 300mm below ground level indicating no specific ground remediation is required for these sites.

9. Seismic Considerations

Peak Ground Acceleration (PGA) reading obtained by GNS for the major events of the Canterbury earthquake sequence to date at the nearest recording devices show that this property would have been subjected to PGA's as follows:

M7.1	4 September 2011	0.91g
M6.3	22 February 2011	0.16g
M6.4	13 June 2011	0.08g
M6.0	23 December 2011	0.09g

Buildings in this area today are designed for P.G.A.'s as follows:

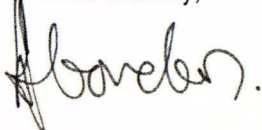
To have no damage	0.11g
To not fail catastrophically	0.34g

A site subsoil classification of D in accordance with AS/NZS 1170.5:2002 is appropriate for seismic design for this site.

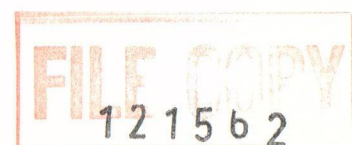
10. Limitations

1. This report has been prepared for the benefit of Horncastle Homes Limited as our client with respect to the brief. The reliance by any other parties on the information or options contained in this report shall, without prior review and agreement in writing, be at such other parties' sole risk.
2. The recommendations and opinions contained in this report are based on the information gained. The nature and continuity of subsoil conditions away from the test locations are inferred and it must be appreciated that actual conditions could vary from the assumed model.
3. If any fill, or soils other than those noted in the above report are encountered in the excavations then the author of this report must be consulted for further advice as the foundation design may need to be modified.

Yours faithfully,



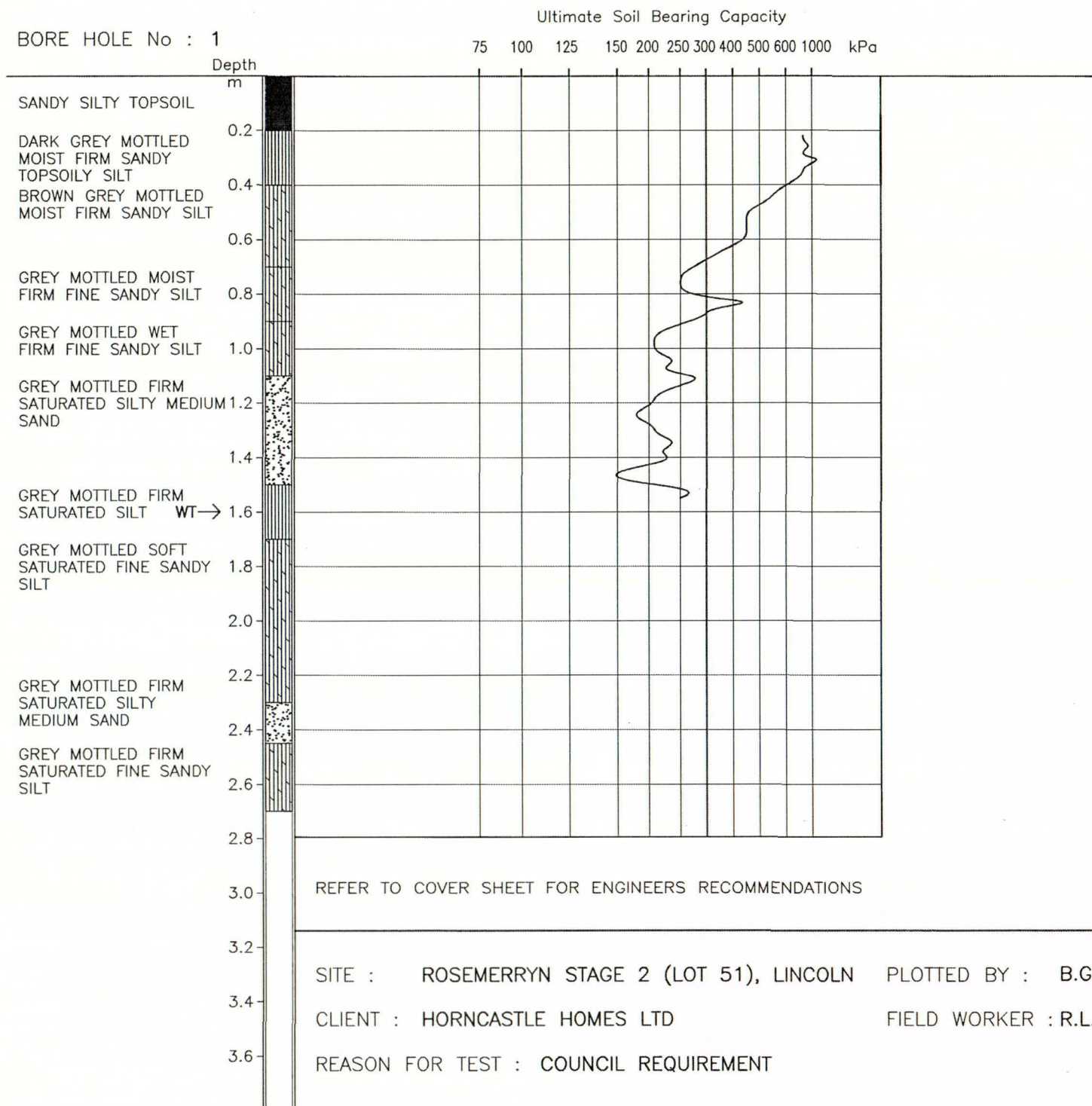
Chris Gordon
Engineer
BE MIPENZ CPEng IntPE(NZ)





SOIL PROFILE AND SCALA PENETROMETER RESULTS

SHEET 01 OF 6



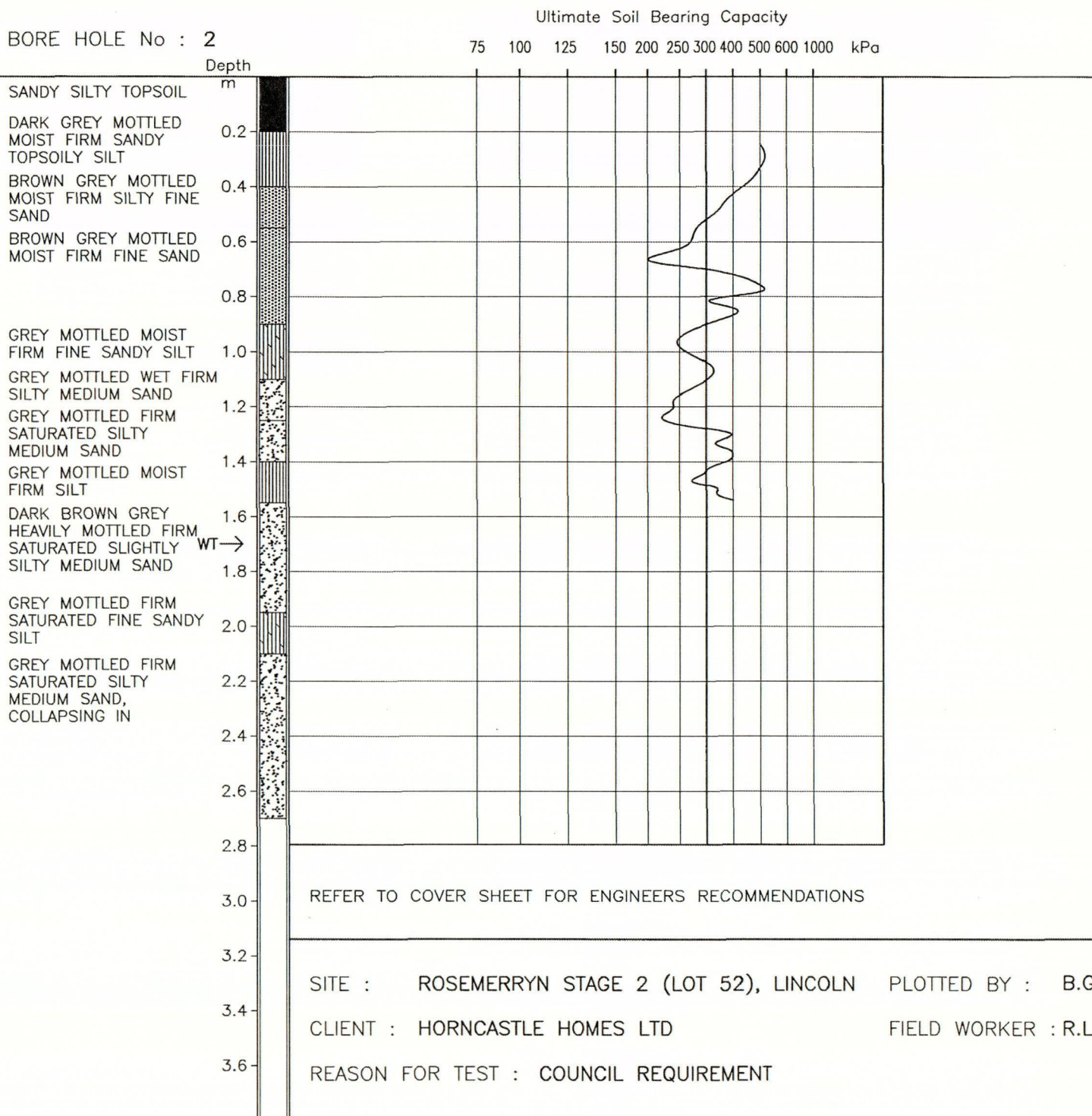
This report (letter, soil test result sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review.

If any fill or soils other than those noted in the above report are found at the bottom of the excavations, the Engineer shall be notified to inspect and issue further details. This report has been prepared solely for the benefit of our Client. No liability is accepted by this firm or by any Principal, or Director, or any servant or agent of this firm, in respect of its use by any other person, and any other person who relies upon any matter contained in this report does so entirely at their own risk. This disclaimer shall apply notwithstanding that the report may be made available to any person in connection with any application for permission or approval, or pursuant to any requirement of law.



SOIL PROFILE AND SCALA PENETROMETER RESULTS

SHEET 02 OF 6



This report (letter, soil test result sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review.

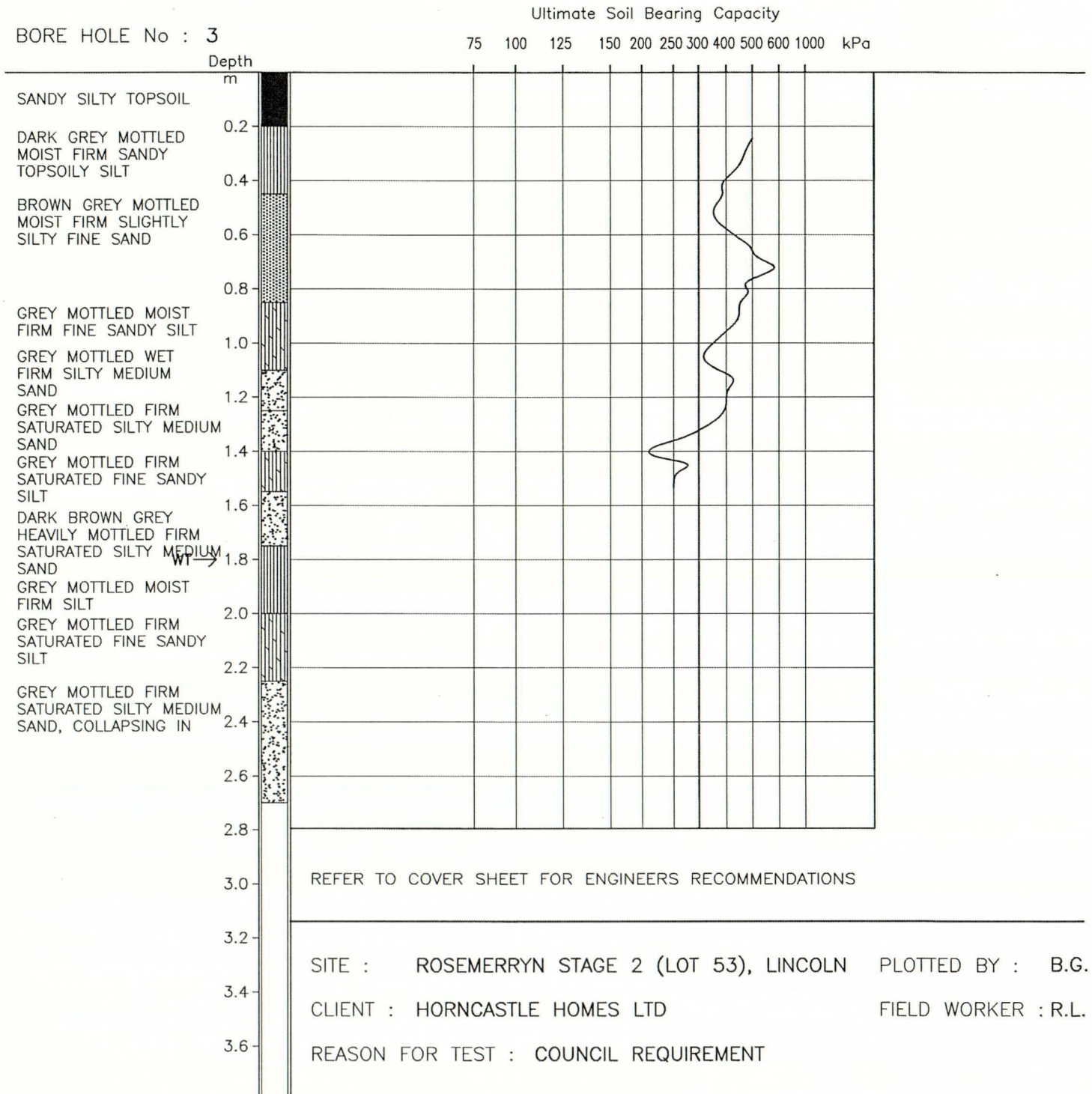
If any fill or soils other than those noted in the above report are found at the bottom of the excavations, the Engineer shall be notified to inspect and issue further details. This report has been prepared solely for the benefit of our Client. No liability is accepted by this firm or by any Principal, or Director, or any servant or agent of this firm, in respect of its use by any other person, and any other person who relies upon any matter contained in this report does so entirely at their own risk. This disclaimer shall apply notwithstanding that the report may be made available to any person in connection with any application for permission or approval, or pursuant to any requirement of law.

FILE COPY 1215b2



SOIL PROFILE AND SCALA PENETROMETER RESULTS

SHEET **03** OF 6



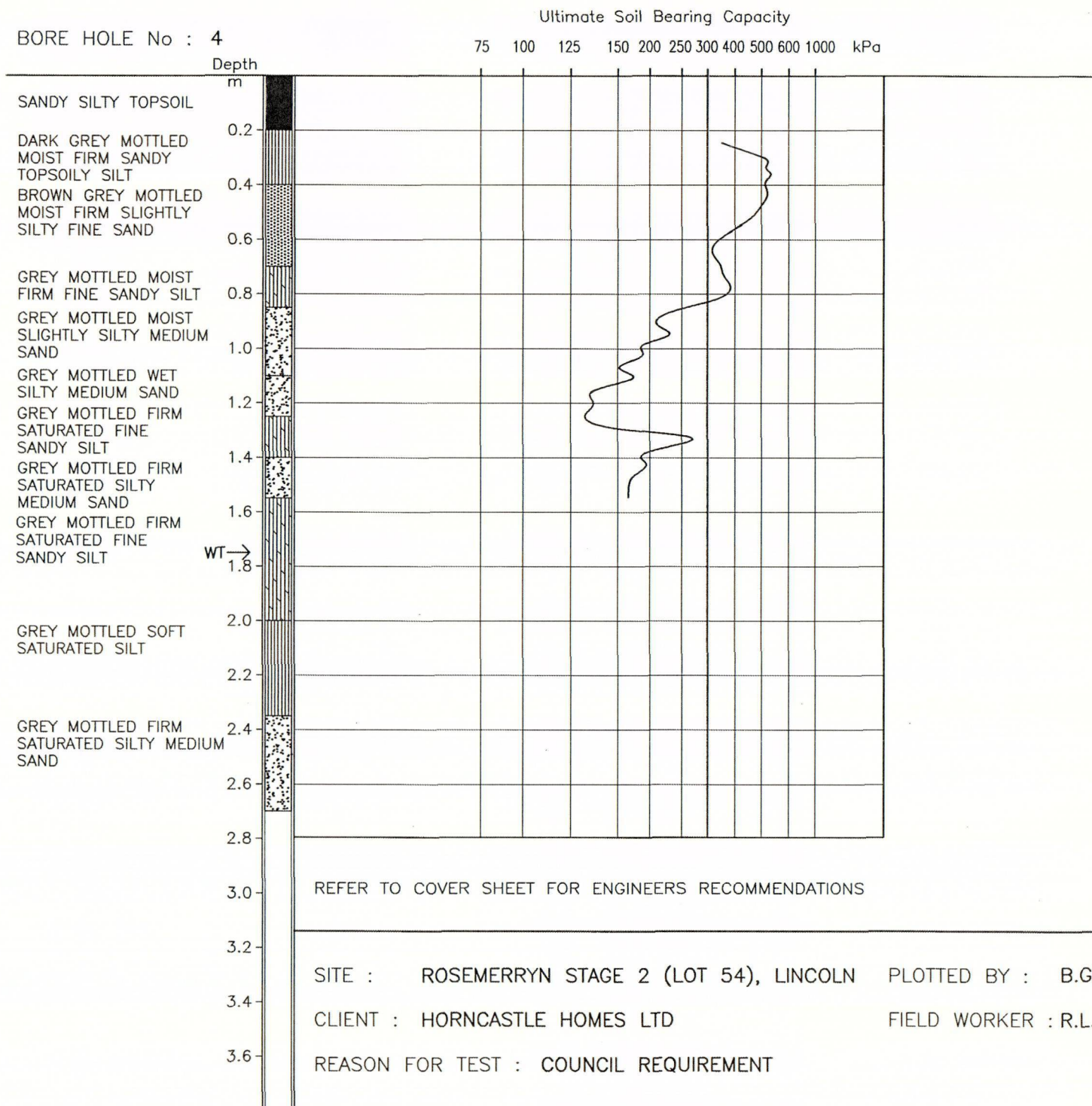
This report (letter, soil test result sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review.

If any fill or soils other than those noted in the above report are found at the bottom of the excavations, the Engineer shall be notified to inspect and issue further details. This report has been prepared solely for the benefit of our Client. No liability is accepted by this firm or by any Principal, or Director, or any servant or agent of this firm, in respect of its use by any other person, and any other person who relies upon any matter contained in this report does so entirely at their own risk. This disclaimer shall apply notwithstanding that the report may be made available to any person in connection with any application for permission or approval, or pursuant to any requirement of law.



SOIL PROFILE AND SCALA PENETROMETER RESULTS

SHEET **04** OF 6



This report (letter, soil test result sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review.

If any fill or soils other than those noted in the above report are found at the bottom of the excavations, the Engineer shall be notified to inspect and issue further details. This report has been prepared solely for the benefit of our Client. No liability is accepted by this firm or by any Principal, or Director, or any servant or agent of this firm, in respect of its use by any other person, and any other person who relies upon any matter contained in this report does so entirely at their own risk. This disclaimer shall apply notwithstanding that the report may be made available to any person in connection with any application for permission or approval, or pursuant to any requirement of law.

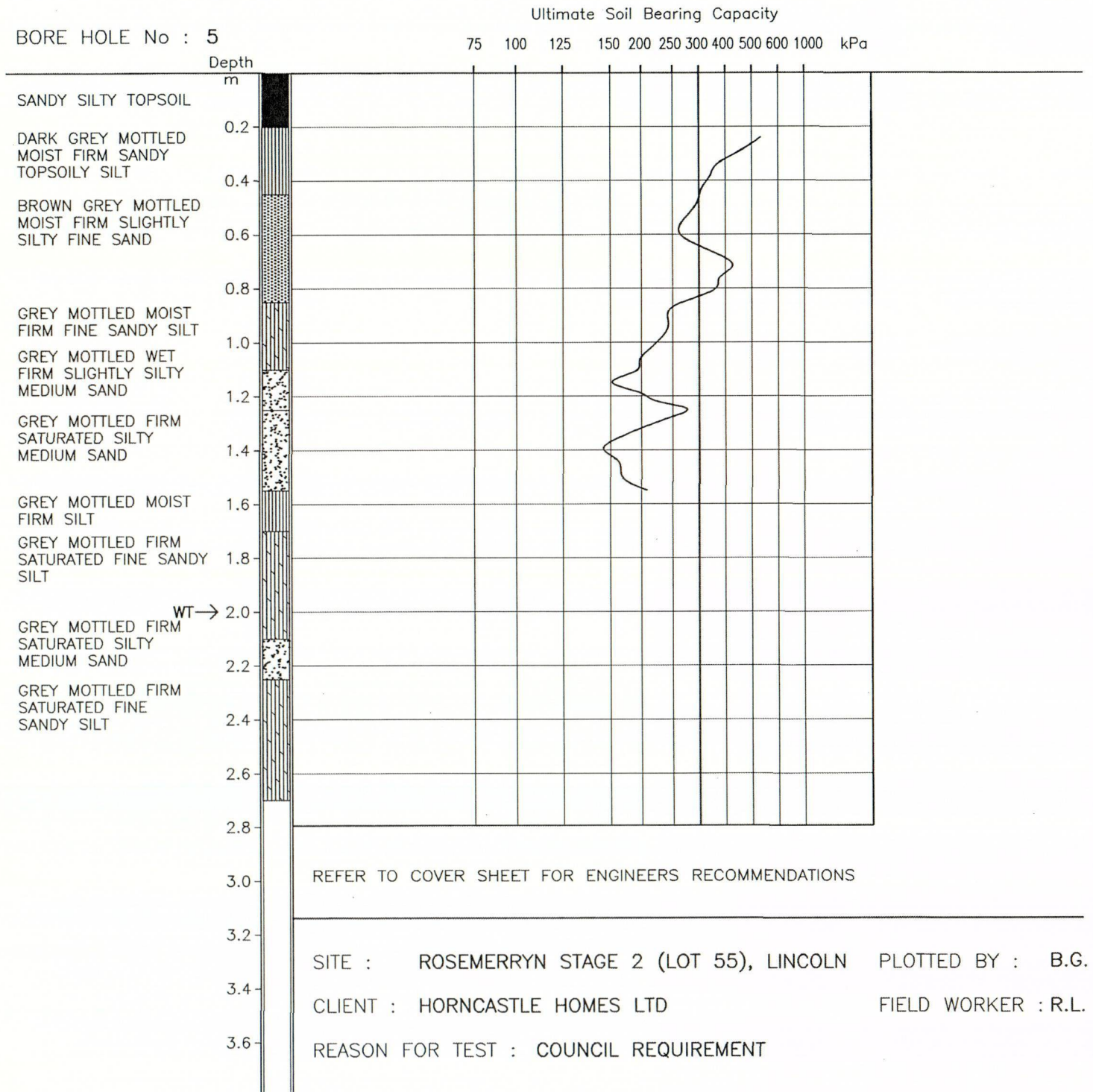
FILE COPY

121562



SOIL PROFILE AND SCALA PENETROMETER RESULTS

SHEET 05 OF 6



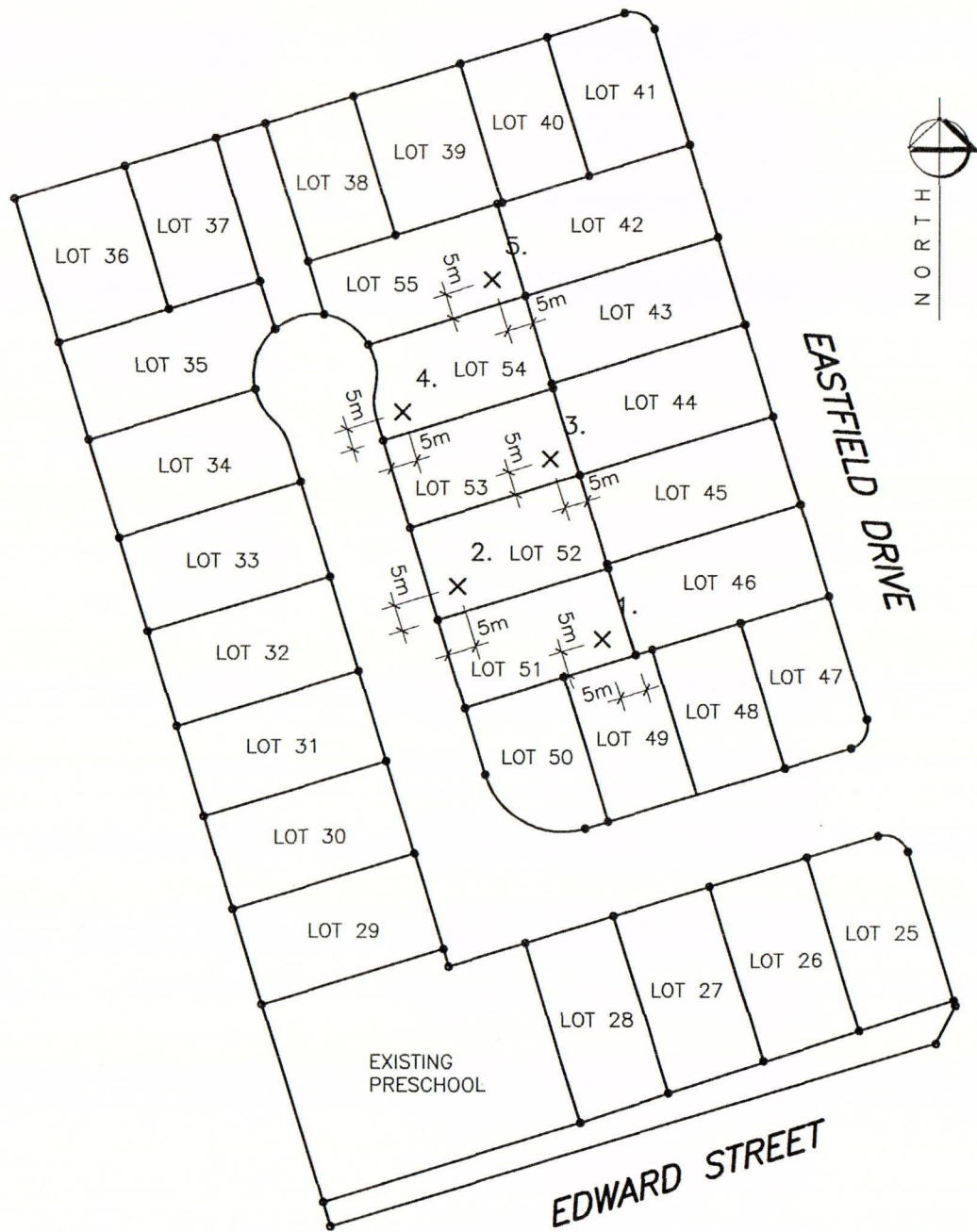
This report (letter, soil test result sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review.

If any fill or soils other than those noted in the above report are found at the bottom of the excavations, the Engineer shall be notified to inspect and issue further details. This report has been prepared solely for the benefit of our Client. No liability is accepted by this firm or by any Principal, or Director, or any servant or agent of this firm, in respect of its use by any other person, and any other person who relies upon any matter contained in this report does so entirely at their own risk. This disclaimer shall apply notwithstanding that the report may be made available to any person in connection with any application for permission or approval, or pursuant to any requirement of law.



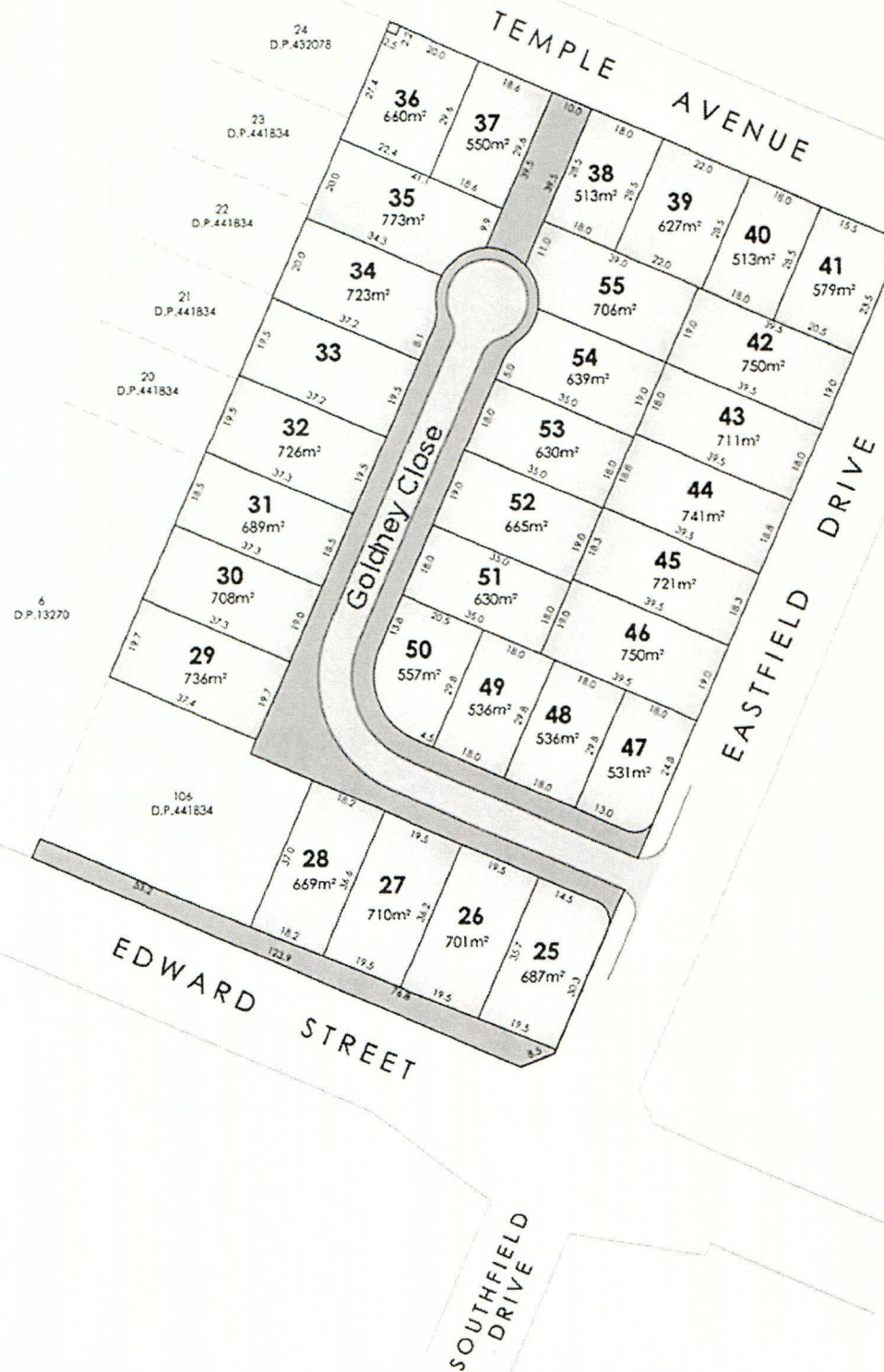
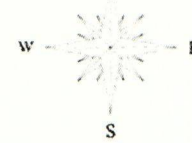
SITE PLAN

SHEET **06** OF 6



1.
X Approximate Position of Penetrometer Test and Auger Hole.

ADDRESS ROSEMERRY N STAGE 2, LINCOLN
LOTS 51 TO 55



Borelog for well M36/8672

Gridref: M36:69507-29314 Accuracy : 2 (1=high, 5=low)

Ground Level Altitude : 9.45 +MSD

Driller : not known

Drill Method : Rotary/Percussion

Drill Depth : -6m Drill Date : 9/10/2008



Environment
Canterbury

Scale(m)	Water Level	Depth(m)	Full Drillers Description	Formation Code
		-0.20m	Dark Grey loamy topsoil	
-0.2				
-0.4			Grey mottled with yellow silty clay mixed with grey silty sand	
-0.6				
-0.8				
-1		-1.00m	Grey puggy silt mottled with orange/yellow rust discolouration	
-1.2				
-1.4				
-1.6				
-1.8				
-2				
-2.2		-2.20m	Grey sandy silt mixed with grey clayey silt. Clay faction increasing	
-2.4				
-2.6				
-2.8				
-3				
-3.2				
-3.4				
-3.6				
-3.8				
-4				
-4.2				
-4.4				
-4.6				
-4.8		-4.80m	Grey mottled with orange brown clayey silt with pieces of timber <100mm diameter	
-5				
-5.2				
-5.4				
-5.6				
-5.8				
		-6.00m		

Borelog for well M36/8678

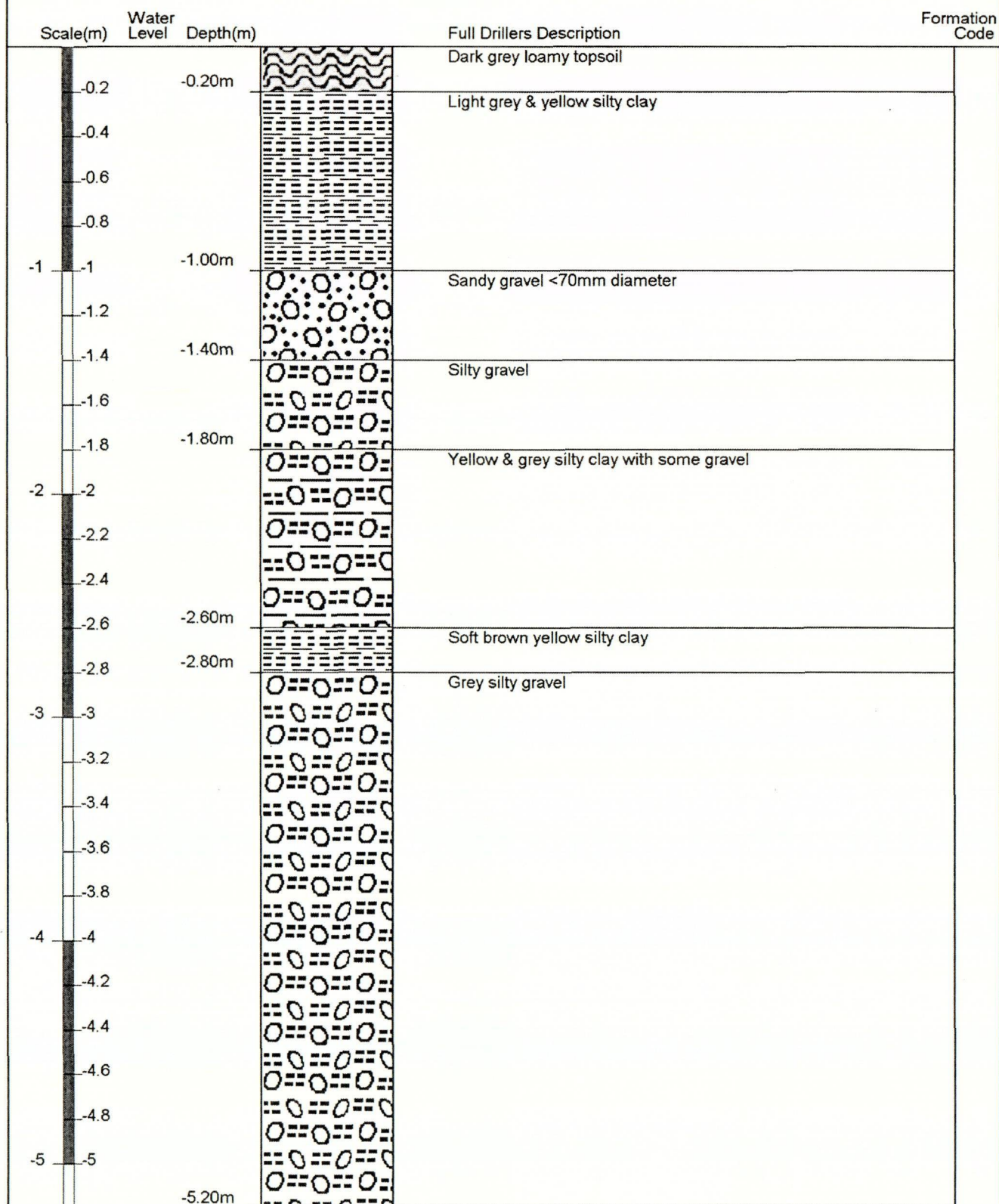
Gridref: M36:69444-29810 Accuracy : 2 (1=high, 5=low)

Ground Level Altitude : 10.14 +MSD

Driller : not known

Drill Method : Rotary/Percussion

Drill Depth : -5.2m Drill Date : 9/10/2008



FILE COPY 1215b2

Borelog for well M36/0520

Gridref: M36:690-292 Accuracy : 4 (1=best, 4=worst)

Ground Level Altitude : 7.5 +MSD

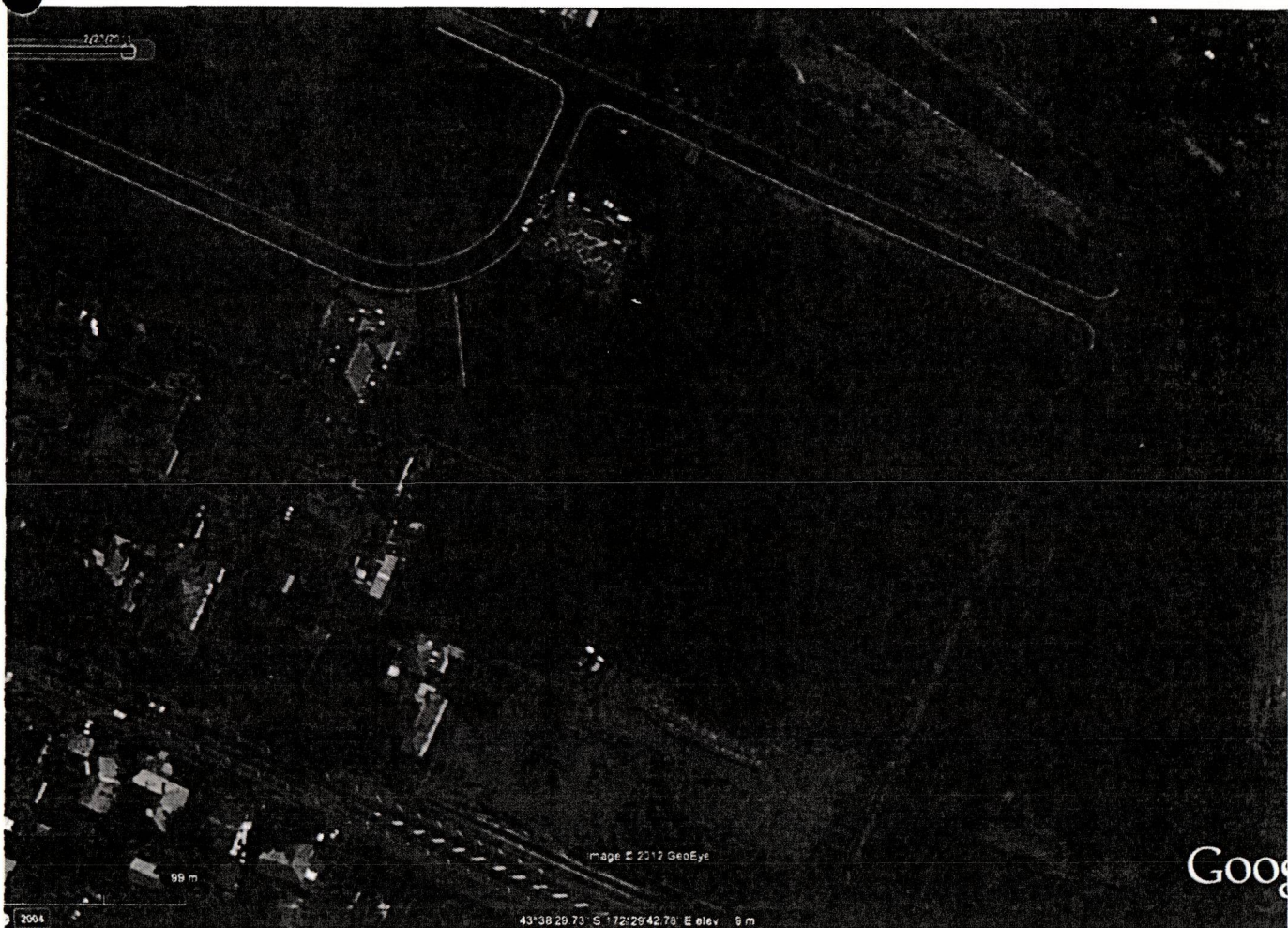
Driller : Miller F

Drill Method : Driven Pipe

Drill Depth : -40.2m Drill Date : 1/07/1898



Scale(m)	Water Level 0.2m Min	Depth(m)	Full Drillers Description	Formation Code
			Clay	
		-3.70m		sp
-5			Shingle	
-10				
-15				
-18.3m				ri
-20			Clay and sand	
-25				
-30				
-35				
-36.6m			Shingle	br
-40		-40.2m		li-1



23/2/11 GOOGLE EARTH IMAGE

FILE COPY 121562

28 February 2012

Fulton Hogan Land Development Ltd
29 Sir William Pickering Drive
PO Box 39185
Christchurch 8545
Attn: Greg Dewe

Dear Greg,

STAGE 1A ROSEMERRYN FARM SUBDIVISION – GEOTECHNICAL COMPLETION REPORT

1. Introduction

As part of the Stage 1A Rosemerryn Farm subdivision development, located at Lincoln, Aurecon has carried out a geotechnical investigation and assessment. The assessment is detailed in the Aurecon geotechnical report *“Geotechnical Assessment Report, Rosemerryn Farm Stage 1A, Fulton Hogan Land Development Ltd”*, Rev1, dated 30 September 2011.

As part of the subdivision consent, conditions relating to geotechnical aspects were included. These conditions include Condition No. 53, 57 and 58 in Consent 115292, and Condition 5 and 6 in Consent 115293.

Site earthworks for the subdivision have been completed and therefore this geotechnical completion report has been prepared in accordance with Consent 115292 and 115293, as part of the final documentation for the subdivision.

This geotechnical completion report is accompanied by a Statement of Professional Opinion on the Suitability of Land for Building Construction, as required by the Selwyn District Council (SDC) Code of Practise.

2. Previous Reports

As part of the subdivision consent the following geotechnical information was provided:

- *“Geotechnical Assessment Report, Rosemerryn Farm Stage 1A, Fulton Hogan Land Development Ltd”*, dated 30 September 2011.
- Additional geotechnical information provided to Nick Traylen of Geotech Consulting Ltd (Peer Reviewer), by email dated 19 October 2011.
- Reply to Peer Reviewer queries, by email dated 21 October 2011.
- Additional geotechnical testing information, in relation to Condition 53, by email to Rosie Flynn from Selwyn District Council, dated 24 November 2011.
- *“Stage 1A Rosemerryn Farm Subdivision, Technical Categories Assessment”* letter dated 29 November 2011. Previous reports were completed prior to the Department of Building and Housing technical categories were defined. Hence this follow up letter was provided to relate the new technical categories, as well as implications for residential foundations.

3. Geotechnical Summary for the Site

Based on the deformation limits provided in Department of Building and Housing '*Revised guidance on repairing and rebuilding houses affected by the Canterbury earthquake sequence*', dated November 2011 and the liquefaction assessment for the site, Stage 1A was defined as Technical Category TC2.

For Technical Category 2 areas the DBH has recommended types of foundation systems for residential houses in their November 2011 publication. Schematics and typical cross sections of these foundation systems are presented in the DBH publication.

As required under the new DBH guidelines for detailed house design, a site specific geotechnical assessment shall be carried out by suitability qualified chartered engineer with experience in residential house development. A chartered professional geotechnical engineer is not required for Technical Category 2 type residential lots.

4. Subdivision Conditions

The following consent conditions are addressed as follows:

4.1 Condition 53

SDC requested additional geotechnical testing be carried out at the site. Three additional cone penetration tests (CPT) were carried out. The test information and liquefaction assessment results were provided to Rosie Flynn from Selwyn District Council, by email on 24 November 2011.

4.2 Condition 57

SDC requested that some level of lateral spreading mitigation be carried out along the stormwater drain that runs along the southern property boundary.

Based on site observations, the stormwater drain in question ranges from 1.3m to 1.35m in depth. This depth is taken from the ground level on the subdivision side. Recent excavations in the Stage 1a development indicate the standing groundwater level is in the order of 2m below ground level. These levels were observed after heavy rainfall in early November, which indicates that the groundwater level is lower than previously thought. Based on the depths of the groundwater and stormwater drain we consider that the potential for lateral spreading is low. The low potential for lateral spreading is reflected in the lack of ground damage observed along the drain following the 4 September 2010 Darfield Earthquake (Mag 7.1).

Therefore we consider that the potential lateral spreading mitigation measures defined by the geotechnical report are not required.

There may be a potential slope instability issue with the open drain banks, during an extreme earthquake event. We note that the drainage ditch is relatively shallow and based on observations of other drainage ditches within the Canterbury Region, where bank failure has occurred adjacent to drainage ditches it has typically been limited in extent. However, we recommend to limit any erosion or slope stability issues affecting house foundations, the houses building footprints should be setback from the crest of the drain by a minimum of 10m.

4.3 Condition 58

We consider all subdivided lots, roads and reserves to be suitable for their intended purposes to service a residential subdivision from a geotechnical perspective. As mentioned above in section 4.2 in relation to the drainage ditch, we consider the risk from lateral spreading to be low and that there is no need for mitigating measures. We do however recommend a building footprint setback of 10m from

the crest of the drainage ditch. These would affect lots 26, 26, 27 and 28. The limitations and specific development requirements for each of the lots are provided in Table 1.

Table 1 – Lot Assessments

Lot	Assessed Technical Category	Foundation Options and General Recommendations
25	TC2	TC2 type foundations as defined by DBH (2011) Raft type foundation is preferable Specific foundation investigation will be required as defined by DBH (2011) 10m setback from crest of drain for any residential building
26	TC2	TC2 type foundations as defined by DBH (2011) Raft type foundation is preferable Specific foundation investigation will be required as defined by DBH (2011) 10m setback from crest of drain for any residential building
27	TC2	TC2 type foundations as defined by DBH (2011) Raft type foundation is preferable Specific foundation investigation will be required as defined by DBH (2011) 10m setback from crest of drain for any residential building
28	TC2	TC2 type foundations as defined by DBH (2011) Raft type foundation is preferable Specific foundation investigation will be required as defined by DBH (2011) 10m setback from crest of drain for any residential building
29	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
30	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
31	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
32	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
33	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
34	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
35	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
36	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
37	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)

38	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
39	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
40	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
41	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
42	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
43	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
44	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
45	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
46	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
47	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
48	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
49	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)
50	TC2	TC2 type foundations as defined by DBH (2011) Specific foundation investigation will be required as defined by DBH (2011)

The DBH has recommended types of foundation systems for residential houses built in areas potentially susceptible to seismically induced liquefaction in their publication *'Revised guidance on repairing and rebuilding houses affected by the Canterbury earthquake sequence'*, dated November 2011. Schematics and typical cross sections of these foundation systems are presented in the DBH publication.

As the lots have been identified as TC2, an assessment against NZS3604 has not been carried out, as foundations for residential buildings in TC2 require specific investigation and detailing.

The DBH guideline identifies that raft type foundations or piles are suitable for TC2 ground. The raft foundation options are likely to be cheaper than the piled foundation options. A piled foundation for residential housing would minimise expected settlement and damage during a large seismic event. However the DBH guidelines indicate that although piles are an option for TC2 sites, this foundation option will require deep geotechnical investigations and design.

If the piled foundation option is adopted, then the floor slab should be well reinforced to provide continuity across the building floor and foundation elements. The objective will be to provide additional capacity in the floor slab and enhance its ability to redistribute loads, if necessary, during large seismic events. All pile heads need to be adequately tied into the floor slab.

As part of the detailed house foundation design, particular attention should be paid to detailing the connection joints of buried services (water and sewer pipes, power conduits, etc.) between the house foundation and the in situ ground. The design should allow sufficient movement and ductility to account for seismic shaking and liquefaction induced movement, and to allow for the easy reinstatement if they were to be damaged during a future seismic event.

As required under the new DBH guidelines for detailed house design, a site specific geotechnical assessment shall be carried out by a suitability qualified chartered engineer with experience in residential house development. Thereby, allowing site specific geotechnical information to be used in the foundation design.

4.4 Condition 5

As per Condition 57 response.

4.5 Condition 6

As per Condition 58 response.

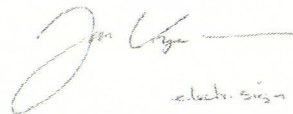
We trust this meets your requirements and if there are any further queries please do not hesitate to contact us.

Yours sincerely



Robert Smith

Geotechnical Engineer


electr. sign

Jan Kupec

Ground Engineering Technical Director

PRODUCER STATEMENT – PSI – DESIGN

ISSUED BY:	The Engineering Company Ltd <small>(Design Firm)</small>		
TO BE SUPPLIED TO:	Selwyn District Council <small>(Building Consent Authority)</small>		
IN RESPECT OF:	New Dwelling with attached Garage <small>(Description of Building Work)</small>		
AT:	Lot 54, Goldney Close, Rosemerryn Estate, Lincoln <small>(Address)</small>		
LOT 54	DP 451072	SO	

We have been engaged by the Horncastle Homes Ltd to above to provide the **structural design** of the work listed, shown on the **ENGCO CONSULTING** drawings titled:

HORNCASTLE HOMES Ltd, LOT 54, ROSEMERRYN STAGE 2, LINCOLN

Item	Covered by this PS-I	Drawing or Detail
I.	TC2 Ribraft Slab details	S1 to S6 (21.08.2012)

in respect of the requirements of Clause(s) B1 of the Building Code for the **part** the proposed building works specified only. The design has been prepared in accordance with **VM1/AS1** the approved Compliance & Guidance Documents issued by Department of Building & Housing.

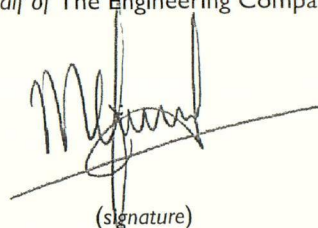
On behalf of the Design Firm, and subject to:

- (i) The design has been prepared in accordance with the recommendations of the Lewis & Barrow Geotechnical Report, (Ref: 20172), 3 May 2012 and in accordance with the DBH guidance document. The Engineering Company Ltd holds no responsibility for seismic induced damage sustained beyond the limits of the DBH Guidance recommendations.
- (ii) ENGCO is responsible for conducting all inspections required for the issue of code compliance, in accordance with the attached schedule.
- (iii) All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed above will comply with the relevant provisions of the Building Code.

I, Matthew Cusiel, am a Chartered Professional Engineer, CPEng#161509, and am a Member of IPENZ. The Engineering Company Ltd holds a current policy of Professional Indemnity Insurance no less than \$200,000.

Signed by M. Q. Cusiel, BE(hons), MIPENZ, CPEng, IntPE
on behalf of The Engineering Company Ltd, 8/1025 Ferry Rd, Ferrymead, Christchurch



(signature)

Date: 21 August 2012

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of \$200,000.

LOCATION:

Lot 54, Goldney Close, Lincoln

Schedule of Engineering Inspections	
Inspection Stage	Timing of Inspection
Foundation excavation	After stripping organics off surface.
Slab pre-pour	After placing of reinforcing, before pouring

It is the contractor's responsibility to notify The Engineering Company Ltd 48 hours before engineering inspections are required. The total number of inspections will depend upon the construction methodology and staging. Additional inspections from those listed above may be required upon conditions found on site. See also, local territorial authority requirements for construction monitoring.

FILE COPY

121562

17 SEP 2012

PRODUCER STATEMENT – PSI – DESIGN

ISSUED BY:	The Engineering Company Ltd <small>(Design Firm)</small>		
TO BE SUPPLIED TO:	Selwyn District Council <small>(Building Consent Authority)</small>		
IN RESPECT OF:	New Dwelling with attached Garage <small>(Description of Building Work)</small>		
AT:	Lot 54, Goldney Close, Rosemerryn Estate, Lincoln <small>(Address)</small>		
LOT	54	DP	451072 SO

We have been engaged by the Horncastle Homes Ltd to above to provide the **structural design** of the work listed, shown on the **ENGCO CONSULTING** drawings titled:

HORNCASTLE HOMES Ltd, LOT 54, ROSEMERRYN STAGE 2, LINCOLN

Item	Covered by this PS-I	Drawing or Detail
I.	TC2 Ribraft Slab details	S1 to S6 (21.08.2012)

in respect of the requirements of Clause(s) B1 of the Building Code for the **part** the proposed building works specified only. The design has been prepared in accordance with **VM1/AS1** the approved Compliance & Guidance Documents issued by Department of Building & Housing.

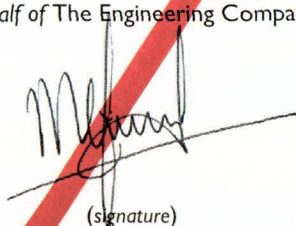
On behalf of the Design Firm, and subject to:

- The design has been prepared in accordance with the recommendations of the Lewis & Barrow Geotechnical Report, (Ref: 20172), 3 May 2012 and in accordance with the DBH guidance document. The Engineering Company Ltd holds no responsibility for seismic induced damage sustained beyond the limits of the DBH Guidance recommendations.
- ENGCO is responsible for conducting all inspections required for the issue of code compliance, in accordance with the attached schedule.
- All proprietary products meeting their performance specification requirements;

I **believe on reasonable grounds** the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed above will comply with the relevant provisions of the Building Code.

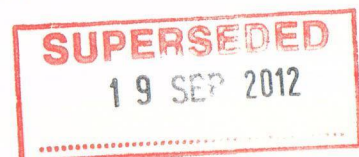
I, Matthew Cusiell, am a Chartered Professional Engineer, CPEng#161509, and am a Member of IPENZ. The Engineering Company Ltd holds a current policy of Professional Indemnity Insurance no less than \$200,000.

Signed by M. Q. Cusiell, BE(hons), MIPENZ, CPEng, IntPE
on behalf of The Engineering Company Ltd, 8/1025 Ferry Rd, Ferrymead, Christchurch



(signature)

Date: 22 August 2012



Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of \$200,000.

LOCATION:

Lot 54, Goldney Close, Lincoln

Schedule of Engineering Inspections	
Inspection Stage	Timing of Inspection
Slab pre- pour	After placement of all reinforcing

It is the contractor's responsibility to notify The Engineering Company Ltd 48 hours before engineering inspections are required. The total number of inspections will depend upon the construction methodology and staging. Additional inspections from those listed above may be required upon conditions found on site. See also, local territorial authority requirements for construction monitoring.

Project: Goldney Close Slabs - Lincoln
Job No: 12-196
Date: July 2012
By: MC
Page: 1



HORNCastle HOMES – TC2 Ribraft Slabs – Design Notes

LOTS 51-56 : Goldney Close, Rosemerryn Estate, Lincoln

1. Geotechnical Reference:

See **Lewis & Barrow** Report "Lots 51 to 56" Goldney Close, Stage 2, Rosemerryn Subdivision, Lincoln.
File Ref: 20172, 3 May 2012.

Report Recommendations:

- Slab required for TC2 conditions. The Scala testing on these lots suggests >300kPa bearing is available close to the surface, precluding any site preparation other than stripping and replacing organics.

2. Design Considerations:

Refer to the DBH "Revised Guidance" document, section 5 "New Foundations".

Slabs must be:

- Must be robust enough to cope with 2.0m of loss of bearing around the edges and 4m at any point across the internal point of the slab.
- Capable of coping with 100mm of ULS settlement below and be easily repairable.
- TC2 land by definition has been identified as having less than 100mm of potential settlements and therefore any isolated pads remote from the house need not be tied, assuming any damage associated with settlement is easily repairable.

3. Slab Design:

Firth Ribraft slabs are specifically engineered to meet the requirements section 5.4 of the DBH "Revised Guidance" document. Steel fibre reinforcement (DFR) has been added primarily to meet the shear strength requirements.

The SFR design methodology is described on the attached sheets D.N. 3-5.

A spreadsheet is used to calculate the neutral axis depth in accordance with NZS3101 – appendix to section C5, so that the section flexural capacity can be calculated with various steel configurations. The value "a" is adjusted until the internal section actions balance (i.e. $C = T$). Once the neutral axis is known by iteration, the section strength can be determined.

4. Design Load Cases:

These are described in the attached sheets D.N. 1-2. Essentially these cover the worst case scenarios of the loss of bearing requirements required to be considered by section 5.4 of the DBH "Revised Guidance" document.

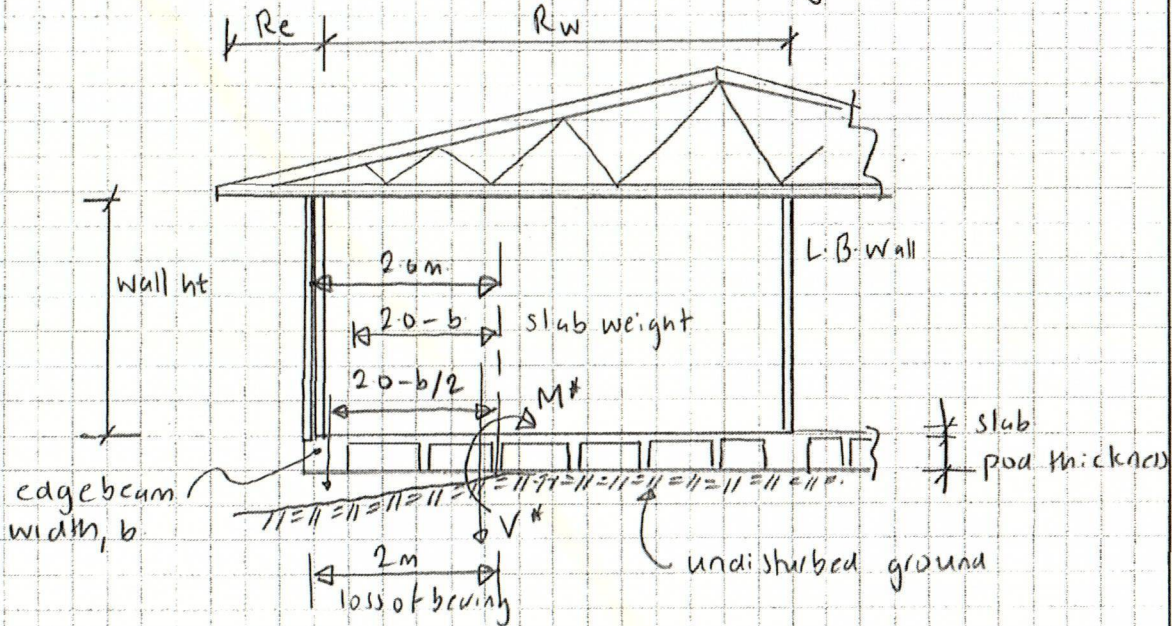
- LC 1 = Cantilevering of slab 2m at edge
- LC 2 = Cantilevering of edge beam 2m at corners
- LC 3 = Edge beam spanning a 4m internal loss of bearing
- LC 4 = Internal slab spanning 4m loss of bearing with a LB wall and beam in the centre
- LC 5 = Internal beam with 4m loss of bearing supporting a LB wall.

5. House Descriptions:

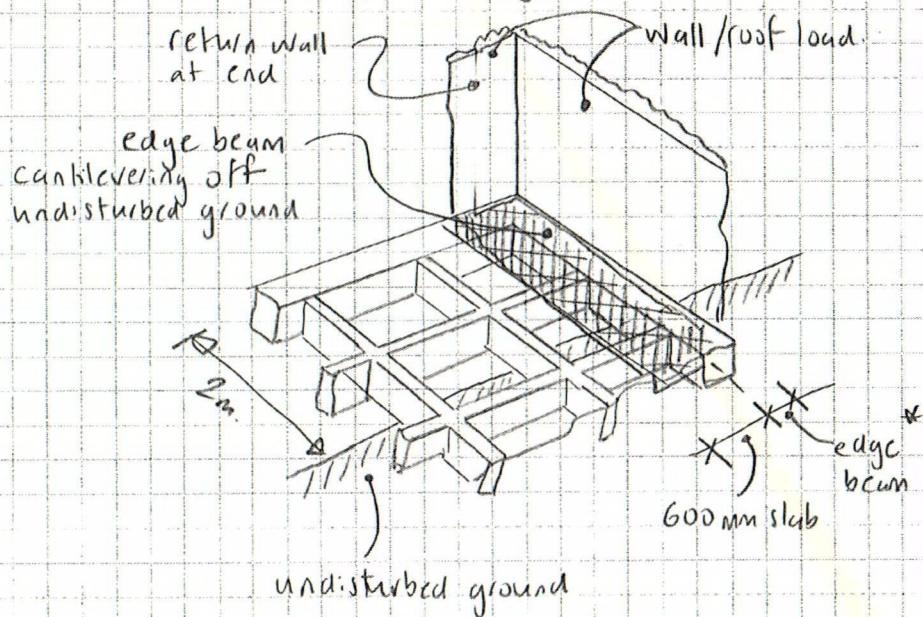
The proposed houses at Lots 51 to 56 Goldney Close are all single storey, brick or Rockcote clad with light clad trussed roofs.



Load case 1 : 2m loss of edge bearing - Slab Actions



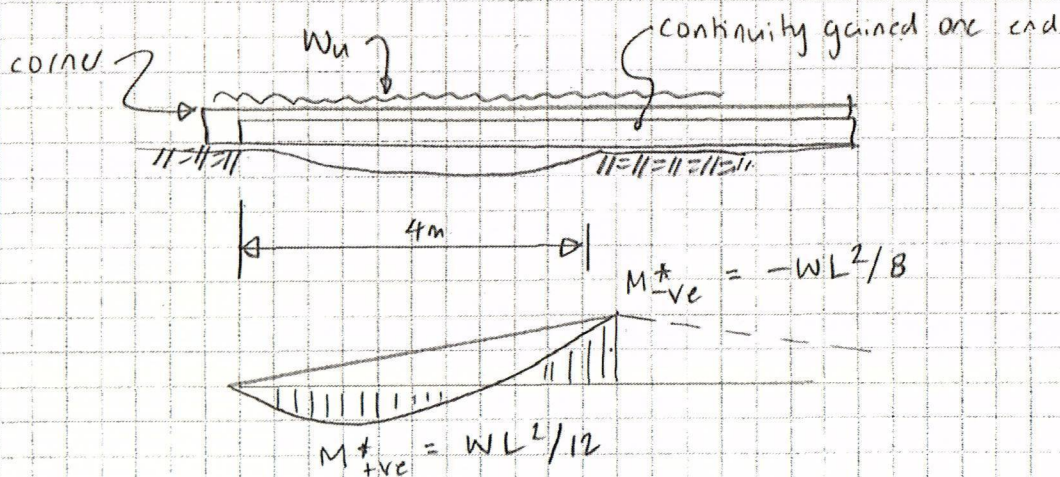
Load Case 2 : 2m loss of edge bearing - Edge beam at corners



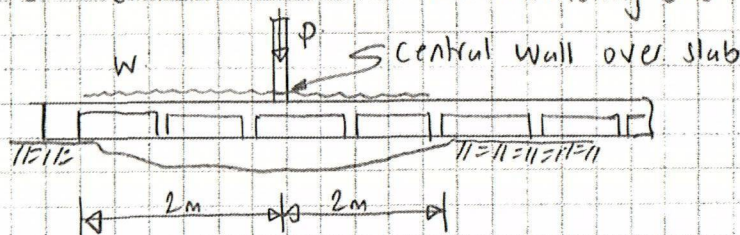
* note: ensure edge beam extends 2.5m min back from line of loss of bearing

Load case 3: 4m loss of bearing under Edge beam

critical member actions are continuity one end only

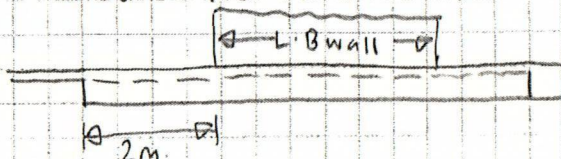


Load case 4: 4m loss of bearing under slab with wall crossing as per 3 - critical actions with continuity one end only.



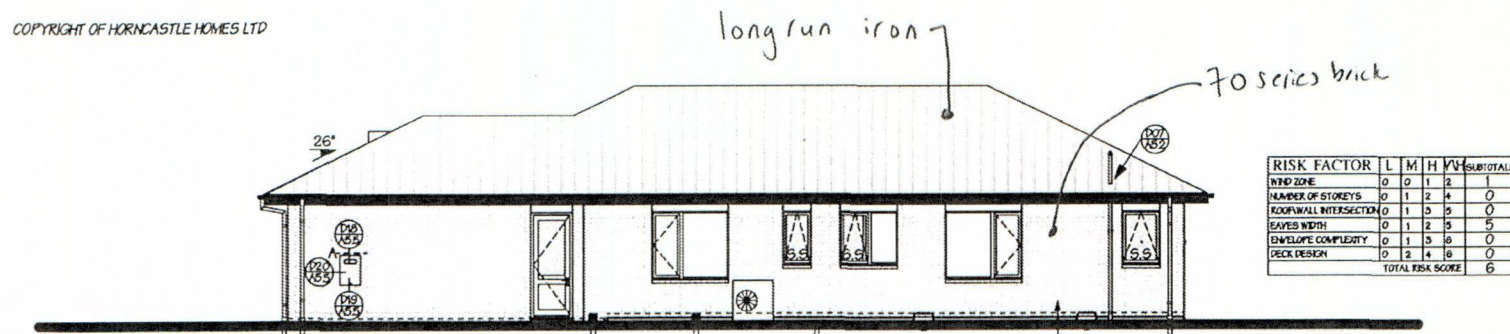
Load case 5: 4m loss of bearing under L.B. wall

ensure rib extends onto edge or 2m past L.B. wall



depending on position of loss of bearing, continuity may or may not be gained

⇒ design for $M^*_{+ve} = M^*_{-ve} = (W+P) \cdot L^2/8$



ID	MODEL	WIDTH mm	HEIGHT mm	GLAZED AREA sqm	VENTILATION AREA sqm
DC01	DSP	3000 mm	2115 mm	4.32 sqm	3.23 sqm
DC02	DSP	875 mm	2205 mm	0.99 sqm	1.59 sqm
DC03	GSP	4780 mm	2115 mm	0.00 sqm	19.67 sqm
DC04	PTSF	1275 mm	2115 mm	0.58 sqm	1.67 sqm
DC05	D59 OT	1500 mm	2050 mm	1.18 sqm	2.85 sqm
DC06	D59 OT	1500 mm	2050 mm	1.18 sqm	2.85 sqm
DC07	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC08	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC09	D77	1480 mm	2050 mm	0.00 sqm	1.28 sqm
DC10	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC11	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC12	D77	1480 mm	2050 mm	0.00 sqm	1.28 sqm
DC13	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC14	D77	1480 mm	2050 mm	0.00 sqm	1.28 sqm
DC15	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC16	D40	779 mm	2075 mm	0.00 sqm	1.49 sqm
DC17	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC18	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC19	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm

ELEVATION 1

Scale: 1:100

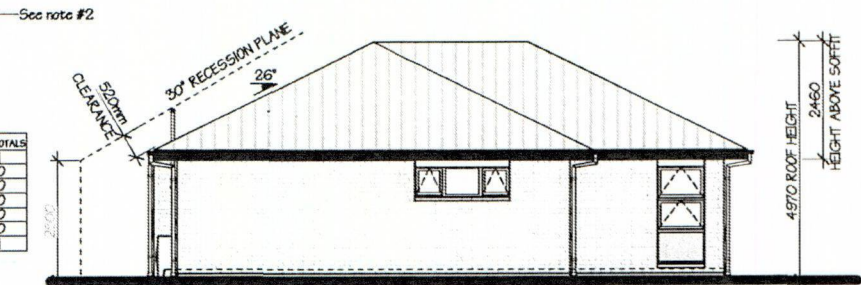
TIMBER TREATMENT SCHEDULE:

SGS KILN DRIED PINUS RADIATA

EXTERNAL WALLS:	H12 TREATED
INTERNAL WALLS:	H12 TREATED
ALL BEAMS & LINTELS:	H12 TREATED
ALL FRAMES TO HAVE:	H12 BOTTOM PLATE
TRUSSES & EAVE FRAMING:	H12 TREATED
BRACING PLY:	H3.2 TREATED
PLY TO FLAT ROOF:	H3.2 TREATED
WINDOW & DOOR REVEALS:	H3.1 TREATED
VALLEY BOARDS:	H12 TREATED
PURLINS:	H12 TREATED
GARAGE DOOR REVEALS:	H3.1 TREATED
CAVITY BATTENS:	H3.1 TREATED

VENEER LINTEL TABLE
A 160x10mm
LINTELS SIZED USING
NZS 4229-1999 TABLE 12.2

RISK FACTOR	L	M	H	VV	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOF/WALL INTERSECTION	0	1	5	5	0
EAVES WIDTH	0	1	2	5	0
ENVELOPE COMPLEXITY	0	1	5	6	0
DECK DESIGN	0	2	4	8	0
TOTAL RISK SCORE					1



ELEVATION 2

Scale: 1:100

NOTE:

-GRADE 'A' SAFETY GLAZING IN ALL BATHROOMS WHERE GLAZING IS UNDER OR WITHIN 2m OF FLOOR LEVEL TO ALL GLASS PANELS WHICH ARE OVER 0.5m WIDE & WITHIN 0.5m TO FLOOR LEVEL, AND TO ALL PANELS WHICH ARE GREATER THAN 1m HIGH, AND ALL DOOR PANELS WHICH ARE GREATER THAN 0.75m² (NZS 4223)

□ = SAFETY GLAZING.

-ALL DOORS AND ALL WINDOWS OVER 600mm TO BE FITTED WITH SUPPORT BARS. BARS & FITTING POSITION TO BE SUPPLIED BY ALUMINIUM SUPPLIER (9.110.5 v).

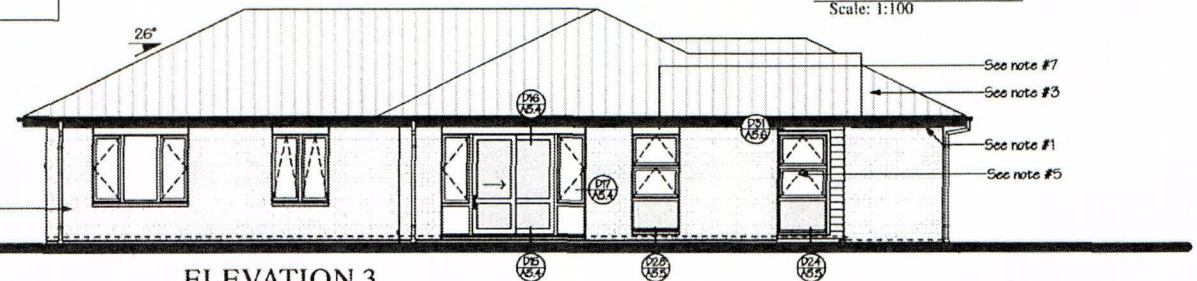
-S.S = SAFETY STAYS FITTED TO WINDOW.

-ALL STANDARD WINDOWS HAVE BEEN MOVED UP TO UNDERSIDE OF SOFFIT.

ID	MODEL	WIDTH mm	HEIGHT mm	GLAZED AREA sqm	VENTILATION AREA sqm
WC01	W10	2630 mm	1430 mm	2.91 sqm	1.52 sqm
WC02	W100	1030 mm	2030 mm	1.44 sqm	1.16 sqm
WC03	W100	1000 mm	2000 mm	1.44 sqm	1.16 sqm
WC04	W100	1000 mm	2000 mm	1.44 sqm	1.16 sqm
WC05	W18	1200 mm	1400 mm	1.11 sqm	1.47 sqm
WC06	W22	2000 mm	1400 mm	2.10 sqm	1.52 sqm
WC07	W15	2000 mm	600 mm	0.80 sqm	0.62 sqm
WC08	W2	800 mm	1100 mm	0.62 sqm	0.79 sqm
WC09	W20R	1600 mm	1400 mm	1.83 sqm	0.76 sqm
WC10	W3	1200 mm	1100 mm	0.99 sqm	0.59 sqm
WC11	W1	600 mm	1100 mm	0.43 sqm	0.58 sqm
WC12	W20	1600 mm	1400 mm	1.83 sqm	0.76 sqm

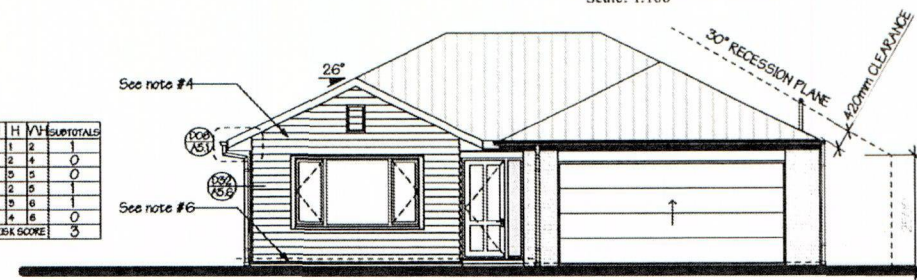
RISK FACTOR	L	M	H	VV	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOF/WALL INTERSECTION	0	1	5	5	0
EAVES WIDTH	0	1	2	5	0
ENVELOPE COMPLEXITY	0	1	5	6	1
DECK DESIGN	0	2	4	8	0
TOTAL RISK SCORE					2

See note #2



ELEVATION 3

Scale: 1:100



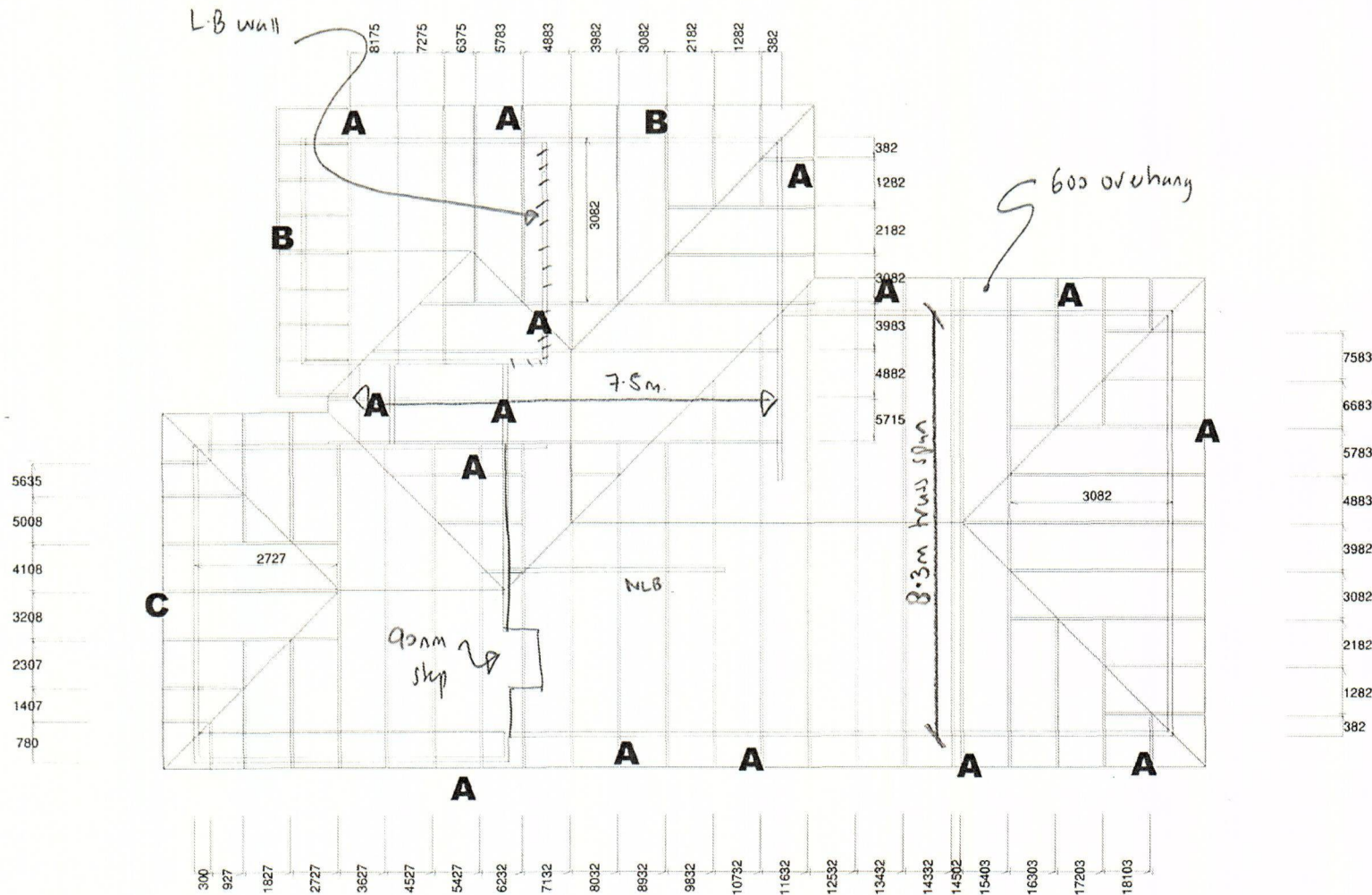
ELEVATION 4

Scale: 1:100

12-196

Goldney Close Lot 54

BUILDING CONSENT LAYOUT


CARTERS
MANUFACTURING

 21 Broughs Rd
 Christchurch
 Ph (03) 359 2731

 JOB No **CD084818**

 Client: Horncastle Homes
 Job Name: J3634
 Address: Lot 54, Goldney Close
 Rosemerry

Consent #:

 Pitch: 26.000
 Roof Material: Galv Iron .5mm
 Soffit Overhang: 600
 Wind Area: High
 Snow Load: 0.428 (Factored)

 Trusses And Rafters At 900 Centres
 Unless Stated Otherwise.

 This layout is to be read in conjunction
 with the Architectural plans.

DRAWN BY Brent Yellowlees.

DATE 7 Aug, 2012 PAGE 2 of 2

 These lintels have been sized using
 one of the following:

 The GANGLAM 04/2008 and
 FLITCH BEAM 12/2007
 selection manuals from MiTek NZ Ltd.

 hyONE and hy90 lintels have been sized
 using designIT v4 NZ software
 (incl. sub versions) or selection manuals,
 hy90 Edition 1, and hyONE April 2008 as
 provided by CHH Woodproducts.

 Unless otherwise stated the timber grade
 for all lintels is MSG8. Lintels not shown
 are to be selected as per NZS3604 2011.

 All walls shown on this layout are
 considered to be load bearing.

LINTEL	SIZE	GRADE
A	150 x 90	hy90
B	200 x 90	hy90
C	300 x 90	hy90


 See Page 1 for
 Truss Layout and
 Fixings

 No. conc
 loads

 NOTIFICATION OF POINT LOADED LINTELS AND POINT LOADS ON
 INTERNAL WALLS WHERE THE DOWNLOAD IS HIGHER THAN 10kN
 OR THE UPWARD LOAD IS GREATER THAN 12kN
 Note: If no point loads indicated, loading does not exceed above.

FILE

121562

LOSS OF BEARING ACTIONS FOR RIBRAFT SLABS ON TC2 SITES in accordance with DBH guidelines

Job name: LOT 54 - GOLDNEY CLOSE

date: 21/08/12

File: EngCo 12-196

Client: HORNCastle HOMES

House Location: Rosemerryn Estate - Stage 2 - Lincoln

INPUT CELLS IN BLUE ONLY

SEE EXPLANATION OF LOAD CASES ON FOllOWING SHEETS "Design Notes" - Pages DN-1 & DN-2

Actions		Building Element Weights (single storey dwellings only)			
Roof & External wall loading	Wall Cladding:	70 Series Veneer	Wt =	1.60	kPa
	Wall Height:	2.4 m			
	estimated %'age of openings:	15 %	Wall weight = Ht x (1-%'openings) x Wt =	3.26	kN/m
	Roof Cladding:	Long run Iron	Roof Wt =	0.35	kPa (incl frame & ceiling)
	Eave width, Re:	0.6 m	L.D. = Re + Rw/2 =	4.8	m
	Truss span to exterior wall, Rw:	8.4 m	Roof weight = L.D. x Wt =	1.68	kN/m
	Other loads to exterior walls:	0 kN	Total Weight at edge (from roof & wall):	4.94	kN/m
Slab and edge beam details	Pod thickness:	300 mm			
	Slab thickness, Tf:	100 mm	Total Slab Ribraft Wt (inc. SDL) =	3.80	kPa
	S.D.L's - (partition walls, etc):	0.25 kPa	Edge beam Wt =	2.88	kN/m
	Edge beam width, Be:	300 mm	Total Load at base of edge beam:	11.62	kN/m
Interior load bearing wall loading	Roof span to Interior wall, Ri:	7.5 m	L.D. = Ri/2 =	3.75	m
	Internal wall weight:	1.00 kN/m	Int. Roof wt =	1.31	
	Internal beam width, Bi:	300 mm	Int. beam Wt =	2.88	
			Total Load at base of internal beam:	5.19	kN/m
Live Loading	Q, Live load:	2.5 kPa	EQ comb Factor =	0.4	
			Post EQ Live Load:	1.00	kPa

Load Case 1		2m loss of edge bearing - Slab Actions (Hogging)			
M*/rib @ 1.2m:	M*g = Wall/Roof Wt x 2.0m + Edge beam Wt x (2m-width/2) + slab wt x (2m-edge beam)^2 / 2 =			20.7	kNm/m
	M*q = Q x comb. factor x 1.9m^2/2 =			1.8	kNm/m
	Earthquake load combination = (M*g & 0.4.M*q) x 1.2m (rib spacing) =			27.0	kNm/rib
	V*g = Wall/Roof Wt + Edge beam Wt + slab wt x (2m-edge beam) =			11.6	kN/m
V*/rib @ 1.2m:	V*q = Q x comb. Factor x 1.9m =			1.9	kN/m
	Earthquake load combination = (V*g & 0.4V*q) x 1.2m (rib spacing) =			16.2	kN/rib

Load Case 2		2m loss of edge bearing - EDGE BEAM Actions at corner (hogging)			
L = 2.0m	M*g = (Wall/roof /Edge bm Wt + Slab Wt x 0.6m width) x L^2 / 2 + (Wall/roof/Edge bm Wt) x 0.9m x 2m =			34.3	kNm
	M*q = (Q x comb. factor) x 0.9m width x L^2 / 2 =			1.8	kNm
M*:	Earthquake load combination = M*g & 0.4.M*q =			36.1	kNm
V*/rib @ 1.2m:	V*g = (Wall/roof/Edge beam Wt + Slab Wt x 0.6m width) x 2.0m + (Wall/roof/edge bm Wt) x 0.9m =			27.2	kN
	V*q = (Q x comb. factor) x 0.6m width x 2.0m =			1.2	kN
	Earthquake load combination = (V*g & 0.4V*q) =			28.4	kN

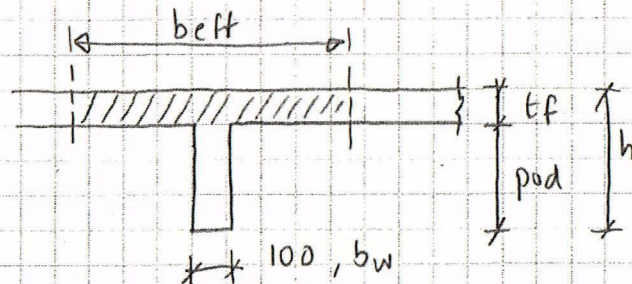
Load Case 3		4m loss of bearing - EDGE BEAM Actions (spanning over 4m gap)			
L = 4.0m	-ve M*g = (Wall/roof Wt + Edge beam Wt + Slab Wt x 0.6m width) x L^2 / 8 =		-ve	20.2	kNm
	-ve M*q = (Q x comb. factor) x 0.9m width x L^2 / 8 =		-ve	1.8	kNm
hogging (-ve) M*:	Earthquake load combination = M*g & 0.4.M*q =		-ve	22.0	kNm
	+ve M*g = (Wall/roof Wt + Edge beam Wt + Slab Wt x 0.6m width) x L^2 / 12 =		+ve	13.5	kNm
sagging (+ve) M*:	+ve M*q = (Q x comb. factor) x 0.9m width x L^2 / 12 =		+ve	1.2	kNm
	Earthquake load combination = M*g & 0.4.M*q =		+ve	14.7	kNm
V*/rib @ 1.2m:	V*g = (Wall/roof Wt + Edge beam Wt + Slab Wt x 0.6m width) x L / 2 =			20.2	kN
	V*q = (Q x comb. factor) x 0.9m width x L / 2 =			1.8	kN
	Earthquake load combination = (V*g & 0.4V*q) =			22.0	kN

Load Case 4		4m loss of bearing - INTERNAL SLAB with L.B central wall (P, kN) - spanning over 4m gap			
Central Load on Rib = Int slab beam wt + Int. wall wt + Int. roof wt:		5.19	kN (per m width of beam crossing ribs)		
L = 4.0m	M*g = Slab Wt .L^2 / 8 + P.L / 8 =	-ve	10.2	kNm	
	M*q = Q x comb. Factor.L^2 / 8 =	-ve	2.0	kNm	
M*/rib @ 1.2m:	Earthquake load combination = (M*g & 0.4M*q) x 1.2m (rib spacing) =	-ve	14.6	kNm	
V*/rib @ 1.2m:	V*g = Slab Wt.L / 2 + P/2 =		10.2	kN	
	V*q = (Q x comb. factor).L / 2 =		2.0	kN	
	Earthquake load combination = (V*g & 0.4V*q) x 1.2m (rib spacing) =		14.6	kN	

Load Case 5		4m loss of bearing - INTERNAL 300mm BEAM with L.B central wall (P kN/m) - spanning over 4m gap			
		Distributed wall & roof weight, W:	2.31	kN/m	
		Additional point Load, P:	1	kN (assume central)	
L = 4.0m	M*g = (Beam Wt + 0.9m Slab Wt + W) .L^2 / 8 + P.L / 4 =			18.2	kNm
	M*q = (Q x comb. Factor) x 1.2m width .L^2 / 8 =			2.4	kNm
-ve & +ve M*:	Earthquake load combination = M*g & 0.4.M*q =			20.6	kNm
V*/rib @ 1.2m:	V*g = (Rib Wt + 0.9m Slab Wt +P).L/2 + P/2 =			17.7	kN
	V*q = (Q x comb. factor) x 1.2m width.L/2 =			2.4	kN
	Earthquake load combination = (V*g & 0.4V*q) x 1.2m (rib spacing) =			20.1	kN

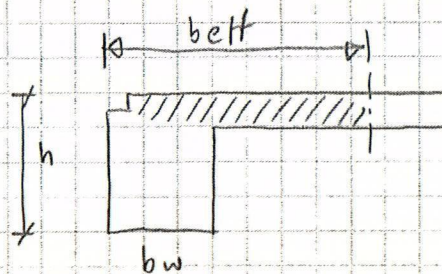
Sectional shapes

1. Slab bending



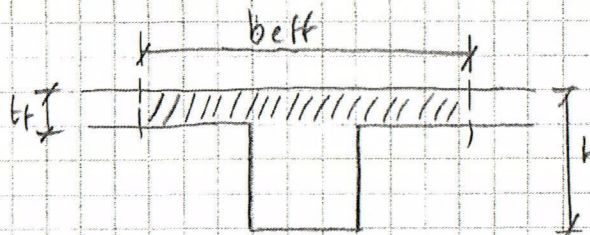
$$b_{eff} = 2 \cdot h + b_w < 8 t_f$$

2. Edge Beam



$$b_{eff} = h + b_w$$

3. Internal L.B. Rib



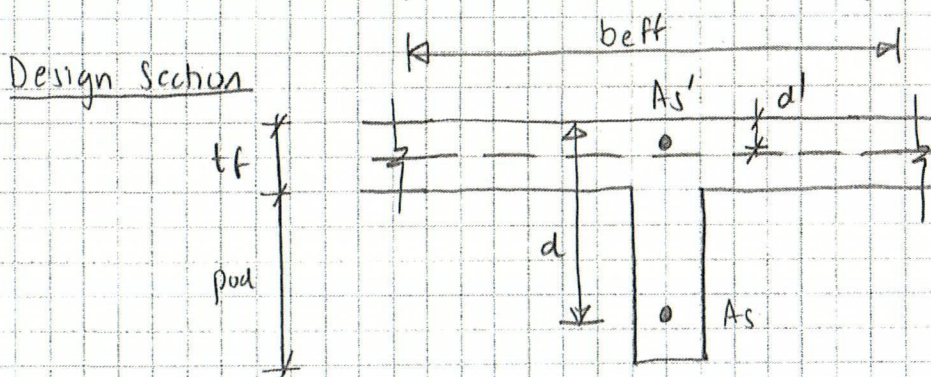
$$b_{eff} = 2 \cdot h + b_w < 8 t_f$$

Design of Fibre Reinforced Ribraft Slabs (SFR)

- Design in accordance with NZS 3101 - appendix to CS
- The design mix shall contain steel fibres so that:

$$\left. \begin{array}{l} f_{R,1} = 1.5 \text{ MPa} \\ f_{R,4} = 1.0 \text{ MPa} \end{array} \right\} \begin{array}{l} \text{Residual tensile strengths in} \\ \text{design mix by supplier} \end{array}$$

(See fig C5 A.1 - 'Cmod' Diagram)

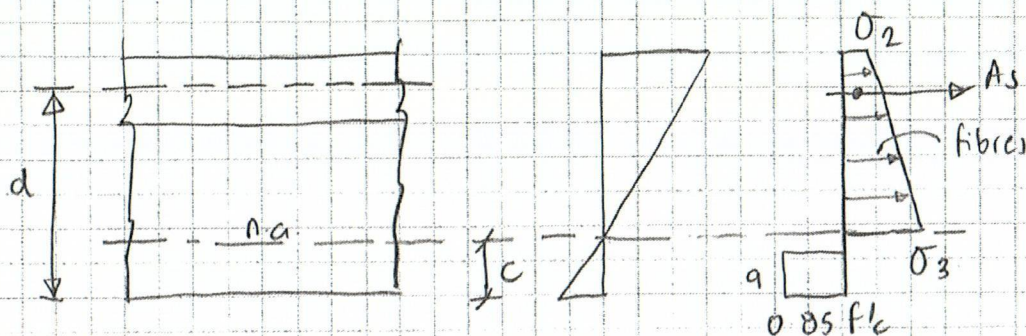


$$A_s' = \text{mesh within } b_{eff} + \text{additional bar}$$

$$d = h - 50 \text{ typically} \quad d' = 35 \text{ mm typ}$$

Design procedure - use spreadsheet to make following calculations

1. hogging (tension at top)



Stress profile to NZS 3101

- σ_2 & σ_3 are calculated as follows:

$$\left. \begin{aligned} \sigma_2 &= 0.45 f_{R,1} k_h \\ \sigma_3 &= 0.37 f_{R,4} k_h \end{aligned} \right\} \text{ where } k_h = \text{size factor}$$

$$k_h = 1.0 - 0.6 \left(\frac{h - 125}{475} \right)$$

where $125 < h < 600$

- $f_{R,1}$ & $f_{R,4}$ are specified as 1.5 & 1.0 in the design mix

Once σ_2 & σ_3 are known, take moments of stress \times conc area for the flange & web & for $A_s(d - a/2)$ to determine section strength.

