2538 State Highway 50, Roys Hill

Please note, this is an abridged file. For complete file, please visit the Hastings District Council

Thank you.

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4/3/05

CONCEPT
MASTER BUILDERS

H.D. Consent AMENDED

RESOURCE MANAGEMENT
- 4 MAR 2005
RECEIVED

Att: Tony Hales

Re: Barnes Consent Application
ABA 2004 2396

Further to our meeting and Rexford Gardiners visit to you yesterday, Please find attached info.

Our Client is querying the need for a water softener which I forwarded an email to you on 21/2/05. Copy enclosed.

Regards Barry

Concept Building Limited Concept House 369 State Highway 2 RD2 Hastings
Tel 06 878 4690 Fax 06 876 2732 Email info@conceptmb.co.nz www.conceptmb.co.nz

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17/03/2005

18/02/05

Att Bunclers AMENDED

att Barry.

Re Bairs House s/ Hway 50

Permit No 20042396.

Quote No 6117. Windows and doors

will be Constructed and

glazed in accordance with

NZS 4211 1985 Zone VH LEVEL 8.

as Quoted.

FIRST WINDOWS & DOORS

NZS 4211	ZONE	LEVEL
1985	VH	8

att This To Tony Hales

Hastings District Council

Thanks

Allan.

FIRST™
WINDOWS & DOORS
44 AUSTIN STREET - NAPIER
Ph 06 - 843 4191 Fax 06 - 843 4533

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17/03/2005

Penguin

CERAMICS

AMENDED

To Barry - Carrpt.
From Daniel.
Date 23/2/05

Barnes Mosaic

Our methods for tiling mosaic over plastered walls is using Lata Flex, polymer modified cementitious adhesive with 4mm notched trowel. Grouted with Mapei, chemically setting grout. for water resistance.

Regards

Daniel

28 Havelock Road Havelock North PO Box 8233 Phone 06 877 6447 Fax 06 877 2944

23/02/2005 10:31 64-6-8772944 PENGUIN CERAMICS PAGE 01

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17/03/2005

ems
Effluent Management Systems Ltd

AMENDED

EFFLUENT MANAGEMENT SYSTEM

DESIGN SPECIFICATION

Client:	Barns (C/- Concept Master Builders)
Site Location:	State Highway 50, Hastings
System Type:	Gould Enviroclear wastewater treatment plant.
Effluent Distribution Method:	Dripline (1.5 *l*/hr @ 0.6 m emitter spacings) Laid at 1 m centres
Total Lineal Length:	250 m
Design Loading Rate:	4.5 litres/m²/day
Design:	3 bedroom home = Potential occupancy of 6 people @ 200 litres each/day = 1200 litres/day potential effluent discharge
Land Area Required:	266.666 m²

Steve Crockford
Director

Registration No.: 12382
IPENZ No.: 254300

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17/03/2005

GOULD
GT SYSTEMS

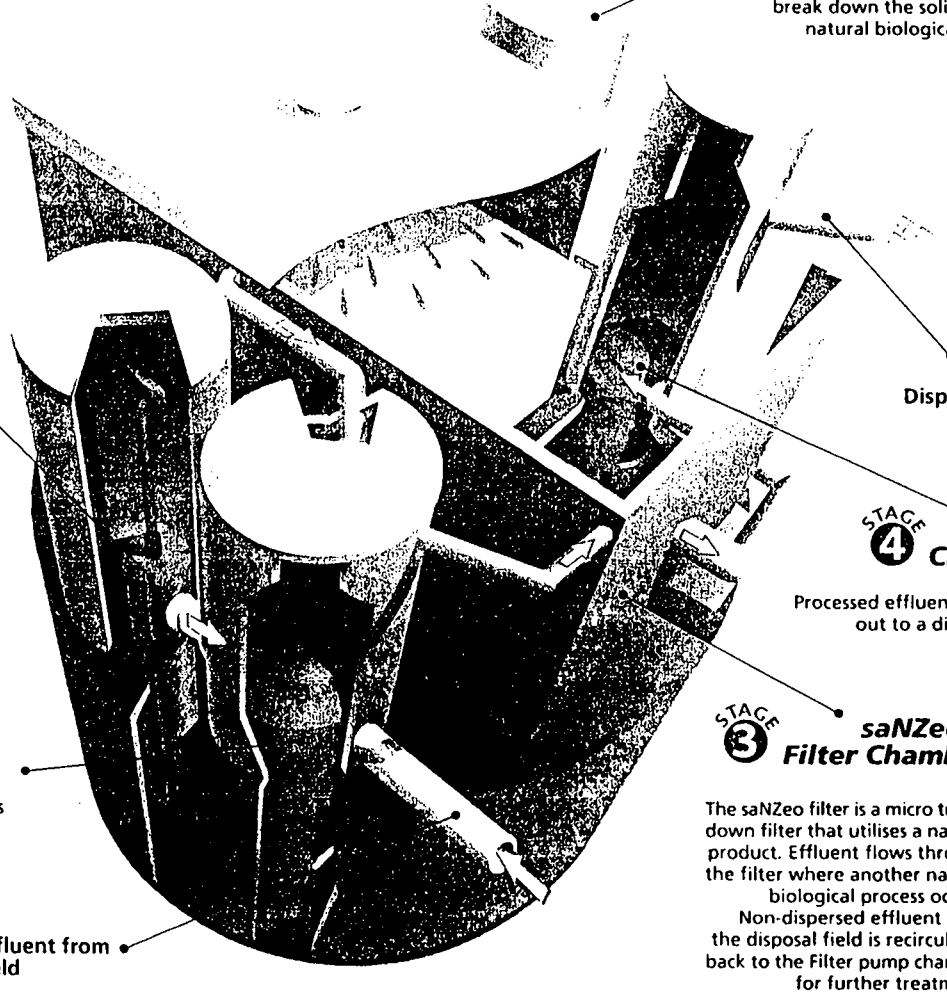
Specialist Manufacturers of Wastewater Treatment Plants and Septic Tank Filters

The Gould Enviroclear™ Sewage System

(Recirculating Progressive Filtration)

specifically has the following benefits:

- Less maintenance than other advanced systems.
- Fewer pumps, no air pumps.
- Requires less electricity than other similar systems.
- Includes a trickledown saNZeo™ filter.



STAGE 1 *Primary Chamber*

Solids enter the primary chamber and are filtered. Bacteria residing on the filter break down the solids using a natural biological process.

Solids are reduced to 1mm in diameter by the Gould GT150 filter.

Outlet to Disposal Field

STAGE 4 *Pump Chamber*

Processed effluent is pumped out to a disposal field.

STAGE 2 *Filter Pump Chamber*

Effluent now flows into this chamber and is then filter pumped over our saNZeo trickle down filter.

STAGE 3 *saNZeo™ Filter Chamber*

The saNZeo filter is a micro trickle down filter that utilises a natural product. Effluent flows through the filter where another natural biological process occurs. Non-dispersed effluent from the disposal field is recirculated back to the Filter pump chamber for further treatment.

Recycled Effluent from Disposal Field

FREEPHONE 0800 [illegible]

TEL: 64-6-353-6157 · FAX: 64-6-353-3020 · MOBILE: 021-505-198

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GOULD
GT SYSTEMS

Specialist Manufacturers of Wastewater Treatment Plants and Septic Tank Filters

The Gould Enviroclear™ Wastewater Treatment Plant

The Gould Enviroclear™ Wastewater Treatment Plant produces superior quality effluent and is ideal for use in environmentally sensitive locations or locations where high water table levels exist. The treatment plant uses the latest development in effluent filter technology, the Gould GT150 plus the Gould SaNZeo™ Filter.

The Gould Enviroclear™ Wastewater Treatment Plant offers:

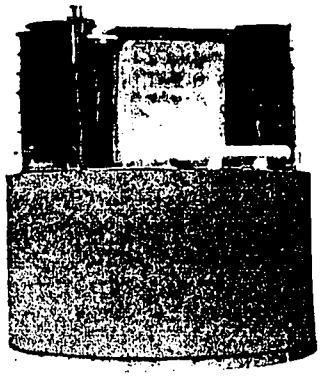
- The opportunity to recycle your own effluent by using it to irrigate gardens, trees, lawns and shelter belts.
- An environmentally friendly system that is easily installed.
- Low maintenance requirements.
- Large 8000 litre capacity suited for domestic and small commercial properties.
- A three year service to ensure your systems optimal performance.
- Prompt and ongoing support from Gould GT Systems.
- Resulting high-quality effluent at an affordable price.

Gould GT Systems (NZ) Limited is committed to producing the best effluent systems available. We contribute substantial resources to the development of superior wastewater treatment plants so that our clients are assured of owning systems that provide long term effective and environmentally friendly sewerage treatment.

Gould GT Systems (NZ) Limited, or their Approved Installers, deliver and install the Gould Enviroclear™ Wastewater Treatment Plant.

Dimensions:
Diameter: 2.5 metres
Height: 2.5 metres from base to top of inspection risers

Installed price $



The Gould Enviroclear™ ready for installation

This system is ideal for properties with limited amounts of topsoil, poor soakage and also for environmentally sensitive areas. The domestic plant caters for low flows up to 2000 litres per day and our commercial system for flows up to 100,000 litres per day.

FREEPHONE 0800 850 870 TEL: 64-6-353-6157 • FAX: 64-6-353-3020 • MOBILE: 021-505-198

FLETCHER ALUMINIUM

AWNING & CASEMENT WINDOW INSTALLATION DETAILS

Date: 01-02-04 Replaces: 05/03 Scale: 1:2 Cad : 1.26

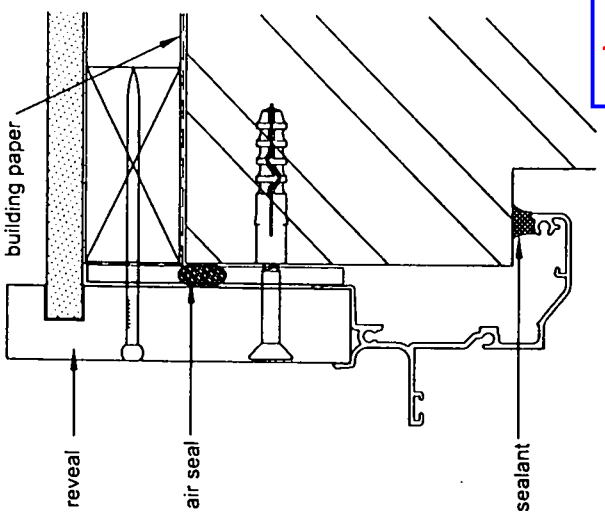
CONCRETE BLOCK

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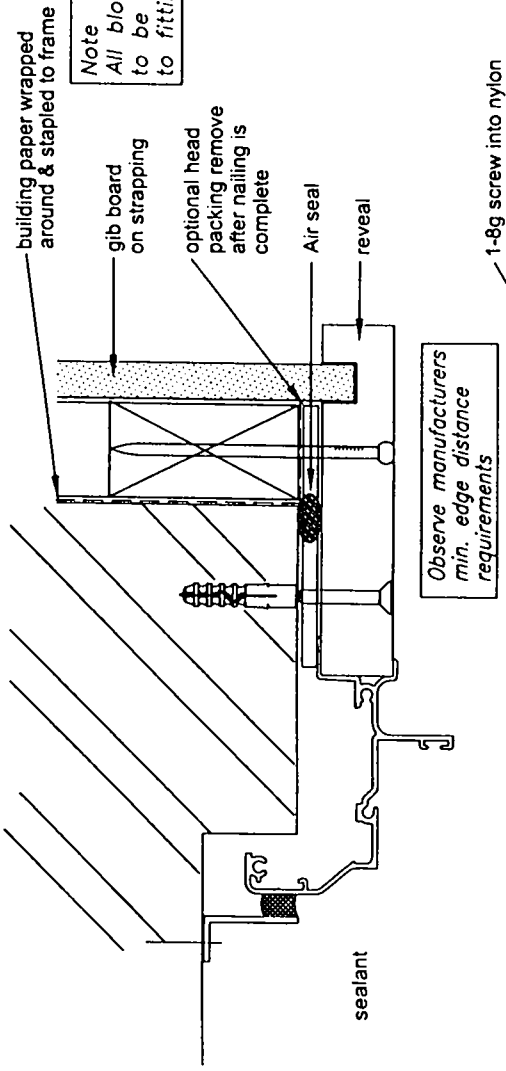
APPROVED
PLUMBING AND BUILDING
TONY HALES
18/03/2005

AMENDED PLAN Refer to previous plans for past endorsements 18/03/2005

Jamb Detail



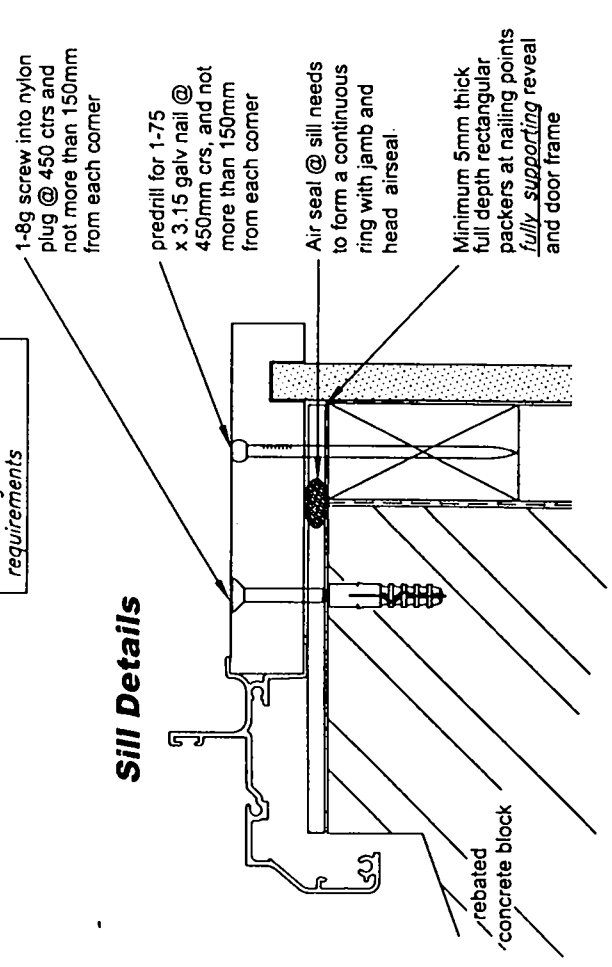
Head Details



Note All blockwork needs to be sealed prior to fitting window

Observe manufacturers min. edge distance requirements

Sill Details



Note:
1. Check with cladding manufacturers if additional properietary sill flashings are required
2. To be read in conjuction with WANZ WIS Stage 1: Pre Cladding Trim Preparation

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For Technical Assistance Call 0800 55 11 00

FLETCHER ALUMINIUM

AWNING & CASEMENT WINDOW INSTALLATION DETAILS

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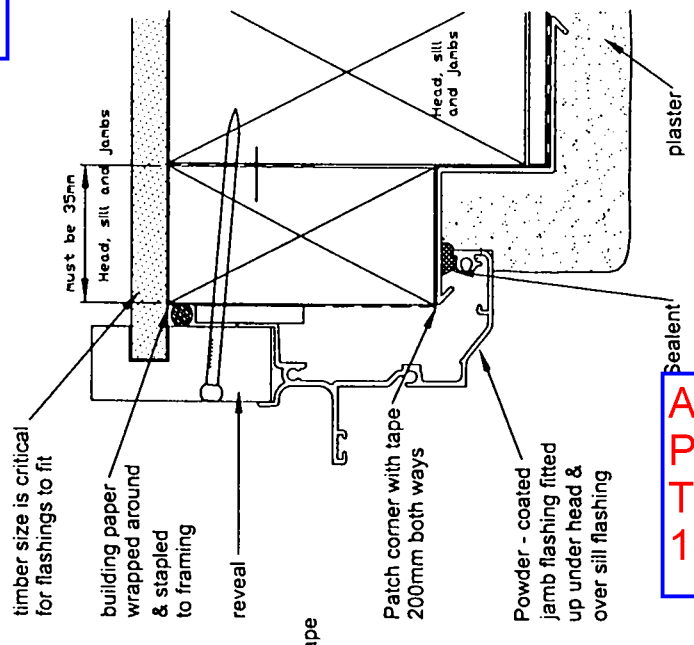
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FULLY RECESSED PLASTER