- adjust 'c' (na) depth until Compression = Tension
- This process is done using the attached spreadsheet

2 - Sagging - a similar approach is used.

3 - Shear - the most benefit of using SFR is that no minimum shear is required when the fibre mix & type is adequate to ensure the characteristic residual flexural strength $f_{R,4} \geq 1.0 \text{ MPa}$.

$$\text{Ensure } V_n < V_{d,3} = V_b + V_{fd}$$

$$V_b = \text{concrete shear contribution as per NZS3101}$$

$$= k_a k_d (0.07 + 10 \rho_w) \sqrt{f_c} b_w d$$

$$V_{fd} = \text{steel fibre contribution of shear strength}$$

$$= 0.7 \cdot k_f \cdot k_1 \cdot \gamma_{fd} \cdot b_w d$$

$$\text{where } k_f = 1 + n \left(\frac{h_f}{b_w} \right) \left(\frac{h_t}{d} \right) \leq 1.5 \quad \text{where } n = \frac{b_f - b_w}{h_f} \leq 3.0$$

$$\text{ \& } n < 3 b_w / h_f$$

$$k_1 = 1 + \sqrt{\frac{200}{d}} \leq 2$$

$$\text{ \& } \gamma_{fd} = 0.12 f_{R,4} \text{ (inc in shear strength due to fibre)}$$

ENGCO Consulting - Steel fibre reinforced (SFR) Ribraft slabs calculator to NZS3101 - Appendix C5

LOAD CASE 1 - 2m loss of edge bearing - Cantilevering of slab ribs (Hogging only)

Contract: LOT 54 - GOLDNEY CLOSE				Location: Rosemerryn Estate - Stage 2 - Lincoln				Date: 21-Aug-12		File: EngCo 12-196	
member actions (from first page) :		M*-ve:	27.0	kNm/1.2m		M*+ve: N.A. (Tension at top only)		V* :	16.2	kN/1.2m	
RED CELLS FROM PREVIOUS INPUT						INPUT CELLS IN BLUE					

1. Member and reinforcing details (see design notes)

Section details				fibre details							sectional properties			
f'c	20	Mpa	As,mesh/m	150	mm ²	r1	1.5	MPa	modifier	0.45	Ag = 110000 mm ²			
b.eff	800	mm	As,mesh eff	120	mm ²	fr4	1	MPa	modifier	0.37	N.A. depth from top = 104.55 mm			
df	100	mm									Act top = 80455 mm ²			
bw	100	mm				kh =	0.653				Act Bottom = 29545 mm ²			
h	400	mm												
d'	35	mm	from top											
d	350	mm	from top								check minimum reinforcement requirement			
flange reo	233	mm ²	Mesh/H12	fy	500	MPa			As(min) flange =	76.4	from C5A-17 of NZS3101			
web reo	113	mm ²	H12	fy	500	MPa			As(min) rib =	28.1	assumes pure bending			

2. Bending strength - flange in tension (hogging)

a=	81.04	mm	c=	95.3	
(adjust "a" so C = T)					
			T (reo) =	116.50	kN
			T (fibre) =	21.27	kN
C=	137.77	kN	T (Total) =	137.77	kN
fibre stress profile		moments (about c)			
σ2 (at c=)	0.441		fibre flange	4.02	
at flange junction	0.289		fibre web	1.12	
σ3 (at reo)	0.241		reo	37.80	
			total	42.94	
M* = 27.0			ΦMn	36.5	kNm
					OK

3. Bending strength - flange in compression (sagging)

a=	6.97	mm	c=	8.2	
(adjust "a" so C = T)					
			T (reo) =	56.50	kN
			T (fibre) =	38.25	kN
C=	94.75	kN	T (Total) =	94.75	kN
fibre stress profile		moments (about c)			
σ2 (at c=)	0.441		fibre flange	1.51	
at flange junction	0.387		fibre web	1.66	
σ3 (at reo)	0.241		reo	19.58	
			total	22.75	
M* = N.A.			ΦMn	19.3	kNm
					N.A.

4. Shear Strength

shear strength of hogging section					shear strength of sagging section				
pw=	0.00638		kf=	1.5	n=	3	pw	0.00323	
Vb=	21.85	kN	(kf must be less than:)		(n lesser of:)		Vb=	16.01	kN
Vfd	8.08	kN	k1	1.76	n1	3	Vfd	7.74	kN
Φ Vc	22.4	kN			n2	3.00	Φ Vc	17.8	kN
Vb1	21.85	(=0.7+10pw).sqrt(f'c).dbw)							
vb2	27.75								

ENGCO Consulting - Steel fibre reinforced (SFR) Ribraft slabs calculator to NZS3101 - Appendix C5

Load Case 2 : 2m loss of edge bearing - Edge Beam Actions at corner (hogging)

Contract	LOT 54 - GOLDNEY CLOSE	Location:	Rosemerryn Estate - Stage 2 - Lincoln	Date:	21-Aug-12	File:	EngCo 12-196
member actions:	M*-ve: 36.1	kNm	M*+ve: N.A. (tension at top only)	V* :	28.4	kN	
		RED CELLS FROM PREVIOUS INPUT	INPUT CELLS IN BLUE				

1. Member and reinforcing details (see design notes)

Section details				fibre details				sectional properties			
f'c	20	Mpa	As,mesh/m	150	mm ²	r1	1.5	MPa	modifier	0.45	Ag = 160000 mm ²
bf	700	mm	As,mesh eff	105	mm ²	fr4	1	MPa	modifier	0.37	N.A. depth from top = 162.50 mm
df	100	mm									Act top = 88750 mm ²
bw	300	mm				kh =	0.653				Act Bottom = 71250 mm ²
h	400	mm									
d'	35	mm	from top								
d	350	mm	from top								
flange reo	331	mm ²	Mesh / 2-H12	fy	500	MPa			check minimum reinforcement requirement		
web reo	226	mm ²	2-H12	fy	500	MPa			As(min) flange = 84.3	from C5A-17 of NZS3101	
									As(min) rib = 67.7	assumes pure bending	

2. Bending strength - flange in tension (hogging)

a=	40.16	mm	c=	47.2	
(adjust "a" so C = T)					
			T (reo) =	165.50	kN
			T (fibre) =	39.31	kN
C=	204.81	kN	T (Total) =	204.81	kN
fibre stress profile		moments (about c)			
σ2 (at c=)	0.441		fibre flange	3.71	
at flange junction	0.282		fibre web	3.95	
σ3 (at reo)	0.241		reo	57.08	
			total	64.75	
M* = 36.1			Φ Mn	55.0	kNm
					OK

3. Bending strength - flange in compression (sagging)

a=	13.54	mm	c=	15.9	
(adjust "a" so C = T)					
			check less than : 100		
			T (reo) =	113.00	kN
			T (fibre) =	48.15	kN
C=	161.15	kN	T (Total) =	161.15	kN
fibre stress profile		moments (about c)			
σ2 (at c=)	0.441		fibre flange	1.23	
at flange junction	0.390		fibre web	4.94	
σ3 (at reo)	0.241		reo	38.78	
			total	44.95	
M* = N.A.			Φ Mn	38.2	kNm
					N.A.

4. Shear Strength

shear strength of hogging section					shear strength of sagging section				
pw=	0.00302		kf=	1.285714	n=	3			
Vb=	49.08	kN	(kf must be less than:)		(n lesser of:)				
Vfd	20.77	kN	k1	1.76	n1	3			
Φ Vc	52.4	kN			n2	9.00			
Vb1	49.08	(=0.7+10pw).sqrt(f'c).dbw)			Vb1	42.98			
vb2	83.25				vb2	79.83			
									OK

Load case 2 solution:

300mm wide edge beam - 2-H12 top bars and 2-H12 bottom bars - 20Mpa SFR concrete

FILE COPY
121502

ENGCO Consulting Ltd - Steel fibre reinforced (SFR) Ribraft slabs calculator to NZS3101 - Appendix C5

LOAD CASE 3 - 4m Loss of bearing on edge beam

Contract LOT 54 - GOLDNEY CLOSE	Location: Rosemerryn Estate - Stage 2 - Lincoln	Date: 21-Aug-12	File: EngCo 12-196
member actions: M*-ve: 22.0 kNm	M*+ve: 14.7 kNm	V*: 22.0 kN	
RED CELLS FROM PREVIOUS INPUT		INPUT CELLS IN BLUE	

1. Member and reinforcing details (see design notes)

2. Member and Reinforcing details (see design notes)														
Section details					fibre details					sectional properties				
f'c	20	Mpa	As,mesh/m	150	mm ²	r1	1.5	MPa	modifier	0.45	Ag =	160000	mm ²	
bf	700	mm	As,mesh eff	105	mm ²	fr4	1	MPa	modifier	0.37	N.A. depth from top =	162.50	mm	
df	100	mm									Act top =	88750	mm ²	
bw	300	mm				kh =	0.653				Act Bottom =	71250	mm ²	
h	400	mm												
d'	35	mm	from top											
d	350	mm	from top											
flange reo	331	mm ²	Mesh / 2-H12	fy	500	MPa					check minimum reinforcement requirement			
											As(min) flange =	84.3	from C5A-17 of NZS3101	
web reo	226	mm ²	2-H12	fv	500	MPa					As(min) rib =	67.7	assumes pure bending	

2. Bending strength - flange in tension (hogging)

a=	40.16	mm	c=	47.2	
(adjust "a" so C = T)					
			T (reo) =	165.50	kN
			T (fibre) =	39.31	kN
C=	204.81	kN	T (Total) =	204.81	kN
fibre stress profile		moments (about c)			
σ2 (at c=)	0.441	fibre flange	3.71		
at flange junction	0.282	fibre web	3.95		
σ3 (at reo)	0.241	reo	57.08		
		total	64.75		
M* = 22.0		ΦMn	55.0	kNm	OK

3. Bending strength - flange in compression (sagging)

a= 13.54 mm	c= 15.9	check < 100
(adjust "a" so C = T)	check less than : 100	
	T (reo) = 113.00 kN	
	T (fibre) = 48.15 kN	
C= 161.15 kN	T (Total) = 161.15 kN	
fibre stress profile		moments (about c)
σ2 (at c=)	0.441	fibre flange 1.23
at flange junction	0.390	fibre web 4.94
σ3 (at reo)	0.241	reo 38.78
		total 44.95
M*= 14.67	ΦMn 38.2 kNm	OK

4. Shear Strength

shear strength of hogging section					shear strength of sagging section				
pw= 0.00302		kf= 1.2857143		n= 3		pw 0.00215			
Vb= 49.08 kN		(kf must be less than:)		(n lesser of:)		Vb= 42.98 kN			
Vfd 20.77 kN		k1 1.76		n1 3		Vfd 19.91 kN			
Φ Vc 52.4 kN				n2 9.00		Φ Vc 47.2 kN			
Vb1 49.08		(=0.7+10pw).sqrt(f'c).dbw)			Vb1 42.98				
vb2 83.25					vb2 79.83				

V* = 22.0

Φ Vc = 47.2

OK

Load case 3 solution:

300mm wide edge beam - 2-H12 top bars and 2-H12 bottom bars - 20Mpa SFR concrete

ENGCO Consulting - Steel fibre reinforced (SFR) Ribraft slabs calculator to NZS3101 - Appendix C5

Load Case 4 : 4m loss of bearing under 100mm ribs across INTERNAL BEAM with L.B central wall (P kN/m)

Contract LOT 54 - GOLDNEY CLOS				Location: Rosemerryn Estate - Stage 2 - Lincoln				Date: 21-Aug-12		File: EngCo 12-196	
member actions:		M*-ve:	14.6	kNm/1.2m	M*+ve:	14.6	kNm/1.2m	V* :	14.6	kN/1.2m	
RED CELLS FROM PREVIOUS INPUT							INPUT CELLS IN BLUE				

1. Member and reinforcing details (see design notes)

Section details				fibre details						sectional properties			
f'c	20	Mpa	As,mesh/m	150	mm ²	r1	1.5	MPa	modifier	0.45	Ag =	110000	mm ²
bf	800	mm	As,mesh eff	120	mm ²	fr4	1	MPa	modifier	0.37	N.A. depth from top =	104.55	mm
df	100	mm									Act top =	80455	mm ²
bw	100	mm				kh =	0.653				Act Bottom =	29545	mm ²
h	400	mm											
d'	35	mm	from top										
d	350	mm	from top										
flange reo	120	mm ²	mesh only	fy	500	MPa			As(min) flange =	76.4	from C5A-17 of NZS3101		
web reo	113	mm ²	H12	fy	500	MPa			As(min) rib =	28.1	assumes pure bending		

2. Bending strength - flange in tension (hogging)

a=	48.50	mm	c=	57.1	
(adjust "a" so C = T)					
			T (reo) =	60.00	kN
			T (fibre) =	22.44	kN
C=	82.44	kN	T (Total) =	82.44	kN
fibre stress profile					
σ2 (at c=)	0.441		moments (about c)		
at flange junction	0.283		fibre flange	4.20	
σ3 (at reo)	0.241		fibre web	1.28	
			reo	20.45	
			total	25.92	
M* = 14.6			Φ Mn	22.0	kNm
					OK

3. Bending strength - flange in compression (sagging)

a=	6.97	mm	c=	8.2	check <	100
(adjust "a" so C = T)					check less than :	100
			T (reo) =	56.50	kN	
			T (fibre) =	38.25	kN	
C=	94.75	kN	T (Total) =	94.75	kN	
fibre stress profile						
σ2 (at c=)	0.441		moments (about c)			
at flange junction	0.387		fibre flange	1.51		
σ3 (at reo)	0.241		fibre web	1.66		
			reo	19.58		
			total	22.75		
M* = 14.6			Φ Mn	19.3	kNm	
						OK

4. Shear Strength

shear strength of hogging section					shear strength of sagging section				
pw=	0.00329		kf=	1.5	n=	3	pw	0.00323	
Vb=	16.79	kN	(kf must be less than		(n lesser of:)		Vb=	16.01	kN
Vfd	8.08	kN	k1	1.76	n1	3	Vfd	7.74	kN
Φ Vc	18.7	kN			n2	3.00	Φ Vc	17.8	kN
Vb1	16.79	(=0.7+10pw).sqrt(f'c).dbw)			Vb1	16.01			
vb2	27.75				vb2	26.61			
</									

Load Case 5 : 4m loss of bearing - INTERNAL 300mm BEAM with L.B central wall (P kN/m) - spanning over 4m gap

Contract LOT 54 - GOLDNEY CLOSE	Location: Rosemerryn Estate - Stage 2 - Lincoln	Date: 21-Aug-12	File: EngCo 12-196
member actions: M*-ve: 20.6	kNm/1.2m M*+ve: 20.6	kNm/1.2m V* : 20.1	kN/1.2m
RED CELLS FROM PREVIOUS INPUT		INPUT CELLS IN BLUE	

1. Member and reinforcing details (see design notes)

Section details			fibre details							sectional properties			
f'c	20	Mpa	As,mesh/m	150	mm ²	r1	1.5	MPa	modifier	0.45	Ag =	170000	mm ²
bf	800	mm	As,mesh eff	120	mm ²	fr4	1	MPa	modifier	0.37	N.A. depth from top =	155.88	mm
df	100	mm									Act top =	96765	mm ²
bw	300	mm				kh =	0.653				Act Bottom =	73235	mm ²
h	400	mm											
d'	35	mm	from top										
d	350	mm	from top										
flange reo	346	mm ²	Mesh / 2-H12	fy	500	MPa			As(min) flange =	91.9	from C5A-17 of NZS3101		
web reo	226	mm ²	2-H12	fy	500	MPa			As(min) rib =	69.6	assumes pure bending		

2. Bending strength - flange in tension (hogging)

a=	41.92	mm	c=	49.3	
(adjust "a" so C = T)					
			T (reo) =	173.00	kN
			T (fibre) =	40.81	kN
C=	213.81	kN	T (Total) =	213.81	kN
fibre stress profile			moments (about c)		
σ2 (at c=)	0.441		fibre flange	4.23	
at flange junction	0.282		fibre web	3.93	
σ3 (at reo)	0.241		reo	59.52	
			total	67.68	
M* = 20.6			ΦMn	57.5	kNm
					OK

3. Bending strength - flange in compression (sagging)

a=	12.14	mm	c=	14.3	check < 100
(adjust "a" so C = T)					
			T (reo) =	113.00	kN
			T (fibre) =	52.13	kN
C=	165.13	KN	T (Total) =	165.13	kN
fibre stress profile			moments (about c)		
σ2 (at c=)	0.441		fibre flange	1.43	
at flange junction	0.390		fibre web	4.95	
σ3 (at reo)	0.241		reo	38.86	
			total	45.24	
M* = 20.63			ΦMn	38.5	kNm
					OK

4. Shear Strength

shear strength of hogging section						shear strength of sagging section					
pw=	0.00316		kf=	1.2857143	n=	3	pw	0.00215			
Vb=	49.75	kN	(kf must be less than:)		(n lesser of:)		Vb=	42.98	kN		
Vfd	20.77	kN	k1	1.76	n1	3	Vfd	19.91	kN		
Φ Vc	52.9	kN			n2	9.00	Φ Vc	47.2	kN		
										V* =	20.1
										Φ Vc =	47.2
Vb1	49.75	(=0.7+10pw).sqrt(f'c).dbw)					Vb1	42.98			
vb2	83.25						vb2	79.83			OK

Load case 5 solution: 300mm wide internal beam with 2-H12 top bars and 2-H12 bottom bars - 20Mpa SFR concrete



MEMORANDUM OF DESIGN OF RESTRICTED BUILDING WORK FROM LICENSED BUILDING PRACTITIONER (LBP)

The Building: Lot 54, DP 451072, Goldney Close, Rosemerryn Estate, Lincoln

The Owner: Horncastle Homes

LBP: M Cusiel CPEng 161509

Practice Area: Structural

Design Legal Entity: The Engineering Company Ltd, 8/1025 Ferry Rd, Christchurch 8023, 03 366 7955

(Design firm name / Address / email / phone)

Identification of design work that is Restricted Building Work

Description of Restricted Building Work	BC Clause	Means of compliance	Reliance on other LBPs	Reliance on Proprietary Elements	Waiver
RibRaft Floor Slab	B1	B1/VM1	Yes	Yes	

Accompanying Documents

Drawing Register ☐
Drawings ☐
Calculations ☐

Specifications ☐
Design Report ☐
Geotechnical Report ☐

PS 1 ☒
PS 2 ☐
Other ☐

By

Declaration

I, **Matthew Cusiel**, LBP state that I have applied the skill and care reasonably required of a competent design professional in carrying out or supervising the Restricted Building Work described on this form and that based on this I also state that the RBW:

- (a) complies with the Building Code clauses identified on this form; or
(b) complies with the Building Code subject to any waiver or modification of the Building Code recorded on this form.

Signature: 

Date: 22 August 2012

Note: This form is consistent with clause 45(a) of the Building Act 2004. The form shall only be used for residential projects less than 10 metres high.



MiTek New Zealand Limited

Correspondence from : **AUCKLAND**
40 Neales Road, East Tamaki 2013
PO Box 58-014, Botany 2163
Phone: 09 274 7109
Fax: 09 274 7100

CHRISTCHURCH
14 Pilkington Way, Wigram 8042
PO Box 8387, Riccarton 8440
Phone: 03 348 8691
Fax: 03 348 0314

www.mitek.nz.co.nz

MiTek 20/20 Engineering 4.6.6.138

Printed: 21:08:31 07 Aug 2012

PRODUCER STATEMENT for MiTek 20/20[®] TRUSS DESIGN - Version 4.6

ISSUED BY: **MiTek New Zealand Limited**

TO: **Christchurch Manufacturing**

IN RESPECT OF: **MiTek[®] Truss Designs**

This producer statement covers the MiTek 20/20[®] truss design and the structural performance of the GANG-NAIL[®] connector plate for the job reference **CD084818** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

The MiTek 20/20[®] truss design program has been developed by MiTek New Zealand Limited for the design of MiTek[®] timber roof, floor and attic trusses in New Zealand. The truss designs computed by MiTek 20/20[®] are prepared using sound and widely accepted engineering principles, and in accordance with compliance documents of the New Zealand Building Code and Verification Method B1/VM1; and internationally accepted standard ANSI/TPI 1 - 2002 as an alternative solution to satisfy the requirements of Clause B1 of the New Zealand Building Code.

On behalf of MiTek New Zealand Limited, and subject to:

- i) All proprietary products meeting their performance specification requirements
- ii) The provision of adequate roof bracing and overall building stability
- iii) Correct selection and placement of GANG-NAIL connector plates
- iv) Correct input of Truss Design Data as shown in the Fabricator Design Statement for this job
- v) The design being undertaken by the accredited fabricator under the terms of the software licence

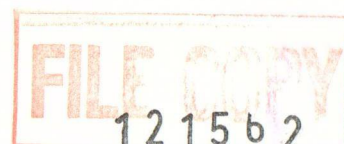
I believe on reasonable grounds that the trusses, if constructed in accordance with the MiTek 20/20[®] truss design and shop drawings, will comply with the relevant provisions of the New Zealand Building Code.

MiTek New Zealand Limited holds a current policy of Professional Indemnity Insurance no less than \$500,000.

On behalf of MiTek New Zealand Limited,

Date: Tuesday, 7 August 2012

In Ling Ng, BE (Hons), CPEng, IntPE, MIPENZ (ID: 146585)
TECHNICAL SERVICES MANAGER, MiTek New Zealand Limited



Job: CD084818

Client: Horncastle Homes
Phone:Site: J3634
Lot 54, Goldney Close
RosemerryDescription:
Building Consent No.:
MiTek 20/20 Engineering 4.6.6.138

MiTek New Zealand Limited.

Phone:

Printed: 21/08/11 07:07 Aug 2012

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator **Christchurch Manufacturing**, being licensed to use the MiTek 20/20® software, to the client listed above and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

MiTek 20/20® TRUSS DESIGN DATA

The MiTek 20/20® computer design for this job is based on the following design parameters entered into the program. The Fabricator shall ensure that these job details are current and relevant to the project for the design of the MiTek® trusses.

Job Details

Importance Level : 2

Design Working Life : 50 years

Roof Truss

Timber Group: MSG8 DDP H1.2

Pitch: 26.000 deg

Nominal Overhang: 600 mm

RoofMaterial: Galv Iron .5mm
Dead Load: 0.210 kPa
Restraints: 900 mm centres
Live Load: Q_{ur} = 0.250 kPa
Q_c = 1.100 kN**Ceiling**Material: Standard
Dead Load: 0.200 kPa
Restraints: 400 mm centres
Live Load: Q_c = 1.400 kN**Wind**Area: High (44.0 m/s)
Pressure Coeff: C_{pe} = varies; C_{pi} = -0.30, 0.20**Snow**Location: at 100 m
Open Ground Load: 0.900 kPa
Basic Roof Load: 0.428 kPa

The timber for these MiTek® trusses shall be treated to the requirements of NZS 3602:2003 and shall be graded to the requirements of NZS 3603:1993. Unless otherwise noted, this design assumes that the steel fixings and timber connectors proposed are located in a "closed environment", as defined by NZS3604:2011 Section 4.

MiTek® Truss List

Legend: * = detail only, ? = input only, Fxx = failed design, Ø = non certified, Unmarked trusses = designed successfully, LB = lateral bracing required
GB = gable brace 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)
CJ1	1	2307	26.000	900	J2A	1	2182	26.000	900	T1A	1	8010	26.000	900
CJ1A	1	2307	26.000	900	J2B	1	2182	26.000	900	T2	1	5500	26.000	900
CT1	1	5980	26.000	900	J2C	3	2182	26.000	900	T2A	3	5500	26.000	900
CT2	3	5980	26.000	900	J3	3	1282	26.000	900	T3	1	6375	26.000	900
*ET1	1	4245	26.000	900	J3A	3	1282	26.000	900	T4	1	8010	26.000	900
*HB1	3	6458	19.028	900	J4	1	2727	26.000	900	T5	1	4245	26.000	900
*HB2	1	2371	19.028	900	J4A	1	2727	26.000	900	T5A	1	4245	26.000	900
*HB3	1	3342	19.028	900	J4B	1	2727	26.000	900	T6	1	4245	26.000	900
*HB4	2	4683	19.028	900	J5	1	1827	26.000	900	TG1	1	8010	26.000	900
HT1	1	5500	26.000	900	J5A	1	1827	26.000	900	TG2	1	6375	26.000	900
HT2	1	5500	26.000	900	*R1	3	973	26.000	900	V1	1	2083	26.000	900
J1	4	3082	26.000	900	*R2	2	1518	26.000	900	V2	1	1183	26.000	900
J1A	1	3082	26.000	900	*R3	3	891	26.000	900	V3	1	1587	26.000	900
J1B	1	3082	26.000	900	*R3A	1	891	26.000	900	V4	1	2487	26.000	900
J1C	1	3082	26.000	900	*R4	1	774	26.000	900	V5	1	878	26.000	900
J1D	1	3082	26.000	900	*R5	1	5445	26.000	900	V6	1	1373	26.000	900
J1E	2	3082	26.000	900	*R6	10	1305	0.000	669	V7	1	473	26.000	900
J2	1	2182	26.000	900	T1	5	8010	26.000	900					

Total quantity : 88

The computer design input has been carried out by:

Name of Computer Operator: Brent Yellowlees

Qualifications and Title: Truss Detailer

Signed:

CARTERS

A Division of Carter Holt Harvey

Dated: Tuesday, 7 August 2012

BUILDING CONSENT LAYOUT

CARTERS
MANUFACTURING

21 Broughs Rd
Christchurch
Ph (03) 359 2731

JOB No **CD084818**

Client: Horncastle Homes
Job Name: J3634
Address: Lot 54, Goldney Close
Rosemerry

Consent #:

Pitch: 26.000
Roof Material: Galv Iron .5mm
Soffit Overhang: 600
Wind Area: High
Snow Load: 0.428 (Factored)

Trusses And Rafters At 900 Centres
Unless Stated Otherwise.

This layout is to be read in conjunction
with the Architectural plans.

DRAWN BY Brent Yellowlees

DATE 7 Aug,2012 PAGE 1 of 2

FIXINGS

A=47x90 JH
B=47x120 JH
D=47x190 JH
E=95x165 JH



Joist Hanger

C=CT200 (Pair)
M=Multigrip (Pair)
N=Nail On Plate
K=CPC 40 (Pair)
P=CPC 80 (Pair)
X=N21 Cleat (Pair)

CT 200



Multi Grips



Nail on plate



CPC

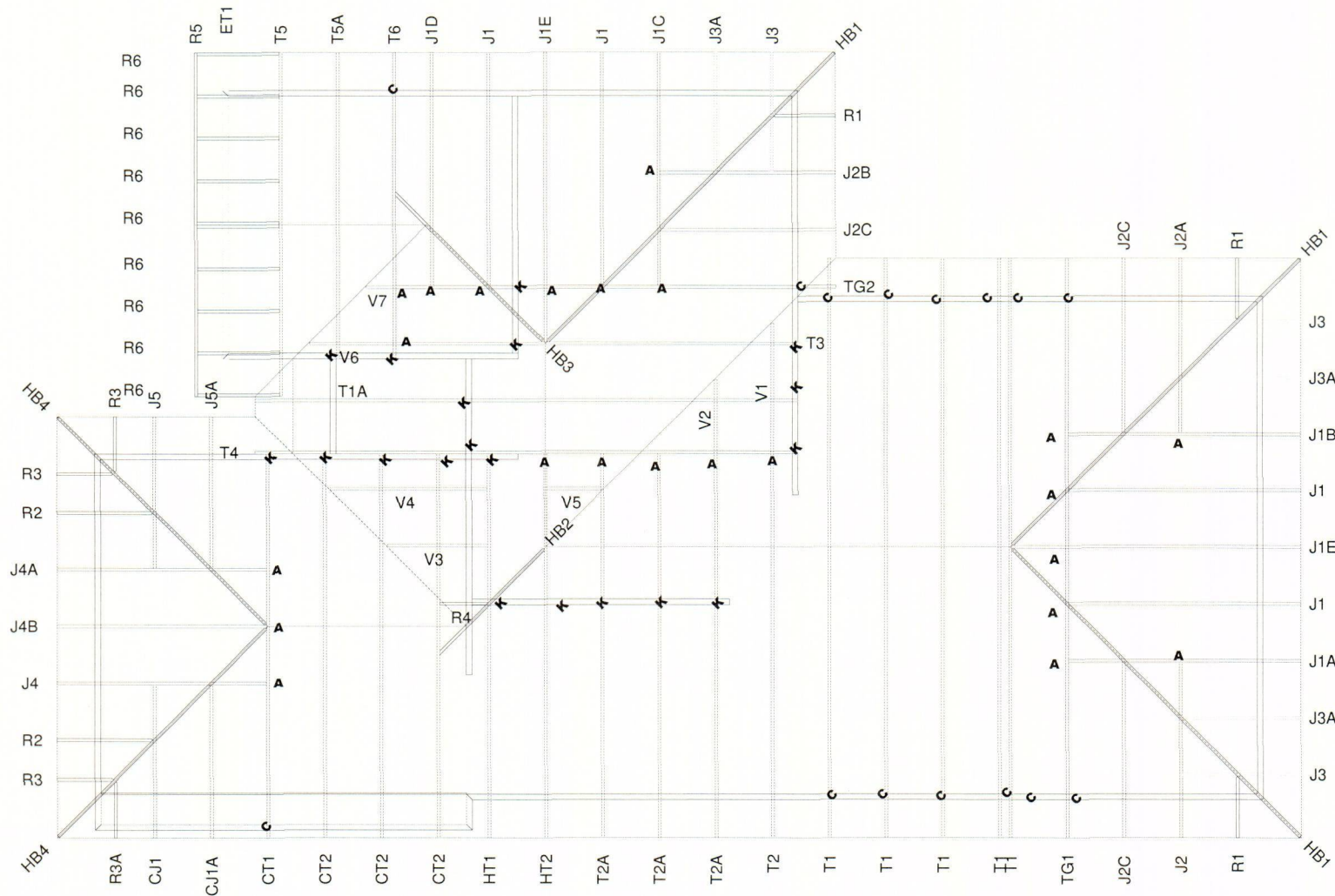
**All other Truss
fixings must be
Two wire dogs
Unless indicated
as above.**

NOTE

Please contact your local CARTERS
Manufacturing Branch for any queries
regarding this layout.
This truss layout is for consent purposes
only and must be followed by an
"As Built" layout and supporting documents
at the time of manufacture



See Page 2 for Dimensions
and Point Loads.



FILE COPY
121562

BUILDING CONSENT LAYOUT

CARTERS

MANUFACTURING

21 Broughs Rd

Christchurch

Ph (03) 359 2731

JOB No **CD084818**

Client: Horncastle Homes

Job Name: J3634

Address: Lot 54, Goldney Close
Rosemeryn

Consent #:

Pitch: 26.000

Roof Material: Galv Iron .5mm

Soffit Overhang: 600

Wind Area: High

Snow Load: 0.428 (Factored)

Trusses And Rafters At 900 Centres
Unless Stated Otherwise.

This layout is to be read in conjunction
with the Architectural plans.

DRAWN BY Brent Yellowlees

DATE 7 Aug,2012 PAGE 2 of 2

These lintels have been sized using
one of the following:

The GANGLAM 04/2008 and
FLITCH BEAM 12/2007
selection manuals from MiTek NZ Ltd.

hyONE and hy90 lintels have been sized
using designIT v4 NZ software
(incl. sub versions) or selection manuals,
hy90 Edition 1, and hyONE April 2008 as
provided by CHH Woodproducts.

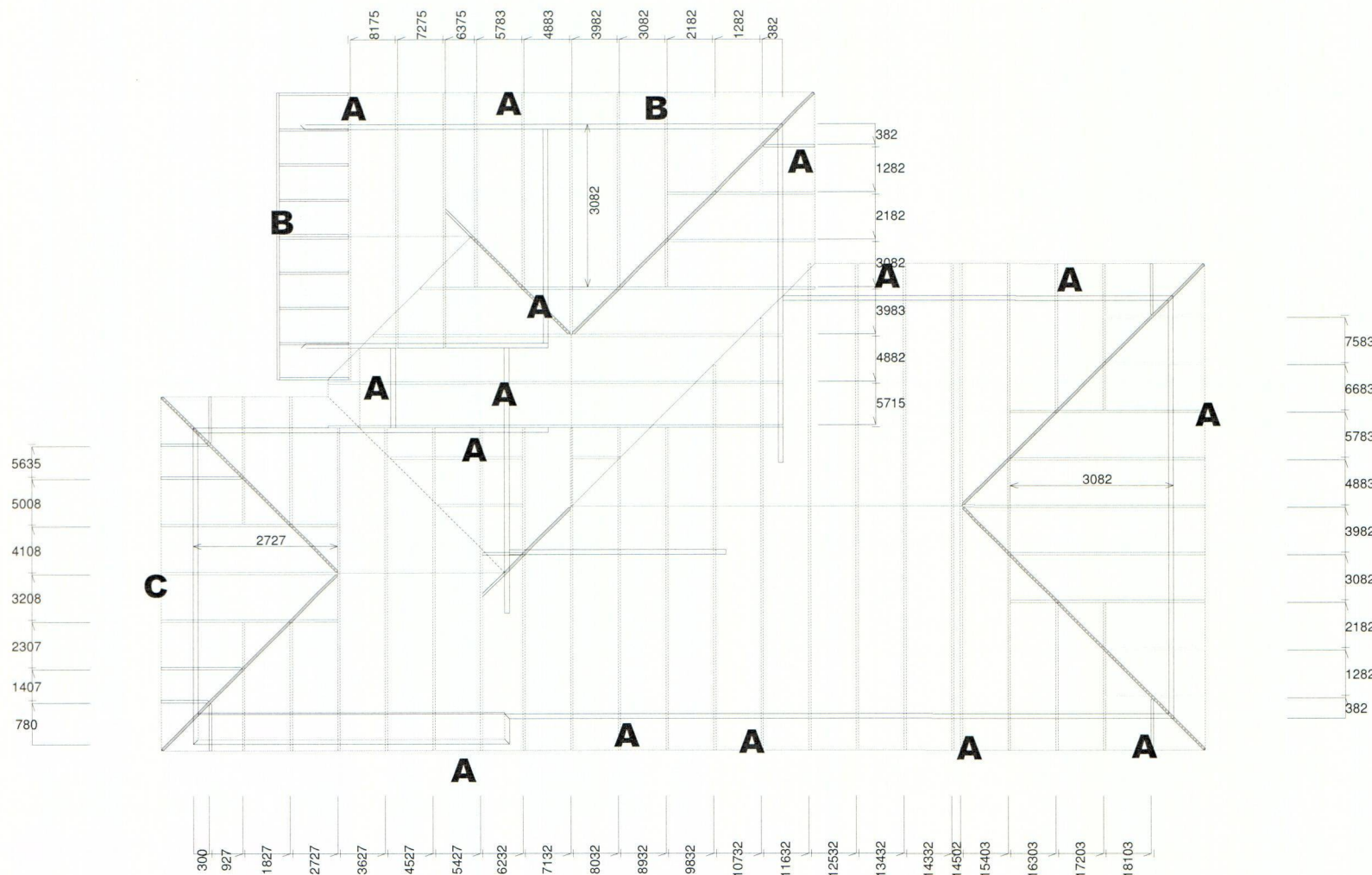
Unless otherwise stated the timber grade
for all lintels is MSG8. Lintels not shown
are to be selected as per NZS3604 2011.

All walls shown on this layout are
considered to be load bearing.

LINTEL	SIZE	GRADE
A	150 x 90	hy90
B	200 x 90	hy90
C	300 x 90	hy90



See Page 1 for
Truss Layout and
Fixings



NOTIFICATION OF POINT LOADED LINTELS AND POINT LOADS ON
INTERNAL WALLS WHERE THE DOWNLOAD IS HIGHER THAN 10kN
OR THE UPWARD LOAD IS GREATER THAN 12kN
Note: If no point loads indicated, loading does not exceed above.

Benefits of using our building products

Lightweight construction

Lightweight James Hardie building products mean lighter building frames that require lower embodied energy materials to support the building systems. This also means lighter concrete foundations and thinner-gauge steel or timber sections to support upper-storey construction. Lightweight construction materials consume less energy to transport to site and are much quicker to install.

In brief, lightweight construction, which can be achieved by using James Hardie building products, helps to achieve an overall smaller carbon footprint.

For more information on lightweight construction visit www.jameshardie.co.nz

Just the right size

Minimising and recycling waste can have significant social, economic and environmental benefits. With this in mind, designers and installers should place a greater emphasis on selecting building materials and product sizes that minimise waste. The range of products and sizes offered by James Hardie assists in minimising waste.

Low maintenance

James Hardie products require lower maintenance when compared to some other conventional building materials. Lower maintenance generally means you'll need to paint less frequently = greater ecological sustainability over the life of a building.

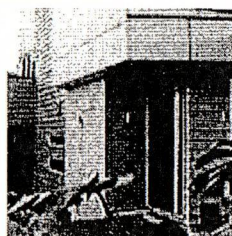
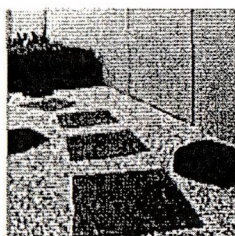
Durability

Some of the hidden factors that determine the true environmental impact of a product are its serviceable life, maintenance and disposal requirements. James Hardie building products have a proven durability record. All products we develop are exposed to extreme weather conditions they will face during their lifetime such as dry to wet, humid, hot and freezing temperatures in order to evaluate their performance. The following tests are carried out on James Hardie fibre cement products to test their real life durability performance. These tests are carried out in accordance with AS/NZS 2908.2

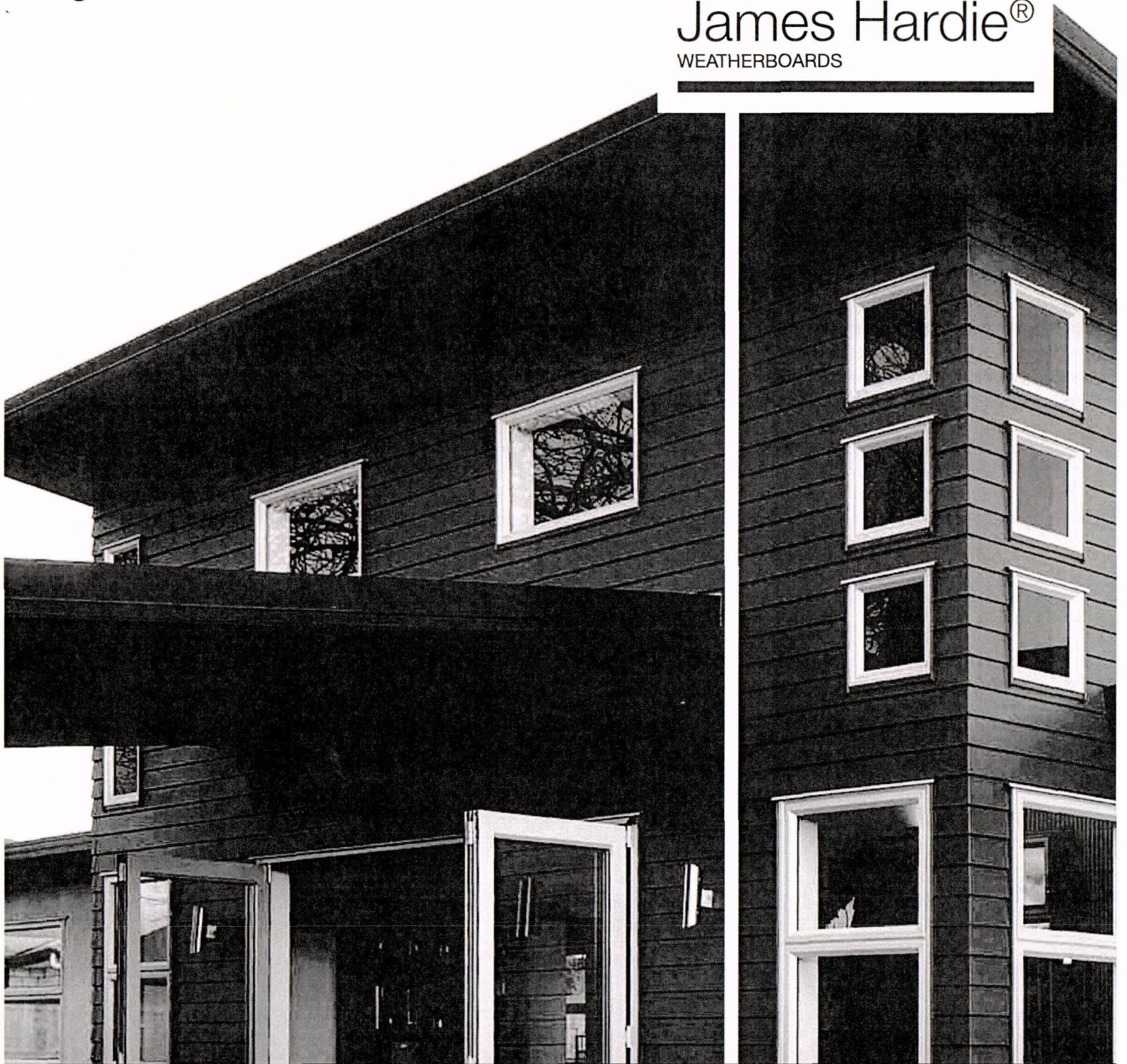
- Water permeability – testing weather resistance of an exterior product
- Warm water – testing for strength when the product is subjected to warm water
- Heat rain – testing the product performance in varying dry or wet conditions
- Soak dry – testing strength after prolonged wetting
- Frost resistance – testing for strength after exposure to freeze and thaw conditions

James Hardie building products are also resistant to termite attack and are suitable where non-combustible materials are required by the New Zealand Building Code (NZBC). This is particularly relevant when building products are required close to a boundary. James Hardie cladding/lining products outperform other building materials such as timber, UPVC or EIFS when used in a fire-rated wall construction.

Regularly maintained, James Hardie products will not only meet the minimum durability requirements of NZBC, but will also meet the 50-year serviceable life requirement for a timber-framed building.



James Hardie®
WEATHERBOARDS



Technical Specification

FEBRUARY 2012 / NEW ZEALAND



James Hardie
a smarter way™

FILE COPY
121562

Contents

1	APPLICATION AND SCOPE	3	5	FIXING	6
1.1	Application	3		JAMES HARDIE WEATHERBOARDS	
1.2	Scope	3	5.1	General	6
1.3	Details	3	5.2	Fastener Durability	6
1.4	Specific Design	3	5.3	Nail Sizes and Fixing Method	7
2	DESIGN	3	5.4	Gun Nailing	7
2.1	Compliance	3	6	JOINTING	7
2.2	Responsibility	3	7	FINISHING	7
2.3	Site and Foundation	4	7.1	Preparation	7
2.4	Ground Clearances	4	7.2	Sealants	7
2.5	Moisture Management	4	7.3	Painting	7
2.6	Structure	4	7.4	Staining	7
2.7	Wind Loading	4	8	STORAGE AND HANDLING	8
2.8	Fire Rated Walls	4	9	MAINTENANCE	8
2.9	Energy Efficiency	4	10	PRODUCT INFORMATION	8
3	FRAMING	5	10.1	Manufacturing and Classification	8
3.1	General	5	10.2	Durability	8
3.2	Dimensions	5	10.2.1	Resistance to Moisture/Rotting	8
3.3	Structural Grade	5	10.2.2	Resistance to Fire	8
3.4	Durability	5	10.2.3	Alpine Regions	8
3.5	Frame Construction	5	10.3	Product Size and Mass	8
3.5.1	Direct Fix Construction Method	5	11	SAFE WORKING PRACTICES	9
3.5.2	Cavity Construction Method	5	12	PRODUCT SIZES	11
3.6	Tolerances	5	13	ACCESSORIES	12
4	PREPARATION	5	14	DETAILS	14
4.1	HomeRAB® PreClad™ Lining or Building Underlay	5		PRODUCT WARRANTY	39
4.2	RAB Board	5			
4.3	Flashing	5			
4.4	Vent Strip	5			
4.5	Cavity Battens	6			
4.6	Intermediate Support	6			
4.7	Corners	6			
4.8	External Corners	6			
4.9	Internal Corners	6			
4.10	Junctions and Penetrations	6			

WE VALUE YOUR FEEDBACK

To continue with the development of our products and systems, we value your input. Please send any suggestions, including your name, contact details, and relevant sketches to:

Ask James Hardie®

Fax 0800 808 988

literaturefeedback@jameshardie.co.nz

1 Application and scope

1.1 APPLICATION

James Hardie Weatherboards are made of fibre cement and are pre-primed. They are categorised as a lightweight cladding product as per NZS 3604.

James Hardie Weatherboards are manufactured in different profiles ranging between smooth and patterned finishes such as:

SMOOTH WEATHERBOARD

Smooth Weatherboard (7.5mm) is available in three widths (180mm, 240mm and 305mm) and has a smooth finish.

RUSTICATED WEATHERBOARD

Rusticated Weatherboard (7.5mm) combines a rough-sawn texture with a smooth strip in the lap area. It is 205mm wide.

STYLELINE™ WEATHERBOARD

Styleline Weatherboard (7.5mm) has a texture of indented vertical and horizontal lines. It has a smooth strip in the area of the lap. It is 205mm wide.

FRONTIER WEATHERBOARD

Frontier Weatherboard (7.5mm) is available in two widths (245mm and 310mm). The board has a woodgrain textured surface.

IF YOU ARE A SPECIFIER

Or other responsible party for a project, ensure that the information in this document is appropriate for the application you are planning and that you undertake specific design and detailing for areas which fall outside the scope of these specifications.

IF YOU ARE AN INSTALLER

Ensure that you follow the design, moisture management and associated details and material selection provided by the designer. All the details provided in this document must be read in conjunction with the specifier's specification.

MAKE SURE YOUR INFORMATION IS UP TO DATE

When specifying or installing James Hardie products, ensure you have the current manual. If you're not sure you do, or you need more information, visit www.jameshardie.co.nz or Ask James Hardie™ on 0800 808 868.

1.2 SCOPE

This specification covers the use of James Hardie Weatherboards for buildings that fall within the scope of NZS 3604 and NZBC Acceptable Solution 'E2/AS1', paragraph 1.1. This specification covers the use of James Hardie Weatherboards in both direct fixed and cavity construction methods. Please refer to 'E2/AS1' for further information regarding the selection of construction method for claddings.

1.3 DETAILS

Various James Hardie Weatherboards details are provided in the Details section of this document. This specification and details in CAD file are also available to download from our website at www.jameshardie.co.nz.

1.4 SPECIFIC DESIGN

For use of James Hardie Weatherboards outside the scope of this document, the architect, designer or engineer must undertake specific design. For advice on designs outside the scope of this specification, Ask James Hardie on 0800 808 868.

2 Design

2.1 COMPLIANCE

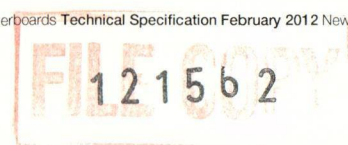
James Hardie Weatherboards comply with section 9.5.2 of 'E2/AS1'. Information contained in this document regarding the installation of James Hardie Weatherboards are aligned with 'E2/AS1' of New Zealand Building Code (NZBC).

2.2 RESPONSIBILITY

The specifier or other party responsible for the project must ensure that the information and details in this specification are appropriate for the intended application and that additional detailing is performed for specific design or any areas that fall outside the scope of this technical specification. For applications outside the scope of this literature and details which are not provided herein, the architect, designer or engineer must undertake specific design and it should be ensured that the intent of their design meets the requirements of the NZBC.

All dimensions shown are in millimetres unless noted otherwise. All New Zealand Standards referenced in this manual are current edition and must be complied with.

James Hardie conduct stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.



2.3 SITE AND FOUNDATION

The site on which the building is situated must comply with the NZBC Acceptable Solution 'E2/AS1' 'Surface Water'. Foundation design must comply with the requirements of NZS 3604 'Timber Framed Buildings' or be as per specific engineering design. The grade of adjacent finished ground must slope away from the building to avoid the possibility of water accumulation in accordance with NZBC requirements.

2.4 GROUND CLEARANCES

The clearance between the bottom edge of cladding and paved/unpaved ground must comply with section 9.1.3 of E2/AS1. The finished floor level must also comply with these requirements. These clearances must be maintained throughout the life of the building.

James Hardie Weatherboards must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by NZS 3604.

James Hardie Weatherboards must have a minimum clearance of 100mm from paved ground and 175mm from unpaved ground.

On the roofs and decks the minimum clearance must be 50mm.

Do not install external cladding such that it may remain in contact with water or ground.

2.5 MOISTURE MANAGEMENT

It is the responsibility of the specifier to identify moisture related risks associated with any particular building design.

Wall construction design must effectively manage moisture, considering both the interior and exterior environments of the building, particularly in buildings that have a higher risk of wind driven rain penetration or that are artificially heated or cooled.

Walls shall include those provisions as required by the NZBC Acceptable Solution 'E2/AS1' 'External Moisture'. In addition all wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate appropriate flashing for waterproofing. The other materials, components and installation methods used to manage moisture in the walls, must comply with the requirements of relevant standards and the NZBC. For further information in relation to designing for weathertightness, refer to the Building Research Association of New Zealand (BRANZ) and the Department of Building and Housing (DBH) updates on the following websites, respectively www.branz.co.nz and www.dbh.govt.nz.

2.6 STRUCTURE

Timber-framed buildings must be designed in accordance with NZS 3604 (Timber Framed Buildings). When the framing is provided as per the specific engineering design, the framing stiffness must be equivalent to or more than the stiffness requirements of NZS 3604.

2.7 WIND LOADING

James Hardie Weatherboards cladding is suitable for use in all New Zealand wind zones up to and including VH as defined in NZS 3604.

A specific design is required for all situations where a building falls in a specific engineering design (SED) wind zone.

2.8 FIRE RATED WALLS

Walls clad with James Hardie Weatherboards using a direct fix or cavity construction method can achieve fire ratings of up to 60/60/60 when constructed in accordance with this literature, including the fire rated system requirements as specified in James Hardie 'Fire and Acoustic' Design Manual. Refer to this design manual for further information about fire rated systems.

2.9 ENERGY EFFICIENCY

External walls constructed using James Hardie Weatherboards, bulk insulation, where the area of glazing is 30% or less of the total wall area and constructed as per this technical specification complies with the requirements for walls in NZBC Acceptable Solution H1/AS1 (NZBC Clause H1 Energy Efficiency), Replacement Table 1. To meet thermal insulation requirements for the construction, the bulk insulation as specified in Table 1 must be used. This insulation may be substituted with insulations having higher R-values. The thermal insulation of a wall gets affected when the depth of the timber framing is increased or decreased. The calculation used in Table 1 is based on a timber framing size 90 x 45mm and using an internal lining material such as James Hardie Villaboard® Lining or a 10mm plasterboard.

Table 1

Insulation capability		
Climate Zone	Construction R-Value Requirement	Minimum R-Value of Insulation Required
1 and 2	1.9 m ² °C/W	#R2.0
3	2.0 m ² °C/W	#R2.2
Total construction R-Value depends on the insulation material used and the framing ratio. The insulation material R-Values specified in this table are for studs spaced at 600mm c/c and nogs spaced at 800mm c/c.		
# To achieve higher R-Values, the wall insulation must be replaced with an insulation material having higher R-Values to suit the requirements.		
For further guidance on insulation requirement refer to current edition of 'House Insulation Guide' published by BRANZ.		

3 Framing

3.1 GENERAL

This James Hardie Weatherboards technical specification is only suitable for timber-framed buildings. Other framing materials are outside the scope of this specification.

3.2 DIMENSIONS

A 35mm minimum stud width is required unless noted otherwise in this specification.

3.3 STRUCTURAL GRADE

Minimum timber grade requirements are No.1 framing or MSG6 grade in accordance with NZS 3631 'New Zealand Timber Grading Rules' or equivalent.

3.4 DURABILITY

To comply with the NZBC requirements the external framing must be treated to a minimum H1.2 treatment. Refer to the NZBC Acceptable Solution B2/AS1 'Durability' for further information about the durability requirements.

For timber treatment information refer to NZS 3602 (Timber and Wood-Based Products for use in Buildings) and NZS 3640 (Chemical Preservation of Round and Sawn Timber) for minimum timber treatment selection and treatment requirements. Also refer to framing manufacturer's literature for further guidance on timber selection. Framing must be protected from moisture at sites in accordance with the recommendations of framing manufacturer's.

Note: Refer to NZS 3602 for information about the allowable moisture contents in timber.

3.5 FRAME CONSTRUCTION

All timber framing sizes and set-out must comply with NZS 3604 and stud, nogs/dwangs centres as required by this specification:

Use of timber framing must be in accordance with framing manufacturer's specifications.

3.5.1 Direct Fix Construction Method

The following framing must be provided for direct fixed construction method:

- Studs must be provided at 600mm centres maximum.
- Nogs must be provided at 1200mm centres maximum.
- Double studs will be required at internal corners for fixing weatherboards without drilling the weatherboard ends.

3.5.2 Cavity Construction Method

The following framing must be provided for cavity construction method:

- When studs are at 600mm centres the nogs must be provided at 800mm centres maximum.
- When studs are at 400mm centres the nogs may be provided at 1200mm centres maximum.

- Double studs are required at internal corners.
- Extra packers may be required at external corners.

3.6 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.

4 Preparation

4.1 HOMERAB® PRECLAD™ LINING OR BUILDING UNDERLAY

HomeRAB PreClad Lining or building underlay must be provided as per the requirements of the NZBC Acceptable Solution 'E2/AS1' 'External Moisture' and NZS 3604.

The building underlays must comply with Table 23 of 'E2/AS1'.

The building underlays must be fixed in accordance with 'E2/AS1', NZS 3604 and the underlay manufacturer's recommendations.

Walls which are not lined on the inside face e.g. garage walls or gable ends must include a rigid sheathing or an air barrier behind the cladding which complies with the requirements of the NZBC 'Acceptable Solution' 'E2/AS1'. HomeRAB PreClad Lining is suitable for use in these applications. It must be installed in accordance with HomeRAB PreClad Lining Installation Manual.

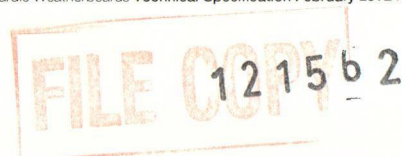
4.2 RAB BOARD

For EH wind zone, RAB Board (6mm) must be used. Refer to James Hardie Rigid Air Barriers installation manual for information regarding its installation.

4.3 FLASHING

All wall openings, penetrations, intersections, connections, window sills, heads and jambs must be flashed prior to weatherboard installation. Please refer to moisture management requirements in Clause 2.5. The building underlays must be appropriately incorporated with penetration and junction flashings. Materials must be lapped in such a way that water tracks down to the exterior on the face of building underlay. James Hardie will assume no responsibility for water infiltration within the wall due to poor installation of flashings or building underlays.

The selected flashing materials must comply with the durability requirements of Table 20 of Acceptable Solution 'E2/AS1'.



4.4 VENT STRIP

The James Hardie uPVC cavity vent strip has opening area of 1000m²/m length and must be installed at the bottom of all walls constructed using the drained and ventilated cavity construction method. It is important that the openings in the vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities.

4.5 CAVITY BATTENS

Buildings with a risk score of 7-20 calculated in accordance with the NZBC Acceptable Solution 'E2/AS1' Table 3 requires James Hardie Weatherboards to be installed on a cavity.

The battens provide airspace between the frame and cladding and are considered a 'packer' only in this specification.

The timber battens must be minimum H3.1 treated in accordance with NZS 3640 (Chemical preservation of round and sawn timber) to comply with the durability requirements of B2/AS1.

Cavity battens must comply with 'E2/AS1' and

- be minimum 18mm thick
- be minimum as wide as the width of studs
- be fixed by the cladding fixings to the main framing through the building underlay
- until claddings are fixed the battens need only to be tacked to framing. (Batten fixing is required temporarily to keep them straight on the wall during construction.)

The cavity battens are installed as described below:

- Fix cavity battens to studs.
- Battens must be fixed with 40 x 2.8mm galvanised nails at 800mm centres maximum.

4.6 INTERMEDIATE SUPPORT

Where studs are at 600mm centres an intermediate means of restraining the building underlay and insulation from bulging into the cavity shall be installed. An acceptable method to achieve this is using one of the following options as per E2/AS1:

- intermediate cavity batten between the studs
- 75 mm galvanized mesh
- polypropylene tape at 300mm centres fixed horizontally and drawn taut

No intermediate supports are required where

- studs are at 400mm centres or
- rigid air barriers instead of building underlays are used.

4.7 CORNERS

Anticipated joist shrinkage must be allowed for in the design process. Do not run trims or aluminium extrusions continuously across solid floor joists. Trims or extrusions to be flashed to best trade practice at these locations.

4.8 EXTERNAL CORNERS

James Hardie Weatherboards can be finished at external corners using uPVC or aluminium corner mould, corner soakers and box corner. Refer to Figures 5, 6, 7, 19, 20 and 21.

4.9 INTERNAL CORNERS

James Hardie Weatherboards can be finished at internal corners using uPVC or aluminium 'W' mould. Refer to Detail 8, 9, 22 and 23.

4.10 JUNCTIONS AND PENETRATIONS

Refer to Clause 2.5 of this specification for moisture management requirements. All windows and doors must be detailed as per the requirements of this specification. James Hardie has developed the window details for James Hardie Weatherboards which meet the requirements of E2 'External Moisture' approved document of the NZBC. Refer to Figures 11 to 13 and Figures 25 to 33.

5 Fixing James Hardie Weatherboards

5.1 GENERAL

The horizontal lap of James Hardie Weatherboards must be 30mm minimum. James Hardie Weatherboards must be kept dry and under cover whilst in storage prior to and during fixing.

Cut ends which are exposed or where sealant is applied to the boards such as box corners, internal corners etc. must be primed prior to installation. Dust and loose material must be removed before priming.

An H3.1 treated timber cant strip must be provided to support the bottom board on the wall. Refer to Figures 3 and 17.

5.2 FASTENER DURABILITY

Fasteners must meet the durability requirements of NZ Building Code. NZS 3604 specifies requirements for fixing material to be used in relation to the exposure conditions and are summarised in Table 2.

Table 2

Exposure conditions and nail selection prescribed by NZS 3604		
Nail Material		
Zone D*	Zone C outside sea spray zone and Zone B and Geothermal hot spots	Bracing — All zones
Grade 316 Stainless	Hot-dipped galvanised or 316 stainless	Grade 316 Stainless

* (Zone C areas where local knowledge dictates that increased durability is required, appropriate selection shall be made). Microclimate conditions as detailed in NZS 3604, Paragraph 4.2.4 require SED.

7 Finishing

Also refer to the NZBC Acceptable Solution 'E2/AS1' Table 20 and 21 for information regarding the selection of suitable fixing materials and their compatibility with other materials.

5.3 NAIL SIZES AND FIXING METHOD

James Hardie Weatherboards must be fixed to studs with the types of nails specified in Table 3, in accordance with the following requirements

- All nails must be driven flush with the board surface.
- When fixing weatherboard at the ends, nail must be driven at a minimum distance of 20mm from the end.
- For nails driven 50mm or closer from the end edges of James Hardie Weatherboards, holes must be pre-drilled using a 3mm Titanium drill bit.

When using rigid air barrier like HomeRAB PreClad Lining or RAB Board, the cladding fixing nails must be increased in length equal to the thickness of the rigid air barrier.

Table 3

Nail requirements for James Hardie Weatherboards	
DIRECT FIXED TO FRAME	
Face Nailing	
50 x 2.8mm HardieFlex™ nails	Finish flush with the board surface
CAVITY CONSTRUCTION	
Face Nailing	
75 x 3.15mm HardieFlex™ nails	Finish flush with the board surface

5.4 GUN NAILING

James Hardie Weatherboards can be gun-nailed for face nailing fixing methods. Nails must be finished flush with board surface.

Round head nails must be used and the size of these nails must comply with the requirements of Table 3.

Nails must be fired at a minimum distance of 50mm from the ends of boards when gun nailing is used — double studs will be required.

Note: Do not use 'D' head nails.

6 Jointing

The ends of James Hardie Weatherboards are jointed off-stud using a back soaker. The joints may be located centrally between studs but no closer than 150mm from the studs. The joints must be staggered by 600mm minimum. Flexible silicone sealant must be used with back soakers for jointing. Refer to Figures 4 and 18.

Protective coating of James Hardie Weatherboards is required in order to meet the durability requirements of the New Zealand Building Code.

7.1 PREPARATION

Remove any surface dirt, grime or other contaminants and ensure the James Hardie Weatherboards are dry before painting.

7.2 SEALANTS

All sealants must demonstrate the ability to meet the relevant requirements of the NZBC. Application and use of sealants must comply with manufacturer's instructions. Sealants, if coated, must be compatible with the paint system.

7.3 PAINTING

All James Hardie Weatherboards are pre-primed on their face and bottom edge with a factory-applied acrylic base coat.

James Hardie Weatherboards must be painted within 90 days of installation. All exposed faces, including the top edges under the sills and bottom edges of James Hardie Weatherboards and accessories must be finished with two coats of quality exterior paint system complying with any of parts 7, 8, 9, and 10 of AS 3730.

James Hardie Weatherboards can be painted dark colours when installed with aluminium mouldings only.

When using uPVC corner moulds or flashings, the light reflective value of the colour used must be more than 40% as required under section 4.3.1 of 'E2/AS1'. Dark colours cause excessive movements and deteriorate the cladding performance.

Some environments require special coatings. Paint selection and specifications is dependant on the paint system chosen. Refer to the paint manufacturer.

7.4 STAINING

Stains containing linseed oil are specifically designed for wood and may not be suitable for fibre cement cladding products, primed or unprimed. Semi-transparent stains can vary in uniformity of appearance depending on method of application and conditions and will require a high level of skill and craftsmanship to achieve a uniform appearance. Clear coats have not proven durable in exterior exposure and James Hardie considers them a maintenance item that may require application of a refurbishing sealer at regular intervals. James Hardie does not warrant the appearance and durability of the use of semi-transparent stains and clear coats.

For further information contact the stain manufacturers. Refer to Section 13 for stain manufacturer details.



8 Storage and handling

James Hardie Weatherboards must be laid flat on a smooth level surface. To ensure optimum performance, store weatherboards under cover and keep dry prior to fixing. If the weatherboards should become wet, allow to dry thoroughly before fixing.

Do not carry weatherboards on the flat, always carry in the vertical position to avoid excessive bending.

9 Maintenance

It is the responsibility of the specifier to determine normal maintenance requirements to comply with the NZBC Acceptable Solution B2/AS1.

The extent and nature of maintenance will depend on the geographical location and exposure of the building.

As a guide, it is recommended that basic normal maintenance tasks shall include but not be limited to:

- Washing down exterior surfaces every 6-12 months*,
- Re-applying exterior protective finishes**,
- Maintaining the exterior envelope and connections including joints, penetrations, flashings and sealants.
- Cleaning out gutters, blocked pipes and overflows as required,
- Pruning back vegetation which is close to or touching the building.

**Do not use a water blaster to wash down the cladding.*

***Refer to your paint manufacturer for washing down and recoating requirements related to paint performance.*

10 Product information

10.1 MANUFACTURING AND CLASSIFICATION

James Hardie New Zealand is an ISO 9001 Telarc certified manufacturer. James Hardie Weatherboards is manufactured to meet the requirements of AS/NZS 2908.2: 2000 'Cellulose-Cement Products', James Hardie Weatherboards has a classification of Type A Category 3 in accordance with this standard.

The weatherboards are supplied pre-primed on their face and bottom edge with an acrylic primer. The bottom front edge is square machine trimmed. The top covered edge is square water-jet trimmed.

James Hardie Weatherboards are identified by the printing of the name at regular intervals on the back face.

10.2 DURABILITY

James Hardie Weatherboards, when installed and maintained as per the technical specification, will meet the durability requirements for claddings as required in the NZBC Approved Document B2 'Durability'.

10.2.1 Resistance to Moisture/Rotting

James Hardie Weatherboards demonstrates resistance to permanent moisture induced deterioration (rotting) and has passed the following tests in accordance with AS/NZS 2908.2

- Water Permeability (Clause 8.2.2)
- Warm Water (Clause 8.2.4)
- Heat Rain (Clause 6.5)
- Soak Dry (Clause 8.2.5).

10.2.2 resistance to fire

James Hardie Weatherboards has the following Early Fire Hazard Indices (tested to AS 1530 Part 3).

Table 4

Early fire hazard indices	
Flammability (FI)	0
Spread of Flame Index (SFD)	0
Heat evolved index	0
Smoke developed index (SDI)	0 - 1

10.2.3 ALPINE REGIONS

In regions subject to freeze/thaw conditions, James Hardie Weatherboards must not be in direct contact with snow or ice build up for extended periods, e.g. external walls in alpine regions must be protected where snow drifts over winter is expected.

The James Hardie Weatherboards have been tested in accordance with AS/NZS 2908.2 Clause 8.2.3.

10.3 PRODUCT SIZES AND MASS

Available sizes of James Hardie Weatherboards and their weights are given in Table 5. James Hardie Weatherboards are classified as a light weight wall cladding (not exceeding 30kg/m²) in accordance with NZS 3604.

11 Safe working practices

WARNING — DO NOT BREATHE DUST AND CUT ONLY IN WELL VENTILATED AREA

James Hardie products contain sand, a source of respirable crystalline silica which is considered by some international authorities to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) minimise dust when cutting by using either 'score and snap' knife, fibre cement shears or, where not feasible, use a HardieBlade™ Saw Blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area to avoid breathing dust; (4) wear a properly-fitted, approved dust mask or respirator (e.g. P1 or P2) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods — never dry sweep. For further information, refer to our installation instructions and Safety Data Sheets available at www.jameshardie.co.nz.

FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

James Hardie recommended safe working practices

CUTTING OUTDOORS

1. Position cutting station so wind will blow dust away from the user or others in working area.
2. Use one of the following methods based on the required cutting rate:

BEST

- Score and snap
- Hand guillotine
- Fibreshear

BETTER

- Dust reducing circular saw equipped with HardieBlade™ Saw Blade and HEPA vacuum extraction

GOOD

- Dust reducing circular saw with HardieBlade™ Saw Blade.

CUTTING INDOORS

- Cut only using score and snap, hand guillotine or fibreshears (manual, electric or pneumatic).
- Position cutting station in a well-ventilated area.

SANDING/REBATING/DRILLING/OTHER MACHINING

When sanding, rebating, drilling or machining you should always wear a P1 or P2 dust mask and warn others in the immediate area.

IMPORTANT NOTES

1. For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best" — level cutting methods where feasible.
2. NEVER use a power saw indoors.
3. NEVER use a circular saw blade that does not carry the HardieBlade™ logo.
4. NEVER dry sweep — Use wet suppression or HEPA vacuum.
5. NEVER use grinders.
6. ALWAYS follow tool manufacturers' safety recommendations.

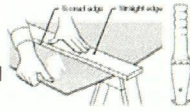
P1 or P2 respirators should be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.co.nz to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

Working instructions

Refer to recommended Safe Working Practices before starting any cutting or machining of product.

Score and Snap

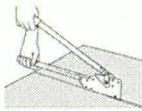
Score and Snap is a fast and efficient method of cutting the product using special tungsten tipped Score and Snap knife.



Preferably score on the face side of the product. Score against a straight edge and repeat the action to obtain adequate depth for clean break — normally 1/3 of sheet thickness. Snap upwards to achieve break. Smooth any rough edges with a rasp.

Hand guillotine

Make guillotine cut on the off-cut side of line to allow for the thickness of the blade.



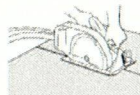
Fibreshear heavy duty

An electrically powered, fast, clean and effortless way of cutting James Hardie building products, especially around curves such as archways. Make Fibreshear cut on the "off-cut" side of the line to allow for the thickness of the shear.



HardieBlade™ Saw Blade

The HardieBlade™ Saw Blade used with a dust-reducing saw connected to a HEPA vacuum is ideal for fast, clean cutting of James Hardie fibre cement products. A dust-reducing saw uses a dust deflector or a dust collector connected to a vacuum system. When sawing, clamp a straight-edge to the sheet as a guide and run the saw base plate along the straight edge when making the cut.



Hole-forming

For smooth clean cut circular holes:

Mark the centre of the hole on the sheet.

Pre-drill a 'pilot' hole.

Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill.

For irregular holes:

Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face. Tap carefully to avoid damage to sheets, ensuring that the sheet edges are properly supported.



Storage and handling

All James Hardie building products should be stored to avoid damage, with edges and corners of the sheets protected from chipping. James Hardie building products must be installed in a dry state and be protected from rain during transport and storage. The product must be laid flat under cover on a smooth level surface clear of the ground to avoid exposure to water or moisture, etc.

Quality

James Hardie conducts stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.

12 Product sizes

Table 5















Product information								
				Coverage information				
Product	Length (mm)	Width (mm)	Thickness (mm)	Effective cover	No. of planks/ metre height	Mass kg/ lineal m (approx. at EMC)	Mass kg/m2 approx. at EMC)	Pallet weight kg (60/120 units/pack)
Smooth	4200	180	7.5	150	6.7	2.4	16.0	600/1170
	4200	240	7.5	210	4.8	2.6	13.7	770/1540
	4200	305	7.5	275	3.6	3.6	12.9	950/1900
Rusticated	4200	205	7.5	175	5.7	2.6	14.9	700/1350
Styleline	4200	205	7.5	175	5.7	2.6	14.9	700/1350
Frontier	4200	245	7.5	215	4.7	3.1	14.4	790/1580
	4200	310	7.5	280	3.6	3.8	13.6	970/1950

Note: All dimensions provided are based on nominal only and subject to manufacturing tolerances.

*The effective thickness of finished 7.5mm James Hardie Weatherboards on the wall at the lap is approx 17-19mm.












13 Accessories

Accessories supplied by James Hardie for James Hardie Weatherboards					
	Accessory and Material Number			Size (MM)	Material/Appearance
	External Corner Soaker				Etch Primed
	- 310	303930	310		Aluminium Self colour
	- 245	303931	245		
	- 180	303932	180		
	Concealed Back Soaker				Etch Primed
	- 310	303933	310		Aluminium Self colour
	- 245	303934	245		
	- 205	303935	205		
	- 180	303936	180		
	External Flashing (box)	- 3000	300852	3000	uPVC
	External Corner (box) Mould				Etch Primed
	- 3000	300380	3000		Aluminium
	- 2700	300378	2700		
	External Corner Mould 135°				Etch Primed
	- 2700	300375	2700		Aluminium
	Weatherboard Cap Mould	- 3000	300995	3000	uPVC
	Internal 'W' Corner Mould	- 2700	300870	2700 long	uPVC
	Internal Corner Mould 135°	- 2700	300383	2700 long	Etch Primed Aluminium
	Corner Underflashing	- 50 x 50	303745	3000 long	uPVC
	Vent Strip		302490	3000 long	PVC White
	Internal 'W' Corner	- 2700	300386	2700 long	Etch Primed Aluminium
	HardieFlex™ nail	- 5kg	304253	75 x 3.15mm	316 Stainless Steel
	HardieFlex™ nail	- 5kg	304251	75 x 3.15mm	Hot Dip Galvanised
	HardieDrive™ Screw	100 jar	300928	7g x 30mm	316 Stainless Steel
	- self drilling and embedding timber screw				

Accessories not supplied by James Hardie for James Hardie Weatherboards

James Hardie recommends the following products for use in conjunction with its Weatherboards. James Hardie does not supply these products. Please contact component manufacturer for information on their warranties and further information on their products.

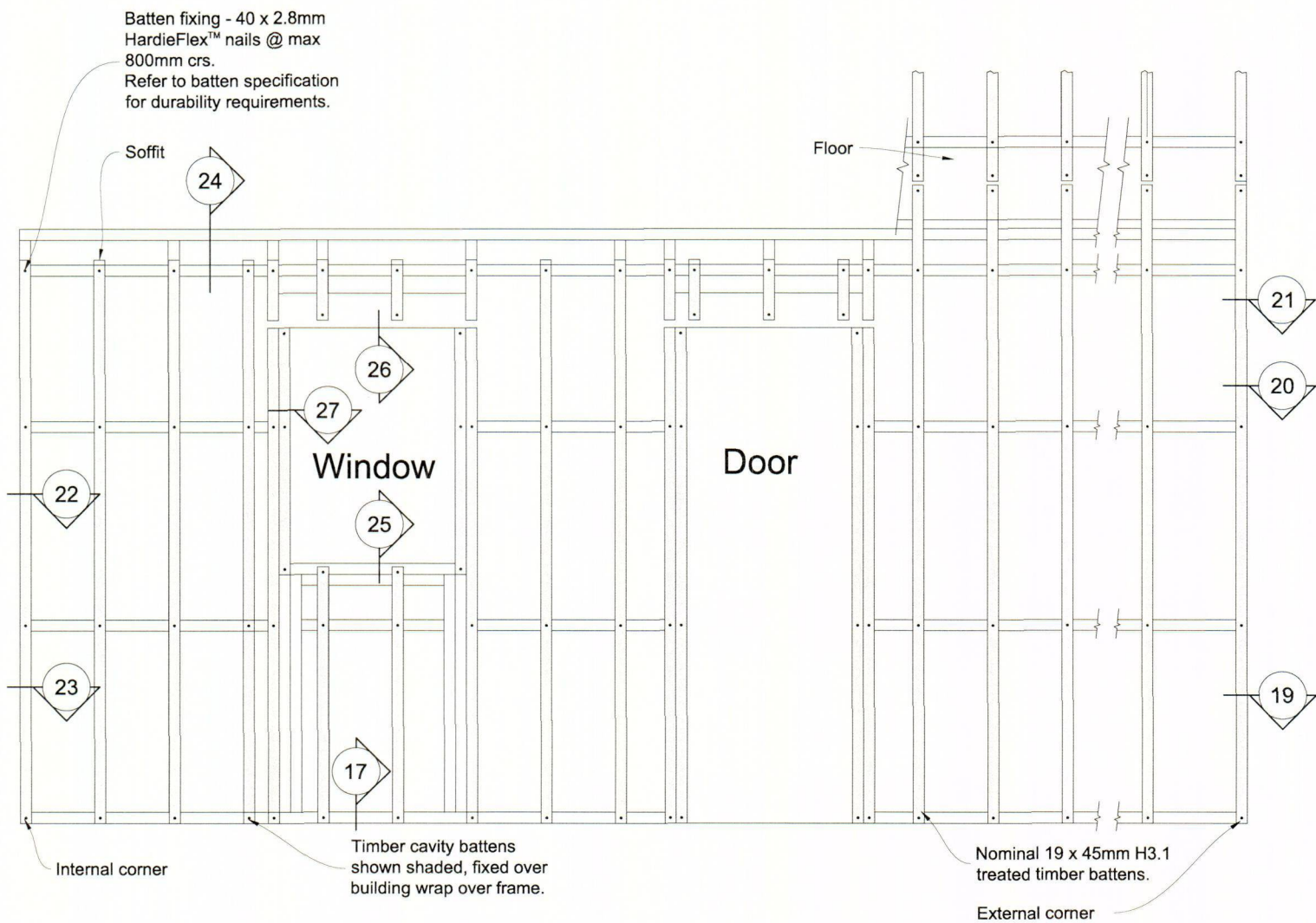
	Accessory and Material Number	Size (MM)	Material/Appearance
	HardieFlex™ nail	40 x 2.8mm and 50 x 2.8mm	316 Stainless Steel
	HardieFlex™ nail	40 x 2.8mm and 50 x 2.8mm	Hot Dip Galvanised
	Flexible sealant ie: Sikaflex AT Facade	Tube	Cured rubberised compound
	PEF Rod Sika Boom or similar	Polyethylene foam	Semi rigid foam
	Flashing Tape Tyvek, Protecto Wrap or similar	Proprietary tape to adhere to building underlay	
	Flashing to Table 20 'E2/AS1'	Refer Figure 13	Flashing fabricator
	Timber Scriber	As required	H3.1 Treated Timber. Timber merchant or cut on site
	Cant Strip Redway Developments 03 358 5775	To suit	uPVC
	Stain available from Timberkote Tel: 0800 724 642 Wattyl Tel: 0800 735 551	To suit	
	Scoring Knife		

14 Details

Various details outlined in the following table are available on Pages 15 to 38.

Table 7

Details				
DESCRIPTION	DIRECT FIXED		CAVITY CONSTRUCTION	
	FIGURE	PAGE	FIGURE	PAGE
Framing Setout	Figure 1	15		
Sheet Fixing Setout	Figure 2	16	Figure 16	26
Concrete Footing	Figure 3	17	Figure 17	27
Weatherboard Fixing	Figure 4	18	Figure 18	28
uPVC or Aluminium Box Corner	Figure 5	19	Figure 19	29
External Boxed Corner	Figure 6	19	Figure 20	29
External Corner Soaker	Figure 7	20	Figure 21	30
Internal 90° uPVC or Aluminium 'W' Mould	Figure 8	20	Figure 22	30
Internal 135° Aluminium 'W' Mould	Figure 9	21	Figure 23	31
Soffit Detail	Figure 10	21	Figure 24	31
Sill Flashings without Facings	Figure 11	22	Figure 25	32
One Piece Head Flashing without Facings	Figure 12	22	Figure 26	32
Jamb Flashing without Facings	Figure 13	23	Figure 27	33
Batten Setout			Figure 14 and 28	24 and 34
Batten Fixing			Figure 15	25
Parapet Flashing			Figure 29	35
Meter Box at Head			Figure 30	35
Meter Box at Sill			Figure 31	36
Meter Box at Jamb			Figure 32	36
Pipe Penetration			Figure 33	37
One Piece Apron Flashing Joint			Figure 34	38



Note: If studs are placed at 400mm centres
no intermediate battens are required and
nogs may be placed at max 1200mm centres.

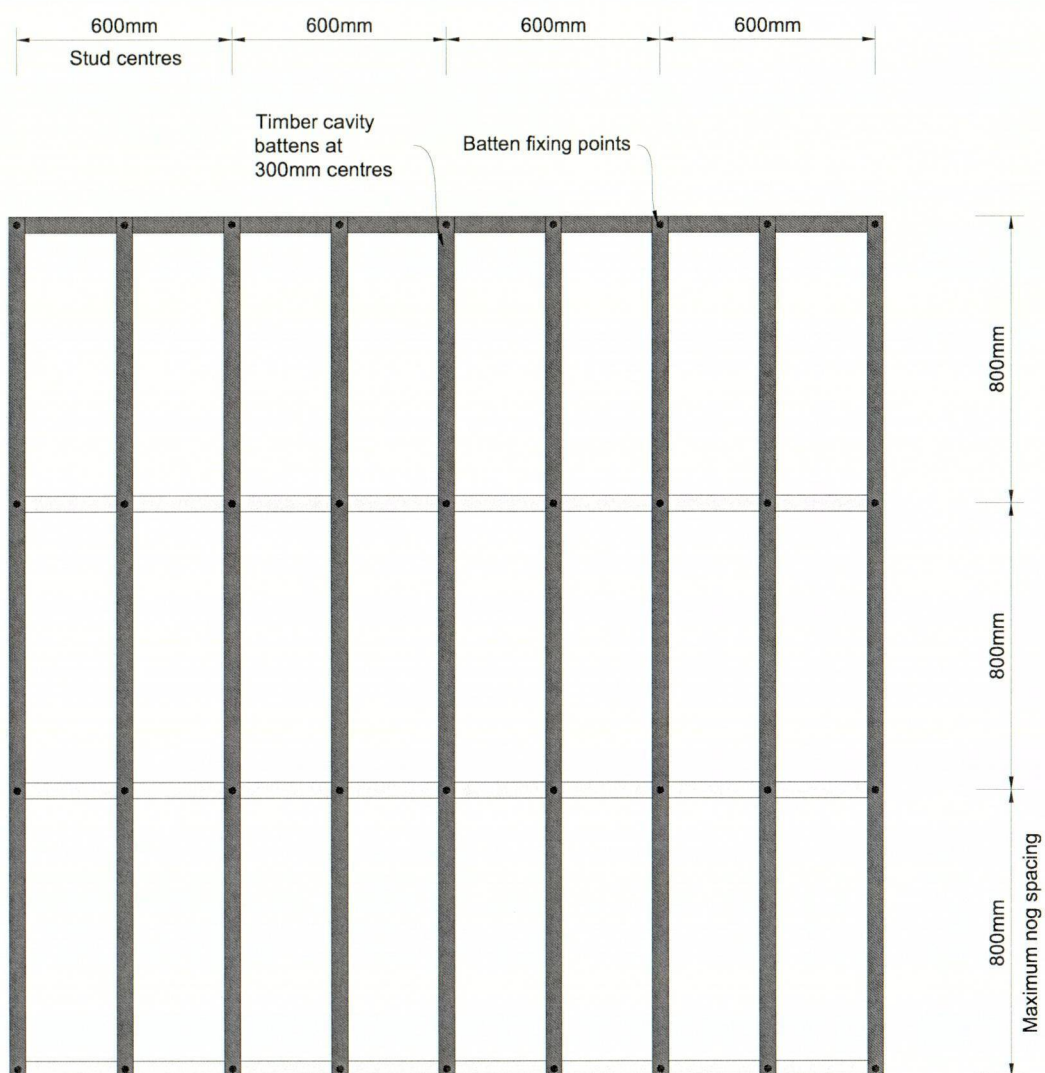
Wall Elevation

Note!
Section notations refer to
Figure numbers.