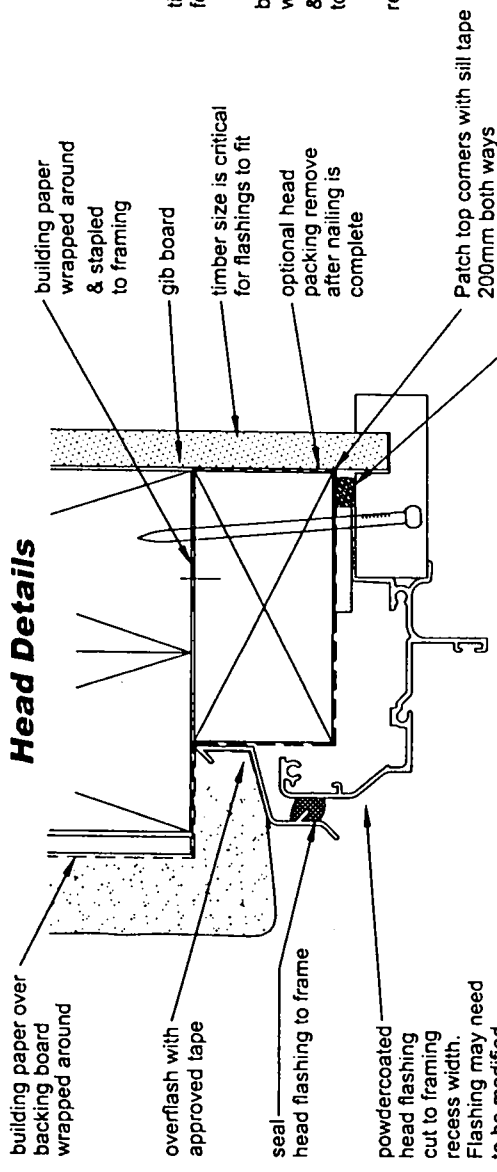
AMENDED PLAN Refer to previous plans for past endorsements 18/03/2005

APPROVED
PLUMBING AND BUILDING
TONY HALES
18/03/2005

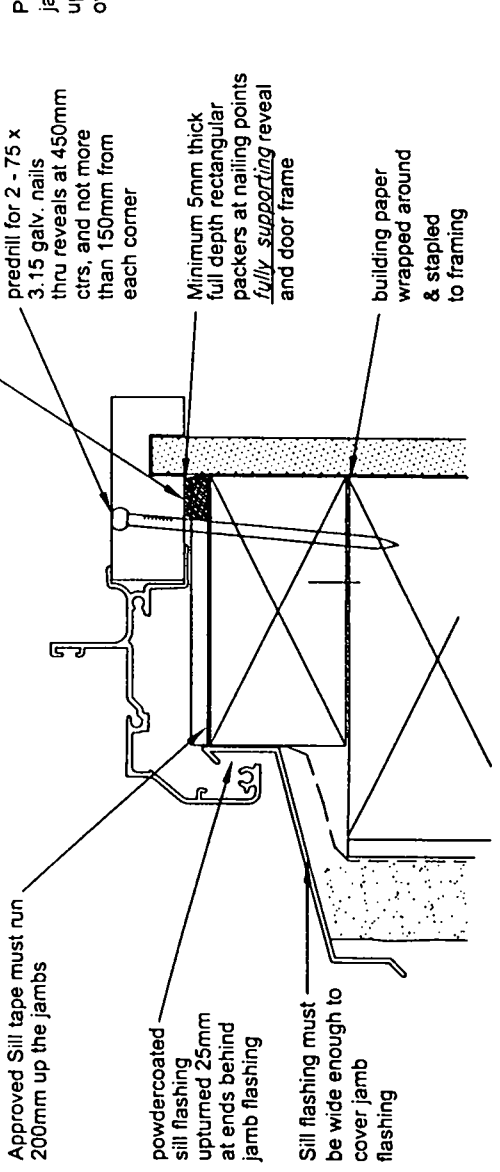
Jamb Details



Head Details



Sill Details



Note:
1. Check with cladding manufacturers if additional properietary sill flashings are required
2. To be read in conjuction with WANZ WIS Stage 1: Pre Cladding Trim Preparation

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From: Barry Koenders - Concept <barry@conceptmb.co.nz>
To: Tony Hales <tonyh@hdc.govt.nz>
Date: Monday, 21 February, 2005 4:21 PM
Subject: Fw: Water Test

Tony

I have had this reply from Derek Barnes regarding the water softener. Can you shed any light on his request?

Thanks Barry
-----Original Message-----
From: Derek and Carol <d.c.barnes@xtra.co.nz>
To: Barry Koenders - Concept <barry@conceptmb.co.nz>
Date: Monday, 21 February, 2005 12:18 PM
Subject: Water Test

Hi Barry,
Re: need for water softener. Can you please check if the rules have changed in the last 12 months. The water test was done for our neighbours (Leader) in May 04 and they were not required by council to fit a water softener or any other treatment facility.
Regards,
Derek

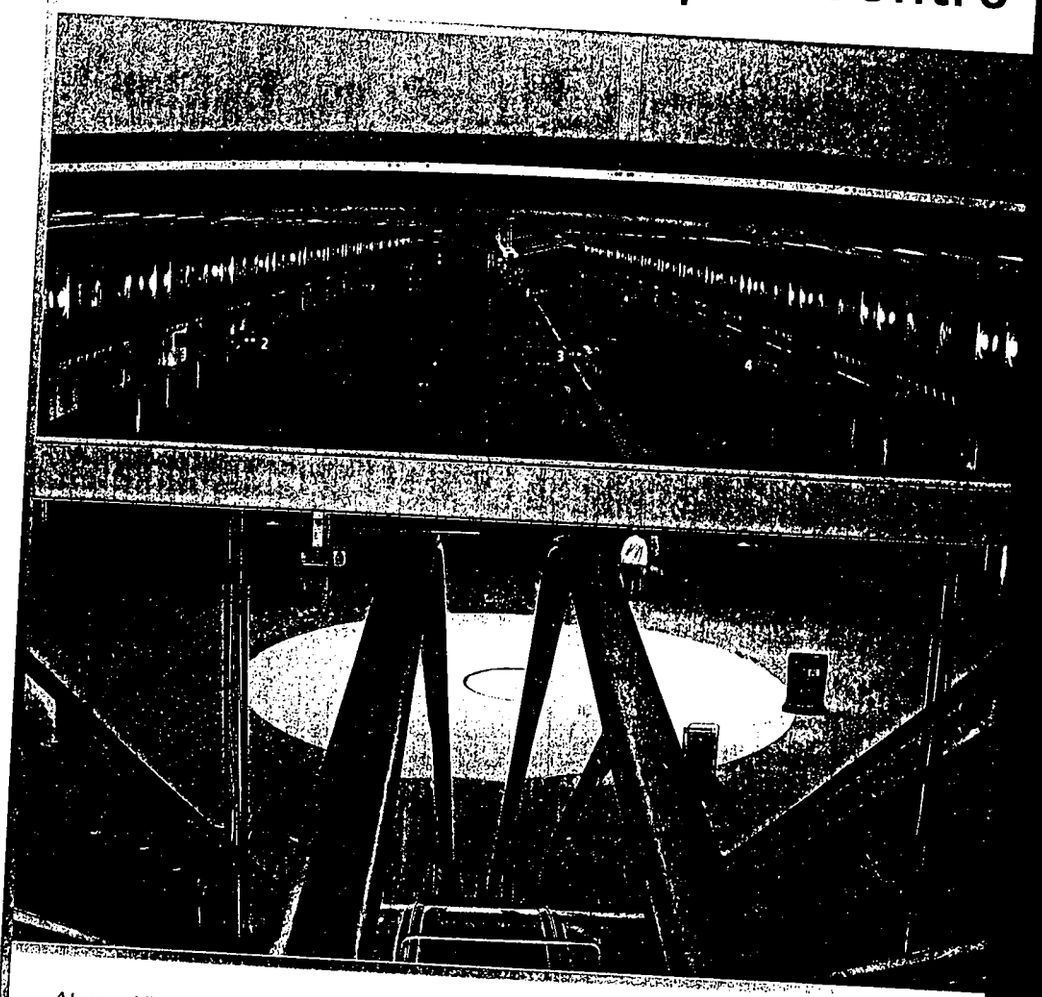
Reply sent 16/3/2005

24/2/05

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Britomart ...

a world class transport centre



The new state-of-the-art Britomart Railway Station is now operational. The first train's arrival is the culmination of months of hard construction work that started in November 2001 - a construction project that Waterproofing Systems Ltd was able to make a substantial contribution to.

Above: View of main tunnel from top of escalator.

"As one of the youngest waterproofing companies working in the construction industry at the moment, it was great for such trust to have been placed in us so early. This opportunity to demonstrate our technical capabilities has helped lift our market profile and build our credibility. It also highlighted our ability as a company to access leading edge products from around the world. Now that we have this big project under our belt, it will certainly open doors in other project areas as well."

Tony McMurtrie
Managing Director
Waterproofing Systems Ltd

waterproofing
SYSTEMS LTD

Providing the Britomart project with durable waterproofing solutions

Waterproofing the tunnels

Rawmat Type S membrane & Rawseal waterstops



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Waterproofing a concrete structure that sits only about 100m from the sea and 6 metres below sea level creates a challenge - a challenge that Waterproofing Systems Ltd was able to address with their Rawmat bentonite membrane system.

This unique system of pre-hydrated, self-healing membrane and waterstops, provided the Britomart project with the ultimate durable waterproofing solution... and because Rawmat can be installed in all weather conditions, no installation time was lost. Opus International Consultants specified that a bentonite product should be used, but only Waterproofing Systems had the right kind of product.

How does Bentonite Work?

Bentonite is a natural clay formed from volcanic ash which can swell to form an impermeable mass, preventing the passage of liquid. Natural sodium bentonite clay will absorb water and expand up to 16 times its dry volume when in contact with water. When confined, e.g. between the ground and the floor slab, this tendency to swell generates substantial swell pressures, preventing the passage of water.

When correctly installed, the Rawmat/Rawseal acts as an effective hydrostatic seal. An important factor affecting the amount of swell achieved, is the quality of water hydrating the bentonite. The significant advantage of the pre-hydrated system is that the initial hydration occurs under factory-controlled conditions.



Above: Rawmat membrane being installed to the roof of the main tunnel and covered by concrete.

Why Bentonite for Britomart?

1. **The Britomart site was a wet site - other products were not suitable for this project.**

   Being so far below sea level, it was almost impossible to provide the sufficiently dry substrate required by other products or systems. Given the construction programme, and the hydrostatic pressures on site, these other systems would not have performed to the same level as the pre-hydrated bentonite system.

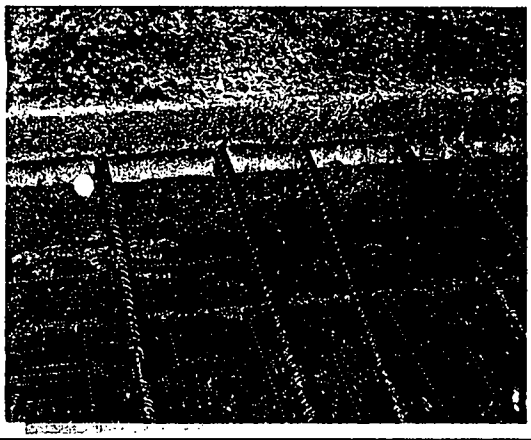
2. **A variety of substrates were required**

   In much of the tunnel it was not possible to install the waterproofing system directly to the building substrate. For much of the tunnel the pre-hydrated bentonite was installed to the excavated clay. Bentonite is one of the few products that can be installed on a variety of substrates including rock face, concrete and sacrificial steel shutters.

3. **A non weather-dependent solution was necessary to keep the project timeline on track.**

   The programme for construction of the tunnel was very tight. Much of the waterproofing was scheduled for the winter months, which would have been a problem with conventional waterproofing systems. No weather-related "down time" occurred during the bentonite installation.

Below: Floor slab construction detail. Rawseal TR35 triangular and RC50 slab waterstops used.



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THE TIMELINE

late 2001

Waterproofing Systems Ltd begins supplying the Rawmat pre-hydrated bentonite to the Britomart main tunnel.

early 2002

Beca Carter, Jasmax and Downer Engineering are impressed by the Waterproofing Systems product range and applicator. Additional contracts are awarded for work on the basement, roof and parapets of the Central Post Office.

late 2002

Waterproofing Systems secures the Concourse Tunnel using Rawmat/Rawseal.

early 2003

The project continues to grow. Waterproofing Systems commences work on the Streetscapes contract using Polyflame, Rawmat and a variety of Gripset Liquid membranes.

"The Britomart project was challenging right from the start. We had to show that our product was superior and that it had more advantages over other specified products. We felt confident that Waterproofing Systems would always be a strong contender, but it was not always straightforward and one or two issues had to be overcome.

This was probably the most demanding waterproofing job in New Zealand for the past 10 years, so I feel confident that we can address the requirements of any other project coming up in the future."

John Stallard
Technical Director
Waterproofing Systems Ltd

Why the Rawmat Syste

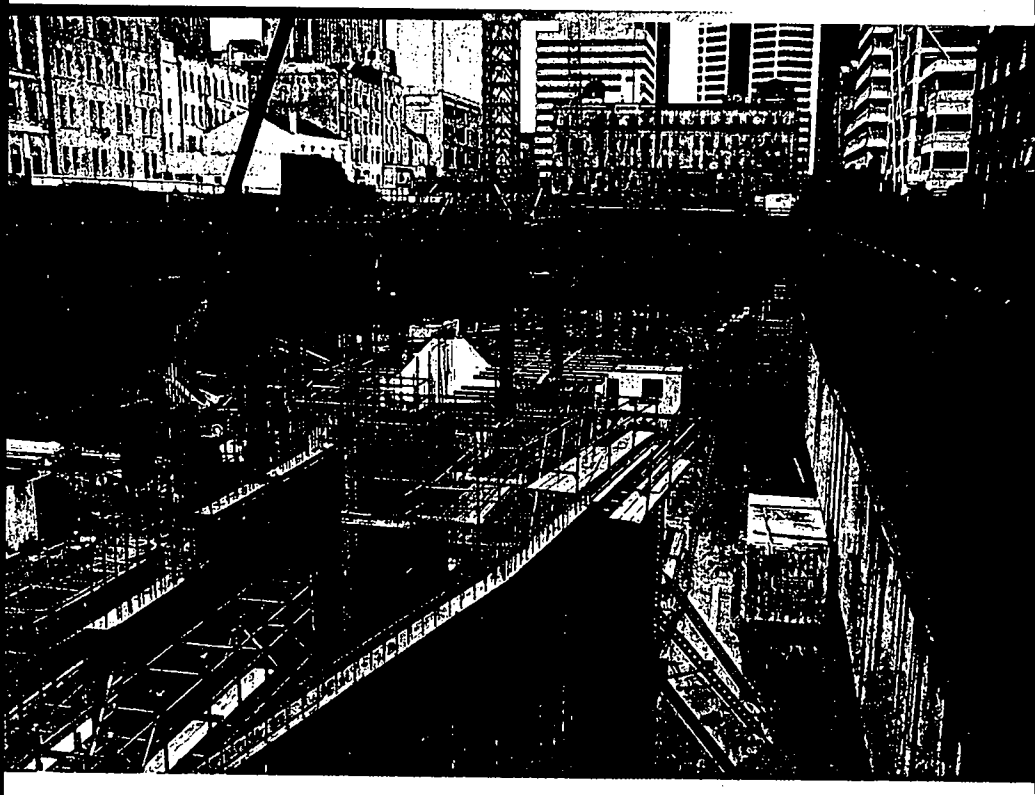
Rawmat pre-hydrated bentonite membranes and Rawseal w
quality sodium bentonite clay. Unlike dry bentonite systems, the pre-hydrated products are supplied in an impermeable state and don't require on-site wetting to become an impermeable barrier.