Figure 14: Cavity framing and batten set out

FILE COPY
121562

Figure 15: Cavity framing batten fixing



Minimum stud width 35mm

Note: No horizontal timber cavity battens required at nogs

Figure 16: Cavity weatherboard fixing setout

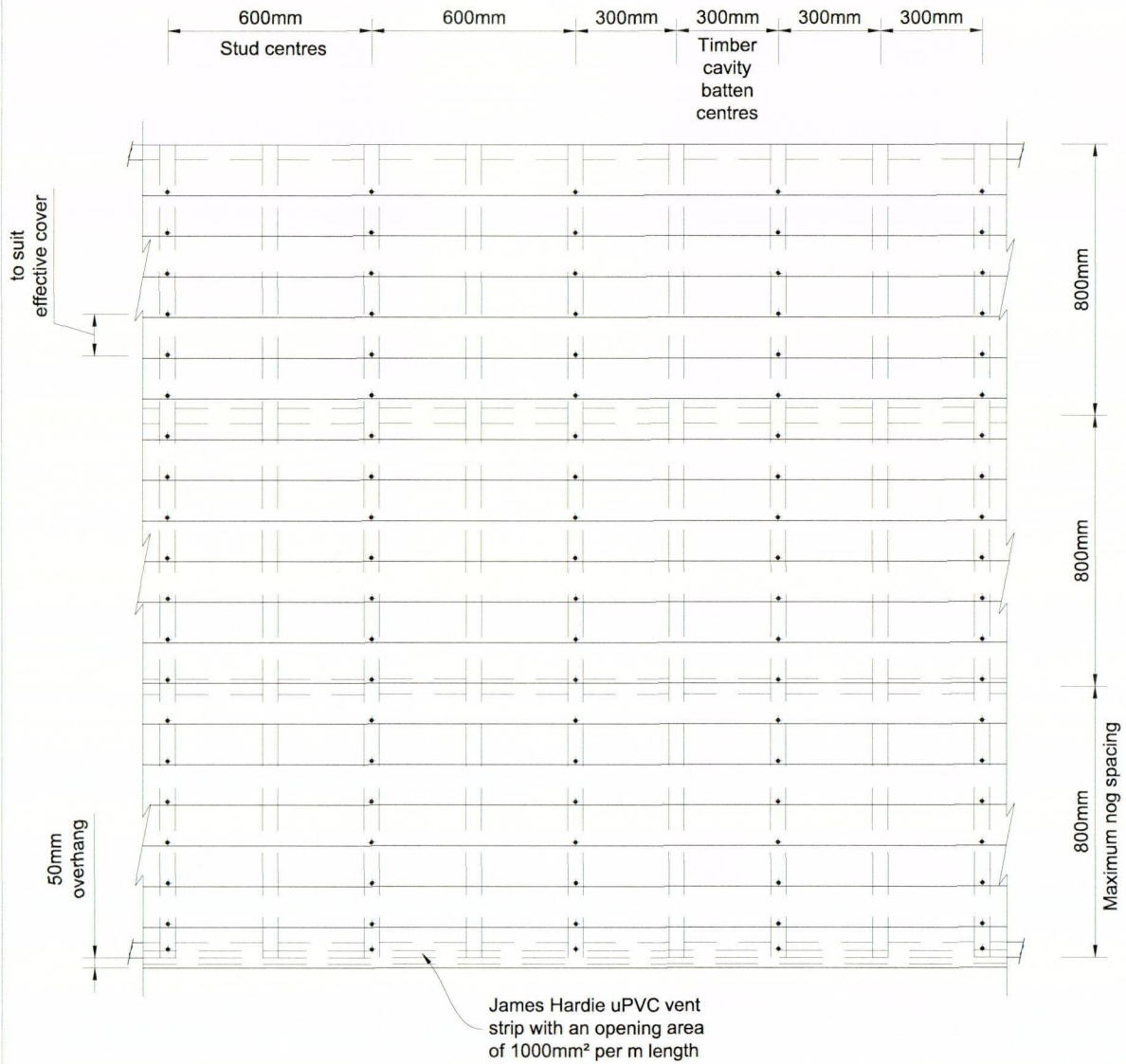


Figure 17: Cavity concrete footing

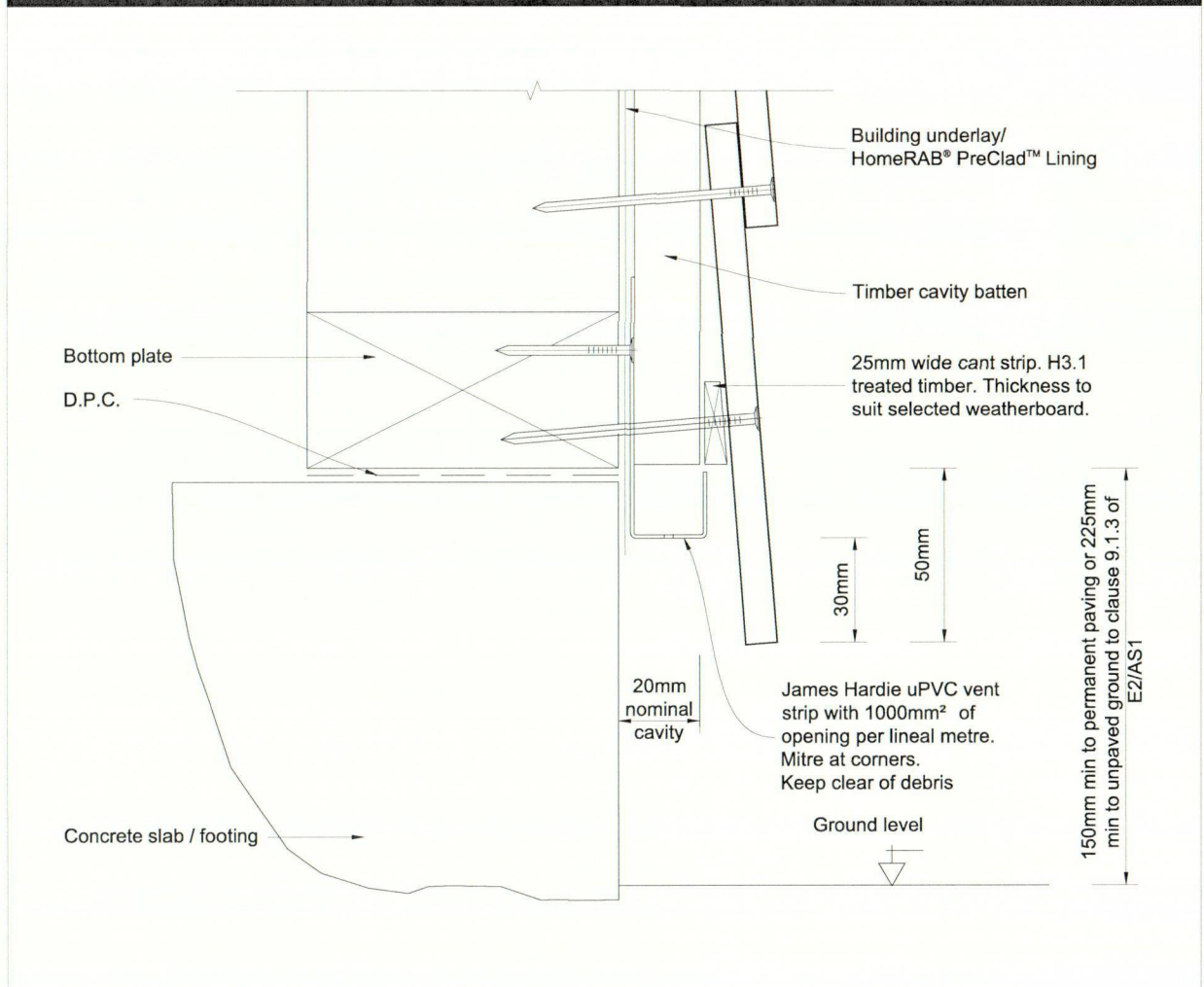
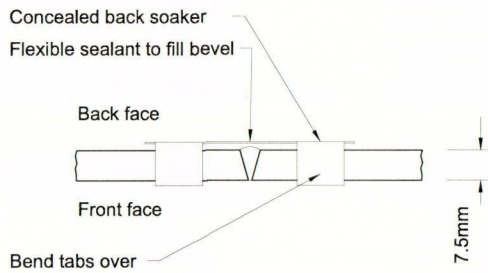
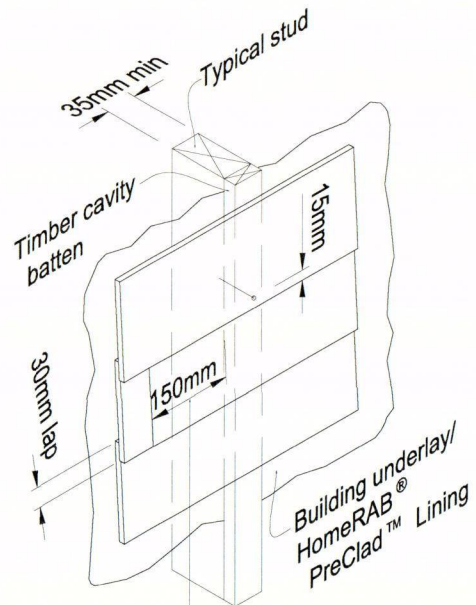


Figure 18: Cavity weatherboard fixing



Concealed Back Soaker Joint



Concealed back soaker join in weatherboard to be 150mm minimum from side of stud.
Joints must be staggered by 600mm minimum

Jointing off Stud

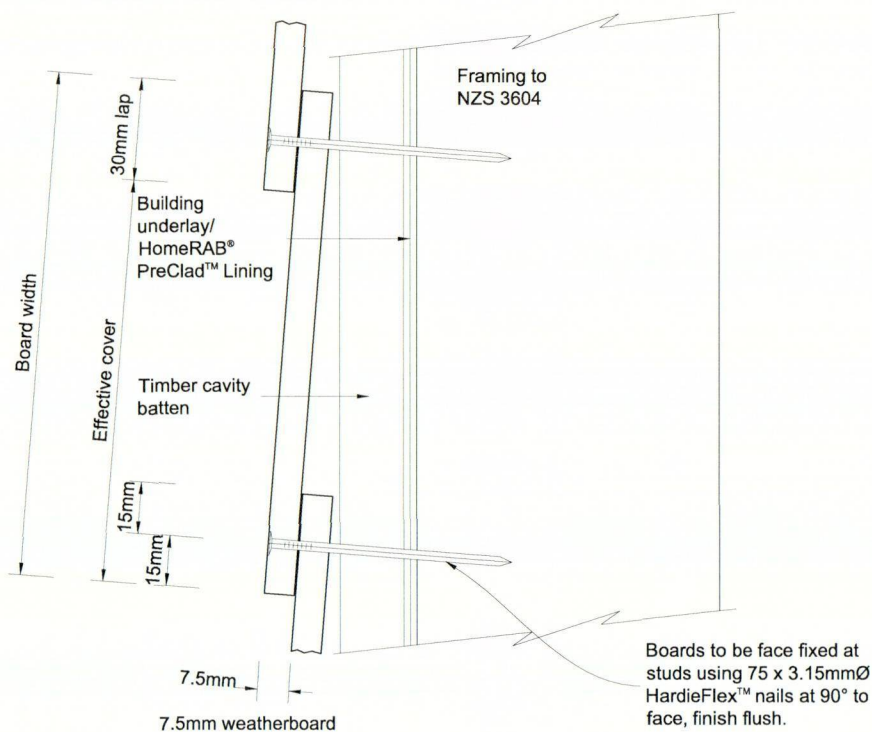


Figure 19: Cavity uPVC or aluminium box corner

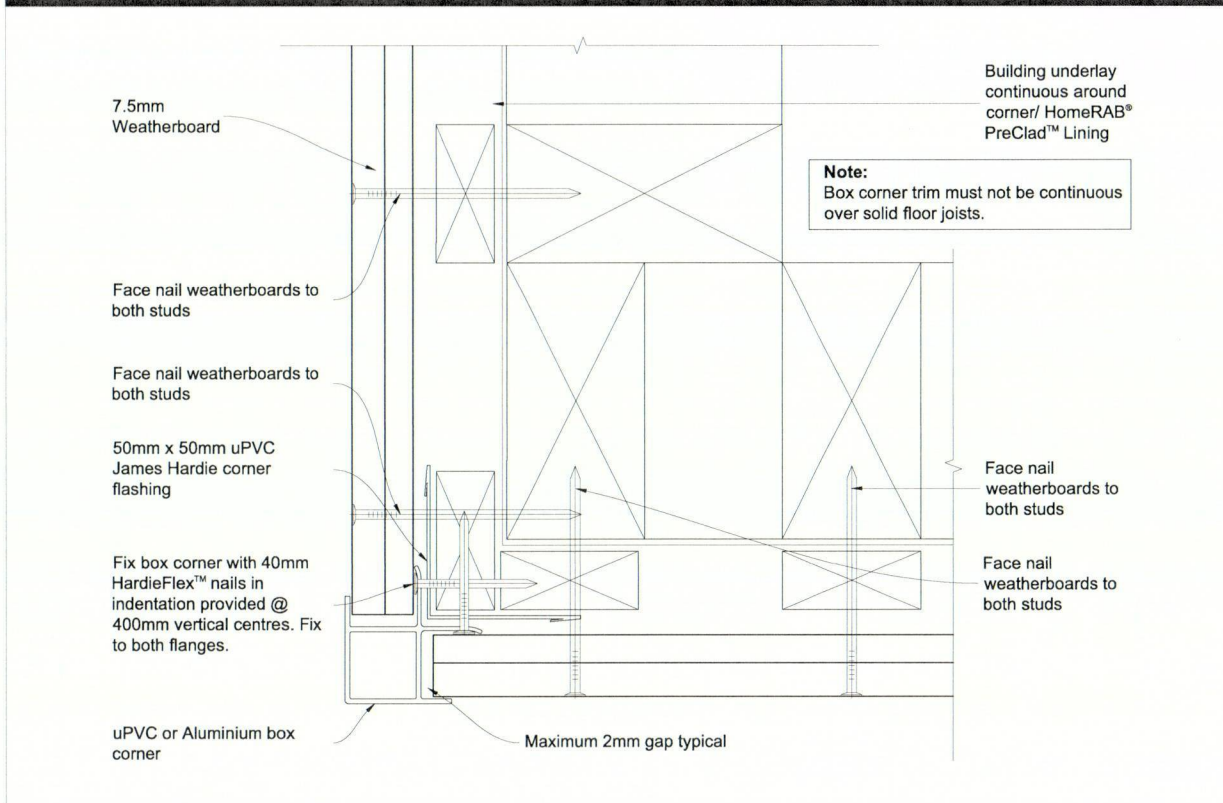


Figure 20: Cavity boxed corner

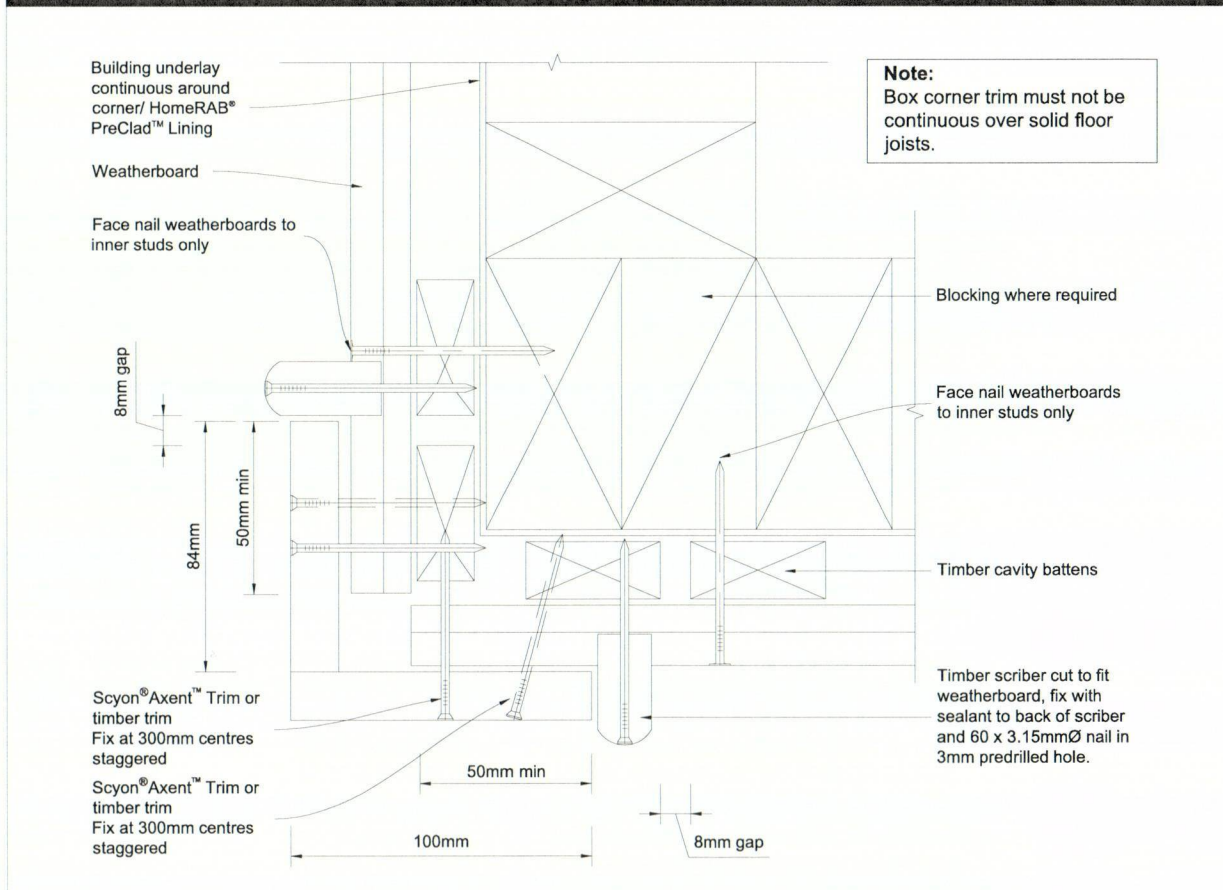
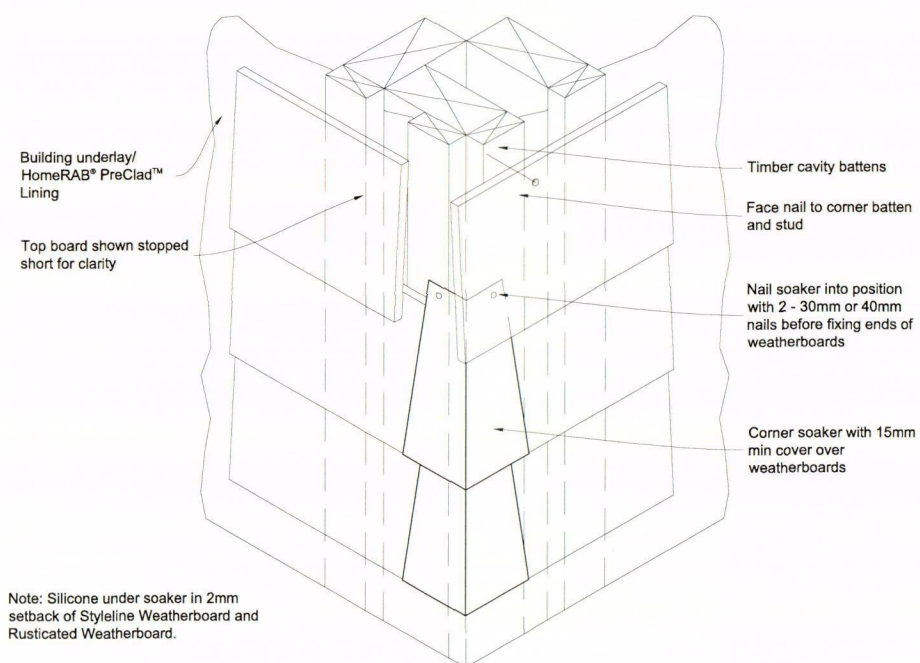


Figure 21: Cavity external corner soaker



Corner Soaker

Soaker material	Nail material
Aluminium or Galvanised Steel	Hot dip galvanised or Stainless Steel as required for durability

Figure 22: Cavity internal 90° uPVC or aluminium 'W' mould

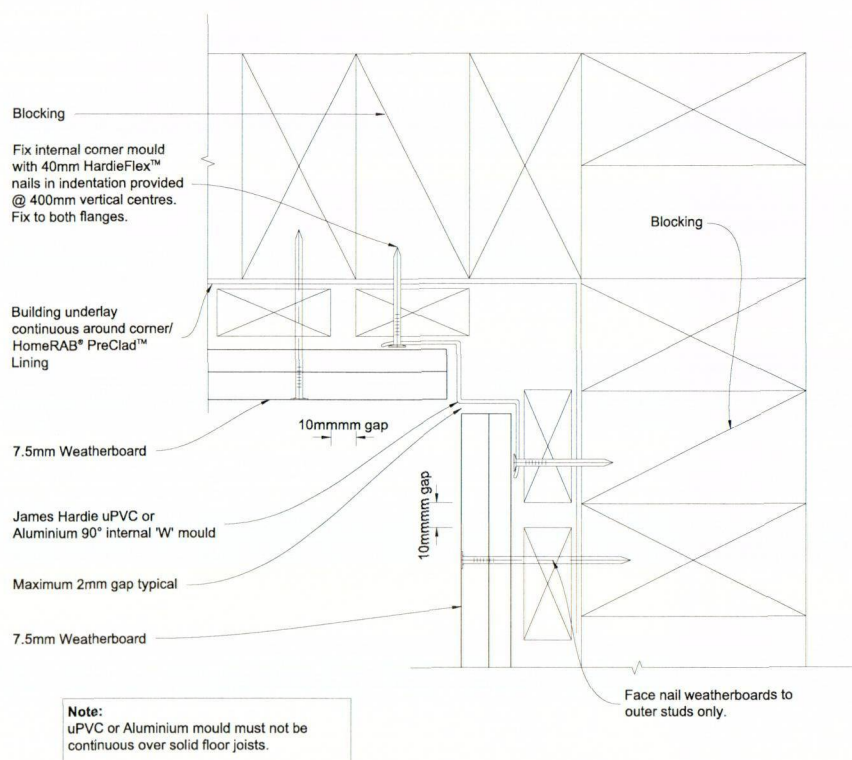


Figure 23: Cavity internal 135° aluminium 'W' mould

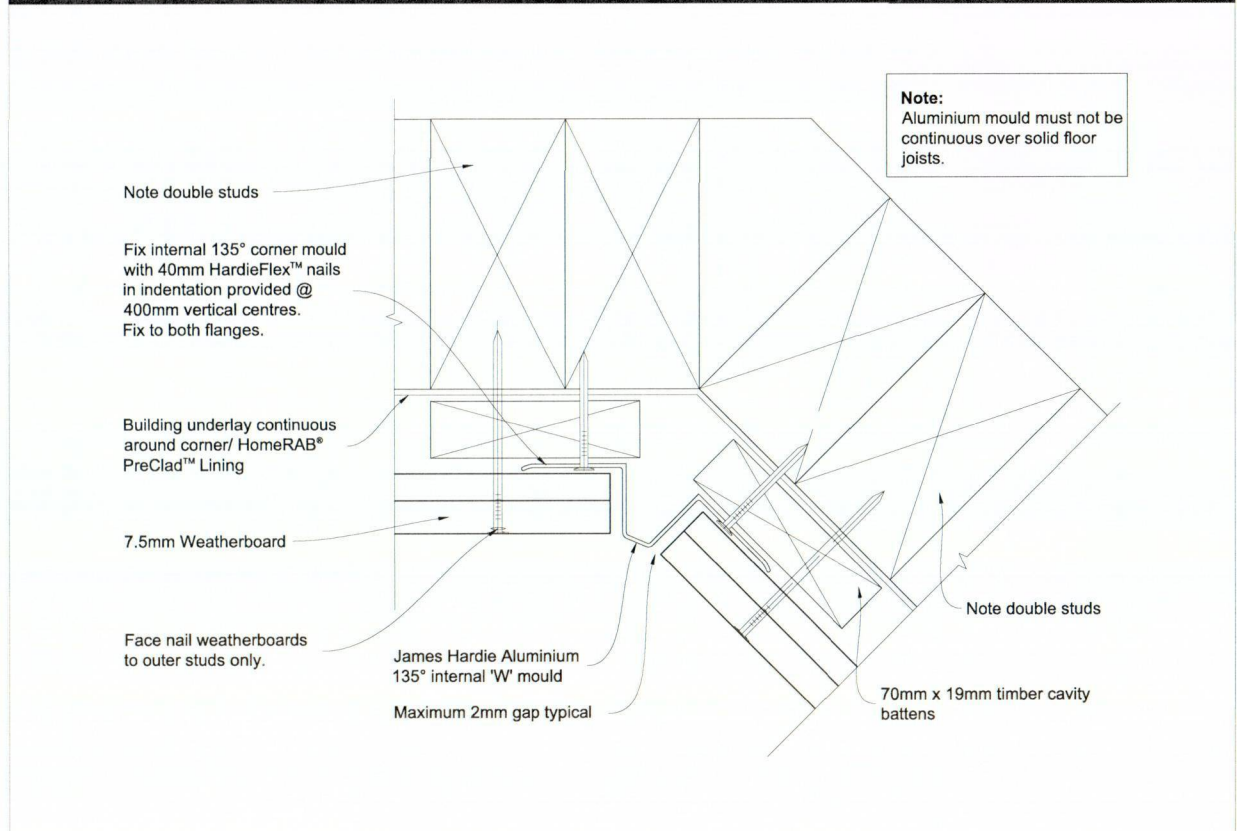


Figure 24: Cavity soffit detail

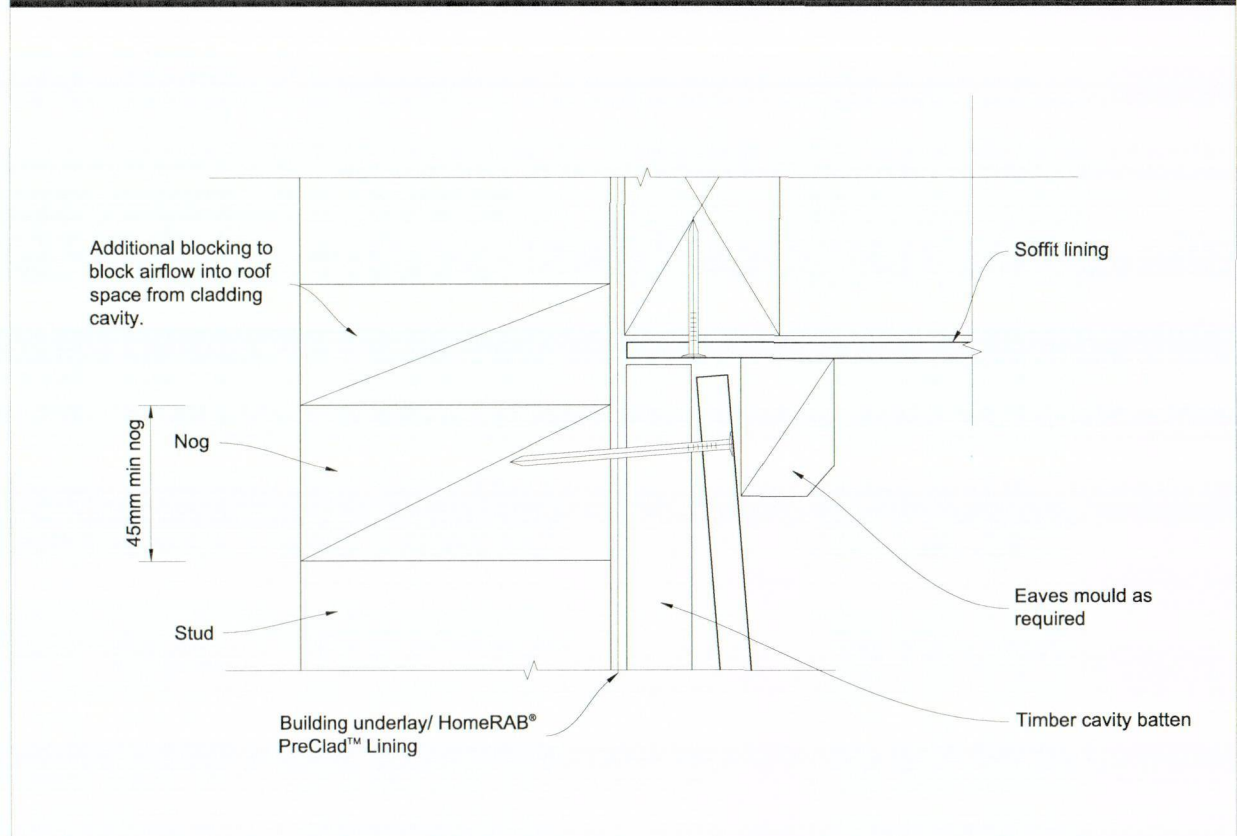
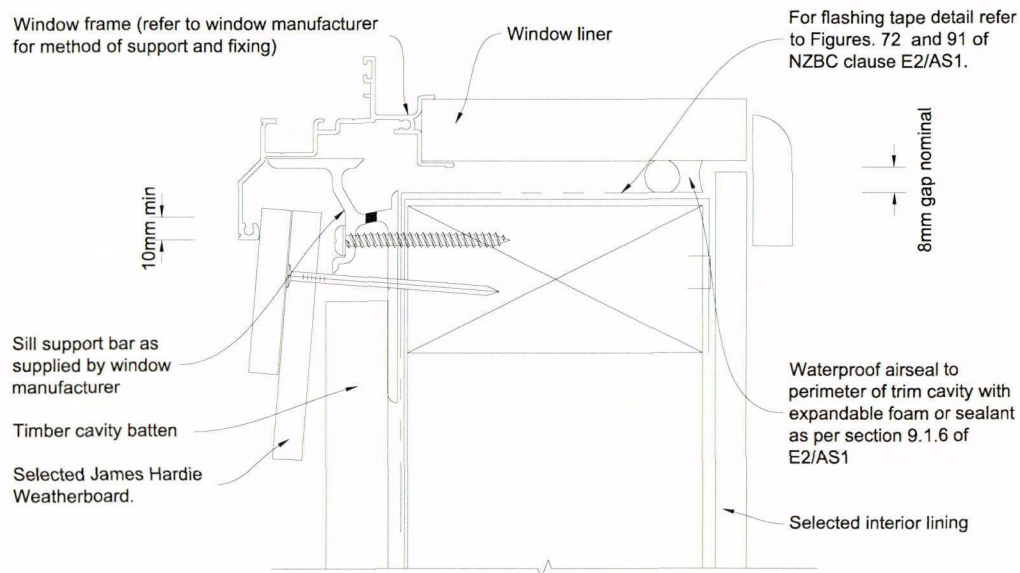


Figure 25: Cavity sill flashings without facings



General notes for materials selection

1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC 'E2/AS1'.
2. Building underlay must comply with acceptable solution NZBC 'E2/AS1' and NZS 3604.
3. Flashing tape must have proven compatibility with the selected building underlay and other materials with which it comes into contact as per Table 21 of 'E2/AS1'.
4. Sill support bars must comply with EM6, E2/AS1 and B2/AS1

Refer to the manufacturer or supplier for technical information for these materials.

Figure 26: Cavity one piece head flashing without facings

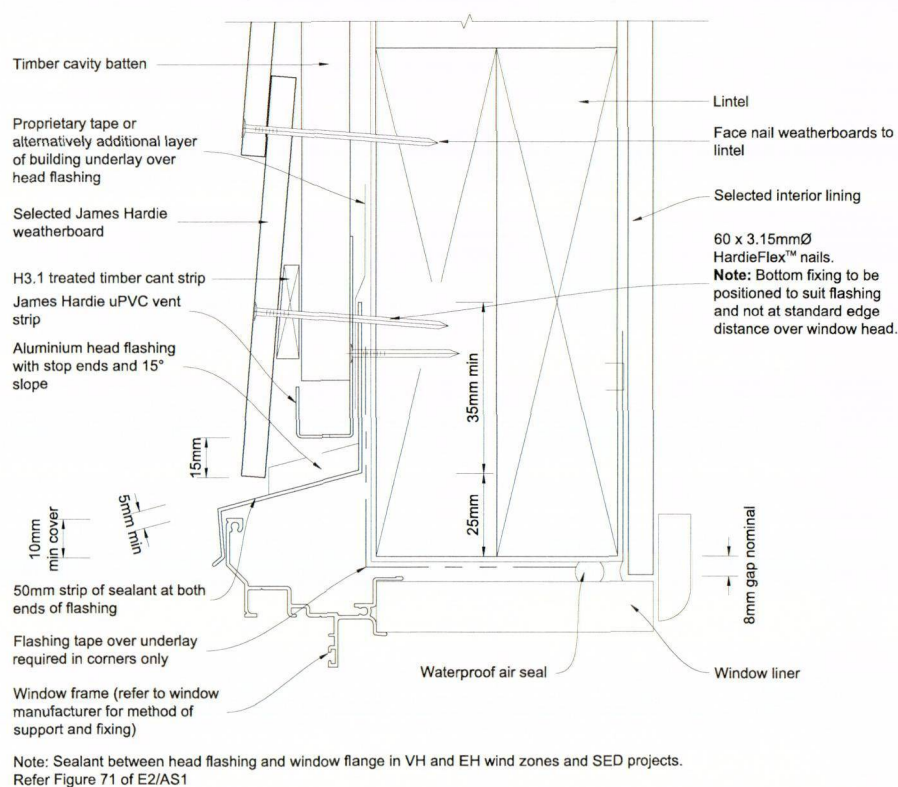


Figure 27: Cavity jamb flashing without facings

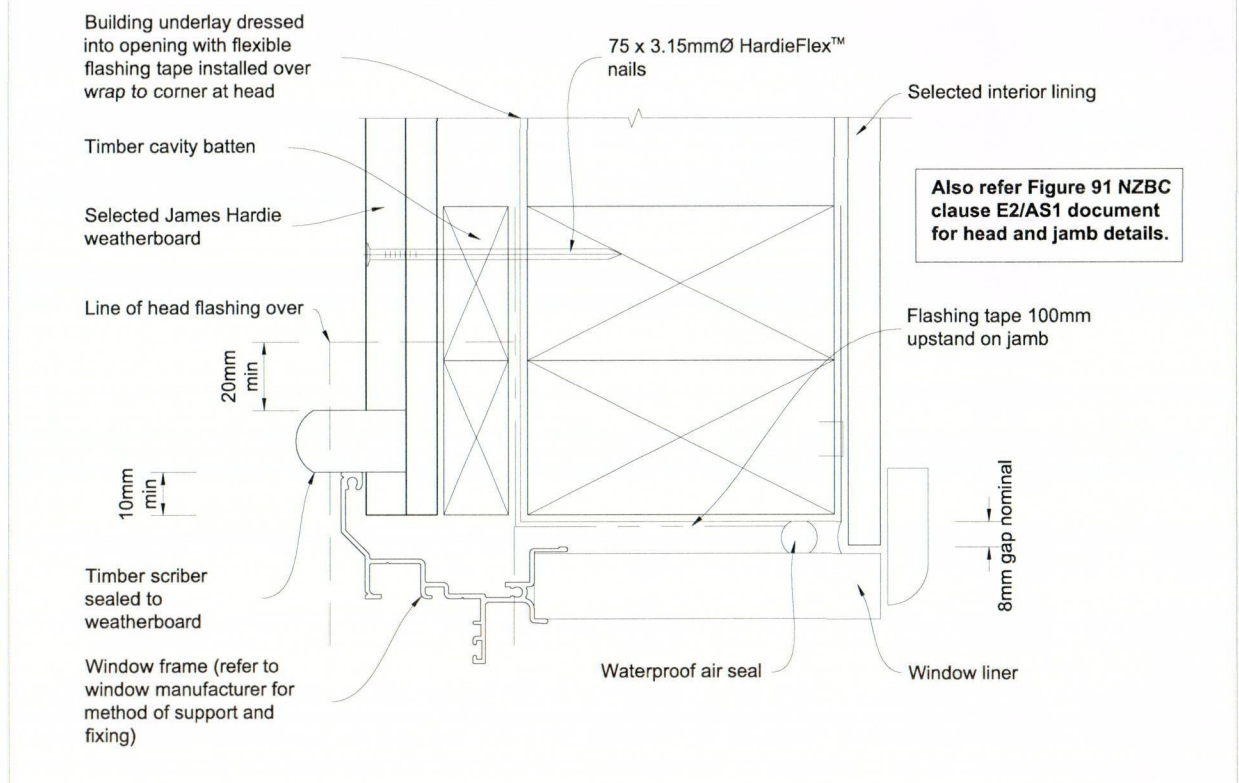
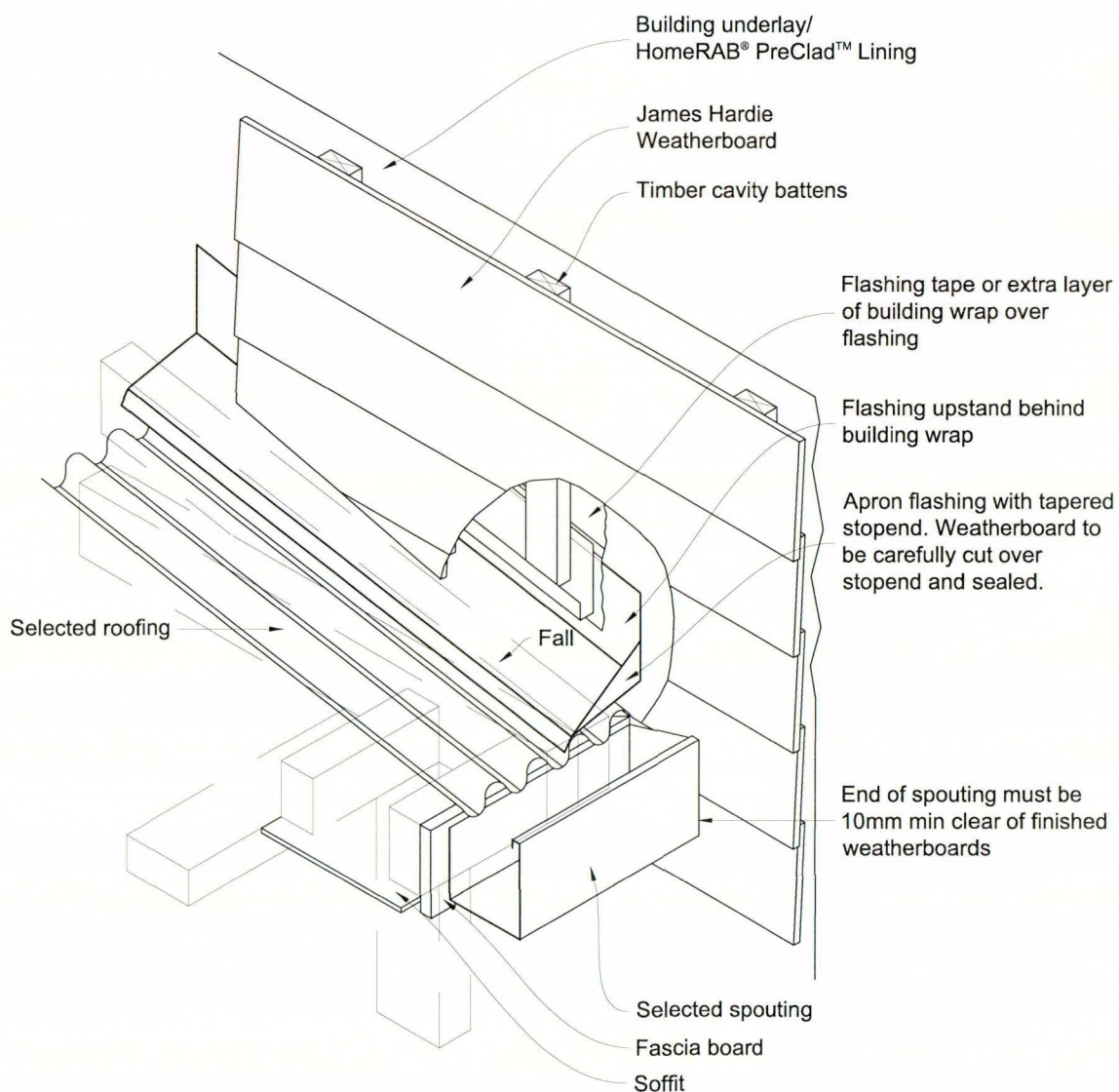


Figure 28: Cavity framing and batten setout



*

When 50 year durability for flashing is required refer Table 20 NZBC E2/AS1 document.

Figure 29: Cavity parapet flashing

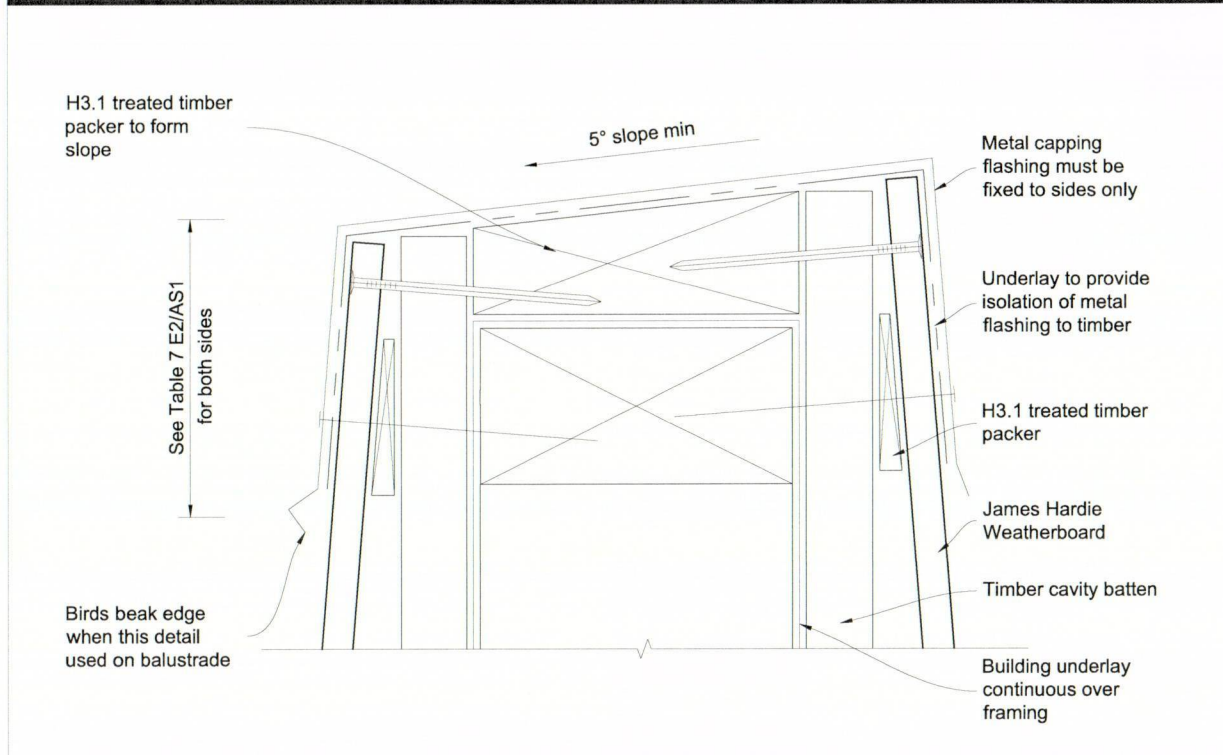


Figure 30: Cavity meter box at head

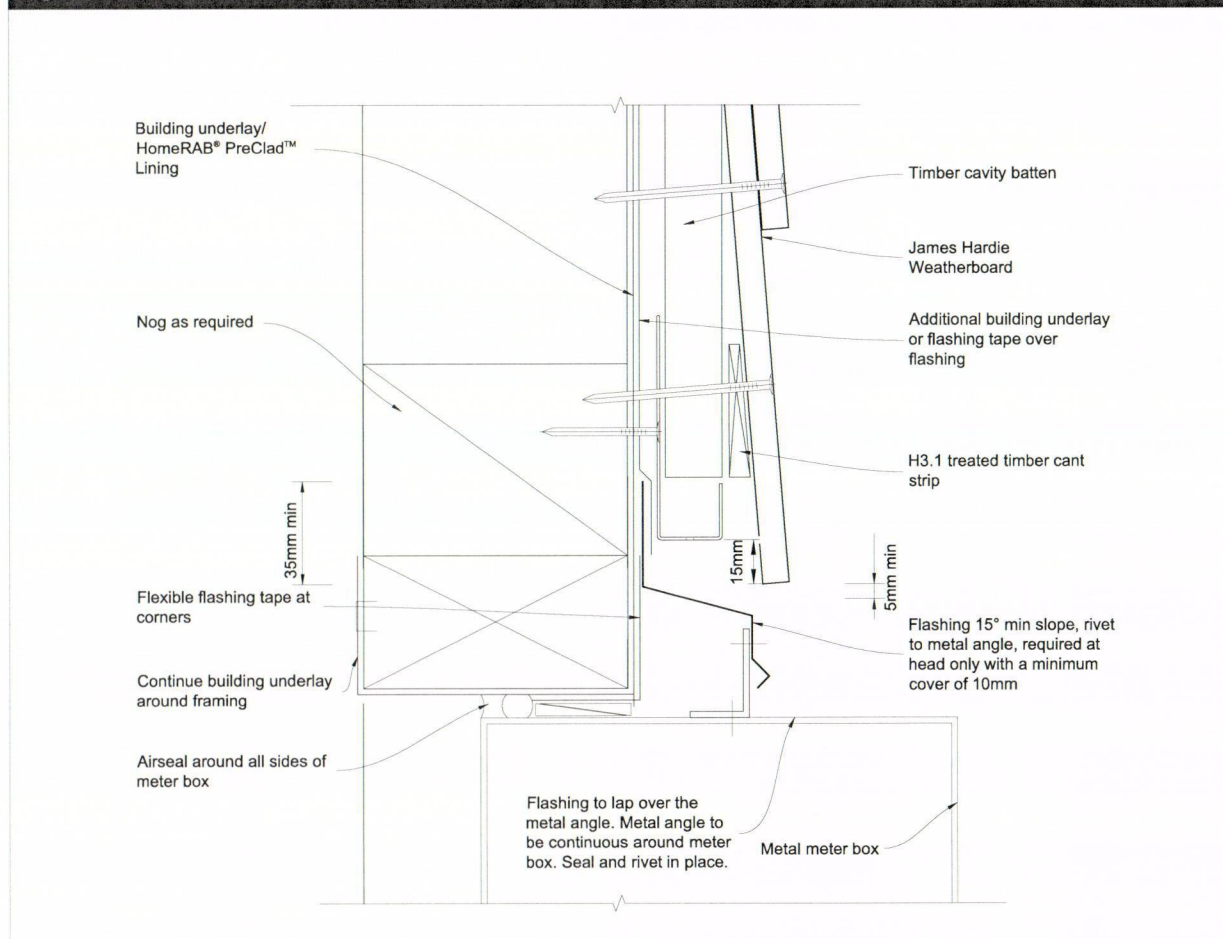


Figure 31: Cavity meter box at sill

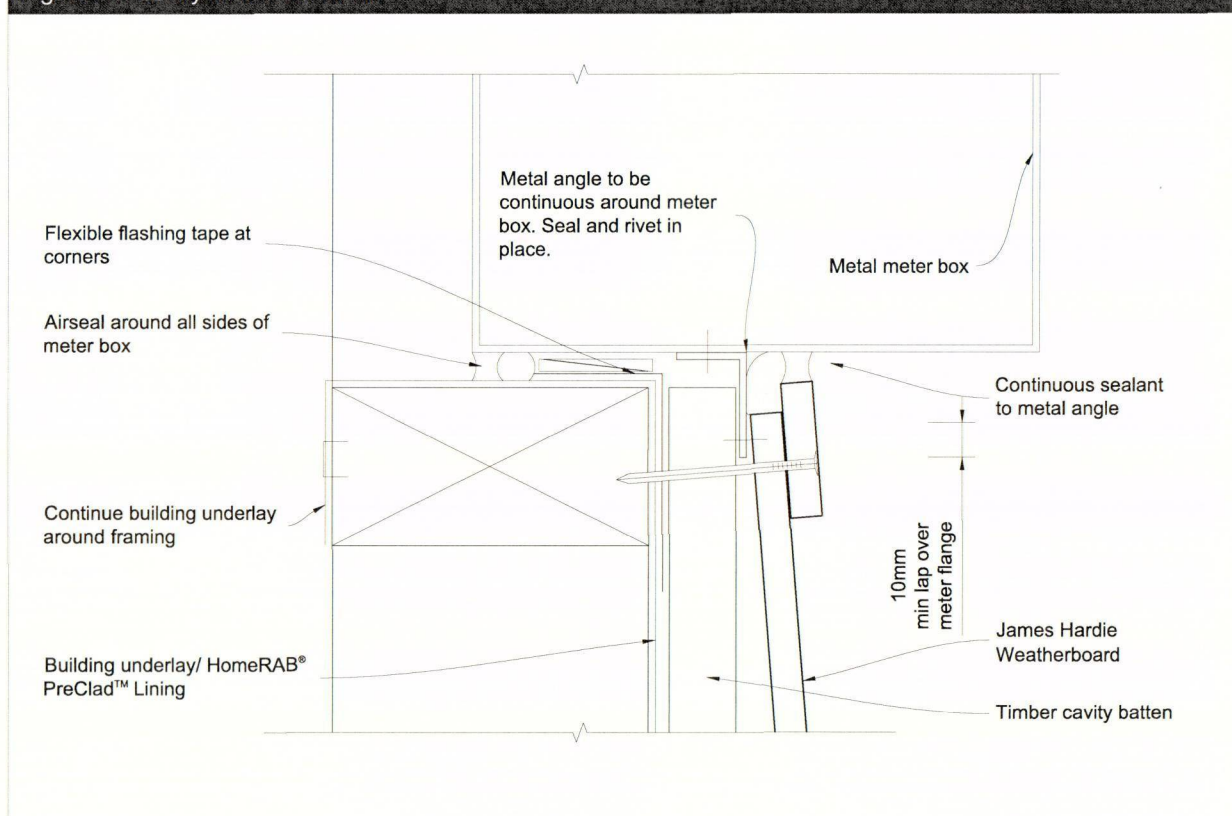


Figure 32: Cavity meter box head flashing at jamb

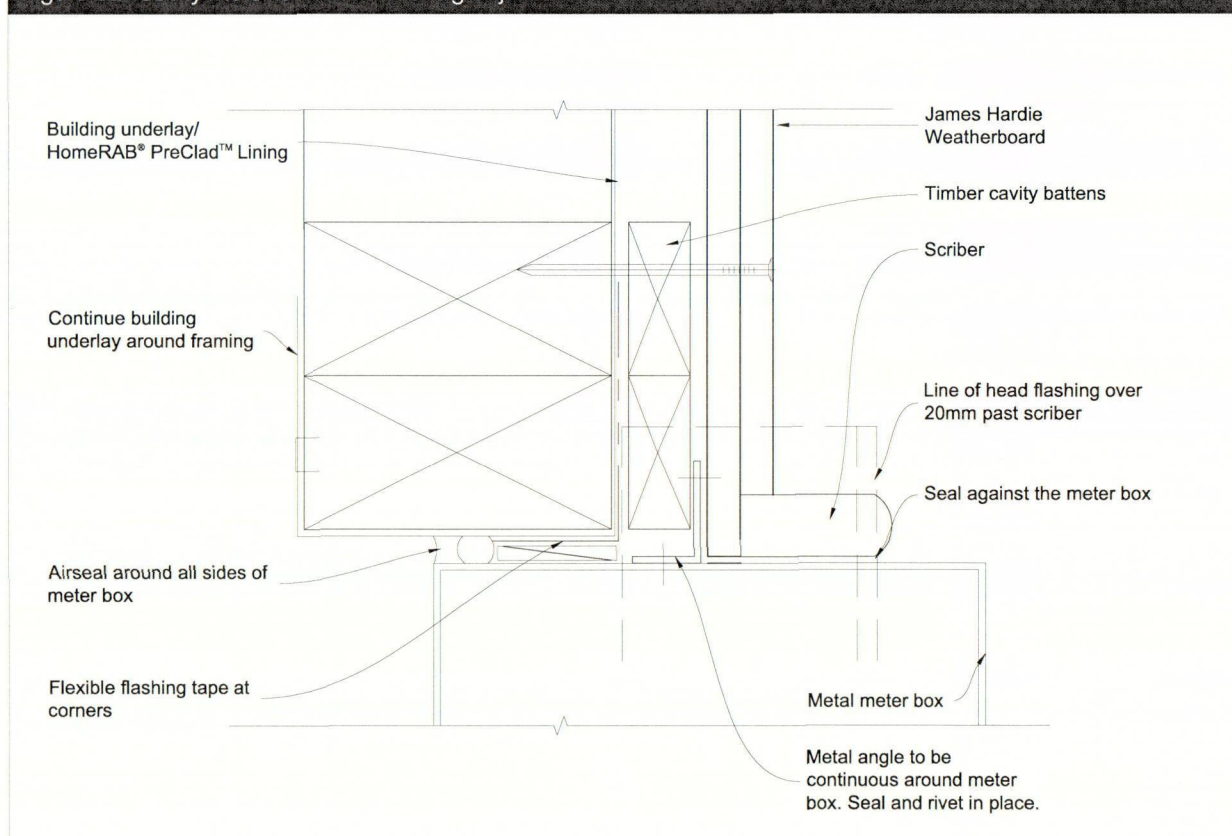


Figure 33: Cavity pipe penetration

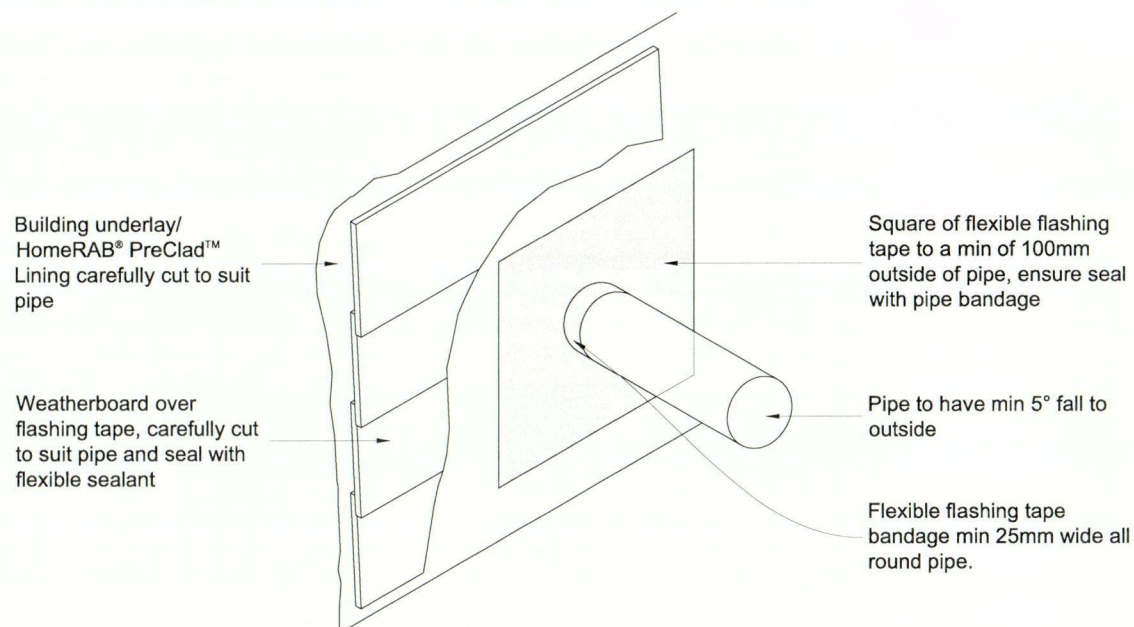
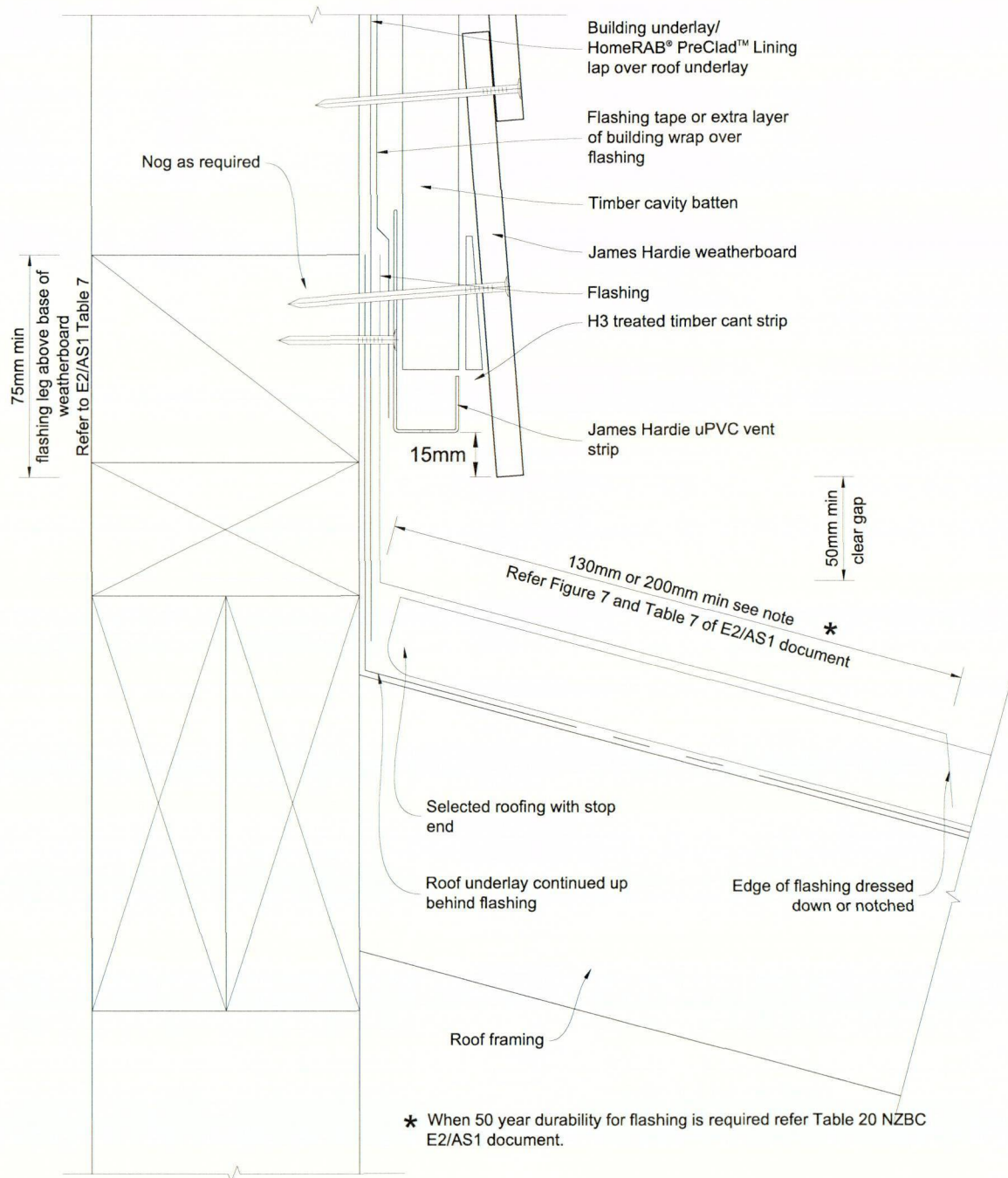


Figure 34: Cavity one piece apron flashing joint



Product Warranty

James Hardie®
WEATHERBOARDS

February 2012

James Hardie New Zealand Limited ("James Hardie") warrants for a period of 15 years from the date of purchase that the James Hardie Weatherboards (the "Product"), will be free from defects due to defective factory workmanship or materials and, subject to compliance with the conditions below, will be resistant to cracking, rotting, fire and damage from termite attacks to the extent set out in James Hardie's relevant published literature current at the time of installation. James Hardie warrants for a period of 15 years from the date of purchase that the accessories supplied by James Hardie will be free from defects due to defective factory workmanship or materials.

Nothing in this document shall exclude or modify any legal rights a customer may have under the Consumer Guarantees Act or otherwise which cannot be excluded or modified at law.

CONDITIONS OF WARRANTY:

The warranty is strictly subject to the following conditions:

- a) James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation.
- b) This warranty is not transferable.
- c) The Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer's instructions and good trade practice.
- d) The project must be designed and constructed in strict compliance with all relevant provisions of the current New Zealand Building Code ("NZBC"), regulations and standards.
- e) The claimant's sole remedy for breach of warranty is (at James Hardie's option) that James Hardie will either supply replacement product, rectify the affected product or pay for the cost of the replacement or rectification of the affected product.
- f) James Hardie will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing James Hardie will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, efflorescence or performance of paint/coatings applied to the Product, normal wear and tear, growth of mould, mildew, fungi, bacteria, or any organism on any Product surface or Product (whether on the exposed or unexposed surfaces).
- g) All warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law.
- h) If meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the original and replacement Products due to the effects of weathering and variations in materials over time.

Disclaimer: The recommendations in James Hardie's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to conditions (c), (d), (f) and (g) above. James Hardie has tested the performance of James Hardie Weatherboards when installed in accordance with the James Hardie Weatherboards technical specification, in accordance with the standards and verification methods required by the NZBC and those test results demonstrate the product complies with the performance criteria established by the NZBC. However, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design) James Hardie shall not be liable for the recommendations made in its literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the NZBC, regulations and standards, as it is the responsibility of the building designer to ensure that the details and recommendations provided in the relevant James Hardie installation manual are suitable for the intended project and that specific design is conducted where appropriate.

Copyright February 2012. © James Hardie New Zealand Limited. TM and ® denotes a Trademark or Registered Mark owned by James Hardie Technology Limited.

Ask James Hardie™
Call 0800 808 868
www.jameshardie.co.nz



James Hardie
a smarter way™



Ask James Hardie™

Call 0800 808 868

www.jameshardie.co.nz

Copyright February 2012. © James Hardie New Zealand Limited. TM and ® denotes a Trademark or Registered Mark owned by James Hardie Technology Limited.

FILE COPY
121562

Building a Secure and Weathertight Home

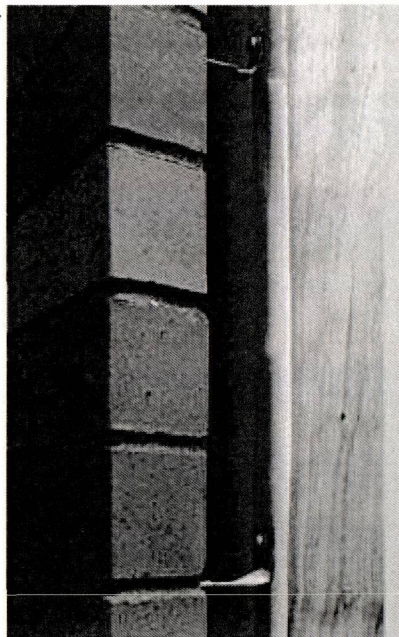
Ventilated Cavity Construction system

This proven system is immune to the 'weathertightness' or the leaky building rot issue that is plaguing many homes.

When built to Monier Brickmaker's Specifications the timber framing is protected from water by a full height cavity behind the brick veneer.

This cavity allows for critical air movement between weep holes at the base of the wall and air vents at the top.

- Keeps timber dry
- No rot
- No fungi No mould
- Manages water
- Lots of air movement
- Solid stable rigid cladding option
- Non load bearing
- No control joints required - minimal movement
- Ultimate substrate for solid plaster



A wall detail showing the Monier Brickmaker's Cavity Brick system

There has been considerable coverage regarding the leaky building and toxic rot issue. Exposed as a major problem in many new homes, it is going to cost millions of dollars to remedy. Very little attention however has been paid as to how to avoid this problem. There have been many suggestions such as using treated instead of untreated timber in the framing. Such a solution does not deal with the fundamental problems of water getting in past the cladded exterior or window flashings etc. The solution is to construct a home that keeps the water right away from the timber framing and the interior lining. Monier Brickmakers Cavity Brick System is just such a solution.

Since 1996, there have been more than 50,000 new homes built in New Zealand clad in 'brick veneer' -i.e. bricks supported by a structural timber frame. More than half of these have been built with Monier Brickmakers clay brick.

Most of these homes were constructed to Monier Brickmakers specifications using untreated timber framing. The brick veneer is separated from the timber framing by a minimum air gap of 40mm and as much as 75mm to manage water, and allow air flow.

The Monier Brickmakers Cavity Brick System is not waterproof, nor is it intended to be. It is a method of construction that is designed to manage water better than any other major cladding system. The water seeps through the bricks and mortar joints, runs down the inside face of the bricks, and out through the weepholes at the bottom of the brick veneer wall. Water cannot bridge the cavity to the timber framing. Monier Brickmakers brick veneer does not have to rely on intricate flashing details and complicated specifications to ensure water does not break the only line of defence. Monier Brickmakers brick veneer is a 'belts and braces' system where, flashings provide additional water tightness to the barrier created by the

cavity. When untreated timber framing is maintained in a dry environment, as described, dangerous fungi and moulds cannot thrive.

Air movement is critical in a high performance cladding system. The Monier Brickmakers Cavity Brick System provides for superior air movement that does not affect the insulation behind the building paper. There are weepholes at the bottom of the wall, above the windows and air vents along the top of the brick veneer. This simple system allows for an optimum flow of air from the bottom of the wall to the top. It achieves total protection of the structural timber by using proven construction methods and simple science. Wet bricks are dried by air movement. The continual flow of air ensures that the timber framing is maintained in a dry condition -in other words, the wall breathes.

In addition, a superior plastered or 'monolithic' external appearance can be achieved simply by using Monier Brickmakers bricks as the ideal plaster substrate. The bricks may be painted or plastered to provide a wide range of finishes. In doing this you are actually waterproofing an established and proven system for managing water.

This option provides the 'ultimate monolithic cladding solution' - (refer to Monier Brickmakers for Plaster Prestos) .

Invest in bricks and mortar - build with confidence -build with Monier Brickmakers proven rot free cladding solutions.



The surface texture of the bricks provides a wide range of choice from smooth face to wire cut face to rumbled bricks. The surface appearance also comes in a variety of finishes.

Features and Benefits

Durability

- Virtually unaffected by environment
- Kiln fired @ 1000°C
- Proven over thousands of years

Uniqueness

- No two bricks are the same
- Each veneer has its own characteristics that make it unique
- Designed imperfections - provides the character

Versatility

- Small module allows flexibility in design
- Textures, styles and various sizes allow versatility
- Blends well with other materials

Colour

- Permanent colour throughout the product
- Unaffected by ultraviolet light
- No problems with dark colours or reflectivity

Cost

- Not expensive - comparatively priced
- Rawlinsons show cost at approximately \$86 per square metre
- Approximately 4.5% of typical project cost

Installation

- Only one trade involved
- Fewer delays from inclement weather
- Installed as a finished product

Security

- Bricks do not catch fire
- They are difficult to break through
- Your investment is secure and weathertight

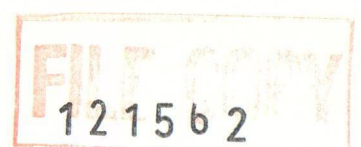
Maintenance

- Just requires a wash every now and then
- Very stable and will not deteriorate

Acoustics

- Excellent sound barrier
- Consider the local environment
- STC rating of 45dBa - Close living

Timeless



- Used in every country
- Often in vogue - a safe option
- Mellows with age - never dates

Resale

Most building companies build in brick

Why Use Monier Brickmakers

- Made in New Zealand
- Largest and most experienced manufacturers of clay bricks in NZ
- Full technical support

SPOUTING & FASCIA SYSTEMS

The Natural Choice for Style and Strength in Rainwater Systems

As a long-time innovator in rainwater systems, Steel & Tube Roofing Products has a range of products to enhance any building. For any style of home, rural and industrial building, there are proven systems that are strong, practical, affordable and very attractive.

Features

Style at home

With a range of spouting profiles to complement conventional and contemporary styled homes, or the option of a concealed fascia gutter system, you are certain to find a look you'll love. Our range of residential spoutings are suited to any roof type or pitch, and can be attached to the Multiline External metal fascia system using our patented bracket system. Alternatively, they can be fastened directly to a timber fascia using concealed brackets. Make your choice from a wide range of modern and traditional colours, or unpainted Zinalume™ for economy and the latest style statements. Selected products are also available in copper for a timeless alternative.

Ready for the big jobs

With a range of standard industrial spoutings, or custom design and manufacture for larger projects, designers have peace of mind when selecting products for commercial and industrial applications.

It's easy to look good

To make it easy to get a great looking finish, selected products feature accessories such as ready-made stop-ends and corners, and optional Flush-Fit end laps.

Durability

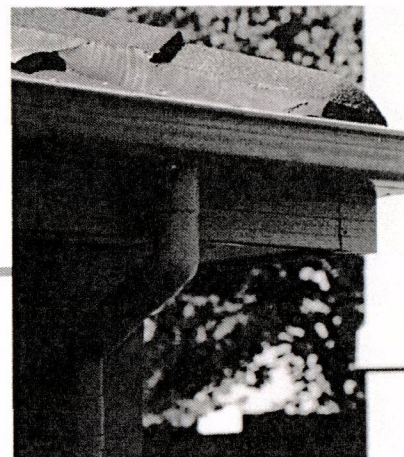
Products selected and maintained in accordance with Steel & Tube Roofing Products' recommendations on environmental categories, will meet the performance expectations in regard to durability as expressed in the New Zealand Building Code.

Drinking Water

All pre-painted and metallic coated products supplied by Steel & Tube Roofing Products are guaranteed as being suitable for the collection of drinking water.

Quality

Steel & Tube Roofing Products' operations are all certified to a minimum standard of ISO 9002 for the manufacturing, marketing and delivery of metal roofing and rainwater products.



Materials

New Zealand is exposed to a wide range of environmental conditions, from harsh West Coast beaches through moderate inland locations to industrial and geothermal sites. All rainwater systems are available in a range of finishes to suit any environment. Prior to selecting a product from this guide discuss the particular site conditions with your preferred supplier to ensure the profile and finish will perform to your expectations.

Protective Film

To ensure the surface is not damaged during transport and handling, prepainted materials have a protective strippable film. This should be removed during installation, and before prolonged exposure to sunlight.

Compatibility

Contact with or water run off from dissimilar metals such as lead, copper or stainless steel should be avoided with any Colorsteel® or Zinalume™ product. In particular avoid discharging copper spouting or downpipes from upper storeys onto lower roof sections. Monel rivets should not be used.

Colour Matched Paint

The use of colour matched paint for the touching up of scratches is not recommended, as the paint has different weathering characteristics to pre-painted materials. Accessories should be colour matched before installation.

Maintenance and Warranties

Maintenance

Few products are absolutely maintenance-free and all are subject to the cumulative effects of weather, dust, salt and other airborne deposits — some of which are extremely aggressive. In order to ensure the maximum service life from the chosen coating system, the property owner should note:

Normal rainwashing will remove some atmospheric debris, but manual washing is required for areas that do not receive adequate rainwashing, specifically the underside of spouting, and the fascia surface, which is sheltered by the spouting attached to it.

As high-risk areas, these require regular manual washing as a condition of the warranty:

Environment	Very Severe	Severe	Moderate
Washing Required	Monthly	Every three months	Every six months

Surfaces may be washed with water and a soft bristled brush. For hard to access areas, waterblasting at pressures up to 20MPa may be more appropriate. In all cases spouting should be cleaned out at least every six months; more frequently in marine areas or where fallout from leaves etc, is severe. Refer to New Zealand Steel's Specifiers & Builders Guide for more information.

Warranties

Depending on material and environment, products may be eligible for a **Warranty Plus** of up to 10 years covering paint surfaces, up to 10 years against perforation of spouting as a result of corrosion, and up to 15 years against perforation of fascia as a result of corrosion. Note that selecting a suitably durable material is important — refer to your preferred supplier, Steel & Tube Roofing Products, or New Zealand Steel's Specifiers & Builders Guide for further information.

FILE 121562

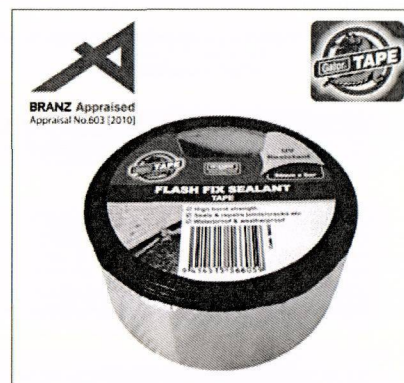
HOLDFAST® GATOR® FLASH FIX SEALANT TAPE DATA SHEET

Product Code: 56605 (50mm x 3m), 56606 (75mm x 3m),
56607 (100mm x 3m), 56608 (50mm x 10m),
56609 (75mm x 10m), 56610 (100mm x 10m),
56500 (50mm x 25mm)

Product Name: HOLDFAST® Gator® Flash Fix Sealant Tape

Description

Gator Bond Flashing Tape is based of SBS modified rubberised asphalt with foil backing. Conformable with good adhesion to a broad range of substrates.



Technical Data

Total Thickness	1.0mm
Elongation	(ASTM412) 1500 %
Permeance	(ASTME96B) max. 0.003
Water Absorption	0.23
Pliameance	(ASTM D146) Passes
Resistance to hydrostatic head	45.72m

BRANZ Appraisal Summary – from BRANZ Report number DC1968

Tensile strength	(ASTM D412) Passed
Nail sealability	(ASTM D1970 Section 7.10) Passed
Peel Adhesion	(method A of ICBO criteria)
Tested on	Kraft Building Paper, DuPont (NZ) Ltd, Tyvek Home Wrap, Thermakraft Industries (NZ) Ltd Diflex 130, Thermakraft Industries (NZ) Ltd "Watergate", Thermakraft Industries (NZ) Ltd "Cover UP" and Marshall Waterproofing NZ/AUS Ltd Tekton – Passed
Pliability	Passed
Accelerated ageing	Passed
Concluding	Gator Bond Flashing Tape passed all requirements of the ICBO AC148 July 2001 Acceptance Criteria for Flashing Materials.

Applications

Holdfast Gator Bond Flashing Tape is used for sealing around building wrap inside corner details, inside balcony details, termination of protrusion details, detailing around drains, footings non uniform surfaces. For both, below and above ground applications.

Applying

Cut Holdfast Gator Bond Flashing Tape to the required length, remove protective film and press the shelf adhering bitumous surface firmly on to the substrate. Ensure there is complete contact and avoid air inclusion. For greater conformity on irregular surfaces warm tape as applying or by pre warming roll. Warming will also be required in cold conditions.

Packaging

Colour: Aluminium Foil (Exterior), Black (Adhesive Side)
Packaging: Plastic wrapped rolls of various sizes.

Storage

Store unopened in cool and dry location.

Surfaces

Type: All usual building substrates

FILE COPY
121562

State: clean, dry, free of dust, loose debris and grease or other barriers to adhesion

Clean: Holdfast Bulldog Aluminium Powder Coat Cleaner

Health and Safety

Apply usual industrial hygiene.

Remark

The directives contained in this documentation are the result of our experiments and of our experience and have been submitted in good faith. Because of the diversity of the materials and substrates and the great number of possible applications which are out of our control, we cannot accept any responsibility for the results obtained. In every case it is recommended to carry out preliminary experiments.

Last Updated: 1st October 2010

Dektite®



The versatile solution for hundreds of applications.

Designed to enable practically any pipe flashing operation to be carried out within minutes, **Dektite®** is simple to install - and very effective. Providing the perfect weatherproof, flexible seal, **Dektite®** protects against leakage on a wide range of pipe or vent projections, and is designed to conform to most roof profiles and pitch. For a maintenance-free seal on pipes from 0 - 440mm diameter, it's much more than a flexible solution to pipe flashing. It's a means of saving **time and money!**

Easy Selection Guide

Code	PIPE mm	BASE mm	PITCH	COLOUR
DB 0-35 DG 0-35	0-35	99x99	0 - 60°	BLACK (EPDM)* DB GREY (EPDM)* DG
DB 5-55 DG 5-55	5-55	137x137	0 - 45°	
DB 50-70 DG 50-70	50-70	178x178	0 - 45°	
DB 5-120 DG 50-120	5-120	218x218	0 - 45°	
DB 110-170 DG 110-170	110-170	284x284	0 - 45°	
DB 160-220 DG 160-220	160-220	365x365	0 - 45°	
DB 160-300 DG 160-300	160-300	453x453	0 - 45°	
DB 290-440 DG 290-440	290-440	581x581	0 - 45°	

E.P.D.M. withstands temperatures from -50°C to 115°C, & up to 150°C intermittently

* DEKTITE® Pipe Flashings can also be used to flash square pipes.
Just add 30% to the pipe diameter and trim the cone to suit.

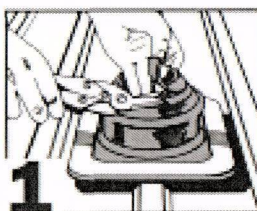
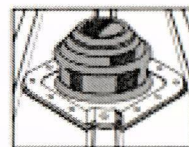


EPDM - Perfect for approved flues!

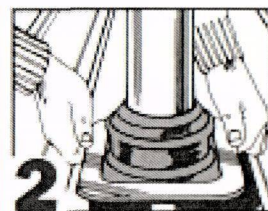
Dektite® EPDM polymer flashings have been officially tested by the Coal Corporation of Victoria, Australia and conform to all Australian and UK Standards on approved flue systems. Under no circumstances should any polymer flashing be installed on a non approved flue or an 'active' combustion heater flue.

INSTALLATION INSTRUCTIONS

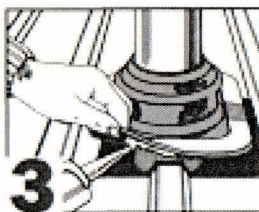
For more effective drainage always fit the Dektite on the Diamond or bias.



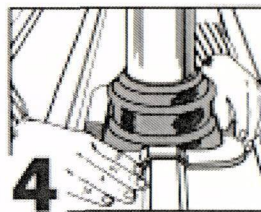
1 Cut a neat hole in roofing sheet with minimum clearance for pipe and insert pipe through hole. Trim the cone to suit pipe size using sharp tin snips. Where necessary, support cut sections of sheet with additional framing.



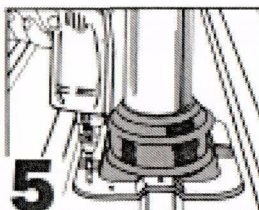
2 Slide Dektite® flashing down over pipe. Lubricating the pipe with water allows the pipe to slide snugly into position.



3 Apply a neutral cure silicone* sealant by turning back the flexible flange.



4 Press base to the roof profile by hand, smooth out any awkward creases. Don't fully extend to allow for vibration.



5 Fasten using sealed rivets or washers. Fit fasteners progressively outward in opposing pairs to avoid gaps.



Dektite®

First and the Best!

*Refer to page 28 for silicone usage

HINT: When flashing a metal flue that has an exposed seam, using a neutral cure sealant, seal the seam from underside of cowl to the top of Dektite® cone.

FILE COPY
1215b2



Specification Code	Minimum Length (m)	Lining requirement	Other requirements
BL1-H	0.4	10mm or 13mm GIB Braceline® to one side only	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 - Structure; AS1 Clause 3 Timber (NZS 3604:2011)
- NZBC B2 - Durability AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING**Timber Floor**

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or

Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB Ezybrace® Systems 2011 or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604.

WALL LINING

One layer 10mm or 13mm GIB® Braceline.

Sheets can be fixed vertically or horizontally.

Sheet joints shall be touch fitted.

Use full length sheets where possible.

PERMITTED SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB Ezybrace® Systems 2011.

FASTENING THE LINING**Fasteners**

32mm x 6g GIB® Grabber® high thread screws. (GIB Braceline® Nails may be used with 10mm GIB Braceline® only.)

Fastener centres

50,100,150, 225, 300mm from each corner and 150mm thereafter around the perimeter of the bracing element.

For vertically fixed sheets place fasteners at 300mm centres to the sheet joint.

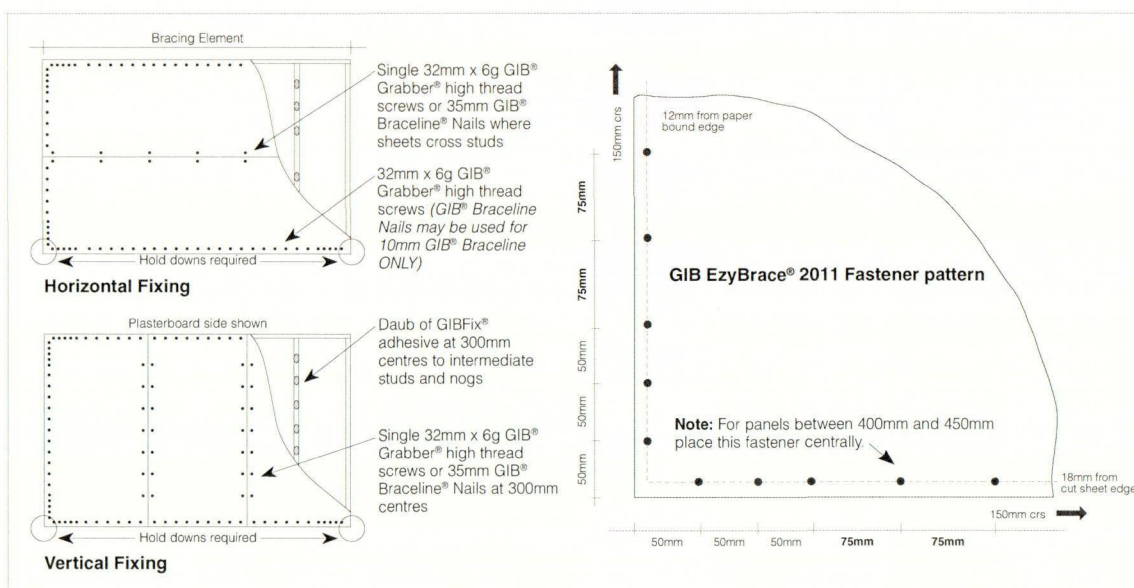
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.

Use daubs of GIB Fix® adhesive at 300mm centres to intermediate studs.

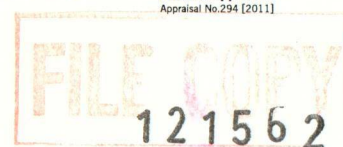
Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.



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 the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).





Specification Code	Minimum Length (m)	Lining requirement
GS1-N	0.4	Any 10mm or 13mm GIB® Standard Plasterboard to one side only

WALL FRAMING

Wall framing to comply with;

- NZBC B1 - Structure; AS1 Clause 3 Timber (NZS 3604:2011)
- NZBC B2 - Durability AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor
Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or
Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor

INTERNAL WALL BRACING LINES
In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and 600mm centres thereafter.

EXTERNAL WALL BRACING LINES
In accordance with the requirements of NZS 3604 for external plate fixing.

WALL LINING

Any 10mm or 13mm GIB® Plasterboard lining.
Sheets can be fixed vertically or horizontally.
Sheet joints shall be touch fitted.
Use full length sheets where possible.

PERMITTED SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB Ezybrace® Systems 2011.

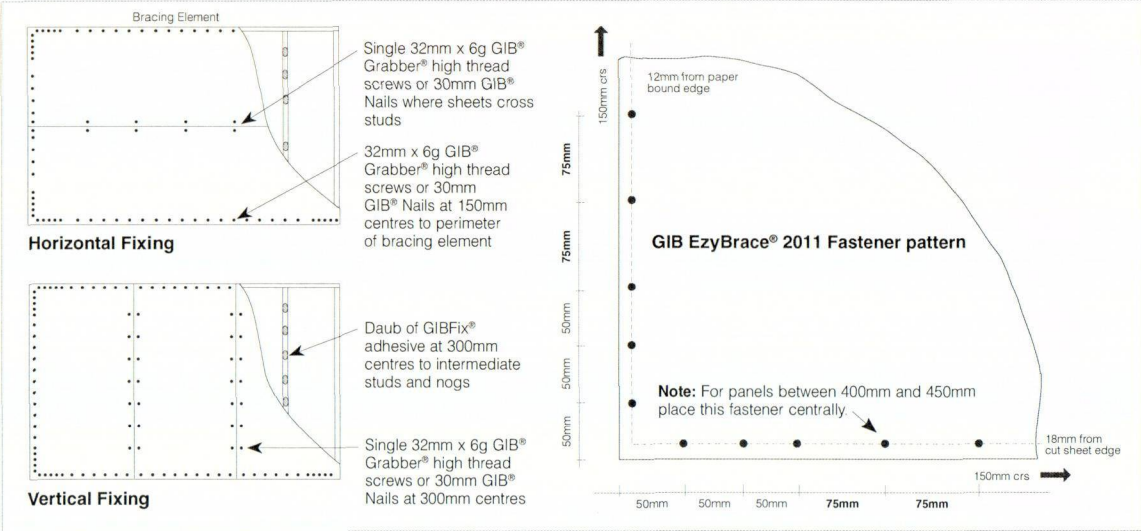
FASTENING THE LINING

Fasteners
32mm x 6g GIB® Grabber® high thread screws; or
30mm GIB® Nails.

Fastener centres
50,100,150, 225, 300mm from each corner and 150mm thereafter around the perimeter of the bracing element.
For vertically fixed sheets place fasteners at 300mm centres to intermediate sheet joints.
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.
Use daubs of GIB Fix® adhesive at 300mm centres to intermediate studs.
Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.



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 the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).



Specification Code	Minimum Length (m)	Lining requirement
GS2-N	0.4	Any 10mm or 13mm GIB® Standard Plasterboard fixed to each side of the wall framing.

WALL FRAMING

Wall framing to comply with;

- NZBC B1 - Structure; AS1 Clause 3 Timber (NZS 3604:2011)
- NZBC B2 - Durability AS1 Clause 3.2 Timber (NZS 3602)

Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber Floor

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or

Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor

INTERNAL WALL BRACING LINES

In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and then 600mm centres thereafter.

WALL LINING

One layer 10mm or 13mm GIB® Plasterboard to each side of the wall.

Sheets can be fixed vertically or horizontally.

Sheet joints shall be touch fitted.

Use full length sheets where possible.

PERMITTED SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB® Ezybrace Systems 2011.

FASTENING THE LINING

Fasteners

32mm x 6g GIB® Grabber® high thread screws; or 30mm GIB® Nails.

Fastener centres

50,100,150, 225, 300mm from each corner and 150mm thereafter around the perimeter of the bracing element.

For vertically fixed sheets place fasteners at 300mm centres to intermediate sheet joints.

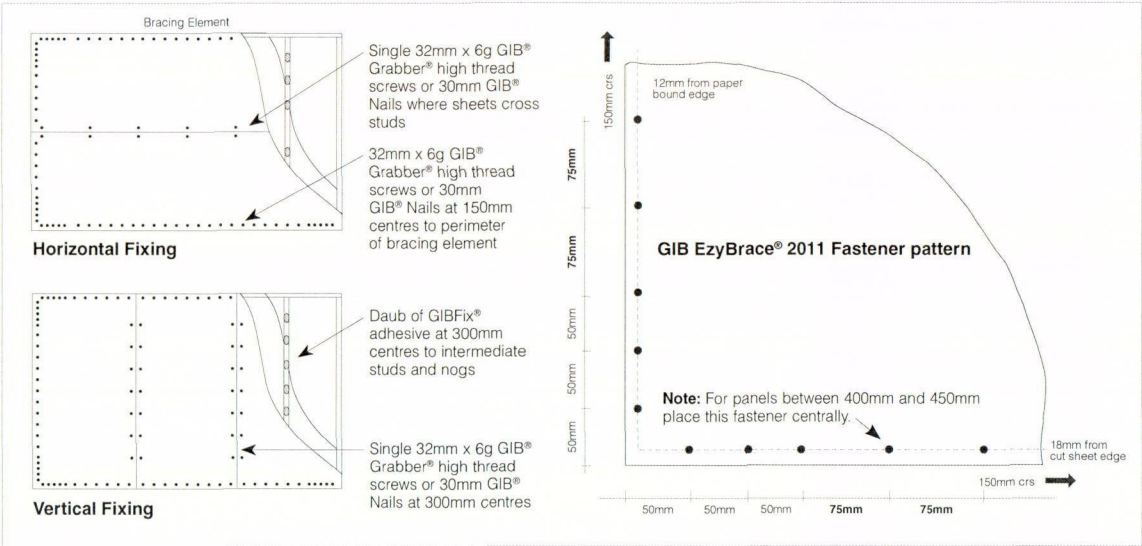
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.

Use daubs of GIB Fix® adhesive at 300mm centres to intermediate studs.

Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

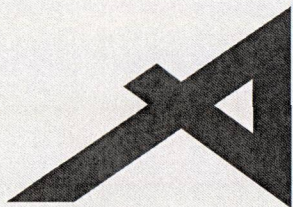
JOINTING

All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.



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 the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).





BRANZ Appraised

Appraisal No.427 [2007]

BRANZ Appraisals

Technical Assessments of products
for building and construction

BRANZ APPRAISAL CERTIFICATE No. 427 (2007)

GIB AQUALINE® WET AREA SYSTEMS

Winstone Wallboards Limited
P O Box 12 256
Penrose
Auckland 1642

Tel: 09 633 0100
Fax: 09 633 0101
Helpline Tel: 0800 100 422
Helpline Fax: 0800 229 222
Web: www.gib.co.nz
Email: info@gib.co.nz



BRANZ

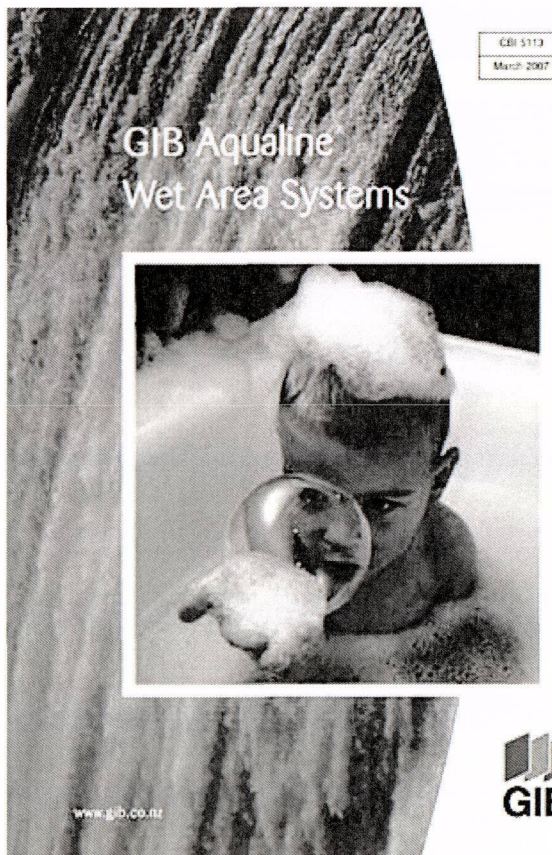
BRANZ Limited
Private Bag 50 908
Porirua City
New Zealand
Tel: +64 4 237 1170
Fax: +64 4 237 1171
www.branz.co.nz

BRANZ Pty Ltd
P O Box 830
Brookvale
NSW 2100
Australia
Tel: +61 2 9938 6011
Fax: +61 2 9938 6911
www.branz.com.au



1.1 GIB Aqualine® Wet Area Systems are for the interior lining of timber and steel frame walls and ceilings in wet areas such as bathrooms, laundries, kitchens and toilets where a water resistant lining material is desirable.