Unlike dry systems, which are prone to shrinkage and cracking, the Rawmat pre-hydrated bentonite is highly resistant to the effects of water contaminants. These contaminants can induce cationic exchange in dry bentonite systems causing them to have a reduced swell, shrink and crack as the clay converts from sodium bentonite to the calcium form. Additionally, unlike dry systems, there is no loss of bentonite with the Rawmat membranes, when they are cut during detailing work.

"We found that the tanking material could be easily applied and consider that the pre-hydrated product supplied by Rawmat was superior, in this application, to other bentonite products on the market."

Principal Engineer
Opus International Consultants

As the construction of the main tunnel was progressing, a variety of other waterproofing needs arose. What started out as one contract using Rawmat membrane and Rawseal waterstops, grew to supplying a wide variety of products with three other substantial contracts being secured.



Above: View of the main tunnel under construction. The Central Post Office (CPO) building is at the far end.

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The Project Grows!

CPO Roof Restoration

Perforated base sheet/Glasflame 2mm/Polyflame 4mm sand/Sungard

The existing roof was comprised of an asphalt membrane, covered in a concrete screed and pavers. The roof area of 1800 m² required complete renovation. The pavers/screed was removed and substrate repairs were completed. A perforated base sheet was installed followed by the Glasflame 2mm/ Polyflame 4mm torch-on system. A Sungard UV coat was then applied. Laterno roof vents were also installed to allow moisture to escape from the concrete substrate.

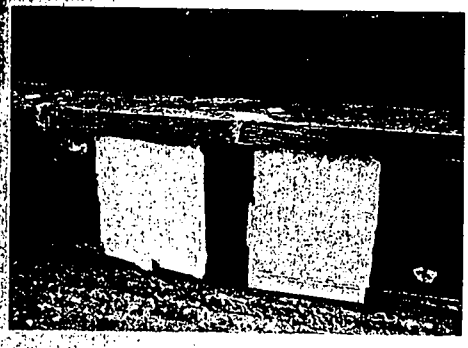


Above: Glasflame 2mm base sheet being installed on the CPO roof.

CPO Roof Parapets

Gripset 51/Gripset RD

The CPO roof has a 1.8 metre high parapet around its perimeter which had previously been waterproofed with an asphalt sheet. This old membrane was removed and the parapets were cleaned. Gripset 51 bituminous rubber membrane was used as a primer, onto which the Gripset RD acrylic membrane was applied. Gripset RD is a flexible elastomeric liquid membrane designed to waterproof a variety of external and exposed surfaces, and provides maximum long term protection by forming a tough and durable film.

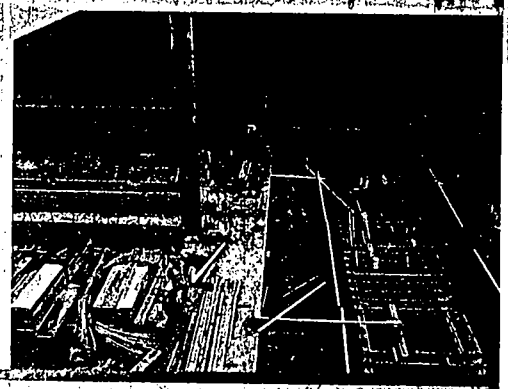


Above: Test areas of Gripset 51/Gripset RD on the parapets of the CPO roof.

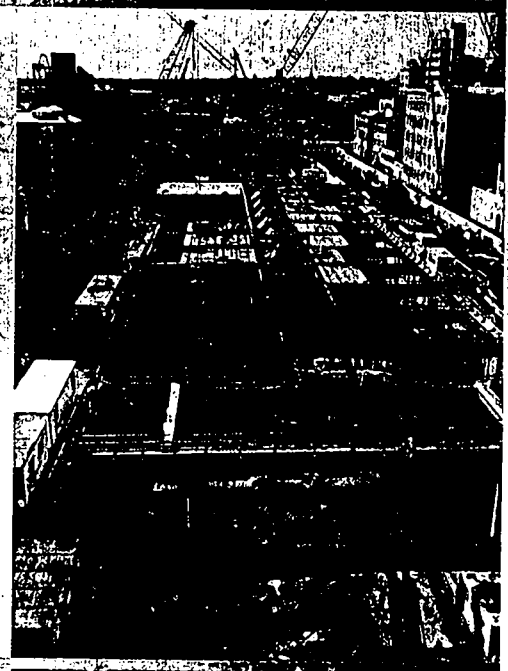
Secant Piles of Main Tunnel

Edplug/Edseal Ultra

The specification for the secant piles was originally for bentonite strips to be installed to all the junctions between the piles. However, the Edplug/Edseal Ultra range of cementitious waterproofing components was used instead to waterproof these areas. These products have a particularly aggressive crystallization quality making them very effective in this application. Edplug is a single component hydraulic cement, that instantly stops running water or seepage through cracks or holes in concrete. Edseal Ultra's aggressive crystalisation prevents dampness coming through the concrete surface.



Right: Secant piles on main tunnel to be waterproofed with Edplug/Edseal Ultra.



Right: View of site under construction, showing the "volcanoes" located down the centre. These provide some natural light to the tunnel.

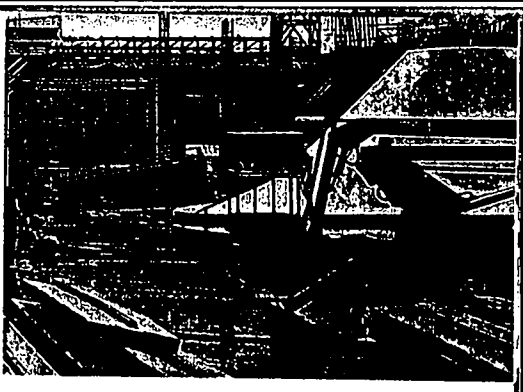


Right: Substrate renovation on the CPO roof commences.

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concourse entry to the main tunnel, waterproofed with a double layer Polyflame 4mm system.





the Project grows and grows...

Below: Internal gardens waterproofed with Gripset 51/Dry Mix.



Street Scapes: planter boxes / treepits / canopies

Polyflame 4mm

The streetscapes contract covered the ground level works including planter boxes, tree pits, pedestrian paving etc. Our Polyflame 4mm torch-on membrane was used to waterproof the more critical areas such as the tree pits. Gripset 51 was used in the lower specification areas as a damp-proofing solution. Polyflame has many outstanding product features, making it the ultimate choice when selecting torch-on products. Its superior qualities of tensile strength, elongation and tear resistance, sets Polyflame apart as the ideal durable solution for your waterproofing requirements.

Flashing "Volcanoes"

Gripset 2P liquid membrane

Down the middle of the main tunnel, large "volcanoes" were installed to provide natural lighting to the tunnel.

Above: "Volcanoes" being craned into place along the centre of the roof to the main tunnel.

Each of these needed a flashing system around the perimeter where the pre-hydrated bentonite membrane terminated. Gripset 2P, a two-part latex rubber liquid membrane, was used as a termination flashing.

Internal gardens

Gripset 51/Dry Mix

On both sides of the main exit from the tunnel, large garden and waterfeatures have been developed. Our Gripset 51/Dry Mix system was used to waterproof the garden pits. These pits were approximately 2 meters deep. The Dry Mix component creates a hard cementitious finish which protects the waterproofing membrane from root penetration.

In addition, Gripset 51 was used to waterproof the water collection areas that make up the waterfeature.

"This was a demanding project in regard to physical application as some of the access was difficult. But we had the type of material that made it a whole lot easier.

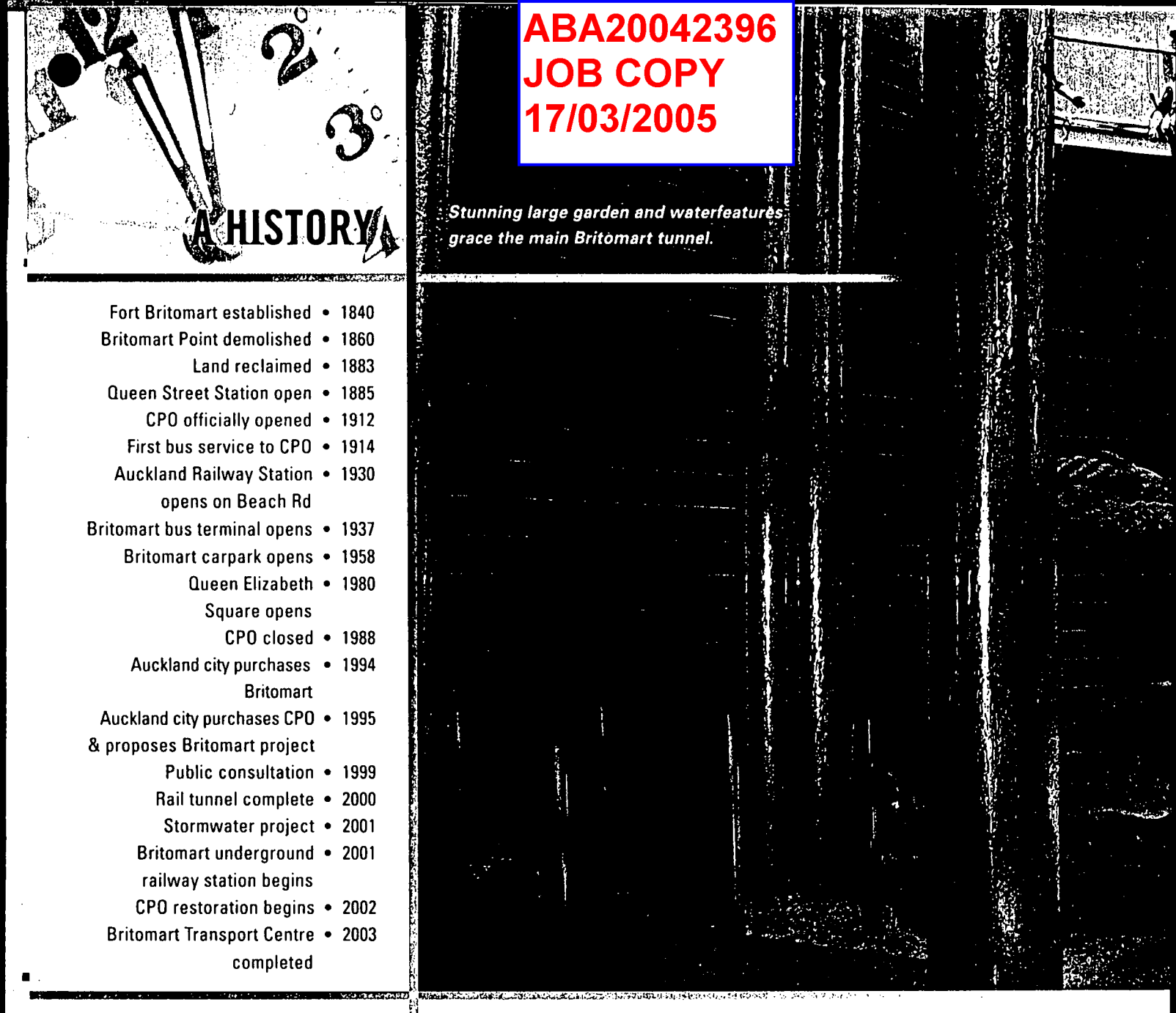
No other waterproofer in New Zealand would have had such a big project - we ended up laying 24,000 square metres of material. There are a lot of large projects that we would not have tackled before, but are now tackling, because we have the confidence to do so."

Fred Alarcon
Director
Waterproofing Services Ltd



Above: Tunnel under construction - inside view.

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A HISTORY

Stunning large garden and waterfeatures grace the main Britomart tunnel.

Fort Britomart established	•	1840
Britomart Point demolished	•	1860
Land reclaimed	•	1883
Queen Street Station open	•	1885
CPO officially opened	•	1912
First bus service to CPO	•	1914
Auckland Railway Station opens on Beach Rd	•	1930
Britomart bus terminal opens	•	1937
Britomart carpark opens	•	1958
Queen Elizabeth Square opens	•	1980
CPO closed	•	1988
Auckland city purchases Britomart	•	1994
Auckland city purchases CPO & proposes Britomart project	•	1995
Public consultation	•	1999
Rail tunnel complete	•	2000
Stormwater project	•	2001
Britomart underground railway station begins	•	2001
CPO restoration begins	•	2002
Britomart Transport Centre completed	•	2003

When your project demands durable waterproofing solutions you can trust, work with the right company who can specify the right products for the job.

Ph +64 6 357 9148
Fax +64 6 357 9410
Email info@waterproofing.co.nz

waterproofing SYSTEMS LTD
we're watertight
www.waterproofing.co.nz

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ACCEPTABLE SOLUTION G13/AS1 SANITARY PLUMBING

1.0 SCOPE

1.0.1 This acceptable solution applies to above-ground non-pressure (gravity flow) sanitary plumbing for *buildings* having 3 storeys or less. The term above-ground includes all pipework within, or on the *building*, including any basement(s).

1.0.2 The solution does not include:

a) Specialised types of *sanitary fixtures* or *sanitary appliances* used within *buildings* such as hospitals, laboratories and factories, or

b) The conveyance of industrial liquid wastes, chemical or toxic wastes and other wastes which cannot be discharged to a *sewer*.

1.0.3 Protection of water seals

Water seals shall be protected from pressure fluctuations within the sanitary pipework so as to prevent foul air and gases entering the *building*. The methods described in this acceptable solution for protecting *water seals* generally require each *fixture discharge pipe* to be vented.

Comment:

Individually venting each fixture discharge pipe provides the greatest flexibility in the arrangement and lengths of discharge pipes.

2.0 WATER TRAPS

2.1 Water trap requirements

2.1.1 All discharge points to the *plumbing system* shall have a *water trap* to prevent foul air from the *plumbing system* entering the *building*.

2.2 Water trap dimensions

2.2.1 The depth of the *water seal* (see Figure 1) shall be:

a) For *waste pipes* connected indirectly to the drainage system by discharging over a *gully trap*: no less than 40 mm.

b) For *discharge pipes* connected either to a *discharge stack* or directly to the drainage system; no less than 70 mm.

Comment:

G1/AS1 permits a 50 mm water seal depth for WC pans - refer to Figure 1 of G1/AS1.