1.2 GIB Aqualine® Wet Area Systems are based on 10 mm and 13 mm thick GIB Aqualine® water resistant plasterboard.



2.1 GIB Aqualine® Wet Area Systems have been appraised for use as a wet area wall and ceiling lining in buildings within the following scope:

- on framed walls and ceilings within the scope limitations on NZS 3604; and,
- on timber and light gauge steel framed walls and ceiling subject to specific design; and,

2.2 GIB Aqualine® may also be used to substitute for some other GIB® Plasterboards in fire-rated, sound-rated and bracing-rated wall and floor/ceiling constructions.

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the GIB Aqualine® Wet Area Systems, if designed, used, installed and maintained in accordance with the statements and conditions of this Certificate, will meet or contribute to meeting the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. GIB Aqualine® Wet Area Systems meet the requirements for loads arising from self-weight, earthquake, wind and impact [i.e. B1.3.3 (a), (f), (h) and (j)]. See Paragraphs 8.1 - 8.3.

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.

FILE COPY
121562

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.1 (c) 5 years. GIB Aqualine® Wet Area Systems meet these requirements. See Paragraphs 9.1 - 9.5.

Clause C3 SPREAD OF FIRE: Performance C3.3.1, C3.3.2, and C3.3.5. GIB Aqualine® Wet Area Systems meet these requirements by providing passive fire and smoke protection.

Clause E3 INTERNAL MOISTURE: Performance E3.3.4, E3.3.5 and E3.3.6. GIB Aqualine® Wet Area Systems meet these requirements. See Paragraphs 13.1 - 13.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. GIB Aqualine® Wet Area Systems meet this requirement and will not present a health hazard to people.

Clause G6 AIRBORNE AND IMPACT SOUND: Performance G6.3.1 and G6.3.2. GIB Aqualine® Wet Area Systems meet the requirements. See Paragraph.

3.2 This Certificate appraises an Alternative Solution in terms of New Zealand Building Code compliance.

4.1 The GIB® plasterboards and accessories used in the GIB Aqualine® Wet Area System and supplied or specified by Winstone Wallboards Limited are as follows:

GIB Aqualine®

4.2 GIB Aqualine® is a paper-bound, modified water-resistant gypsum-plaster core sheet lining material. The sheets have a taper on the two long sheet edges. GIB Aqualine® is available in 10 mm and 13 mm sheet thicknesses, a sheet width of 1200 mm and in lengths of 2400 mm, 2700 mm, 3000 mm and 3600 mm. The maximum weights are 7.8 kg/m² and 10.2 kg/m² for 10 mm and 13 mm thick sheets respectively. GIB Aqualine® face paper is green in colour.

Fastenings

- GIB® Grabber® High Thread Drywall screws for fixing to timber:
6g x 25 mm and 32 mm.
- GIB® Grabber® Self Tapping Drywall screws for fixing to light gauge steel:
6g x 25 mm and 32 mm.
- GIB® Nails
30 mm and 40 mm x 2.8 mm

Adhesive and Sealants

- GIBFix® Wood Bond (Acrylic)
- GIBFix® All-Bond (Solvent)

GIB® Accessories and GIB® Jointing Compounds

- As specified in the GIB Aqualine® Wet Area Systems and GIB® Site Guide Technical Literature.

Finishes

4.3 Finishes such as tiling, flexible sheet vinyl, paints and wallpapers have not been assessed and are outside the scope of this Certificate.

Handling and Storage

5.1 The best results are achieved when GIB Aqualine® is treated as a finishing material and protected from damage. Sheets must be stacked flat and kept dry at all times. For limits on stack heights see the GIB® Site Guide. Sheets must be carried on edge and not dragged.

5.2 All accessories must be kept dry.

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the GIB Aqualine® Wet Area System. The Technical Literature must be read in conjunction with this Certificate. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Certificate must be followed.

General

7.1 GIB Aqualine® provides a water-resistant lining as a base for finishing systems in wet areas such as bathrooms, toilets, laundries and kitchens. The typical finishes are ceramic tiles and flexible sheet vinyl to walls and paint, and wallpaper to walls and ceilings.

7.2 GIB Aqualine® must not be used in the following situations:

- For bracing applications in shower areas or adjacent baths (See Paragraphs 7.4 and 8.2).
- In areas of high humidity (above 90% RH) or continually wet such as group showers, steam rooms, or swimming pools.
- Installed over a vapour barrier.
- Applied directly to masonry, concrete or solid plaster.
- Applied over other sheet lining materials.
- Used externally of the building envelope.
- Exposed to temperatures of 52°C or greater for prolonged periods. (Refer to appliance and fitting manufacturer's for installation details.)

7.3 GIB Aqualine® may be substituted for some other GIB® Plasterboard products in specific GIB® Bracing Systems, GIB® Fire Rated Systems, GIB® Noise Control Systems and GIB Ultraliner® PLUS Lining System.

Wet Areas

7.4 Wet areas are spaces where sanitary fixture and sanitary appliances are located such as bathrooms, toilets, laundries and kitchens. There are two general categories of wet areas as follows:

1. Water Splash – These are areas subject to intermittent splashing of water such as around baths, vanities, tubs and sinks.
2. Shower Areas – These are areas subject to frequent and heavy water splash such as enclosed showers, unenclosed shower zones and showers over baths.

7.5 Both the above wet area categories must be finished with surfaces and joints that are impervious and easily cleaned. Shower areas must additionally be waterproof. This can be achieved using proprietary rigid shower lining systems, flexible vinyl shower wall finish, or tiling. Tiled shower areas must include a wet area waterproofing membrane system under the tiles.

Intertency Walls – Wet Areas

7.6 Intertency drywall constructions that incorporate fire resistance and noise control must be protected from water splash. In shower areas GIB Aqualine® must not be substituted for other GIB® Plasterboards but must be an extra lining layer. Refer to the GIB Aqualine® Wet Area Systems Technical Literature.

Tiling

7.7 GIB Aqualine® is suitable as a substrate for tiling up to the following weights:

- 10 mm GIB Aqualine® up to 20kg/m²
- 13 mm GIB Aqualine® up to 32kg/m².

Note: Most ceramic and porcelain wall tiles weigh less than 20kg/m². For further information on tiling consult the BRANZ Good Practice Guide – Tiling.

Framing

7.8 Supporting framing must comprise one of the following subject to the minimum sizes, dwang centres and all other frame requirements of GIB Aqualine® Wet Area Systems Technical Literature:

- Timber framing must be designed and constructed in accordance with NZS 3604, or to a specific design using NZS 3603 and NZS 4203 (AS/NZS 1170).
- Steel framing must be designed to withstand loads in accordance with NZS 4203 (AS/NZS 1170).

Structure

Bracing

8.1 GIB Aqualine® can be used in place of GIB® Standard plasterboard in GIB® bracing elements. GIB Aqualine® can be used in place of GIB Braceline® in GIB® bracing elements 900 mm or longer, provided the perimeter of the element is fixed with GIB Braceline® Nails or GIB Braceline® screws at 100 mm centres, using the GIB Braceline® corner fixing pattern.

8.2 GIB Aqualine® must not be used for bracing in shower areas or behind baths.

Impact Resistance

8.3 GIB® plasterboards provide adequate resistance to soft body impact, based upon experience of use in domestic and light commercial applications.

Durability

Serviceable Life

9.1 GIB Aqualine® has a serviceable life of at least 15 years as a fully protected shower or water splash lining. As a general wall and ceiling lining GIB Aqualine® will have a serviceable life in excess of 50 years. The ability of GIB Aqualine® to remain durable is dependent on being protected and remaining dry in service, and being maintained in accordance with this Certificate.

Maintenance

9.2 The building must be maintained weathertight and all lining systems protected from internal and external moisture.

9.3 Finishes to water splash and shower areas, including tiles, grout, waterproof membranes, sealants and flexible sheet vinyl must be checked to ensure the integrity of the system is maintained. They must be repaired or replaced if necessary. When repairing or replacing finishes, the GIB Aqualine® substrate must be checked for defects and repaired or replaced, as required.

9.4 For flexible sheet vinyl, particular attention must be paid to joints especially at corners. Checks should be made to ensure the vinyl has not been punctured. Where damage has occurred, repairs must be made immediately.

9.5 Impact damage to GIB Aqualine® plasterboard, resulting in small holes and cracks, may be patched, stopped and finished. For larger areas of damage, expert advice on repair must be sought from Winstone Wallboards Ltd.

Outbreak of Fire

10.1 Separation or protection must be provided to GIB Aqualine® Wet Area Systems from heat sources such as stoves, heaters, flues and chimneys.

10.2 NZBC Acceptable Solution C/AS1, Part 9 and Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

Spread of Fire

11.1 When 10 mm GIB Aqualine® is substituted into fire rated systems in place of 10 mm GIB Fyreline®, the FRR of that system will be maintained. Similarly, the FRR is maintained when 13 mm GIB Aqualine® is substituted for 13 mm GIB Fyreline®.

Flame Barrier

12.1 Where flame barriers are required by Acceptable Solution C/AS1 Table 6.3, GIB Aqualine® is a suitable material to provide a 10 minute flame barrier, provided all sheet joints are formed over framing, or backblocked with GIB® plasterboard.

Internal Moisture

13.1 When installed in accordance with this Certificate, GIB Aqualine® Wet Area Systems will provide wall surfaces adjacent to sanitary fixtures and sanitary appliances that are impervious and easily cleaned.

13.2 The construction methods meet with the internal moisture requirements of the NZBC Acceptable Solution E3/AS1.

13.3 To minimise internal condensation, adequate levels of ventilation and thermal resistance must be provided to all spaces where moisture may be generated.

Airborne and Impact Sound

14.1 When GIB Aqualine® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®, 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.

Installation Skill Level Requirement

15.1 Installation of GIB Aqualine® Wet Area Systems can be carried out by any competent building contractor.

General

16.1 GIB Aqualine® Wet Area Systems must be installed in accordance with the Technical Literature. For inspection, reference must be made to the Technical Literature.

Cutting

16.2 GIB Aqualine® is easily cut by scoring the face paper with a sharp short-bladed trimming knife, and then snapping the plasterboard away from the cut face and cutting the back paper or by sawing. Use of a metal straightedge facilitates clean straight cuts. Cut edges can be tidied up by using a knife. Paper dags should be removed.

Health and Safety

16.3 Dust resulting from the sanding of stopping and finishing compounds may be a respiratory irritant, and the use of a suitable facemask is recommended.

Framing

16.4 To achieve an acceptable decorative finish, GIB Aqualine® Wet Area Systems and the GIB® Site Guide specifies that walls must not be lined unless the moisture content of timber framing is less than 18%. Winstone Wallboards Limited recommend a moisture content of 8–12% where buildings are to be air conditioned or centrally heated.

Fixing Sheets

Non-Tiled Areas

17.1 GIB Aqualine® sheets may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws or GIB® Nails at 300 mm centres around the perimeter of the sheet, and with GIBFix® adhesive on all intermediate studs and dwangs. Adhesive must not be used under fasteners. A 5-10 mm gap must be left between the floor and the bottom of the sheet.

Tiled Areas

17.2 Control joints must be provided at maximum 4 m centres.

Internal corners in shower areas must be reinforced with a minimum 32 x 32 x 0.55 mm galvanised metal angle prior to lining the walls.

17.3 GIB Aqualine® sheets may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws at 100 mm centres to perimeter of wall and to all intermediate studs. Adhesive must not be used in place of screws.

Ceilings

17.4 Supports of timber or steel battens or ceiling joists must be 450 centres for 10 mm GIB Aqualine®, or 600 mm centres for 13 mm GIB Aqualine®.

17.5 GIB Aqualine® sheets must be fixed with GIB® Grabber® screws at 600 mm centres around perimeter and at 200 mm centre along supports. Alternatively, sheets are screw fixed at 600 mm centres along the supports and GIBFix® adhesive fixed at 200 mm centre between.

Penetrations and Sealants

18.1 All cut-outs for pipe penetrations must be made neatly using a hole saw. Cut-outs should be made approximately 12 mm diameter greater than the pipe.

18.2 A bead of silicone sealant must be placed to the full thickness of the GIB Aqualine® sheet around all pipe penetrations, at bath rims and preformed shower bases and where an impervious junction is required at the floor/wall line.

18.3 In tiled areas, a bead of silicone sealant 6 mm wide must also be placed to the full thickness of the tiles where the above situation occurs. The sealant manufacturer's technical literature must be followed for installation.

Jointing and Finishing

19.1 Jointing must be carried out in accordance with GIB® Site Guide Technical Literature.

19.2 Tiled shower areas must incorporate a waterproofing membrane over GIB Aqualine®. Waterproofing membranes are outside the scope of this Certificate and must otherwise be specified and approved.

Investigations

20.1 The GIB Aqualine® Wet Area Systems and GIB® Site Guide Technical Literature have been examined by BRANZ and found to be satisfactory.

20.2 Site visits were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.

20.3 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.

20.4 Winstone Wallboards Limited GIB® plasterboards have been assessed for the following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, Hunter hardness, inspection for fungal spores, hard and soft body impact tests.

Quality

21.1 Winstone Wallboards Limited's manufacturing process and details of the quality and composition of the materials, have been examined by BRANZ and found to be satisfactory.

The quality management systems of Winstone Wallboards Limited have been assessed and registered by TELARC as meeting the requirements of ISO 9001, Registration No. 581.

Winstone Wallboards Limited is responsible for the quality of the product supplied.

21.2 The quality of the application and finish on site is the responsibility of the installation, stopping and finishing contractors.

21.3 Designers are responsible for the design of buildings.

21.4 Building owners are responsible for the maintenance in accordance with the instructions of Winstone Wallboards Limited.

Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2588: 1998 Gypsum Plasterboard.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber structures standard.
- NZS 3604: 1999 Timber and framed buildings.
- NZS 4203: 1992 Code of practice for general structural design and design loadings of buildings.
- BRANZ Good Practice Guide - Tiling, March 2004.
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.



BRANZ

In the opinion of BRANZ, GIB Aqualine® Wet Area Systems are fit for purpose and will comply with the Building Code to the extent specified in this Certificate provided they are used, designed, installed and maintained as set out in this Certificate.

The Appraisal Certificate is issued only to the Certificate Holder, Winstone Wallboards Limited, and is valid until further notice, subject to the Conditions of Certification.

Conditions of Certification

1. This Certificate:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the technical literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. The Certificate Holder:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
3. The product and the manufacture are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ.
4. BRANZ makes no representation as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by the Certificate Holder.
5. Any reference in this Certificate to any other publication shall be read as a reference to the version of the publication specified in this Certificate.

For BRANZ

P Robertson
Chief Executive

Date of issue: 4 April 2007

121562

FILE COPY

3.0 STRUCTURAL BRACING & CEILING DIAPHRAGMS

The Ecoply® bracing system provides bracing resistance for walls and subfloor foundations for light timber framed buildings under wind and earthquake loading, to meet the requirements of the NZ Building Code - B1 Structure, and NZS 3604 *Timber Framed Buildings* or specifically designed to NZS 3603 *Timber Structures Standard*.

Any Ecoply structural panel may be used for bracing as long as it is equal to or greater than 7 mm thickness, has a minimum wall length as described in Table 9, treated for the specific

application in accordance with NZS 3602 (summarised in Table 8) and fixed in accordance with Ecoply bracing specifications outlined in this publication.

Shadowclad® exterior cladding, direct-fixed to framing or installed over 20 mm cavity battens, may be used for bracing when installed in accordance with the Shadowclad Specification & Installation Guide.

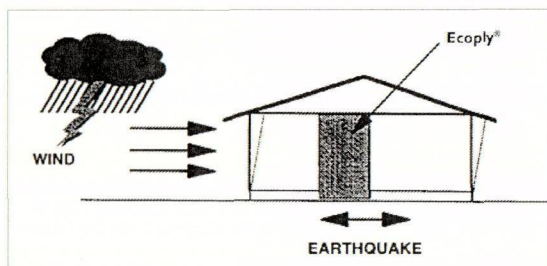
3.1 DESIGN TO COMPLY WITH THE NEW ZEALAND BUILDING CODE

Structure

Timber framed buildings to NZS 3604

NZS 3604 *Timber Framed Buildings* is listed as an Acceptable Solution under clause 3.0 Timber in Acceptable Solution B1/AS1 Structure.

CHH Woodproducts have developed a range of wall bracing elements tested using P21 testing methods referenced in NZS 3604:2011.



Specific design

Because Ecoply is structural plywood manufactured to AS/NZS 2269, it is suitable for design and use in earthquake and wind bracing systems constructed in accordance with NZS 3603 and AS/NZS 1170.

Structural plywood to AS/NZS 2269 is the only sheet brace material with properties defined in a published New Zealand engineering design code, NZS 3603 *Timber Structures*, and so can be designed in compliance with Verification method B1/VM1 under clause 6.0 Timber for use in buildings over three storeys in height.

Demand is calculated by following Section 5, Bracing Design of NZS 3604 or using the GIB Ezy-Brace software, downloadable from www.gib.co.nz

EP bracing systems properties can be easily loaded into the Ezy-Brace software by way of an Excel patch downloadable from www.chhwoodproducts.co.nz/ecoply-bracing together with loading instructions.

Because of changes made in the way the P21 racking test is analysed, BU's have been slightly downgraded in some instances from previous publications.

As a consequence of these changes, historical bracing systems (commonly referred to as the SP bracing series) will not meet the requirements of NZS 3604 and will not be an acceptable system from the 1st of January 2012.

Timber Floors

When carrying out a bracing design for buildings with timber floor structures, the maximum bracing rating that can be accounted for when summing up the bracing units is 120 BUs/m. This does not exclude the installation of bracing elements that are rated higher than 120 BUs/m, however the extra bracing capacity can not be accounted for in the bracing design.

Specific design of floor and sub-floor framing is required for elements rated higher than 120 BUs/m.

Durability

Ecoply plywood is manufactured to meet the requirements of NZS 3602 Timber and Wood based products for use in Buildings. If the product is used, handled and installed in accordance with CHH Woodproducts product literature it will meet the durability clauses of the NZ Building Code.

Table 8 summarises the applications in which Ecoply can be used as structural bracing together with the preservative treatment and fastener material required.

TABLE 8: ECOPLY® SUITABILITY FOR BRACING APPLICATIONS INCLUDING TREATMENT TYPE AND FASTENER MATERIAL

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones¹ including sea spray): E.g. Interior linings	Ecoply Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones¹ B & C: E.g. Plywood bracing and/or rigid underlay (rigid air barrier), fixed to framing with/ without building paper/ wrap over, with/ without cavity battens behind cladding	Ecoply H3 treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone¹ D (sea spray): E.g. Plywood bracing and/or rigid underlay (rigid air barrier), fixed to framing with/without building paper/wrap over, with/without cavity battens behind cladding	Ecoply H3 treated Ecoply Barrier (rigid air barrier)	Stainless steel
Plywood bracing exposed to exterior weather conditions and dampness but not in contact with ground in exposure zones¹ B & C: E.g. Plywood used as both cladding and bracing (direct fixed to framing or over a drained ventilated cavity system)	Refer to Shadowclad® Specification and Installation Guide	
Plywood bracing exposed to exterior weather conditions and dampness but not in contact with ground in exposure zones¹ D (sea spray): E.g. Plywood used as both cladding and bracing (direct fixed to framing or over a 20 mm drained ventilated cavity system)	Refer to Shadowclad Specification and Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones¹ B & C	Ecoply H3 treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zones¹ D	Ecoply H3 treated	Stainless steel
Bracing in wet process buildings in all exposure zones¹ (including sea spray)	Ecoply H3 treated	Stainless steel

¹ Exposure zones as per section 4 of NZS 3604

Rain wetting and construction bracing

Untreated Ecoply® will withstand normal exposure conditions during construction for up to 3 months however aesthetically the sheet appearance will deteriorate as the level of exposure increases. Rain and exposure can cause thinner plywood panels to buckle. Plywood stability is related to the number of veneers and thickness of the panel. Where panel stability is critical, consider using thicker panels.

Humidity and condensation

In uses where the moisture content may exceed 18% for prolonged periods, Ecoply must be H3 treated to resist decay or insect hazard.

Subfloor sheet bracing

H3 treated Ecoply can be used as sheet bracing where dampness does not allow the use of untreated plywood or other sheet materials (section 5 of NZS 3604). Where Ecoply subfloor sheet bracing is exposed to both rain and sun, it must be coated with a three coat, maintained acrylic exterior coating system with a light reflectance value of 40% or greater.

Adjustments for wall height

Use section 5 of NZS 3604 to calculate bracing values:

"Adjustment of bracing capacity of walls of different heights and walls with sloping top plates shall be obtained by the following method:

- For wall bracing elements of heights other than 2.4 m, the bracing rating determined by test or from Table 9 should be multiplied by $2.4 \div \text{element height in metres}$, except that elements less than 2.4 m high shall be rated as if they are 2.4 m high.
- Walls of varying heights, should have their bracing capacity adjusted in accordance with section 5 of NZS 3604 using the average height."

Joining panels for walls higher than maximum sheet length

Ecoply bracing panels must be fixed from top plate to bottom plate (with the exception of bracing specification of EPGs). For wall heights over 2.4 m, Ecoply and Shadowclad is available in 2.7 m sheet lengths. Alternatively, a part sheet can be stacked above a full sheet, butt joined on a single row of nogs with each sheet/part sheet independently nailed off as per the nail spacing in the Ecoply bracing specifications (e.g. 2.4 m x 1.2 m sheet with a 0.3 m x 1.2 m part sheet above it to give a 2.7 m x 1.2 m bracing element).

Cladding as bracing

Shadowclad® is recommended as a cladding which can be used for bracing as well.

12 mm Ecoply® (CD face grade or better) can be H3 treated to meet the requirements of Acceptable Solution E2/AS1 and will perform as a structural, durable and weather tight cladding and bracing element when installed in accordance with the specifications in the Shadowclad Specification and Installation Guide.

However smooth faced plywood such as Ecoply may be prone to appearance related issues such as face checking which occurs naturally and is not considered by CHH Woodproducts to be a manufacturing or product fault. For more information refer to section 1.8: Face checks on plywood exposed to weather: H3.2 CCA treated Ecoply may also have a green tinge to the wood surface and may have fillet marks on the face of the sheet.

For exterior cladding applications where a high visual appearance is desired, CHH Woodproducts strongly recommends the use of Shadowclad as an exterior cladding. Shadowclad has a bandsawn face which helps reduce the incidence and appearance of face checking and is most commonly H3.1 LOSP treated (clear preservative treatment) which does not leave fillet marks on the panel face.

For further information on Shadowclad and plywood as an exterior cladding refer to the Shadowclad Specification and Installation Guide.

Soil

Ecoply must not be allowed to come in contact with soil. The bottom edge of the plywood sheet must be a minimum of 100 mm above decks or paved ground and a minimum of 175 mm above unprotected ground.

Service penetrations in bracing elements

Small openings (e.g. power outlets) of 90 x 90 mm or less may be placed no closer than 90 mm to the edge of the braced element, or waste pipe outlets of max. 150 mm diameter placed at no closer than 150 mm to the edge of the braced element.

Ecoply® Bracing Specification – EP1

June 2012

Single sided structural plywood brace

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EP1	0.6 m	7mm Ecoply®, or Ecoply Barrier one side	125	130

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS3604:2011)
- NZBC B2 - Durability: AS1 Clause 3.2 Timber (NZS3602)

Framing dimensions and height are as determined by the NZS3604:2011 stud and top plate tables for load bearing and non load bearing walls. Kiln dried verified structural grade timber must be used. Machine stress graded timber, such as Laserframe®, is recommended.

Bottom Plate Fixing

Use GIB HandiBrac® hold-down connections at each end of the bracing element. Refer to installation instructions supplied with the connectors for correct installation instructions and bolt types to be used for either concrete or timber floors. Within the length of the bracing element, bottom plates are fixed in accordance with the requirements of NZS 3604:2011.

Lining

One layer 7mm Ecoply structural plywood fixed directly to framing or over cavity battens. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

Fastening the Ecoply

Fasteners

Fasten with 50 x 2.8 mm galvanised or stainless steel flat head nails. Place fasteners no less than 7 mm from sheet edges.

Fasteners for H3.2 CCA treated Ecoply

Where fasteners are in contact with CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised

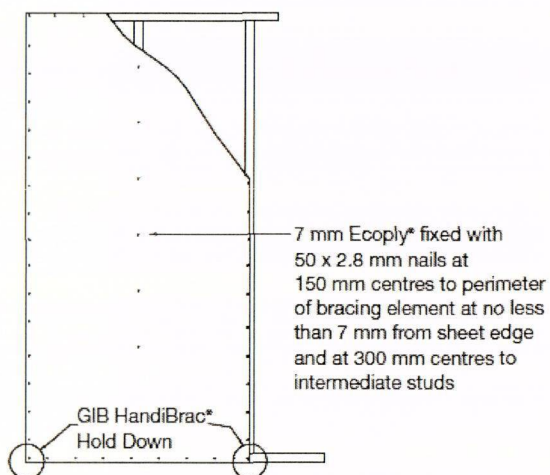
In certain circumstances stainless steel fasteners may be required. Refer to section 4 of NZS 3604:2011 for these circumstances.

Refer to Table 8 in the Ecoply Specification and Installation Guide for further fastener selection advice.

Stainless steel fasteners must be annular grooved

Fastening Centres

Fasteners are placed at 150 mm centres around the perimeter of each sheet and 300 mm centres to intermediate studs.



Ecoply® Bracing Systems are designed to meet the requirements of the NZBC and have been tested and analysed using the P21 method referenced in NZS3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply and Laserframe SG8 timber framing manufactured by Carter Holt Harvey Limited trading as Carter Holt Harvey Woodproducts New Zealand, and GIB® products manufactured by Winstone Wallboards Ltd. **Substituting materials may compromise performance of the system.** GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

DESIGNER AND USER GUIDELINES

THERMAKRAFT 215 **BITUMINOUS** **SELF SUPPORTING** **ROOFING UNDERLAY**

Product Description	<p>Thermakraft 215 Bituminous Self Supporting Roofing Underlay is specifically designed for use in Domestic and Commercial type buildings.</p> <p>Thermakraft 215 Bituminous Self Supporting Roofing Underlay will provide the following functions:</p> <div><div>1)</div><div>Permeable to water vapours.</div></div> <div><div>2)</div><div>Resistance to water and air penetration.</div></div> <div><div>3)</div><div>Resistance to dust and excessive air movement.</div></div> <div><div>4)</div><div>Is self supporting up to 1200mm rafter/purlin spacing.</div></div>												
Applications	<p>Thermakraft 215 Bituminous Self Supporting Roofing Underlay provides the ideal temporary protection against wind, snow and rain prior to the application of the wall cladding or roofing material. It is ideally used to reduce condensation under roofing.</p> <p>Care should be taken not to expose Thermakraft 215 Bituminous Self Supporting Roofing Underlay to continuous wet and windy conditions. Apply during mild conditions.</p>												
Note	<p>Applications outside our recommendations or if unusual conditions exist the suitability of Thermakraft 215 Bituminous Self Supporting Roofing Underlay should be established by contacting a representative of Thermakraft Industries (NZ) Ltd.</p>												
Standard Roll Dimensions	<p>Thermakraft 215 Bituminous Self Supporting Roofing Underlay is coloured black.</p> <p>Rolls are girth wrapped and labelled with the company name and manufacture batch number.</p> <table><tr><td>Roll Sizes</td><td>1250mm x 40m</td><td>50m²</td><td>18 kg</td></tr><tr><td></td><td>1250mm x 20m</td><td>25m²</td><td>9 kg (2 per pack)</td></tr><tr><td></td><td>1450mm x 34.5m</td><td>50m²</td><td>18 kg</td></tr></table>	Roll Sizes	1250mm x 40m	50m ²	18 kg		1250mm x 20m	25m ²	9 kg (2 per pack)		1450mm x 34.5m	50m ²	18 kg
Roll Sizes	1250mm x 40m	50m ²	18 kg										
	1250mm x 20m	25m ²	9 kg (2 per pack)										
	1450mm x 34.5m	50m ²	18 kg										
Standards	<p>Thermakraft 215 Bituminous Self Supporting Roofing Underlay complies with the requirements of AS/NZS 4200.1: 1994 Pliable Building Membranes and Underlays.</p>												
Durability	<p>Thermakraft 215 Bituminous Self Supporting Roofing Underlay when In accordance with the approved document E2 of the Building Code and:</p> <div><div>•</div><div>is installed correctly.</div></div> <div><div>•</div><div>is not subjected to unreasonable conditions of exposure.</div></div> <div><div>•</div><div>is not damaged due to design defects.</div></div> <div><div>•</div><div>is not covered by faulty or thin sheathing.</div></div> <div><div>•</div><div>must not be exposed to the weather for more than 7 days.</div></div> <div><div>•</div><div>is not subjected to prolonged humidites in excess of 90% RH.</div></div> <p>Thermakraft 215 Bituminous Self Supporting Roofing Underlay will last for 50 years.</p>												

THERMAKRAFT 215 Bituminous Self Supporting Roofing Underlay

Installation Thermakraft 215 Bituminous Self Supporting Roofing Underlay may be run vertically over purlins with a 150mm lap. Fix securely to purlins with galvanised fixing clips. The membrane should be firmly laid to avoid excessive dishing between purlins. Avoid prolonged exposure by installing the roof immediately.

NOTE: However if used vertically individual runs should be limited to 10 metres.

Thermakraft 215 Bituminous Self Supporting Roofing Underlay may be run horizontally across rafter/trusses with a 150mm lap, prior to fixing of purlins or battens. Secure to rafters/trusses using appropriate fixing clouts or clips. Avoid prolonged exposure by installing the roof immediately.

NOTE: To conform to NZS 3604: 1999 Section 11.2, underlays under an 8° pitch shall be laid horizontally and the upper sheets shall be lapped over the lower sheet on the roof.

Availability Thermakraft 215 Bituminous Self Supporting Roofing Underlay is available from leading hardware and builders supplies merchants and roofing manufacturers. In case of difficulty contact our office toll free 0800-806-595 for assistance.

Storage Thermakraft 215 Bituminous Self Supporting Roofing Underlay should be stored on end and kept dry.

Fire Retardancy Thermakraft 215 Bituminous Self Supporting Roofing Underlay is a bitumen based product and is therefore not intended for use as a fire retardant product.

Classification In accordance With AS/NZS 4200.1
Duty: Heavy
Flammability Index: Unclassified

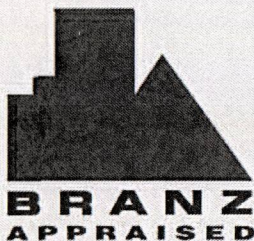
Technical Data (As per AS/NZS 4200.1 and NZS 2295)
Nominal Weight 370 g/m²
Tensile Strength MD 15.57 kN/m
Tensile Strength CD 7.50 kN/m
Edge Tear 99.8 N
Ph Reaction 7.3 nominal
Permeability 197 g/m²/ day
Water Absorption 277 g/m² nominal
Water Penetration Pass

The information contained in this document is believed to be correct and accurate. However all due care should be exercised by those who use it. If in doubt contact a **Thermakraft Industries (NZ) Ltd** representative for advice. Care should be taken to ensure that fixing clips, nails and staples used with **Thermakraft 215 Bituminous Self Supporting Roofing Underlay** are of a type that will have a life of not less than 50 years.



Thermakraft Industries (NZ) Ltd

11 Turin Place, East Tamaki, Auckland, N.Z.
P.O. Box 58-112, Greenmount, Auckland.
Phone 09-273 3727 Fax 09-273 3726 Free Phone 0800 806 595
Email: sales@thermakraft.co.nz Website: www.thermakraft.co.nz



**SPECIFY WITH
CONFIDENCE**

BRANZ Appraisals

**Technical Assessments of
products for building and
construction**

**BRANZ
APPRAISAL
CERTIFICATE
No. 356 (2005)**

This Certificate replaces BRANZ
Appraisal Certificate No. 356 (1998)
issued June 1998.

**THERMAKRAFT
COVER-UP™
BREATHER-TYPE
BUILDING WRAP**

Thermakraft Industries (NZ) Ltd
P O Box 58 112
Greenmount
Auckland

Tel: 09 273 3727
Fax: 09 273 3726
Free phone: 0800 806 595



BRANZ Limited
Private Bag 50 908
Porirua City
New Zealand
Tel: +64 4 237 1170
Fax: +64 4 237 1171
www.branz.co.nz

BRANZ Pty Ltd
P O Box 830
Brookvale
NSW 2100
Australia
Tel: +61 2 9938 6011
Fax: +61 2 9938 6911
www.branz.com.au



Product

1.1 Thermakraft Cover-Up™ is a synthetic breather-type building wrap for use as a wall wrap and air barrier under direct and non-direct fixed wall cladding on timber framed buildings. The product is manufactured from tapes of high density polyethylene woven into sheet form, and is coated on both sides with pigmented low density polyethylene. Micro-perforations are made through the coated membrane to permit the passage of water vapour.



Scope

2.1 Thermakraft Cover-Up™ has been appraised for use as a wall wrap on timber framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- with absorbent wall claddings directly fixed to framing; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer in accordance with NZS 3604:1999; and,
- situated in NZS 3604 Building Wind Zones up to, and including 'Very High'.

2.2 Thermakraft Cover-Up™ has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Thermakraft Cover-Up™ into their design in accordance with the declared properties and the instructions of Thermakraft Industries (NZ) Ltd.

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.

FILE COPY
121562

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Thermakraft Cover-Up™ Breather-Type Building Wrap, if used, designed, installed and maintained in accordance with the statements and conditions of this Certificate, will meet, or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1(a), 50 years and B2.3.1(b), 15 years. Thermakraft Cover-Up™ meets these requirements. See Paragraphs 8.1 and 8.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, Thermakraft Cover-Up™ will contribute to meeting this requirement. See Paragraphs 11.1 - 11.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Thermakraft Cover-Up™ meets this requirement and will not present a health hazard to people.

3.2 This Certificate appraises an **Acceptable Solution** in terms of the New Zealand Building Code compliance. Thermakraft Cover-Up™ meets the requirements for wall wraps and air barriers specified in accordance with NZBC Acceptable Solution E2/AS1, Table 23.

Technical Specification

4.1 Thermakraft Cover-Up™ is a 95 g/m² white sheet membrane material approximately 0.25 mm thick.

4.2 The product is supplied in rolls 2.54 and 2.74 m wide by 18.5, 27.5 and 36.5 m long and 1.37 m wide by 18.5, 27.5 and 73.0 m long. The product is printed with a two colour Thermakraft Cover-Up™ logo repeated along the length of the roll and is labelled with the marketing or construction company's name. The rolls are wrapped in clear polythene film.

Accessories

4.3 Accessories used with Thermakraft Cover-Up™ which are supplied by the installer are:

- Fixings - staples, clouts or proprietary wrap fixings, or other temporary fixings to attach the wall wrap to the framing.
- Building wrap support - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to support the wall wrap in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

Handling and Storage

5.1 Handling and storage of the product, whether on or off site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

Technical Literature

6.1 Refer to the Appraisals listings on the BRANZ website for details of the current Technical Literature for Thermakraft Cover-Up™. The Technical Literature must be read in conjunction with this Certificate. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Certificate must be followed.

Design Information

Timber Framing

7.1 Studs must be provided at maximum 600 mm centres. Dwgangs must be fitted flush between the studs at maximum 1200 mm centres.

General

7.2 Thermakraft Cover-Up™ is intended for use as an alternative to conventional building papers which are fixed over timber framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain.

7.3 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed in. Hence, the building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.

7.4 Thermakraft Cover-Up™ is suitable for use under wall claddings as a wall wrap and air barrier as called up in NZBC Acceptable Solution E2/AS1, Table 23, except that it must not be used with non-absorbent wall claddings such as vinyl or metal based sidings or weatherboards in direct fixed installations. Refer to Table 1.

Table 1: NZBC E2/AS1 Table 23 Requirements

NZBC E2/AS1 Table 23 Wall Wrap Properties	Property Performance Requirement	Actual Property Performance
Absorbency	≥ 100 g/m ²	Does not comply
Vapour Resistance	≤ 7 MN s/g	2.7 MN s/g
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6 and ≤ 9	6.8
Shrinkage	≤ 0.5%	-0.015%
Mechanical	Edge tear and tensile strength	Edge tear: Machine direction = 380 N Cross direction = 299 N Tensile strength: Machine direction = 7.82 kN/m Cross direction = 5.90 kN/m
Air Barrier	Edge tear strength: 90 N Air resistance: ≥ 0.1 MN s/m ³	Pass 0.205 MN s/m ³

7.5 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the building wrap must be supported between the battens to prevent the wrap bulging into the cavity space when bulk insulation is installed in the wall frame cavity in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

7.6 Thermakraft Cover-Up™ is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1. The wrap must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.2.

7.7 Thermakraft Cover-Up™ may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3(b).

Structure

7.8 Thermakraft Cover-Up™ is suitable for use in all Building Wind Zones of NZS 3604 up to, and including, 'Very High'.

Durability

8.1 Thermakraft Cover-Up™ meets code compliance with NZBC Clause B2.3.1 (a), 50 years for building wraps used where the cladding durability requirement or expected serviceable life is not less than 50 years, and code compliance with NZBC Clause B2.3.1 (b), 15 years for building wraps used where the cladding durability requirement is 15 years.

Serviceable Life

8.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 60 days, Thermakraft Cover-Up™ is expected to have a serviceable life of at least 50 years.

Control of Internal Fire and Smoke Spread

9.1 Thermakraft Cover-Up™ has an AS 1530 Part 2 Flammability Index of 1 and meets the requirements of NZBC Acceptable Solution C/AS1 Part 6, Table 6.2 for surface finish requirements for suspended flexible fabrics, and therefore it may be used with no restrictions in all buildings.

Outbreak of Fire

10.1 Thermakraft Cover-Up™ must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9 for the protection of combustible materials.

External Moisture

11.1 Thermakraft Cover-Up™ must be used behind claddings that meet the requirements of the NZBC, e.g. such as those covered by NZBC Acceptable Solution E2/AS1, or claddings covered by a valid BRANZ Appraisal Certificate.

11.2 Thermakraft Cover-Up™, when installed in accordance with the Technical Literature and this Certificate, will assist in the total cladding systems compliance with NZBC Clause E2.

11.3 When used as an air barrier, particular care must be taken to ensure an air tight barrier is achieved, and weather sealing at all openings and penetrations through the cladding meets the requirements of the NZBC.

Installation Information

Installation Skill Level Requirements

12.1 Installation must always be carried out in accordance with the Technical Literature and this Certificate, by competent tradespersons with an understanding of wall wrap installation.

Wrap Installation

13.1 Thermakraft Cover-Up™ must be fixed to all framing members at maximum 300 mm centres with hot-dip galvanised, large-head clouts 20 mm long, zinc plated 6-8 mm staples, or proprietary wrap fixings. The membrane must be pulled taut over the framing before fixing.

13.2 Thermakraft Cover-Up™ must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 75 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.

13.3 The wall wrap should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the membrane by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut membrane must be folded inside the opening and stapled to the penetration framing. Excess wrap may be cut off flush with the internal face of the wall frame.

13.4 Thermakraft Cover-Up™ can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.7(e).

13.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by the wide roll width.

13.6 Any damaged areas of Thermakraft Cover-Up™, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

14.1 The following tests have been carried out on Thermakraft Cover-Up™ by Ensip Papro: Cold extract pH in accordance with AS/NZS 1301.421s; edge tear resistance and tensile strength in accordance with AS/NZS 4200.1; shrinkage in accordance with AS/NZS 4201.3, water resistance in accordance with AS/NZS 4201.4, and air resistance in accordance with BS 6538-3.

14.2 The following tests have been carried out on Thermakraft Cover-Up™ (marketed in Canada as Airtard®) by an independent laboratory for the Canadian Construction Materials Centre (CCMC), in accordance with the requirements of CAN/CGSB-51.32-M77: pliability; tensile strength; water vapour permeance, and water ponding.

14.3 The following tests have been carried out on Thermakraft Cover-Up™ by BRANZ: flammability in accordance with AS 1530.2, and tensile tear strength before and after two months of natural UV aging.

Other Investigations

- 15.1 A durability opinion was given by BRANZ technical experts.
- 15.2 Site inspections were carried out by BRANZ to assess methods used for the installation of Thermakraft Cover-Up™, and to examine completed installations.
- 15.3 The marketer's Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

Quality

- 16.1 The manufacture of Thermakraft Cover-Up™ has not been examined by BRANZ, but details of the methods adopted for quality control and the quality of the materials used, have been obtained.
- 16.2 The quality management system of the wrap manufacturer, Fabrene Corporation, has been assessed and registered as meeting the requirements of ISO 9001: 2000 by TUV ESSEN, Registration Number 02-1308.
- 16.3 The quality of supply to the market is the responsibility of Thermakraft Industries (NZ) Ltd.
- 16.4 Building designers are responsible for the design of the building, and for the incorporation of the wall wrap into their design in accordance with the instructions Thermakraft Industries (NZ) Ltd.
- 16.5 Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft Industries (NZ) Ltd.

Sources of Information

- AS 1530.2 - 1993 Test for flammability of materials.
- AS/NZS 1301.421s: 1988 Determination of the pH value of aqueous extracts of paper, board and pulp - cold extraction method.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays - materials.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays - Methods of test - Shrinkage.
- BS 6538-3: 1987 Method for determination of air permeance using the Garley apparatus.
- CAN/CGSB-51.32-M77 Technical Guide for Sheathing, Membrane, Breather-Type.
- NZS 3604: 1999 Timber Framed Buildings.
- Compliance Document for the New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005.
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.



In the opinion of BRANZ, Thermakraft Cover-Up™ Breather-Type Building Wrap is fit for purpose and will comply with the Building Code to the extent specified in this Certificate provided it is used, designed, installed and maintained as set out in this Certificate.

The Appraisal Certificate is issued only to the Certificate Holder, Thermakraft Industries (NZ) Ltd, and is valid until further notice, subject to the Conditions of Certification.

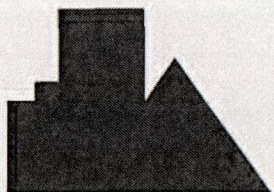
Conditions of Certification

1. This Certificate:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the technical literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. The Certificate Holder:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
3. The product and the manufacture are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ.
4. BRANZ makes no representation as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by the Certificate Holder.
5. Any reference in this Certificate to any other publication shall be read as a reference to the version of the publication specified in this Certificate.

For BRANZ

P Robertson
Chief Executive

Date of issue: 13 December 2005



BRANZ
APPRAISED

**SPECIFY WITH
CONFIDENCE**

BRANZ Appraisals

**Technical Assessments of
products for building and
construction**

**BRANZ
APPRAISAL
CERTIFICATE
No. 472 (2005)**

SUPERFLEX™ WET AREA MEMBRANES

Ardex New Zealand Ltd

P O Box 19549

Woolston

Christchurch

Tel: 03 384 3029

Fax: 03 384 9779



BRANZ Limited
Private Bag 50 908
Porirua City
New Zealand

Tel: +64 4 237 1170
Fax: +64 4 237 1171
www.branz.co.nz

BRANZ Pty Ltd
P O Box 830
Brookvale
NSW 2100
Australia

Tel: +61 2 9938 6011
Fax: +61 2 9938 6911



Product

1.1 Superflex™ Wet Area Membranes are premixed and two-part, liquid applied waterproofing membranes for use under ceramic tiles in internal wet areas.



Scope

2.1 Superflex™ Wet Area Membranes have been appraised for use as waterproofing membranes for internal wet areas of buildings, within the following scope:

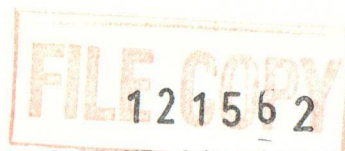
- on floor substrates of concrete, flooring grade particleboard, plywood, and fibre cement sheet tile underlay, and on wall substrates of wet area fibre cement sheet lining systems and wet area plasterboard lining systems; and,
- when protected from physical damage by ceramic tiles; and,
- where floors are designed and constructed such that deflections do not exceed 1/360th of the span.

2.2 The use of Superflex™ Wet Area Membranes on concrete slabs where hydrostatic or vapour pressure is present is outside the scope of this Certificate.

2.3 Movement and control joints in the substrate must be carried through to the tile finish. The design and construction of the substrate and movement and control joints is specific to each building and therefore the responsibility of the building designer and building contractor and is outside the scope of this Certificate.

2.4 Ceramic tile finishes are outside the scope of this Certificate.

2.5 The products must be installed in accordance with the Ardex New Zealand Ltd Technical Literature referred to in Paragraph 6.1 and by Ardex trained and approved applicators.



New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Superflex™ Wet Area Membranes if designed, used, installed and maintained in accordance with the statements and conditions of this Certificate, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years. Superflex™ Wet Area Membranes meet this requirement. See Paragraph 9.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.6. Interior wet area floors and walls incorporating Superflex™ Wet Area Membranes will meet this requirement. Paragraphs 11.1 – 11.7.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Superflex™ Wet Area Membranes meet this requirement and will not present a health hazard to people.

3.2 This Certificate appraises an Alternative Solution in terms of New Zealand Building Code compliance.

Technical Specification

4.1 Materials supplied by Ardex New Zealand Ltd are as follows:

Superflex™ 1 Premixed Bathroom and Balcony

- A one part, polymer-based, ready-to-use, liquid-applied membrane containing micro-fibres, supplied as a light blue thixotropic paste in 6.5 kg (approximately 5 litres) and 20 kg (approximately 15 litres) pails.

Superflex™ 3 Two Part Bathroom and Balcony

- A fast drying, two part, flexible, cementitious-based, liquid applied membrane containing micro-fibres. It is supplied as Superflex™ 3 Part A Liquid in 10 and 20 kg pails and Superflex™ 3 Part B Powder in 10 kg multi-wall bags. When dry, the membrane is light grey in colour.

Superflex™ Primer

- A water-based primer used to seal substrates and enhance the adhesion of the membranes. It is supplied as a red coloured liquid in 20 kg plastic containers.

Handling and Storage

5.1 All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight and out of freezing conditions. The membrane products have a shelf life of 12 months from date of manufacture in the original unopened packaging. Once opened, the products must be used within 3 months.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Superflex™ Wet Area Membranes. The Technical Literature must be read in conjunction with this Certificate. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Certificate must be followed.

General

7.1 Superflex™ Wet Area Membranes are for use in buildings where an impervious waterproof membrane is required to floors and walls to prevent damage to building elements and adjoining areas.

7.2 Superflex™ 3 Two Part is designed to be used where a quicker curing time is required, such as in cool or humid conditions.

7.3 The membranes must be protected from physical damage by the application of ceramic tile finishes.

7.4 Movement and control joints may be required depending on the shape and size of the building or room, and the tile finish specified. Design guidelines can be found in the BRANZ Tiling Good Practice Guide.

7.5 Timber framing systems must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604, or comply with the serviceability criteria of NZS 4203. In all cases framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met and all sheet edges are fully supported. Timber framing systems supporting the substrates must be constructed such that deflections do not exceed 1/360th of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.

Substrates

Plywood

8.1 Plywood must be a minimum of 17mm thick complying with AS/NZS 2269, CD Grade Structural with sanded C face upwards and treated to H3.2 (CCA treated). LOSP treated plywood must not be used. The plywood must be supported with dwangs or framing with a maximum span of 400mm in each direction, fixed with 10g x 50mm stainless steel countersunk head screws at 150mm centres on the edges and 200mm through the body of the sheets.

Fibre Cement Compressed Sheet/ Fibre Cement Sheet Tile Underlay

8.2 Fibre cement compressed sheet must be manufactured to comply with the requirements of AS 2908.2 and must be specified by the manufacturer as being suitable for use as a wet area substrate. Fibre cement sheet tile underlay must be covered by a valid BRANZ Appraisal Certificate for use in internal wet areas. Installation must be in accordance with manufacturer's instructions.

Particleboard

8.3 Particleboard must be specified for the end use in accordance with NZS 3602.

Concrete and Concrete Masonry

8.4 Concrete and concrete masonry substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101 and NZS 3604 Concrete Slab-On-Ground Floors and Concrete masonry to NZS 4229 and NZS 4230.

Wet Area Wall Linings

8.5 Plasterboard wall linings must be manufactured to comply with AS/NZS 2588, and be covered by a valid BRANZ Appraisal Certificate for use in internal wet areas.

8.6 Fibre Cement Sheet must be covered by a valid BRANZ Appraisal Certificate for use in wet areas.

Durability

Serviceable Life

9.1 The Superflex™ Wet Area Membranes, when subjected to normal conditions of environment and use, are expected to have a serviceable life of at least 15 years and be compatible with tile finishes with a design service life of 15-25 years.

Maintenance

10.1 No maintenance of the membranes will be required provided significant substrate movement does not occur and the tile finish remains intact. Regular checks must be made of the tiled areas to ensure they are sound and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiles, grouts and sealants.

10.2 In the event of damage to the membranes, the tiling must be removed and the membrane repaired by removing the damaged portion and applying a patch as for new work.

10.3 Drainage outlets must be maintained to operate effectively, and tile finishes must be kept clean.

Internal Moisture

11.1 Superflex™ Wet Area Membranes when fully cured are impervious to water and when appropriately designed and installed will avoid the likelihood of water penetrating behind linings or entering concealed spaces.

11.2 Superflex™ Wet Area Membranes are suitable for use to achieve constraint of accidental overflow to meet NZBC Clause E3.3.2. A means of Code Compliance is given in NZBC Acceptable Solution E3/AS1 Paragraph 2.

11.3 Surfaces must be finished with ceramic tiles. A means of Code Compliance to NZBC Clause E3.3.3 is given in Acceptable Solution E3/AS1 Paragraph 3.1.1 (b) and 3.1.2 (b).

11.4 Falls in showers and shower areas must be a minimum of 1 in 50. In unenclosed showers, falls must extend a minimum of 1500 mm out from the shower rose. Floor wastes must be provided and the floor must fall to the outlet.

11.5 The waterproofing membrane must completely cover shower bases, and for unenclosed showers it must extend a minimum of 1500 mm out from the shower rose. Further design guidance on waterproofing wet areas, including waterproofing walls and junctions can be obtained from AS 3740, the BRANZ Tiling Good Practice Guide, and flooring and wallboard manufacturers.

11.6 Where water resistant wall finishes such as prefinished sheet materials are used, they must flash over the membrane a minimum of 30mm.

11.7 BRANZ recommends the entire floor be covered by a waterproof membrane for bath, shower and spa rooms where timber, plywood or particleboard floors are used. This is also a requirement of particleboard manufacturers.

Installation Information

Installation Skill Level Requirement

12.1 Installation of the membranes must be completed by approved applicators who have completed and passed the Ardex New Zealand Ltd training programme

12.2 Installation of substrates must be completed by tradespersons with an understanding of internal wet area construction, in accordance with instructions given within the Ardex New Zealand Ltd Technical Literature and this Certificate.

Preparation of Substrates

13.1 Substrates must be dry and clean before installation commences. Surfaces must be even and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents.

13.2 Concrete substrates can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin No. 424.

The relative humidity of the concrete must be 75% or less before membrane application.

13.3 All voids, cracks, holes, joints and excessively rough areas must be filled to achieve a smooth and uniform surface. Junctions of substrate abutments, such as at wall/floor junctions must have a bond breaker joint system installed as set out in the Technical Literature.

13.4 Substrates must be primed with Superflex™ Primer and allowed to cure before the membrane is installed.

Membrane Installation

14.1 Installation must not be undertaken where the substrate surface temperature is below 10°C or above 35°C.

14.2 Superflex™ 3 Two Part Bathroom and Balcony liquid and dry components must be mixed and left to stand for 5 minutes before re-mixing, then applying. Superflex™ 1 Premixed Bathroom and Balcony must be thoroughly stirred before application.

14.3 The membrane must be applied in a minimum of two coats at the rates set out in the Technical Literature to give a total finished thickness of 1.2 – 1.5 mm. Subsequent coats must be applied at an opposite direction to the previous coat.

14.4 Application can be made by roller (medium/long nap), brush (long bristle), or a flat steel trowel.

14.5 Reinforcement fabric is bedded into the wet layer between coats to provide movement protection at wall/wall and wall/floor junctions, and at any other areas such as joints in the flooring substrate, floor cracks or around penetrations in the membrane.

14.6 Clean up may be undertaken with water.

Tiling

15.1 The membrane must be fully cured before tiling. The cured membrane must be protected at all times to prevent mechanical damage, so may require temporary covers until the finishing is completed.

15.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ Good Tiling Practice Guide. The compatibility of the tile adhesive must be confirmed with the adhesive manufacturer or Ardex New Zealand Ltd.

Inspections

16.1 The Technical Literature must be referred to during the inspection of membrane installations by Building Consent Authorities and Territorial Authorities.

16.2 Critical areas of inspection for waterproofing systems are:

- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
- Moisture content of the substrate prior to the application of the membrane.
- Acceptance of the substrate by the membrane installer prior to application of the membrane.
- Installation of the membrane to the manufacturer's instructions, particularly installation to the correct thickness.
- Membrane curing and integrity prior to the installation of

tiles including protection from mechanical damage during curing and prior to tile installation.

Health and Safety

17.1 Safe use and handling procedures for the membrane systems are provided in the Technical Literature. The products must be used in conjunction with the relevant materials safety data sheet for each membrane.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

18.1 The following testing of Superflex™ 1 Premixed Bathroom and Balcony and Superflex™ Two Part Bathroom and Balcony has been undertaken by Ardex Australia Pty Ltd research and development laboratory: water vapour transmission; water absorption; tensile strength and elongation before and after UV exposure, immersion in bleach, immersion in industrial detergent and immersion in water. Test methods and results were reviewed by BRANZ and found to be satisfactory.

18.2 The following testing of Superflex™ 1 Premixed Bathroom and Balcony was undertaken by the Commonwealth Scientific Industrial Research Organisation (CSIRO) Australia:

- In accordance with ANSI A118.10 for ICBO Evaluation Service - dimensional stability; waterproofness; shear strength to ceramic tile and cement mortar; and fungal and micro-organism resistance.
- In accordance with AS 1145 – behaviour under cyclic strain.

Test methods and results were reviewed by BRANZ and found to be satisfactory.

18.3 Testing of Superflex™ 1 Premixed Bathroom and Balcony and Superflex™ 3 Two Part Bathroom and Balcony has been undertaken by BRANZ for low temperature flexibility and peel adhesion after heat/humidity aging.

18.4 Testing for suitability over particleboard in accordance with AS/NZS 4858-2004, Appendix C has not been undertaken because compliance with the standard has been met by satisfactory water vapour transmission test results.

Other Investigations

19.1 An assessment was made of the durability of the Superflex™ Wet Area Membranes by BRANZ technical experts.

19.2 Site visits have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.

19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

20.1 The manufacture of the Superflex™ products by Ardex Australia Pty Ltd has been examined by BRANZ, and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

20.2 The quality management system of Ardex Australia Pty Ltd has been assessed and registered as complying with the requirements of AS/NZS ISO 9001:2000 by SAI Global, Certificate Number QEC1219.

20.3 The quality of manufacture of the Superflex™ products is the responsibility of Ardex Australia Pty Ltd.

20.4 The quality of supply of the Superflex™ products to the market is the responsibility of Ardex New Zealand Ltd.

20.5 Quality on site is the responsibility of the trained and approved applicators.

20.6 Designers are responsible for the substrate design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of the substrate manufacturer, Ardex New Zealand Ltd and this Certificate.

20.7 Building owners are responsible for the maintenance of the tiling systems in accordance with Ardex New Zealand Ltd's instructions.

Sources of Information

- AS 2908.2: 2000 Cellulose-cement products - flat sheet.
- AS 3740 – 2004 Waterproofing of wet areas within residential buildings.
- AS 3958.1 1991 Guide to the installation of ceramic tiles.
- ASTM D2919-01 Standard test method for determining durability of adhesive joints stressed in shear by tension loading.
- AS/NZS 4858 - 2004 Wet area membranes.
- AS/NZS 2269:1994 Plywood - Structural.
- NZS 3101: 1995 The design of concrete structures.
- NZS 3602: 2003 Timber and wood-based products for use in buildings.
- NZS 3604: 1999 Timber framed buildings.
- NZS 4229:1999 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230:1990 Code of practice for the design of masonry structures.
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.
- Tiling Good Practice Guide, BRANZ, March 2004.
- Membrane Roofing Good Practice Guide, BRANZ, November 1999



In the opinion of BRANZ, Superflex™ Wet Area Membranes are fit for purpose and will comply with the Building Code to the extent specified in this Certificate provided they are used, designed, installed and maintained as set out in this Certificate.

The Appraisal Certificate is issued only to the Certificate Holder, Ardex New Zealand Ltd, and is valid until further notice, subject to the Conditions of Certification.

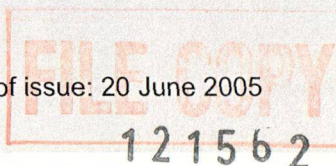
Conditions of Certification

1. This Certificate:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the technical literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. The Certificate Holder:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
3. The product and the manufacture are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ.
4. BRANZ makes no representation as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by the Certificate Holder.
5. Any reference in this Certificate to any other publication shall be read as a reference to the version of the publication specified in this Certificate.

For BRANZ

P Robertson
Chief Executive

Date of issue: 20 June 2005



THE NEW REVOLUTION IN BREATHER TYPE BUILDING MEMBRANES



1 2 1 5 6 9



Thermakraft Cover-Up

THE NEW REVOLUTION IN BREATHER TYPE BUILDING MEMBRANES

Thermakraft Cover-Up is a coated polyolefin (polyethylene) woven into a sheet form with micro-sized pores that allow the membrane to breathe. It is specifically designed for use in domestic and commercial type buildings and is manufactured with extremely high tensile strength in both directions and increased burst resistance **784 kN/m²**.

Thermakraft Cover-Up meets very high wind zone requirements under NZS 3604:1999. Burst not less than **500 kN/m²**.

Thermakraft Cover-Up is tough and should be fastened as directed (refer opposite page). Normally extra support is not required except for very high wind zones where the addition of 19mm **Thermakraft Stud Strap 201** must be used.

NOTE: NZBC ACCEPTABLE SOLUTION E2/AS1 PARAGRAPH 9.1.8.5 WHERE STUD SPACINGS ARE GREATER THAN 450mm CENTRES, AN INTERMEDIATE MEANS OF RESTRAINING THE BUILDING WRAP AND INSULATION FROM BULGING INTO THE DRAINED CAVITY SHALL BE INSTALLED. ACCEPTABLE MEANS OF ACHIEVING THIS IS **Thermakraft Stud Strap 201** FIXED HORIZONTALLY AT 300mm CENTRES.

Thermakraft Cover-Up increases productivity allowing work within the structure to proceed by providing temporary weather protection from wind and rain, yet allowing light through. Being translucent it is easy to see nail lines for nogs and studs, and provides the ultimate barrier against the elements (refer Fig 8 & 9).

Thermakraft Cover-Up is one of the strongest breather type membranes on the market. This factor greatly reduces the danger of damage through site damage and installation problems, or because of storm damage, saving dollars on repairs and reinstallation costs.

WARNING: **Thermakraft Cover-Up** MUST NOT BE USED AS A ROOFING UNDERLAY, OR AS A SARKING OR BARRIER ON WALLS IN DIRECT CONTACT WITH VINYL, METAL OR PVC CLADDING. REFER TO (Fig. 3, 4 & 7) FOR DETAILS OF CAVITY SYSTEM.

Thermakraft Cover-Up has an extremely high puncture resistance, is unaffected by mildew and most chemicals, and is rot resistant. For more information regarding compatibility with chemicals, contact **Thermakraft Industries (NZ) Ltd** on **0800 806 595**.

NOTE: **Thermakraft Cover-Up** is unaffected by LOSP.

Thermakraft Cover-Up comes with an additional bonus - Flame Resistance tested to AS1530 - Part 2 - 1993. **Thermakraft Cover-Up** achieved a Flammability Index of 1 and meets the requirements of NZBC C3/AS1 - Part 6 - Table 6.2.

Thermakraft Cover-Up assists in maintaining the "R" Value in

CSR Bradford Gold Thermal and Acoustic Glasswool Insulation

improving energy efficiency for the life of your home by reducing air movement, and is most effective in high wind areas where **Thermakraft Cover-Up** reduces cold air currents seeping into the wall cavity.

Thermakraft Cover-Up warrants that the product is free from defects and other possible manufacturing problems, and will replace the product if affected by ultra-violet, within the period of 60 days exposure.

E. & O. E.



FIG 1
Builders installing **Thermakraft Cover-Up**. The membrane is kept level by assistance of star lines for stud placements.
NOTE: LAP BELOW BOTTOM PLATE.

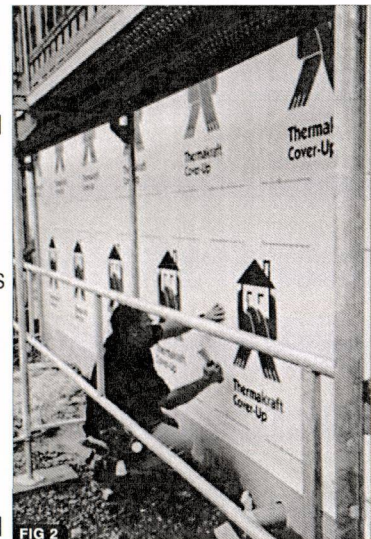


FIG 2
Stud lines are visible for staples, and assists the installer for the placement of staples.



FIG 3
Thermakraft Cover-Up fixed directly to wall framing prior to a 20mm cavity batten is installed.

INSTALLATION PROCEDURES

TOOLS REQUIRED: SHARP KNIFE (complimentary knife in each roll of 100m² Cover-Up), STAPLE GUN, HAMMER.

NOTE: STORE Thermakraft Cover-Up IN CLEAN DRY CONDITIONS AND NOT IN AREAS WITH DIRECT SUNLIGHT.

1. **Thermakraft Cover-Up** is applied to all exterior walls from below bearers to the top plate (Fig 3). Fix securely to the frame with fasteners such as galvanised Little Grippers, or 6mm-8mm staples, or 20mm large head galvanised clouts at 300mm centres horizontally and vertically (Fig 2). Additional fasteners should be used around each opening to be cut out.

2. **Thermakraft Cover-Up** - when using either 2740mm or 1370mm wide rolls horizontally or vertically, a minimum of 150mm lap is required at joints. If it is necessary to tape the laps, use **Thermakraft White PVC 48mm wide Pressure Sensitive Tape**.

NOTE: ALL VERTICAL LAPS MUST BE MADE OVER STUDS. MAKE GOOD REPAIRS ON ANY FORCED TEARS WITH TAPE.

3. **Thermakraft Cover-Up** is wide enough to come from below the bottom plate to the top plate, covering all windows and door openings. Use extra fastenings around each opening to be cut out.

NOTE: Thermakraft Cover-Up WILL PROVIDE TEMPORARY WEATHER PROTECTION DURING CONSTRUCTION. TRANSLUCENCY OF THE MEMBRANE WILL ENABLE WORK TO PROCEED DURING INCLEMENT WEATHER. ON ARRIVAL OF DOORS AND WINDOWS AT EACH OPENING (Fig 5 & 6), CUT THE **Thermakraft Cover-Up** AT 45° AWAY FROM EACH CORNER. PULL THE **Thermakraft Cover-Up** FLAPS INSIDE AND FASTEN TO FRAME (Fig 5).

4. **Thermakraft ALUBAND Window Sealing System** (BEAL Appraisal) IS APPLIED PRIOR TO FITTING WINDOWS (Fig 5 & 6 and as drawings below. Free installation pamphlets available - Phone **0800 805 595**). **NOTE:** BRANZ Appraisal 356 relates to **Thermakraft Cover-Up** only, **NOT** to the **Thermakraft ALUBAND Window Sealing System**.

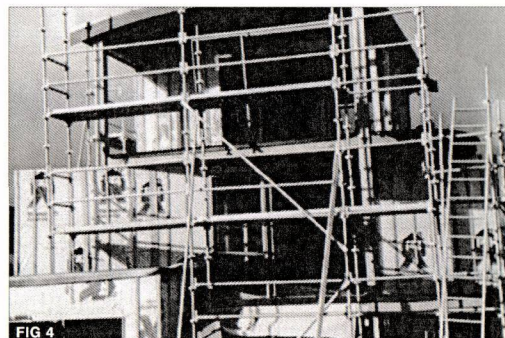


FIG 4 Timber batten cavity over Thermakraft Cover-Up.



FIG 5 "X" cut Thermakraft Cover-Up and fold back with stapling, preparing for ALUBAND WINDOW SEALING SYSTEM. Simple and efficient.

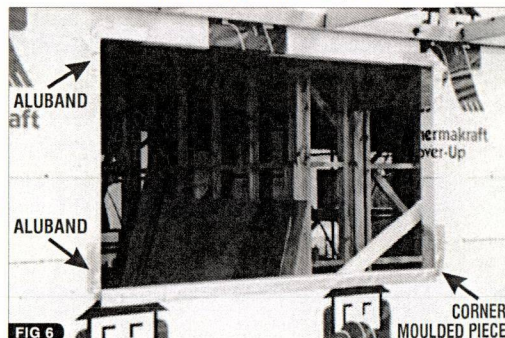
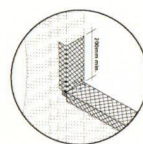
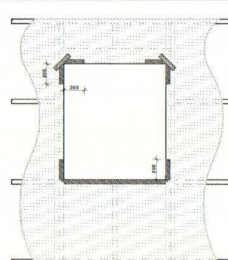
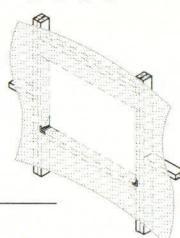
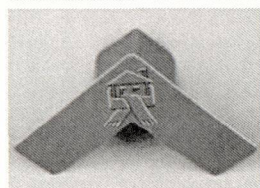
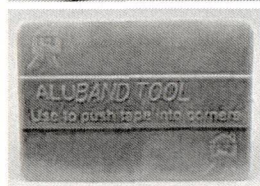
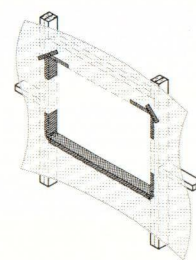


FIG 6 Window opening completed with the Aluband System in place. NOTE: THE ORANGE CORNER MOULDED PIECE AS PART OF THE THERMAKRAFT ALUBAND SEALING SYSTEM.

Providing THE SYSTEM THAT MATTERS



GUARANTEED FOR 50 YEARS



Thermakraft Industries (NZ) Ltd

FILE COPY 121562 E. & O. E.

5. **Thermakraft Cover-Up** is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1 Paragraph 9.3.5.1. The wrap must be supported with 75mm galvanised mesh, or plastic tape or wire at 150mm centres run across the cavity battens to limit deflection to a maximum of 5mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1 Paragraph 9.3.5.2.

6. **Thermakraft Cover-Up** may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1 Paragraph 9.3.3(b).

7. **Thermakraft Cover-Up** can be used as an air barrier (complying with NZBC Acceptable Solution E2/AS1 Table 23) where walls are not lined, such as attic space at gable ends.

GENERAL: Thermakraft Cover-Up IS APPRAISED BY BRANZ LTD, AND IS SUITABLE FOR THE APPRAISED USE. CERTIFICATE No. 356 AVAILABLE ON REQUEST.

Thermakraft Cover-Up MEETS THE PERFORMANCE REQUIREMENTS OF NZBC CLAUSES B2, DURABILITY, E2 EXTERNAL MOISTURE, F2 HAZARDOUS BUILDING MATERIALS.

DURABILITY NZBC B2.3.1A 50 YEARS & B2.3.1B 15 YEARS.

8. **Thermakraft Cover-Up** can be used as a wall wrap on timber framed buildings within the scope:

- NZBC Acceptable Solution E2/AS1 Paragraph 1.1, and
- With absorbent wall claddings directly fixed to framing, and
- With absorbent and non-absorbent wall claddings installed over an 18mm drained cavity, and
- With masonry veneer in accordance with NZS 3604: 1999 Timber Framed Buildings, and
- Situated in NZS 3604: 1999 Timber Framed Buildings, Building wind zones up to and including "VERY HIGH".

Thermakraft Cover-Up can also be used on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of **Thermakraft Cover-Up** into their design, in accordance with the declared properties and the instructions of **Thermakraft Industries (NZ) Ltd.**

Refer also to **BRANZ Report ST0649.**

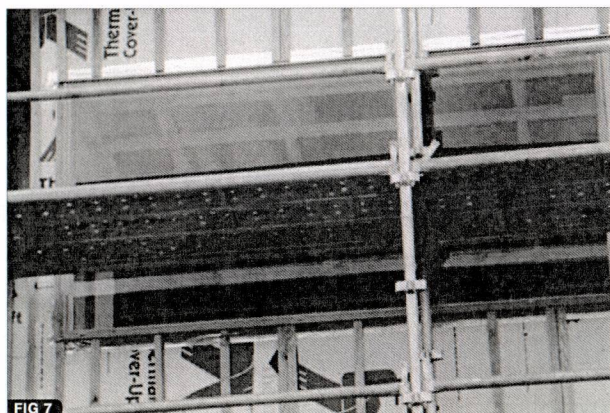


FIG 7 Timber batten cavity with window installed and ALUBAND WINDOW SEALING SYSTEM shown under battens.



FIG 8 Thermakraft Cover-Up showing the translucent quality and the easy see through, and is resistant to tear in high wind zone till sheathed.



FIG 9 Enquire about our Corporate Print Service. Available to merchants and their builder clients. Special conditions apply.

ROLL DIMENSIONS

WIDTH (mm)	LENGTH (m)	m ²
2740	36.5	100
2740	27.5	75
2740	18.5	50

WIDTH (mm)	LENGTH (m)	m ²
1370	73	100
1370	36.5	50
1370	18.5	25

Thermakraft Industries (NZ) Ltd warrants that the product is free from defects and other possible manufacturing problems. **Thermakraft Cover-Up** must be replaced if exposed to ultra-violet light for a period of greater than 60 days.

MEMBRANES FOR INDUSTRY



Thermakraft Industries (NZ) Ltd

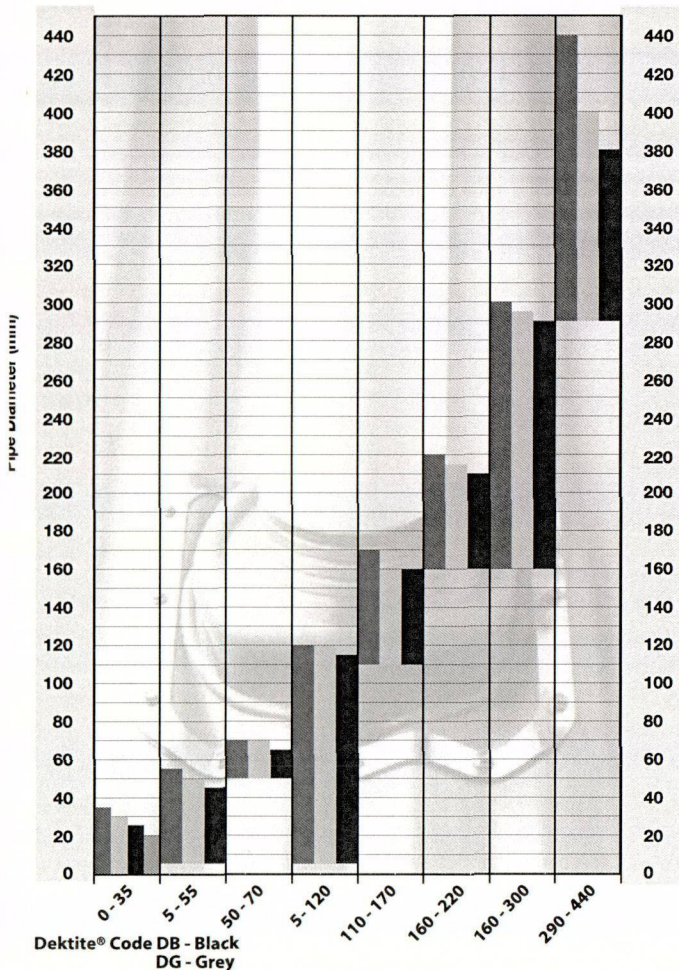
11 Turin Place, East Tamaki, Auckland, New Zealand

P.O. Box 58-112, Greenmount, Auckland, NZ

Freephone: 0800-806 595 Phone: 09-273 3727 Fax: 09-273 3726

Email: sales@thermakraft.co.nz Website: www.thermakraft.co.nz

Dektite® Selector Chart



Step 1

Select the pitch of your roof and choose your colour

Step 2

Select the pipe diameter

Step 3

Read across until you reach your colour

- From 0 to 30° pitch
- From 30 to 35° pitch
- From 35 to 45° pitch
- From 45 to 60° pitch (DFE 0-35 only)

DEKTITE® Distributed in New Zealand by



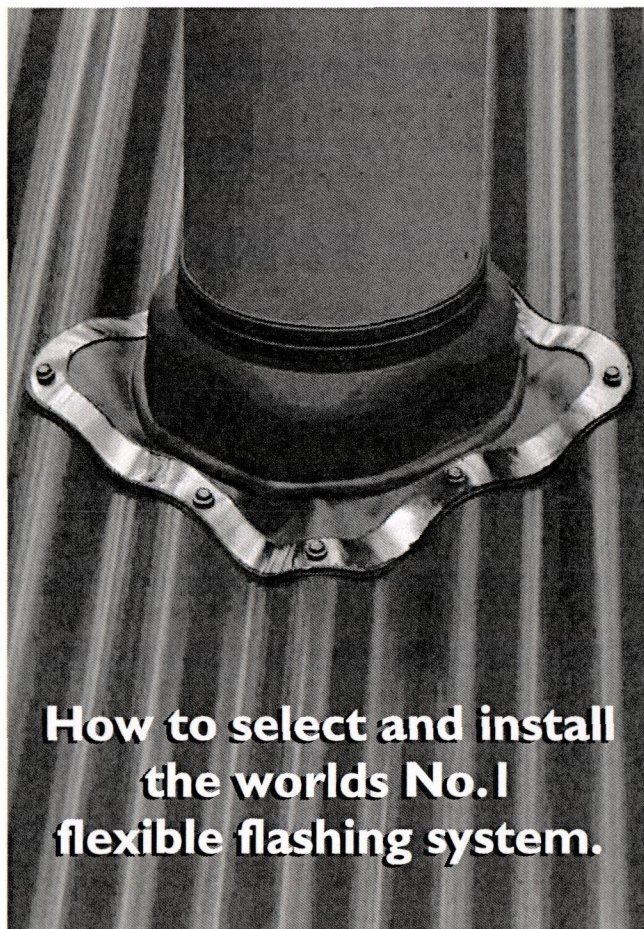
55 Maurice Road, Penrose.
P.O. Box 12387
Penrose, Auckland, New Zealand
Ph (64 9) 622 9100
Fax (64 9) 622 9119
Email: dektite@dlmwallace.co.nz
www.dlmwallace.co.nz

Palmerston North Branch: Ph (64 6) 323 4445 Fax (64 6) 323 4445
Christchurch Branch: Ph (64 3) 365 6453 Fax (64 3) 366 6995

SELECTION AND INSTALLATION HANDBOOK

Dektite®

WEATHERPROOF FLEXIBLE FLASHING SYSTEMS



How to select and install
the worlds No.1
flexible flashing system.



Dektite®

First and the Best!

FILE COPY
121562



TIME AND MONEY SAVING ANSWERS FOR EVERY FLEXIBLE FLASHING SITUATION.

Whatever your building and construction flashing requirements, you'll find an innovative, practical answer in the **Dektite®** range.

The unique features of the high performance **Dektite®** typifies the care and attention to design detail that goes into every Deks product.

From the smallest cable entry to the largest duct opening, or gantry and tank mountings, **Dektite®** will provide the ultimate weathertite seal, and can be installed without soldering, skilled labour or special tools.

The E.P.D.M. material from which the **Dektite®** range is manufactured has been chosen to provide enhanced durability in a wide variety of conditions.

Dektites® resist ozone and ultraviolet light damage, and remain full flexibility under temperatures ranging from -50°C to 150°C.

When you choose from the **Dektite®** range you'll discover the advantages of doing it right with **Dektite®**: better performance and an easier, more economical installation.

Distributed in New Zealand by



Ph (64 9) 622 9100
Fax (64 9) 622 9119
Email: dektite@dlmwallace.co.nz
www.dlmwallace.co.nz

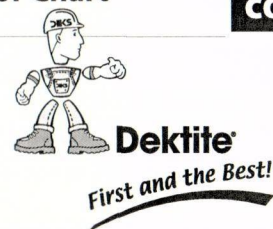
DEKS
Deks Industries Pty. Ltd.



Contents

1

DEKTITE® The essential way to flash and seal pipe penetrations through most roof sheet profiles.	2-5
MINI DEKTITE® This multi-purpose flashing is ideal for smaller plumbing and electrical penetrations.	6-7
DEKTITE® EZI-SEAL™ No need for silicone, just screw it down.	8-9
DEKTITE® SOAKER™ The fastest and easiest way to flash on low pitch and deep profile roofs - without risk of damming	10-11
DEKTITE® RETROFIT™ The fastest way to flash existing penetrations on metal roofs.	12-13
RETROFIT SOAKER™ The 'quick fix' solution to flashing large pipe installations on low pitch or deep profile roofs.	14-15
TILEFLASH™ For concrete, clay tile, and slate roofs.	16-17
DEKTITE® ALUMINIUM® The versatile solution for metal and stone chip tiles.	18
DEKSTRIP® FLASHING With the amazing patented stretch edge	19-26
DEKTITE® PIPE FLASHING WARRANTY	27
HELPFUL HINTS SILICONE SEALANTS	28-29
Dektite® Selector Chart	Back cover

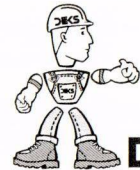




To develop a product that is universally accepted as the best on the market Deks consider every aspect of the Dektite® design: installation, functionality and materials.

Success in this is proven by the performance of the Dektite®. The ingenious shoulder moulding, results in less distortion, which reduces stress on the material, and eliminates ponding with complete water run-off in every situation. The low profile not only looks good but provides a generous internal clearance, so even the steepest roofs are handled with ease.

design features



Dektite®

First and the Best!

Installation is easier with the Dektite®.

- The large base area provides more coverage and greater latitude in cut-out size.
- The cone has clearly marked cut lines for different pipe diameters.
- Around the base of the cone a flexible bead reduces stress on the flashing membrane (to which an aluminium flange is bonded), as it is formed over the roof profile.
- Underneath, moulded ribbing increases sealant retention to ensure an effective, weatherproof seal.

FLEXIBLE CONE SLEEVE

Dektite® cone shape eliminates seal breakdown due to vibration or expansion and contraction, while isolation of pipe from sheeting dampens noise levels.

EASILY IDENTIFIED SIZING

Pipe diameter rings are clearly marked on the cone sleeve (metric and imperial) for cutting to match the appropriate pipe diameter.

LOW PROFILE DESIGN

Sleek, unobtrusive shape is designed to minimise silhouette on roofline, while managing to provide generous internal clearance for steep, angular installations.

STRESS ISOLATION POINTS

Unique to Dektite® two flexible shoulders absorb distortion and stop transfer of stresses from base to cone, as unit is formed over roofing profile.

BONDED ALUMINIUM FLANGE

Corrosion-resistant, malleable flange, evenly distributes fastening pressure and allows ease of hand-shaping on most sheet profiles.

INTEGRITY OF FLASHING SHAPE

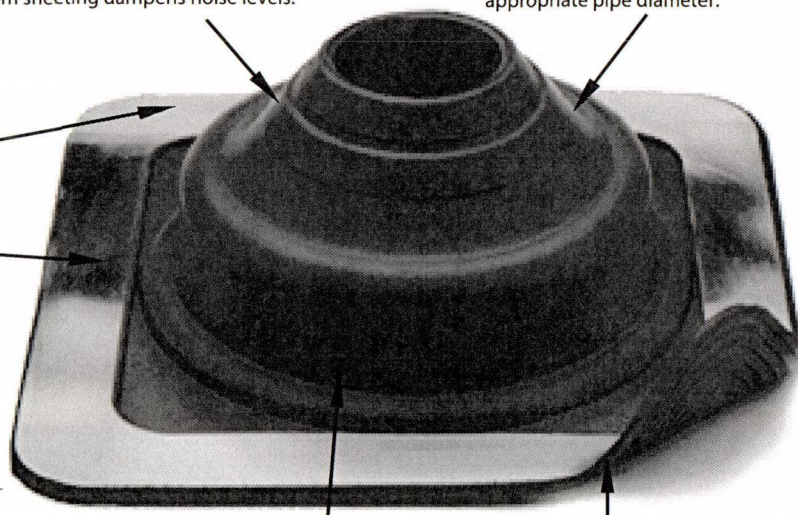
Minimal distortion after installation, maintains natural flashing shape and seal around pipe, while water run-off is improved and 'ponding' eliminated.

LARGE BASE AREA

For better coverage of penetration cut-out and improved performance over steep roof pitches and a wider variety of cladding profiles.

IMPROVED WATERPROOFING

Designed to strengthen sealant bond and improve waterproofing, the ribbed base has an angled skirting edge to help shed moisture and contribute to a superior waterproof seal. For even more efficient water run off the Dektite® can be fitted on the Diamond.



Dektite®



The versatile solution for hundreds of applications.

Designed to enable practically any pipe flashing operation to be carried out within minutes, **Dektite®** is simple to install - and very effective. Providing the perfect weatherproof, flexible seal, **Dektite®** protects against leakage on a wide range of pipe or vent projections, and is designed to conform to most roof profiles and pitch. For a maintenance-free seal on pipes from 0 - 440mm diameter, it's much more than a flexible solution to pipe flashing. It's a means of saving **time and money!**

Easy Selection Guide

Code	PIPE mm	BASE mm	PITCH	COLOUR
DB 0-35 DG 0-35	0-35	99x99	0 - 60°	BLACK (EPDM)* DB GREY (EPDM)* DG
DB 5-55 DG 5-55	5-55	137x137	0 - 45°	
DB 50-70 DG 50-70	50-70	178x178	0 - 45°	
DB 5-120 DG 50-120	5-120	218x218	0 - 45°	
DB 110-170 DG 110-170	110-170	284x284	0 - 45°	
DB 160-220 DG 160-220	160-220	365x365	0 - 45°	
DB 160-300 DG 160-300	160-300	453x453	0 - 45°	
DB 290-440 DG 290-440	290-440	581x581	0 - 45°	

E.P.D.M. withstands temperatures from -50°C to 115°C, & up to 150°C intermittently

*** DEKTITE® Pipe Flashings can also be used to flash square pipes.**
Just add 30% to the pipe diameter and trim the cone to suit.

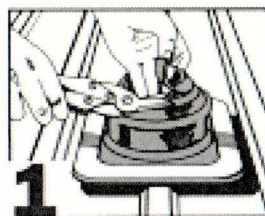
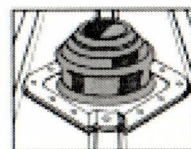


EPDM - Perfect for approved flues!

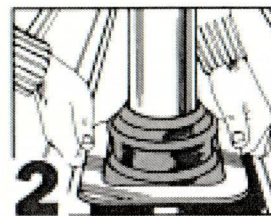
Dektite® EPDM polymer flashings have been officially tested by the Coal Corporation of Victoria, Australia and conform to all Australian and UK Standards on approved flue systems. Under no circumstances should any polymer flashing be installed on a non approved flue or an 'active' combustion heater flue.

INSTALLATION INSTRUCTIONS

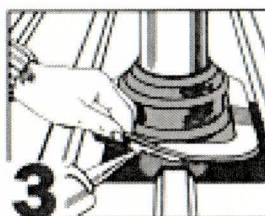
For more effective drainage always fit the Dektite on the Diamond or bias.



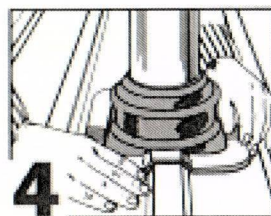
1 Cut a neat hole in roofing sheet with minimum clearance for pipe and insert pipe through hole. Trim the cone to suit pipe size using sharp tin snips. Where necessary, support cut sections of sheet with additional framing.



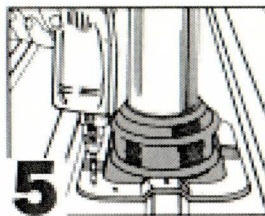
2 Slide Dektite® flashing down over pipe. Lubricating the pipe with water allows the pipe to slide snugly into position.



3 Apply a neutral cure silicone* sealant by turning back the flexible flange.



4 Press base to the roof profile by hand, smooth out any awkward creases. Don't fully extend to allow for vibration.



5 Fasten using sealed rivets or washered screws. Fit fasteners progressively outward in opposing pairs to avoid gaps.



Dektite®
First and the Best!

*Refer to page 28 for silicone usage

HINT: When flashing a metal flue that has an exposed seam, using a neutral cure sealant, seal the seam from underside of cowl to the top of Dektite® cone.

Mini Dektite®



Mini Dektites® increase your on the job versatility even further. Mini Dektites® have been designed specifically for flashing applications such as P.V.C. conduits, electrical wiring and other small diameter wall and roof penetrations, including small-bore copper tubing and lightning conductors.

Just like other Dektite® products, their flexible E.P.D.M. rubber cones are specially compounded to resist degradation from ozone and ultra violet light. Mini Dektites® are as quick and easy to install as any other Dektite®.

They cover pipe diameters up to 35mm, and roof pitches up to 60°.

You can always rely on them for a maintenance-free leak proof seal that flexes with whatever material they're mounted to.

Easy Selection Guide

Code	PIPE mm	BASE mm	PITCH	COLOUR
DB 0-35 DG 0-35	0-35	99x99	0 - 60°	BLACK (EPDM)* GREY (EPDM)*

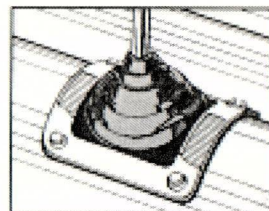
E.P.D.M. withstands temperatures from -50°C to 115°C, & up to 150°C intermittently

INSTALLATION INSTRUCTIONS

Applications include:



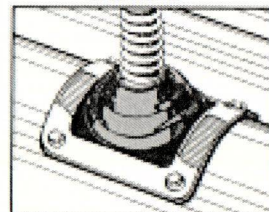
1 Simply cut Mini Dektite® cone to required size for 'snug' fit.



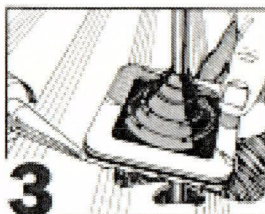
ELECTRICAL CABLES



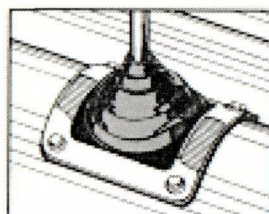
2 Push or pull cable or pipe through cone.



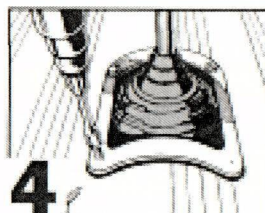
AIR CONDITIONING CONDUITS



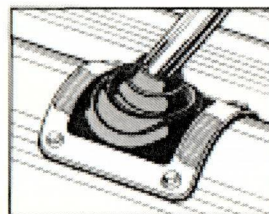
3 Apply neutral-cure Silicone* to underside of flashing (embossed ribbed section). If necessary press flashing into contours of surface configuration.



SOLAR HEATING OR HOT WATER OVERFLOWS



4 Fasten flashing to wall or roof surface with washers self drilling screws.



REFRIGERATION OVERFLOWS and LIGHTNING CONDUCTORS

*Refer to page 28 for silicone usage

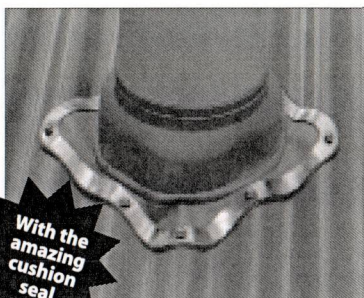
FILE COPY
121562

DEKTITE® EZi-Seal™



Forget the silicone -just screw it down

Dektite® EZi-Seal™ features a revolutionary closed-cell foam gasket which is non-absorbant and non-porous. It hugs the roof line to provide a watertight seal without the need for silicone.



With the
amazing
cushion
seal

Dektite® EZi-Seal™ Hang-sell

Dektite® EZi-Seal™ products are now available in individual hang-sell packs with printed instructions and fasteners included.

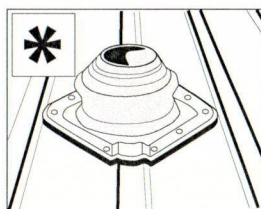
- ✓ **100% Waterproof**
Seals completely waterproof at only 40% compression
- ✓ **Seals on wet or oily surfaces**
No need to clean or prepare the surface
- ✓ **Safer on the roof**
No silicone means no slippery surface or mess
- ✓ **No worries on polycarbonate**
The foam base will not react with polycarbonate roofing
- ✓ **Meets the toughest conditions**
UV, ozone and temperature resistant foam.
- ✓ **EPDM**
Perfect for approved flues

EZi-Seal™ Easy Selection Guide

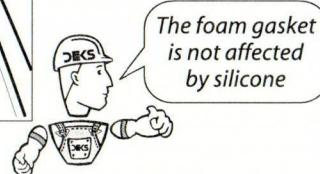
CODE	PIPE mm	BASE mm	PITCH	COLOUR
EZ0-35	0-35	99 x 99	0 - 60°	BLACK EPDM
EZ5-55	5-55	137 x 137	0 - 45°	
EZ50-70	50-70	178 x 178	0 - 45°	
EZ5-120	5-120	218 x 218	0 - 45°	
EZ110-170	110-170	284 x 284	0 - 45°	
EZ160220	160-220	365 x 365	0 - 45°	
EZ160-300	160-300	453 x 453	0 - 45°	
EZ290-440	290-440	581 x 581	0 - 45°	

EZi-Seal carded add C before the size (ie EZC5-55)

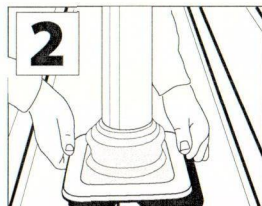
INSTALLATION INSTRUCTIONS



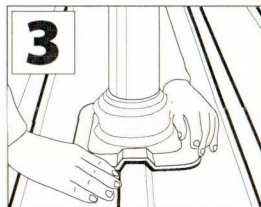
For effective drainage always fit the Dektite® EZi-Seal™ on the diamond or bias.



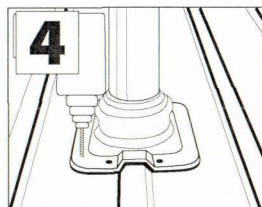
1 Cut a neat hole in roofing sheet with minimum clearance for pipe and insert pipe through hole. Trim the cone to suit pipe size using sharp tin snips.



2 Slide Dektite® flashing down over pipe. Lubricating the pipe with water allows the pipe to slide snugly into position.



3 Press base to the roof profile by hand, smooth out any awkward creases. Don't fully extend to allow for vibration.



4 Fasten using sealed rivets or washers and screws. Fit fasteners progressively outward in opposing pairs to avoid gaps.

Dektite® EZi-Seal™ seals by compression, so ensure fasteners are evenly distributed (approx. every 40mm) around base. It is also essential that fasteners are placed in any valleys created when product forms around a roof ridge.



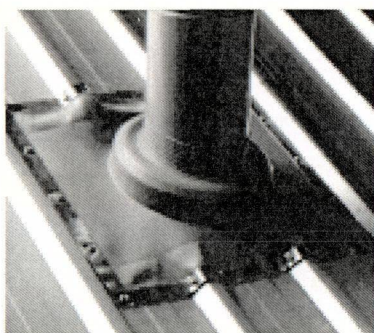
FOR BEST RESULTS:

- Fix fasteners at points where base has creased to conform to roof profile.
- Use 10 x 16 Hex head self-drilling fasteners.
- After screw-fixing the base, flatten the aluminium between the fixings to compress the foam.
- Always install a fixing into the corners of the profile to fully seal against the sheet.
- Make sure the foam is compressed by at least 40% all the way round to ensure an effective seal.



Dektite® Soaker™ The perfect flashing for all tray roofs

The large base of the Dektite® Soaker™ dramatically reduces rainwater back up on very low or very high roof pitches and deep ribbed roofing profiles.



Dektite® Soakers™ are ready to flash straight from the pack. They're faster to flash than old-fashioned methods. Dektite's® unique corrosion resistant aluminium flange is ideal for low pitch and deep profile

roofs, providing a positive leak-proof seal, without risk of damming.

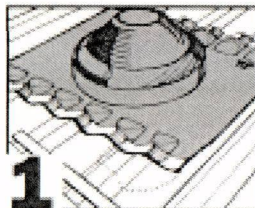
Easy Selection Guide

CODE	BASE mm	PIPE mm	PITCH	PIPE mm	PITCH
DF 602	410x360	75-160	0 - 60°		
DF 603	485x460	114-165	0 - 60°	165 - 255	0-40°
DF 605	708x635	254-358	0 - 60°	365 - 410	0-40°
DF 606	1006x905	380-470	0 - 60°	470 - 610	0-40°

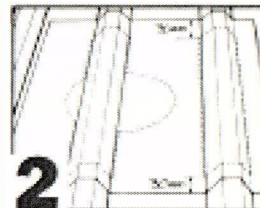
E.P.D.M. withstands temperatures from -50°C to 115°C, & up to 150°C intermittently

***IMPORTANT:** For a 60° pitch, do not cut below the first three sizing ribs on the 603, 605, and 606.

INSTALLATION INSTRUCTIONS



1 Mark position of pipe on roofing sheet, centre Dektite® over mark ensuring word "top" is towards highest part of roof, and preform Dektite® flanges to roof profile.



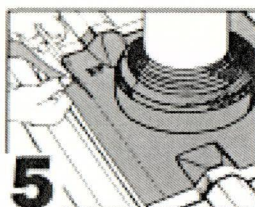
2 Mark ribs or corrugations to be removed to allow adequate drainage around cone. Allow at least 30mm all round to fasten Dektite's® aluminium strips to roofing sheet



3 Cut out marked portions of roof, filing away sharp edges and install pipe securely in place. Where necessary, support cut sections of sheet to additional roof framing.



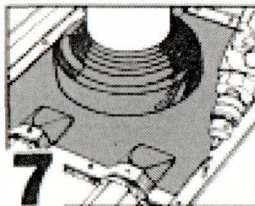
4 Trim Dektite® cone to suit pipe size and slide down pipe using water as lubricant.



5 Form Dektite® base into contours of roofing sheet, positioning loose strips on either side of cone in best position to ensure drainage of pan or tray. Trim excess rubber from outside of loose strips. Trimming should be considered prior to cutting of the roof sheet.



6 Apply a generous bead of neutral-cure sealant* to underside of Dektite® base along entire perimeter.



7 Fasten flashing to roof using washered self-drilling screws, ensuring Dektite® forms flat trough for water run-off. Fix integral aluminium strips from centre outwards before attaching loose strips provided.



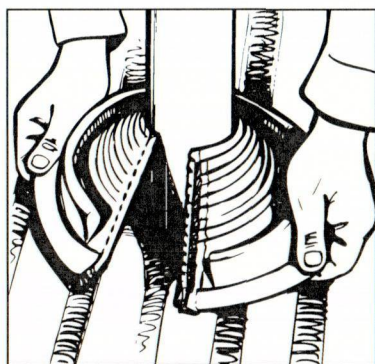
Dektite®
First and the Best!

***Refer to page 28 for silicone usage**

HINT: When flashing a metal flue that has an exposed seam, using a neutral cure sealant, seal the seam from underside of cowl to the top of Dektite® cone.

Dektite® Retrofit™

When it has to flash around, not over...



When it's not possible to slide a flashing over the top of a pipe or vent, you need a Dektite® Retrofit™. Great for repairs on existing installations. Suitable for square penetrations. Add an additional 30% to pipe diameter. For pipes over 150mm use a stainless steel support/hose clip.

✓ **Difficult installations are a breeze!**
Wraps around existing or difficult to access pipes

✓ **Snaps together in seconds**
The built-in crimp means no loose clips or rivets!

✓ **Grips tight and stays tight**
Made from DEK'S quality polymer compound

✓ **Our base makes easy work**
The supple aluminium base conforms like magic!

Dektite® Retrofit Size	Square Pipe/Duct Length of Side (mm)	Cut to ring marked (mm)
RF 801	40	40 - 50
	50	50 - 60
	60	80 - 70
	70	85 - 86
RF 802	80	95 - 105
	90	105 - 115
	100	115 - 130
	120	130 - 140
	140	150 - 170
	160	170 - 190
RF 803	180	210 - 230
	200	240 - 255

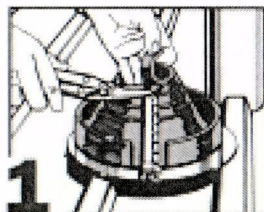
Flashing Square Pipes

For square penetrations simply measure the side of the square, select the correct Dektite® Retrofit™ size and cut to the correct ring as shown.

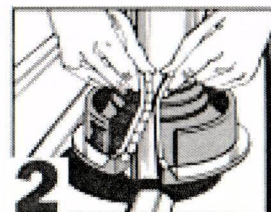
Note: When flashing a square pipe a bead of silicone should be applied along the junction between the EPDM and the pipe. Do not pull back the EPDM to apply the silicone* as this can affect the Dektite® seal against a flat surface.

*Refer to page 28 for silicone usage

INSTALLATION INSTRUCTIONS



1 Measure outside pipe diameter and trim cone where indicated. For square pipes add 30%.



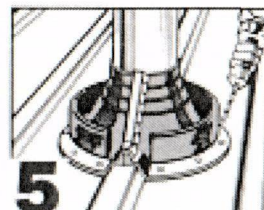
2 With clip in down-stream position, tension top of cone around pipe and engage metal teeth in opposing pockets.



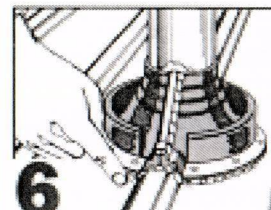
3 To assist in locating clip into pocket, place hand behind the seam. Fasten clip with pliers or multi-grips, working from top to base. **Do not overcrimp.**



4 Apply a neutral-cure silicone* sealant to underside of Dektite and press to contour of sheet profile.



5 Fasten flashing with washed self-drilling screws. As per diagram, secure clip by placing a fastener either side of the clip first.



6 Apply sealant* to top of crimp closure and any other potential leak areas.

Easy Selection Guide

CODE	PIPE mm	BASE diam mm	PITCH	COLOUR
RF 801	20 - 70	160	0 - 40°	GREY (EPDM)*
RF 802	50 - 185	273	0 - 40°	
RF 803	85 - 255	369	0 - 40°	
RFS 4	235 - 425	750 x 660	0 - 40°	

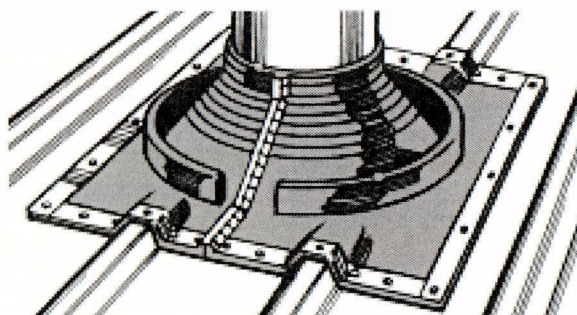
E.P.D.M. withstands temperatures from -50°C to 115°C, & up to 150°C intermittently

*Refer to page 28 for silicone usage

HINT: When flashing a metal flue that has an exposed seam, using a neutral cure sealant, seal the seam from underside of cowl to the top of Dektite® cone.

DEKTITE®

Retrofit™ Soaker™



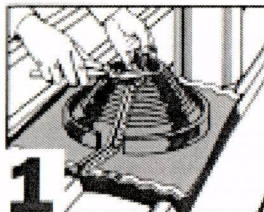
As with other Dektite® products Dektite® Retrofit™ Soakers™ make the job faster, and more cost efficient. Like standard Dektite® Retrofit™ they are designed to flash where access to installation is restricted. Just like a standard Retrofit™ their unique crimp closure mechanism makes pipe or vent flashing an elementary wrap and seal procedure requiring no soldering or special tools. Rain, hail, or shine it's all lovely weather for Dektite® Retrofit™ Soakers™. They flex with the roof decking without cracking or leaking and their smooth non-damming tray area means water run-off is super efficient. Dektite® Retrofit™ Soakers™ are ideal for maintenance work all year round.

One Standard size: for 235 - 425mm pipes.

CODE	PIPE mm	BASE mm	PITCH	COLOUR
RFS 4	235 - 425	750 - 660	0 - 45°	GREY (EPDM)

E.P.D.M. withstands temperatures from -50°C to 115°C, & up to 150°C intermittently

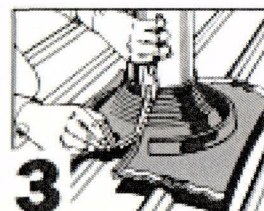
INSTALLATION INSTRUCTIONS



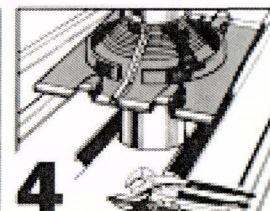
1 Measure outside pipe diameter and trim cone exactly where indicated.



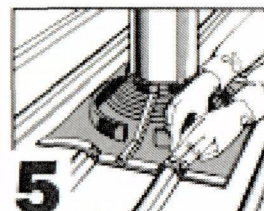
2 With clip in down-stream position tension top of cone around pipe and engage metal teeth in opposing pockets.



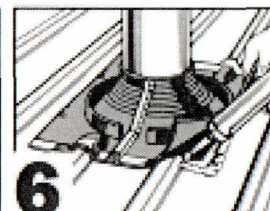
3 Crimp the top three clips with pliers. To assist in completion of crimp, place hand behind the seam for support and continue crimping. Do not overcrimp.



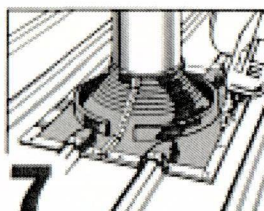
4 Form Dektite base into contours of roofing sheet, positioning loose strips on either side of cone in best position to ensure drainage of pan or tray and trim sides if necessary. Trimming should be considered prior to cutting of the roof sheet.



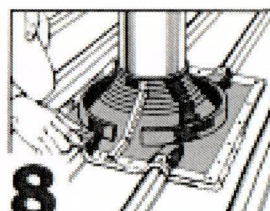
5 Mark out area where ribs of roof panel are to be removed. Where necessary support cut sections of sheet with additional roof framing.



6 Apply a neutral-cure silicone sealant* to underside of Dektite® base and press to contour of sheet profile.



7 Fasten flashing to roof using washered self-drilling screws. Secure clip by placing a fastener either side of the clip



8 Apply neutral-cure sealant* to top of crimp closure and any other potential leak areas.

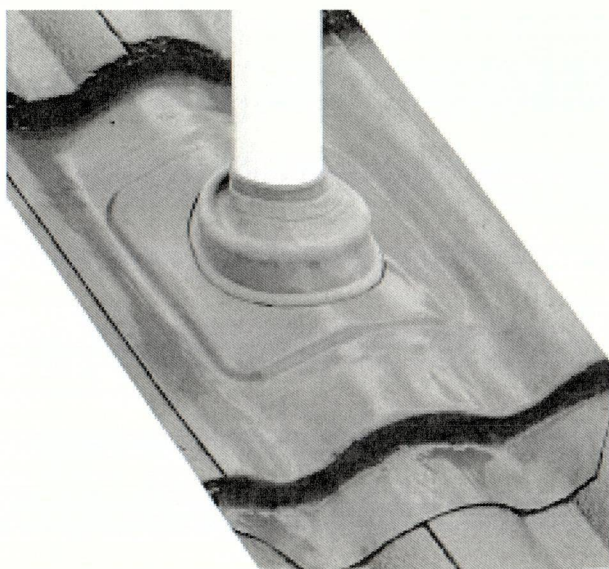
*Refer to page 28 for silicone usage

HINT: When flashing a metal flue that has an exposed seam, using a neutral cure sealant, seal the seam from underside of cowl to the top of Dektite® cone.

FILE COPY
121562

TILEFLASH

for Concrete, Clay Tile and Slate Roofs

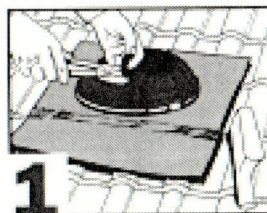


Designed specially for flashing penetrations on concrete tile, clay tile, and slate roofs, Tileflash combines the low profile Dektite®, with a large Acrylead® apron.

Available in a range of sizes to suit virtually any pipe size, the Tileflash cone is universally compatible, whether the penetration is PVC, galvanised steel, zincalume®, or copper.

The use of Acrylead® offers the benefit of a thermo baked, acrylic primer coating to both surfaces of the apron, ready for finish coating to match the surrounding roof area. The potential for lead oxides to leach from the apron and cause staining, is now virtually eliminated.

INSTALLATION INSTRUCTIONS



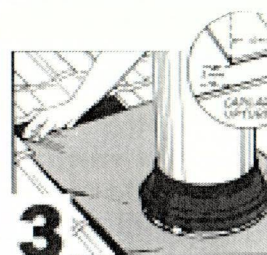
1

Trim Tileflash cone to suit pipe size.



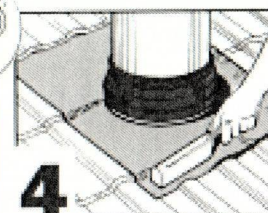
2

After first lubricating the flue with water, slide Tileflash down to tile level.



3

Flatten the sheet lead and form a anti-cappillary fold. Then place the upper edge of the base underneath the tiles up stream.



4

Finally, dress the apron to the surrounding tile area.

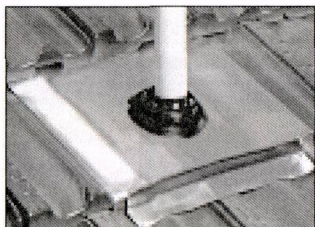

Dektite®
First and the Best!

CODE	PIPE mm	BASE mm	PITCH
TFL5-55	5-55	300 x 500	45°
TFL50-70	50-70	300 x 500	45°
TFL50-120	5-120	400 x 600	45°
TFL 110-170	110-170	450x600	45°
TFL 175-325	175-325	600x900	45°

HINT: When flashing a metal flue that has an exposed seam, using a neutral cure sealant, seal the seam from underside of cowl to the top of Dektite® cone.

Dektite® Aluminium

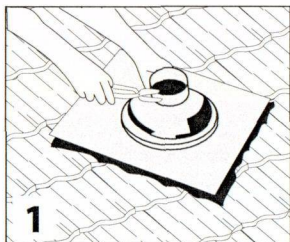
The versatile solution for hundreds of applications.



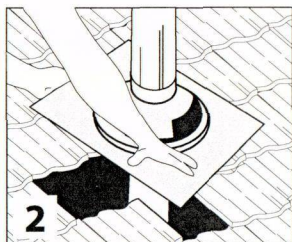
The base is 99.9% pure grade aluminium - strong, malleable and easy to install.

Environmentally friendly, ideal where potable water is collected.

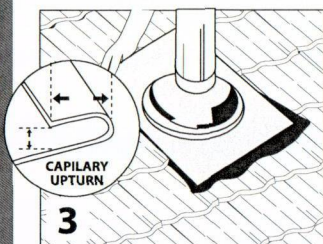
INSTALLATION INSTRUCTIONS



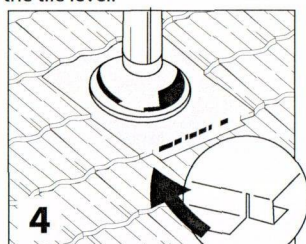
1 Trim Dektite™ cone to suit pipe size using sharp tin snips



2 After lubricating the flue with water, slide Dektite™ down to the tile level.



3 Place upper edge of base under tiles, forming an anti-capillary fold



4 Cut tabs and then just press and tap the bottom corners to form a soaker run-off tray.

Easy Selection Guide

Code	PIPE mm	BASE mm	PITCH	COLOUR
TFA 12-70	12 - 70	600 x 450	0 - 40°	BLACK (EPDM)* RED (EPDM)*
TFA 50-170	50 - 170	600 x 500	0 - 45°	
TFA 110-220	110 - 200	900 x 600	0 - 45°	
TFA 160-300	160 - 300	900 x 764	0 - 45°	

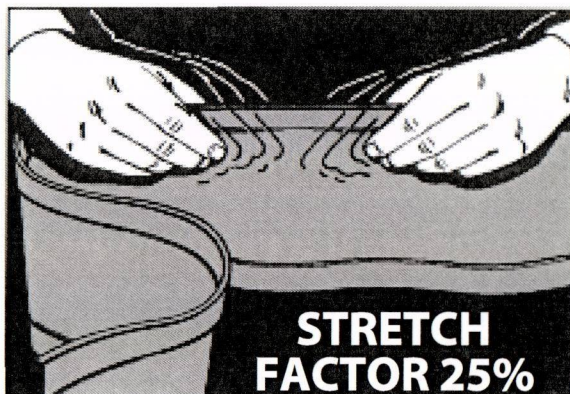
E.P.D.M. withstands temperatures from -50°C to 115°C, & up to 150°C intermittently

HINT: When flashing a metal flue that has an exposed seam, using a neutral cure sealant, seal the seam from underside of cowl to the top of Dektite® cone.

Dekstrip® Flashing

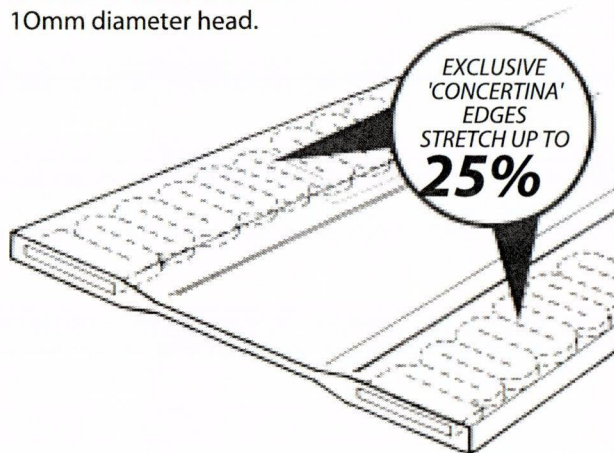


With the amazing patented stretch edge



**STRETCH
FACTOR 25%**

The edges of Dekstrip® contain an expanding aluminium strip (in concertina form) totally encased by the E.P.D.M. rubber flashing. The strip allows the flashing to be stretched and formed around most roof profiles - and maintain that shape. Fastening may be done through the aluminium strip using fasteners with a minimum 10mm diameter head.



EXCLUSIVE
'CONCERTINA'
EDGES
STRETCH UP TO
25%

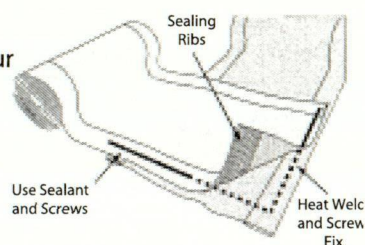
Both edges of Dekstrip® stretch up to 25% and retain shape over most roof cladding profiles.

FILE 121562

DEKSTRIP® TECHNICAL SPECIFICATIONS

Dekstrip® is specially compounded from EPDM based thermoplastic elastomer (TPE) material to give exceptional resistance to ozone, weather and water. Dekstrip® will effectively seal and remain flexible over a wide range of temperature extremes: From - 50°C to 115°C and has been proved to withstand intermittent temperatures up to 150°.

Dekstrip® can be painted to allow for accurate colour matching. For the perfect finish allow Dekstrip® to weather before painting with a quality, flexible acrylic paint.



New Material Thermoplastic Elastomeric (TPE) can now be sealed with a HEAT GUN.

- 1 Ensure the two pieces to be heat welded are well supported underneath.
- 2 Set gun to approx 200°C and fix thin flat nozzle.
- 3 Carefully lift top layer and apply heat to the underneath from a distance of 20-30mm.
- 4 Move slowly along dotted line (see above), heating each area for several seconds.
- 5 Press the two layers together by hand, working down the join melting the two edges of the Dekstrip® into one. Protect hands with a heat resistant glove.

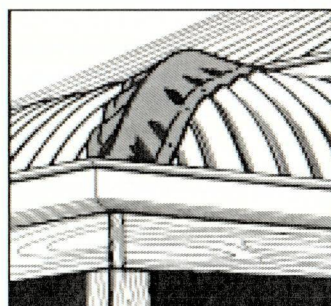
NOTE: Where the aluminium edge must lay on top of cut edge, Dekstrip® should be screw-fixed rather than heat welded. When Dekstrip is hot it becomes soft and will easily puncture. NEVER USE SHARP TOOLS.

Dekstrip® Easy Selection Guide

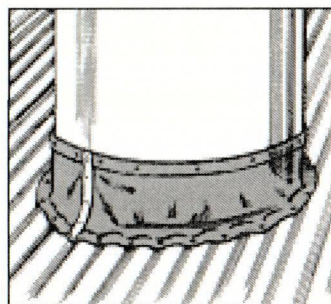
CODE	Length Metres	Width mm	Material
DS3-235	3.1	235	Grey Thermoplastic Elastomer (TPE) Will withstand temperatures from - 50° to 115°C & up to 150°C intermittently
DS10-180	10	180	
DS10235	10	235	
DS10305	10	305	
DS23-180	23	180	
DS23-235	23	235	PRICE AND AVAILABILITY ON APPLICATION
DS23-305	23	305	
DS15/450	15	450	

E.P.D.M. withstands temperatures from -50°C to 115°C, & up to 150°C intermittently

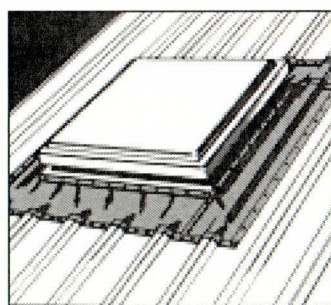
TYPICAL APPLICATIONS



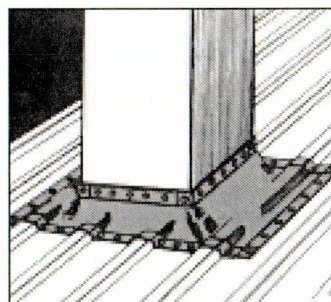
BULLNOSING



ROUND DUCTING

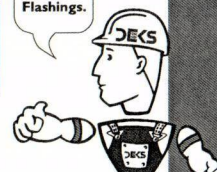


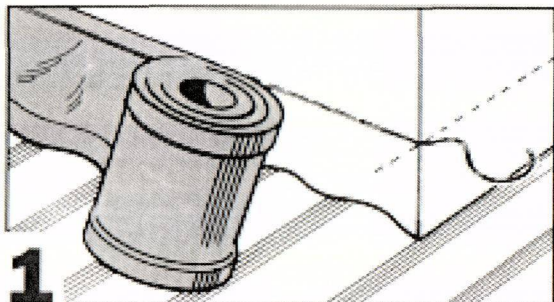
SKYLIGHTS



SQUARE DUCTING

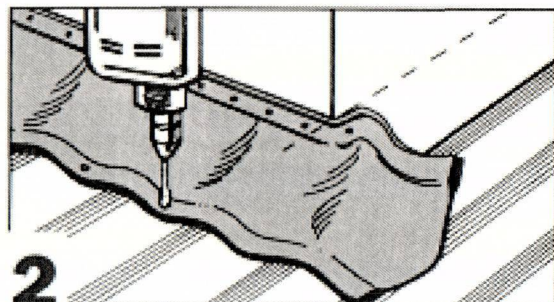
There's just no mistaking Dekstrip® Flashings.





1

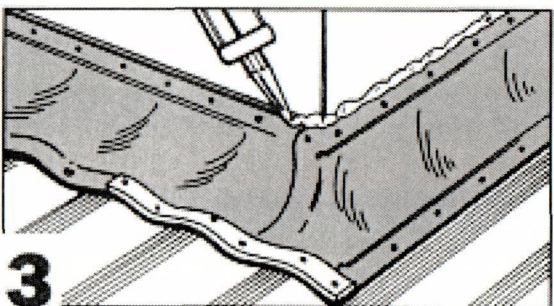
Cut Dekstrip® to required length allowing for overlaps and corner mitres. See instructions on individual applications for recommended allowances. Using a string line guide fasten top edge of flashing using suitable fasteners with a minimum 10mm head. In the case of rivets use a 10mm washer under head.



2

Where edge stretching is required to conform to roof profiles, **fasten the edge that does not require stretching first**. Then stretch the **ENTIRE** length of the other edge, form to profiles, seal and fix. **The flashing will not return to its original length once stretched.**

Where both edges require stretching the fasteners should be installed on opposite sides progressively in pairs.



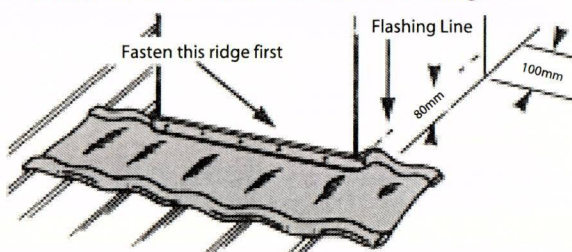
3

Fasteners should be applied to the Dekstrip® in the valley of the corrugations. Apply a generous bead of neutral-cure, alcohol free, low modulus sealant (silicone*) under edges. Finish off both fastened edges with a bead of sealant*. Use the aluminium strip provided to seal any overlapping ends or seal with a Heat Gun.

*Refer to page 28 for silicone usage

SQUARE DUCTING, SKYLIGHTS & CHIMNEYS

Determine length of Dekstrip® required adding approximately 300mm each end for overlap joints at corners. If penetration requires a "water run-off" area on the higher side, the roof cut should be 100mm longer i.e. towards the ridge to allow the Dekstrip® to form a flat tray effect. Where necessary support cut sections of sheet with additional roof framing.

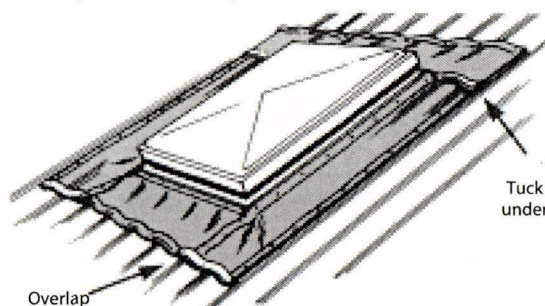


Where possible locate and fasten the Dekstrip® edge to the penetrating product at a height no greater than 80mm from the roof valleys. This will then dictate the flashing line around the product.

2 After establishing the "flashing line" fasten the lower front section first but do not fasten corners.

3 Locate and fasten the top or upper section next, forming the flat tray area required. Do not fasten corners.

4 Locate and fasten side flashings ensuring a tuck under at the top and an overlap at the bottom is attained.



N.B. When overlapping (see diagram) push the edge of the Dekstrip® back to conform with the Dekstrip® shape underneath. Apply liberal sealant* and fasten the leading edge. This sets and weatherproofs the seam. Use the supplied metal strips to finish leading edges. (Metal strips only supplied with the 10m roll.) Cut these to required size and conform to roof profile. Fasten where applicable.

5 In the same manner, seal and fasten all corners.

*Refer to page 28 for silicone usage

LARGE ROUND PIPES

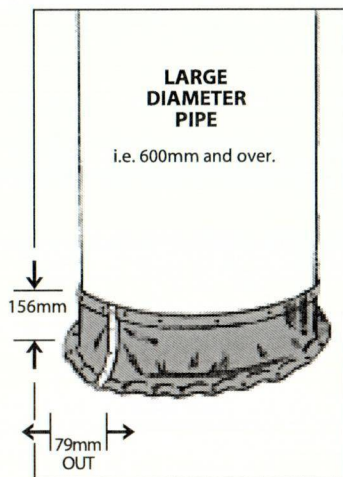
1 Mark a line on the pipe, 156mm above the roof. Take this mark from the valley. Circle the pipe.

2 Fasten Dekstrip® (after applying sealant) at this line. Overlap ends by 50mm.

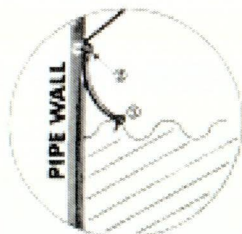
3 Stretch the entire unfastened bottom edge.

4 Seal and fasten bottom edge, allowing same overlap at bottom as at top - suggest valley fixing.

All listed measurements are for 235mm wide strip flash. If using other widths use a ratio of 2/3 up the pipe 1/3 over the roof profile.

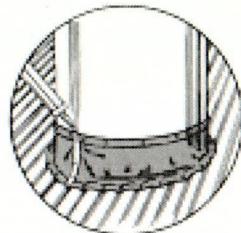


JOINING STRIP FLASHING ENDS ON ROUND PIPES

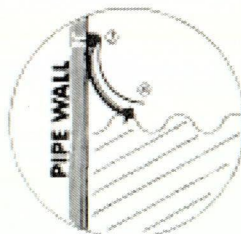


1 Insert metal strip behind overlapped Strip Flashing and fasten at bottom.

2 Then...Fasten at top.

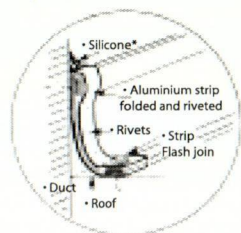


5 Fasten and apply sealant to complete join.



3 Fold metal Strip over top fastener.

4 Remove and replace bottom fastener after conforming the metal strip.



*Suggested method of joining vertical seams (cross section).

*Refer to page 28 for silicone usage

BULLNOSING AND CURVED PROFILE ROOFING

DEKSTRIP® APPLICATION FOR BULLNOSING EXTERNAL CORNER

1 For aesthetics and conformity fasten and fix poly pipe approx 40mm diam over the metal corner, ensuring the nail/screw doesn't protrude above the pipe. This now becomes the "former".

2 Tuck the Dekstrip® under top ridge.

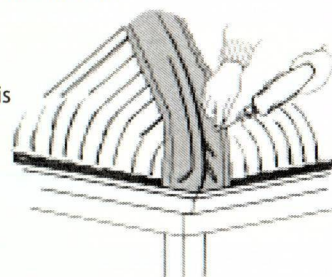
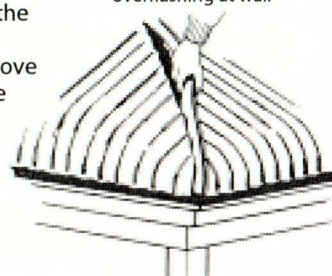
3 Cut the Dekstrip® to required length.

4 Centre the Dekstrip® over "former", using centre-line marked on product.

5 Point for commencement of fastening is optional: either at the gutter, or on the flat just before the sheet curves down towards the gutter. It is recommended fasteners are applied progressively opposite and valley fixed. Using "former" as a guide, fasten flashing to roofing profile ensuring adequate amount of silicone* sealant is applied behind the fastened edges.

A small amount of "width stretching" over the poly pipe is recommended to achieve a pleasing shape. Tuck the Dekstrip® under overflashing at wall.

Tuck Dekstrip® under overflashing at wall



OPTIONS

1 Start fixing and work down nosing to gutter, then up to the under-flashing.

OR

2 Start at gutter edge and work up to overflashing at wall.



Dektite®
First and the Best!

*Refer to page 28 for silicone usage

BULLNOSING AND PARAPET FLASHING

The wall to roof gap to be flashed should not exceed 145mm. Fasten Dekstrip®, preferably to down side of rib, 170mm away from the wall. Fasten the non-stretched side onto the roof commencing at the rear, finishing at the gutter. Unlike other applications, the Dekstrip® needs stretching in a **CERTAIN AREA ONLY** called the **BEND AREA** (see diagram), therefore fasten the wall edge up to the **"BEND AREA"**, then stretch the edge, form to shape and continue fastening to completion.

Recommendations:

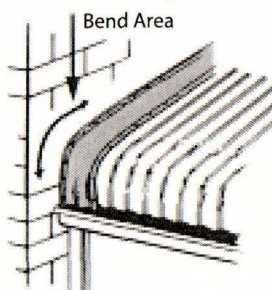
a) Fastening-

Minimum head size of 10mm.

b) Joining-

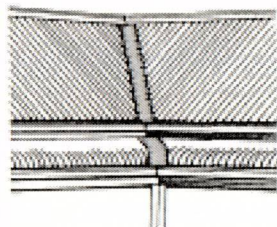
Metal strips are provided with 10 metre rolls for joining purposes.

(Not supplied with Bullnose pack as they are not required.)



INTERNAL CORNERS VALLEY OR CONCAVE

FIXING TO TOP SHEETS FOR THE ELIMINATION OF LEAF AND TWIG BUILD UP



1 Cut strip to required length.

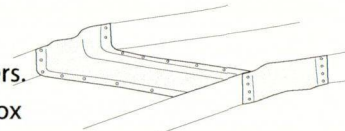
2 Commence fastening progressively and opposite in the valley of the corrugations using a liberal amount of sealant* under all edges. The Strip Flashing need only be stretched in area of rib misalignment.

EXPANSION JOINTS

Dekstrip allows for thermal expansion and contraction of box gutters.

- Fix evenly across the box gutter; keeping it flat and avoiding creases at corners.
- Ensure fixing points are well sealed with good quality washers and fasteners or sealed, washered rivets.

*Refer to page 28 for silicone usage



Dektite® Pipe Flashing Warranty

This warranty on Dektite® Pipe Flashing is given by DEKS Industries Pty Ltd 493 Mountain Highway, Bayswater, 3153, Victoria, Australia ("DEKS"), for the periods and under the terms and conditions listed below.

1. DEKS warrants that all Dektite® Pipe Flashings including Dekfit® Fittings ('the Products') furnished, will perform in accordance with our published specifications and will be free from defects in material and workmanship for a maximum period of 20 years, commencing from the date of delivery to end user.

Under this warranty DEKS will, at its option, repair or replace any defective Products. Any claim should be made in writing within 60 days following the discovery of any defect. DEKS shall not be liable for any costs incurred in the removal of defective items or installation of replacement items nor cost of freight and other associated charges.

2. This warranty shall not apply where:-

(a) the Product has not been installed in strict accordance with our published recommendations;

(b) the Product has been installed in an area which has been exposed at any time during the warranty period to corrosive conditions including but not limited to, corrosive chemicals, ash, fumes or condensates or harmful substance generated within or about the building(s) or fixture(s) to which the Product has been applied;

(c) any damage to the Product has been caused as a result of the negligence or misuse of the Product by the claimant.

(d) any modification to the specification of the Product has been made, save and except where any modification is reasonably necessary in adopting the Product to size.

(e) defects in the Product are a result of mechanical or chemical damage, which occurred during shipment or storage prior to use;

(f) defects are a result of acts of God or other external forces, including but not limited to, failure to provide free drainage of water from around the areas in which the Product has been installed.

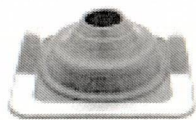
3. To the extent permitted by law, this warranty is given in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose. Where so permitted, the remedies stated herein are exclusive remedies and DEKS shall not be responsible for any indirect, consequential or incidental damages or further loss of any kind whatsoever except as expressly provided by in this Warranty.

Deks Industries Pty Ltd

ABN 77 109 135 544



Colours



GREY EPDM



BLACK EPDM



Silicone Sealants

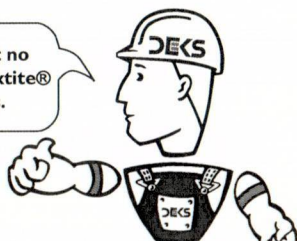
Use only Neutral Cure, Alcohol free, Low Modulus Sealant (Silicone). Deks Industries have trialed the following silicone sealants and found them to provide a satisfactory seal between the EPDM and most commonly used roofing materials.

- OCI Roof and Gutter N-192, Silicone Sealant
- Selleys® Roof & Gutter Silicone Sealant
- Sikasil®-C Multipurpose Silicone Sealant
- Bostik Findley Roof & Gutter Silicone Sealant
- Dow Corning® 791 Silicone Weatherproofing Sealant

Look at this performance

ASTM Method	Test Description	Spec. Req.	Test Results Black EPDM Dektite®	Test Results Grey EPDM Dektite®
D2240	Shore 'A' Hardness:	60 +/-5	60	60
D412	Tensile Strength (MPa min):	7.0 min	10.5	10.5
D412	Elongation @ Break (% min):	350 min	650	650
D624	Tear Resistance Die C(KN/m min):	20.0 min	31.5	32.0
	Trouser Tear (KN/m min):	10.0 min	14.0	14.5
D573	Heat Resistance 70hrs @ 100°C			
	Change in Hardness (points):	+/- 10	+1	+3
	Change in Tensile (%):	+/-25	+3.5	-5.0
	Change in Elongation (%):	+/-25	+14.0	-16.0
D395	Compression Set 22hrs @70°C (%max)		14.0	14.5
D1171	Resistance to Ozone	100ppm No Cracks	Passed	Passed
D2137	Low Temp. Brittleness 3 mins @ -50°C:	Non Brittle	Passed	Passed
U.L.94	Flame Resistance	U.L.94 H.B.	Passed	Passed

There's just no mistaking Dektite® Flashings.



Helpful Hints

Getting the best results from the DEKS range of flexible flashing products.

DEKTITES

- When cutting, do not use a knife. Sharp tin snips will provide the smoothest finish.
- Always cut where sizes are indicated. Incorrect point of cutting may result in poor fit.
- Hand form aluminium edge before fastening.
- Fasten from vertical centre to outside.
- When pulling the Dektite down a pipe, wet the pipe first.

SOAKERS

- Hand preform aluminium metal flange prior to cutting roof.
- Fasten from vertical centre to outside. Fasten sides last.
- In particular circumstances, we recommend use of Soakers **particularly** where roof pitch is below 1.5° or above 45° and pipe sizes are in excess of 100mm.
- Use of a stainless steel band at pipe / soaker join is only necessary in extreme roof pitch situation 55 - 60°

RETROFITS

- Do not overcrimp seam.
- For pipes over 150mm diameter use a stainless steel support clip.

TILE FLASHING

- Dress to profile, avoiding unnecessary beating.
- In flue applications, apply a liberal coating of sealant* over worm drive mechanism.

STRIP FLASHING

- Stretch expanding sides only when necessary and just before fastening.
- Due to the flexibility of the expanding edges and providing that a liberal amount of sealant is used underneath these edges, it is recommended to 'valley' fix where possible.
- Use only neutral-cure, alcohol free, low modulus sealant* (silicone).
- Avoid contact between strip flashing and sharp exposed metal edges.

GENERAL POINTS - APPLICABLE TO ALL DEKS FLASHING PRODUCTS

- Always ensure that a liberal amount of sealant is applied UNDER any perimeter aluminium-backed edge.
- **Seamed Pipes:** Where these are found, always apply a bead of sealant from the Dektite point of contact along the entire seam length.
- Where multiple skin flues are used, E.P.D.M. Dektite are appropriate.
- Under **NO** circumstances should any Dektite product be used on an unapproved (i.e. single skin) flue discharging from a wood combustion appliance.
- Overstretching of E.P.D.M. compound products can lead to shortened life expectancy.

*Refer to previous page for silicone usage

Finishing Schedule

All finishes to comply with NZBC E3 - Internal Moisture

Bathroom & Ensuite

Floor	Substraight Finish	Concrete floor Vinyl - "Gerflor squash's"
Walls	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Lustacryl Semi-Gloss Waterborne Enamel"
Ceiling	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Lustacryl Semi-Gloss Waterborne Enamel"
Doors & Windows		Resene " Lustacryl Semi-Gloss Waterborne Enamel" or Resene " Lusta-Glo Semi-Gloss Enamel"

Separate Wc

Floor	Substraight Finish	Concrete floor Vinyl - "Gerflor squash's"
Walls	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Zylone Low Sheen"
Ceiling	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Ceiling Paint Flat Acrylic"
Doors & Windows		Resene " Lustacryl Semi-Gloss Waterborne Enamel" or Resene " Lusta-Glo Semi-Gloss Enamel"

Laundry in Garage

Floor	Substraight Finish	Concrete floor Resene "Aquapoxy for Flooring Waterborne Epoxy"
Walls	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Zylone Low Sheen"
Ceiling	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Ceiling Paint Flat Acrylic"
Doors & Windows		Resene " Lustacryl Semi-Gloss Waterborne Enamel" or Resene " Lusta-Glo Semi-Gloss Enamel"

Kitchen

Floor	Substraight Finish	Concrete floor Vinyl - "Gerflor squash's"
Walls	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Zylone Low Sheen"
Ceiling	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Ceiling Paint Flat Acrylic"
Doors & Windows		Resene " Lustacryl Semi-Gloss Waterborne Enamel" or Resene " Lusta-Glo Semi-Gloss Enamel"

FILE COPY 121562

Design for Durability

Steel & Tube Roofing and Cladding Solutions on CD-ROM or in printed form, provides design and installation details for residential and commercial applications. Contact your local branch or the Technical Helpline for your copy.

With correct product selection, installation and maintenance, your Steel & Tube Roofing Products roof will remain attractive and weatherproof for many years. Unfavourable design practices will detrimentally affect the performance of your roof and should be avoided. If any of the following situations are evident in your design you should contact your Steel & Tube Roofing Products representative for advice.

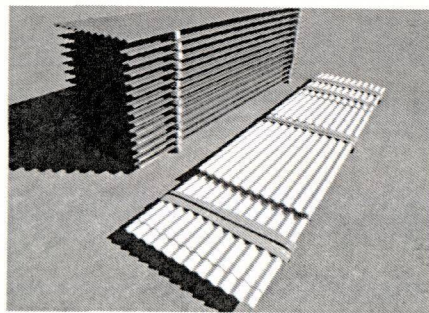
- Areas of roofing, cladding and rainwater systems unwashed by rainfall will accumulate atmospheric debris which can become corrosive when damp. These areas will require maintenance depending on the product used and the environment. Refer to the MAINTENANCE section of this publication.
- Do not discharge water runoff from inert materials such as Zinalume® steel, pre-painted roofing, tiles or clear sheeting onto unpainted galvanised roofing and gutters, as the corrosive salts formed in this situation are unstable and can lead to premature corrosion.
- Where two different metals are in contact one metal will tend to sacrifice itself to protect the other. A similar effect can occur with water flowing over dissimilar metals. In particular, avoid runoff from copper or brass onto Zinalume® steel roofing, and avoid contact with, or runoff from unpainted lead onto Zinalume® steel.
- Fasteners should be compatible with the roofing material chosen and have durability not less than the material being fastened. Stainless steel or aluminium fasteners should be used with pre-painted aluminium roofs.
- Wall cladding should terminate at least 50mm above ground level, and be kept free of vegetation.



Storage

Products are despatched from the factory in top condition, however the material can be ruined before installation by poor storage practices. Premature deterioration due to poor storage may be avoided if these simple guidelines are followed:

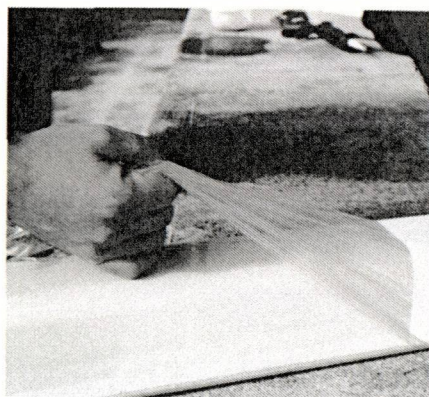
- On arrival, ensure sheets are dry. If wet, open the pack and separate the sheets to allow them to dry. Store packs of the product off the ground in a sheltered position providing some fall to allow water to run off. Protect packs with a loose fitting waterproof cover, allowing air to circulate.
- Contact with wet cement should be avoided at all times.



Installation

The installation of metal roofing products is a specialised field requiring knowledge and experience of numerous issues with regard to trade practice and material compatibility.

- Poor handling prior to or during installation can cause damage which may affect the appearance and ultimate performance of the product. Don't handle sheets roughly or carelessly or drag or slide sheets over each other or rough surfaces, as damage to the coating may occur. Equipment used to handle the sheets should be clean and free of dirt and grit.
- Soft soled shoes should be worn whenever walking on the product to prevent damage to the coating; traffic up the roof should be in the pans of the profile and across the roof should be on the purlin line.
- Prior to installation ensure that the tops of the purlins or girts are all in the same plane; if packing or easing is necessary ensure this is not to the detriment of the connection between the fastener and the structure.
- Sheets should be lapped away from the line of sight wherever possible to enhance aesthetic appeal and all sheets should be stop ended at the top, and lipped at the bottom on pitches below 8°.
- Ensure that the anti-capillary edge is fitted as the external overlap and is visible from the top side.
- The use of touch-up paints is not recommended; if a pre-painted sheet is excessively damaged by scratching it should be replaced. Accessories should be colour matched prior to installation.
- Regularly clean up the area by sweeping swarf, offcuts, rivet shanks and loose fasteners with a soft-bristled broom. Collect and remove all debris daily as unsightly staining from swarf and other unprotected steel items can occur overnight.
- The strippable film applied to some prepainted products must be removed within two weeks of installation, or earlier if storage is in direct sunlight.
- Recommended references are the New Zealand Steel Installer's Guide and the Steel & Tube Roofing and Cladding Solutions.



FILE COPY 121562

Maintenance

Few products are absolutely maintenance-free and all Steel & Tube Roofing Products profiles are subject to the cumulative effects of weather, dust and other airborne deposits, some of which are extremely aggressive. ENVIRONMENTS & WARRANTIES on Page 6 will assist in identifying the category into which the site fits. In order to ensure the maximum service life from the chosen coating system, the property owner should note the following maintenance advice:

- Soft soled shoes should be worn whenever walking on roofing to prevent damage to the coating; walk only in the pans of the profile, and on the purlin line whenever possible.
- Normal rainwashing will remove most accumulated atmospheric debris, but manual washing is required for areas which do not receive adequate rainwashing. These areas, such as wall cladding under eaves, or sheltered areas where overlapping of roof areas occurs due to the design, are known as *unwashed areas*.
- Other *high risk areas* that require manual washing include around flues and extractor vents, under television aerials and trees and sites prone to mould, lichen, bird droppings or debris.
- Spoutings and gutters must be regularly inspected to remove debris, which may cause ponding.
- Surfaces may be washed with water and a soft-bristled brush, or for larger areas waterblasting at pressures up to 20 MPa may be more appropriate.
- The following table shows maintenance requirements for roofing products relative to the environment in which the building is located.



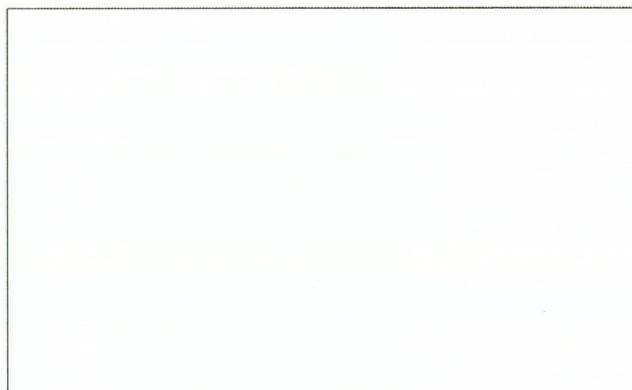
These recommendations are dependant on selection of the appropriate roofing material for the prevailing environment.

Material	Environment	Maintenance Requirement			
		Roof	Walls	Rainwater Systems	Unwashed and High Risk Areas
Pre-Painted steel	Very severe	Rainwashing Only	Wash every 3 months	Wash monthly	Wash monthly
	Severe	Rainwashing Only	Wash every 6 months	Wash every 3 months	Wash every 3 months
	Moderate	Rainwashing Only	Wash every 12 months	Wash every 6 months	Wash every 3 months
Zincalume*	Moderate	Rainwashing Only	Wash every 6 months	Wash every 3 months	Wash every 3 months

Overpainting

- Galvanised or Zincalume® products can be overpainted immediately or after weathering. Use primer and top coat from a reputable paint manufacturer suitable for galvanised steel. Do not use calcium plumbate primers if rain water is to be collected for drinking purposes.
- Pre-painted roofing is best left weathered for at least twelve months prior to overpainting, unless special steps are taken to improve adhesion.
- As with all paint systems preparation is the key. For more information on overpainting Steel & Tube Roofing Products pre-painted materials, refer to the New Zealand Steel Overpainting Guide.

Preferred Supplier



Drinking Water

- Pre-painted and metallic coated products are suitable for the collection of drinking water. On new installations the first 25mm of rainfall should be discarded to avoid contamination from any manufacturing or installation residue. Some post-painted systems are unsuitable for the collection of drinking water, check with the paint supplier for compatibility.

Technical Helpline: 0800 333 247

Website: www.stroofing.co.nz

Email: info@stroofing.co.nz

WHANGAREI
9 Southend Ave
Otaika
PO Box 1869
Ph: 09 438 4600
Fax: 09 438 0342

NORTH SHORE
2 Ride Way
Nth Hbr Ind Estate
PO Box 100-182
Ph: 09 415 8080
Fax: 09 415 9192

AUCKLAND
14 Kerwyn Ave
East Tamaki
PO Box 58-216
Ph: 09 274 4056
Fax: 09 274 8972

HAMILTON
32 Kaimiro St
Pukete Ind Estate
PO Box 10 458
Ph: 07 850 9200
Fax: 07 850 9330

TAURANGA
67 Koromiko St
Judea
PO Box 2001
Ph: 07 578 1089
Fax: 07 577 0186

WELLINGTON
201 Gracefield Rd
Lower Hutt
PO Box 36 082
Ph: 04 568 4359
Fax: 04 568 6770

CHRISTCHURCH
106 Antigua St
Sydenham
PO Box 7306
Ph: 03 377 0994
Fax: 03 377 2680

THERMAL INSULATION

Pink® Batts® Wall



Application

Pink® Batts® wall insulation, is a light weight flexible glass wool insulation product designed to:

- Thermally insulate timber and steel framed walls
- Fit easily in standard wall constructions, or be easily cut to fit in non standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- BRANZ appraised, a durable product for 50 years as required by the NZBC
- Energy saving –a well insulated home can save up to \$1800¹ on energy bills annually
- Non-combustible, will not burn for a safer environment
- R-values up to R2.8, to assist in keeping homes above 18°C, as per the World Health Organisations recommendation for a healthy and comfortable home
- Absorbs sound for a quieter more relaxing home

¹(Department of Building and Housing, Your guide to a smarter home, 2008, p. 28)

Environment

- Manufactured using up to 80% recycled glass, making sustainable use of waste
- Energy used during the manufacture of Pink® Batts® products, is offset by the energy saved by a home fully insulated with Pink® Batts® products within 3-15 months²
- Locally manufactured in Auckland and Christchurch, minimising shipping distances compared to imported products

Potential Green Star NZ Credits

Green Star NZ is a comprehensive environmental rating system for buildings. Pink® Batts® insulation may contribute the following points under Green Star Office Design V.1:

EMI-8	One point	Thermal insulation avoids the use of ozone depleting substances in both manufacture and composition.
MAT-11	One point	90% or more of the thermal insulation used is certified through a recognised a body (e.g., NZ Environmental Choice) as having lower environmental impact.

Certification and further information is available at www.nzgbc.org.nz

Environmental Choice

Higher R-value Pink® Batts® Wall insulation products have Environmental Choice New Zealand Accreditation (*refer to the product specifications*)

- Independently assessed for:

- Waste Minimisation: Recycled content, and recycling of process waste
- Energy Management: Effective energy management policies and procedures
- Manufacturing Process: Not manufactured using blowing agents with a global warming potential
- Product Characteristics: Durability and performance



Licence No 2504017.
Thermal (resistive type)
building insulants.

While only the higher R-value products are eligible for Environmental Choice, all Pink® Batts® Thermal Insulation Products are manufactured in the same environmentally considerate way

²(Beca Carter Hollings & Ferner Ltd, Energy Economics of Fibreglass Insulation, 2005)



THERMAL INSULATION

Pink® Batts® Wall

Health

Product Safety

Pink® Batts® insulation is a non hazardous, safe product

- IARC (International Agency for Research on Cancer) classifies glass wool formulation used to manufacture Pink® Batts® products as Group 3: 'Not classifiable as to its carcinogenicity to humans'
- This the same classification as caffeine, tea, hair colouring, chlorinated drinking water, saccharin
- Pink® Batts® insulation is bio-soluble. In the unlikely event any fibres are inhaled into the lungs they will dissolve in the body fluids and be cleared from the body



General Health

- Pink® Batts® insulation will assist in meeting the World Health Organisation recommendation for houses to be maintained at a minimum temperature of 18°C to provide a healthy and comfortable home
- Pink® Batts® has been accepted into the Asthma and Respiratory Foundation of New Zealand's Sensitive Choice programme. Insulating with Pink® Batts® is beneficial to those suffering from asthma
- A Wellington School of Medicine study found insulated houses resulted in families with fewer sick days and the economic benefit was double the initial cost of the insulation³



³(Howden-Chapman, P. et al. "Effect of insulating existing houses on health inequality: cluster randomised study in the community" British Medical Journal, 2007, p334:460)

Technical Data

Properties	Result		Test Method/Standard	Test Results
Combustibility	Non-Combustible	✓	NZS/AS 1530.1:1994	
Flammability	Non-Flammable	✓	NZS/AS 1530.3:1993 Ignitability (Range 0-20) Spread of Flame Index (Range 0-10) Heat Evolved Index (Range 0-10) Smoke Developed Index (Range 0-10)	= 0 = 0 = 0 = 0-1
R-value	Various*	✓	AS/NZS 4859.1:2002	
Corrosion	Non-Corrosive	N/A	AS/NZS 4859.1:2002-Glasswool exempt	
Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2002-Glasswool exempt	
Vermis Resistance	No Food Source	✓	AS/NZS 4859.1:2002-Glasswool exempt	

*Refer to product specifications

Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in walls will transmit sound readily. Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.

PRODUCT DATA SHEET

Page 2 of 4

THERMAL INSULATION

Pink® Batts® Wall



New Zealand Building Code (NZBC) and Limitations

Pink® Batts® wall insulation when used, installed and maintained in accordance with the requirements outlined in this datasheet will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause B2: Durability

Meets the requirement NZBC B2.3.1 a) 50 years and NZBC B2.3.1 b) 15 years

NZBC Clause E2: External Moisture

Contributes to meeting these requirements

NZBC Clause E3: Internal Moisture

Contributes to meeting these requirements

NZBC Clause F2: Hazardous Building Materials

Meets this requirement and will not present a health hazard to people

Limitations

To meet the provisions of the NZBC as outlined in this datasheet,

Pink® Batts® wall insulation *must* be:

- Installed and maintained in a dry protected environment
- Installed in a building where the provisions of NZBC E2 and E3 are met
- Installed to the requirements of NZS 4246:2006: Energy Efficiency-Installing Insulation in Residential Buildings

Pink® Batts® wall insulation should *not* be:

- Crushed or folded

Wall Installation Instructions

Correct installation with no compression, gaps or folds is critical to ensure Pink® Batts® wall insulation performance is not compromised

Tools:

- Knife and cutting board
- Protective loose fitting, long sleeved clothing
- Dust mask
- Gloves
- Safety goggles

Safety

- Be careful not to cut or bare cables and wires
- Beware of other sharp objects, nails, splinters etc

Instructions:

- Ensure the product is installed dry. If the product is wet, replace it before installing
- If cutting is required, cut oversize by 5-10mm to ensure a friction fit
- Fill gaps around windows and doors with off-cuts
- Insulate around vents, not over them, to allow unhindered ventilation
- Fit Pink® Batts® insulation behind electrical wiring* and plumbing
- Ensure there are no gaps, folds or undesirable compression at edges

*Caution: Electrical cables and equipment partially or completely surrounded with bulk thermal insulation may overheat and fail. This applies to wiring installed prior to 1989



THERMAL INSULATION

Pink® Batts® Wall

PinkFit® Installation Service

Installation is critical in ensuring this product performs well. A small gap around the insulation can significantly reduce the construction R-value

PinkFit® installers are:

- A network of licensed professionals across New Zealand
- Trained installers and guarantee installation to NZS 4246:2006
- The preferred Pink® Batts® installers, and provide a PinkFit® guarantee certificate



Call 0800 PINKFIT
0800 746 534

Specification Notes

State the following:

Product Required:

Pink® Batts® wall insulation and required R-value

Installation Service:

PinkFit® Installation Service and PinkFit® Guarantee Certificate

Product Specifications

Product	Product Code	Environmental Choice	BRANZ Appraised	R-value (m ² ·C/W)	Nominal Thickness (mm)	Size (mm)	Pieces per Pack	Coverage per Pack (m ²)*	Area per Pack (m ²)
Pink®Batts® R1.8 Wall	7120118		●	1.8	90	1140 x 580	26	19.6	17.2
Pink®Batts® R2.2 Wall	7120122		●	2.2	90	1140 x 580	21	15.8	13.9
Pink®Batts® R2.2 Narrow Wall	7120123		●	2.2	90	1140 x 380	22	10.0	9.5
Pink®Batts® R2.4 Wall	7120124		●	2.4	90	1140 x 580	16	12.1	10.6
Pink®Batts® Ultra™ R2.6 Wall	7120126	✓	●	2.6	90	1140 x 580	15	11.3	9.9
Pink®Batts® Ultra™ R2.8 Wall	7120128	✓	●	2.8	90	1140 x 580	10	7.5	6.6

* Coverage relates to standard structure and actual coverage may vary.

Storage: Pink® Batts® must be protected from damage and weather. Store under cover in clean, dry conditions

Accreditations/Appraisals/Certifications



Tasman Insulation New Zealand Ltd
Certified QMS



Tasman Insulation New Zealand
Limited
9-15 Holloway Place, Penrose,
Auckland,
New Zealand

(1) This data sheet may have been superseded. Please refer to www.pinkbatts.co.nz for the most current information. This datasheet supersedes all previous versions. (2) Tasman Insulation New Zealand Ltd retains the right to change specifications without prior notification. (3) Do not use this product for any application not detailed in this data sheet. (4) Recommendations and advice regarding the use of this product are to be taken as a guide only. The purchaser should ascertain the suitability of this product for the particular end-use situation intended and when used in conjunction with other products. (5) Consult Tasman Insulation New Zealand Ltd for further information. (6) All claims about this product are subject to any variation caused by normal manufacturing process and tolerances. (7) The liability of Tasman Insulation New Zealand Ltd and its employees and agents for any errors or omissions in this data sheet or otherwise in relation to the product is limited to the fullest extent permitted by law. Except where the consumer acquires the goods for the purposes of a business, any rights a consumer may have under the Consumer Guarantees Act are not affected. (8) This information is provided without prejudice to Tasman Insulation New Zealand Ltd standard terms and conditions of sale.

Please consider the environment before printing this document

For further information visit www.pinkbatts.co.nz or call 0800 PINK BATTS (746 522)

PRODUCT DATA SHEET

1002 rev B
Nov 08
Page 4 of 4

THERMAL INSULATION

Pink® Batts® Ceiling



Application

Pink® Batts® ceiling insulation is a light weight flexible glass wool insulation product designed to:

- Thermally insulate ceilings in new homes, be retrofitted into existing homes with no insulation or over existing insulation for better performance
- Fit easily into standard ceiling constructions, or be easily cut to fit in non standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- BRANZ appraised, a durable product for 50 years as required by the NZBC
- Energy saving – a well insulated home can save up to \$1800¹ on energy bills annually
- Non-combustible, will not burn for a safer environment
- R-values up to R5.0, to assist in keeping homes above 18°C, as per the World Health Organisations recommendation for a healthy and comfortable home
- Absorbs sound for a quieter more relaxing home

¹(Department of Building and Housing, Your guide to a smarter home, 2008, p. 28)

Environment

- Manufactured using up to 80% recycled glass, making sustainable use of waste
- Energy used during the manufacture of Pink® Batts® products, is offset by the energy saved by a home fully insulated with Pink® Batts® products within 3-15 months²
- Locally manufactured in Auckland and Christchurch, minimising shipping distances compared to imported products

Potential Green Star NZ Credits

Green Star NZ is a comprehensive environmental rating system for buildings. Pink® Batts® insulation may contribute the following points under Green Star Office Design V.1:

EMI-8	One point	Thermal insulation avoids the use of ozone depleting substances in both manufacture and composition.
MAT-11	One point	90% or more of the thermal insulation used is certified through a recognised a body (e.g., NZ Environmental Choice) as having lower environmental impact.

Certification and further information is available at www.nzgbc.org.nz

Environmental Choice

Higher R-value Pink® Batts® Ceiling insulation products have Environmental Choice New Zealand Accreditation (*refer to the product specifications*)

- Independently assessed for:

- Waste Minimisation: Recycled content, and recycling of process waste
- Energy Management: Effective energy management policies and procedures
- Manufacturing Process: Not manufactured using blowing agents with a global warming potential
- Product Characteristics: Durability and performance



Licence No 2504017.
Thermal (resistive type)
building insulation.

While only the higher R-value products are eligible for Environmental Choice, all Pink® Batts® Thermal Insulation Products are manufactured in the same environmentally considerate way

²(Beca Carter Hollings & Ferner Ltd, Energy Economics of Fibreglass Insulation, 2005)



THERMAL INSULATION

Pink® Batts® Ceiling

Health

Product Safety

Pink® Batts® insulation is a non hazardous, safe product

- IARC (International Agency for Research on Cancer) classifies glass wool formulation used to manufacture Pink® Batts® products as Group 3: 'Not classifiable as to its carcinogenicity to humans'
- This the same classification as caffeine, tea, hair colouring, chlorinated drinking water, saccharin
- Pink® Batts® insulation is bio-soluble. In the unlikely event any fibres are inhaled into the lungs they will dissolve in the body fluids and be cleared from the body



General Health

- Pink® Batts® insulation will assist in meeting the World Health Organisation recommendation for houses to be maintained at a minimum temperature of 18°C to provide a healthy and comfortable home
- Pink® Batts® insulation has been accepted into the Asthma and Respiratory Foundation of New Zealand's Sensitive Choice programme. Insulating with Pink® Batts® is beneficial to those suffering from asthma
- A Wellington School of Medicine study found insulated houses resulted in families with fewer sick days and the economic benefit was double the initial cost of the insulation³



³(Howden-Chapman, P. et al. "Effect of insulating existing houses on health inequality: cluster randomised study in the community" British Medical Journal, 2007, p334:460)

Technical Data

Properties	Result		Test Method/Standard	Test Results
Combustibility	Non-Combustible	✓	NZS/AS 1530.1:1994	
Flammability	Non-Flammable	✓	NZS/AS 1530.3:1993 Ignitability (Range 0-20) Spread of Flame Index (Range 0-10) Heat Evolved Index (Range 0-10) Smoke Developed Index (Range 0-10)	= 0 = 0 = 0 = 0-1
R-value	Various*	✓	AS/NZS 4859.1:2002	
Corrosion	Non-Corrosive	N/A	AS/NZS 4859.1:2002-Glasswool exempt	
Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2002-Glasswool exempt	
Vermin Resistance	No Food Source	✓	AS/NZS 4859.1:2002-Glasswool exempt	

*Refer to product specifications

Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in walls will transmit sound readily. Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.

PRODUCT DATA SHEET

Page 2 of 6

THERMAL INSULATION

Pink® Batts® Ceiling



New Zealand Building Code (NZBC) and Limitations

Pink® Batts® ceiling insulation when used, installed and maintained in accordance with the requirements outlined in this datasheet, will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause B2: Durability

Meets the requirement NZBC B2.3.1 a) 50 years and NZBC B2.3.1 b) 15 years

NZBC Clause E2: External Moisture

Contributes to meeting these requirements

NZBC Clause E3: Internal Moisture

Contributes to meeting these requirements

NZBC Clause F2: Hazardous Building Materials

Meets this requirement and will not present a health hazard to people

Limitations

To meet the provisions of the NZBC as outlined in this datasheet,

Pink® Batts® ceiling insulation *must* be:

- Installed and maintained in a dry protected environment
- Installed in a building where the provisions of NZBC E2 and E3 are met
- Installed to the requirements of NZS 4246:2006:Energy Efficiency-Installing Insulation in Residential Buildings

Pink® Batts® ceiling insulation should *not* be:

- Crushed or folded

Ceiling Installation Instructions

Correct installation with no compression, gaps or folds is critical to ensure Pink® Batts® ceiling insulation performance is not compromised

Tools :

- Knife and cutting board
- Lamp and extension cord (15m long)
- Install rod (25mm rod, 1m long) for tight spaces
- Protective loose fitting, long sleeved clothing
- Dust mask
- Gloves
- Safety goggles
- Planks (long enough to span across joists)

Safety

- Beware of loose boards and pipe work when working in the ceiling. Use planks laid across joists to walk on
- Ensure there is adequate lighting
- During daytime, avoid times of excessive heat, the ceiling cavity can get very hot
- Be careful not to cut or bare cables and wires
- Beware of other sharp objects, nails, splinters etc
- Beware of pests such as bees and wasps



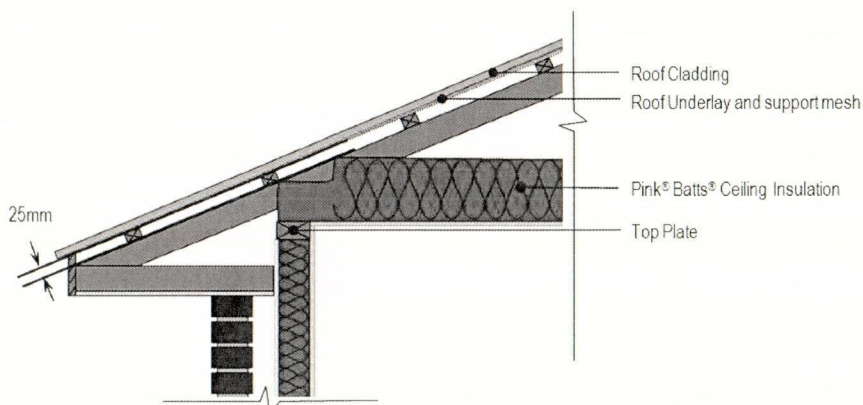
THERMAL INSULATION

Pink® Batts® Ceiling

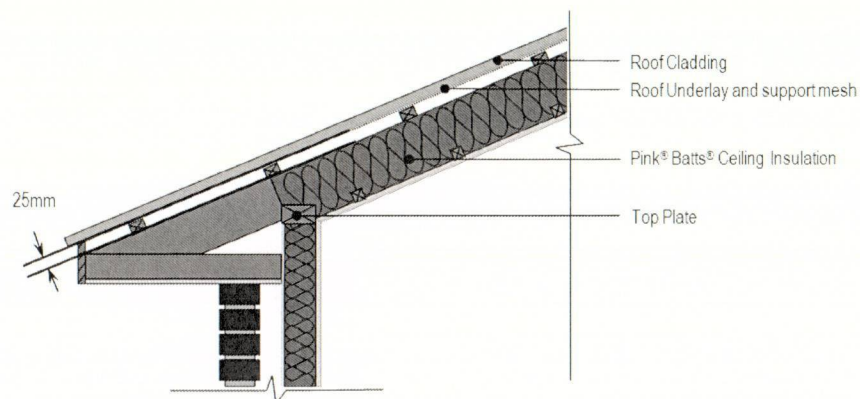
Ceiling Installation Instructions continued...

- Ensure the product is installed dry. If the product is wet, replace it before installing
- Use planks laid across joists to walk and work on
- Any existing insulation should be levelled, refitted if required, and any damp insulation removed
- Start installation at point furthest away from ceiling manhole
- If cutting is required, cut oversize by 5-10mm to ensure a friction fit
- Insulate around vents (not over them) to allow unhindered ventilation
- Insulate directly up to bricked chimneys leaving no gaps
- Fit Pink® Batts® insulation beneath electrical wiring and plumbing (see caution overleaf)
- Install to the outer edge of the top plate
- Maintain a 25mm gap clearance between the Pink® Batts® insulation and roof underlay, if required trim insulation to maintain 25mm clearance. *(Please consult your designer as to the best method for maintaining good insulation performance and the mandatory 25mm clearance for the particular design and construction of your house)*

Pitched Roof



Skillion Roof



THERMAL INSULATION

Pink® Batts® Ceiling

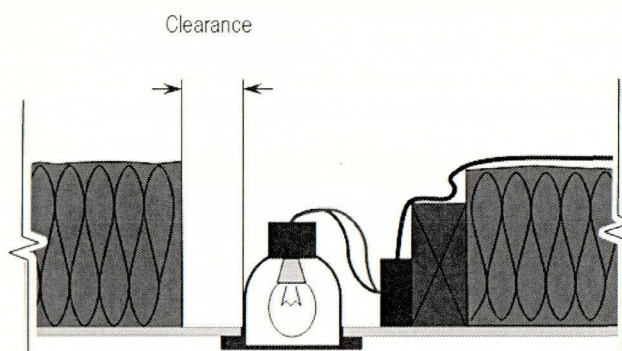


Ceiling Installation Instructions continued...

- Adhere to the clearances below for recessed light fittings, clearances are required for some fittings to prevent light fittings from overheating and failing

Light Fitting Type	Clearance
Unknown Light	200mm
Unclassified Incandescent	50mm
Unclassified Halogen	200mm
CA, RA and OA	No clearance required
CS, RS and OS	100mm
C*, R*, O*, FR and AR	As specified by manufacturer

Recessed Light Clearances



Note: Pink® Batts® ceiling insulation can be installed from below when the ceiling is to be lined or replaced

Caution: Electrical cables and equipment partially or completely surrounded with bulk thermal insulation may overheat and fail. This applies to wiring installed prior to 1989

PinkFit® Installation Service

Installation is critical in ensuring this product performs well. A small gap around the insulation can significantly reduce the construction R-value

PinkFit® installers are:

- A network of licensed professionals across New Zealand
- Trained installers and guarantee installation to NZS 4246:2006
- The preferred Pink® Batts® installers, and provide a PinkFit® guarantee certificate



Call 0800 PINKFIT
0800 746 534



THERMAL INSULATION

Pink® Batts® Ceiling

Specification Notes

State the following:

Product Required:

Pink® Batts® Ceiling insulation and required R-value

Installation Service:

PinkFit® Installation Service and PinkFit® Guarantee Certificate

Product Specifications

Product	Product Code	Environmental Choice	BRANZ Appraised	R-value (m ² ·°C/W)	Nominal Thickness (mm)	Size (mm)	Pieces per Pack	Coverage per Pack (m ²)*	Area per Pack (m ²)
Pink®Batts® R1.8 Ceiling	7110118		●	1.8	95	1220 x 432	26	14.4	13.7
Pink®Batts® R2.2 Ceiling	7110122		●	2.2	115	1220 x 432	24	13.3	12.6
Pink®Batts® R2.6 Ceiling	7110126		●	2.6	140	1220 x 432	20	11.1	10.5
Pink®Batts® R3.2 Ceiling	7110132	✓	●	3.2	170	1220 x 432	16	8.8	8.4
Pink®Batts® R3.6 Ceiling	7110136	✓	●	3.6	180	1220 x 432	14	7.7	7.4
Pink®Batts® Ultra™ R 4.0 Ceiling	7110140	✓	●	4.0	190	1220 x 432	12	6.6	6.3
Pink®Batts® Ultra™ R4.6 Ceiling	7110146	✓	●	4.6	195	1220 x 432	10	5.5	5.3
Pink®Batts® Ultra™ R5.0 Ceiling	7110150	✓	●	5.0	200	1220 x 432	8	4.4	4.2
Pink®Batts® Handy Pack	7110522			2.2	94	610 x 432	24	7.0	6.3

* Coverage relates to standard structure and actual coverage may vary.

Storage

Pink® Batts® insulation must be protected from damage and weather. Store under cover in clean, dry conditions

Accreditations/Appraisals/Certifications



Tasman Insulation New Zealand Ltd
Certified QMS



Tasman Insulation New Zealand
Limited
9-15 Holloway Place, Penrose,
Auckland,
New Zealand

(1) This data sheet may have been superseded. Please refer to www.pinkbatts.co.nz for the most current information. This datasheet supersedes all previous versions. (2) Tasman Insulation New Zealand Ltd retains the right to change specifications without prior notification. (3) Do not use this product for any application not detailed in this data sheet. (4) Recommendations and advice regarding the use of this product are to be taken as a guide only. The purchaser should ascertain the suitability of this product for the particular end-use situation intended and when used in conjunction with other products. (5) Consult Tasman Insulation New Zealand Ltd for further information. (6) All claims about this product are subject to any variation caused by normal manufacturing process and tolerances. (7) The liability of Tasman Insulation New Zealand Ltd and its employees and agents for any errors or omissions in this data sheet or otherwise in relation to the product is limited to the fullest extent permitted by law. Except where the consumer acquires the goods for the purposes of a business, any rights a consumer may have under the Consumer Guarantees Act are not affected. (8) This information is provided without prejudice to Tasman Insulation New Zealand Ltd standard terms and conditions of sale.

Please consider the environment before printing this document

For further information visit www.pinkbatts.co.nz or call 0800 PINK BATTs (746 522)

PRODUCT DATA SHEET

1001 rev C
Apr 09
Page 6 of 6



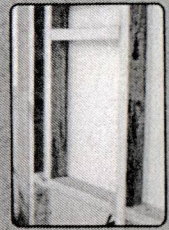
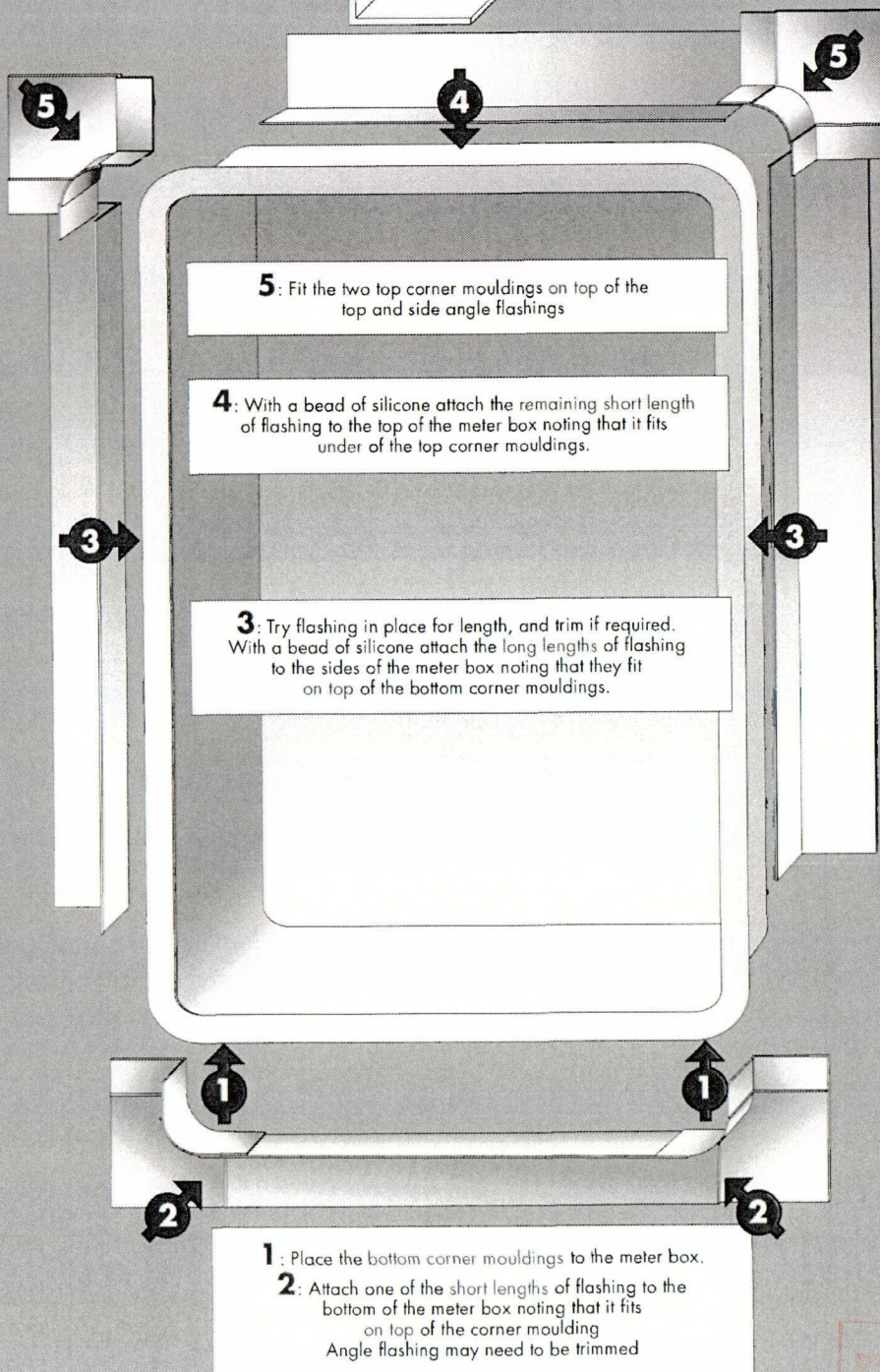
GrantLine

METER BOX INSTALLATION GUIDE

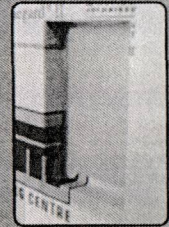
Note: Angle Flashing Strips may need to be trimmed for length

Seal the narrow face of the Angle Flashing Strips to the meter box with a bead of silicone

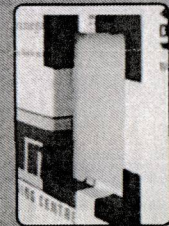
Fix the wide face of the angle Flashing Strips to the framing



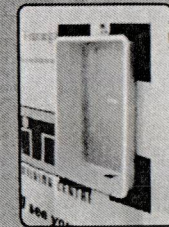
FRAME TO FIT METER BOX



APPLY WEATHER PROOFING



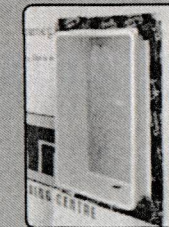
SEAL CORNERS



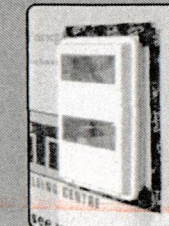
FIX METER BOX IN PLACE



FIX FLASHING



SEAL FLASHING



READY FOR WIRING

FILE COPY 121562

[\(/home\)](#)[OUR NETWORK \(/OUR- NZ'S FIBRE FUTURE \(/NZS-
FIBRE-FUTURE\)](#)[INVESTOR CENTRE
\(/INVESTOR-CENTRE\)](#)[ABOUT US
\(/ABOUT-US\)](#)[SEARCH
\(/SEARCH\)](#)[LOGIN
\(HTTP://CUSTOMER.CHK\)](#)

Homepage (/home) > NZ's Fibre Future (/nzs-fibre-future) > Fibre Subdivisions (/fibre-ready-subdivisions)

**NZ'S FIBRE FUTURE (/NZS-
FIBRE-FUTURE)**[Ultra-Fast Broadband
\(/ultrafast-broadband\)](#)[Rollout and Network Services
Map \(/fibre-rollout-map\)](#)[UFB in your neighbourhood
\(/in_your_neighbourhood\)](#)[Rural Broadband Initiative
\(/rural-broadband-initiative\)](#)[Broadband \(/broadband\)](#)[Fibre Subdivisions \(/fibre-ready-
subdivisions\)](#)[Wiring for fibre \(/wiring-for-
fibre\)](#)

Fibre Subdivisions

As part of our fibre rollout programme we are installing fibre in many new subdivisions around New Zealand. Check the list to see if your new home is in a fibre ready subdivision.

You may not have to wait for UFB to rollout in your area to experience the benefits of telecommunications over fibre. If you have purchased a section and are building a new home in a fibre ready subdivision you can have fibre now.

If you are building a new home make sure you use Cat5 cabling or better to ensure you can optimise broadband speeds. We have developed information for homeowners and installers. Find out more about [wiring for fibre \(/wiring-for-fibre\)](#).

If you are building in a fibre ready subdivision you should [contact WorldxChange \(http://www.xnet.co.nz/about-us/contact/\)](#) or call 0800 123 456 to discuss your telecommunications requirements.



We have included a list of fibre ready subdivisions. This list may not be complete as developers are signing up for fibre in new subdivisions regularly. We do our best to ensure these are added to the list but to be safe ask the developer or the person you are purchasing the section from if your subdivision is fibre ready.

If you are a developer and would like to enquire about fibre in your next development contact Chorus' subdivision group on 0800 SUB DVN (0800 782 386) or email us (<mailto:tsg@chorus.co.nz>).

Fibre-Ready Subdivisions

Location	Subdivision Name or address
North Auckland	
Red Beach	Millwater (http://www.woods.co.nz)
Hibiscus Coast	Kensington Park (http://www.kensingtonpark.co.nz)
Auckland	
Mt Wellington	Stonefields (http://www.stonefields.co.nz)
Waitakere City	Ranui
Takanini	Addison (http://www.addison.co.nz)
Takanini	87-123 Airfield Road
Karaka	Karaka Lakes (http://www.karaka-lakes.co.nz)
Flatbush	Brooklands
Waikato	
Matamata	Evergreen Estate
Tauranga	
Papamoa	Generation Homes (http://www.generation.co.nz)
Poverty Bay	
Gisborne	Wheatstone
Hawkes Bay	
Napier	Parklands Residential Estate
Havelock North	Brookvale
Wellington	

Wiring for fibre

Are you building a fibre subdivision?

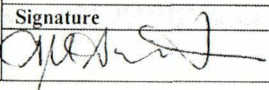
[Find out more](#)[\(/wiring\)](#)

Play it Safe

0800 B4U DIG

Protect the network:

[Find out more](#)[\(/safer_digging\)](#)

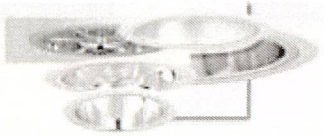
SDoC identification Number¹ - HLL SDOC V4 01032012		
Issuer details		
Name ² (of New Zealand manufacturer or importer)		Contact Address
Home Lighting Limited		180A Station Road Penrose
New Zealand Company Number (if applicable)		PO Box 112 077
3684557		Penrose
		Auckland 1642
Telephone	Fax	Email address
09 525 8052	09 525 8047	ama@homedownlights.co.nz
Medium Risk Article – Details ³ (Product name, type, rating, brand, model, batch numbers, and serial numbers, as applicable)		
HD / 60, 109, 110, 114, 122, 132, 182, 301		
AMENDMENT A (NZ ONLY) TO AS/NZS 60598/2.2 CA80, CA135		
AND IC CLASSIFICATION		
The medium risk article listed above, fully complies with the standard(s), as listed:-		
Standard number & issue year:- AS/NZS 60598.1:2003 AS/NZS 60598.2.2:2001 (AMENDMENT A 2011)		
Standard Title:- LUMINAIRES – GENERAL REQUIREMENTS & TESTS 2003 AND PARTICULAR REQUIREMENTS FOR RECESSED DOWNLIGHTS 2001 INCLUDING AMENDMENT A 2011		
Edition / Amendment status:- EDITIONS 1:2003, 2.2:2001 AND AMENDMENT A 2011		
Or complies with the Conformity Cooperation Agreement - Yes		
Names and addresses of any testing organisation or body		
Name(s)	Address(es)	
WAKEFIELD LABORATORIES	PO BOX 300330 ALBANY 0752	
PARKSIDE LABORATORIES	PO BOX 9194 CHRISTCHURCH	
SPECTRUM LABORATORIES	PO BOX 303042 NORTH HARBOUR POSTAL CTR	
Reference to relevant test reports/certification, and issue date of the reports/certification, that show how compliance is achieved:-		
Report/Certification N°(s)	Issue date(s)	
SPECTRUM LAB: REPORT #5343	29/02/2012	
T216 ZA5 TEST HD109TC	31/01/2012	
T204 ZA5 TEST HD60 TC	17/01/2012	
VDE CERTIFICATE: # 400 211 03	21/11/2011	
VDE CERTIFICATE: # 201 4531 03	23/04/2009	
SPECTRUM LAB: REPORT # 3176A	11/11/2004	
PARKSIDE LAB: REPORT # 4299	20/07/1998	
PARKSIDE LAB: REPORT # 3279	21/12/1995	
WAKEFIELD LAB: REPORT # 10951F	27/11/1995	
Reference to any management systems involved:-		
Declaration		
I hereby declare that the above specified fittings or electrical appliances comply with the requirements of Regulation 83 of the Electricity (Safety) Regulations 2010		Signed for and on behalf of: HOME LIGHTING LIMITED
		Name ⁴ & position, as authorized by the issuer ANN-MARIE AUSTIN GENERAL MANAGER
Issuer Identification: (as affixed to the article)		Signature Date
HD/ 60 109 110 114 122 132 182 301		 01.03.2012

¹ Every declaration of conformity should be uniquely identified.