2.2.2 The diameter of the water trap shall be no less than that given in Table 1.

Table 1: **Fixture water trap & fixture discharge pipe sizes**
Paragraphs 2.2.2 and 4.3.2

Sanitary fixture or appliance	Minimum diameter (mm)
Drinking fountain	25
Bidet Urinal (bowl type) Basin	32
Cleaner's sink Clothes washing machine Kitchen sink (domestic) Laundry tub (single or double) Shower tray Bath	40
Kitchen sink (commercial) Urinal (1 or 2 stall)	50
Urinals (3 or more stalls) Water closet pan	80

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BRANZ APPRAISED

SPECIFY WITH CONFIDENCE

BRANZ APPRAISAL CERTIFICATE No. 404 (2000)

POLYFLAME AND GLASFLAME ROOF MEMBRANE SYSTEMS

Waterproofing Systems Ltd
PO Box 1113
Palmerston North
Tel: 0-6-357 9148
Fax: 0-6-357 9410
Email: info@waterproofing.co.nz

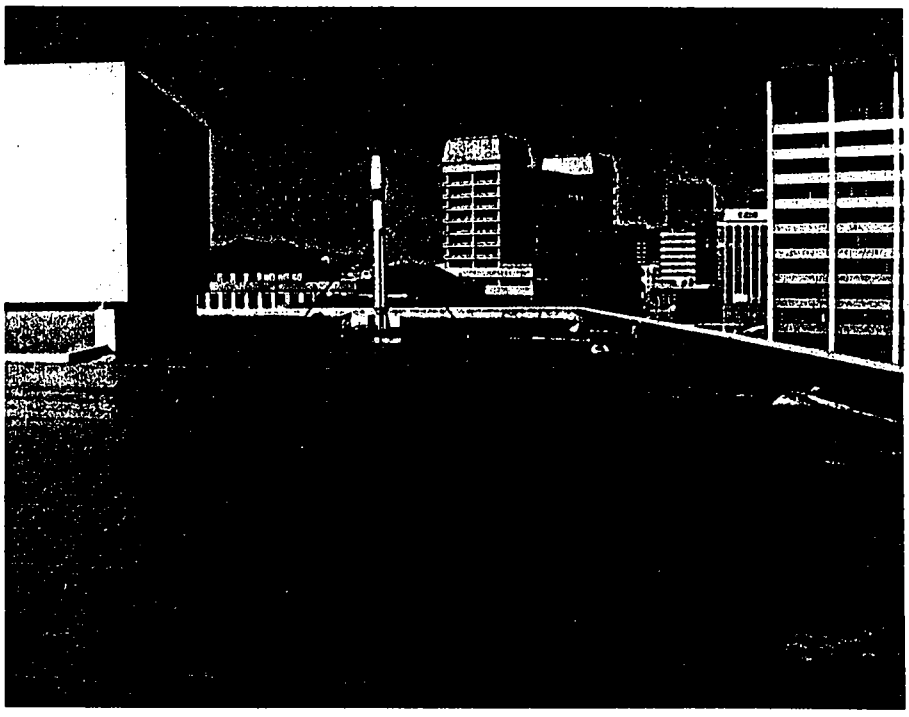
Manufactured by:
Bitumat Co. Ltd
PO Box 7487
Dammam 31462
Kingdom of Saudi Arabia

Readers are advised to check that this Certificate has not been amended, withdrawn or superseded by a later issue. Refer to the "Valid Certificates Index" in BUILD magazine published by BRANZ, the Certificate Listing on the BRANZ Internet Site, or contact BRANZ.

BRANZ, Private Bag 50908
Porirua City
New Zealand
Telephone: +64-4-235 7600
Fax: +64-4-235 6070
http://www.branz.org.nz

Product

- *This Certificate relates to Polyflame and Glasflame Roof Membrane Systems, which consist of modified bitumen membranes applied over a continuous substrate. The systems are installed by Waterproofing Systems Ltd, or its approved applicators.*
- *The products have been appraised for use as single and two-layer waterproof membrane systems for use on nominally flat and sloping roofs, gutters and parapets, when fixed to a continuous substrate of concrete or plywood on new or existing buildings. Details of other uses of the products, such as for deck membranes and tanking are available from Waterproofing Systems Ltd, but have not been assessed and are outside the scope of this Certificate.*
- *The products must be used, installed and maintained in accordance with the marketer's technical literature 'Torch-on Membrane Systems – Bitumat Specification', dated 3 May 1999. Unless stated otherwise, reference to 'technical literature' shall be taken as this document.*



Completed roof membrane system

Building Regulations

1. New Zealand Building Code (NZBC)

In the opinion of BRANZ, Polyflame and Glasflame Roof Membrane Systems, if 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 for the relevant physical conditions of B1.3.3. See Section 9.

Clause B2 DURABILITY: Performance B2.3.1(b), 15 years. See Section 10.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2 and E2.3.6. See Section 13.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The product will not be harmful to people.

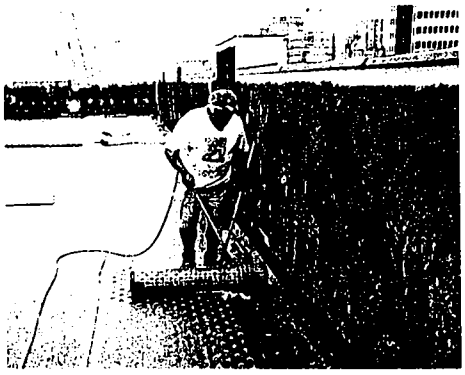
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The Project Grows!

CPO Roof Restoration

[illegible] base sheet/Glasflame [illegible] Polyflame 4mm sand/Sungard

The existing roof was comprised of an asphalt sheet membrane, covered in a concrete screed and pavers. The roof area of 1800 m² required complete renovation. The pavers/screed was removed and substrate repairs were completed. A perforated base sheet was installed followed by the Glasflame 2mm/ Polyflame 4mm torch-on system. A Sungard UV coat was then applied. Eterno roof vents were also installed to allow moisture to escape from the concrete substrate.

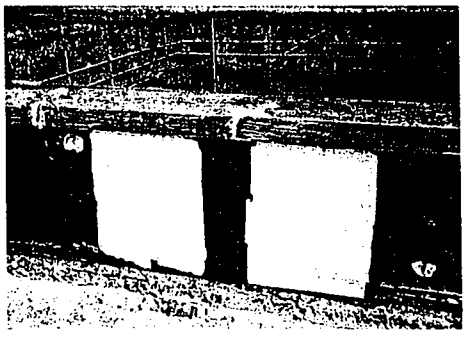


Above: Glasflame 2mm base sheet being installed on the CPO roof.

CPO Roof Parapets

Gripset 51/Gripset RD

The CPO roof has a 1.8 metre high parapet around the perimeter which had previously been waterproofed with an asphalt sheet. This old membrane was removed and the parapets were cleaned. Gripset 51 bitumenous rubber membrane was used as a primer, onto which the Gripset RD acrylic membrane was applied. Gripset RD is a flexible elastomeric liquid membrane designed to waterproof a variety of external and exposed surfaces, and provides maximum long term protection by forming a tough and durable film.



Above: Test areas of Gripset 51/Gripset RD on the parapets of the CPO roof.

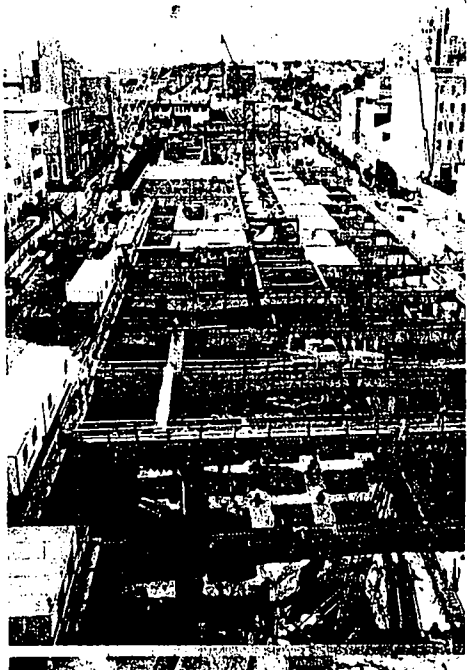
Secant Piles of Main Tunnel

Edplug/Edseal Ultra

The specification for the secant piles was originally for bentonite strips to be installed to all the junctions between the piles. However, the Edplug/Edseal Ultra range of cementitious waterproofing components was used instead to waterproof these areas. These products have a particularly aggressive crystallization quality making them very effective in this application. Edplug is a single component hydraulic cement, that instantly stops running water or seepage through cracks or holes in concrete. Edseal Ultra's aggressive crystalisation prevents dampness coming through the concrete surface.



Right: Secant piles on main tunnel to be waterproofed with Edplug/Edseal Ultra.



Right: View of site under construction, showing the "volcanoes" located down the centre. These provide some natural light to the tunnel.



Right: Substrate renovation on the CPO roof commences.

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Table 10.2 – Rafters (continued) (see 10.2.1.3.2)

(d) Light roof for very high wind zone

Rafter size	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
75 x 40	1.6	B	1.4	B	1.3	B
100 x 40	2.3	B	2.0	B	1.8	B
125 x 40	2.6	B	2.2	B	2.0	B
150 x 40	2.8	B	2.3	B	2.1	B
75 x 50	1.8	B	1.6	B	1.4	B
100 x 50	2.5	B	2.1	B	1.9	B
125 x 50	3.1	B	2.7	B	2.5	B
150 x 50	3.5	B	3.1	B	2.7	C
200 x 50	4.1	B	3.4	C	2.9	C
250 x 50	4.6	B	3.8	C	3.2	C
300 x 50	5.1	C	4.1	C	3.6	C
100 x 75	2.8	B	2.5	B	2.2	B
125 x 75	3.6	B	3.1	B	2.8	C
150 x 75	4.3	B	3.8	C	3.4	C
200 x 75	5.6	C	5.1	C	4.6	D
250 x 75	6.8	C	5.6	C	4.9	D
300 x 75	7.6	C	6.2	D	5.4	D

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

423 Sitting Room Fireplace

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Warmington INDUSTRIES 1994 LTD



Corner Wood Open Fire
Left & Right Hand

Ensure that you have the correct installation details for the Warmington that is to be installed.

Prior to Construction and Installation — Important Notes:

1) Install to AS/NZS 2918: 2001.
2) Install to manufacture's specifications.
3) All new installations require a permit.
4) For special requirements concerning materials (timber mantle and surrounds) within close proximity of Warmington products, please contact your local Warmington Technical Consultant.

Stage 1: Frame Construction Procedure by Builder.

5) Mark out flue centre.
6) Mark out heat cell clearance requirements.
7) Build timber framing to heat cell clearances and chimney chase clearance requirements.
8) Ensure that front face of heat cell clearance alcove is left open and unframed to enable installation of the firebox and adaptor. The chimney chase is left unlined for installation of the flue.
9) Construct plinth only, to required height. *

Stage 2: Install Procedure by Certified "Warmington Installer" only.

10) Fit fire to plinth.
11) Fit adaptor to Firebox.
12) Fit heat cell cabinet to firebox.
13) Fit flue system.
14) Fit cowl and flashing system.
15) Fit fascia kit.
16) Fit vents to heat cell alcove and chimney chase, to cool the heat cell and ensure efficiency of CAITEC™ Technology.

Stage 3: Finishing Procedure by Builder.

17) Construct hearth to required thickness. *
18) Finish framing of heat cell alcove.
19) Close in heat cell alcove and chimney chase.
20) Finish heat cell alcove and hearth to customer's requirements (e.g. paint / tiles).

*** Note: certified installer can install hearth and plinth.**

Maintenance.

1) Ensure that the Warmington and flue system is swept annually or more frequently if required.
2) To sweep flue and firebox: 1) Open damper fully.
   2) Cover front of fire with sheets.
   3) Remove cowl from top of chimney.
   4) Sweep from the top, down the flue.
   5) Remove all soot and ash.
   6) Ensure cowl and bird protection is clean and replaced.
3) Visually inspect fireplace and flue system.

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Warmington INDUSTRIES 1994 LTD

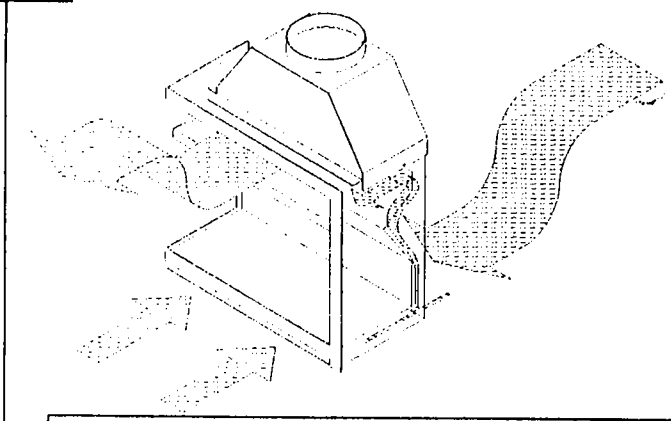
Corner Wood Open Fire

Caitec & mantle Clearances

Caitec™ Technology

Warmington's innovative solution to introduce replacement combustion air back into the home via the unique Warmington multi duct heat exchanger.

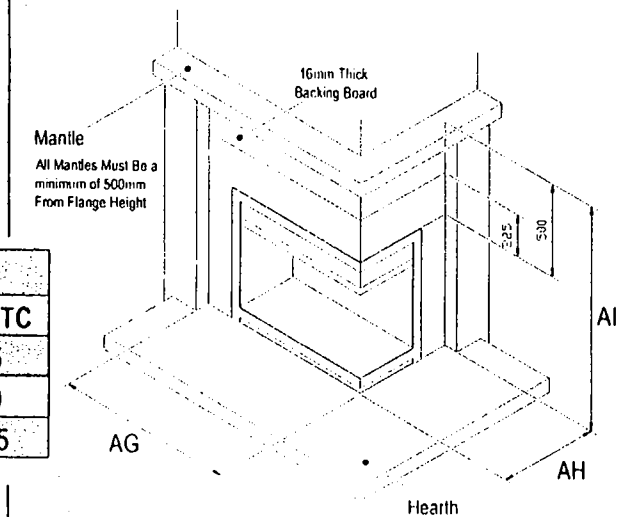
Air Flow



Caitec™ Technology

Caitec ™ draws air from an external air source to ensure that the open fire has pre-heated combustion air maximizing efficiency while maintaining the home at constant pressure equilibrium, reducing the risk of back drafting

Mantle



Mantle Clearances		
Firebox		SI 780TC
Front Width	AG	955
Side Width	AH	530
Height	AI	1205

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Warmington

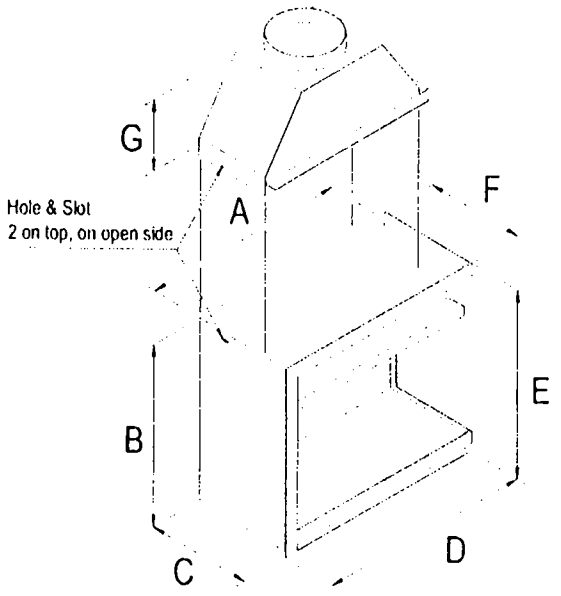
INDUSTRIES 1994 LTD

Flue & Fire to comply to - NZS 7421 : 1990 / ASNZS 2918 : 2001

Corner Wood Open Fire
Left Hand

All dimensions in millimeters (mm)
All dimensions are minimums

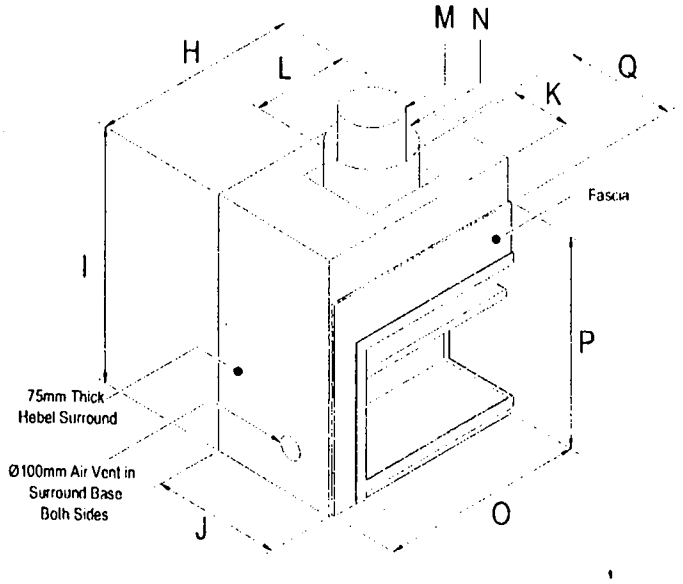
Firebox and Adaptor



Firebox		SI 780TC
Firebox Width	A	780
Firebox Height	B	680
Firebox Depth	C	400
Flange Front Width	D	805
Flange Height	E	705
Flange Side Width	F	380
Adaptor Height	G	260
Surround Width	H	925
Surround Height	I	1120
Surround Depth	J	585
Centre of Flue from front	K	280
Centre of flue from Side	L	450
Flue	M	250
Flue Liner	N	350
Fascia Front Width	O	910
Fascia Height	P	925
Fascia Side Width	Q	585
Heat Output		
Peak - Estimated		19
Range - Estimated		12-14

Minimum Flue Height	
Flue Height	3600
Measured From Top of Adaptor	B + G

Firebox with Heat Cell Cabinet



Check List	
Firebox	
Adaptor (Fastenings)	
Ash pan	
Badge	
Damper Handle	
Packed By	

Adaptor Fitting
Seal adaptor to firebox using high-temp gasket sealant. Bolt through holes provided.
Seismic restraint
Secure firebox through anchor positions provided.

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Warmington

INDUSTRIES 1994 LTD

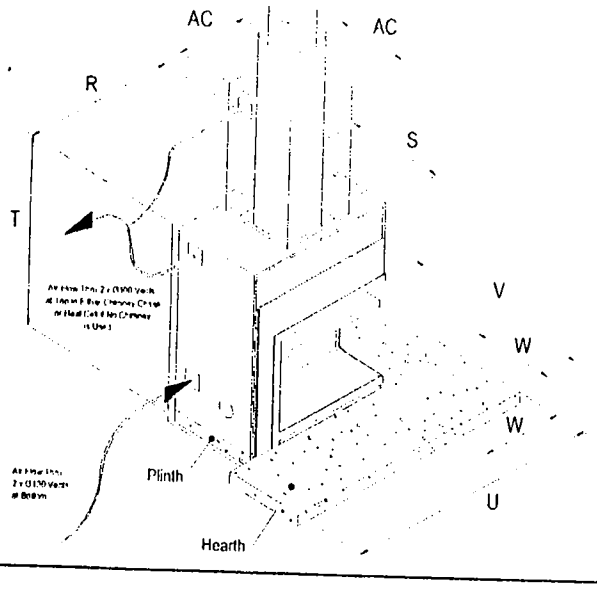
Flue & Fire to comply to - NZS 7421 : 1990 / ASNZS 2918 : 2001

Corner Wood Open Fire

Left Hand

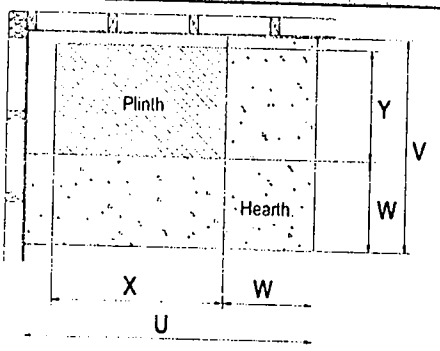
View of Heat Cell clearances (Alcove)

All dimensions in millimeters (mm)
All dimensions are minimums

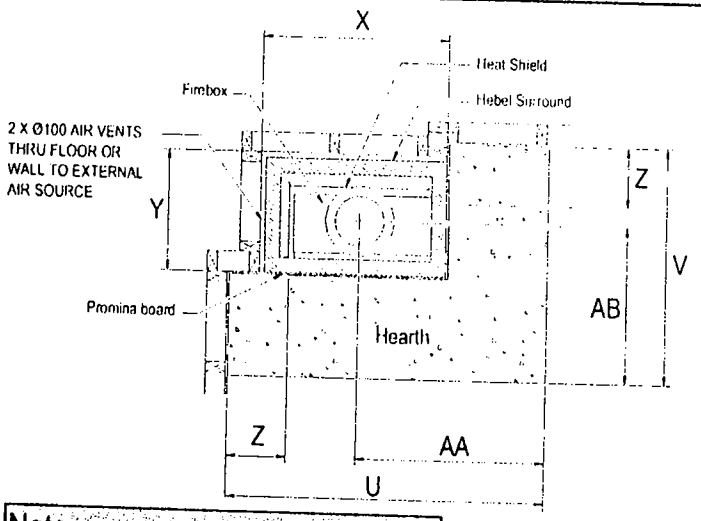


Firebox		SI 780TC
Heat cell Clearance Width	R	950
Heat Cell Clearance Depth	S	610
Heat Cell Clearance Height	T	1145
Hearth Width	U	1605
Hearth Depth	V	1175
Hearth Projection	W	500
Plinth Width	X	950
Plinth Depth	Y	610
To Wall Clearance	Z	300
Hearth to Flue Centre Width	AA	945
Hearth to Flue Centre Depth	AB	780
Chimney Chase Clearance	AC	450
Window Height	AD	1145
Window Width	AE	950
Window Depth	AF	610

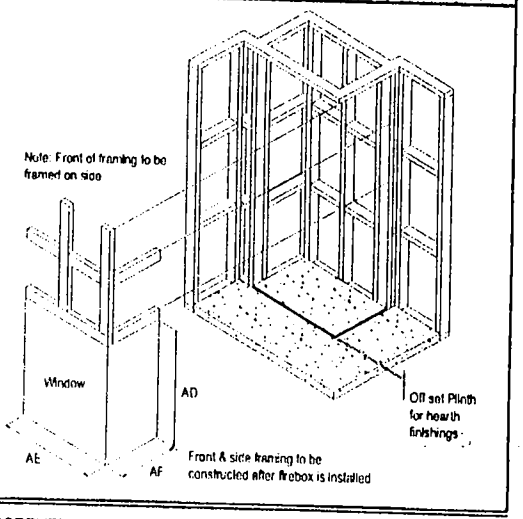
Plinth Position for Corner Install



Plan View of Heat Cell clearances (Alcove)



Framing Out Details (Alcove)



Note:

Centre Line of Flue is 'NOT' in Centre of Alcove

Note: Hearth and Plinth Construction.

For combustible flooring an insulating hearth and plinth of 75mm hebel is required.
Plinth to be off set above hearth by the hearth finishing's (e.g. tiles / granite / plaster / etc)

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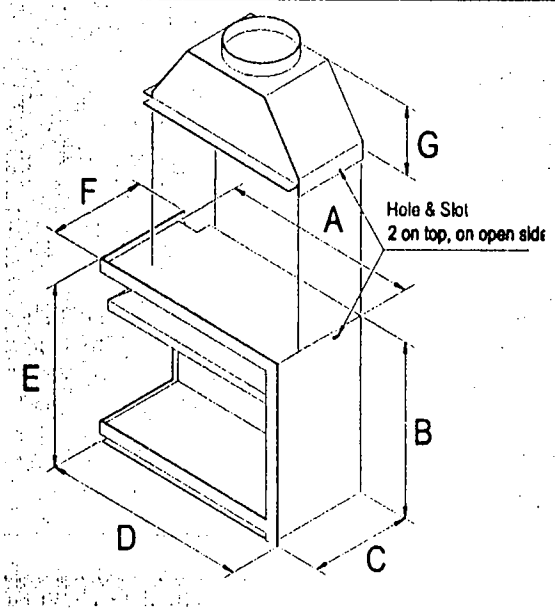
INDUSTRIES 1994 LTD

Corner Wood Open Fire
Right Hand

Flue & Fire to comply to - NZS 7421 : 1990 / ASNZS 2918 : 2001

Firebox and Adaptor

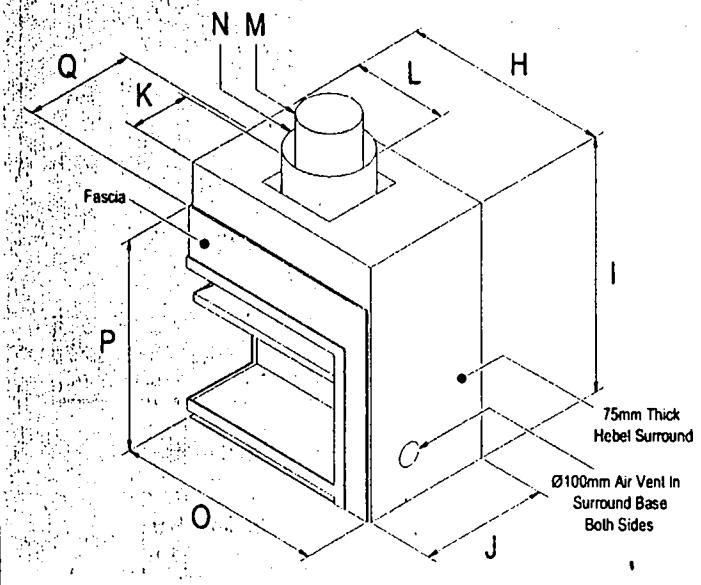
All dimensions in millimeters (mm)
All dimensions are minimums



Firebox		SI 780TC
Firebox Width	A	780
Firebox Height	B	680
Firebox Depth	C	400
Flange Front Width	D	805
Flange Height	E	705
Flange Side Width	F	380
Adaptor Height	G	260
Surround Width	H	925
Surround Height	I	1120
Surround Depth	J	585
Centre of Flue from front	K	280
Centre of flue from Side	L	450
Flue	M	250
Flue Liner	N	350
Fascia Front Width	O	910
Fascia Height	P	925
Fascia Side Width	Q	585
Heat Output		
Peak - Estimated		19
Range - Estimated		12-14

Minimum Flue Height	
Flue Height	3600
Measured From Top of Adaptor	B + G

Firebox with Heat Cell Cabinet



Check List	
Firebox	
Adaptor (Fastenings)	
Ash pan	
Badge	
Damper Handle	
Packed By	

Adaptor Fitting

Seal adaptor to firebox using high-temp gasket sealant. Bolt through holes provided.

Seismic restraint

Secure firebox through anchor positions provided.

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Warmington

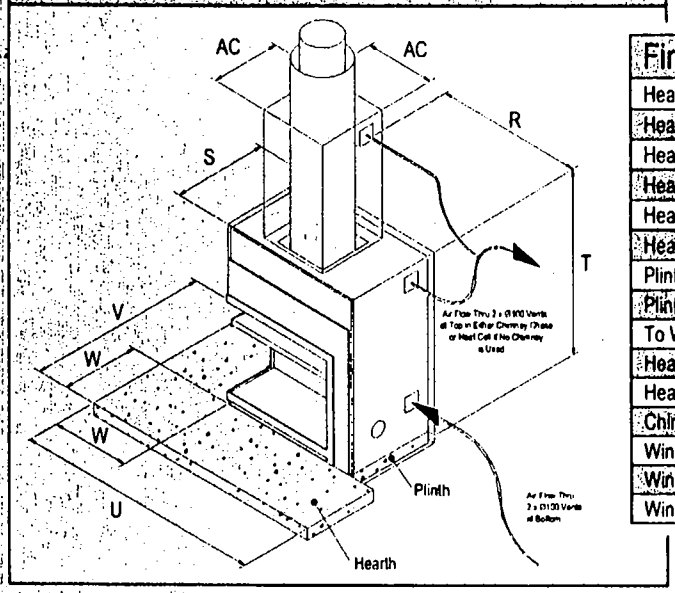
INDUSTRIES 1994 LTD

Flue & Fire to comply to - NZS 7421 : 1990 / ASNZS 2918 : 2001

Corner Wood Open Fire
Right Hand

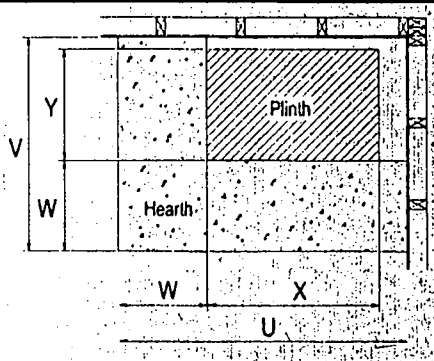
All dimensions in millimeters (mm)
All dimensions are minimums

View of Heat Cell clearances (Alcove)

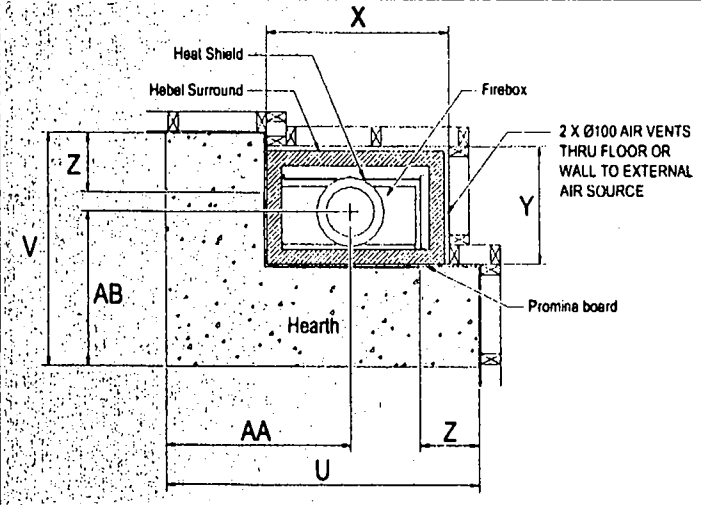


Firebox		SI 780TC
Heat cell Clearance Width	R	950
Heat Cell Clearance Depth	S	610
Heat Cell Clearance Height	T	1145
Hearth Width	U	1605
Hearth Depth	V	1175
Hearth Projection	W	600
Plinth Width	X	950
Plinth Depth	Y	610
To Wall Clearance	Z	300
Hearth to Flue Centre Width	AA	945
Hearth to Flue Centre Depth	AB	780
Chimney Chase Clearance	AC	450
Window Height	AD	1145
Window Width	AE	950
Window Depth	AF	610

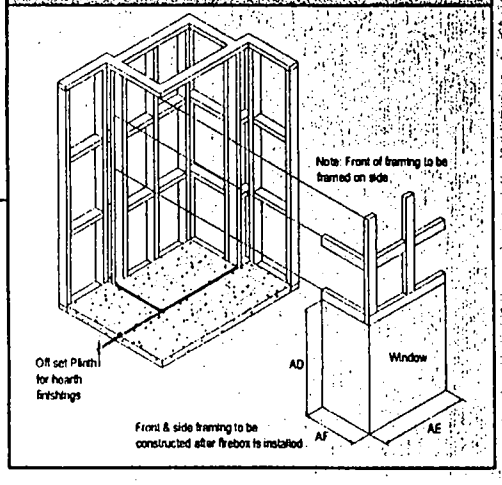
Plinth Position for Corner Install



Plan View of Heat Cell clearances (Alcove)



Framing Out Details (Alcove)



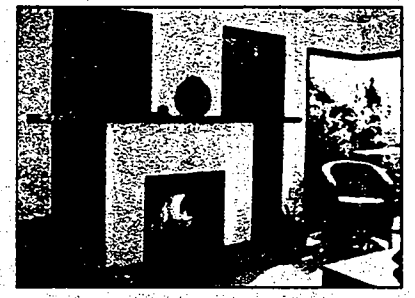
Note:
Centre Line of Flue is 'NOT' in Centre of Alcove

Note: Hearth and Plinth Construction.
For combustible flooring an insulating hearth and plinth of 75mm hebel is required.
Plinth to be off set above hearth by the hearth finishings (e.g. tiles / granite / plaster / etc)