² The responsible issuer must be unequivocally specified.

³ The "Article" must be unequivocally described so that the declaration of conformity may be related to the article in question. For mass-produced products, it is not necessary to give individual serial numbers. Where variants of an article are to be covered, these must be detailed.

⁴ Full name and function of the signing person(s) authorised by the issuer's management to sign on its behalf should be given. The number of signatures, or equivalent, included will be the minimum determined by the legal form of the issuer's organization.



DOT DOWNLIGHTS

[Home](#) [Product Selector](#) [Distributors](#) [DOT Update](#) [Profile](#) [Installation](#) [Warranty](#) [Contact](#)

Search

DOT 109



OPTIONS

ACCESSORIES



/55 Silver Painted Ceiling Bezel



A3 Halo Glass

NB: White Ceiling Bezel fitted as standard



CEL-I SPIRAL T2 / 12W
GLS / 100W
HAPAR25 / 75W

Available with Thermal Cut-off control on request
Bayonet Cap (BC) lampholder available on request
White Ceiling Bezel - paintable

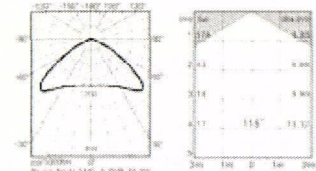
NZCEP54 - Classification: **CA (GLS)**

IP 20

Lampholder: Ceramic E27 (edison screw)

Weight: 382gms

DOT 109 - 100W GLS



Beam Angle	Beam Index	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	100°	110°	120°	130°	140°	150°	160°	170°	180°
10°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
15°	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
20°	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
25°	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
30°	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
35°	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
40°	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
45°	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
50°	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
55°	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
60°	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
65°	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
70°	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
75°	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
80°	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
85°	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
90°	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
95°	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
100°	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
110°	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
120°	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
130°	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
140°	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
150°	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
160°	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
170°	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
180°	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0



100mm dia.
hole cut out



120mm dia.
bezel

Contact a distributor now to discuss your lighting needs.



[Home](#) [Product Selector](#) [Distributors](#) [DOT Update](#) [Profile](#) [Installation](#) [Warranty](#) [Contact](#)

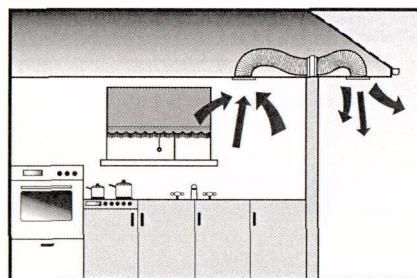
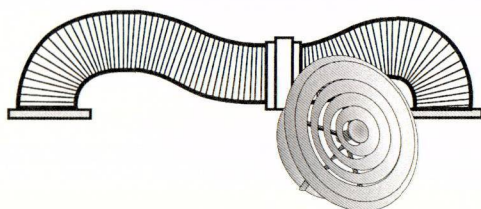
Copyright © 2004 - 2007 DOT Downlights. All rights reserved.
The DOT range of downlights is protected by international patents and intellectual property rights.
Web by: [IPNetGroup](#)

**PDL**

NEW PRODUCT DATA AND APPLICATION SHEET

CATALOGUE #	DESCRIPTION	BARCODE #
6401	4" In-line Exhaust Fan	9416175168789
6501	5" In-line Exhaust Fan	9416175168796
6601	6" In-line Exhaust Fan	9416175168802

DESCRIPTION In-line Exhaust Fans



BOX QUANTITY 1

OUTER QUANTITY 4

FEATURES

4", 5" and 6" models available.
Stylish round grilles.
Easy to install, clean, and maintain.
Air movement ranges between 85m³ (4"), and 230m³ (6").
Round grille does not need to be oriented.
Round grille is designed for mounting with clamps for fast, easy installation. Using clamps prevents cracking of ceiling materials around screw holes.
Screw fixing option available.
Quiet operation.
Motor contains a safety thermal fuse.
Heavy duty, light weight, flexible PVC ducting.
Conform to AS/NZS3350.
230-240V a.c. 50hz.
IP rating: IPX2. Max running temperature: 40 deg C.
Timer units, available as a separate accessory – allows fans to be used efficiently and economically.



PDL

NEW PRODUCT DATA AND APPLICATION SHEET

SPECIFICATIONS

Conform to AS/NZS3350.
230-240V a.c. 50hz.
IP rating: IPX2.
Max running temperature: 40 deg C.

APPLICATIONS

Ideal air movement fans for bathrooms, kitchens, laundries, toilets, living areas, bedrooms, and garages/workshops. Designed to create healthy living environments through the controlled replacement of air.

COMMENTS

In-line fans can be used in-conjunction with the appropriate sized accessory kit. These kits enable the in-line fans to be ducted externally – through the wall – where the roof or soffit area does not allow for this.

The in-line fan timer (cat 6312) is easily mounted into the foot of the fan motor and allows for efficient running of the in-line fans.

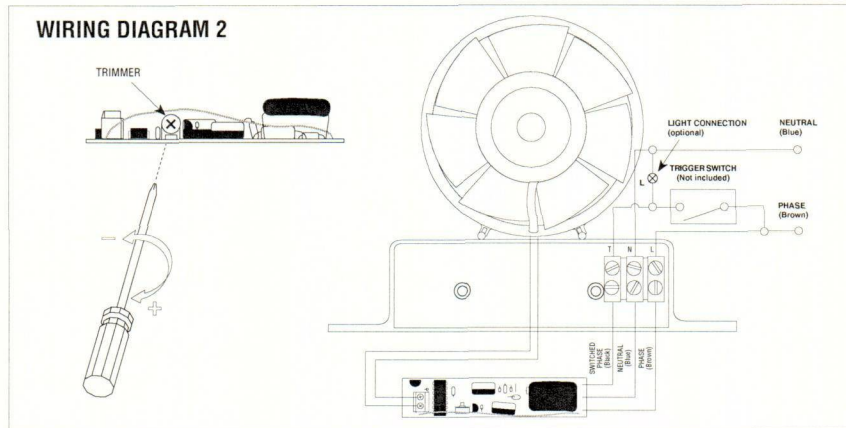
FAQs

Ducting supplied: 6401: 3M, 6501: 4M. 6601: 6M.

FITTING AND WIRING PDL 6312 TIMER ACCESSORY (Not included)

1. Remove the cover on the fan motor unit bracket.
2. Remove 2 motor wires from terminal block and re-connect to electronic board as shown in Wiring Diagram 2.
3. Connect the remaining electronic board and mains supply wires to terminal block and trigger switch as shown in Wiring Diagram 2. Ensure mains supply cable is fixed with the cable fastener.
4. Position electronic board into the motor unit bracket slots.
5. The timer can be pre-set from 3 to 20 minutes by adjusting the trimmer (**only adjust with all supply circuits switched off**).
6. Replace the cover on the fan motor unit bracket.

NOTE: The fan will automatically start up 20 seconds after light or trigger switch is on and will continue to operate for the time pre-set after the light or trigger switch is turned off. (Max. load of timer is 150W).



PDL EXHAUST FAN RANGE

IN-LINE EXHAUST FANS

- 6401 4" IN-LINE EXHAUST FAN
- 6501 5" IN-LINE EXHAUST FAN
- 6601 6" IN-LINE EXHAUST FAN

WALL/CEILING EXHAUST FANS

- 6402 4" WALL/CEILING EXHAUST FAN
- 6502 5" WALL/CEILING EXHAUST FAN
- 6602 6" WALL/CEILING EXHAUST FAN

ACCESSORIES (not included)

6412 4" THROUGH WALL KIT

– Includes: Square grille surround, Angled fixed grille, Gravity Louvres, Aluminium Ducting (115mm compacted, 320mm extended).

6512 5" THROUGH WALL KIT

– Includes: Square grille surround, Angled fixed grille, Gravity Louvres, Aluminium Ducting (115mm compacted, 320mm extended).

6612 6" THROUGH WALL KIT

– Includes: Square grille surround, Angled fixed grille, Gravity Louvres, Aluminium Ducting (115mm compacted, 320mm extended).

6312 ELECTRONIC TIMER (FOR IN-LINE EXHAUST FANS ONLY)

– Adjustable time : 3 to 20 minutes, Max Load : 150W

6322 ELECTRONIC TIMER (FOR WALL/CEILING EXHAUST FANS ONLY)

– Adjustable time : 3 to 20 minutes, Max Load : 150W

SPARES

GRILLES

- 6401G 4" IN-LINE ROUND GRILLE
- 6501G 5" IN-LINE ROUND GRILLE
- 6601G 6" IN-LINE ROUND GRILLE

DUCTING

- 6401D 4" IN-LINE DUCTING 3m
- 6501D 5" IN-LINE DUCTING 4m
- 6601D 6" IN-LINE DUCTING 6m

MOTORS

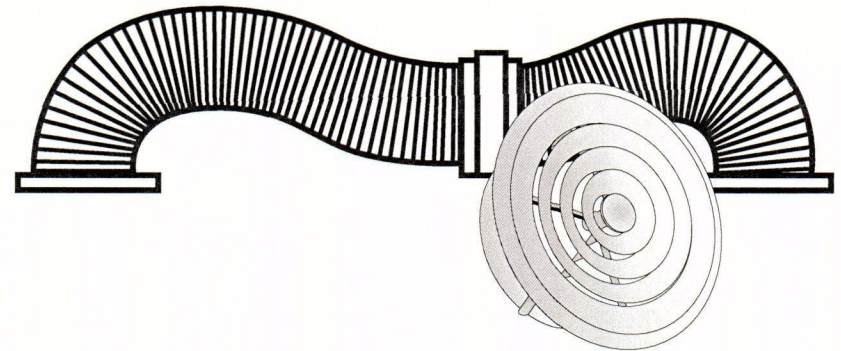
- 6401M 4" IN-LINE MOTOR
- 6501M 5" IN-LINE MOTOR
- 6601M 6" IN-LINE MOTOR



IN-LINE EXHAUST FANS

Models 6401, 6501, 6601

OPERATING INSTRUCTIONS



GENERAL INFORMATION

- Precautions must be taken to avoid the back-flow of gases into the room from the open flue of gas or other open-fire appliances.
- This fan should not be used for the extraction of combustible gases or vapour.
- WARNING:** Before obtaining access to terminals, **all** supply circuits must be disconnected.
- The appliance is not intended for use by young or infirm persons without supervision.
- Young children should be supervised to ensure that they do not play with the appliance.
- Ensure that a suitable disconnection switch is installed in the fixed wiring, in accordance with the local wiring rules and regulations.
- Do not install within 120cm of a stove.**

SPECIFICATIONS

	MODEL		
	6401	6501	6601
Ducting Diameter(mm/inches)	100/4"	120/5"	150/6"
Duty At Free Discharge (m ³ /h)	85	130	230
Nominal Air Flow Pressure (mmH2O)	0.65	0.30	0.80
Voltage	230-240 Volts	230-240 Volts	230-240 Volts
Frequency	50Hz	50Hz	50Hz
Wattage	11	15	29
Sound Pressure Level At 1.5m db (A)	44	46	50
Insulation Class	II	II	II
Protection	IPX2	IPX2	IPX2
Max Running Temperature	40°C	40°C	40°C

INSTALLATION INSTRUCTIONS

INSTALLATION (NB: the fan motor unit must only be mounted indoors)

- Remove all parts from packaging.
- Determine and locate positions to place the inlet grille (indoor ceiling), outlet grille (outdoor soffit) and motor unit (joist inside the ceiling). Ensure the grille areas are free from obstruction and between 2 studs or joists. NB: The shortest possible distance between the grilles is recommended for optimum performance.
- Inside the roof ceiling, mount the motor unit to a joist using screws provided, ensuring it is held firmly to reduce vibrations. **Ensure the airflow direction label is pointing towards the outlet grille.**
- To ensure ducting will be fully retained, stick one piece of foam tape around both circumferences of the duct at each end of motor unit (see Figure 1).
- Drill two small witness holes to mark each position in ceiling and outdoor soffit (for inlet and outlet grilles).
- Attach flexible ducting to inlet side of motor unit duct (completely over foam tape). Secure with one of the straps provided.
- Stretch out a good, adequate length of the flexible ducting to reach the marked inlet grille hole position and cut. **Ensure there is adequate length of flexible ducting to reach both grilles prior to cutting.**
- Attach remaining flexible ducting to outlet side of motor unit duct (completely over foam tape). Secure with one of the straps provided.
- Stretch out the flexible ducting to reach near the marked outlet grille hole position and cut.
- From the inside, locate marked hole position in ceiling for the inlet grille to be fitted and cut hole:

Model	Cut hole diameter	Alternatively, use this card as a template for marking appropriate hole size.
6401	119mm	
6501	144mm	
6601	169mm	

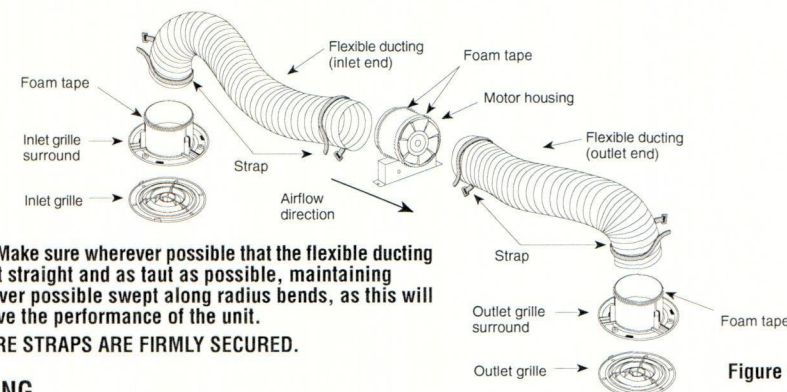
TEMPLATE

119mm 144mm 169mm (DIA. HOLES)

CENTRE POINT

6401 6501 6601

- To ensure ducting will be fully retained, stick one piece of foam tape around the circumference of the duct at the end of the inlet grille surround (see Figure 1).
- Reach into inlet ceiling hole and pull flexible ducting through. Attach flexible ducting to inlet grille surround duct (completely over foam tape). Secure with one of the straps provided.
- Carefully un-clip centre grille from the grille surround. Insert the inlet grille surround into the ceiling hole.
- Secure the grille surround by turning the 3 clamp screws clockwise until the surround is flush against the surface. Do not over-tighten the screws.
- Clip centre grille back into the inlet grille surround.
- Repeat steps 10 to 15 for mounting the outlet grille to the outdoor soffit.



Note: Make sure wherever possible that the flexible ducting is kept straight and as taut as possible, maintaining wherever possible swept along radius bends, as this will improve the performance of the unit.

ENSURE STRAPS ARE FIRMLY SECURED.

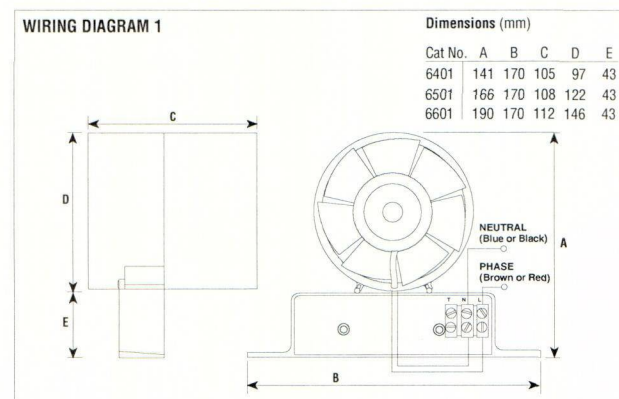
WIRING

Note: All wiring must be securely fixed and the supply cable must be a minimum of 1mm² in section and maximum cable outside diameter is to be 7mm. All wiring must comply with the current regulations.

IMPORTANT: Switch off mains supply before making any electrical connections.

STANDARD MODELS (Wiring Diagram 1)

- Remove the cover on the fan motor unit bracket.
- Check that the wiring from the motor is held firmly in the terminal block.
- Connect the mains supply as shown in Wiring Diagram 1, ensuring mains supply cable is fixed with cable fastener.
- Replace the cover on the fan motor unit bracket.





Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE

UNIVERSAL FLOORING & PREMIUM VINYL ADHESIVE

Issue 3 (29.03.05)

- Universal Soft Floor Covering Adhesive
- Low Odour & Solvent Free Water Based
- Direct Stick & Double Bond Installations
- Flexible
- Highly Resistant to Plasticizer Migration
- High Early Bond Strength
- Conforms to AS3553 - Adhesives for Flooring"

DESCRIPTION

Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE is a water based trowelable adhesive for bonding most types of soft floor coverings - vinyls and carpets.

Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE is formulated on special polymer emulsions and tackifiers which enables the widest options in usage, and one way wet or one way dry bonding with strong tack.

Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE is a hard-set adhesive which displays high early bond strength.

Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE is specially formulated to be highly resistant to plasticizer migration from vinyls, and will not show migration staining.

PURPOSE FOR USE

Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE is suitable for adhering commercial and domestic vinyls (sheet, tile or slat form), linoleum, carpets, underlays, PVC backed carpets, needle felts to concrete, cement sheet or wooden subfloors.

LIMITATIONS

Because of the wide range of surfaces and floorings, a test of any new combination should be conducted before using.

Not recommended for:

- Oily timber
- Oil tempered particle board
- External use.

PREPARATION

Ensure the surface is even, clean, dry and free from oil, dust or flaking paint. A very porous or highly absorbent surface (eg. concrete or wood) should be primed first with Giltgrip WB FLOORING PRIMER.

Ensure concrete subfloors are free from hydrostatic pressure, and test moisture content prior to priming or laying floor covering.

Refer to AS/NZS 2455.1:1995 Part 1 and AS 1884-1985 for installation practice and maintenance.

APPLICATION & COVERAGE RATE

Do not apply adhesive if temperature is below 10°C.

Spread UNIVERSAL PREMIUM VINYL ADHESIVE evenly with a V notch trowel.

Smooth backed Vinyls:

Trowel: 1.6 mm V-notch (coverage approx. 5 m²/L)

Ideal Open time: 10 minutes at 20°C

Hot Press Tiles

Please read in conjunction with "Guidelines for the use of Bostik Flooring Adhesives when bonding PVC & Hot Press Tiles –

Issued February 2004 or later". Confirm with your tile supplier that the Hot Press Tile that you have selected has a vinyl backing layer and is suitable for bonding with an acrylic, water based adhesive system..

Trowel: 1.6 mm V-notch (coverage approx. 5 m²/L)

Ideal Open time: 10 minutes at 20°C

Note: Windows which allow access of direct sunlight should be masked off using masking tape and paper.

Textured backed Vinyls & PVC backed carpets:

Trowel: 2.4 mm V notch (coverage approx 3m²/L).

Ideal Open time: 15 minutes at 20°C

For non-absorbent subfloors the open time may be extended to allow a more aggressive instant bond to be made.

Note: If the vinyl is light weight and has a tendency to telegraph trowel marks, then the floor covering should be laid while the adhesive is wet, or a smooth square faced trowel can be used with attention to the quantity applied.

All seams should be sealed with a vinyl seam sealer or welded using a hot air welding tool.

Carpets & Underlays (Direct Stick or Double Bond):

Trowel: 2.4 mm V-notch (coverage approx. 3 m²/L)

Ideal Open time: 20 minutes at 20°C

For a more aggressive instant bond the open time should be extended to when the adhesive has tacked up. This can be assessed by lightly pressing your finger onto the surface of the adhesive then pulling away - tack up is observed when the adhesive appears stringy / leggy.

Ensure adhesive transfer occurs into the carpet backing.

Note: Open time is influenced by substrate porosity and atmospheric conditions (i.e. Temperature, humidity, and air movement).

Roll the installation using a 25 - 35 kg roller in both directions immediately after laying. Then re-roll after 20 minutes.

Avoid heavy traffic for 24 hours after installation.

For vinyl installations refer to AS1884-1985 Floor Coverings".

Resilient Sheet and Tiles - Laying and Maintenance Practices for further preparation and laying details.

For carpet installations refer to AS/NZS2455.1-1995 Textile Floor Coverings - Installation Practices for further preparation and laying details.

TYPICAL TECHNICAL DATA

Base:	Acrylic
Colour:	Off white
Viscosity:	Thick paste
Solids:	71 %

PACKAGING

Available in 20L pails

FILE COPY 121562

CLEAN UP

Tools should be washed with water whilst adhesive is still wet.

SAFETY PRECAUTIONS

Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE is not dangerous to health or flammable. A Material Safety Data Sheet is available on request.

STORAGE & SHELF LIFE

Do not allow to freeze, store out of direct sunlight, keep in original containers tightly closed when not in use.

Shelf life: minimum 12 months from date of manufacture if stored under cover between 5°C and 30°C.

Bostik Technical Services are available to pre-test any samples of substrate where the specifier / applicator may believe doubts on application suitability exists.

The tests will aid in determining the proper surface preparation method. Following this procedure will remove many of the unknown variables that affect field success. Please contact your Gilt Edge Industries for further details.

WARRANTY

Your purchase of this product is subject to Bostik's standard terms and conditions of sale. The representation and recommendations regarding the products are based on tests which we believe to be reliable. However, no guarantee of their accuracy can be made because of the great range of field conditions and variations encountered in raw materials, manufacturing equipment and methods. Thus, the products are sold with a limited warranty only, and on the condition that purchasers will make their own tests to determine the suitability of the product for their particular purposes. Under no circumstances will Bostik be liable to anyone except for replacement of the products or refund of the purchase price.

All other warranties whether express or implied, including without limitation, any warranty of merchantability of fitness of purpose are expressly disclaimed unless prohibited by law or given in writing by Bostik for a specific project.

ALL SALES ARE EXPRESSLY LIMITED TO THE TERMS AND CONDITIONS OF SALE OF BOSTIK NZ LIMITED

Distributed by Gilt Edge Industries Limited

Auckland
Wellington

Phone 09 443 7067
Phone 04 569 7067

Christchurch Phone 03 379 7067
Dunedin Phone 03 455 7067



Giltgrip WB FLOORING PRIMER

ISSUE 2 (08.11.04)

- Water Based / Low Odour
- Improves Adhesion to Porous Surfaces
- Stops Excessive Adhesive Penetration
- Very Low Foaming

DESCRIPTION

Giltgrip WB FLOORING PRIMER is a water-based primer for porous surfaces. It is designed especially to complement the Bostik Findley range of water based flooring adhesives.

PURPOSE FOR USE

Giltgrip WB FLOORING PRIMER is used to prime concrete, plasterboard, cement sheet, wood and other porous or highly absorbent surfaces prior to application of adhesive.

LIMITATIONS

Because of the wide range of surfaces and floorings, a test of any new combination should be conducted before using.

Not recommended for:

- Oily timber
- Oil tempered particle board
- External use.

SUBSTRATE PREPARATION

• CONCRETE BASE

Ensure that the substrate is clean, dry and structurally sound. Cleaning methods should include, sweeping and vacuuming. A tap test is recommended to help identify any potential drummy spots that may need further preparation on the concrete floor.

Refer to AS/NZS 2455.1.1995 Part 1 and AS 1884-1985 for installation practice and maintenance.

• CONCRETE WATER BEADING TEST

A water beading test should be carried out on all concrete surfaces prior to the installation of Bostik Adhesives, Primers, Moisture Seal or any of the Ultralevel flooring range on the concrete floor. Apply a small amount of water in numerous random positions across the floor. If water beads form in any of these areas this will confirm the presence of a surface coating, sealer or contaminant. If water beading occurs contact Gilt Edge Industries for further specific preparation advice.

• CONCRETE MOISTURE TEST

To help eliminate all the inherent problems that can be associated with concrete moisture content, it is recommended that prior to installations;

- New concrete must be cured for at least 28 days
- A moisture test, as suggested by Australian Standards be carried out on all concrete substrates in accordance with AS1884(1985) & DR99463 Pt 1/2 to determine the concrete moisture content.

CONCRETE LEVELLING

Place a straight edge over the concrete floor to ensure it conforms to AS1884 (1985) & DR99463/64 Pt 1/2 for direct stick overlay floors. If levelling is required only use the Bostik Ultralevel Range of self-levelling cementitious compounds. Refer to the current technical data sheet prior to any installation of these products.

• STRUCTURAL SHEET FLOORING

All structural sheet flooring must be flat sanded. Existing adhesives, oils and penetrating contaminants etc must be removed. Sweep and vacuum the sheet flooring to ensure a dust free area prior to adhesive application.

APPLICATION

Do not apply if below 10°C

Apply Giltgrip WB FLOORING PRIMER evenly by broom, nap roller, brush or spray equipment direct to floor.

Coverage: approximately 10 - 15m²/L

Dry Time: 10-20 minutes, depending on substrate and atmospheric conditions.

Allow to dry completely before applying adhesives.

TYPICAL TECHNICAL DATA

Base:	Acrylic
Colour:	White, dries clear
Viscosity:	Thin liquid
Solids:	20 %

PACKAGING

Available in 20L containers

CLEAN UP

Tools should be washed with water whilst primer is still wet.

SAFETY PRECAUTIONS

Giltgrip WB FLOORING PRIMER is not dangerous to health or flammable. A Material Safety Data Sheet is available on request.

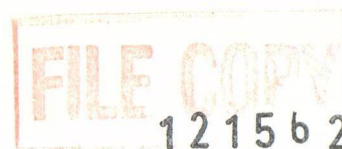
STORAGE & SHELF LIFE

Do not allow to freeze, store out of direct sunlight, keep in original containers tightly closed when not in use.

Shelf life: minimum 12 months from date of manufacture if stored under cover between 5°C and 30°C.

Bostik Technical Services are available to pre-test any samples of substrate where the specifier / applicator may believe doubts on application suitability exists.

The tests will aid in determining the proper surface preparation method. Following this procedure will remove many of the unknown variables that affect field success. Please contact Gilt Edge Industries for further details.



WARRANTY

Your purchase of this product is subject to Bostik's standard terms and conditions of sale. The representation and recommendations regarding the products are based on tests which we believe to be reliable. However, no guarantee of their accuracy can be made because of the great range of field conditions and variations encountered in raw materials, manufacturing equipment and methods. Thus, the products are sold with a limited warranty only, and on the condition that purchasers will make their own tests to determine the suitability of the product for their particular purposes. Under no circumstances will Bostik be liable to anyone except for replacement of the products or refund of the purchase price.

All other warranties whether express or implied, including without limitation, any warranty of merchantability of fitness of purpose are expressly disclaimed unless prohibited by law or given in writing by Bostik for a specific project.

ALL SALES ARE EXPRESSLY LIMITED TO THE TERMS AND CONDITIONS OF SALE OF BOSTIK NZ LIMITED

Distributed by Gilt Edge Industries Limited

Auckland	Phone 09 443 7067	Christchurch	Phone 03 379 7067
Wellington	Phone 04 569 7067	Dunedin	Phone 03 455 7067

Installation Guide



Acclimatisation of material before installation

Remove material from packaging, spread out if possible and allow to condition in room where installation is to take place at a constant temperature of 18°-26° for a period of 24 hours prior to installation. This temperature should be maintained during installation, and for a 24 hour period after installation.

Sub-floors

The substrate should be prepared in accordance with AS1884: 1985.

Surfaces must be:

- Permanently dry
- Smooth
- Level
- Clean
- Of sound construction

ie. The surfaces must be free of dust, oil, grease, polish, loose material or other contaminants.

Concrete Floors

The substrate must be finished using a suitable proprietary form of self-levelling compound.

Highly absorbent surfaces will require a water based primer, such as polymer 6000, to be applied first

A new concrete slab should be finished to a hand-trowel finish and have the necessary absorbency for the adhesive to disperse into the substrate

All concrete bases must be subjected to a moisture test in accordance with Appendix A of the standard.

Timber and Particleboard Floors

Sound timber sub-floors are suitable when covered with flooring grade hardboard underlay in accordance with the Standard. This always includes Structural Particleboard to eliminate later potential movement.

For other underlays which are highly absorbent, such as MDF/ThinLine and Cement Sheet, these will require the use of a primer, such as Polymer 6000, to be applied first.

Existing Floorcoverings

All existing floorcoverings must be removed and the sub-floor made good before laying. Paper felts must not be used.

Adhesives

MEGA-BOND – Karndean Design Floorcovering Adhesive

A high quality water bases co-polymer adhesive formulated to give good initial grab and excellent open time.

Formulated for use with: Knight-Tile, Da Vinci, Renoir, Michelangelo and Van Gogh.

Australian and New Zealand Standard

Install the products in accordance with AS1884: 1985 – Floor Coverings – Resilient Sheet and Tiles – Laying and Maintenance Practice.

Coverage

Mega-Bond will cover approx. 4-5 square metres per litre, depending upon the condition of the prepared substrate and notched spreader.

Laying Procedure Using The Wet 'Bonding' Method

Correct Trowel Size

Ideally use a 1.0mm x 1.0mm "U" notched trowel. As an alternative, you can use a 1.6mm x 1.6mm "V" notched trowel.

Constant monitoring of the condition of the trowel notches is essential. The distance between notches must ensure that sufficient adhesive is spread to ensure 100% of the tile/plank is in contact with the adhesive spread pattern. Worn notches, especially on the larger "V" notched trowel, will cause insufficient adhesive to be applied.

Wet bonding

Stir the adhesive well and keep container closed when not in use.

Lay the tiles/planks onto freshly spread adhesive.

Do not allow for any tack-up time, which ensures best possible bond strength and eliminates the risk of tile/plank "peaking".

Be careful not to squeeze any adhesive up between the tile/planks. I.e. **Drop** tiles/planks carefully into place; **do not** slide them.

Use hand-pressure or a hand-roller across the whole surface.

Do not roll immediately to avoid "oozing".

Roll with a 30-40kg roller as soon as the adhesive is tacky. Repeat rolling after 90 minutes. Heavy traffic and wet cleaning must be deferred for 24 hours.

FILE COPY 1215 b 2

Installation Guide

Laying Procedure Using The Wet 'Bonding' Method (continued)

Tile direction

Lay the tiles following the direction of the surface emboss. There is no pattern match and the tiles should be butted together at random to achieve the most natural effect.

Plank direction

Lay the planks with end-joints completely at random and not closer than one plank width to each end-joint. This will achieve the most natural appearance of a wood strip floor.

Clean up

Floor: Remove wet adhesive with a damp cloth. Remove dry adhesive with Karndean Shield Stripper.

Equipment: Remove wet adhesive with water. Remove dry adhesive with Mineral Turps or Solvent Cleaner.

Floor Surface Finish and Seal

Cleaning and polishing is a recommended option which can be organised through your retailer

Summary

- Lay to AS1884:1985.
- Prime highly absorbent surfaces – ie MDF/Thinline and Cement Sheet.
- Use Hardboard over Structural Particleboard.
- Use a 1.0mm x 1.0mm trowel (minimum) to a 1.6mm x 1.6mm trowel (maximum).
- DO NOT use a trowel that has worn notches.
- Spread adhesive 4 to 5 square metres per litre.
- LAY INTO THE ADHESIVE WET. Do not allow for any tack-up time.
- Drop tiles/planks into place. Don't slide them.
- Hand press (or use a hand-roller) across the whole surface of each tile/plank.
- DO NOT roll immediately with a floor roller.
- Roll with a 30kg to 40kg roller after adhesive has tacked-up to avoid "oozing". Roll again after 90 minutes.
- Remove excessive surface adhesive immediately using a damp cloth.
- Lay TILES directional following the direction of the surface emboss.
- Lay PLANKS at random ensuring end-joints are one plank width apart from each other.
- Finished floor MUST BE stripped and sealed using the Karndean
- Shield Maintenance System

Finishing Schedule

All finishes to comply with NZBC E3 - Internal Moisture

Bathroom & Ensuite

Floor	Substraight Finish	Concrete floor Vinyl -"Knight plank"
Walls	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Lustacryl Semi-Gloss Waterborne Enamel"
Ceiling	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Lustacryl Semi-Gloss Waterborne Enamel"
Doors & Windows		Resene " Lustacryl Semi-Gloss Waterborne Enamel" or Resene " Lusta-Glo Semi-Gloss Enamel"

Separate Wc

Floor	Substraight Finish	Concrete floor Vinyl -"Knight plank"
Walls	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Zylone Low Sheen"
Ceiling	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Ceiling Paint Flat Acrylic"
Doors & Windows		Resene " Lustacryl Semi-Gloss Waterborne Enamel" or Resene " Lusta-Glo Semi-Gloss Enamel"

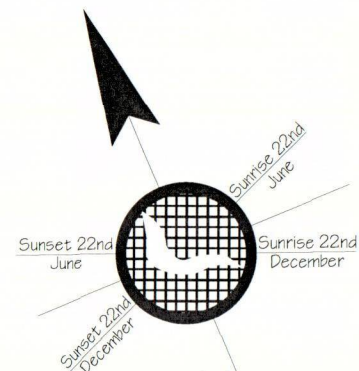
Laundry in Garage

Floor	Substraight Finish	Concrete floor Resene "Aquapoxy for Flooring Waterborne Epoxy"
Walls	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Zylone Low Sheen"
Ceiling	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Ceiling Paint Flat Acrylic"
Doors & Windows		Resene " Lustacryl Semi-Gloss Waterborne Enamel" or Resene " Lusta-Glo Semi-Gloss Enamel"

Kitchen

Floor	Substraight Finish	Concrete floor Vinyl -"Knight plank"
Walls	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Zylone Low Sheen"
Ceiling	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Ceiling Paint Flat Acrylic"
Doors & Windows		Resene " Lustacryl Semi-Gloss Waterborne Enamel" or Resene " Lusta-Glo Semi-Gloss Enamel"

FILE COPY 1215 b 2



SELWYN DISTRICT COUNCIL
SITING APPRC/ED
PROPOSAL ...DOMESTIC DWELLING
DATE 12/9/12 PLANNER FM

NOTE:
-CHECK POSITION OF SEWER & STORMWATER LATERALS ENTERING SITE BEFORE START OF WORK.
-ANTI-SLIP: ON ALL ACCESS ROUTES (BOTH EXTERNAL AND INTERNAL). PROVIDE ANTI-SLIP SURFACES COMPLYING WITH NZBC D1/AS1/TABLE 2 (EXCEPT SURFACES INSIDE ENTRY DOORS OF HOUSING MAY BE CONSIDERED AS DRY AREAS).
-REFER TO LOCATION PLAN - PAGE A1.1 FOR SITE BENCHMARK.

SITE DESCRIPTION	
Zone L 1	
Lot No 54	DP 451072
FLOOR AREA	180.08 sam
SITE AREA	639.86 sqm
SITE COVERAGE	28.14 %
GARAGE AREA	38.51 sam
CORROSION ZONE	ONE
WIND ZONE	HIGH
EARTHQUAKE ZONE	2
SNOW LOAD	0.428kPa

GOLDNEY CLOSE

HORNCastle HOMES LTD.

SITE PLAN
Scale: 1:100

0 10000 mm



DESIGN	M. BOTT	CHECK	N. VEEVERS	DATE	27/8/12	PAGE REVISION DATE	
DRAWN	D. HARRISON	LOT 54-TURNKEY-ROSEMERRYN STAGE 2-J3634.vwx					

A1.0

DRAWING LIST		
Page Number	Page revision date	Drawing Title
SITE		
A1.0		SITE PLAN
A1.1		LANDSCAPE & SITE DETAILS
PLANS		
A2.0		FOUNDATION PLAN
A2.1		SLAB PLAN
A2.2		BRACING PLAN
A2.3		INSULATION & ELECTRICAL PLAN
A2.4		FLOOR PLAN
ELEVATIONS		
A3.0		ELEVATIONS
SECTIONS		
A4.0		SECTIONS A-A, B-B
A4.1		SECTIONS C-C, D-D, E-E
DETAILS		
A5.0		FOUNDATION DETAILS
A5.1		FRAMING DETAILS
A5.2		ROOFING DETAILS
A5.3		PLUMBING DETAILS
A5.4		CLADDING DETAILS
A5.5		CLADDING DETAILS
A5.6		CLADDING DETAILS

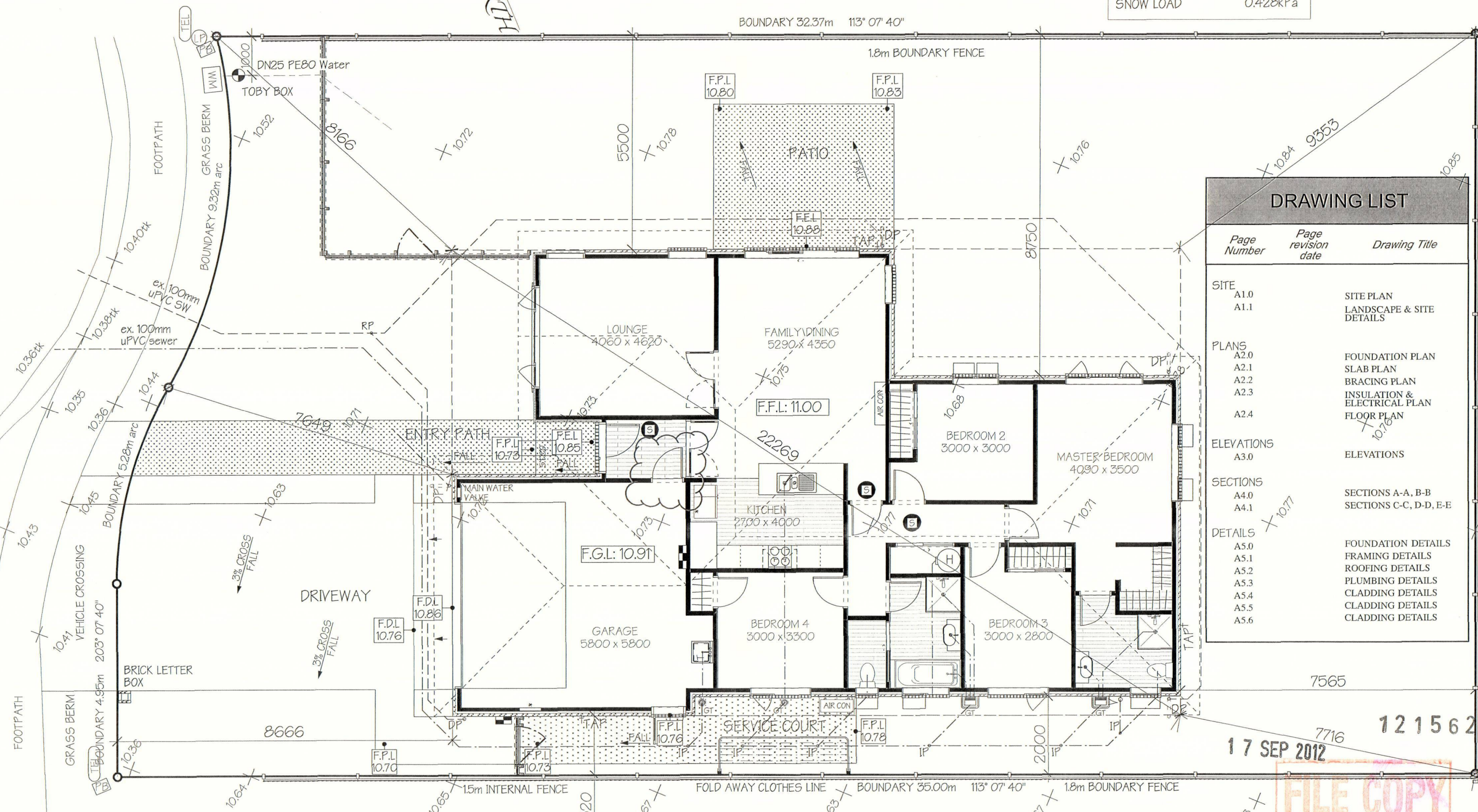
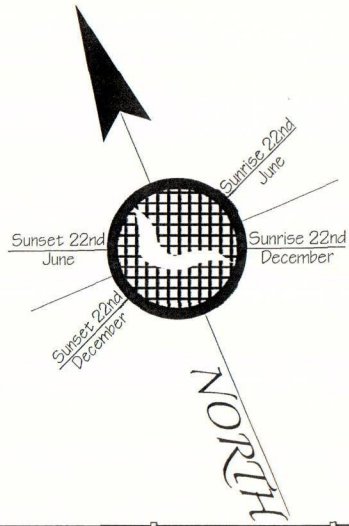
DATE	REMARKS
PROCESSED	
SIXTH APPROPRIATE	
SIXTH DISTRICT OFFICE	

NOTE:
-CHECK POSITION OF SEWER & STORMWATER LATERALS ENTERING SITE BEFORE START OF WORK.
-ANTI-SLIP: ON ALL ACCESS ROUTES (BOTH EXTERNAL AND INTERNAL). PROVIDE ANTI-SLIP SURFACES COMPLYING WITH NZBC D1/AS1/TABLE 2 (EXCEPT SURFACES INSIDE ENTRY DOORS OF HOUSING MAY BE CONSIDERED AS DRY AREAS).
-REFER TO LOCATION PLAN - PAGE A1.1 FOR SITE BENCHMARK.

SITE DESCRIPTION

Zone L 1	
Lot No 54	DP 451072
FLOOR AREA	180.08 sqm
SITE AREA	639.86 sqm
SITE COVERAGE	28.14 %
GARAGE AREA	38.51 sqm
CORROSION ZONE	ONE
WIND ZONE	HIGH
EARTHQUAKE ZONE	2
SNOW LOAD	0.428kPa

GOLDNEY CLOSE

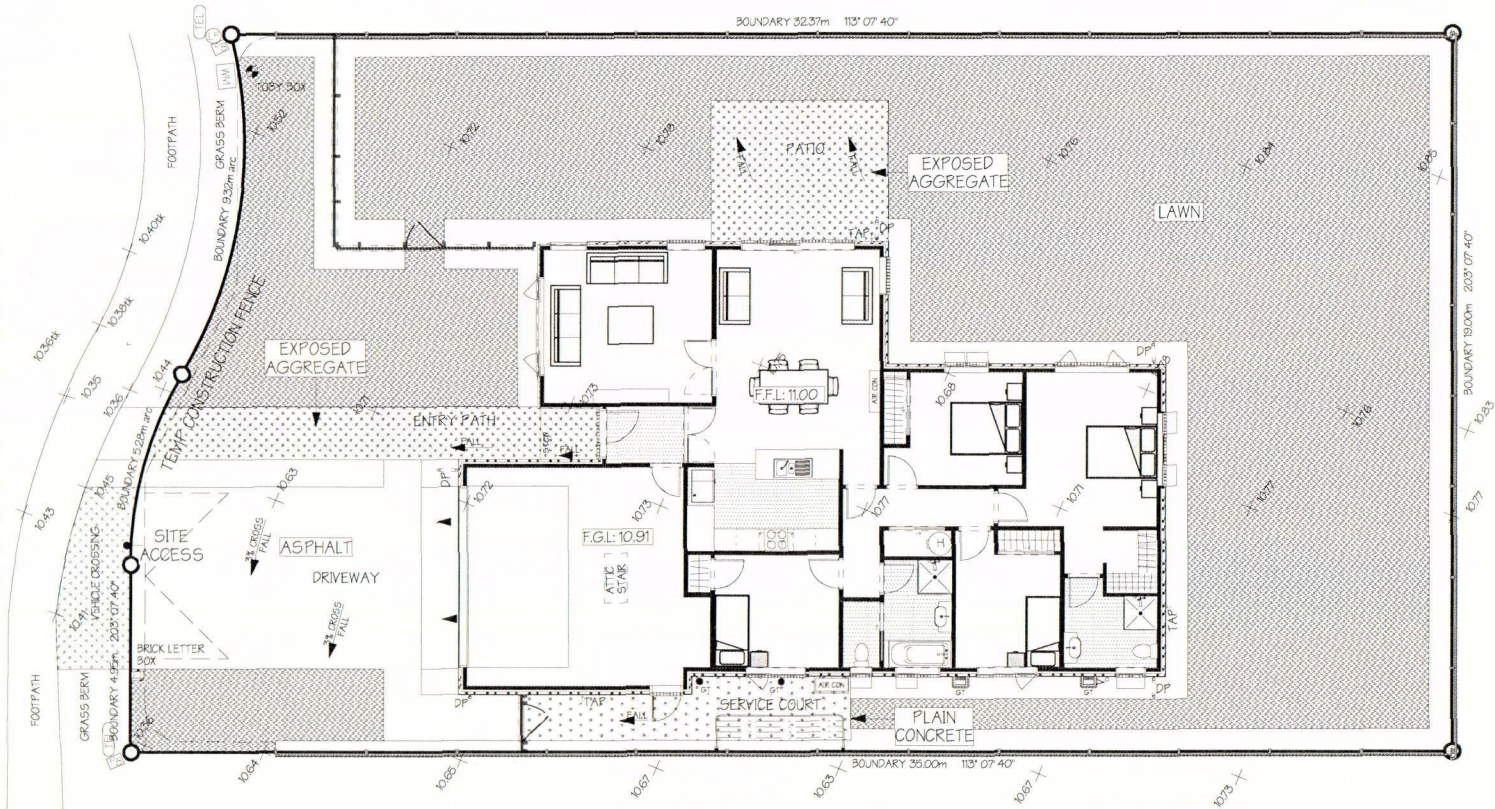


DRAWING LIST		
Page Number	Page revision date	Drawing Title
SITE		
A1.0		SITE PLAN
A1.1		LANDSCAPE & SITE DETAILS
PLANS		
A2.0		FOUNDATION PLAN
A2.1		SLAB PLAN
A2.2		BRACING PLAN
A2.3		INSULATION & ELECTRICAL PLAN
A2.4		FLOOR PLAN
ELEVATIONS		
A3.0		ELEVATIONS
SECTIONS		
A4.0		SECTIONS A-A, B-B
A4.1		SECTIONS C-C, D-D, E-E
DETAILS		
A5.0		FOUNDATION DETAILS
A5.1		FRAMING DETAILS
A5.2		ROOFING DETAILS
A5.3		PLUMBING DETAILS
A5.4		CLADDING DETAILS
A5.5		CLADDING DETAILS
A5.6		CLADDING DETAILS

SURFACE FINISHES & AREAS		
DRIVEWAY	ASPHALT	47.43 sqm
SERVICE COURT	PLAIN CONCRETE	12.59 sqm
ENTRY PATH	EXPOSED AGGREGATE	16.42 sqm
PATIOS	EXPOSED AGGREGATE	17.42 sqm
1.8m STD. FENCE	STAINED, GOLDEN TAN	81.60 m
1.5m MERV. FENCE	PAINTED, COLOUR T.B.C	12.50 m
LAWN		281.62 sqm

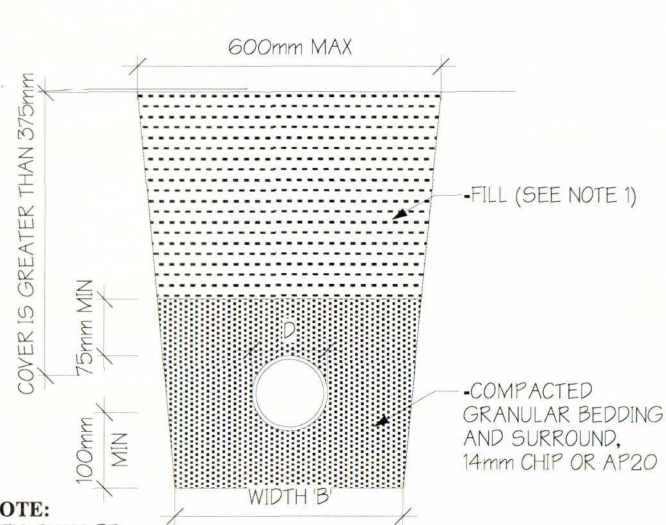
LANDSCAPING NOTES:
-LAWN LAYOUT IS INDICATIVE ONLY (TO BE CONFIRMED BY OWNER ON SITE)
-BASIC SHRUB LAYOUT TO BE CONFIRMED BY OWNER ON SITE

GOLDNEY CLOSE



LANDSCAPE PLAN

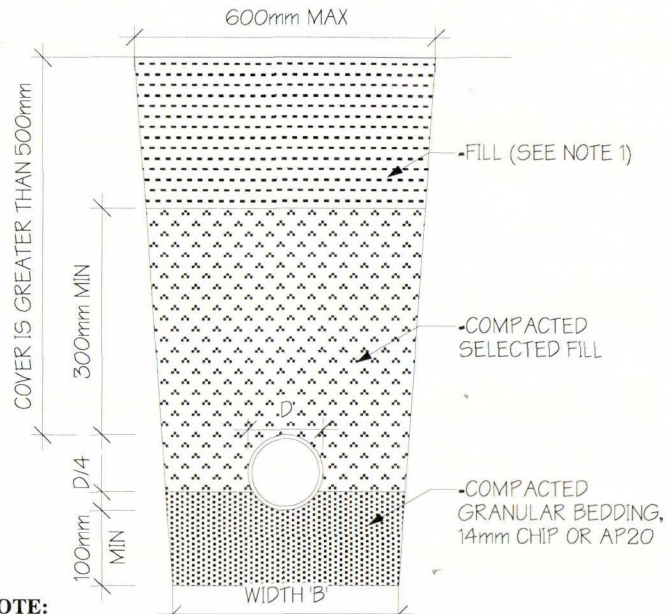
Scale: 1:200



NOTE:
1. FILL SHALL BE:
-ORDINARY WHERE DRAINS ARE LOCATED BELOW GARDENS AND OPEN COUNTRY
-COMPACTED SELECTED FILL WHERE THE DRAINS ARE LOCATED BELOW RESIDENTIAL DRIVEWAYS AND SIMILAR AREAS SUBJECT TO LIGHT TRAFFIC
2. WIDTH 'B' SHALL BE THE PIPE DIAMETER + 200mm

BEDDING & BACKFILLING

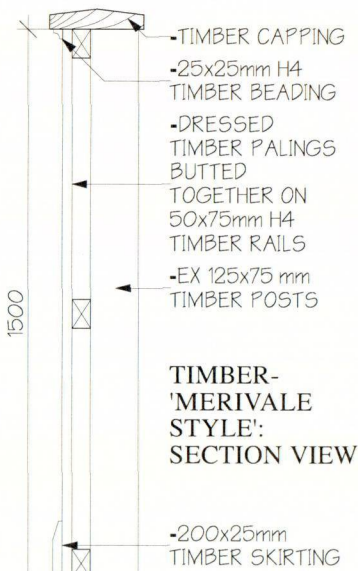
BEDDING TYPE 'D' OF NZS 7643
COVER GREATER THAN 375mm



NOTE:
1. FILL SHALL BE:
-ORDINARY WHERE DRAINS ARE LOCATED BELOW GARDENS AND OPEN COUNTRY
-COMPACTED SELECTED FILL WHERE THE DRAINS ARE LOCATED BELOW RESIDENTIAL DRIVEWAYS AND SIMILAR AREAS SUBJECT TO LIGHT TRAFFIC
2. WIDTH 'B' SHALL BE THE PIPE DIAMETER + 200mm

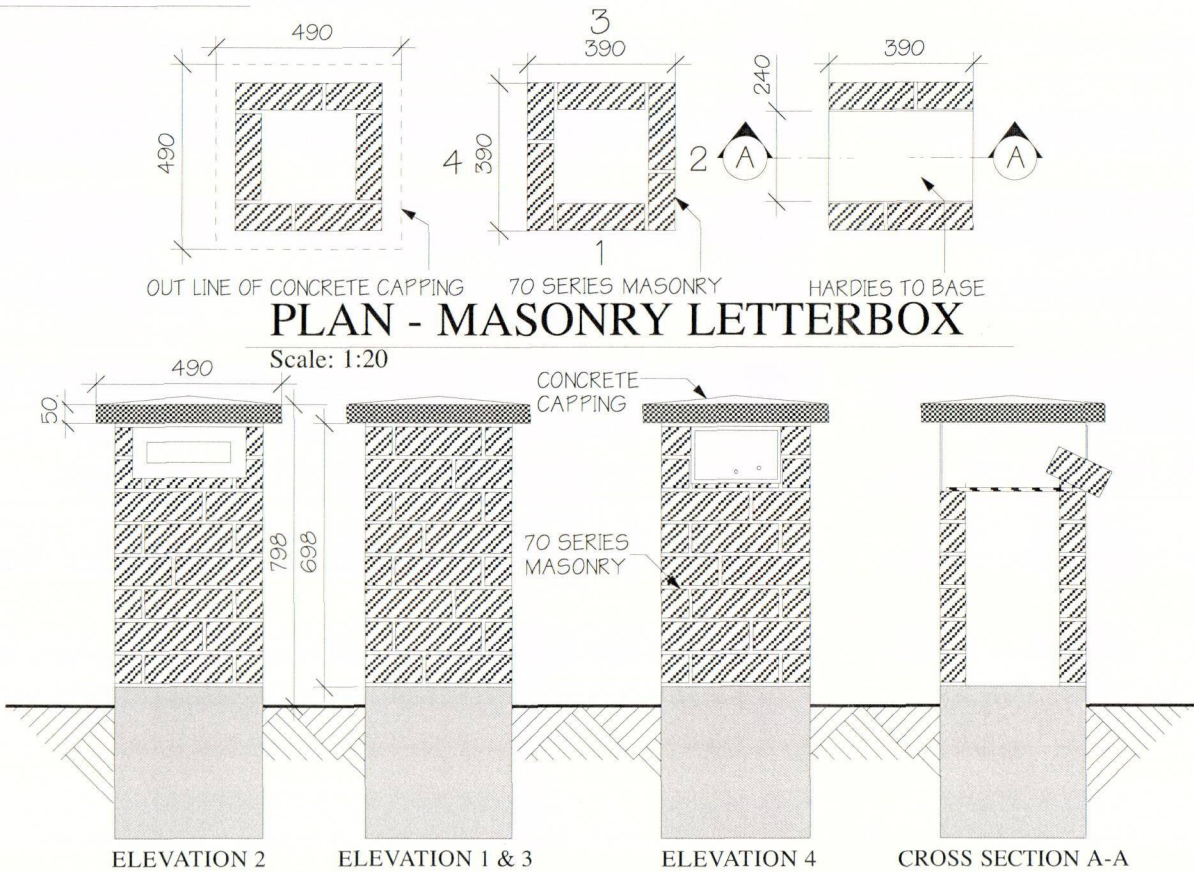
BEDDING & BACKFILLING

BEDDING TYPE 'B' OF NZS 7643
COVER GREATER THAN 500mm



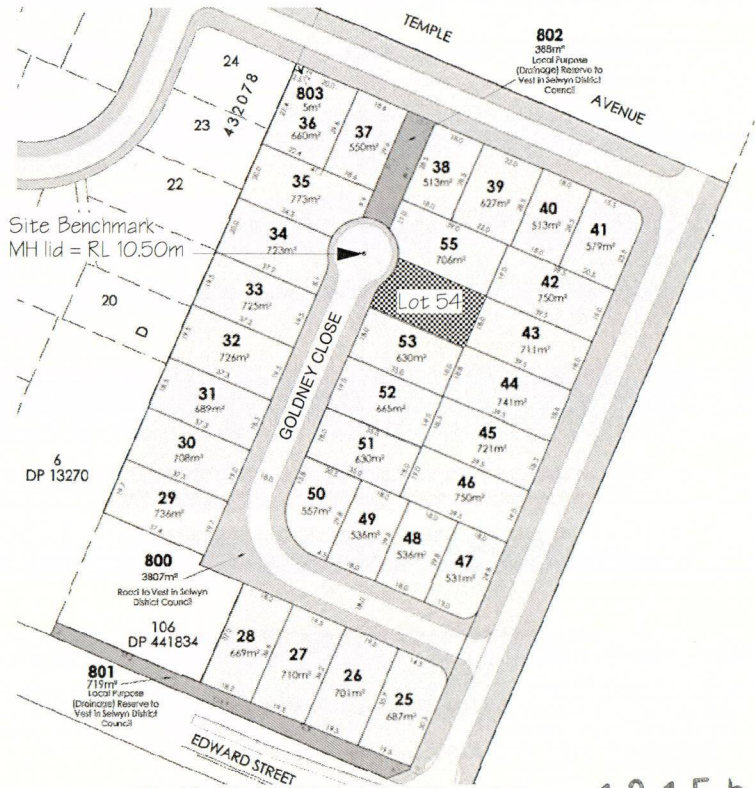
FENCE DETAIL

Scale: 1:20



ELEVATIONS & CROSS SECTION - MASONRY LETTERBOX

Scale: 1:20



LOCATION PLAN NTS 1215 b 2

NOTE:

- NOTE:**
-REFER TO DETAILS FOR PIPE WORK THRU SLAB & THRU FOUNDATIONS.

- 100mm DIA FOUL WATER PIPE FOR ALL TOILETS.

- WHERE DRAINS ARE LAID AT GRADIENTS OF 1:80 OR LESS, VERIFIABLE LEVELLING DEVICES SHALL BE USED TO ENSURE UNIFORM AND ACCURATE GRADIENTS.

- TERMINAL VENT PIPE IS TO BE A MINIMUM DIAMETER OF 80mm IN ACCORDANCE WITH CLAUSE 4.2.1 OF G13/A52.

- WASTE PIPES SHALL BE SUPPORTED IN ACCORDANCE WITH CLAUSE 6.2 AND 6.3 OF G13/AS1.

- BEDDING & BACKFILLING OF DRAINS IS TO FULLY COMPLY WITH FIGURE 7.2 OF G13/AS2.

- READ PLANS IN CONJUNCTION WITH ENGCO CONSULTING: ENGINEERING DRAWINGS S1- S6, 22/08/12 FOR SPECIFIC RIB RAFT LAYOUT AND DETAILS

NOTE:

- LAUNDRY GULLY TRAP TO BE THE OVERFLOW RELIEF GULLY FOR THE SYSTEM AS PER NZBC G13/A52 3.3.2



17 SEP 2012

SEP 2012 FILE COPY

A2.0

Scale: 1:100

FOUNDATION KEY:

- AAV — AIR ADMITTANCE VALVE
- IP — INSPECTION POINT
- RP — RODDING POINT
- 40mm — PIPE SIZE
- @ 1:40 — GRADIENT
- (3.1m) — DEVELOPED LENGTH

NOTE:

- REFER TO DETAILS FOR PIPE WORK THRU SLAB & THRU FOUNDATIONS.
- 100mm DIA FOUL WATER PIPE FOR ALL TOILETS.
- WHERE DRAINS ARE LAID AT GRADIENTS OF 1:80 OR LESS, VERIFIABLE LEVELLING DEVICES SHALL BE USED TO ENSURE UNIFORM AND ACCURATE GRADIENTS.
- TERMINAL VENT PIPE IS TO BE A MINIMUM DIAMETER OF 80mm IN ACCORDANCE WITH CLAUSE 4.2.1 OF G13/AS2.
- WASTE PIPES SHALL BE SUPPORTED IN ACCORDANCE WITH CLAUSE 6.2 AND 6.3 OF G13/AS1.
- BEDDING & BACKFILLING OF DRAINS IS TO FULLY COMPLY WITH FIGURE 7.2 OF G13/AS2.
- READ PLANS IN CONJUNCTION WITH ENGCO CONSULTING: ENGINEERING DRAWINGS S1- S6, 22/08/12 FOR SPECIFIC RIB RAFT LAYOUT AND DETAILS

NOTE:

- LAUNDRY GULLY TRAP TO BE THE OVERFLOW RELIEF GULLY FOR THE SYSTEM AS PER NZBC G13/AS2 3.3.2

SUPERSEDED

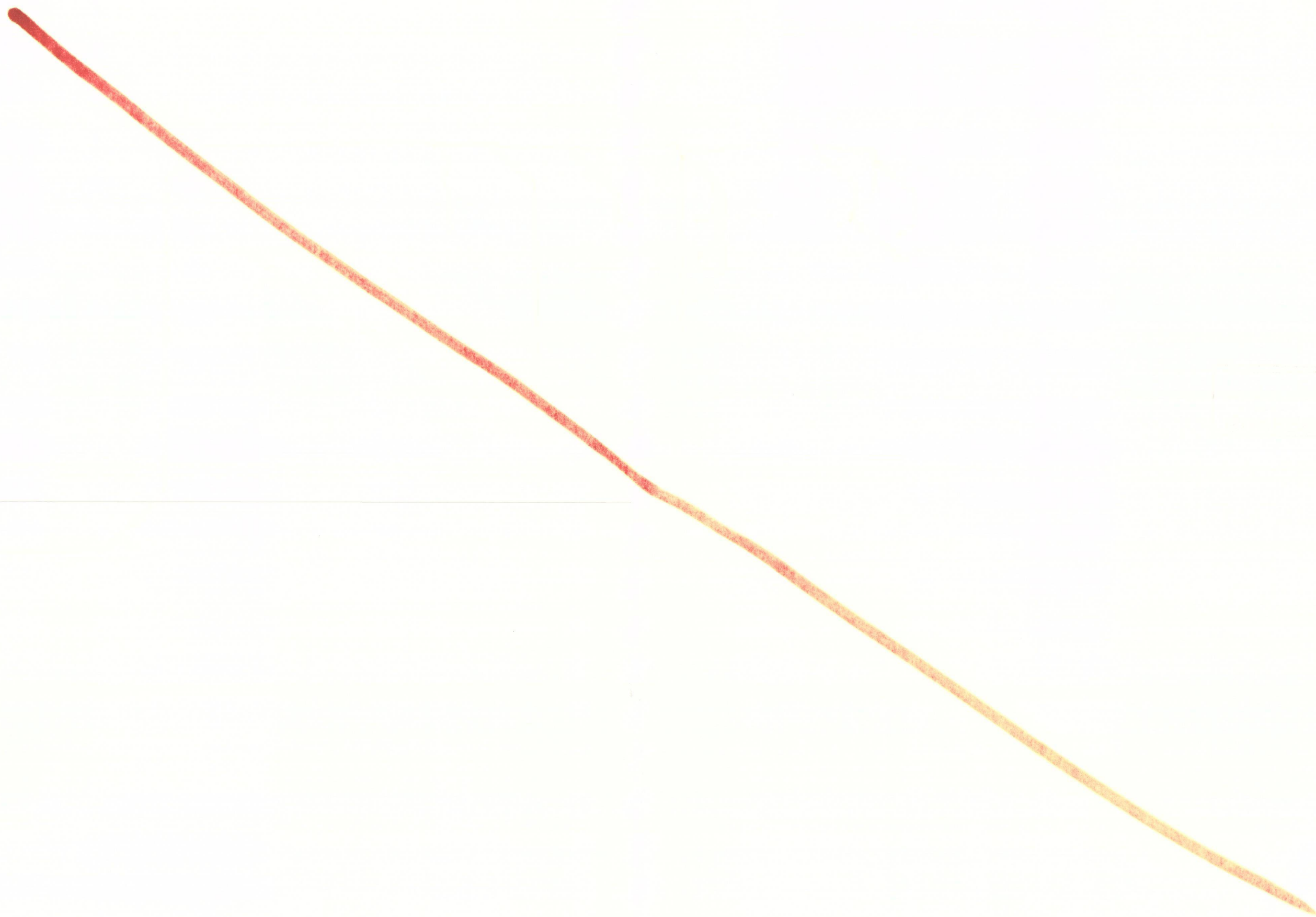
19 SEP 2012

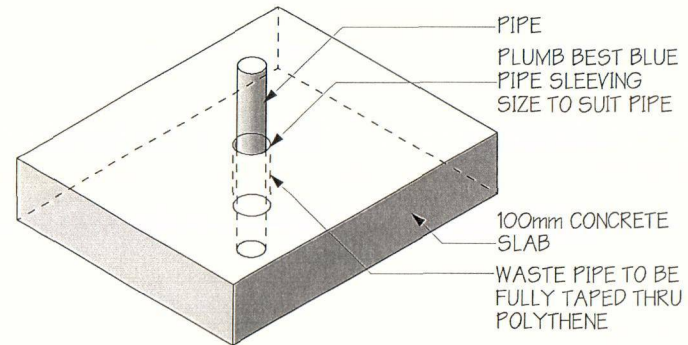
1215 b 2

FILE COPY

FOUNDATION PLAN

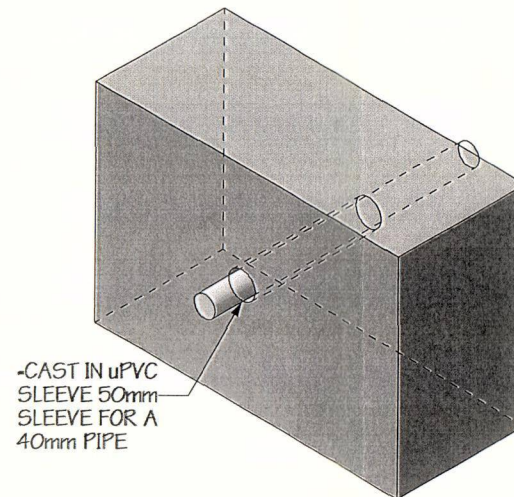
Scale: 1:100





SLAB PIPE PENETRATION

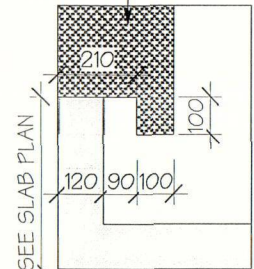
Scale: 1:10



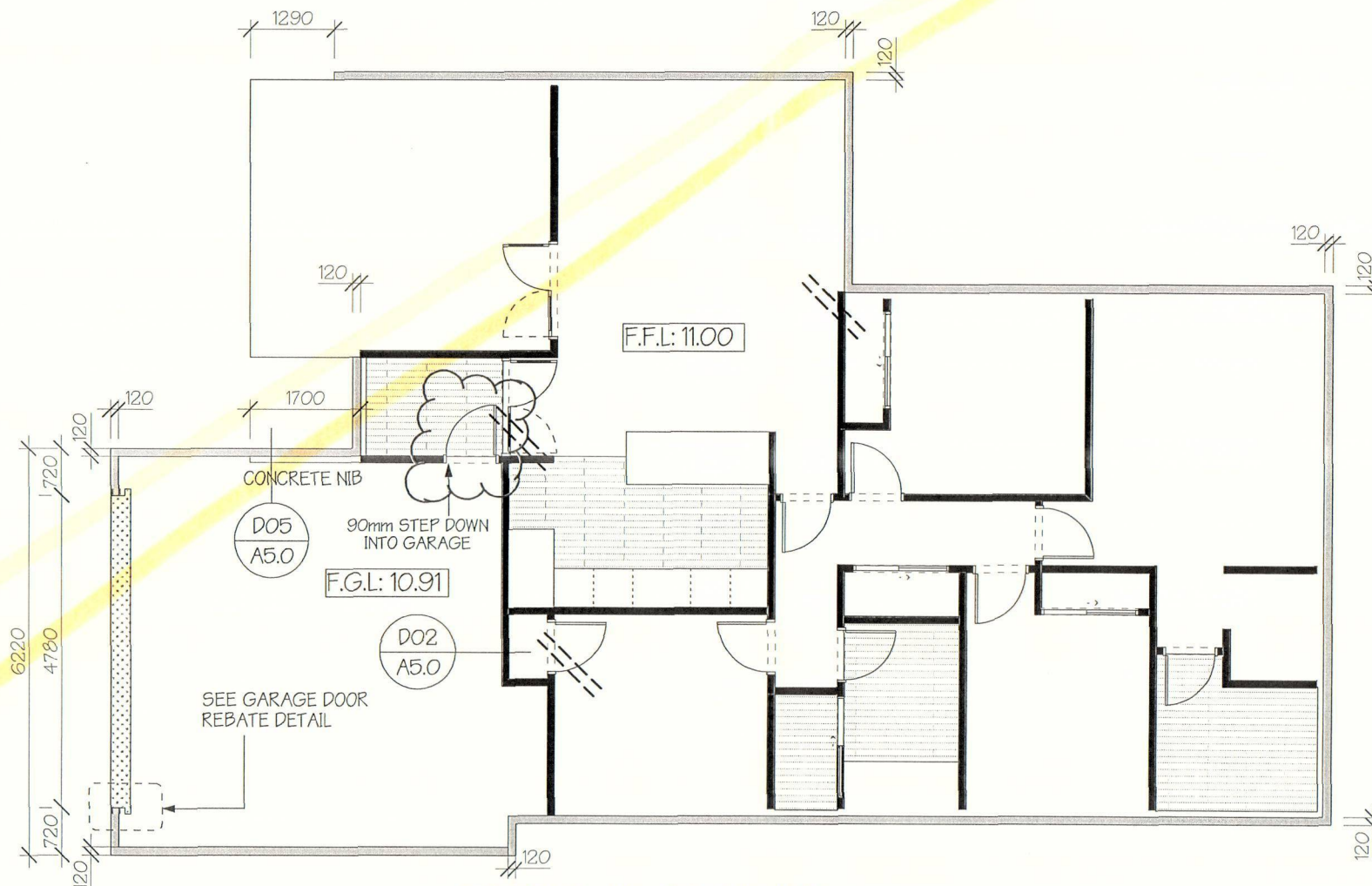
FOUNDATION PIPE PENETRATION

Scale: 1:10

GARAGE DOOR
REBATE WITH SPONGE
FINISH



GARAGE DOOR
REBATE 1:20



FLOOR SLAB PLAN

Scale: 1:100

SLAB KEY
--- SUPPLEMENTARY REINFORCING
BARS AS PER ATTACHED ENGCO
ENGINEERING DRAWINGS

121562

17 SEP 2012

FILE COPY



FOUNDATION PIPE PENETRATION

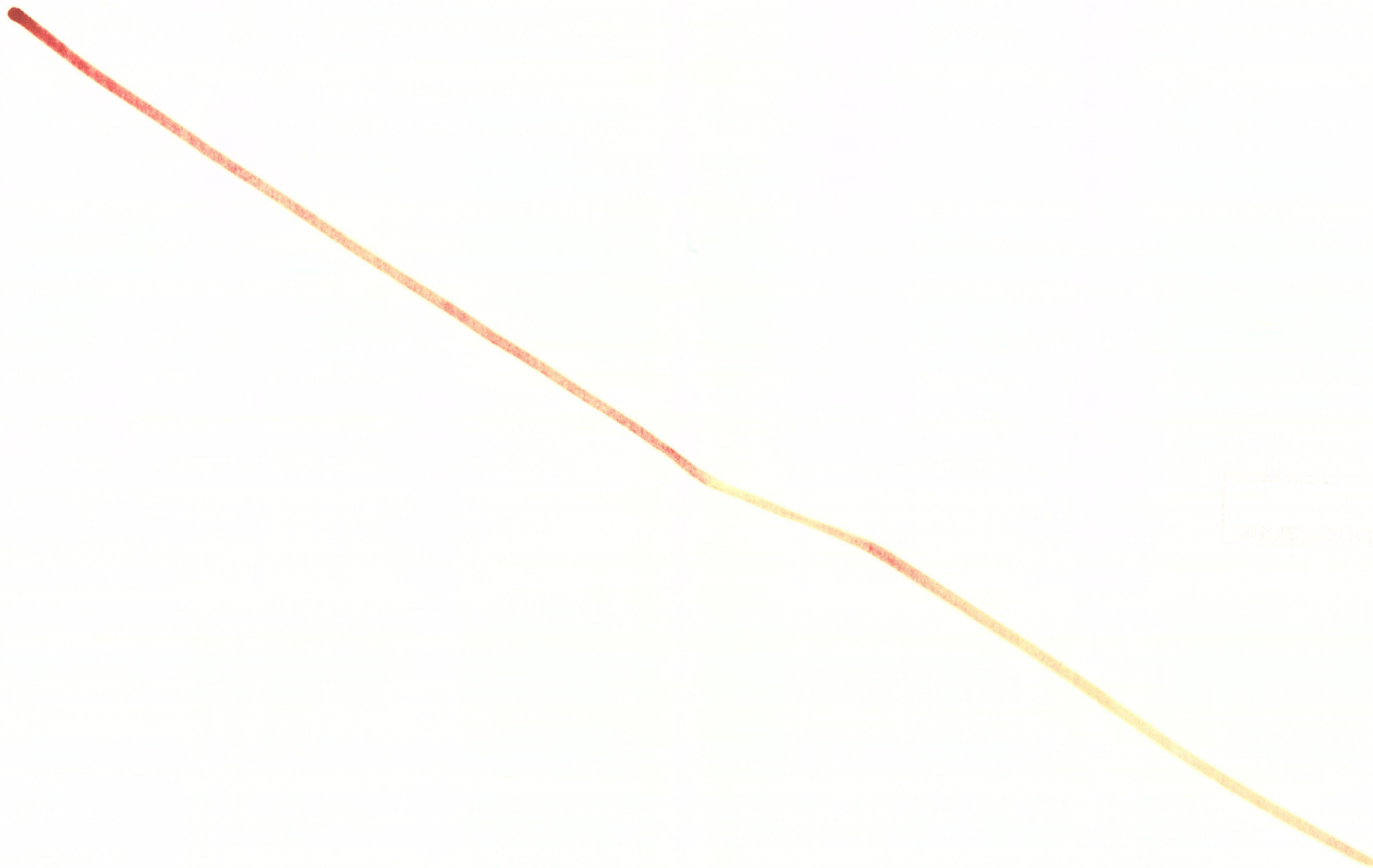
SUPERSEDED

19 SEP 2012

**SLAB KEY**

SUPPLEMENTARY REINFORCING
BARS AS PER ATTACHED ENGCO
ENGINEERING DRAWINGS

121502



Details

box 1

Name

LOT 54 TURNKEY, HORNCastle HOMES

Street and Number

LOT 54 GOLDNEY CLOSE

Lot and DP Number

LOT 54 DP451072

City/Town/District

SELWYN

Location of Storey:

SINGLE

(delete one)

Building height to apex

4.97

m

Roof weight

Light

Roof height above eaves

2.46

m

Cladding weight

Heavy

Stud height

2.57

m

Room in roof space

N

Average roof pitch

29

°

Subsoil Classification

D

Snow Load

0.428

kpa

Building length

BL=

19.73

m

Gross Building

Building width

BW=

12.46

m

Plan Area

GPA=

180.08

m2

No When the average roof pitch is over 25 degrees, use the eaves length and width to determine BL and BW.

No For heavy roofs use the roof plan at eaves level to determine GPA.

10

Wind Zone

box2

Region:

A

W

Roughness:

* Urban

Open

Exposure:

* Sheltered

Exposed

Topography:

* T1

T2

T3

T4

Wind Zone:

Low (0.5)

Medium (0.7)

High (1.0)

Very high (1.3)

Extra high (1.6)

Specific Design

Along

60

Across

60

Factor:

1

11

Earthquake

box3

From figure Eq1 select Earthquake Zone:

1

2

3

4

12

BU's required Wind

box4

From Table W1A/B

W Along =

60.00

BU's/m

W Across =

60.00

BU's/m

Total Wind load,

W ALONG:

W Along x BW =

747.572

BU'sW ACROSS:

W Across x BL =

1183.799

BU's

13

BU's required Earthquake

box5

From Table EQ1

E =

7.20

BU's/m2

Note : For a room in the roof space use E+3

Total earthquake load,

EQ ALONG and EQ ACROSS:

E x GPA BU's =

1296.60

BU's

14

BRACING LINE REQUIREMENT CALC'S

NUMBER OF BRACING LINES ACROSS (M.N)

6

NUMBER OF BRACING LINES ALONG (A.B)

4

WIND

1183.80

EQ

1296.60

TOTAL BRACING UNITS REQ ACROSS

1183.80

TOTAL BRACING UNITS REQ ALONG

747.57

MIN UNITS PER LINE ACROSS

98.65

MIN UNITS PER LINE ALONG

93.45

NOTE : USE THE GREATER OF THE FOLLOWING

- FIGURES ABOVE

- OR 15 BU'S X BUILDING LINE LENGTH

- 100 BU'S MINIMUM

15

PLATE FIXING TABLE

EXTERNAL BRACED WALLS

EP1 - FIXED WITH HANDIBRAC AT EACH END OF BRACING ELEMENT

BL1-H - FIXED WITH HANDIBRAC AT EACH END OF BRACING ELEMENT

OTHERS - EXTERNAL NON BRACED WALLS TO BE FIXED WITH TRUBOLTS @ 900c/s

INTERNAL BRACED WALLS

GS1-N - FIXED WITH 75 x 3.8mm SHOT FIRED FASTENERS WITH 16mm DISCS SPACED AT 150mm AND 300mm FROM END STUDS AND 600mm CENTRES THEREAFTER.

GS2-N - FIXED WITH 75 x 3.8mm SHOT FIRED FASTENERS WITH 16mm DISCS SPACED AT 150mm AND 300mm FROM END STUDS AND 600mm CENTRES THEREAFTER.

OTHERS- NON BRACED INTERNAL WALLS MAY BE SHOT FIRED.

16

Along

Bracing Line

1

Minimum BU's Required

2

Bracing Element No.

3

Bracing Type

4

Length Element (m)

Bracing Elements Provided

3

EP1

4

Length Element (m)

Lower

Wind

5W

Rating BU/m (m)

6W

BU's Achieved (BU/m x L)

Earthquake

5W

Rating BU/m (m)

6W

BU's Achieved (BU/m x L)

Totals Achieved

W

1464.56

EQ

1429.23

From Shee

W

747.572

EQ

1296.60

Wreq/ EQreq =

0.577

17

Across

Bracing Line

1

Minimum BU's Required

2

Bracing Element No.

3

Bracing Type

4

Length Element (m)

Bracing Elements Provided

3

EP1

4

Length Element (m)

Lower

Wind

5W

Rating BU/m (m)

6W

BU's Achieved (BU/m x L)

Earthquake

5W

Rating BU/m (m)

6W

BU's Achieved (BU/m x L)

Totals Achieved

W

1748.54

EQ

1620.7

From Shee

W

1183.799

EQ

1296.60

18

BRACING KEY

DIAGONALLY OPPOSING PAIR OF CONTINUOUS STEEL STRIPS EACH HAVING A CAPACITY OF 8kN IN TENSION, FIXED TO EACH TOP CHORD OR RAFTER THAT IS INTERSECTED, AND TO THE TOP PLATE. Ref. NZS3604:2011 10.4.2

= WET AREA

= BRACING UNIT TO ONE WALL FACE

= BRACING UNIT TO BOTH WALL FACES

19

BRACING PLAN

Scale: 1:100

121562

A2.2

Calculation Method

Stud Height	2.570 m				
Total Wall Area	56.22 m x 2.57 m	=	144.48 sq m		
Floor & Roof Area (EXT GARAGE)	141.57 sq m				
Area of Glazing	140.35 sq m	105.9 sq m	=	34.45 sq m	
% Glazing / Wall Area	34.45 sq m / 144.48 sq m	=	23.85 %		
Wall Area less Window & Doors	144.48 sq m - 34.45 sq m	=	110.03 sq m		
Area of reduced Insulation	6.16 sq m				
Area of Ceiling less reduction	135.41 sq m				

Reference Building CONSTRUCTION VALUES

HL	AROOF	+	BROOF	+	AWALL	+	AFLOOR	+	AGLAZING	
	3.3		3.3		2.0		1.3		0.26	
HL	135	+	6	+	110	+	142	+	34	
	3.3		3.3		2.0		1.3		0.26	

HL 41 + 2 + 55 + 109 + 133 = 339

Proposed Building CONSTRUCTION VALUES

HL	AROOF	+	BROOF	+	AWALL	+	AFLOOR	+	AGLAZING	
	3.4		2.3		2.1		1.4		0.26	
HL	135	+	6	+	110	+	142	+	34	
	3.4		2.3		2.1		1.4		0.26	

HL 40 + 3 + 52 + 101 + 133 = 329

HL Proposed 329 < HL Referenced 339 GOOD

Insulation Calculation Table

Stud height (STH)	2.570 m
Perimeter (- GARAGE) (P)	56.22m
Floor Area (-Garage) (A)	141.57 sq m
Total Wall Area (STH x P)	144.48 sq m
Roof Area	141.57 sq m
Wall Area (- Windows)	110.03 sq m

Wall Areas (LENGTH x STH)	LENGTH	AREA (GROSS)
North	16.48m	40.29 sq m
East	11.28m	27.5 sq m
South	16.49m	39.77 sq m
West	11.16m	28.72 sq m

Window areas	WALL AREA NETT	WINDOW AREA/WALL
North	25.14 sq m	15.15 sq m
East	24.17 sq m	3.32 sq m
South	30.47 sq m	9.3 sq m
West	22.05 sq m	6.67 sq m
Total area		34.45 sq m

% Glazing / Total Wall Area	23.85 %
East, South, West Combined %	
Windows E + W + S	19.3 sq m
Walls E + W + S	95.99 sq m
% Glazing E + W + S	20.11 %

If both are under 30% use the Schedule Method

Under Floor Insulation	
Area/Perimeter Ratio	2.52
* If ratio is under 2.5 underfloor poly is required for horncastle construction methods	
* If ratio is under 1.9 foundation design needs redesigned	

Note: See table page 89 of branz insulation guide

MIN INSULATION REQUIREMENTS (CONSTRUCTION VALUES)	
ROOF	R3.3
WALLS	R2.0
FLOOR	R1.3
GLAZING	R0.26

* SEE GLAZING NOTE FOR COMPLIANCE
* SEE LIGHTING NOTE FOR CA LIGHT COMPLIANCE

HORNCastle HOMES LTD.

NOTE:
-LIGHTING INDICATIVE ONLY,
LAYOUT TO BE CONFIRMED BY
OWNER ON SITE

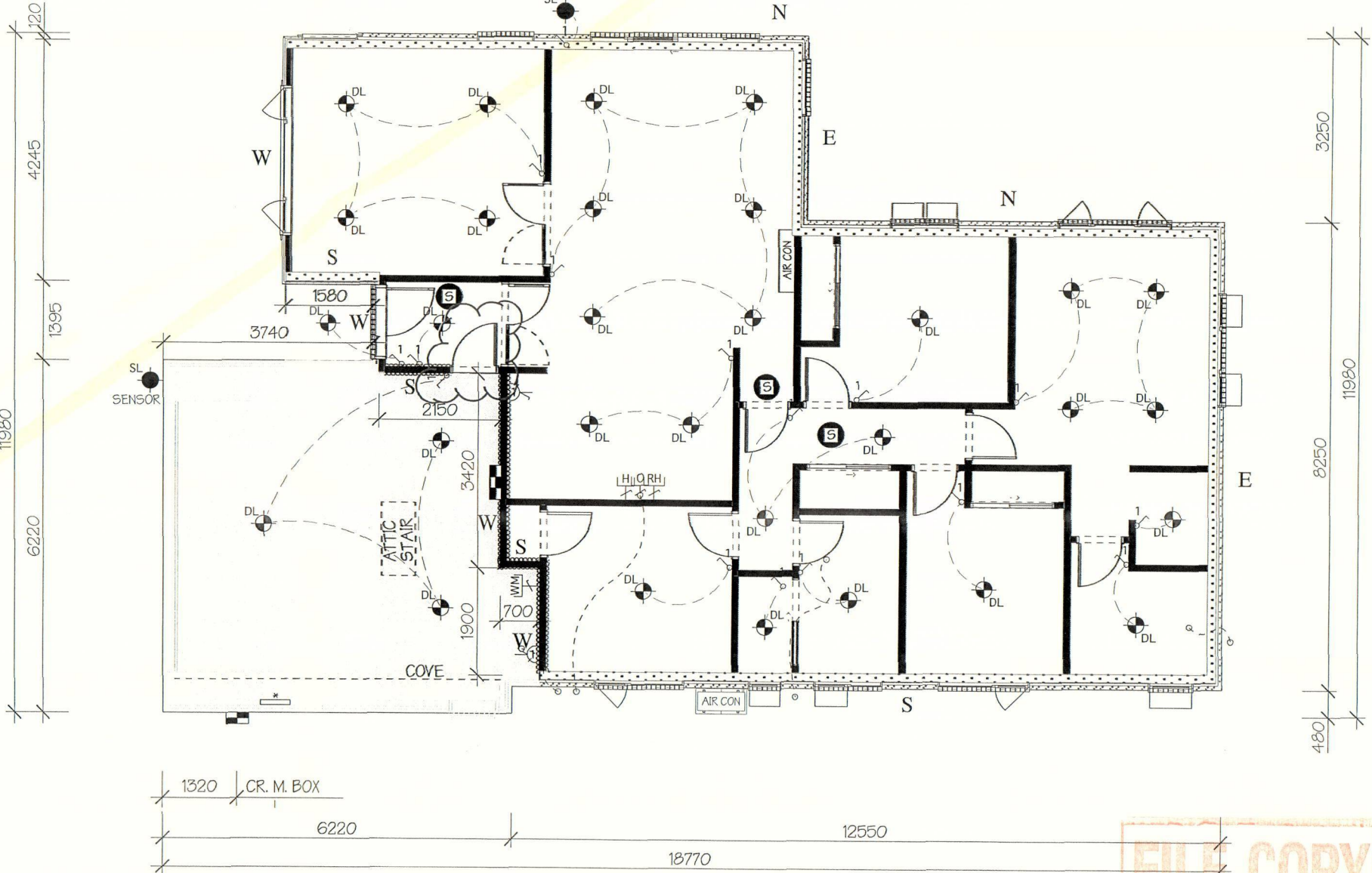
SPECIFICATION:
CEILING: R3.6 PINK BATTS ULTRA
WALLS: R2.6 PINK BATTS ULTRA
FLOOR: 50mm STRIP POLY (12m WIDE)
GLAZING: R0.26 STD DOUBLE GLAZING
GARAGE INT. WALL: R2.6 PINK BATTS

RECESSED DOWNLIGHT:
HALOGEN
HD109TC : REFER TO
SPECIFICATION FOR COMPLIANCE
DOCUMENT CERTIFICATE.

STANDARD GLAZING
UNITS USED:
ALL DOUBLE GLAZED UNITS
COMPLY WITH TABLE G2 NZS
4218:2004 & MEET 0.26 (msq
°C/W)
STANDARD UNIT
4mm GLASS /12mm AIR GAP /4mm
GLASS
SLIDER PANEL
5mm GLASS /8mm AIR GAP /5mm
GLASS
SAFETY PANEL
4mm TOUGHENED /8mm AIR GAP
/6.38mm LAMINATE

INSULATION &
ELECTRICAL KEY:
INSULATION (GGE INT. WALL)
DL RECESSED DOWNLIGHT
SL SPOT LIGHT
TWO WAY SWITCH
ONE WAY SWITCH (SINGLE)
RANGE HOB
(ISOLATION SWITCH REQ'D)
OVEN IN WALL
(ISOLATION SWITCH REQ'D)
RANGEHOOD
(ISOLATION SWITCH REQ'D)
WASHING MACHINE
(10amp SOCKET OUTLET)
SINGLE SWITCHED SOCKET

AREA OF REDUCED
BATTS THICKNESS



INSULATION & ELECTRICAL PLAN
Scale: 1:100

17 SEP 2012

FILE COPY
121562

Calculation Method

Stud Height	2.570 m			
Total Wall Area	56.22 m x 2.57 m	=	144.48 sq m	
Floor & Roof Area (EXT GARAGE)	141.57 sq m			
Area of Glazing	140.35 sq m	105.9 sq m	=	34.45 sq m
% Glazing / Wall Area	34.45 sq m / 144.48 sq m	=	23.85 %	
Wall Area less Window & Doors	144.48 sq m - 34.45 sq m	=	110.03 sq m	
Area of reduced Insulation	6.16 sq m			
Area of Ceiling less reduction	135.41 sq m			

Reference Building CONSTRUCTION VALUES

HL	AROOF	+	BROOF	+	AWALL	+	AFLOOR	+	AGLAZING
	3.3		3.3		2.0		1.3		0.26
HL	135	+	6	+	110	+	142	+	34
	3.3		3.3		2.0		1.3		0.26

HL 41 + 2 + 55 + 109 + 133 = 339

Proposed Building CONSTRUCTION VALUES

HL	AROOF	+	BROOF	+	AWALL	+	AFLOOR	+	AGLAZING
	3.4		2.3		2.1		1.4		0.26
HL	135	+	6	+	110	+	142	+	34
	3.4		2.3		2.1		1.4		0.26

40 + 3 + 52 + 101 + 133 = 329

HL Proposed 329 < HL Referenced 339

GOOD

Insulation Calculation Table

Stud height (STH)	2.570 m
Perimeter (- GARAGE) (P)	56.22m
Floor Area (-Garage) (A)	141.57 sq m
Total Wall Area (STH x P)	144.48 sq m
Roof Area	141.57 sq m
Wall Area (- Windows)	110.03 sq m

Wall Areas (LENGTH x STH)	LENGTH	AREA (GROSS)
North	16.48m	40.29 sq m
East	11.28m	27.5 sq m
South	16.49m	39.77 sq m
West	11.16m	28.72 sq m

Window areas	WALL AREA NETT	WINDOW AREA/WALL
North	25.14 sq m	15.15 sq m
East	24.17 sq m	3.32 sq m
South	30.47 sq m	9.3 sq m
West	22.05 sq m	6.67 sq m
Total area		34.45 sq m

% Glazing / Total Wall Area	23.85 %
East, South, West Combined %	
Windows E + W + S	19.3 sq m
Walls E + W + S	95.99 sq m
% Glazing E + W + S	20.11 %

If both are under 30% use the Schedule Method

Under Floor Insulation	
Area/Perimeter Ratio	2.52
* If ratio is under 2.5 underfloor poly is required for horncastle construction methods	
* If ratio is under 1.9 foundation design needs redesigned	

Note: See table page 89 of branz insulation guide

MIN INSULATION REQUIREMENTS (CONSTRUCTION VALUES)	
ROOF	R3.3
WALLS	R2.0
FLOOR	R1.3
GLAZING	R0.26

* SEE GLAZING NOTE FOR COMPLIANCE
* SEE LIGHTING NOTE FOR CA LIGHT COMPLIANCE

HORNCastle HOMES LTD.