Q23
Family Room Fireplace

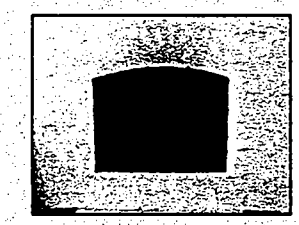
Everybody's idea of **Elegance**







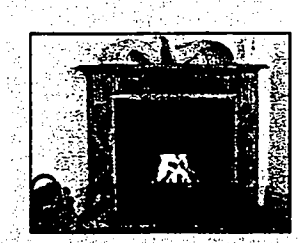
Jetmasters fit into existing fireplaces



1. Awaiting transformation

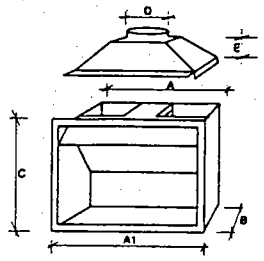


2. Select the right firebox to suit



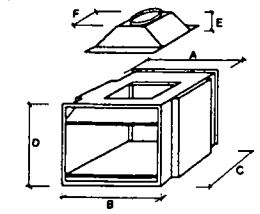
3. The installation complete

JETMASTER UNIVERSAL



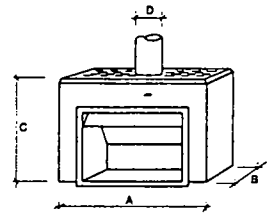
MODEL	A	A1	B	C	D	E	Heating Capacity Cu. Metres Wood	Gas
440	470	510	320	610	200	185	75	75
500	550	600	350	650	200	200	85	75
600	650	700	350	650	200	200	100	75
600 LOW	650	700	350	600	200	200	100	75
700 SH	750	800	350	650	200	200	130	75
700 SH LOW	750	800	350	600	200	200	130	75
700 D	750	800	400	700	225	200	160	
850	900	950	460	750	250	230	180	
850 LOW	900	950	460	700	250	230	180	
1050	1100	1150	510	800	300	250	220	

JETMASTER DOUBLE-SIDED



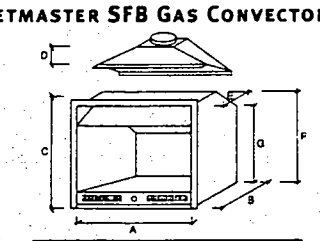
MODEL	A	B	C	D	E	F	Heating Capacity Cu. Metres Wood
700	850	800	610	700	220	345	180

JETMASTER FREESTANDING



MODEL	A	B	C	D	Heating Capacity Cu. Metres Wood	Gas
700SH	1050	390	810	200	180	80

JETMASTER SFB GAS CONVECTOR



MODEL		700
Frame Width	A	700
Box Width		730
Box Depth	B	295
Frame Height	C	650
Gather Height	D	200
Behind Frame	E	115
Box Height	F	630
Back Height	G	440
Flange To Flue ℄	Y	300
Flue Size		200
Heating Capacity (Cu.m)		85-100

Gas Connection (I.D.)	LPG 8mm Copper NG 12.5mm Copper
Gas Input LPG/NG	45/50 MJ/HR
Min. Flue Height	3.6 metres standard

All dimensions shown in millimetres.

THE FIREPLACE LTD

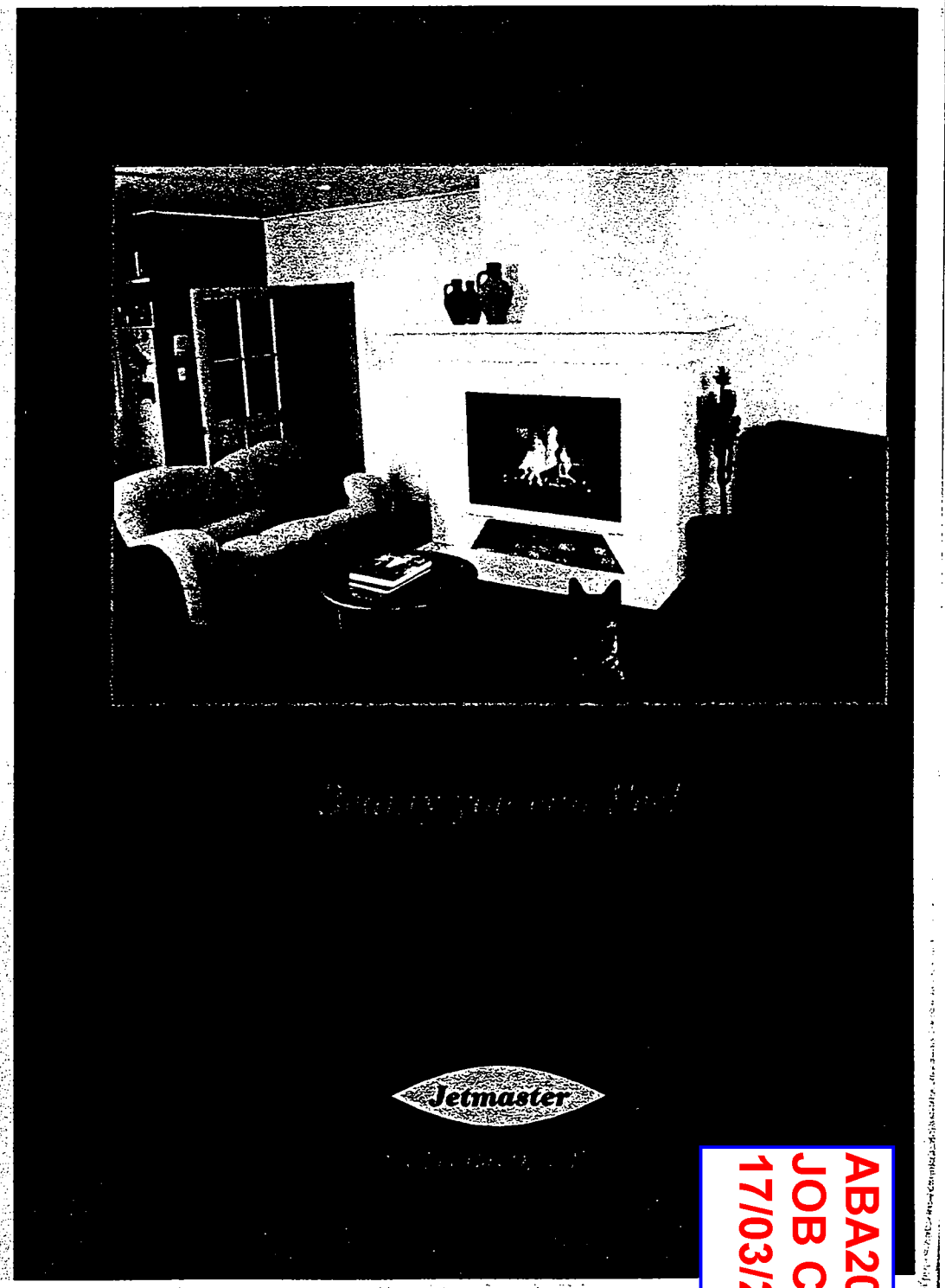
AUCKLAND
12 Tawari Street, Mt Eden
Telephone (09) 623 6990
Fax (09) 623 6994

WELLINGTON
133 Thorndon Quay
Telephone (04) 473 7207
Fax (04) 473 7213

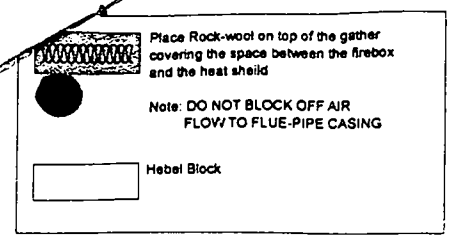
CHRISTCHURCH
54 Mandeville Street
Telephone (03) 348 8011
Fax (03) 348 8023

DUNEDIN
477 Princes Street
Telephone (03) 479 0041
Fax (03) 479 0042

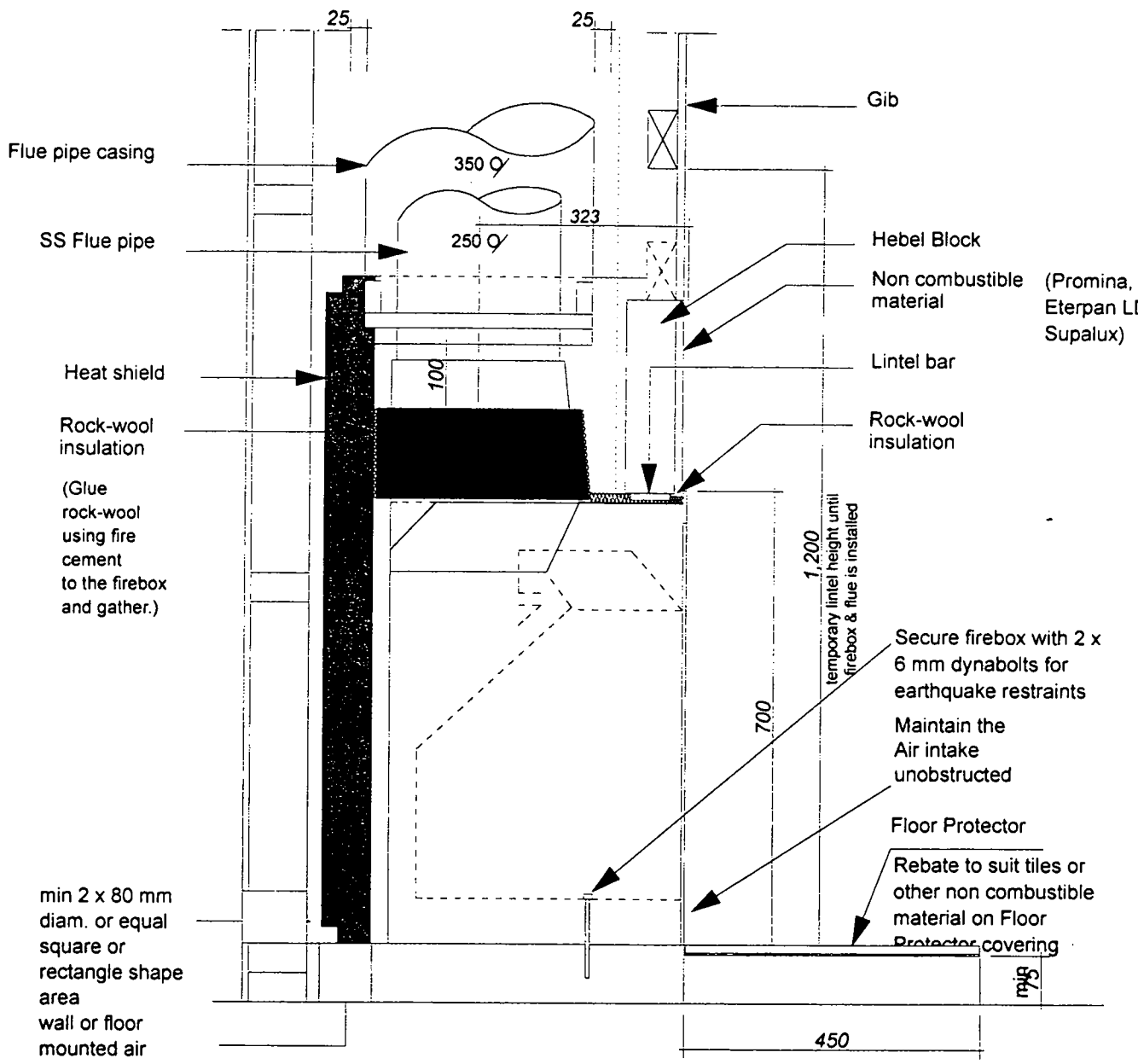
YOUR LOCAL JETMASTER DEALER



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min 25 mm. from flue pipe casing to combustible material



All external air vents & ceiling penetrations must be bird and rodent proofed with permanently fixed screen.

It is important to ensure the Jetmaster firebox is seated at the required finished Floor Protector level.

The Fireplace Ltd specifies that allowances must be made for Air Replacement Vents. Please refer to specific Installation Instructions.

Title: JM 850 Low installation into Timber Framing		Drg No:	WD01
Scale: 1:10	Drawn: AB		
Revision: JM850Lowtimva	Date: 16/08/2004		

The Fireplace Ltd

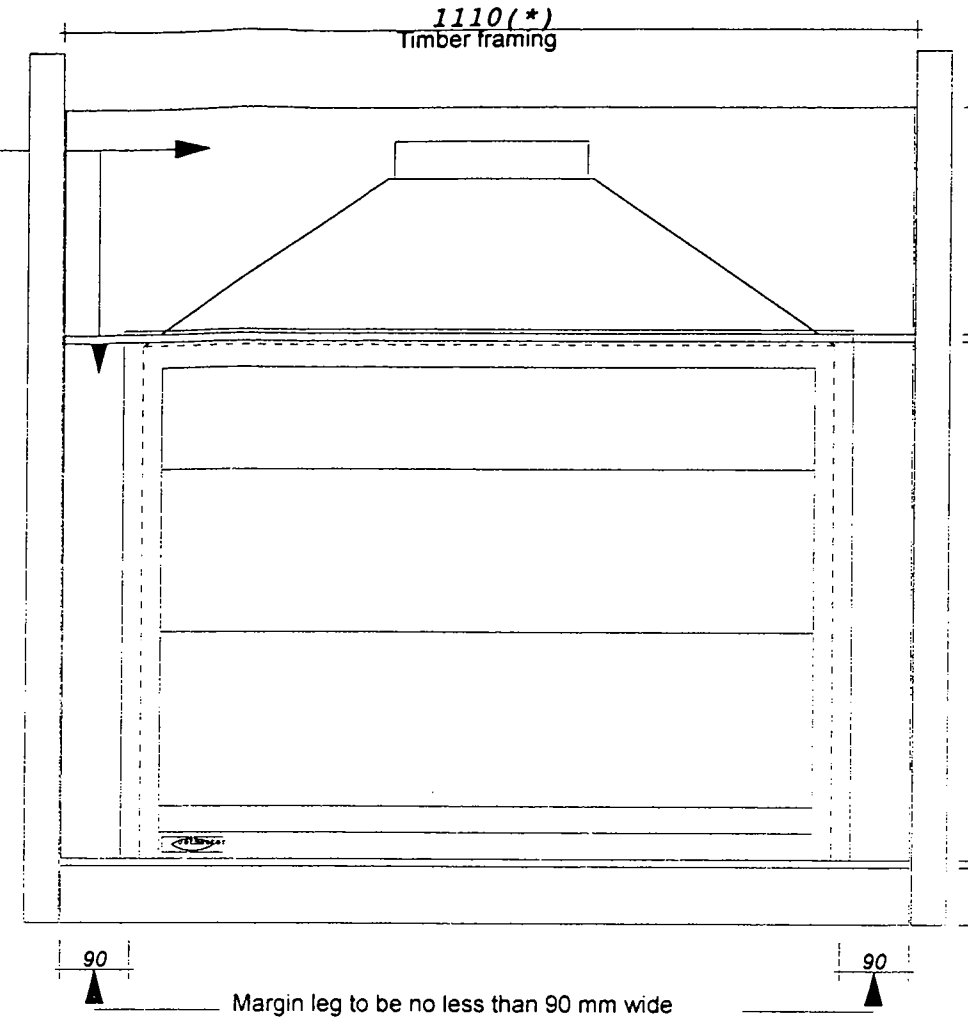
Barnes V5.pln; 0. Story: 1 : 10; 25/2/05 3:37 pm; 1/1

Non combustible material
(Promina, Eterpan LD, Supalux)

IMPORTANT

Where an internal wall board finish is required around the fireplace, ensure allowance is made to place non combustible internal wall lining (e.g. Promina, Eterpan LD, Supalux) to cover the extent of the Hebel Block surround.

Directly touching the firebox with any board or plaster will cause cracking from heat expansion.
Allow 2 mm minimum space away from the firebox.
Under no circumstance is the width of vertical margins legs to be less than 90 mm and the height of the margin lintel to be less than 300 mm.

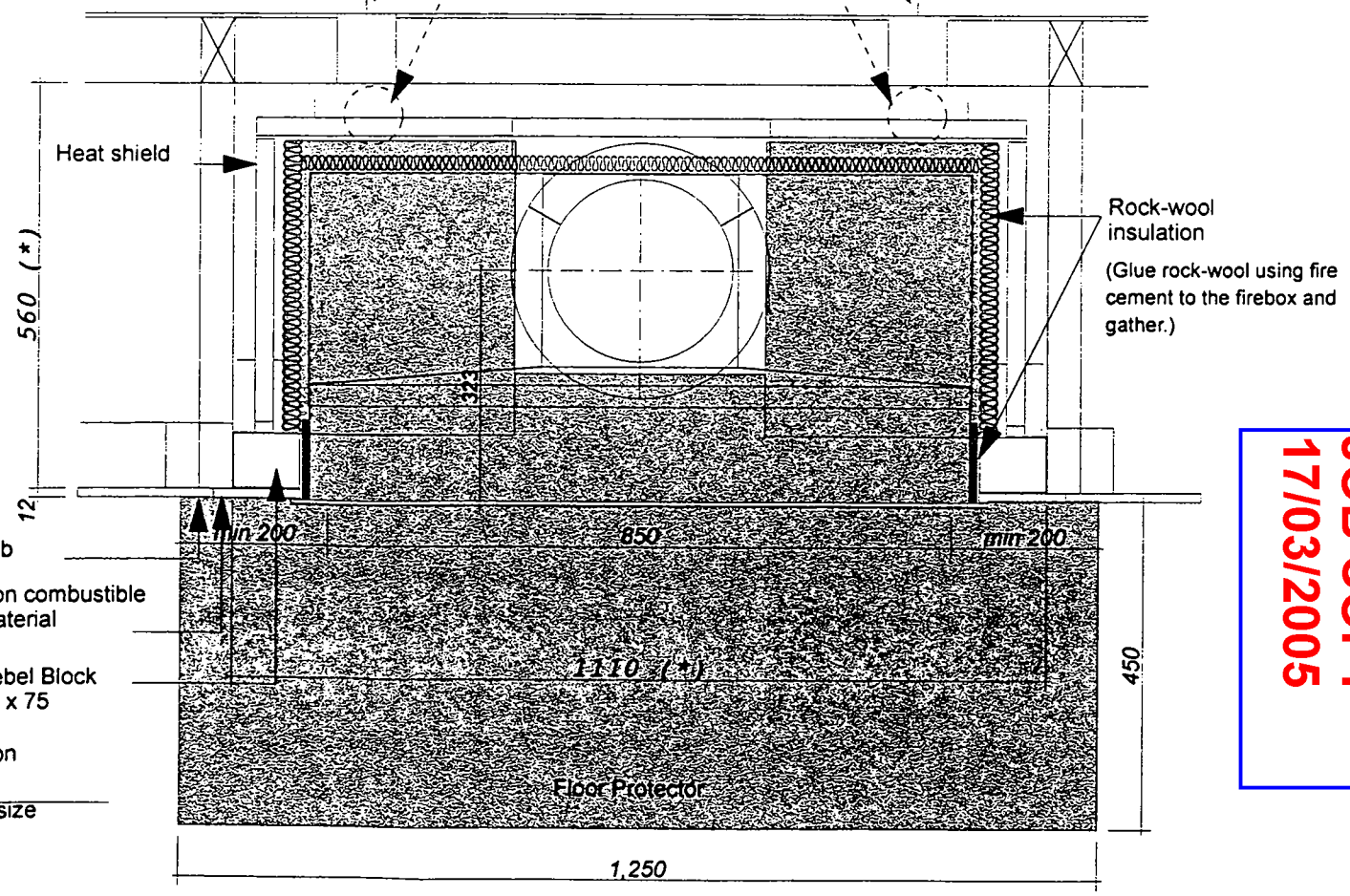


Bond Hebel Blocks together using appropriate adhesive (e.g. Gorilla Grip or similar) and secure with screws for added strength

Lintel bar

Ensure allowance made for firebox to sit on finished Floor Protector

min 2 x 80 mm diam. or equal square or rectangle shape area wall or floor mounted air vents.



(*) Please note that these dimension (Based on Hebel Block margins) are the absolute minimum size - widths and depths may be increased if desired.

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Nu-Age Plaster

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Email: mike.james@nu-age.co.nz

Attn: Concept Builders

Marc Lucas has asked me to forward this information pertaining to the Nu-Lite Cladding Solution.

The councils have all up to date information on the systems as I gave it to them myself [illegible]

Any Further questions don't hesitate to call.

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Yours Truly,

Mike James

.....

Technical Administrator
Nu-Age Plaster

Nu-Age Plaster

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Version 4 Printed September 2004

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Kale Print, Tauranga

A special thanks to all who had a part in the compilation of this manual and corresponding literature pertaining to the Nu-therm, Nu-Lite and Nu-Solid Cladding Solutions.

For further information contact Nu-Age Plaster
0800 4NUAGE
www.nu-age.co.nz

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Nu-Age Plaster

Nu-Age Plaster is New Zealand's number one Dry Mortar supplier.
It was founded in 1995 for the express purpose of bringing
from Germany to New Zealand the worlds leading dry mortar products,
application technology and application techniques.

Nu-Age has spent nearly 10 years working with the top German firms:

- Researching the best ingredients and blends using the very latest computerised batching and mixing equipment to ensure that you get the best quality plaster every time.

- Searching out the best application technology. Nu-Age has distribution rights for the M-Tec range of plaster pumps and mixers, recognised throughout the world as setting the industry standard.

- Studying application techniques so that they can teach you how to get it right every time.

- Testing, experimenting and adapting their learnings to produce a package perfectly matched to New Zealand building techniques and climatic conditions.

Research shows that using Nu-Age Plaster products, application techniques and M-Tec application technology regularly reduces application time to about one quarter of that required for conventional techniques at higher levels of quality.

And if that's not enough, check out the after sales and technical back up services. You won't find better.

Nu-Age Plaster - endeavouring to find a better solution

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Nu-Age Plaster

Disclaimer

The information contained within this manual is solely to provide a general description and instructions for application for all Nu-Age Plaster cladding solutions when being applied to standard construction techniques in conjunction with the NZBC and all relevant NZ Standards. The focus of information pertains to the extensity of the scope as outlined in the manual for the individual Nu-Age Plaster Cladding Solutions. Users of any Nu-Age Plaster Cladding Solution are required to carry out their own investigations as to the specific requirements that the Cladding Solution is to be applied to. All information in this Technical Manual is believed to be accurate at the time of compilation. no warrantee or representation, express or implied(other than as may be implied by law) is made by Nu-Age Plaster Ltd as to its accuracy, reliability or completeness. Nu-Age Plaster reserves the right to modify and/or update information and details contained in this Technical Manual. The onus remains on the user of any Nu-Age Plaster Cladding Solution to ensure the most recent information available is followed. The most recent version of the Nu-Age Plaster Technical Manual and details are available from the website at www.nu-age.co.nz

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15 YEAR WARRANTEE

- Nu-Age Plaster Cladding Solutions have been designed, tested, appraised for New Zealand conditions.
- Over 3000 residential and commercial buildings in New Zealand have been clad with a Nu-Age Plaster Cladding Solution ranging from homes to high-rise apartments to commercial applications all with successful results across the board.
- A Telarc Q Base registered company Nu-Age Plaster follows strict guidelines in quality control to ensure consistently good product goes out the door every time.
- Nu-Age Plaster Cladding Solutions are only installed by Nu-Age Plaster Approved Applicators who have undergone specific training and quality control regimes to ensure you get the best job done.

Nu-Age Plaster is so confident in our Cladding Solutions we are prepared to offer a **15 year Manufacturers Warrantee** on all systems. For all these reasons and more choose Nu-Age Plaster Cladding Solutions and we'll Guarantee 'your peace of mind'

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Nulite
Cladding Solution

Introduction

Nu-Age Plasters Nu-Lite exterior cladding solution is a revolutionary new monolithic cladding offering a comprehensive range of solutions for the building industry. With smooth clean lines and the versatility to achieve complex shapes and features demanded by today's Architects and designers, Nu-lite cladding solution is the logical choice for your home, office or business to provide a light crack resistant, aesthetically pleasing weatherproof seal for your building.

Nu-Age Plaster is so confident in the Nu-Lite cladding solution they can offer a 15 Year Manufacturers Warrantee.

System Description

The Nu-lite cladding solution is a cavity based monolithic plaster cladding system installed over fibre cement substrate. A 10mm coat of polystyrene saturated polymer based plaster is applied to the substrate followed by a 2-3mm coat of Skim Coat with glass fibre mesh embedded, then finished with a 2-5mm finishing coat, providing either a grit sponge finish or undulating Adobe finish.

This system contains 4x4mm or 6x6mm reinforced alkali-resistant glass fibre mesh to enhance the strength and resist surface cracking of the plaster.
Nu-Lite is designed to be applied on residential to light commercial structures where domestic construction teqniques are applied.

An acrylic-based exterior paint system is required over the Nu-Lite finishing plasters to ensure weather tightness and give the desired finish colour.

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Cladding Solution

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1. SCOPE AND LIMITATIONS

1.1. Scope

Nu-lite is a Monolithic Proprietary cladding system for use within the following scope:

- On residential and light commercial timber frame buildings.
- On buildings built within the scope limitations set out in NZS 3604 in regard to building height, number of storeys, shape and size.
- On buildings situated in NZS 3604 Building Wind Zones up to, and including 'Very High'.
- With aluminium and timber window and door joinery.
- With installation carried out only by Nu-Age Plaster Ltd approved applicators.

1.2 Site and Structural Requirements

All sites where buildings clad with Nu-Age Plaster Nu-lite are to comply with Acceptable Solution E1/AS1.
Clearances below floor level to finished ground are to comply with requirements of NZS 3604:1999
Foundation design to comply with requirements of NZS 3604:1999 or be designed and approved by Structural Engineer.
The Nu-lite system is to be fixed over H3.1 Timber Battens.
Timber framed buildings to be clad with Nu-lite are to be designed in accordance with NZS 3604:1999 or be designed and approved by a structural engineer.

1.3 Bracing

All bracing for structures must comply with NZS 3604:1999 or Designed and approved by structural engineer.

1.4 Wind Loading

Nu-lite is suitable for use in wind zones up to and including Very High (VH) as defined in NZS 3604:1999 in terms of performance relating to external moisture and structure.

2. BUILDING REGULATIONS

The Nu-lite System if used, designed, installed and maintained in accordance with the statements and specifications provided in this manual, will meet, or contribute to meeting the following provisions of the NZBC:

Clause B1 Structure
Performance B1.3.1, B1.3.2 and B.1.3.4 for the relevant physical conditions of B1.3.3.

Clause B2 Durability
Performance B2.3.1 (b), 15 years.

Clause E2 External Moisture
Performance E2.3.2.

Clause F2 Hazardous Building Materials
Performance F2.3.1. This product will not present a health hazard to people.

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3. NU-LITE DESIGN INFORMATION

Nu-lite will provide a seamless monolithic finish to the exterior of a building provided sensible design methods are followed.

As Nu-Lite is installed over fibre cement sheet substrate, the substrate manufacturer's instructions must be followed.

3.1 Large wall areas

Avoid large expanses of unbroken exterior wall. Windows, doors and feature components can be incorporated to hide imperfections, which will create a better finish.

3.2 Large Eaves and projecting trim

The addition of eaves dramatically reduces the effects on a buildings elements from sun, wind and rain which can contribute to damage of the exterior cladding. Protection of openings and intersections is recommended by Nu-Age Plaster to extend the lifespan of the cladding and to reduce the maintenance requirements of the cladding at these points.

3.3 Timber Framing - General

- Timber wall framing must be treated as required by NZS 3602 and 82/AS1.
- Studs must be at a maximum 600 mm centres.
- Dwangs/nogs must be at maximum 800 mm centres.
- All new timber framing must comply with NZS 3604: 1999 timber framed buildings or be to a specific structural design.
- Timber framing must have a moisture content of no more than 24% at the time of application of the plaster.
- Wall framing behind battens where substrate sheets are joined must be nominal 50 mm thickness (i.e. 45 mm minimum finished thickness).

3.4 Tolerances

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

3.5 Control Joints

- Horizontal and vertical control joints must be located over structural supports.
- Horizontal control joints in walls clad with Nu-lite must be provided at maximum 5 m vertical centres and at all mid-floor intersections.
- Vertical control joints in the Nu-lite system must be provided at intervals not exceeding 5.4 m in length, aligned with any control joint in the structural framing, where building frame movement is likely, or where the system abuts other construction.

NOTE:

Compressed cement manufacturers installation specifications including control joints to be followed at all times. Any statements made in this documentation that differ from the documentation from fibre cement sheet suppliers will result in fibre cement sheet documentation taken precedence.

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3.6 Sloping Surfaces

The slope of surfaces such as sills and parapets must be a minimum of 15° from the horizontal. Tops of sills, parapets and balustrades that are more than 250mm wide must have a minimum 30° slope.

3.7 Electrical Cables

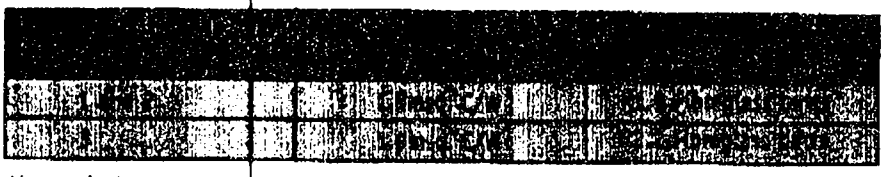
Cables penetrating the cladding system must be installed in conduits or ducts to ensure that any PVC sheathing does not come in contact with the cladding system.

3.8 Fire Protection

- Nu-lite must be separated from heating appliances, flues and chimneys, in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9 for the protection of combustible materials.
- The system is suitable for use as an external wall cladding system when restricted to:
  - Single storey buildings 1 m or more from the boundary for all purpose groups.
  - Buildings up to 7 m high, 1 m or more from the boundary, for all purpose groups other than SC and SD.
  - Fully sprinklered buildings up to 25 m high, 1 m or more from the boundary for all purpose groups other than SC, SD, SA and SR.
  - Buildings containing purpose group SH, with a building height less than 10 m and located 1 m or more from the boundary.

3.9 Insulation

The Nu-lite system alone does not meet NZBC Acceptable Solution E3/AS1. Additional wall insulation must be added as specified in the following table.



Alternatively, a specific thermal design may be carried out.

3.10 Impact Resistance

- Nu-lite has adequate resistance to hard and soft body impacts likely to occur in normal residential or light commercial use. Where a greater level of impact protection is required a heavier grade of mesh may be used.
- The likelihood of impact damage to the product when used in commercial situations must be considered at the design stage, and appropriate protection such as bollards or barriers provided in vulnerable areas.

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3.11 Minimum ground clearances

- At ground level, the bottom edge of the Nu-lite system must be kept clear of paved surfaces, such as footpaths and mowing strips, by a minimum of 100 mm and unpaved surfaces by 175 mm.
- The ground clearances to finished floor levels as set out in NZS 3604 must be adhered to at all times.
- At balcony, deck or low pitch roof/wall junctions, the bottom edge of the Nu-lite system must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 50 mm.

3.12 Handling and Storage

- Bags of plaster, coatings, and other materials or components must be kept dry and protected from damage, preferably stored off the floor on timber pallets or dunnage.
- Bags of Nu-Age Plaster must be used within the designated shelf life of six months from date of manufacture.

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4. NU-LITE UPVC COMPONENT RANGE

Starter Strips (LW-STARTER)



Nu-Age Plaster incorporates Nu-Lite Starter Strips into their Nu-lite system. These flashings are located at the base of the wall and cap the compressed cement sheets shielding the edge from the elements and providing screed guides for the applicators. This component sits on top of the cavity battens and is fixed through its back wall into the bottom plate of the wall framing.

Vermin Tray (VERMIN)



This uPVC flashing works in conjunction with the starter strips at the base of the wall. Fitted behind the fibre cement sheet the vermin tray acts as a barrier from the penetration of vermin into the drained and ventilated cavity created by the cladding system. This component is fixed through its back wall into the bottom plate prior to batten installation and is hidden as it sits 20mm above the base of the starter strip. The punchings in the vermin tray provide a ventilation opening area of 1000mm sq. per lineal metre of wall.