NOTE:
-LIGHTING INDICATIVE ONLY,
LAYOUT TO BE CONFIRMED BY
OWNER ON SITE

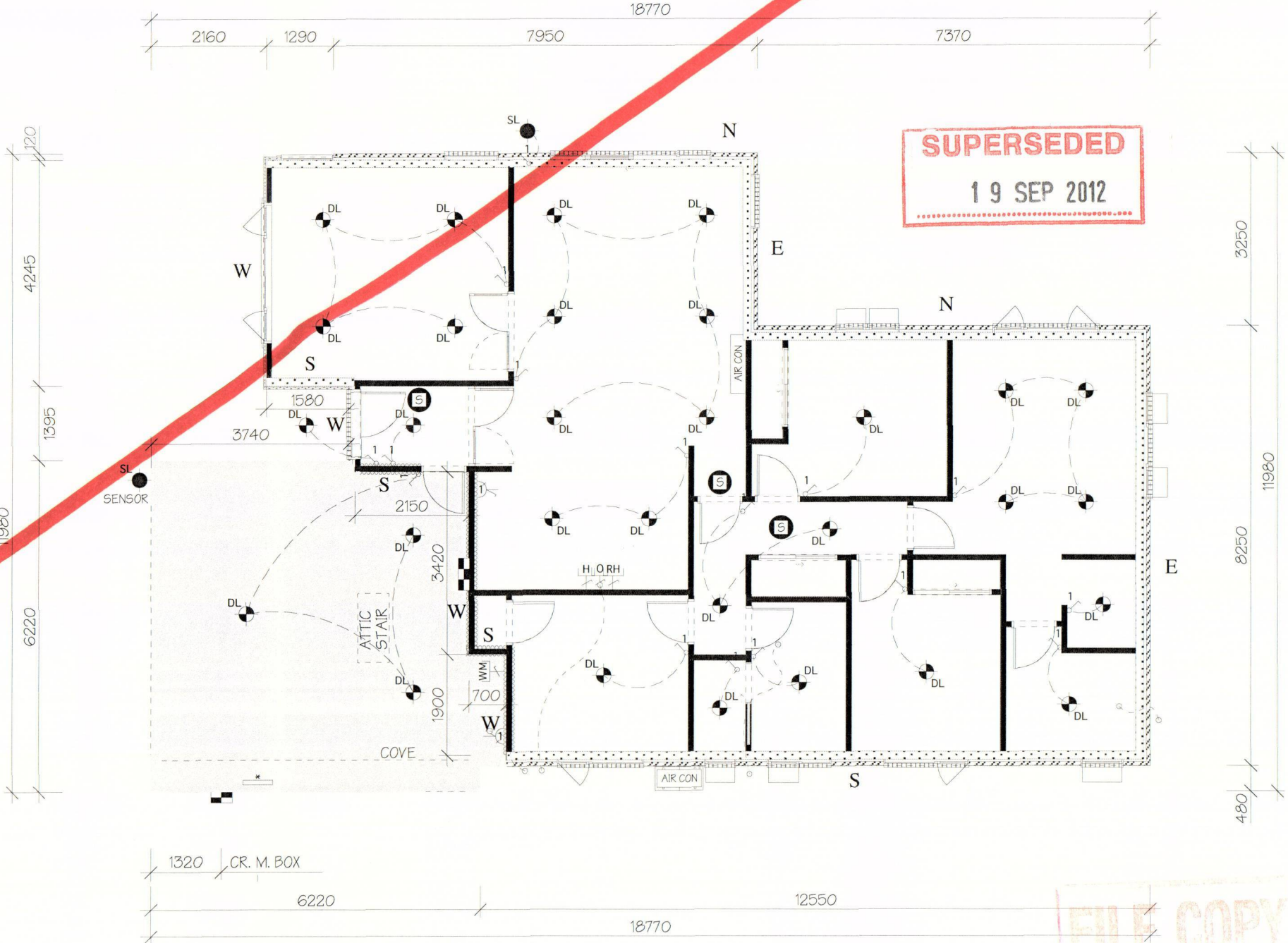
SPECIFICATION:
CEILING: R3.6 PINK BATTS ULTRA
WALLS: R2.6 PINK BATTS ULTRA
FLOOR: 50mm STRIP POLY (12m WIDE)
GLAZING: R0.26 STD DOUBLE GLAZING
GARAGE INT. WALL: R2.6 PINK BATTS

RECESSED DOWNLIGHT:
HALOGEN
HD109TC: REFER TO
SPECIFICATION FOR COMPLIANCE
DOCUMENT CERTIFICATE.

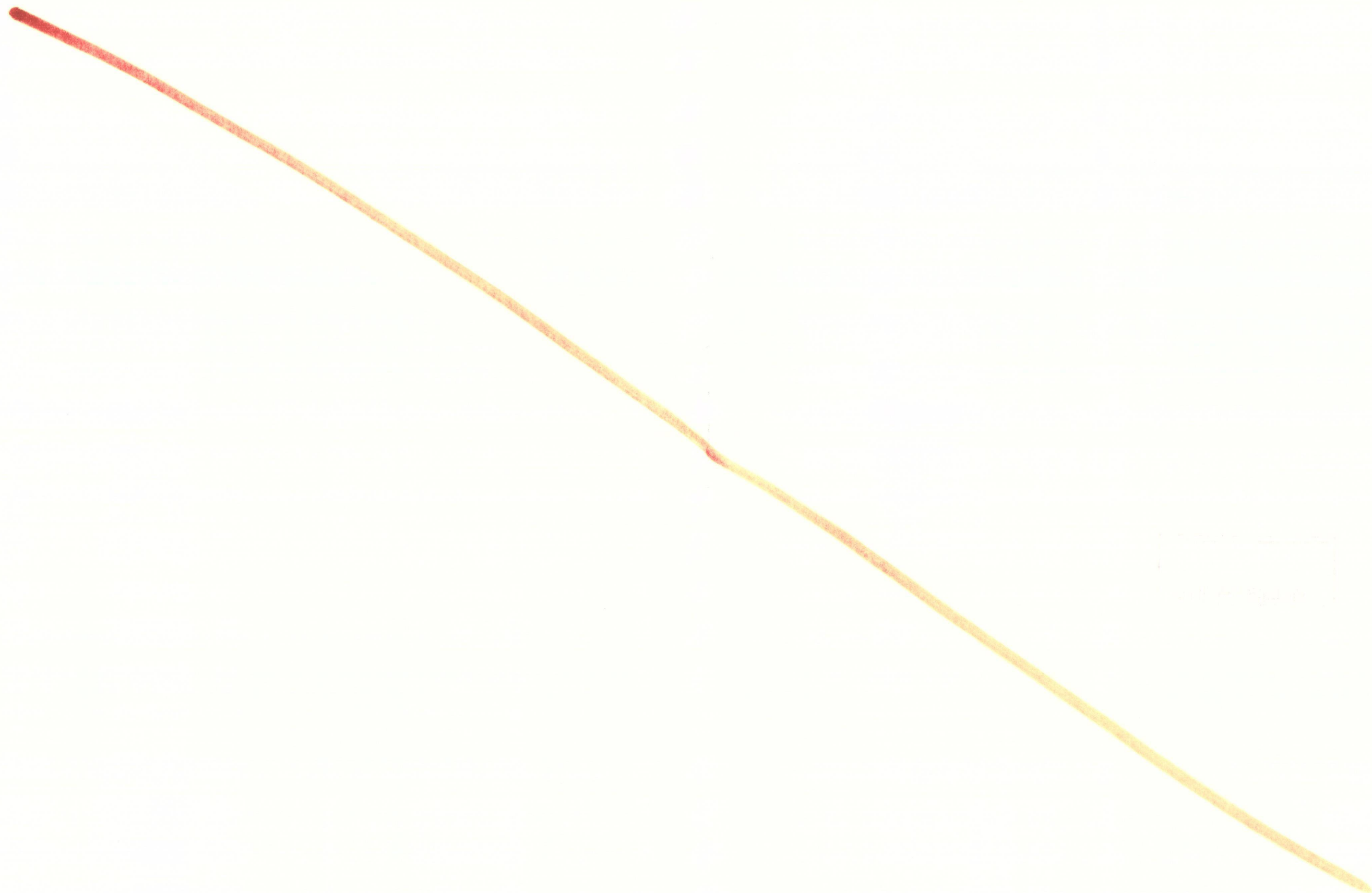
STANDARD GLAZING
UNITS USED:
ALL DOUBLE GLAZED UNITS
COMPLY WITH TABLE G2 NZS
4218:2004 & MEET 0.26 (msq
°C/W)
STANDARD UNIT
4mm GLASS /12mm AIR GAP /4mm
GLASS
SLIDER PANEL
5mm GLASS /8mm AIR GAP /5mm
GLASS
SAFETY PANEL
4mm TOUGHENED /8mm AIR GAP
/6.38mm LAMINATE

INSULATION &
ELECTRICAL KEY:
INSULATION (GGE INT. WALL)
DL RECESSED DOWNLIGHT
SL SPOT LIGHT
TWO WAY SWITCH
ONE WAY SWITCH (SINGLE)
RANGE HOOD
(ISOLATION SWITCH REQ'D)
OVEN IN WALL
(ISOLATION SWITCH REQ'D)
RANGEHOOD
(ISOLATION SWITCH REQ'D)
Washing MACHINE
(10amp SOCKET OUTLET)
SINGLE SWITCHED SOCKET

AREA OF REDUCED
BATTS THICKNESS



INSULATION & ELECTRICAL PLAN
Scale: 1:100



FLOOR AREA OVER FOUNDATION

180.08 sq m	inc Garage
STUD HEIGHT	2570mm
PERIMETER =	64.66 m
SLAB AREA =	346.47 sq m
ROOF AREA OVER EAVES =	208.90 sqm
INT WALL LENGTH (90)=	70.32 m
GARAGE AREA =	38.51 sq m

PLAN KEY:

- METER BOX
- FUSE BOARD
- SMOKE ALARM
- DOWN PIPE
- TERMINAL VENT
- GULLY TRAP
- VINYL FLOOR

- NOTES:**
- ALL DIMENSIONS TO TIMBER FRAMING; NOT TO FINISHED ROOM SIZES
 - SEE FOUNDATION PLAN FOR LOAD BEARING WALLS
 - BATT INSULATION BETWEEN HABITABLE & NON-HABITABLE SPACES
 - PROTECTION FOR STEEL FIXINGS & FASTENINGS: FIXINGS & FASTENINGS EXCLUDING NAILS SHALL HAVE ADDITIONAL CORROSION PROTECTION IN ACCORDANCE WITH NZS3604:2011 TABLE 4.1 (F)(a)
 - MECHANICAL VENTILATION IN HOUSING REMOVING MOISTURE SHALL BE VENTED OUTSIDE (INCLUDES WET AREAS & COOKER HOODS. REFER TO NZBC G4/A51.1.3.c.ii.) MECHANICAL VENTILATION TO BE 150 DIA 230 CU MH INLINE FAN DUCTED TO SOFFIT.
 - SMOKE ALARMS TO BE INSTALLED TO AS1670.6 REQUIREMENTS. EQUIPMENT TO COMPLY WITH AS3786.
 - JOINTS BETWEEN FIXTURES & WALL LININGS: WHERE BATHS, BASINS, TUBS, OR SINKS ABUT IMPERVIOUS LININGS, THE JOINT BETWEEN FIXTURE & LINING SHALL BE SEALED TO PREVENT WATER PENETRATION TO CONCEALED SPACES OR BEHIND LININGS
 - SHOWERS ARE PRE-FORMED FIBREGLASS CUBICLES. SHOWERS FITTED WITH 6mm MILLINIUM REVERSIBLE FRAMELESS PIVOT DOOR WITH TOUGHENED SAFETY GLASS
 - HWC TO HAVE COPPER RELIEF VALVE & DRAIN TO OUTSIDE
 - HOT WATER PIPE TO KITCHEN;
 - DEVELOPED LENGTH > 12m
 - NOMINAL PIPE SIZE 15mm
 - ALL PIPING POLYBUTYLENE.
 - INSULATE TO NZBC G12/A51
 - 65 DIA. ROUND DOWNPIPE, 88 x 137mm GUTTERS
 - MULTILINE QUAD GUTTER BY STEEL AND TUBE HAS A CROSS SECTIONAL AREA OF 6850mm2
 - CABIN HOOKS TO FRENCH DOORS
 - 20mm POLY BEHIND ALL RECESSED BOXES
 - 25mm REBATE IN SLAB FOR GARAGE DOOR SPONGE FINISH
 - ALL CAVITY SLIDERS TO RECESS FULLY WITH PULL RINGS
 - IT IS THE BUILDERS RESPONSIBILITY TO CHECK THE GARAGE DOOR REBATE SIZES BEFORE POURING.
 - MAN HOLE TO BE ATTIC STAIR WITH ROUGH OPENING OF 1300x600. POSITION BETWEEN TRUSSES ONLY. MODEL LWS2800
 - CABIN HOOK TO BE FITTED TO GARAGE BACK DOOR IF LAUNDRY IS IN GARAGE WITH NO OPENING WINDOW

STUD SIZES

STUDS HAVE BEEN SIZED USING 3604 : 2011 TABLE 8.2 & 8.4

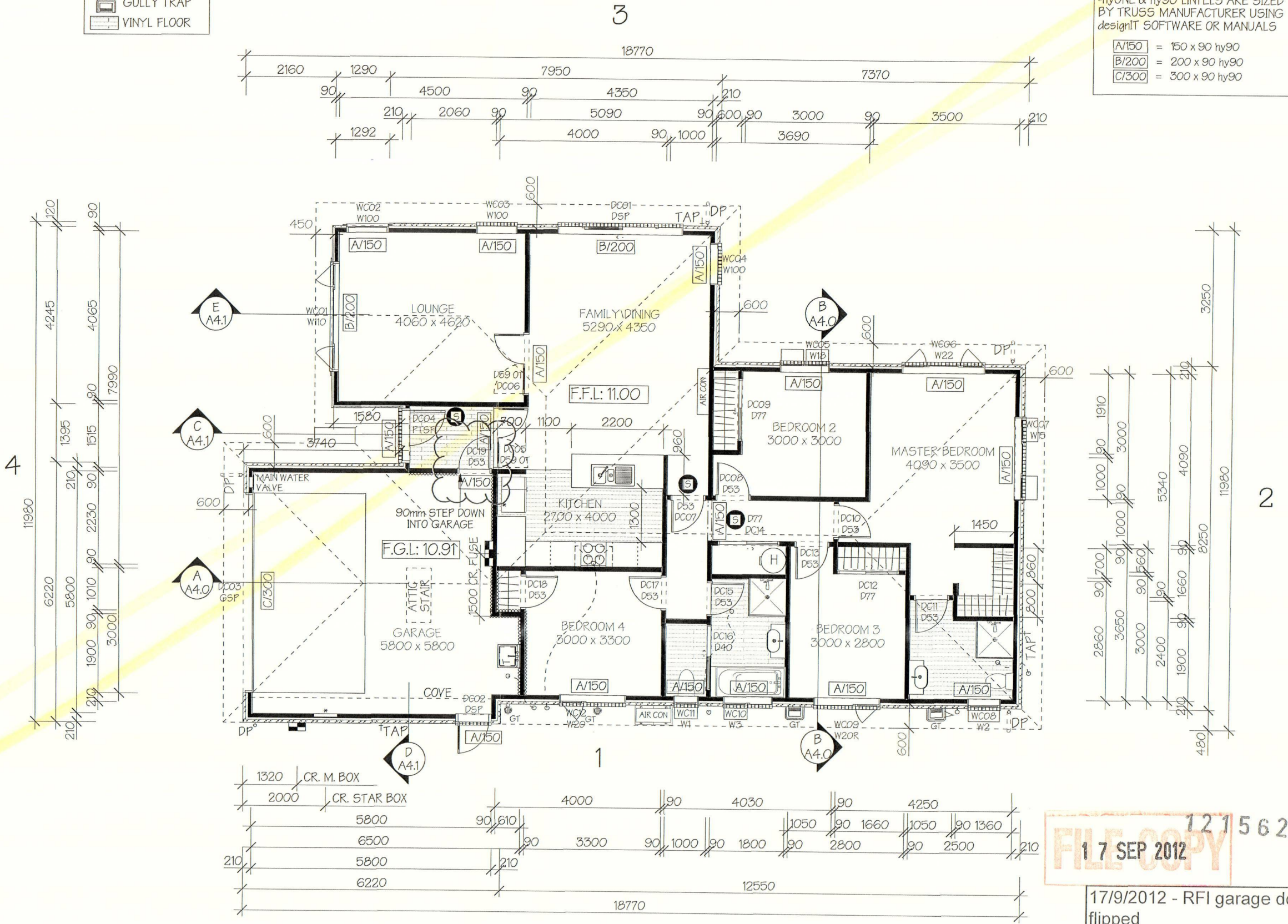
- EXT = 90x45 SGB @ 400crs
- INT LB = 90x45 SGB @ 600crs
- INT NONLB = 90x45 SGB @ 600crs

LINTEL SIZES

ALL LINTELS HAVE BEEN SIZED BY TRUSS & FRAME MANUFACTURER UNLESS STATED ON PLAN.

- SGB LINTELS HAVE BEEN SIZED USING 3604:2011
- hyONE & hy90 LINTELS ARE SIZED BY TRUSS MANUFACTURER USING designIT SOFTWARE OR MANUALS

A/150	= 150 x 90 hy90
B/200	= 200 x 90 hy90
C/300	= 300 x 90 hy90



FLOOR PLAN
Scale: 1:100

121562
17 SEP 2012

17/9/2012 - RFI garage door flipped

FLOOR AREA OVER FOUNDATION

180.08 sq m	inc Garage
STUD HEIGHT	2570mm
PERIMETER =	64.66 m
SLAB AREA =	346.47 sq m
ROOF AREA OVER EAVES =	208.90 sqm
INT WALL LENGTH (90)=	70.32 m
GARAGE AREA =	38.51 sq m

PLAN KEY:

- METER BOX
- FUSE BOARD
- SMOKE ALARM
- DOWN PIPE
- TERMINAL VENT
- GULLY TRAP
- VINYL FLOOR

- NOTES:**
- ALL DIMENSIONS TO TIMBER FRAMING; NOT TO FINISHED ROOM SIZES
 - SEE FOUNDATION PLAN FOR LOAD BEARING WALLS
 - BATT INSULATION BETWEEN HABITABLE & NON-HABITABLE SPACES
 - PROTECTION FOR STEEL FIXINGS & FASTENINGS: FIXINGS & FASTENINGS EXCLUDING NAILS SHALL HAVE ADDITIONAL CORROSION PROTECTION IN ACCORDANCE WITH NZS3604:2011 TABLE 4.1 (F)(a)
 - MECHANICAL VENTILATION IN HOUSING REMOVING MOISTURE SHALL BE VENTED OUTSIDE (INCLUDES WET AREAS & COOKER HOODS. REFER TO NZBC G4/AS11.3.c.ii) MECHANICAL VENTILATION TO BE 150 DIA 230 CU M/H INLINE FAN DUCTED TO SOFFIT.
 - SMOKE ALARMS TO BE INSTALLED TO AS1670.6 REQUIREMENTS. EQUIPMENT TO COMPLY WITH AS3786.
 - JOINTS BETWEEN FIXTURES & WALL LININGS: WHERE BATHS, BASINS, TUBS, OR SINKS ABUT IMPERVIOUS LININGS, THE JOINT BETWEEN FIXTURE & LINING SHALL BE SEALED TO PREVENT WATER PENETRATION TO CONCEALED SPACES OR BEHIND LININGS
 - SHOWERS ARE PRE-FORMED FIBREGLASS CUBICLES. SHOWERS FITTED WITH 6mm MILLENNIUM REVERSIBLE FRAMELESS PIVOT DOOR WITH TOUGHENED SAFETY GLASS
 - HWC TO HAVE COPPER RELIEF VALVE & DRAIN TO OUTSIDE
 - HOT WATER PIPE TO KITCHEN:
 - DEVELOPED LENGTH > 12m
 - NOMINAL PIPE SIZE 15mm
 - ALL PIPING POLYBUTYLENE.
 - INSULATE TO NZBC G12/AS1
 - 65 DIA. ROUND DOWNPIPE, 88 x 137mm GUTTERS
 - MULTILINE QUAD GUTTER BY STEEL AND TUBE HAS A CROSS SECTIONAL AREA OF 6850mm2
 - CABIN HOOKS TO FRENCH DOORS
 - 20mm POLY BEHIND ALL RECESSED BOXES
 - 25mm REBATE IN SLAB FOR GARAGE DOOR SPONGE FINISH
 - ALL CAVITY SLIDERS TO RECESS FULLY WITH PULL RINGS
 - IT IS THE BUILDERS RESPONSIBILITY TO CHECK THE GARAGE DOOR REBATE SIZES BEFORE POURING.
 - MAN HOLE TO BE ATTIC STAIR WITH ROUGH OPENING OF 1300x600. POSITION BETWEEN TRUSSES ONLY. MODEL LWS2800
 - CABIN HOOK TO BE FITTED TO GARAGE BACK DOOR IF LAUNDRY IS IN GARAGE WITH NO OPENING WINDOW

STUD SIZES

STUDS HAVE BEEN SIZED USING 3604 : 2011 TABLE 8.2 & 8.4

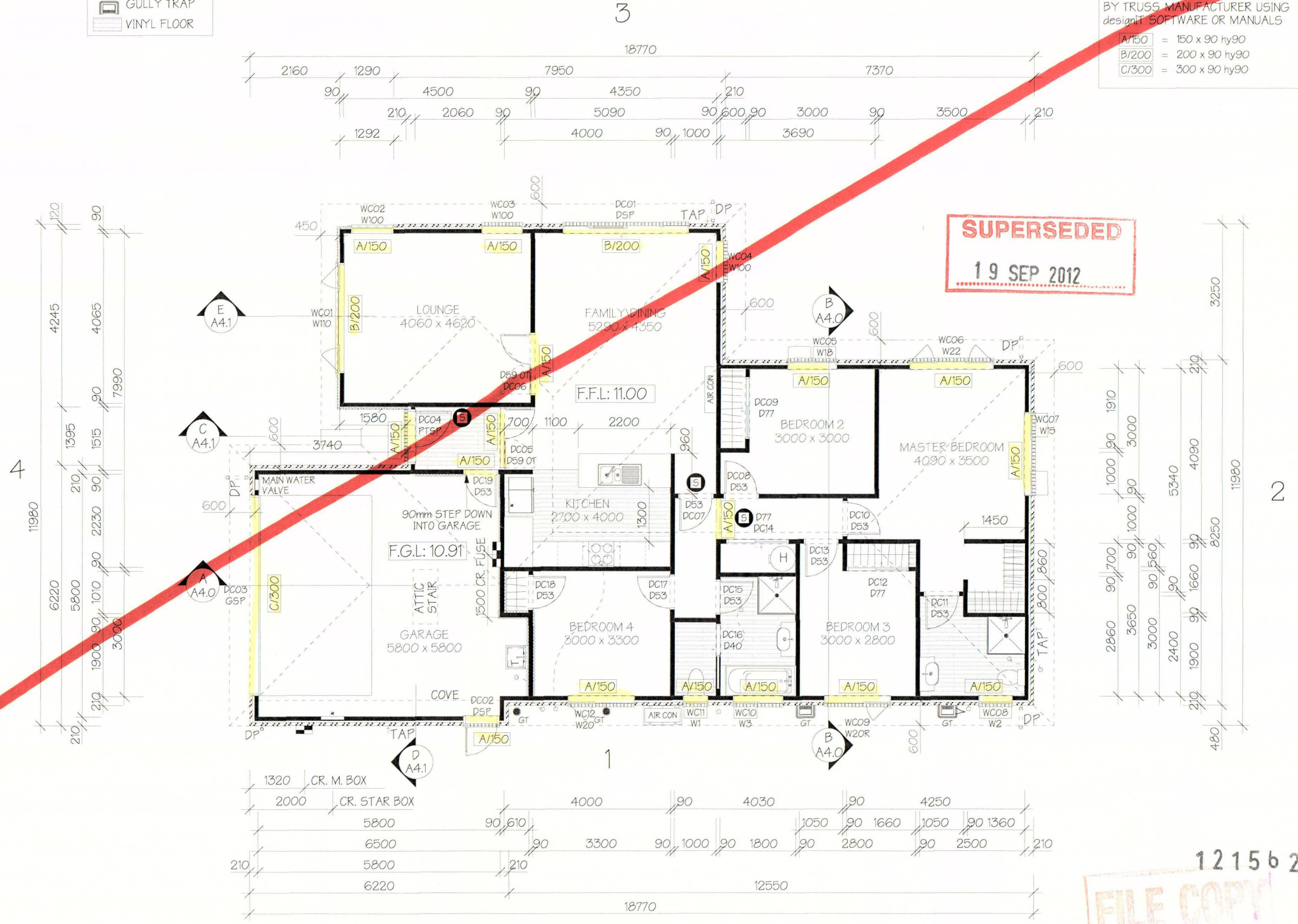
- EXT = 90x45 SGB @ 400crs
- INT LB = 90x45 SGB @ 600crs
- INT NONLB = 90x45 SGB @ 600crs

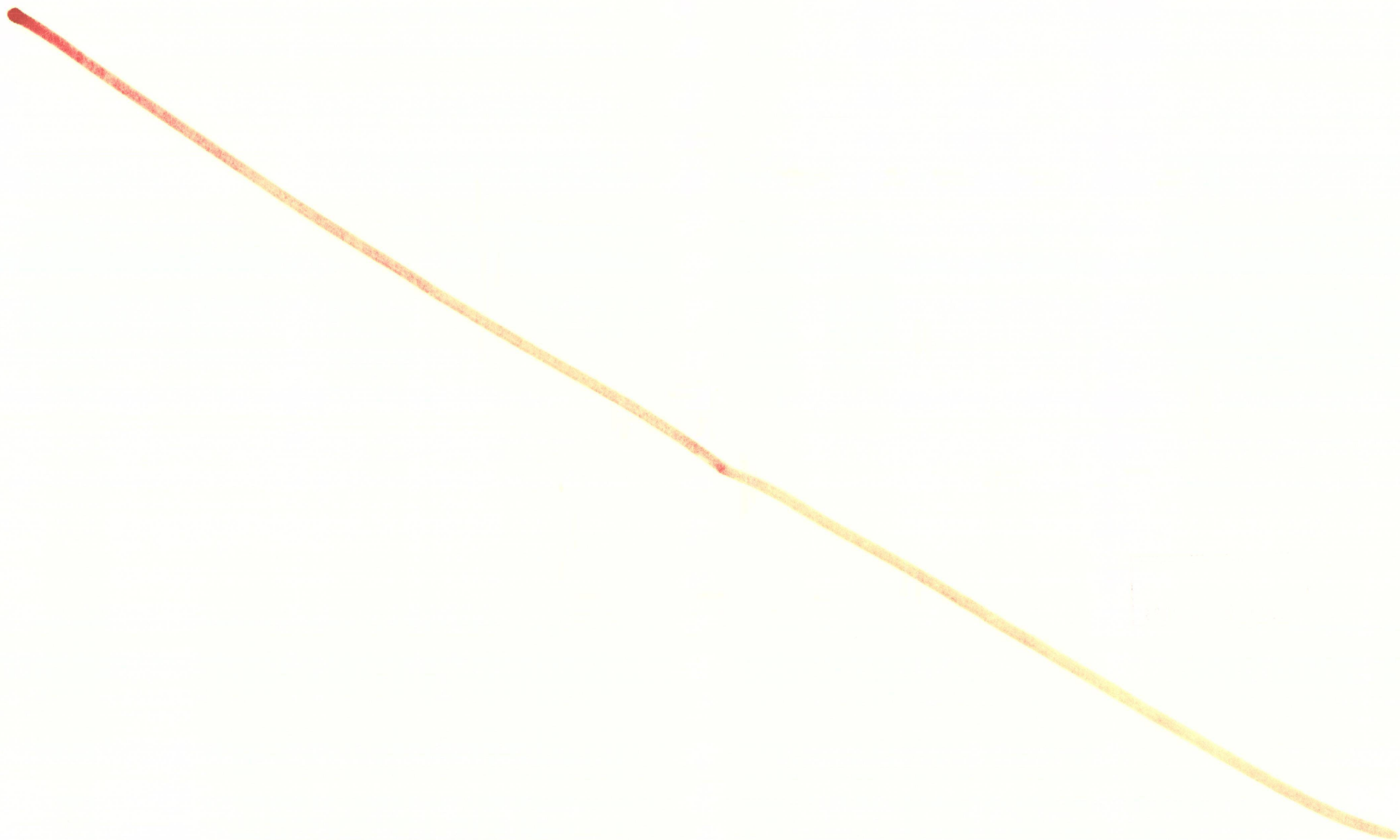
LINTEL SIZES

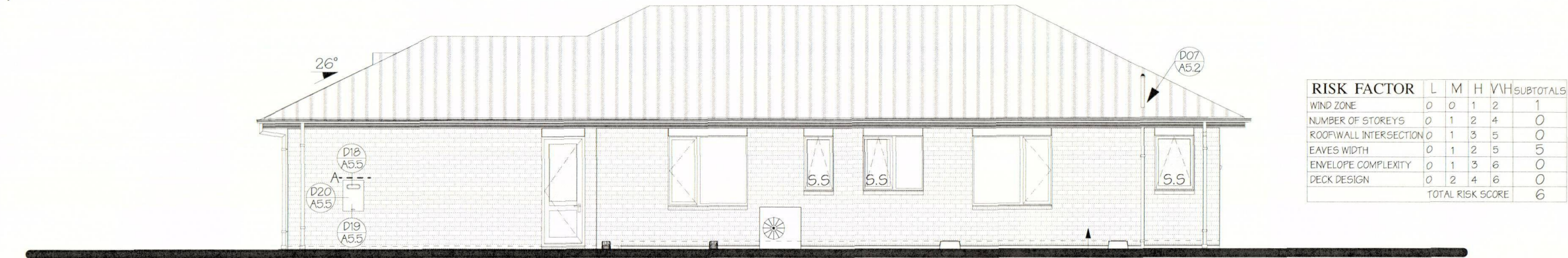
ALL LINTELS HAVE BEEN SIZED BY TRUSS & FRAME MANUFACTURER UNLESS STATED ON PLAN.

- SGB LINTELS HAVE BEEN SIZED USING 3604:2011
- hyONE & hy90 LINTELS ARE SIZED BY TRUSS MANUFACTURER USING designIT SOFTWARE OR MANUALS

A/150	= 150 x 90 hy90
B/200	= 200 x 90 hy90
C/300	= 300 x 90 hy90







DOOR SCHEDULE					
ID	MODEL	WIDTH mm	HEIGHT mm	GLAZED AREA sqm	VENTILATION AREA sqm
DC01	DSP	3000 mm	2115 mm	4.32 sqm	3.23 sqm
DC02	DSP	875 mm	2205 mm	0.99 sqm	1.59 sqm
DC03	GSP	4780 mm	2205 mm	0.00 sqm	20.52 sqm
DC04	PTSP	1315 mm	2115 mm	0.62 sqm	1.71 sqm
DC05	D59 OT	1500 mm	2050 mm	1.18 sqm	2.85 sqm
DC06	D59 OT	1500 mm	2050 mm	1.18 sqm	2.85 sqm
DC07	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC08	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC09	D77	1480 mm	2050 mm	0.00 sqm	1.28 sqm
DC10	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC11	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC12	D77	1480 mm	2050 mm	0.00 sqm	1.28 sqm
DC13	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC14	D77	1480 mm	2050 mm	0.00 sqm	1.28 sqm
DC15	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC16	D40	779 mm	2075 mm	0.00 sqm	1.49 sqm
DC17	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC18	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC19	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm

ELEVATION 1

Scale: 1:100

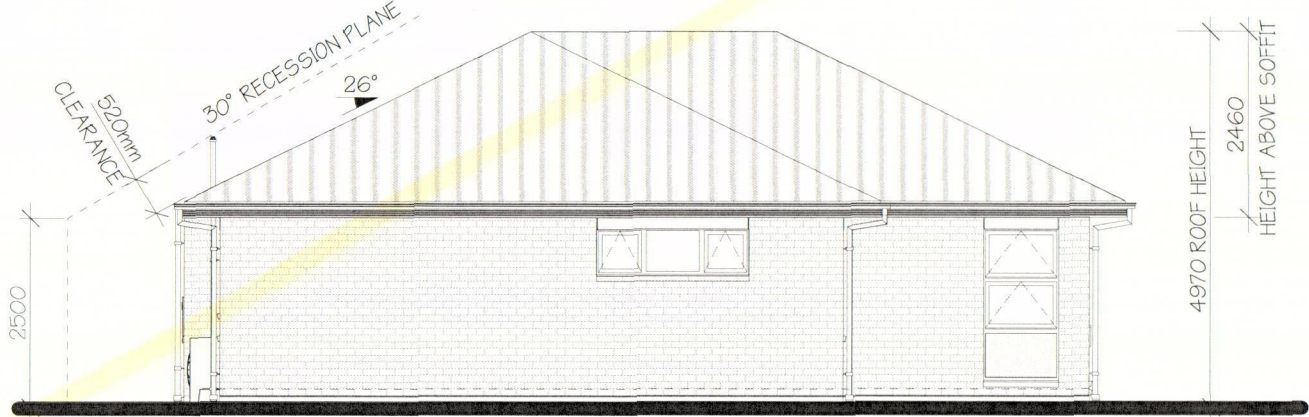
TIMBER TREATMENT SCHEDULE:

SG8 KILN DRIED PINUS RADIATA	
EXTERNAL WALLS:	H1.2 TREATED
INTERNAL WALLS:	H1.2 TREATED
ALL BEAMS & LINTELS:	H1.2 TREATED
ALL FRAMES TO HAVE:	H1.2 BOTTOM PLATE
TRUSSES & EAVE FRAMING:	H1.2 TREATED
BRACING PLY:	H3.2 TREATED
PLY TO FLAT ROOF:	H3.2 TREATED
FLAT ROOF SOFFIT FRAMING:	H1.2 TREATED
WINDOW & DOOR REVEALS:	H3.1 TREATED
VALLEY BOARDS:	H1.2 TREATED
PURLINS:	H1.2 TREATED
GARAGE DOOR REVEALS:	H3.1 TREATED
CAVITY BATTENS:	H3.1 TREATED

VENEER LINTEL TABLE	
A 60x10mm	
LINTELS SIZED USING NZS 4229:1999 TABLE 12.2	

RISK FACTOR	L	M	H	VH	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOFWALL INTERSECTION	0	1	3	5	0
EAVES WIDTH	0	1	2	5	0
ENVELOPE COMPLEXITY	0	1	3	6	0
DECK DESIGN	0	2	4	6	0
TOTAL RISK SCORE					1

See note #2



ELEVATION 2

Scale: 1:100

NOTE:

•GRADE 'A' SAFETY GLAZING IN ALL BATHROOMS WHERE GLAZING IS UNDER OR WITHIN 2m OF FLOOR LEVEL, TO ALL GLASS PANELS WHICH ARE OVER 0.5m WIDE & WITHIN 0.5m TO FLOOR LEVEL, AND TO ALL PANELS WHICH ARE GREATER THAN 1m HIGH, AND ALL DOOR PANELS WHICH ARE GREATER THAN 0.75m2. (NZS:4223)

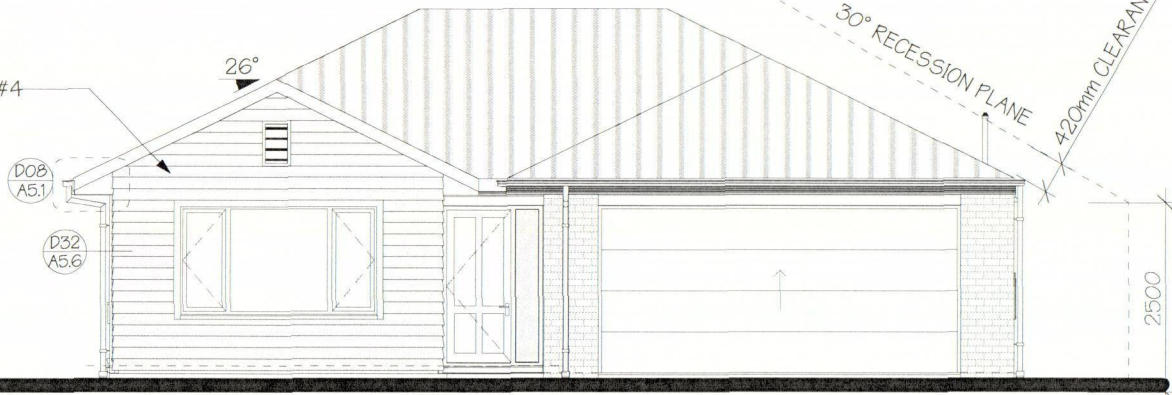
□ = SAFETY GLAZING.

•ALL DOORS AND ALL WINDOWS OVER 600mm TO BE FITTED WITH SUPPORT BARS. BARS & FITTING POSITION TO BE SUPPLIED BY ALUMINIUM SUPPLIER (9.1.10.5 v).

•S.S = SAFETY STAYS FITTED TO WINDOW.

RISK FACTOR	L	M	H	VH	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOFWALL INTERSECTION	0	1	3	5	0
EAVES WIDTH	0	1	2	5	1
ENVELOPE COMPLEXITY	0	1	3	6	1
DECK DESIGN	0	2	4	6	0
TOTAL RISK SCORE					3

See note #4



ELEVATION 4

Scale: 1:100

WINDOW SCHEDULE					
ID	MODEL	WIDTH mm	HEIGHT mm	GLAZED AREA sqm	VENTILATION AREA sqm
WC01	W110	2630 mm	1430 mm	2.91 sqm	1.52 sqm
WC02	W100	1000 mm	2000 mm	1.37 sqm	1.10 sqm
WC03	W100	1000 mm	2000 mm	1.44 sqm	1.16 sqm
WC04	W100	1000 mm	2000 mm	1.44 sqm	1.16 sqm
WC05	W18	1200 mm	1400 mm	1.11 sqm	1.47 sqm
WC06	W22	2000 mm	1400 mm	2.10 sqm	1.52 sqm
WC07	W15	2000 mm	600 mm	0.80 sqm	0.62 sqm
WC08	W2	800 mm	1100 mm	0.62 sqm	0.79 sqm
WC09	W20R	1600 mm	1400 mm	1.83 sqm	0.76 sqm
WC10	W3	1200 mm	1100 mm	0.99 sqm	0.59 sqm
WC11	W1	600 mm	1100 mm	0.43 sqm	0.58 sqm
WC12	W20	1600 mm	1400 mm	1.83 sqm	0.76 sqm

RISK FACTOR	L	M	H	VH	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOFWALL INTERSECTION	0	1	3	5	0
EAVES WIDTH	0	1	2	5	0
ENVELOPE COMPLEXITY	0	1	3	6	1
DECK DESIGN	0	2	4	6	0
TOTAL RISK SCORE					2

See note #2



ELEVATION 3

Scale: 1:100

See note #6

See note #3

See note #1

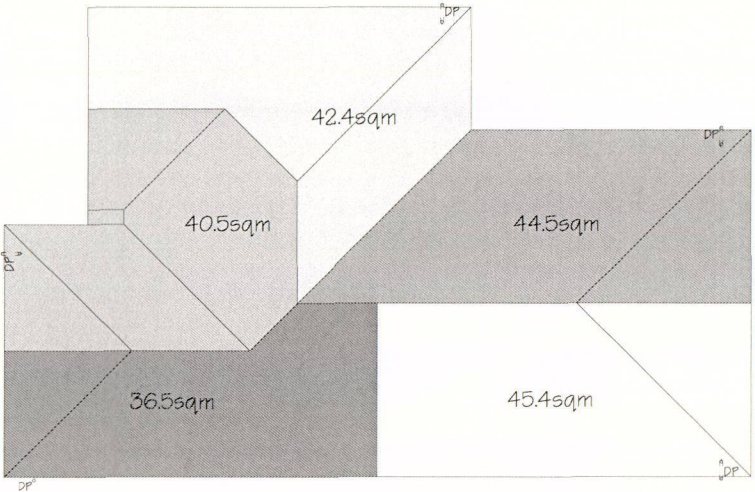
See note #5

- es
1. COLORSTEEL PLUMBDEK ROOFING ON H1.2 75x45 PURLINS @ 900 crs max WITH BUILDING PAPER.
 2. TRUSSES TO BE DESIGNED AND CERTIFIED BY APPROVED MANUFACTURER. TRUSSES @ 900 crs max
 3. SECTIONAL GARAGE DOOR & TRACKS
 4. GARAGE DOOR REBATE WITH SPONGE FINISH. REFER TO FOUNDATION PLAN FOR REBATE SIZE
 5. ENGINEERED FOUNDATION - REFER TO ATTACHED ENGINEERED DESIGN FOR DETAILS
 6. DOUBLE GLAZED POWDER COATED ALUMINIUM FRAMED WINDOWS & DOORS WITH H3.1 TIMBER REVEALS
 7. H1.2 90x45 SGB KILN DRIED LASER FRAME FRAMING. STUDS @ 400crs WITH THERMAKRAFT BUILDING WRAP. 2 ROWS OF DWANGS
 8. BRICK SILL @ 15°

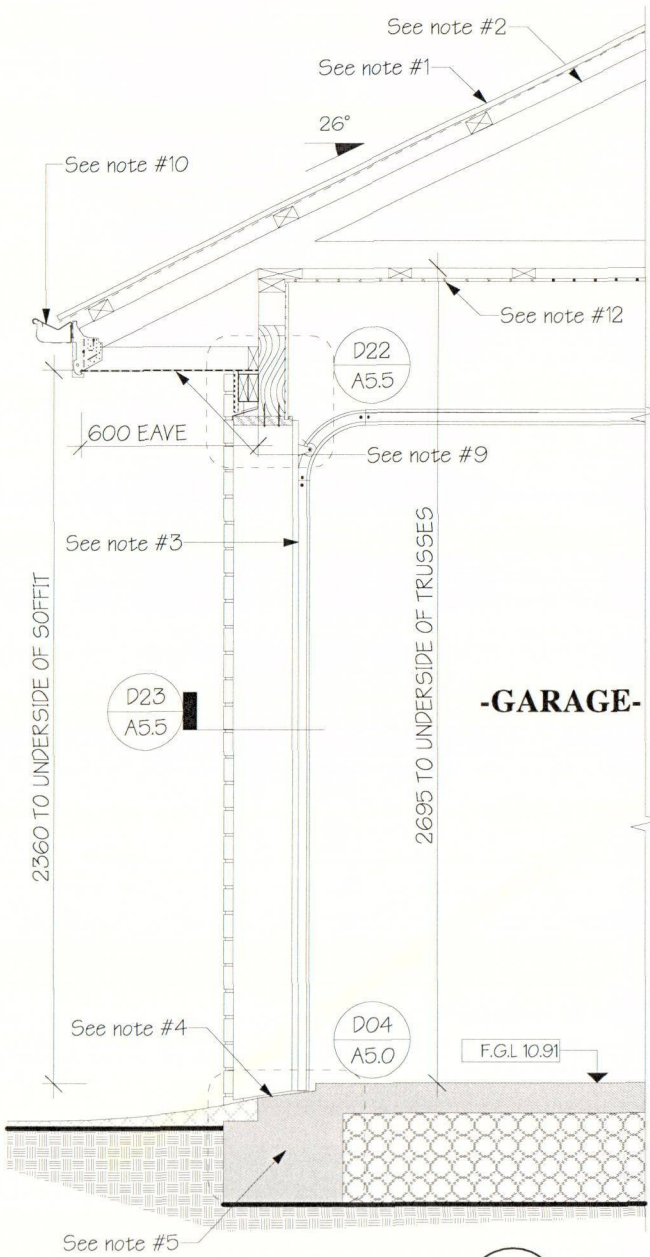
9. 4.5mm HARDIESOFFIT TO UNDERSIDE OF SOFFIT BEARER WITH PVC JOINTERS
10. COLORSTEEL GUTTER & FASCIA SYSTEM
11. 75x35 CEILING BATTENS @ 400crs
12. 10 mm GIBRALTER BOARD LINING TO WALLS. GLUE & SCREW FIX (FINISH TO LEVEL 4)
13. R 3.6 CEILING BATTS
14. R 2.6 ULTRA WALL BATTS
15. 140x35 CEILING PLATE
16. 70 SERIES CLAY BRICKS BRICK TIES @ - 400mm HORZ. MAX - 400mm crs VERTICALLY

NOTE:
-REFER TO A5-BUILT TRUSS DESIGN FOR TRUSS TO PLATE, PLATE TO STUD, AND LINTEL FIXINGS

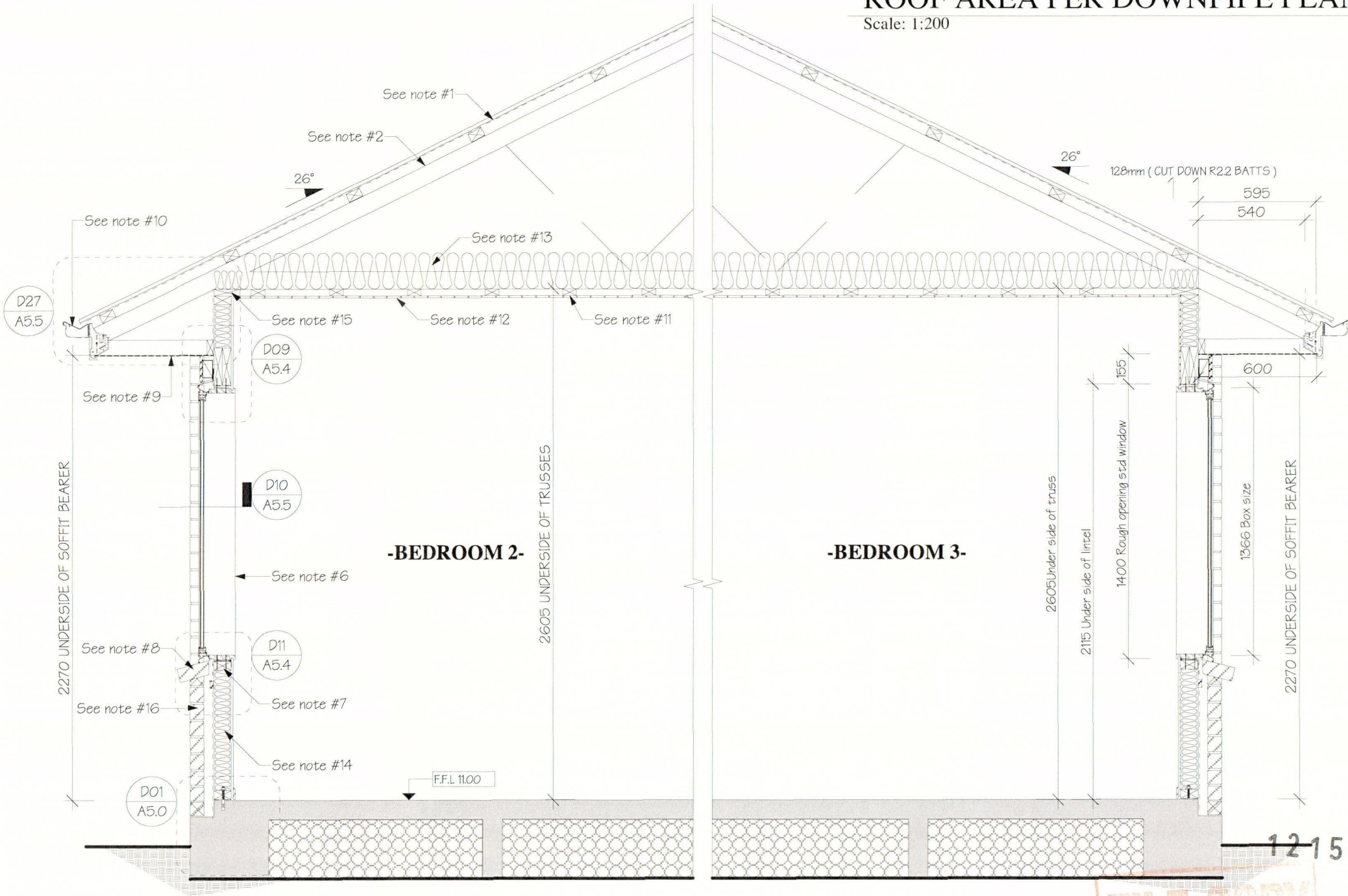
NOTE:
EACH 65MM DIA. ROUND UPVC DOWNPIPE TAKING A MAX. PLAN ROOF AREA OF 50SQM, WITH THE GUTTER TAKING A MAX. CROSS SECTIONAL AREA OF 7000SQM IN ACCORDANCE WITH E1/A51 TABLE 5 AND FIGURE 15.



ROOF AREA PER DOWNPIPE PLAN
Scale: 1:200



A - A CROSS SECTION
A2.4 GARAGE
Scale 1: 25



B - B CROSS SECTION
A2.4 STANDARD
Scale 1: 25

Notes

1. 4.5mm HARDIESOFFIT TO UNDERSIDE OF SOFFIT BEARER WITH PVC JOINTERS

2. H1.2 90x45 SG8 KILN DRIED LASER FRAME FRAMING. STUDS @ 400crs WITH THERMAKRAFT BUILDING WRAP. 2 ROWS OF DWANGS

3. R 2.6 ULTRA WALL BATTS

4. 75x35 CEILING BATTENS @ 400crs

5. DOUBLE GLAZED POWDER COATED ALUMINIUM FRAMED WINDOWS & DOORS WITH H3.1 TIMBER REVEALS

6. STEP TO BE A MAXIMUM OF 120mm (H); WITH ANTI-SLIP FINISH COMPLIANT WITH NZBC D1/AS1/ TABLE 2

7. SECTIONAL GARAGE DOOR & TRACKS

8. THERMAKRAFT BUILDING PAPER TO GABLE FRAMING TO FORM RIGID AIR BARRIER (NZBC ACCEPTABLE SOLUTION E2AS1 TABLE 23)

9. COLORSTEEL GUTTER & FASCIA SYSTEM
10. R 3.6 CEILING BATTS

11. TRUSSES TO BE DESIGNED AND CERTIFIED BY APPROVED MANUFACTURER. TRUSSES @ 900 crs max

12. 15mm GREY BUTYNOL OVER 17.5mm H3.2 CCA TREATED PLYWOOD ON TAPERED TIMBER FERRINGS TO CREATE 2° SLOPE ON H1.2 140x45 SOFFIT FRAMING @ 400crs MAX. PLY TO BE FIXED WITH 10 GAUGE x 50mm STAINLESS STEEL COUNTERSUNK HEAD SCREWS, AT 150mm CENTRES ON EDGES, AND 200MM IN THE BODY OF THE SHEET. ALLOW 3mm GAPS BETWEEN ALL SHEETS

13. 10 mm GIBRALTER BOARD LINING THROUGH-OUT BOTH. GLUE & SCREW FIX (FINISH TO LEVEL 4)

14. 140x35 CEILING PLATE

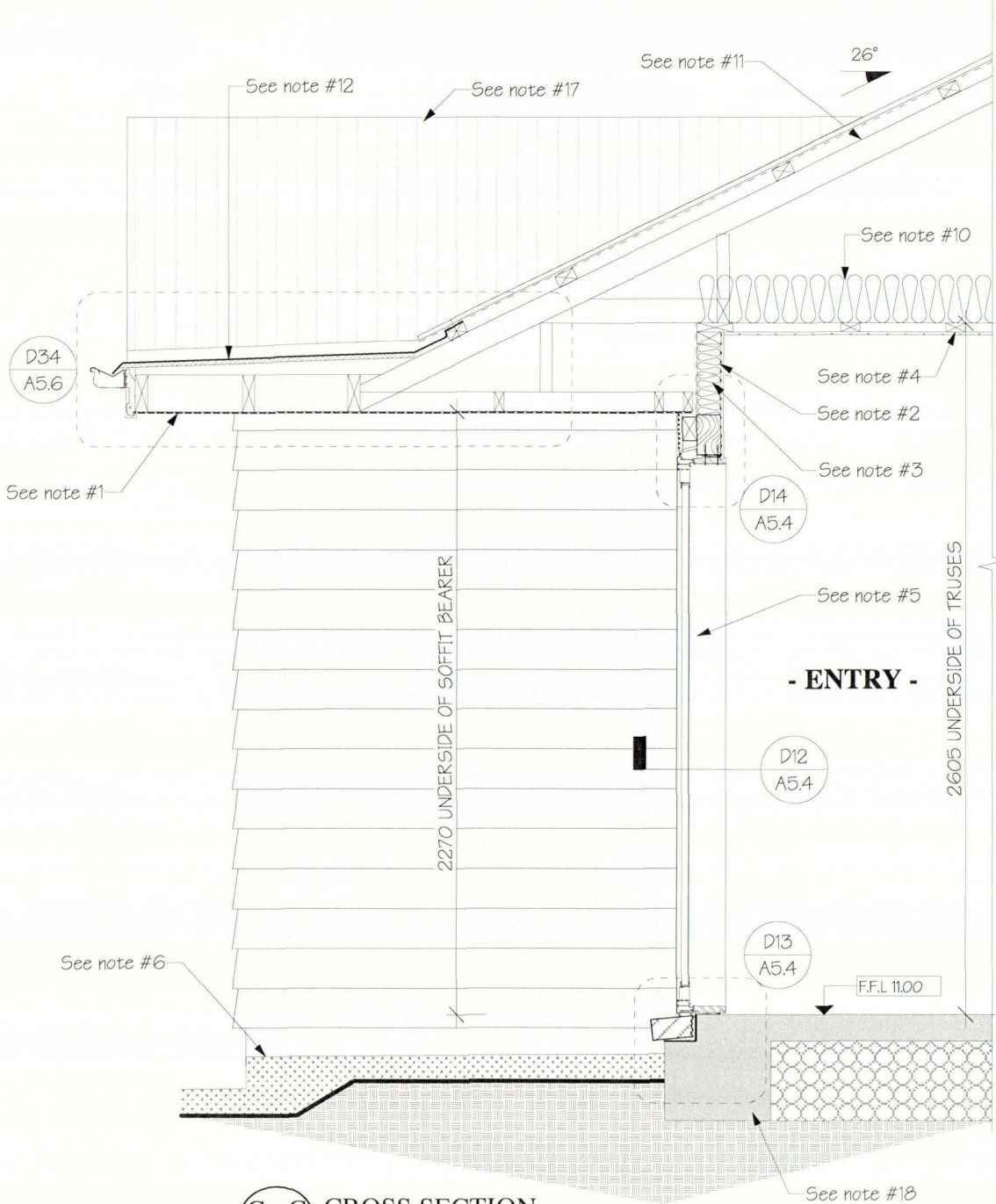
15. HARDIES LINEA WEATHERBOARDS (180mm) ON H3.1 20mm BATTENED CAVITY & BUILDING WRAP. CUT ENDS OF WEATHERBOARDS TO BE PRIMED. CAVITY TO FINISH WITH A UPVC VENT STRIP

16. 70 SERIES CLAY BRICKS BRICK TIES @ - 400mm HORZ. MAX - 400mm crs VERTICALLY

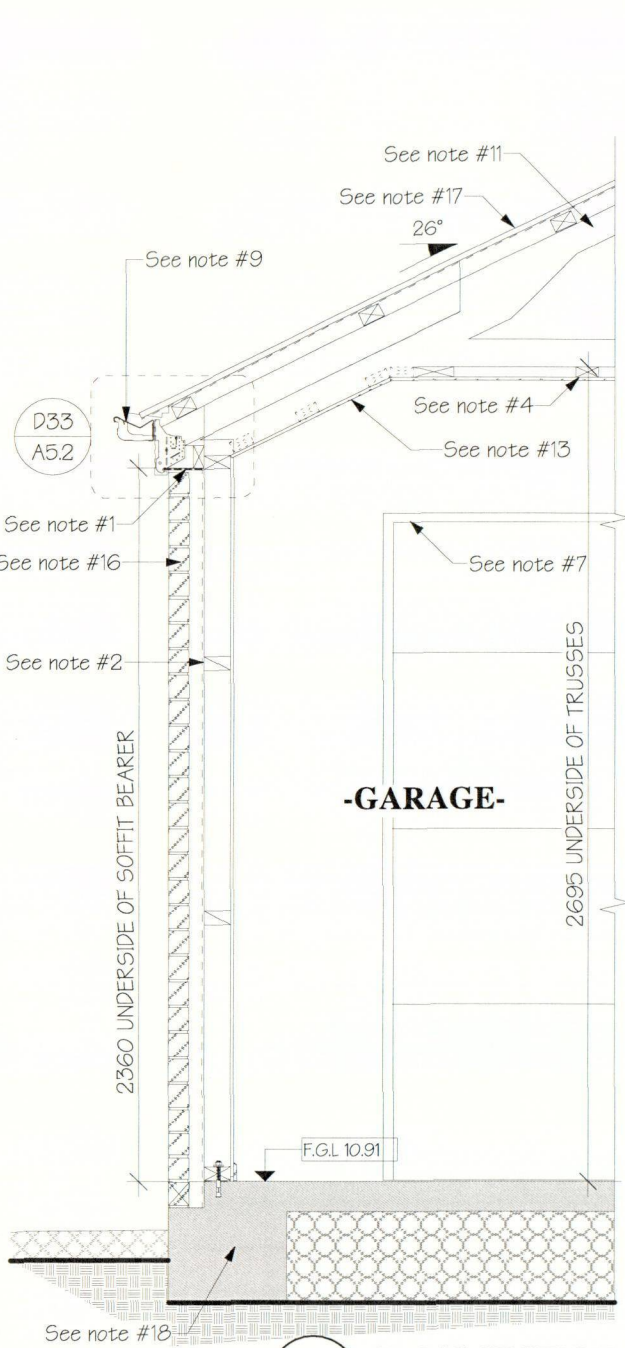
17. COLORSTEEL PLUMBDEK ROOFING ON H1.2 75x45 PURLINS @ 900 crs max WITH BUILDING PAPER.

18. ENGINEERED FOUNDATION - REFER TO ATTACHED ENGINEERED DESIGN FOR DETAILS

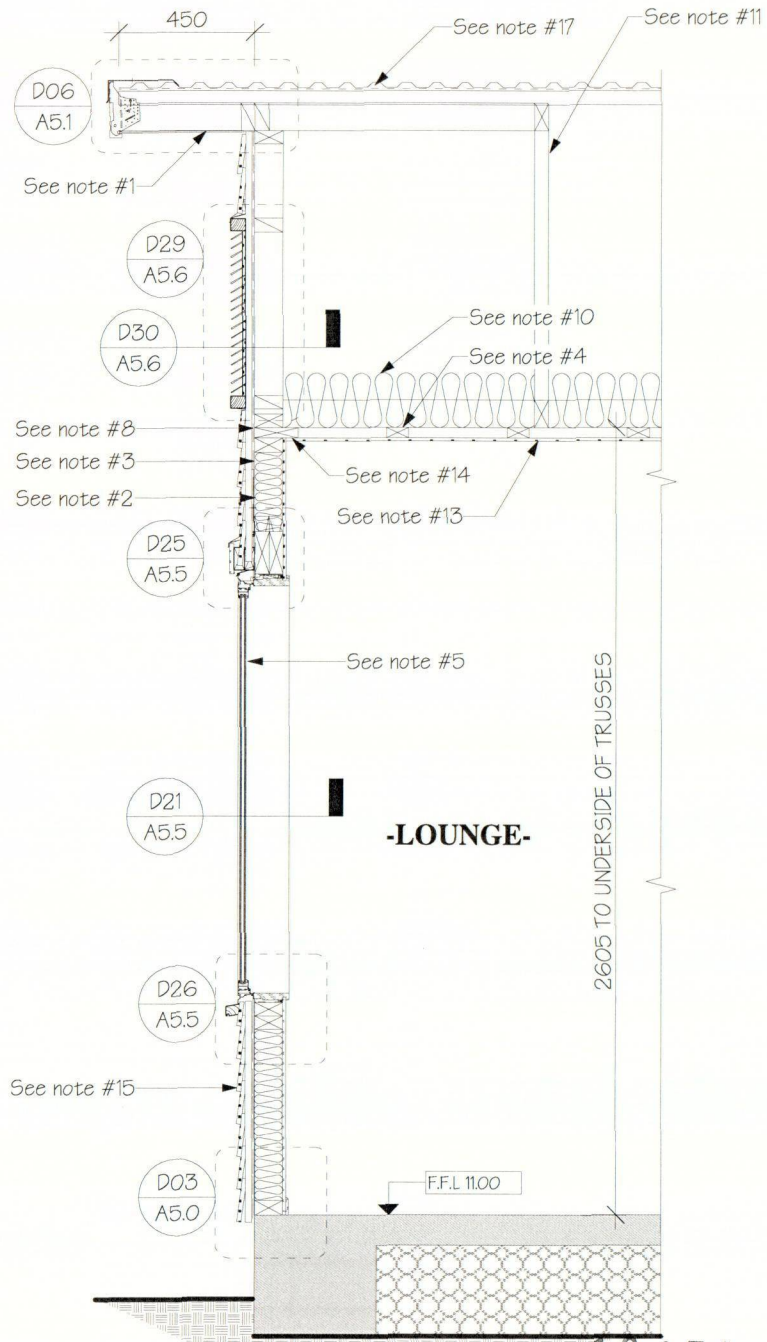
NOTE:
-REFER TO AS-BUILT TRUSS DESIGN FOR TRUSS TO PLATE, PLATE TO STUD, AND LINTEL FIXINGS



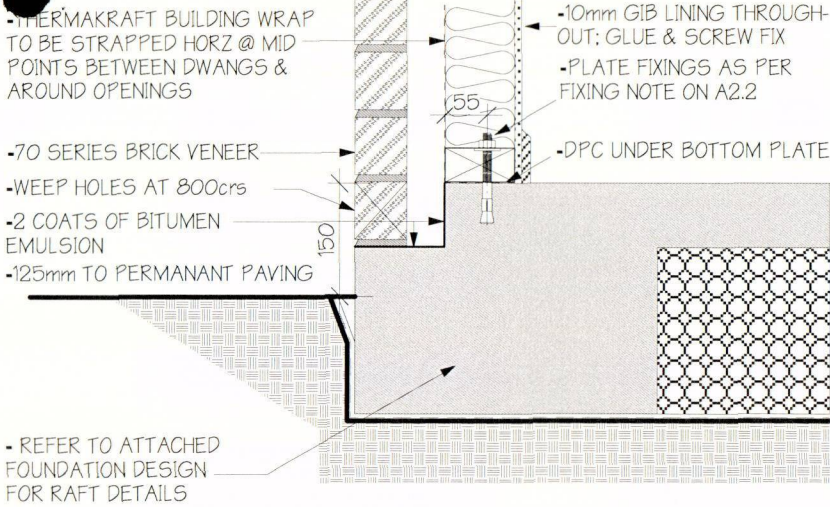
C - C CROSS SECTION
A2.4 ENTRY
Scale 1 : 25



D - D CROSS SECTION
A2.4 COVE TRUSS
Scale 1 : 25



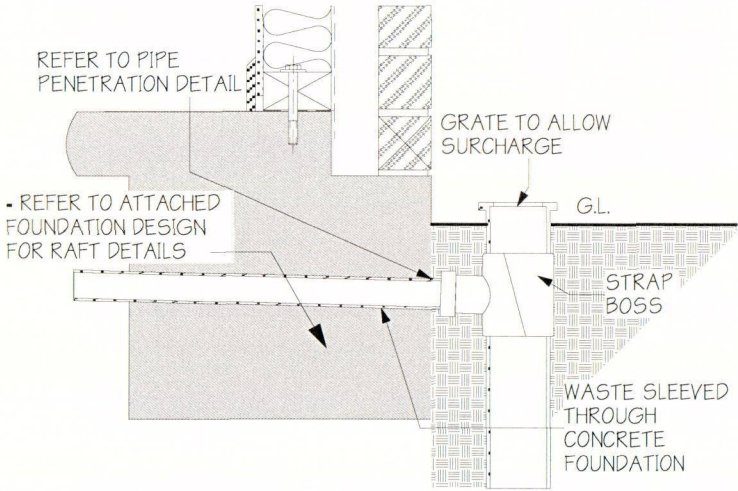
E - E CROSS SECTION
A2.4 GABLE END
Scale 1 : 25



D01
A4.0

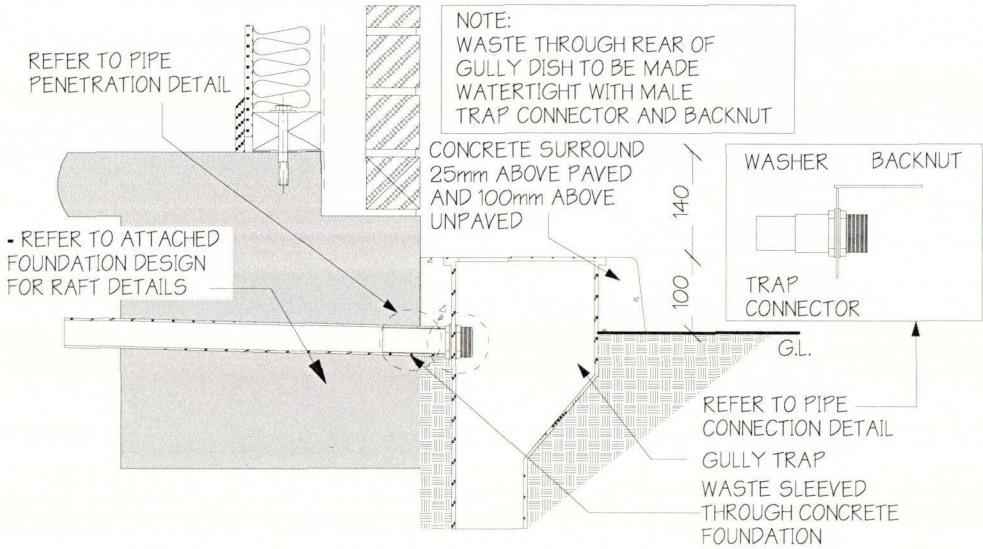
BRICK VENEER FOUNDATION*

Scale: 1:10



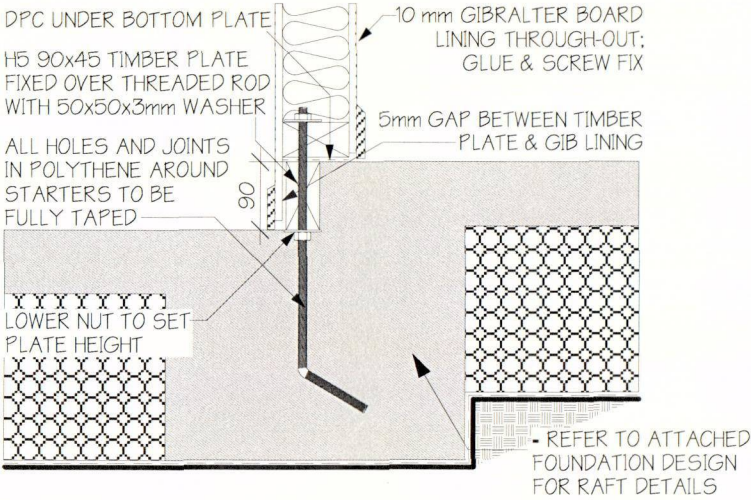
**WASTE DISCHARGING *
TO SINGLE GULLY**

Scale: 1:10



WASTE DISCHARGING TO REAR OF GULLY*

Scale: 1:10

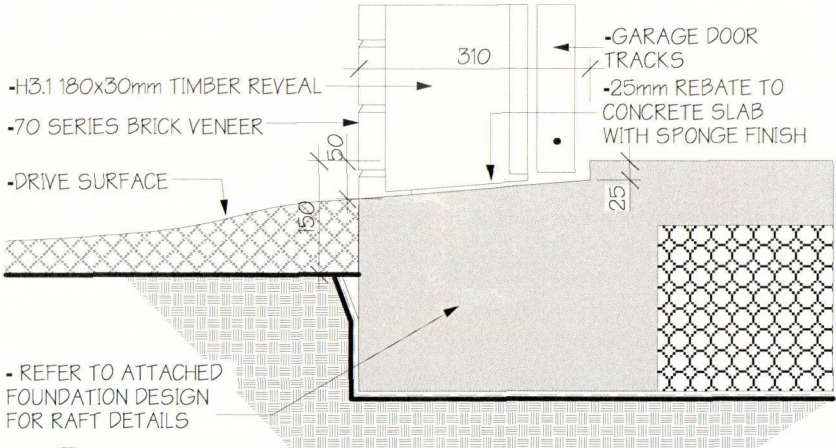


D02
A2.1

STEP FOUNDATION *

Scale: 1:10

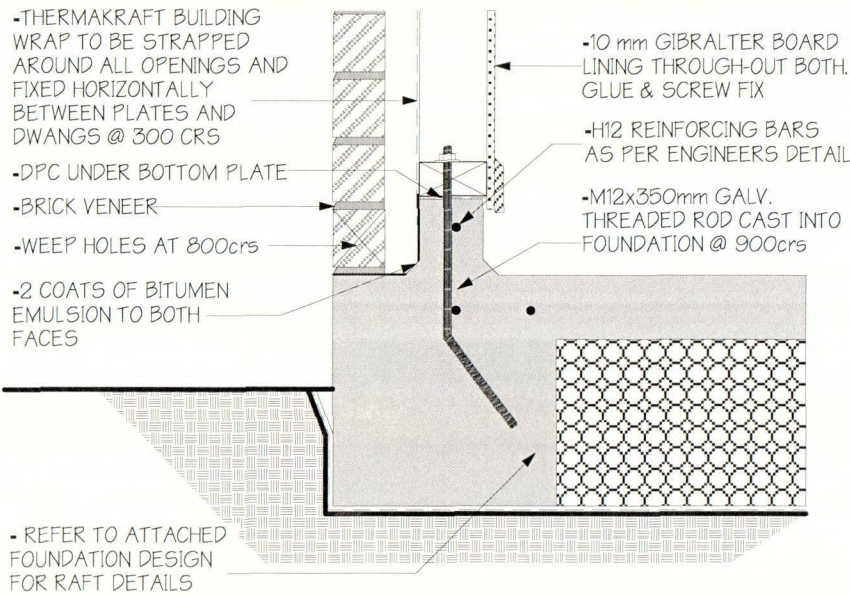
Note: THREADED ROD POSITION WILL VARY DEPENDING ON BRACING. CHECK BRACING PLAN BEFORE PLACING



D04
A4.0

GARAGE DOOR REBATE *

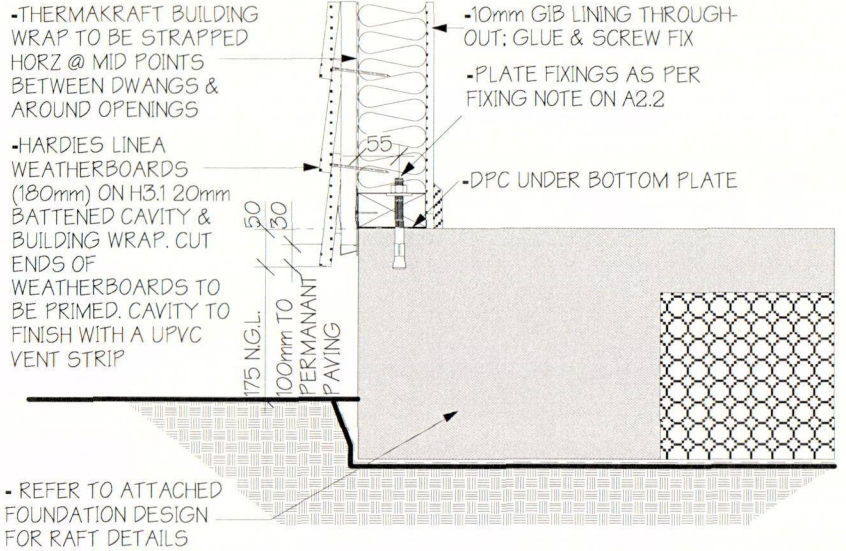
Scale: 1:10



D05
A2.1

BRICK VENEER NIB

Scale: 1:10



D03
A4.1

LINEA FOUNDATION

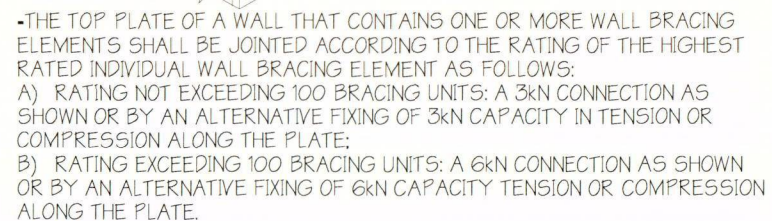
Scale: 1:10



Scale: 1:10



Scale: 1:10



TOP PLATE CONNECTIONS

Scale: N / A



Scale: 1:10



Scale: 1:10



PANEL HOLD DOWN: INTERNAL / EXTERNAL WALL

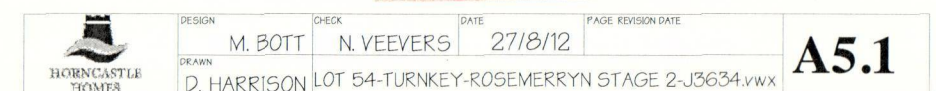
Scale: N / A

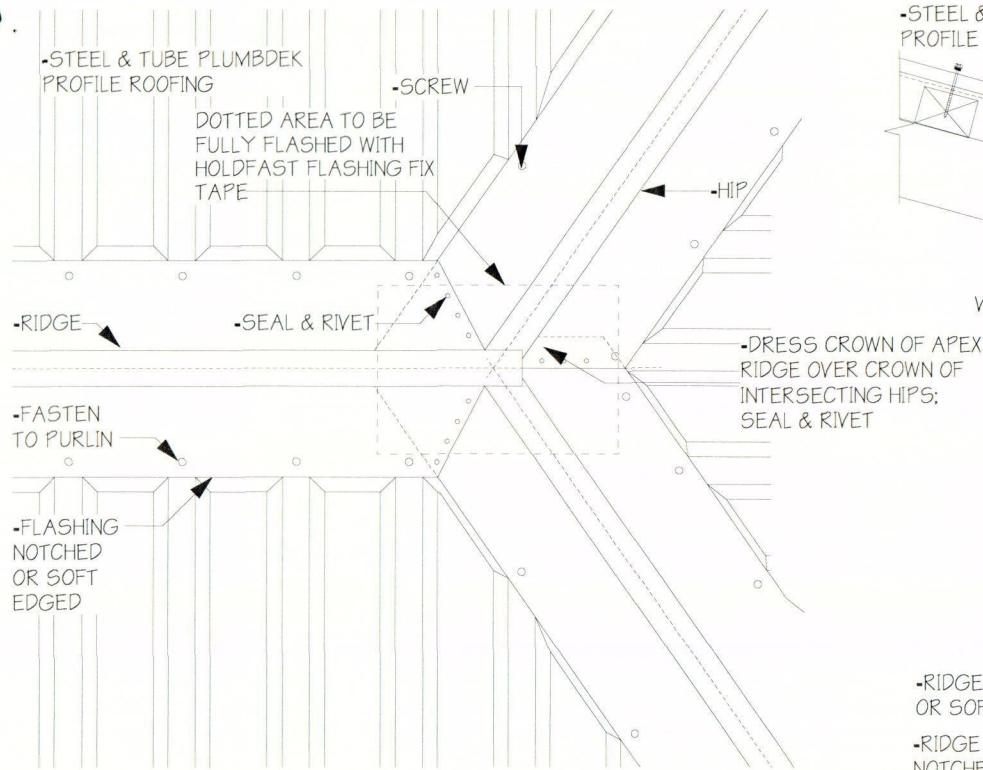


Scale: 1:10



Scale: 1:10

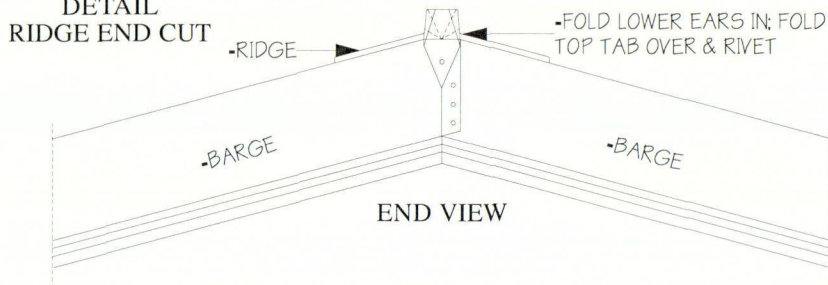
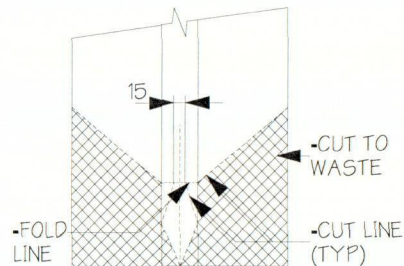
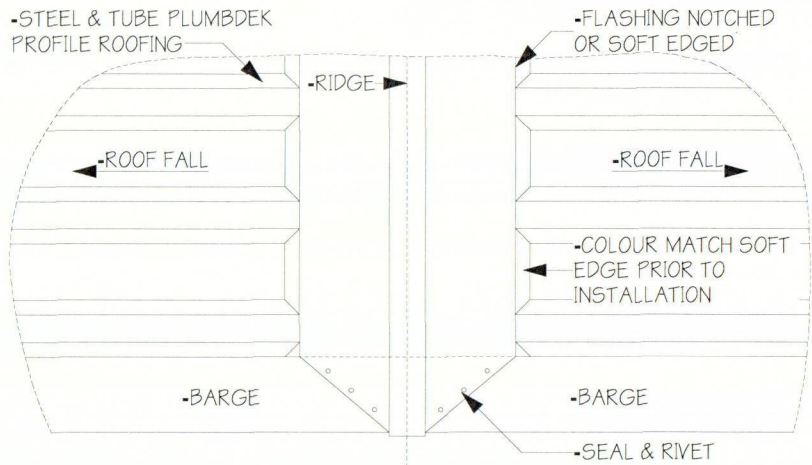




NOTE: SOFT EDGED FLASHINGS TO BE COLOUR MATCHED PRIOR TO INSTALLATION

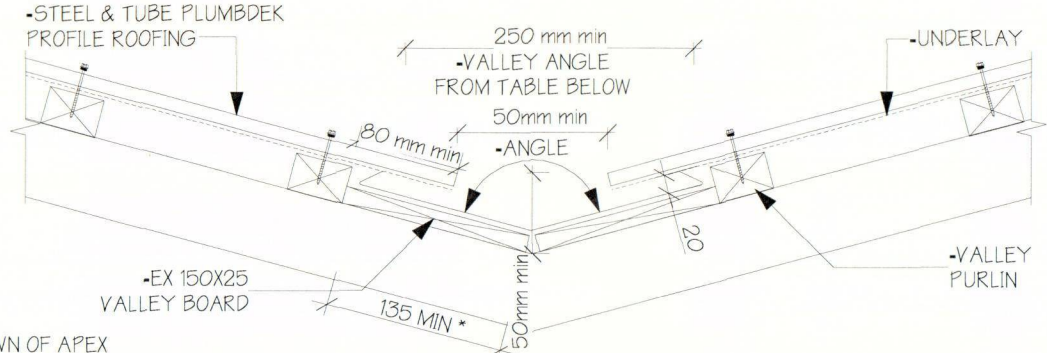
LONGRUN PLUMBDEK HIP

Scale: 1:10



LONGRUN PLUMBDEK RIDGE END

Scale: 1:10



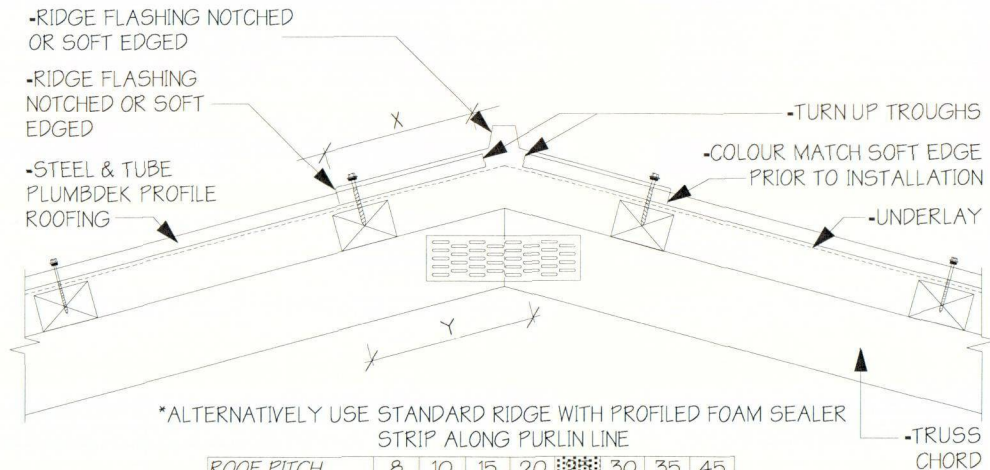
VALLEY ANGLES & CATCHMENTS

ROOF PITCH	<8	8	10	15	20	25	30	35	45
VALLEY ANGLE VARIES		169	166	159	152	143	139	132	120
MAX CATCHMENT	*	20m2	26m2	27m2	35m2	43m2	52m2	63m2	75m2

*FOR DEGREES BELOW 8° & LARGER CATCHMENTS; DESIGN AS INTERNAL GUTTER IN ACCORDANCE WITH E1/AS1, FIGURE 16

LONGRUN PLUMBDEK VALLEY

Scale: 1:10



*ALTERNATIVELY USE STANDARD RIDGE WITH PROFILED FOAM SEALER STRIP ALONG PURLIN LINE

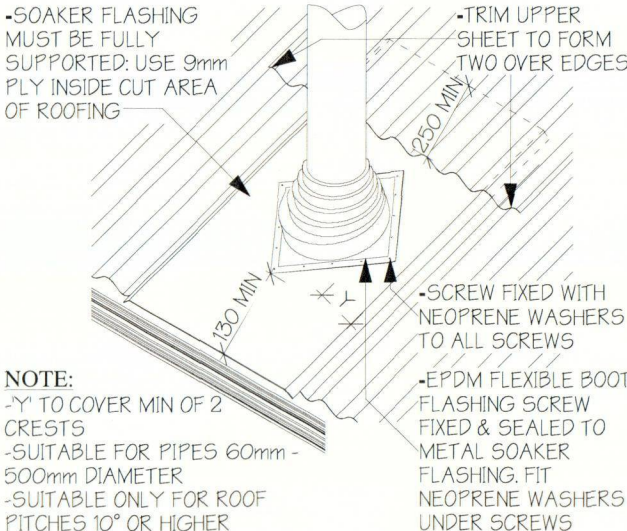
ROOF PITCH	8	10	15	20	25	30	35	45
DIMENSION X mm	168	167	162	156	143	134	115	
DIMENSION Y mm	218	217	212	206	193	184	165	

X = LOW / MEDIUM / HIGH WIND ZONES WHERE PITCH > 10°
Y = ALL WIND ZONES WHERE PITCH < 10°

FOR STANDARD RIDGE USING EX 50mm PURLINS ON FLAT

LONGRUN PLUMBDEK RIDGE

Scale: 1:10



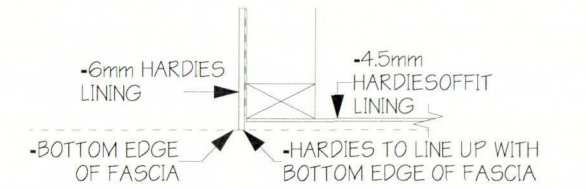
NOTE:

-Y TO COVER MIN OF 2 CRESTS
-SUITABLE FOR PIPES 60mm - 500mm DIAMETER
-SUITABLE ONLY FOR ROOF PITCHES 10° OR HIGHER

FLASHING FOR SMALL PIPES

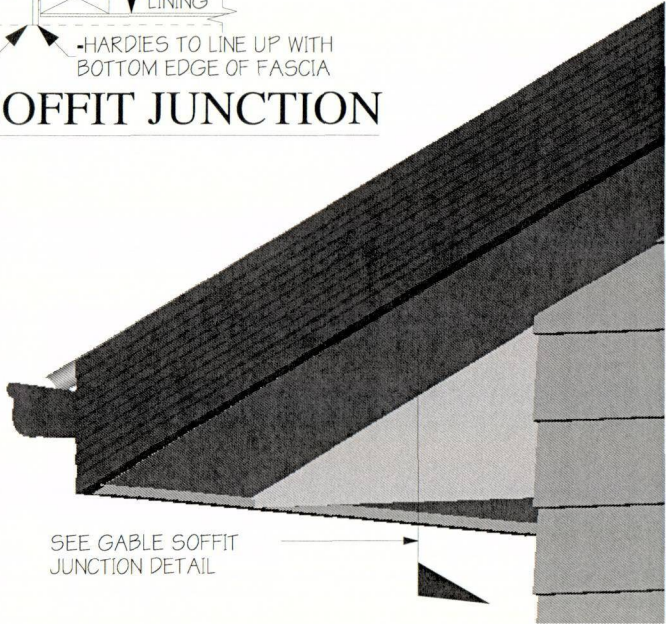
Scale: 1:10

D07
A3.0



GABLE SOFFIT JUNCTION

Scale: 1:10

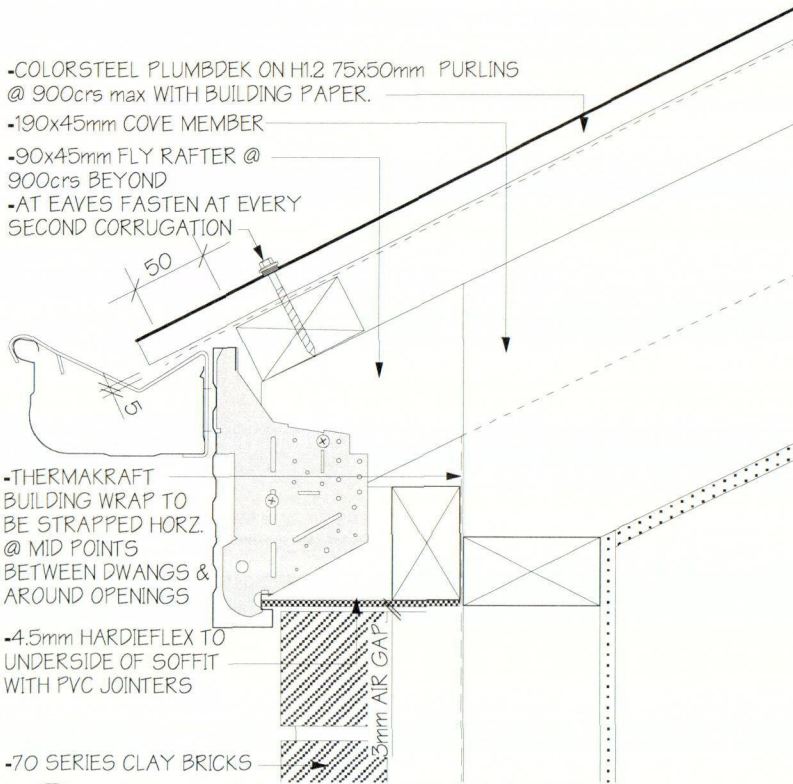


SEE GABLE SOFFIT JUNCTION DETAIL

3D GABLE DETAIL

Scale: 1:10

D08
A3.0

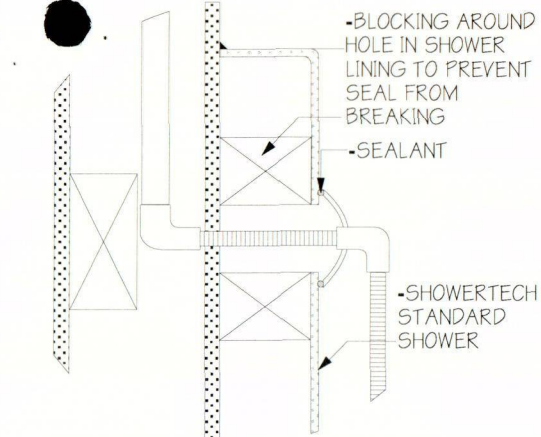


BRICK TO COVE MEMBER

Scale: 1:5

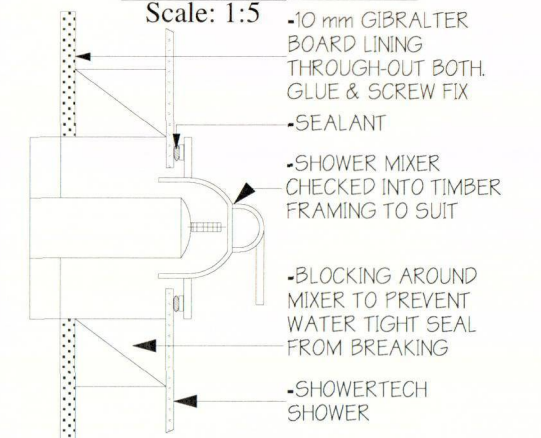
D33
A4.1

121562
FILE COPY



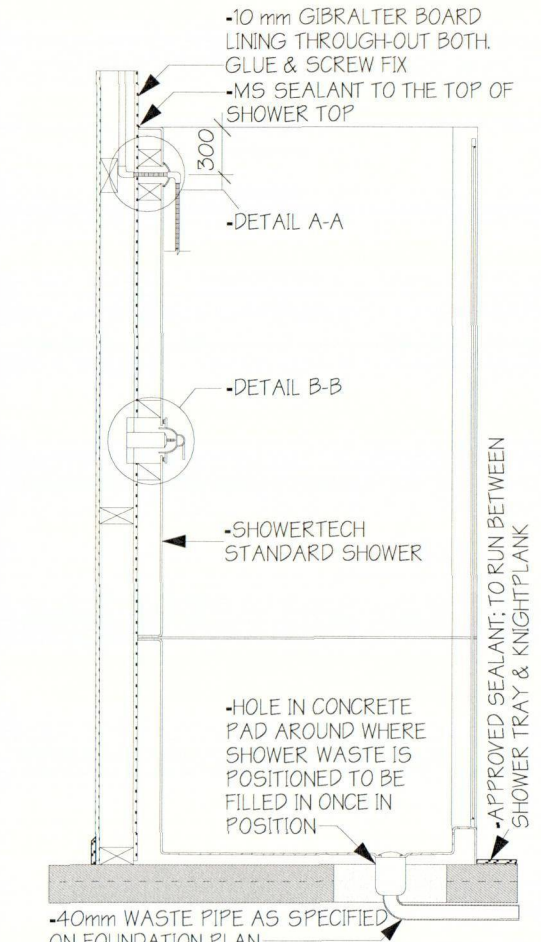
DETAIL A-A

Scale: 1:5



DETAIL B-B

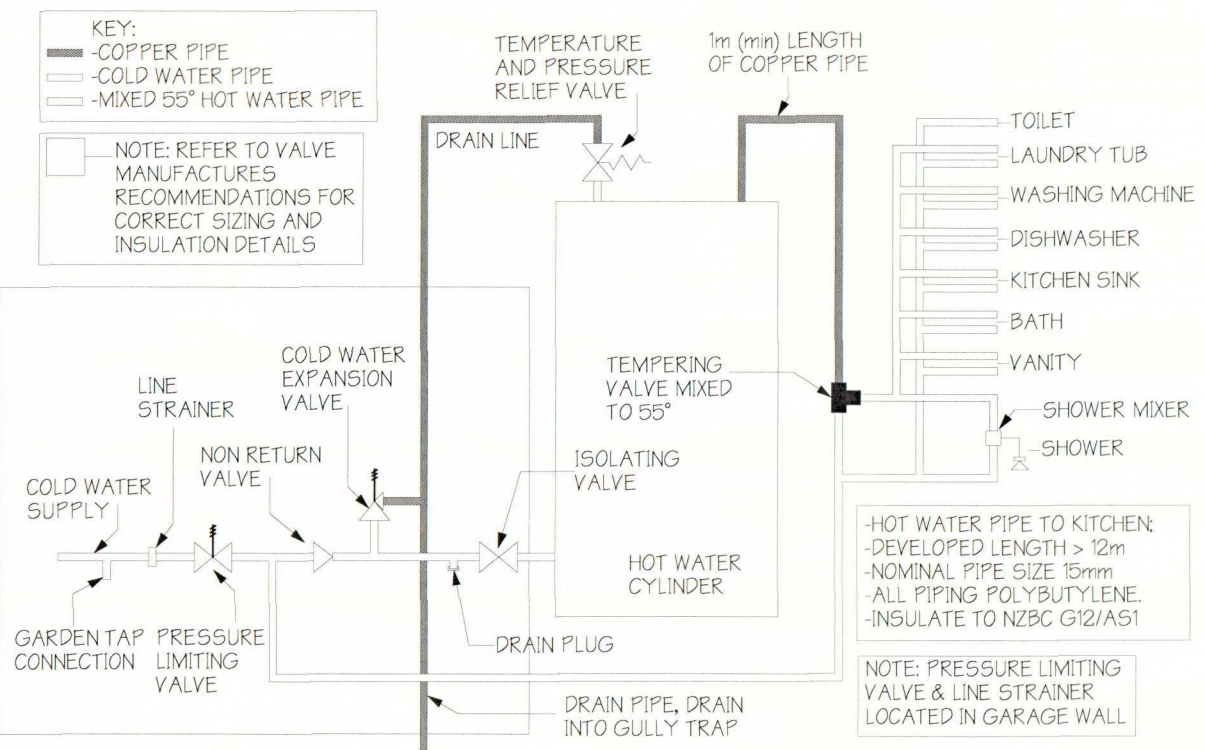
Scale: 1:5



SHOWER CROSS SECTION

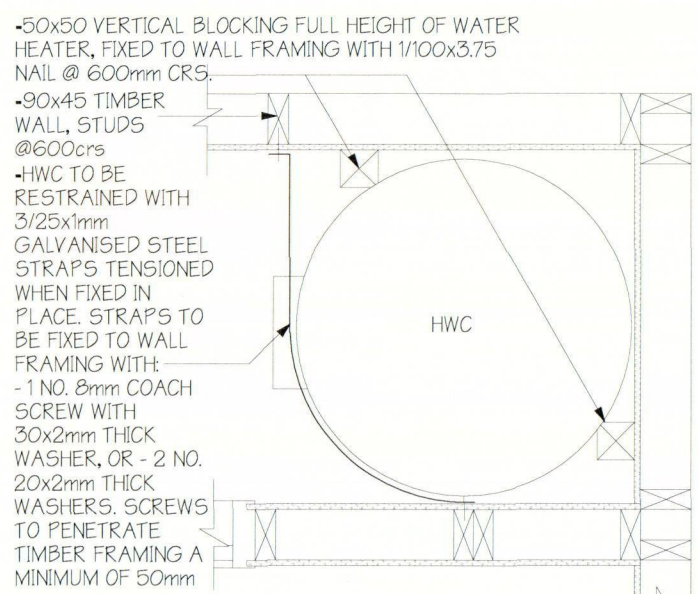
Scale: 1:20

HORNCastle HOMES LTD.