Jamb (LW-JAMB)



This component is fixed vertically over the fibre cement sheet up the side of the windows. This flashing is designed to clip into the aluminium window frame providing a weather barrier, preventing water from penetrating the building envelope at the jamb position.

Sill (LW-Sill)



This component is fixed horizontally over the fibre cement sheet along the bottom of the windows. This flashing is designed to clip into the aluminium window frame providing a weather barrier, preventing water from penetrating the building envelope at the sill position.

Control Joint(CONTROL 12)



As the Nu-lite system is installed over fibre cement sheets, the manufacturers specifications must be followed for control joint locations.
These control joints allow for shrinkage of the framing, expansion and contraction of the cladding substrate. These control joints are put in place to allow controlled movement of the cladding by allowing the rubber centre section of the control joint to flex laterally reducing surface cracking of the plaster.

Widra S.S Corner Bead



This stainless steel component sits on top of the fibre cement sheet at external corner positions and reinforces the plaster at these points from impact damage. The bead is adhered to the external corner with adhesive mortar or liteweight plaster and is set at 10mm allowing applicators to finish the liteweight base coat against the ribs while providing a straight edge to the corner.

Note: Text in brackets following component name refer to order description.
Utilise these component descriptions for ordering purposes.

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5. NU-LITE SYSTEM SPECIFICATIONS

5.1 Fibre Cement Sheet Substrate

Nu-Age Plaster accepts the following fibre cement sheet substrates for use with the Nu-Lite cladding solution.

- 4.5mm James Hardies Hardibacker
- 4.5mm CSR Stucco Backer sheet
- 4.5mm BGC Fibre Cement Durabacker
- 4.5mm Eterpan

5.2 Cavity Battens

Timber cavity battens are nominal 20 mm thick (minimum 18 mm) by 45 mm wide timber treated to H3.1.

5.3 uPVC Components

Refer to section 4.

Note: A 3mm gap must be maintained between face of fibre cement sheet and back face of aluminium joinery in order to install uPVC flashings.

5.4 Building Paper/Wrap

Building paper or wrap complying with NZBC Acceptable Solution E2/AS1 or NZS 3604, or other BRANZ Appraised breather-type membranes may be used with Nu-Lite.

Building wrap support - Polypropylene strap must be used where vertical batten spacing exceeds 300mm centres for securing the building wrap in place and preventing bulging of the bulk insulation into the drainage cavity.

Note: additional vertical battens may also be installed to provide support.

5.5 Plasters

Levelling Coat of Liteweight Plaster

A Portland Cement-based plaster, comprising of coarse sand, polystyrene beads and additives, supplied in 25kg bags. Nu-Lite can be trowel applied but for optimum results Nu-Age Plaster recommends pump application of a 10mm levelling coat of the product.

Reinforcing Coat of Skim Coat

A fine sand and cement-based plaster, supplied in 25 kg bags. It can be trowel applied but preferably spray applied in a 2-3 mm thick layer followed by embedment of fibreglass mesh reinforcement into the outside surface.

Finishing Coat of Adobe Finish

A sand, cement and lime based plaster, supplied in 25 kg bags. It is trowel applied to give a sculptured finish 3-5 mm in thickness.

Finishing Coat of Sponge Finish

A sand, cement and lime based plaster. supplied in 25 kg bags. It is trowel or spray-applied to a thickness of 2-3 mm.

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5.6 Reinforcing Mesh

Alkali-resistant fibreglass mesh supplied by Nu-Age Plaster must be used with the Nu-lite system. The fibreglass mesh is available in two grades:

4 x 4 mm Green Mesh (150 g/m2), 1200 mm x 50 m rolls
6 x 6 mm Blue Mesh (150 g/m2), 1200 mm x 50 m rolls

5.7 Fixings

Fixing of the fibre cement sheet substrate must be in accordance with the substrate sheet manufacturer's instructions.

Nom. 45x20mm Batten fixings to be min. 50mm in length to provide a 30mm penetration into substrate framing.

5.8 Flashing Tapes

Nu-Age Plaster accepts all BRANZ appraised flashing tapes for use with the Nu-lite system. The use of flashing tapes around openings, balcony abutments and parapets creates a secondary weather shield acting as a concealed barrier against water penetration through the building envelope.

5.9 Flexible Sealant

BRANZ Appraised flexible sealants must be used to seal control joints and openings, as and where required and stated in Nu-Age Plaster Technical Manuals.

5.10 Window and Door Trim Cavity Airseals

BRANZ Appraised self expanding, moisture cure polyurethane foam airseals suitable for this use must be used to create airseals at the interior face of the window and door joinery trim cavity.

5.11 Weather Protective Paint Coat

See Nu-Age Plaster Paint Specification Sheet

Application must be carried out in accordance with the paint manufacturer's instructions and must meet the performance requirements of the NZBC.

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6. INSTALLATION INSTRUCTIONS

6.1 Building paper/wrap

- Exterior timber framed walls to be wrapped with building paper/wrap and fixed in accordance with NZBC Clause E2 External Moisture.
- Polypropylene strap to be used where batten spacings exceed 300mm centres. See detail 1 of Nu-lite Technical Manual

6.2 Window Flashing Tapes

Prior to the installation of the cavity battens, proprietary flexible sill and jamb flashing tapes must be installed around the opening in accordance with the manufacturer's instructions.

6.3 Battens

- A continuous horizontal member can be fixed along the line of the soffit. Alternatively 100mm horizontal batten blocks can be used along the soffit line.
- Vertical members fixed over studs run up to horizontal members at soffit line and min. 30mm below finished floor level. Vertical battens at a maximum of 600mm centres.
- Horizontal packers 100mm long max. are installed on the dwangs, bottom plate, sill trimmers and lintels and where required for sheet fixing.
- Alternatively additional vertical battens may be used in place of horizontal batten blocks.
- At openings a continuous vertical batten must be installed and fixed with its edge hard against end of aluminium head flashing, providing a stop-end to the head flashing.
- Battens to be fixed to framing every 300mm max. This can be achieved using fibre cement sheet fixings. Battens may be tacked in place until fibre cement sheet is fitted and fixed through fibre cement sheet and batten combined. For fixing sizes see 5.7.
- If additional horizontal batten blocks are required to achieve fixing centres they may be introduced between vertical battens with a min. of 50mm clearance between end of 100mm max. batten block and any other member.

Note:
All battens to be nominal 20mm. Timber battens to be treated in accordance with NZS 3602. See Detail 1 of Nu-lite Technical manuals.

6.4 Compressed Cement Sheet

See manufacturers documentation for installation instructions.

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Quotation ... skylights, chimneys, flues and vents etc.

..."

Tags : ... "KB Longrun Corrugate" ex NZ Steel Ltd
Colours are as per the standard Colorsteel Endura Colour chart.
Colours required outside our standard colour range may incur a surcharge.
Roofing underlay will be laid Vertically with Iron not Horizontally.

6.5 uPVC Flashings

Vermin strip

- Vermin strip is to be installed along bottom edge of the vertical battens with back heel against timber bottom plate and the base covering the ends of the battens. Base of Vermin Strip to be installed min. 30mm below finished floor level. Vermin strip fixed to bottom plate through battens and at intermediate positions if required.

Starter Strip

- Starter Strip to be installed over top of battens at base of wall with its lowest point min. 50mm below finished floor level and fixed through the back heel at 300mm centres min.
- Height from finished ground level is to comply with NZS 3604:1999

6.6 Window flashings

Sill Flashing

- Measure window length and allow an additional 50mm flashing length each side of window.
- On top of the fibre cement sheet, force sill flashing up under window until the flashing return clips into the joinery groove.
- Fix sill flashing in place through back wall using staples, alternatively utilise fibre cement sheet fixings to fix through fibre cement sheet, batten and flashing combined.
- All joins in flashings are to be sealed and flashing taped where possible.

Jamb flashing

- Measure height of window and cut flashing allowing an additional 50mm in jamb flashing length.
- Remove the return clip and depth stop portion of the jamb flashing 50 from the top. This allows the jamb flashing to continue past the aluminium head flashing.
- Install jamb flashings on top of fibre cement sheet, overlapping sill flashing at bottom and with the flashing return clipped into the aluminium window joinery.
- Fix jamb flashings in place through back wall using staples, alternatively utilise fibre cement sheet fixings to fix through fibre cement sheet, batten and flashing combined.

Note:
Where a door opening occurs in an exterior wall, a junction between the jamb flashing and starter strip is required.

Head Flashing

- Install head flashing with back heel hard against timber framing and building paper/wrap. Ends of head flashing must finish against the vertical batten edge and uPVC jamb flashing.
- Flashing tape heel of head flashing to building paper/wrap.
- Run sealant bead along head-batten/jamb intersection.

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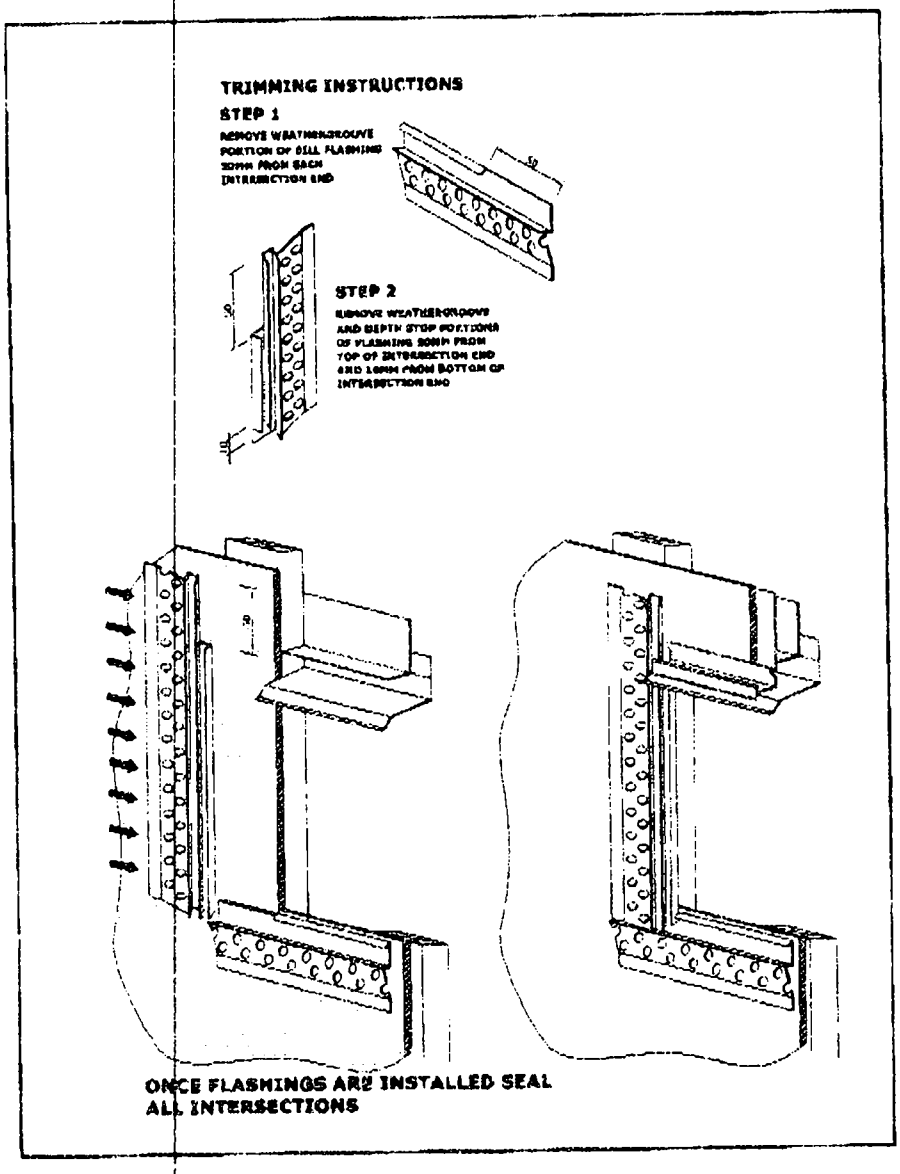


Diagram: Nu-lite Recessed Window Detail

Note:

Above windows, a vermin tray is required to cap base of battens and prohibit the entry of vermin.

See diagram.

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6.7 Stainless Steel Corner Beads

- Widra Stainless Steel corner beads are positioned on external corners to provide additional reinforcing of the plaster at these high risk impact points.
- The beads are cut to length and adhered to the external corner on top of the fibre cement sheet using adhesive mortar or liteweight plaster by dabbing the product through the bead and onto the wall 50mm from the top and approx. 500mm thereafter.
- Widra corner beads are set to protrude 10mm from adjacent wall planes and give the applicator screed guides for the liteweight levelling coat.
- 10mm screed guides may be glued on to assist in achieving required thicknesses at soffits and at base of the wall.

6.8 Kick-Out Flashings

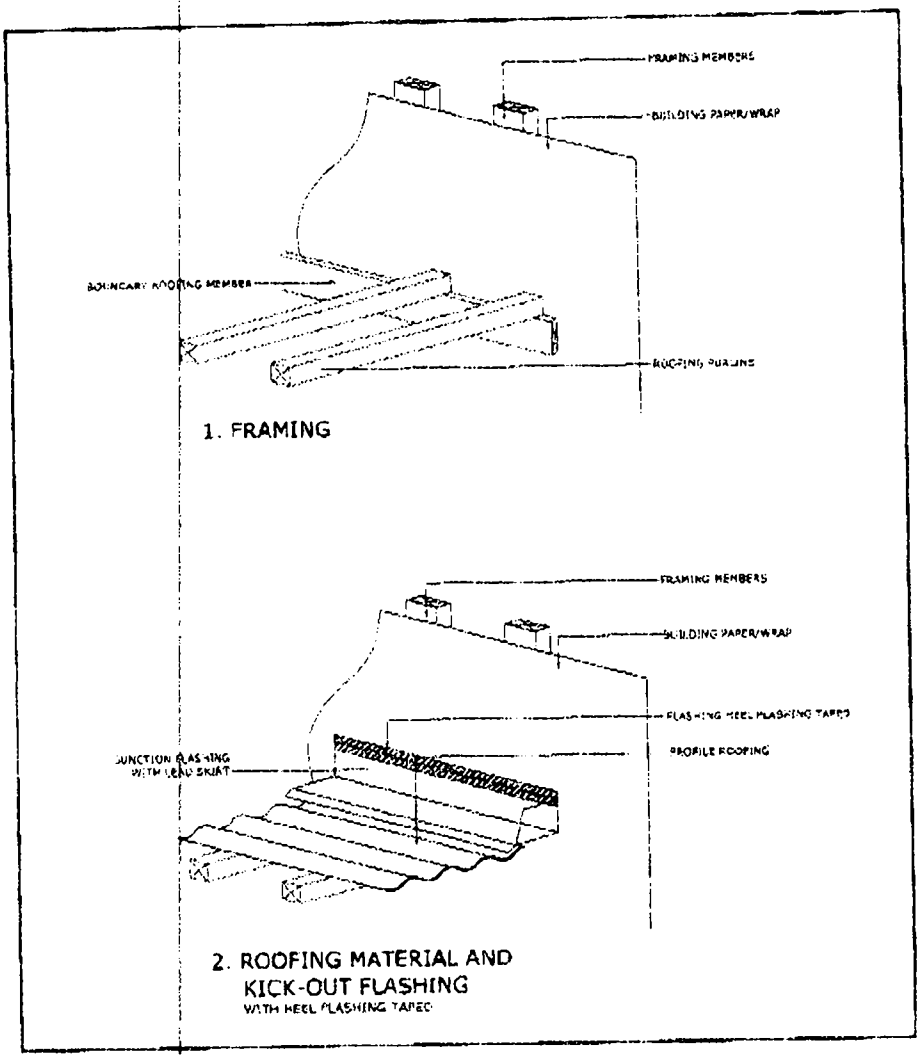


Diagram: Roof Kick-Out 1-2

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