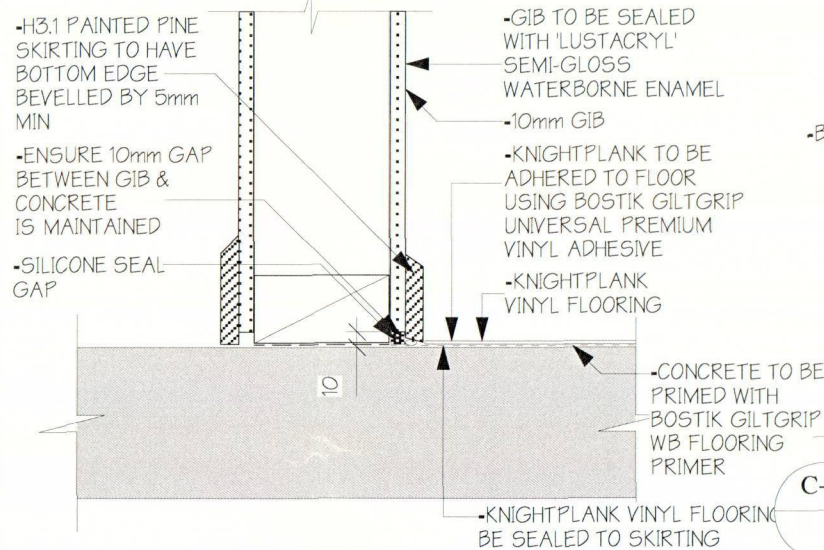
TYPICAL MAINS PRESSURE INSTALLATION

Scale: 1:20



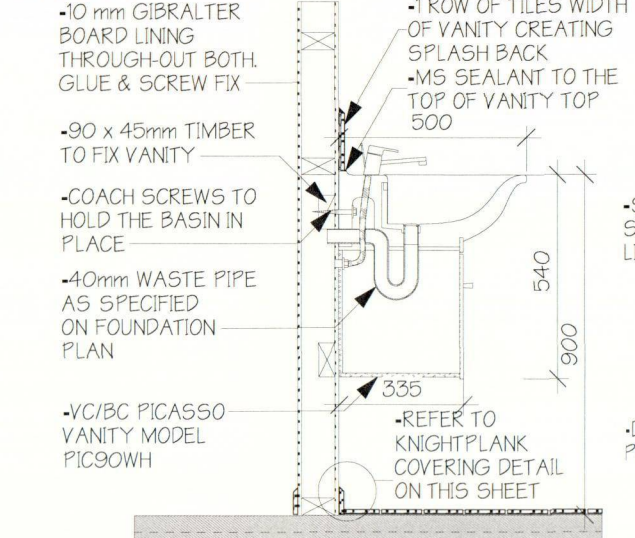
H.W.C. RESTRAINT

Scale: 1:10



KNIGHT PLANK TO WALL JOINT

Scale: 1:5

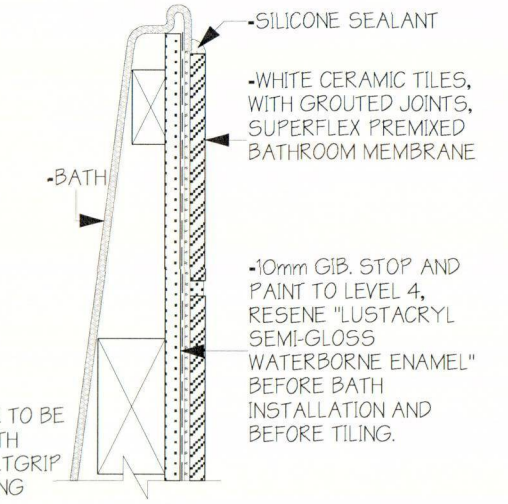


VANITY CROSS SECTION

Scale: 1:20

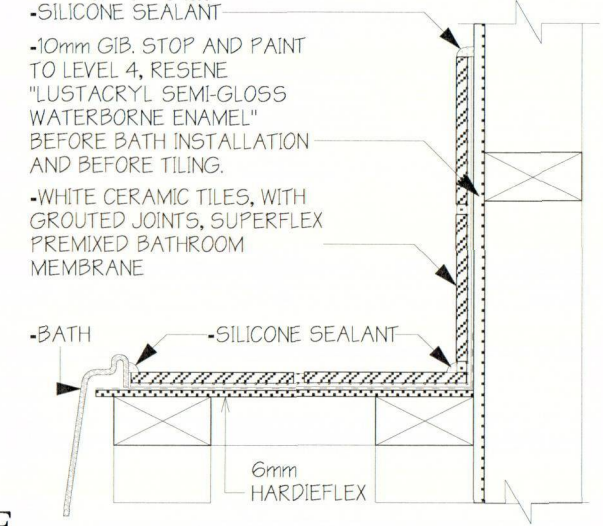


BATH TANKING



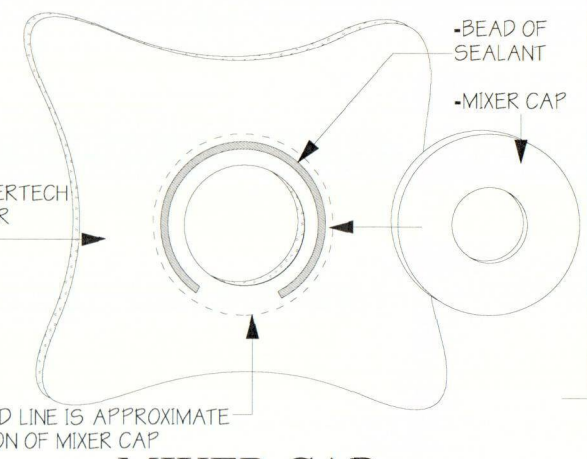
BATH TILE EDGE

Scale: 1:5



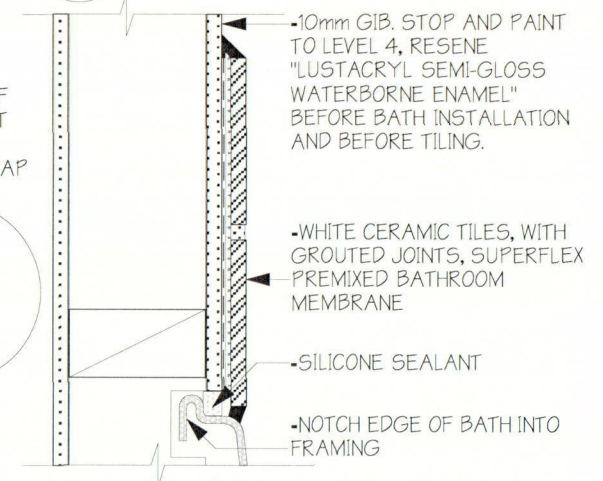
END OF BATH

Scale: 1:5



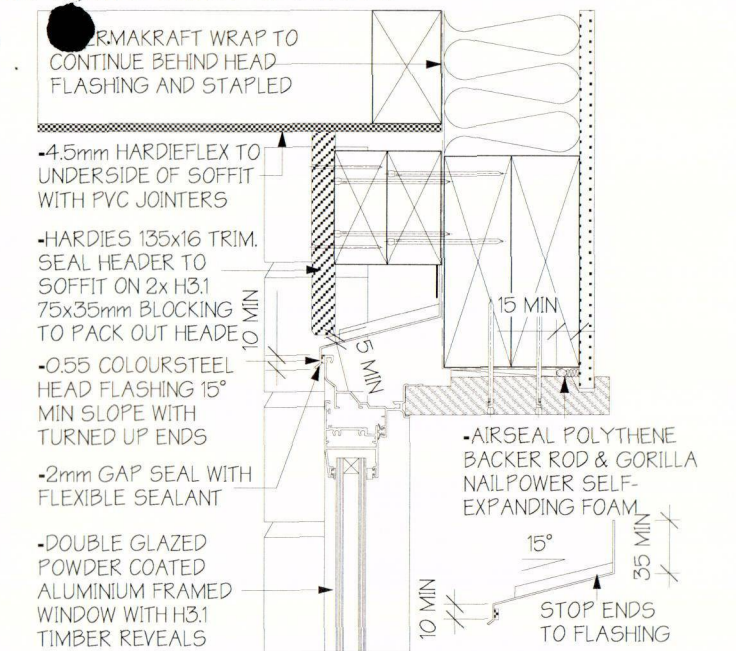
MIXER CAP

Scale: 1:5



BATH TO WALL JUNCTION

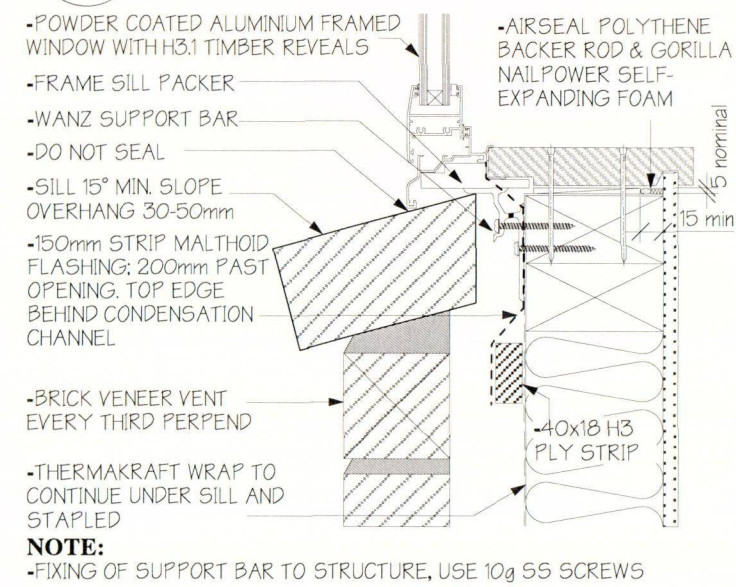
Scale: 1:5



D09
A4.0

WINDOW HEAD*

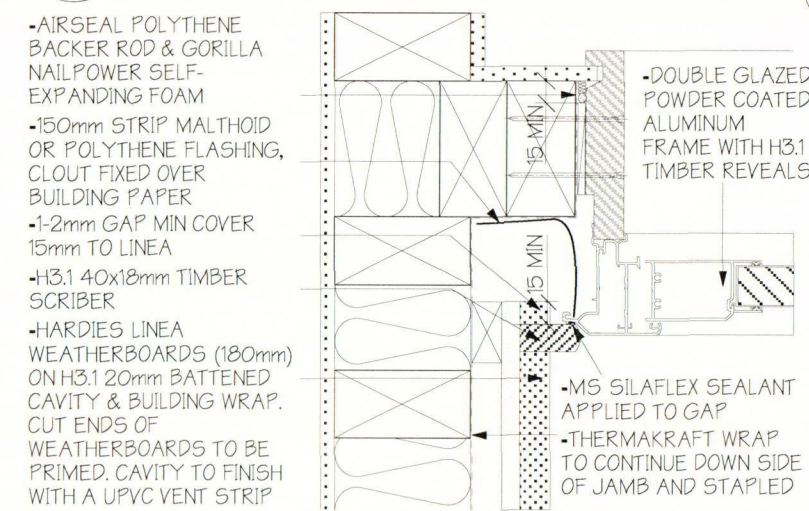
Scale: 1:5



D11
A4.0

BRICK WINDOW SILL*

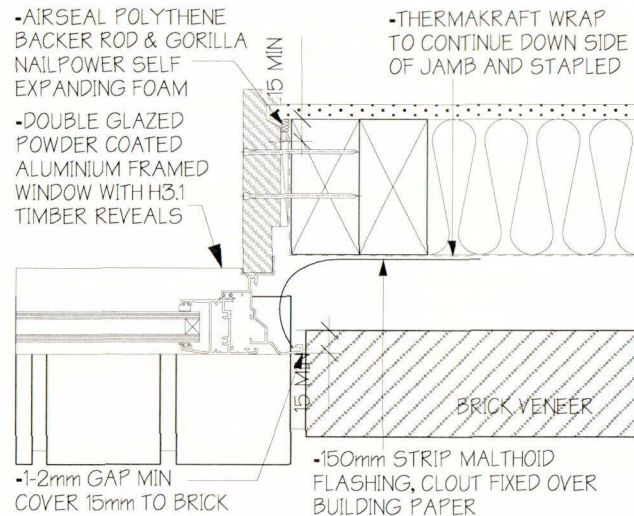
Scale: 1:5



D12
A4.1

ENTRY DOOR JAMB

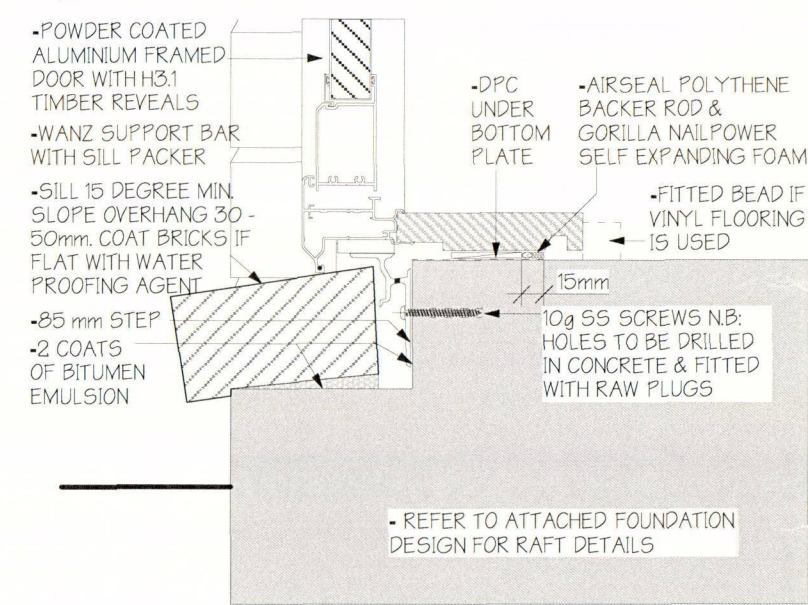
Scale: 1:5



D10
A4.0

WINDOW JAMB*

Scale: 1:5



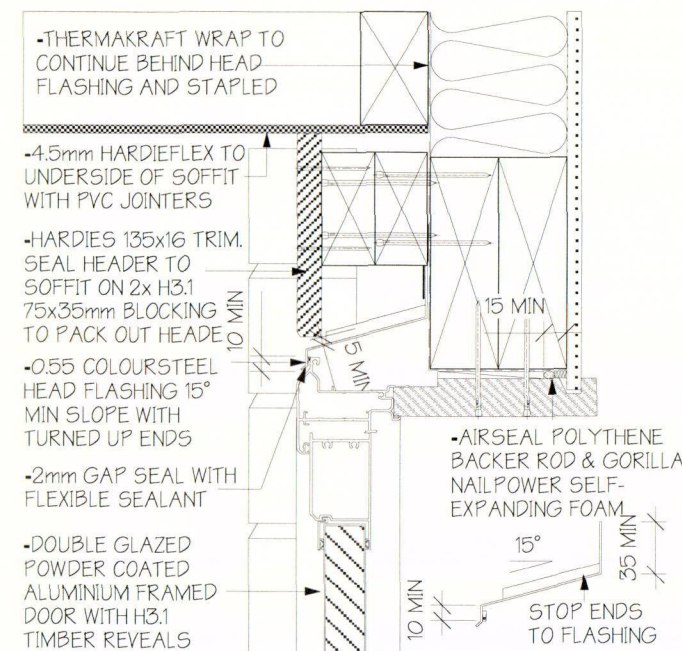
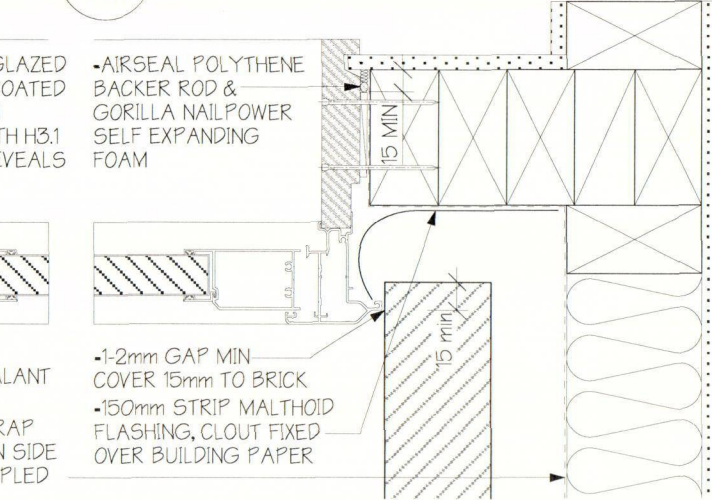
NOTE:

- IF FLOOR COVERING IS VINYL USE SUPPLIED BEADING
- IF BRICK IS TO BE SLOPED FURTHER EITHER INCREASE THE DEPTH OF THE STEP OR REDUCE THE THICKNESS OF THE BRICK
- FIXING OF SUPPORT BAR TO STRUCTURE, USE 10g SS SCREWS IN RAW PLUGS
- BRICKS ARE TO BE SEALED IF SLOPE IS LESS THAN 15°

D13
A4.1

ENTRY DOOR SILL*

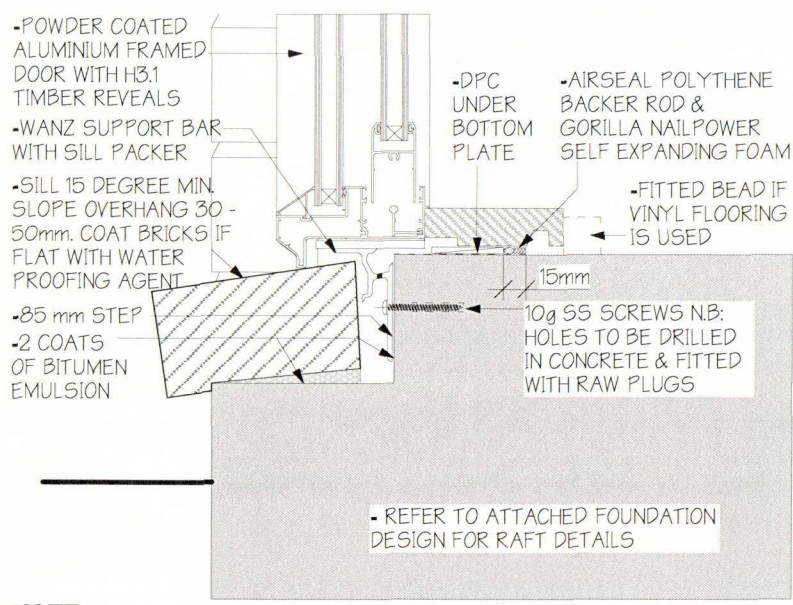
Scale: 1:5



D14
A4.1

ENTRY DOOR HEAD*

Scale: 1:5



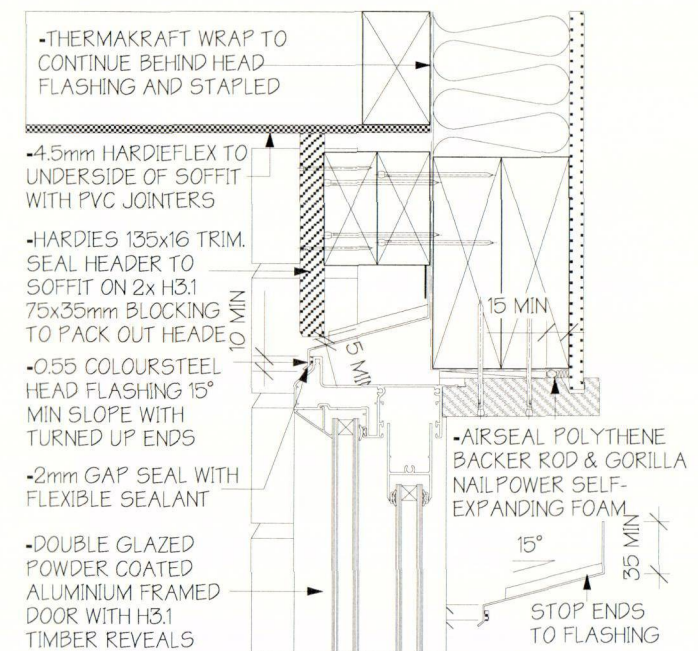
NOTE:

- IF FLOOR COVERING IS VINYL USE SUPPLIED BEADING
- IF BRICK IS TO BE SLOPED FURTHER EITHER INCREASE THE DEPTH OF THE STEP OR REDUCE THE THICKNESS OF THE BRICK
- FIXING OF SUPPORT BAR TO STRUCTURE, USE 10g SS SCREWS IN RAW PLUGS
- BRICKS ARE TO BE SEALED IF SLOPE IS LESS THAN 15°

D15
A3.0

SLIDING DOOR SILL*

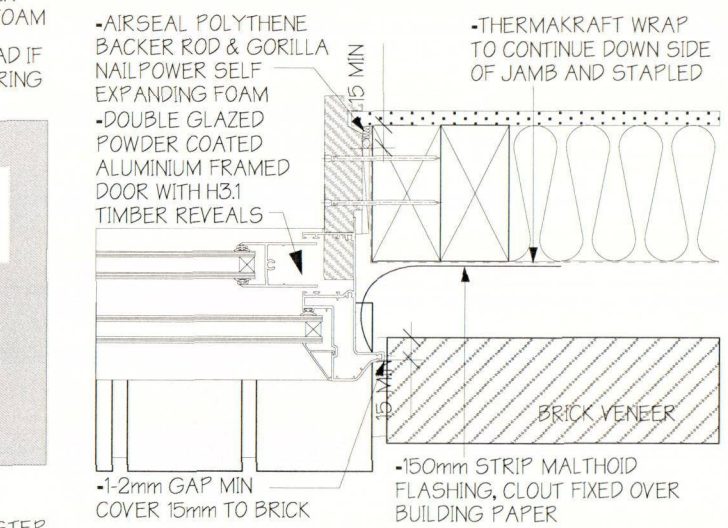
Scale: 1:5



D16
A3.0

SLIDING DOOR HEAD*

Scale: 1:5

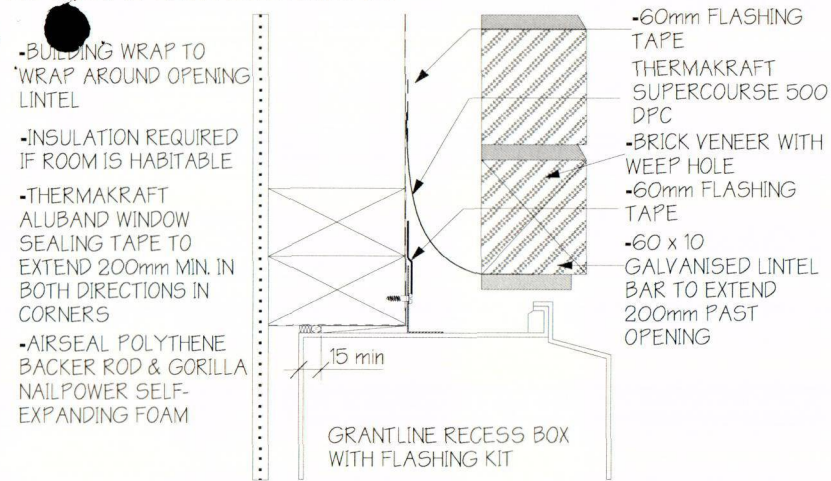


D17
A3.0

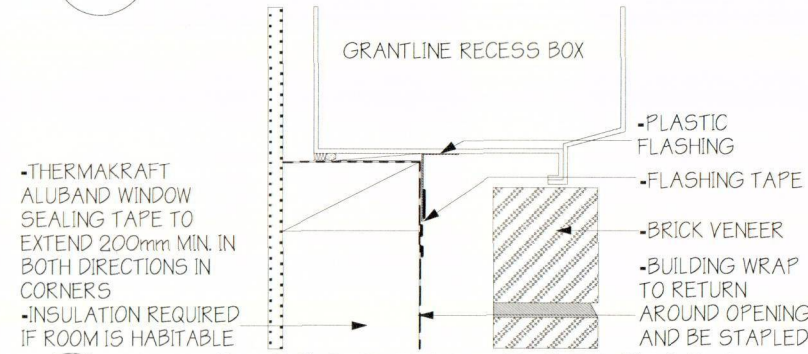
SLIDING DOOR JAMB*

Scale: 1:5

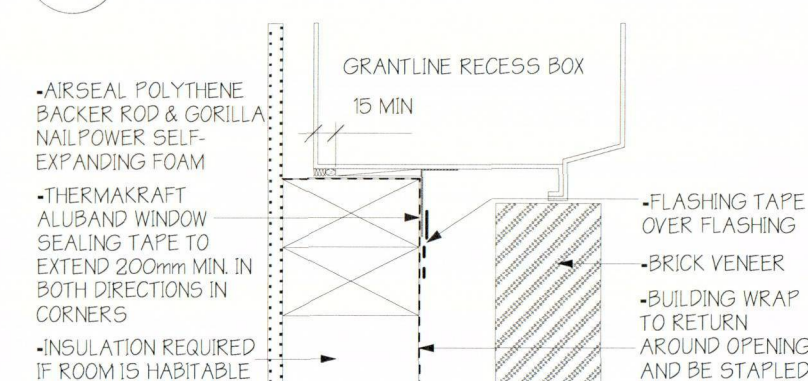
FILE COPY 121562



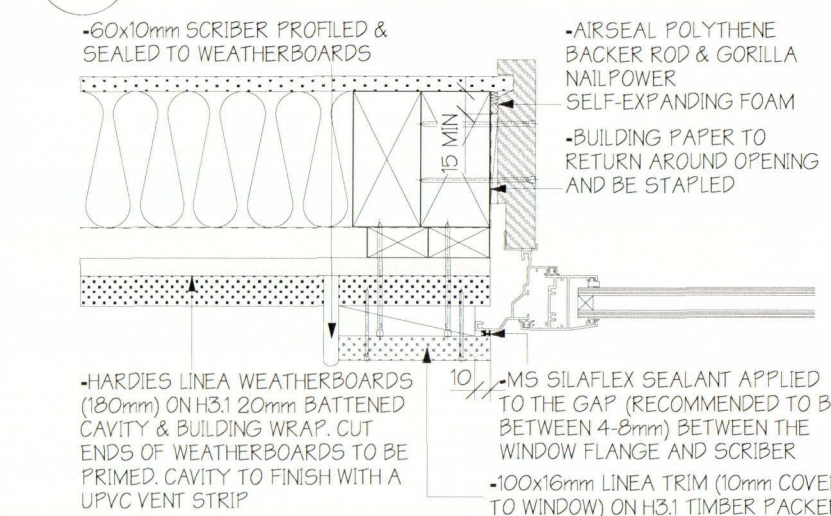
D18
A3.0
RECESS METER BOX HEAD*
Scale: 1:5



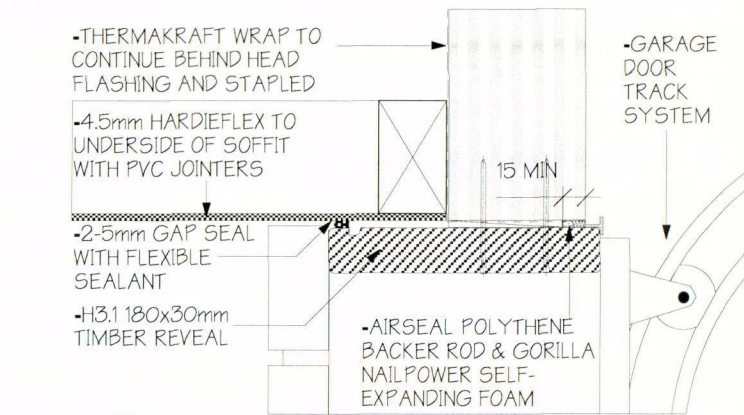
D19
A3.0
RECESS METER BOX SILL*
Scale: 1:5



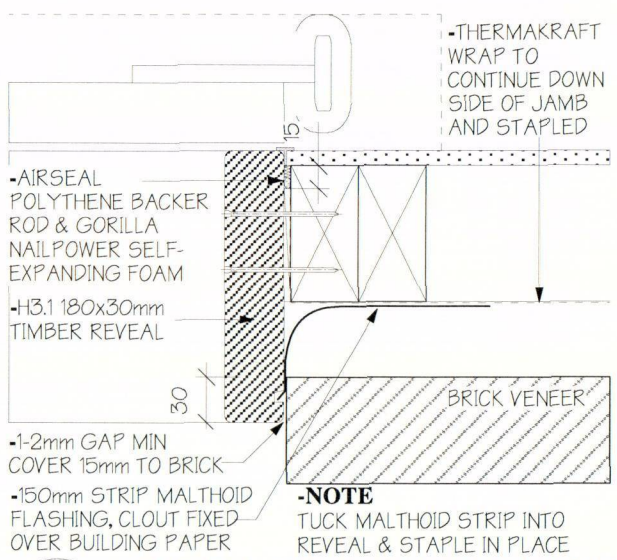
D20
A3.0
RECESS METER BOX JAMB*
Scale: 1:5



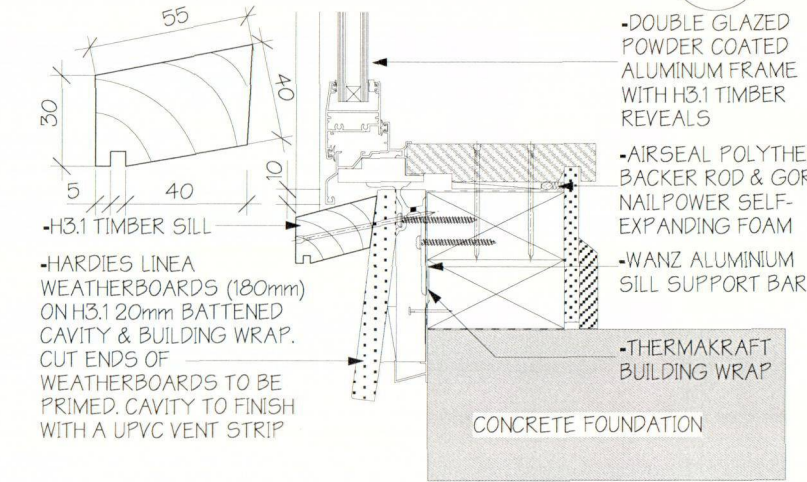
D21
A4.1
LINEA WINDOW JAMB*
Scale: 1:5



D22
A4.0
GARAGE DOOR HEAD
Scale: 1:5

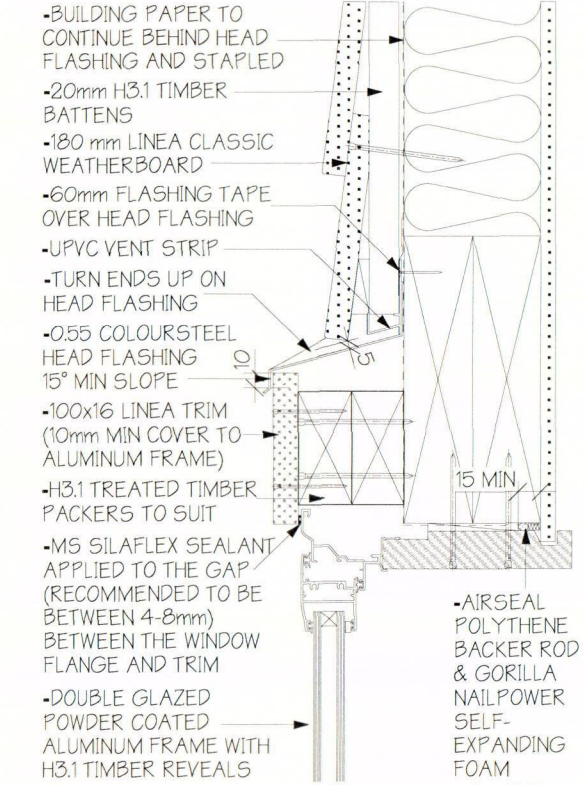


D23
A4.0
GARAGE DOOR JAMB
Scale: 1:5

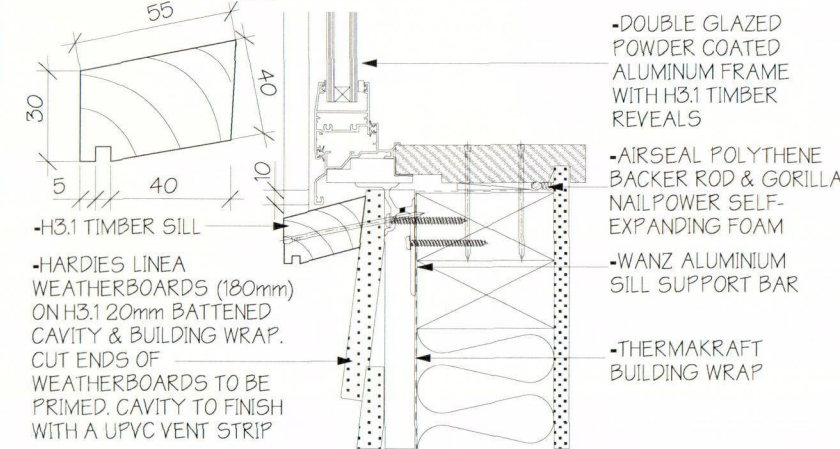


N.B: FIXING OF SUPPORT BAR ONLY REQUIRED AT 'GLAZING BLOCK POINTS' ATTACHED TO STRUCTURE USING 2x10g SS SCREWS

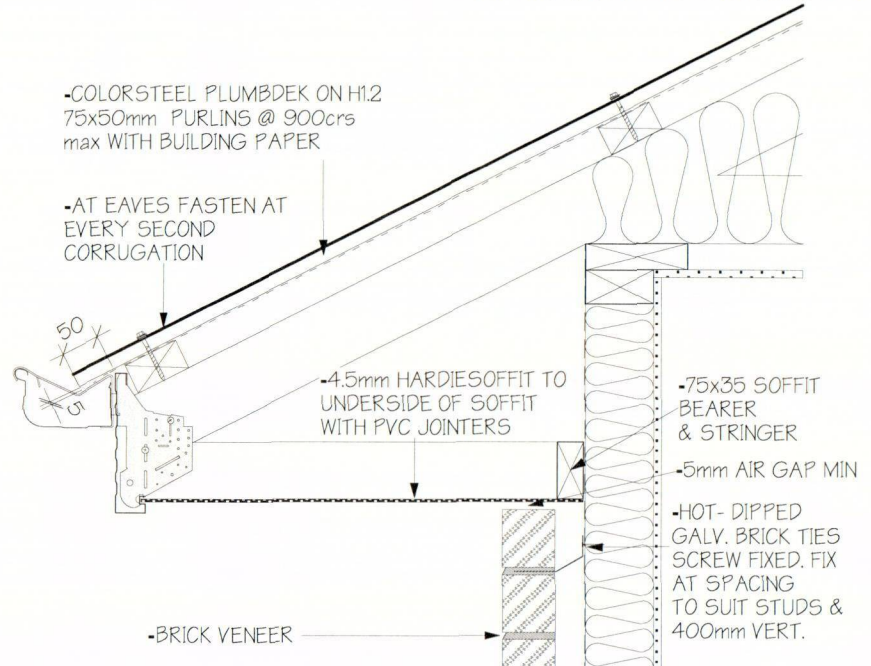
D24
A3.0
LINEA WINDOW SILL
Scale: 1:5



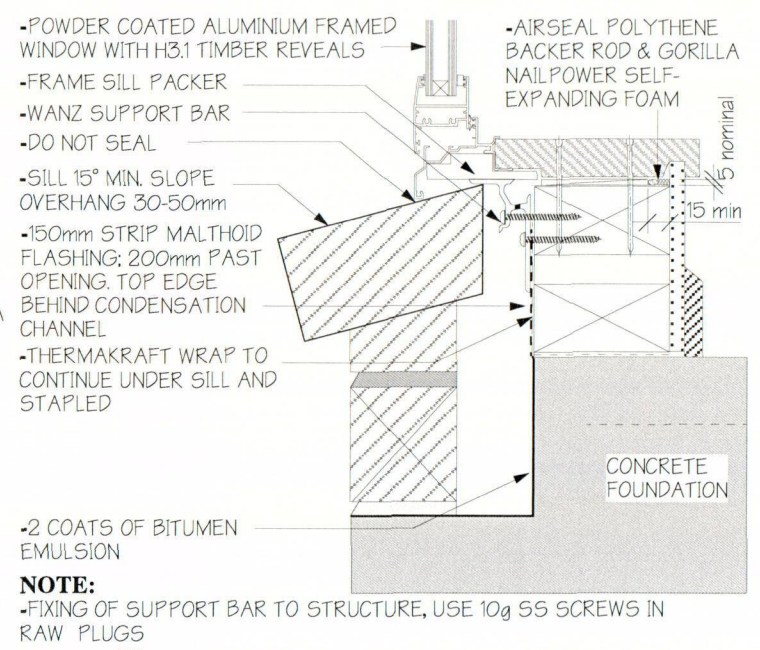
D25
A4.1
LINEA WINDOW HEAD*
Scale: 1:5



D26
A4.1
LINEA WINDOW SILL
Scale: 1:5

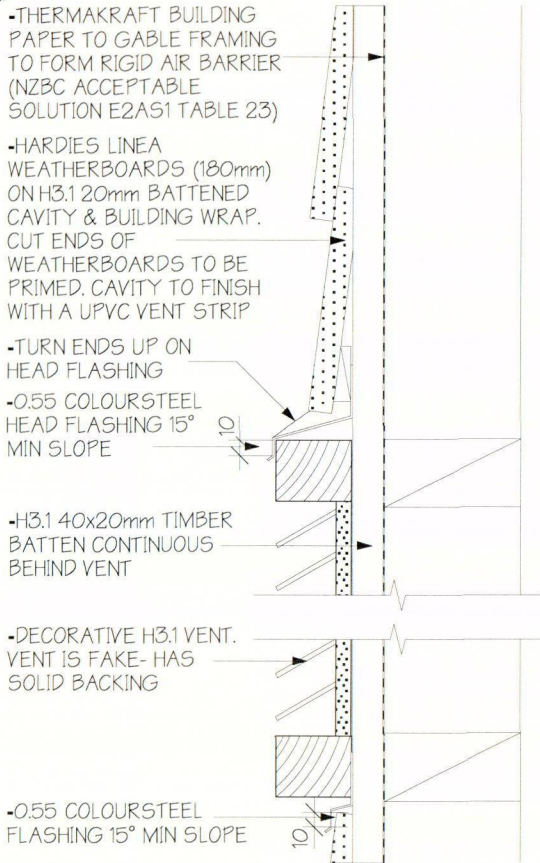


D27
A4.0
BRICK TO SOFFIT*
Scale: 1:10



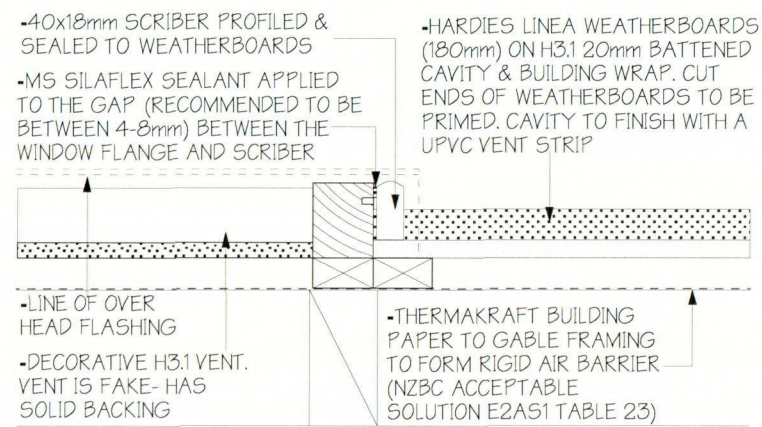
D28
A3.0
BRICK WINDOW SILL*
Scale: 1:5

FILE COPY
121562



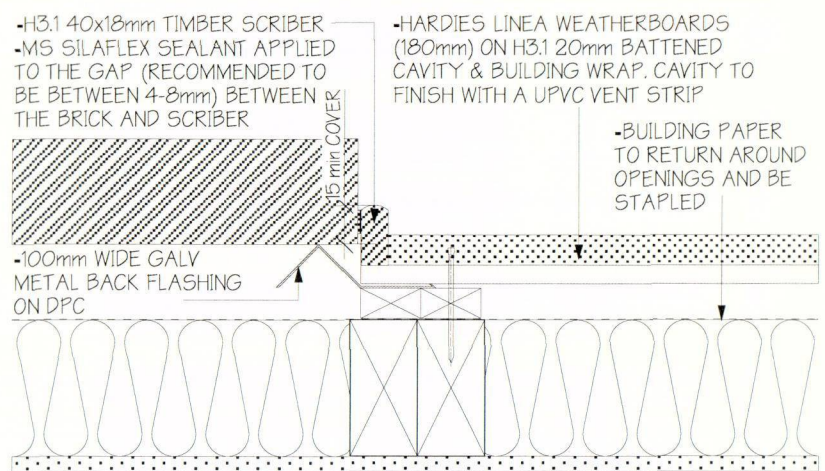
D29
A4.1

VENT HEAD & SILL
Scale: 1:5



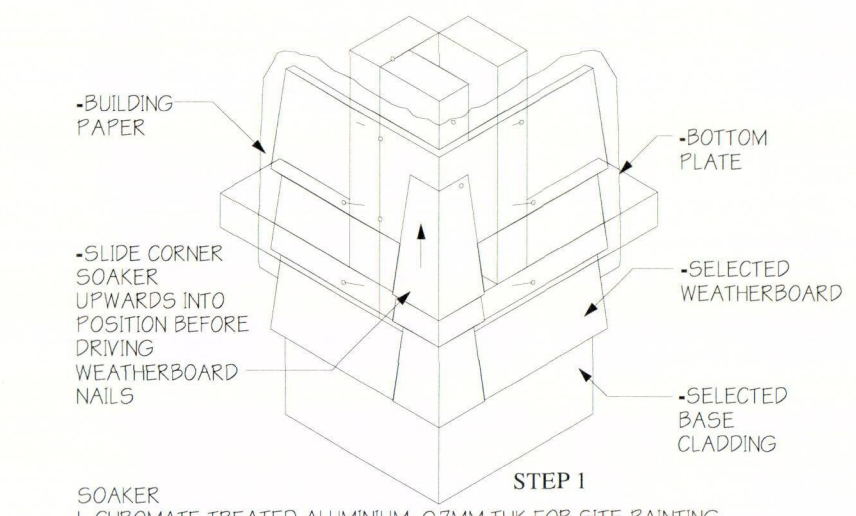
D30
A4.1

VENT JAMB
Scale: 1:5

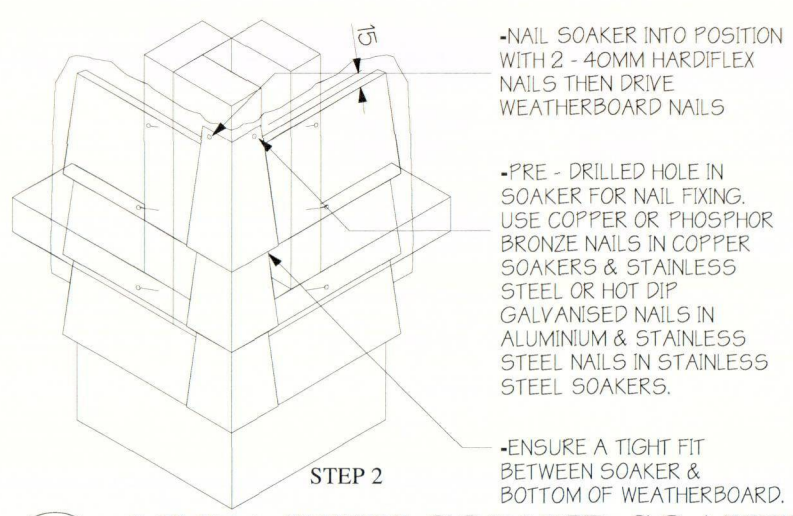


D31
A3.0

BRICK TO LINEA *
Scale: 1:5

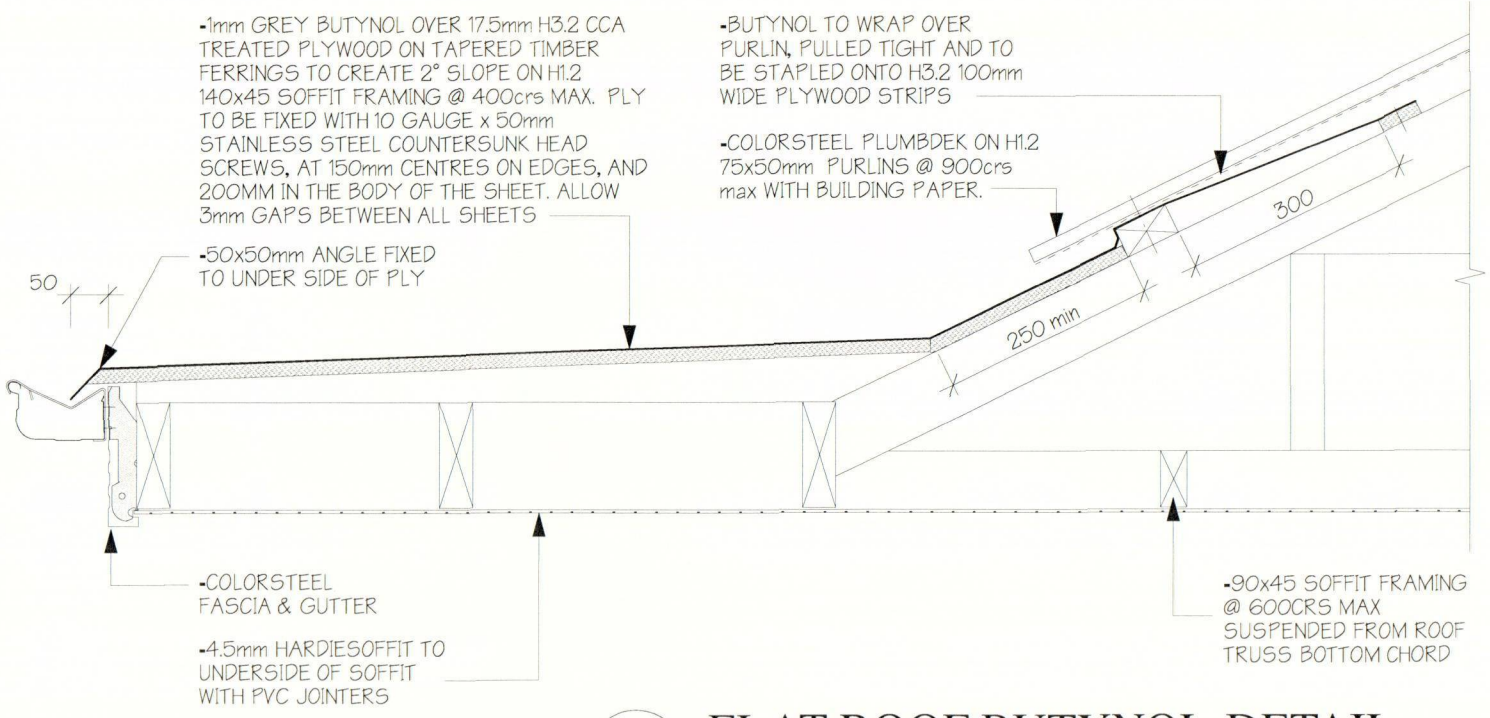


SOAKER
! CHROMATE TREATED ALUMINIUM 0.7MM THK FOR SITE PAINTING.



D32
A3.0

LINEA WITH CORNER SOAKERS
Scale: 1:10



D34
A4.1

FLAT ROOF BUTYNOL DETAIL
Scale: 1:10

121562

FILE COPY

GENERAL

- 1. These drawings are not to be used for construction until the plan (sheet S2) is signed by the main contractor
- 2. Do not scale. refer any discrepancies to the architect/engineer.
- 3. These drawings are to be read in conjunction with the Architects & Engineers drawings.
- 4. The builder shall be responsible for any damage to works during construction.
- 5. The sand blinding layer shall be 20mm min. & 50mm max. to aid levelling & to prevent rocking of pods.
- 6. Vapour barrier to be 0.25mm (250 micron) polythene complying with NZS 4229. / NZS 3604
- 7. Finished ground level adjacent to slab to be protected from wind, water erosion and undermining.

FOUNDATIONS

- 1. For assumed allowable bearing capacity refer to calculations/installer guide. Unless otherwise noted in documentation
- 2. If there is any doubt about the integrity of the material on which the slab is to be founded - a FIRTH representative must be notified immediately.

CONCRETE

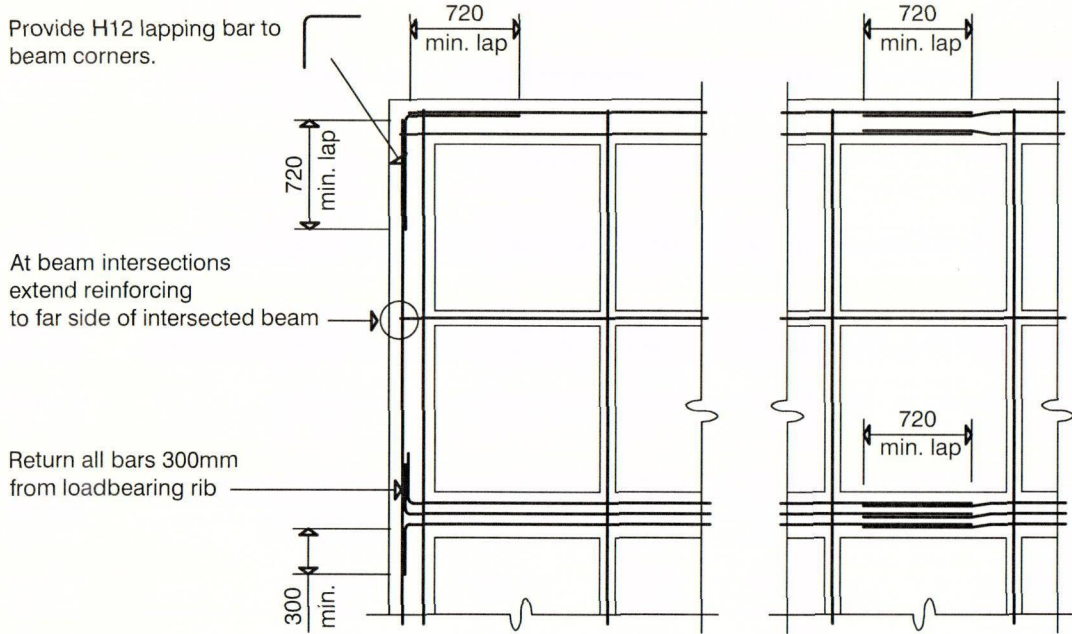
- 1. All workmanship & materials to conform to NZS 3109, NZS 4210 & local authority regulations.
- 2. Minimum covers to reinforcement:
 - Exposed to earth - 75mm.
 - Protected by vapour barrier - 50mm.
 - Not exposed to weather except for a brief period during construction - 25mm.
- 3. No holes or chases other than those specified are to be made in the slab without the approval of the Engineer.
- 4. All concrete shall be not less than 20 MPa FIRTH E/Q Fibre mix grade with 20mm nominal maximum aggregate size & 80mm slump & shall comply with NZS 3109.
- 5. All concrete to be mechanically vibrated & carefully worked around the reinforcement & into the corners of the formwork.

INSPECTIONS

- 1. Inform ENGCO 48 hrs. in advance of a required inspection. Contact Matt Cusiel 03 366 7955



STEEL

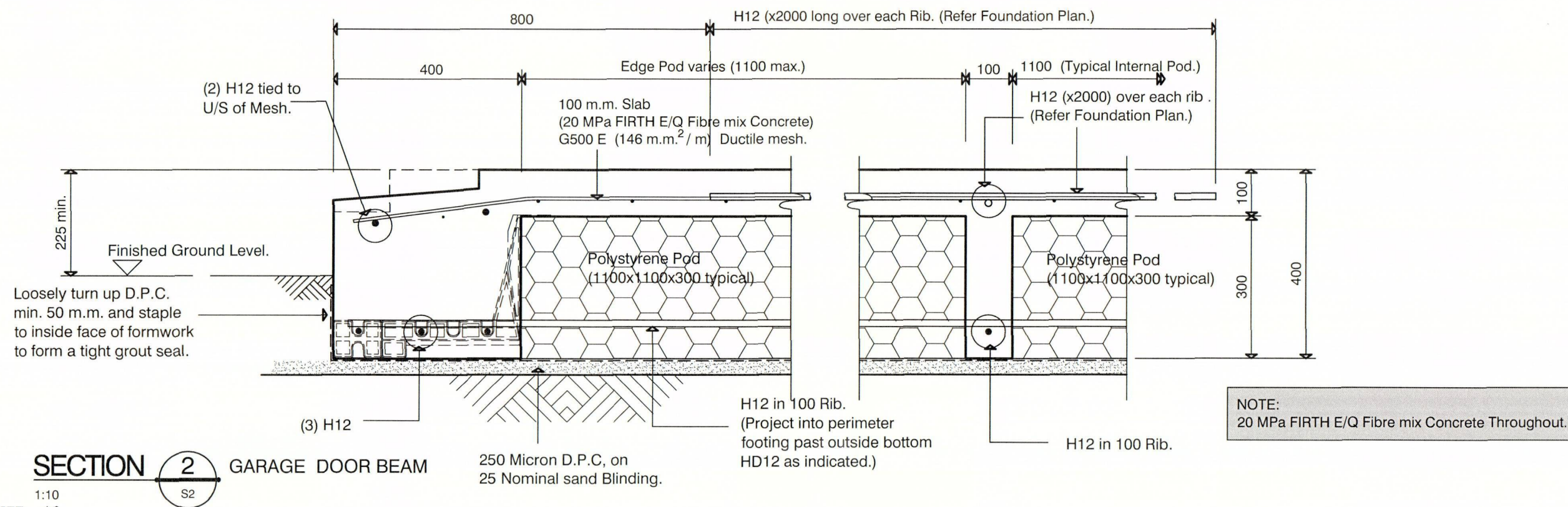
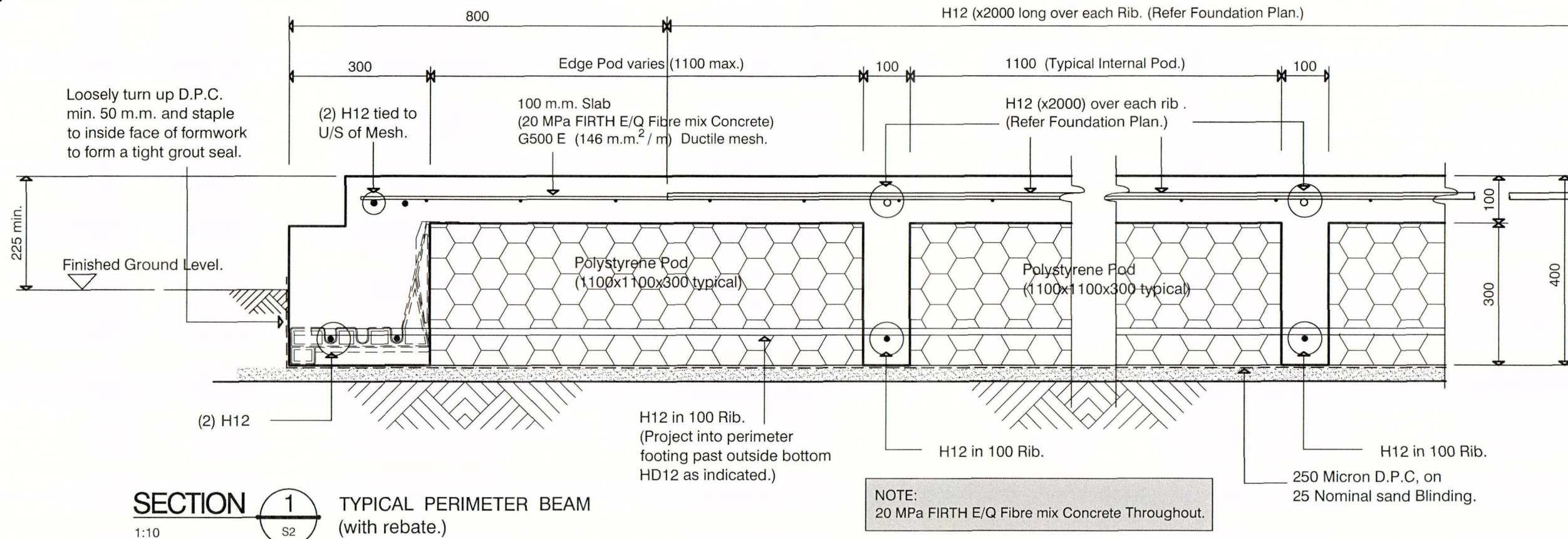
- 1. All reinforcing shall be new Zealand sourced and conform to AS/NZS 4671 :2001 in grade 300 or grade 500E.
- 2. All bends to be made cold without fracture.
- 3. All reinforcing shall be deformed type unless otherwise stated.
- 4. Grade 500E deformed bars shall be designated 'H', Grade 300 deformed bars shall be designated 'D' and Grade 300 round bars shall be designated 'R'
- 5. Minimum bar splice 720mm. (or unless otherwise noted)
- 6. All reinforcement to be fixed & tied where necessary in its specified position.
- 7. Welding of steel is not permitted
- 8. Spacers:
 - Edge at 1200mm ctrs (one on edge & two on corners, typically).
 - Internal one on each side of pod (typically).
 - 25/40 or similar mesh chair to be used as necessary.
- 9. All mesh shall comply with AS/NZS 4671 & shall conform with elongation requirements exceeding 10%.
- 10. All Mesh shall lap a minimum of 225 m.m.



TYPICAL CORNER STEEL & MIN. LAPPING REQUIREMENTS
N.T.S.

ORIGINAL SIZE = A3
CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE COMMENCING WORK

 unit 8 • the sails • 1025 ferry road • ferrymead • christchurch 8023 p 03 366 7955 • f 03 366 7954 • e OFFICE@ENGCO.co.nz	 HORNCastle HOMES	JOB TITLE: HORNCastle HOMES Ltd. LOT 54 ROSEMERRYN STAGE 2 LINCOLN	SHEET TITLE: GENERAL NOTES.	REVISIONS		
				ENGCO CONSULTING - STRUCTURAL ENGINEERS DESIGNED: M. CUSIEL DRAWN: S.BLOCKLEY SCALE: DATE: 22.08.2012		
				DWG NO. S1	OF 6	FILE NO. 12196



ORIGINAL SIZE = A3

CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE COMMENCING WORK



unit 8 • the sails • 1025 ferry road • ferrymead • christchurch 8023
p 03 366 7955 • f 03 366 7954 • e OFFICE@ENGCO.co.nz



HORNCastle
HOMES

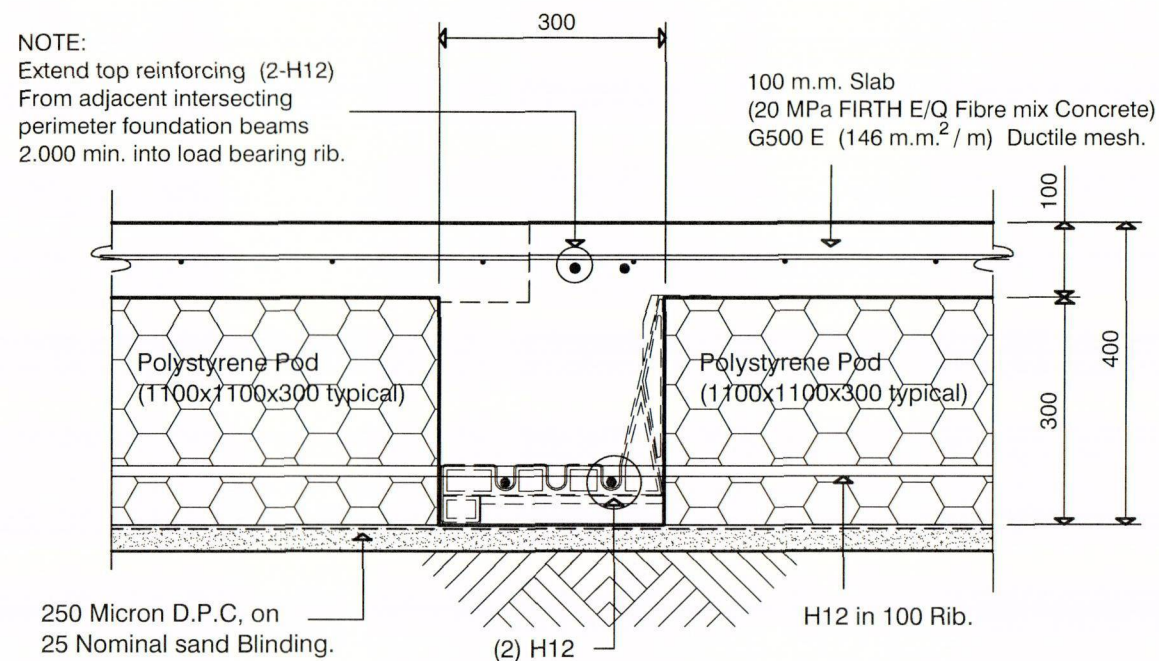
JOB TITLE:
HORNCastle HOMES Ltd.
LOT 54
ROSEMERRYN STAGE 2
LINCOLN

SHEET TITLE:
TYPICAL FOUNDATION
SECTIONS

REVISIONS

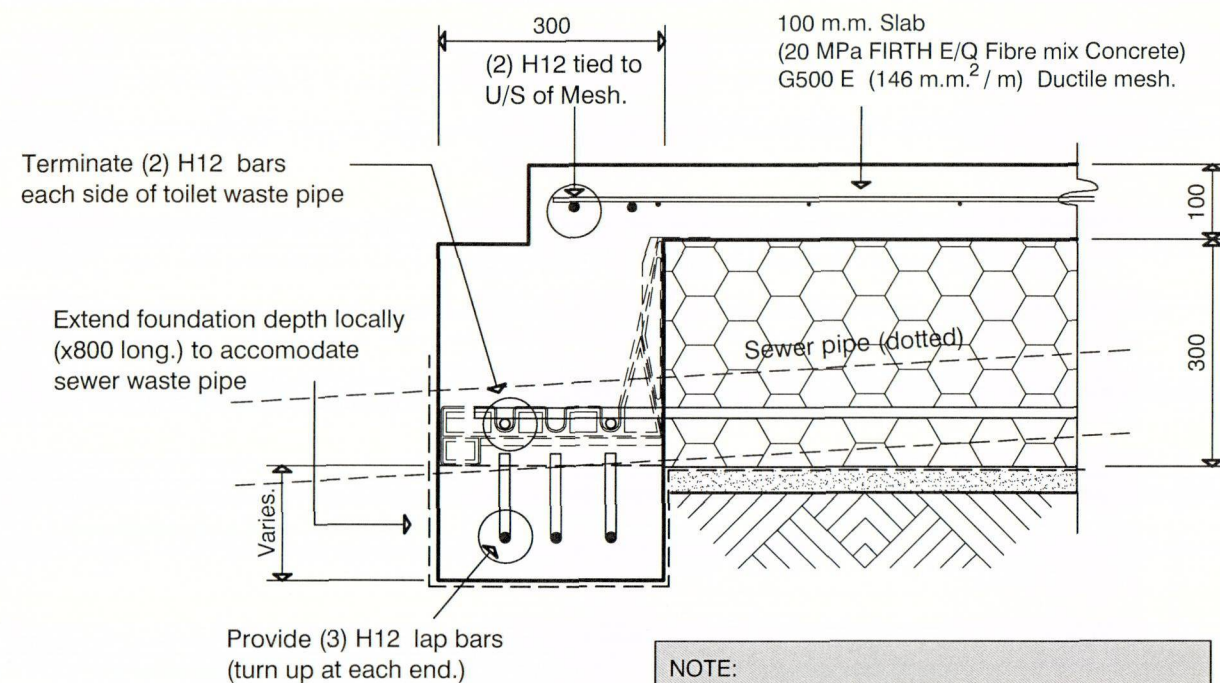
ENGCO CONSULTING - STRUCTURAL ENGINEERS
DESIGNED: M. CUSIEL DRAWN: S.BLOCKLEY
SCALE: DATE: 22.08.2012

DWG NO. S3 OF 6 FILE NO. 12196

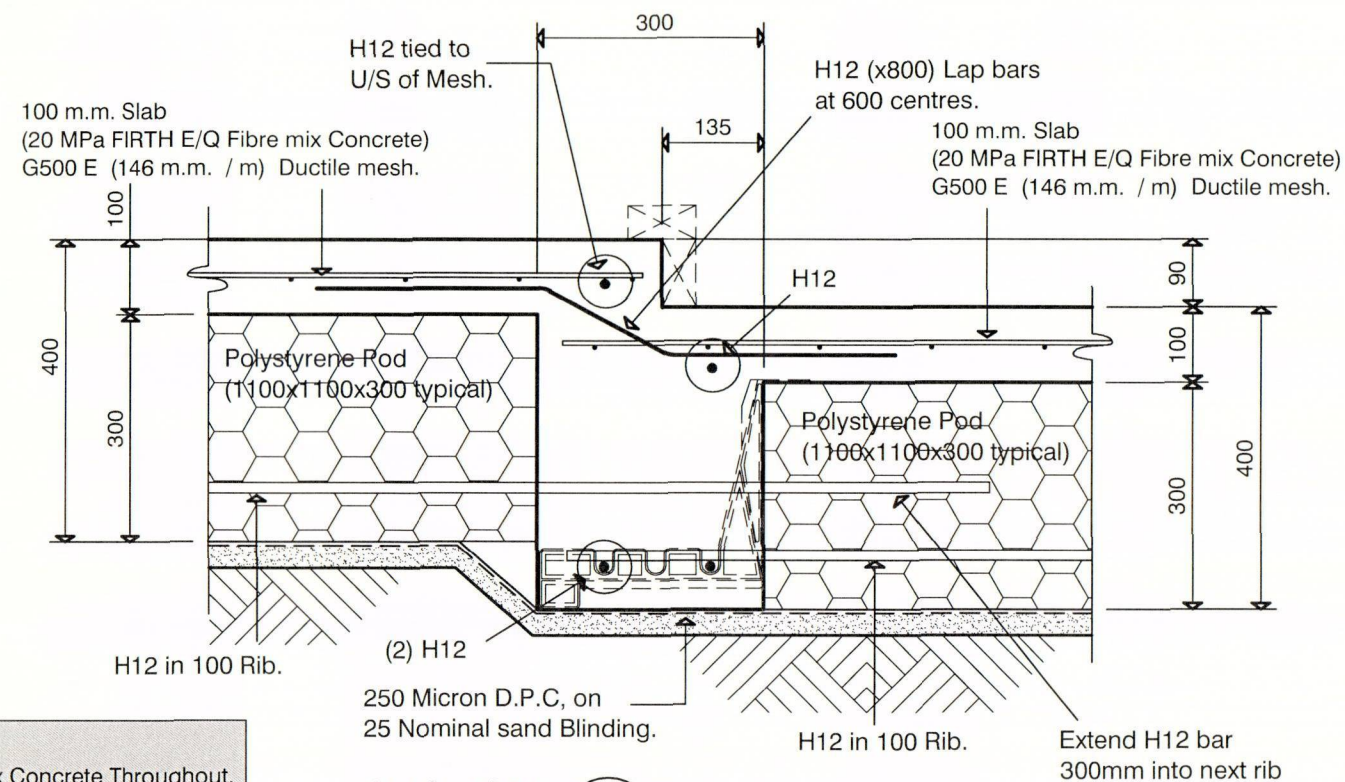


SECTION 5
1:10 S2
**TYPICAL 300 WIDE
INTERNAL RIB.**

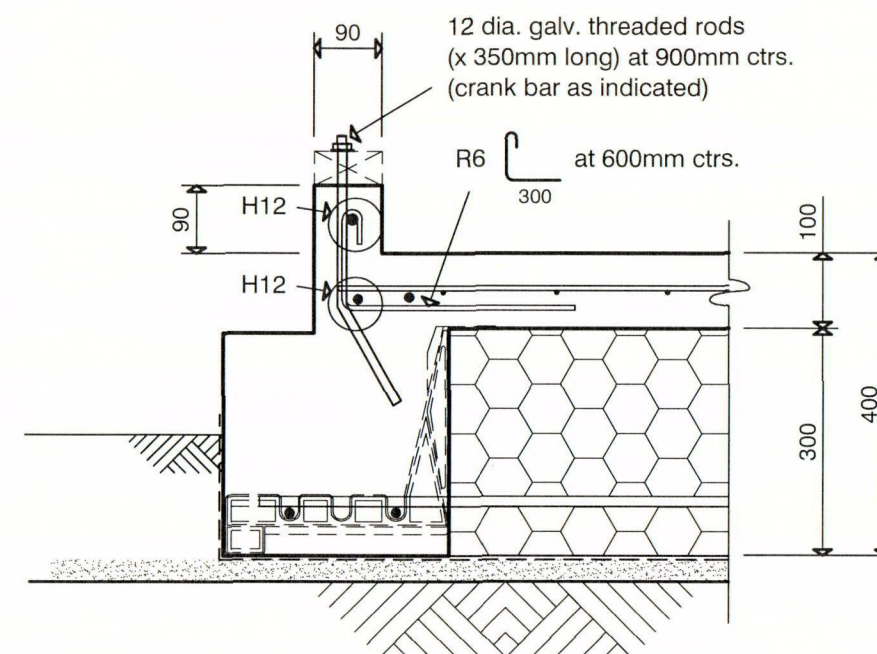
NOTE:
20 MPa FIRTH E/Q Fibre mix Concrete Throughout.



**TYPICAL SECTION
LOCALISED DEEPENING OF FOUNDATION BEAM
TO ACCOMODATE TOILET WASTE PIPE.**



SECTION 6
1:10 S2
**TYPICAL 300 WIDE
INTERNAL GARAGE STEP**



SECTION 7
1:10 S2
UPSTAND NIB

ORIGINAL SIZE = A3

CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE COMMENCING WORK

ENGCO
CONSULTING ENGINEERS

unit 8 • the sails • 1025 ferry road • ferryroad • christchurch 8023
p 03 366 7955 • f 03 366 7954 • e OFFICE@ENGCO.co.nz



**HORNCASTLE
HOMES**

JOB TITLE:
**HORNCASTLE HOMES Ltd.
LOT 54
ROSEMERRYN STAGE 2
LINCOLN**

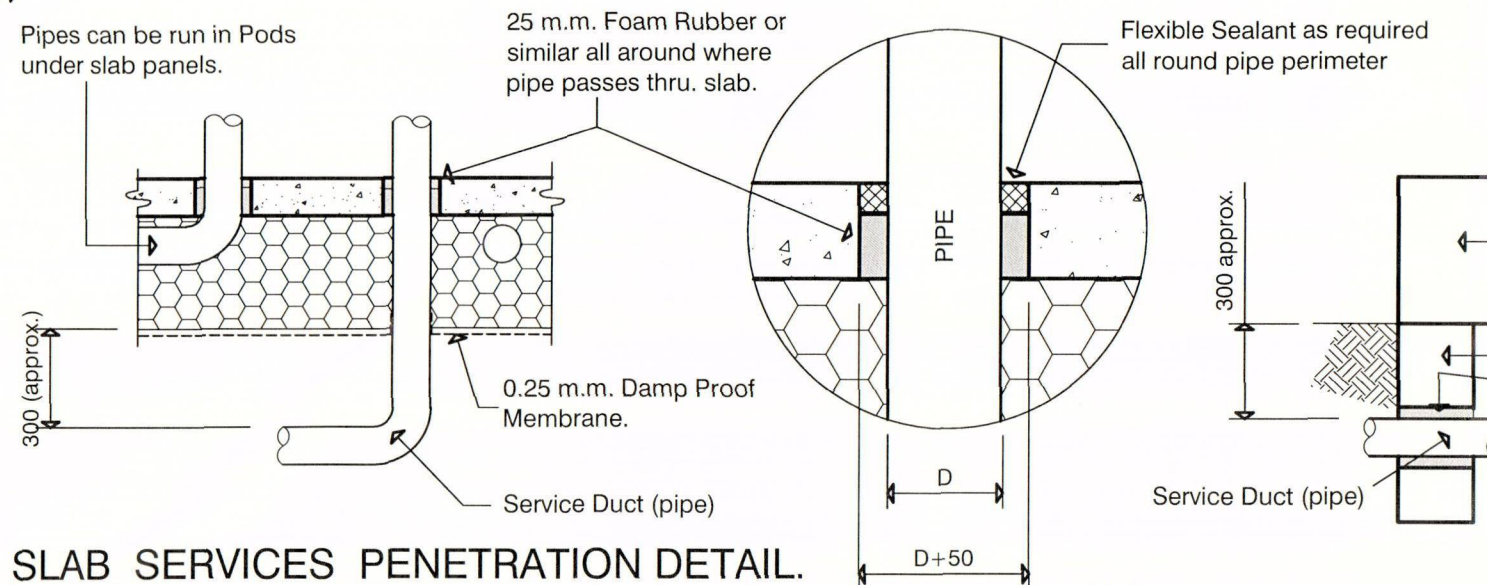
SHEET TITLE:
**TYPICAL FOUNDATION
SECTIONS**

REVISIONS

ENGCO CONSULTING - STRUCTURAL ENGINEERS
DESIGNED: M. CUSIEL DRAWN: S.BLOCKLEY
SCALE: DATE: 22.08.2012

DWG NO. **S5** OF 6 FILE NO. 12196

121562



NOTE:
Where penetrations through Slab Panel exceed 500 m.m. Square, Crack Control Bars will be required.

FOUNDATION SERVICES PENETRATION DETAILING.

1:20

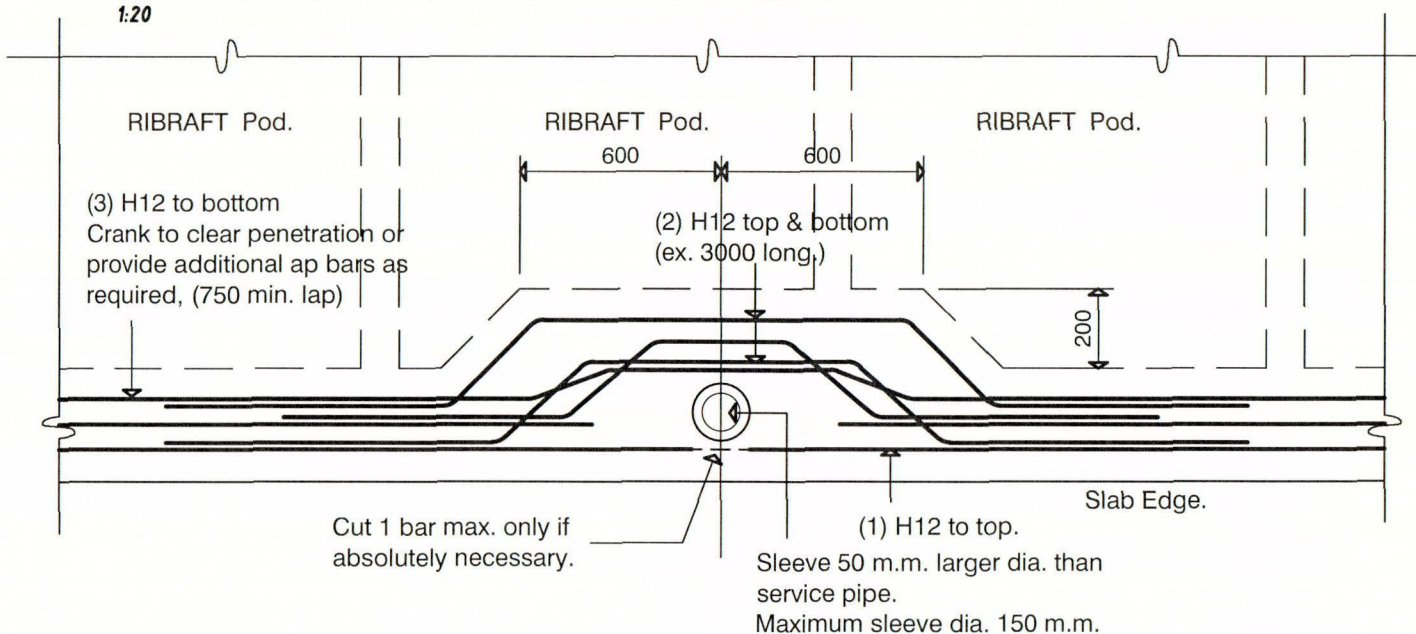
Ideally, services ducts shall be conveyed underground to their plan location then brought up through the polystyrene pod and the concrete floor slab, but this may not always be possible. Services shall not be placed within any concrete except to cross that section of concrete i.e. services shall not run along ribs or edge beams. The maximum diameter of the services shall be as outlined in table below.

MAXIMUM DIAMETER OF PIPE SERVICES		
ELEMENT	VERTICAL SERVICES	HORIZONTAL SERVICES
300mm wide edge beam	50mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, unless detailed as per note 1.
500mm localised wide edge beam	100mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, see note 1.
300mm wide internal load bearing rib	50mm in a duct 50mm larger diameter than pipe	50mm in a duct 50mm larger diameter than pipe, see note 1.
100mm wide internal rib	Nil	50mm in a duct 50mm larger diameter than pipe, see note 1.
Slab	110mm in a duct 50mm larger diameter than pipe or for large services 450mm square see also note 2.	Nil

(1) The need for a duct 50mm larger than the service diameter can be deleted when the pipe work does not cross the interface between the bottom of the RibRaft system and the ground at any point along its length. An example would be services laid within the plane of the pods and passing through the edge beam and discharging to a gully trap or similar. In these cases the diameter of the service can be increased to a maximum of 100mm and a service duct is not required. The pipe work shall be wrapped in denso tape where it crosses concrete elements to prevent adhesion between the concrete and pipe work.

LARGE SLAB PENETRATION DETAIL.

1:20



TYPICAL DETAIL.

LOCALISED INCREASE IN WIDTH AT EDGE BEAM WHERE VERTICAL SERVICES OF UP TO 100 m.m. DIA. ARE REQUIRED

ORIGINAL SIZE = A3 1:20

CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE COMMENCING WORK



unit 8 • the sails • 1025 ferry road • ferrymead • christchurch 8023
p 03 366 7955 • f 03 366 7954 • e OFFICE@ENGCO.co.nz



HORNCastle
HOMES

JOB TITLE:
HORNCastle HOMES Ltd.
LOT 54
ROSEMERRYn STAGE 2
LINCOLN

SHEET TITLE:
TYPICAL SERVICES
PENETRATION DETAILS

REVISIONS		
ENGCO CONSULTING - STRUCTURAL ENGINEERS		
DESIGNED: M. CUSIEL DRAWN: S.BLOCKLEY		
SCALE: DATE: 22.08.2012		
DWG NO.	OF	FILE NO.
S6 121502	6	12196

ADMINISTRATION	UNITS	RATE/UNIT
----------------	-------	-----------

PROCESSING

INSPECTIONS / CONDITIONS / ADVICE NOTES

X	\$14.00	\$1218.00
X	\$ 0.74	\$142.08
X	\$14.00	\$ 84.00
Total		1444.08

Other (List):	\$	
	\$	
	\$	
Fixed Fee (if applicable) \$	LESS DEPOSIT	\$

28168

TOTAL CHARGES FOR CONSENT (as per invoice)

\$

2,026.25

BUILDING CONSENT RECORD

LEGAL

DESCRIPTION: Lot 54 DP 451072

VALUATION NO: 24041 - 690 - 54

CONSENT NO: 121562

PROPERTY

ADDRESS: 10 Goldney Close, Lincoln

OWNER:

Homcastle Homes

PROJECT

DESCRIPTION: Domestic Dwelling

AGENT:
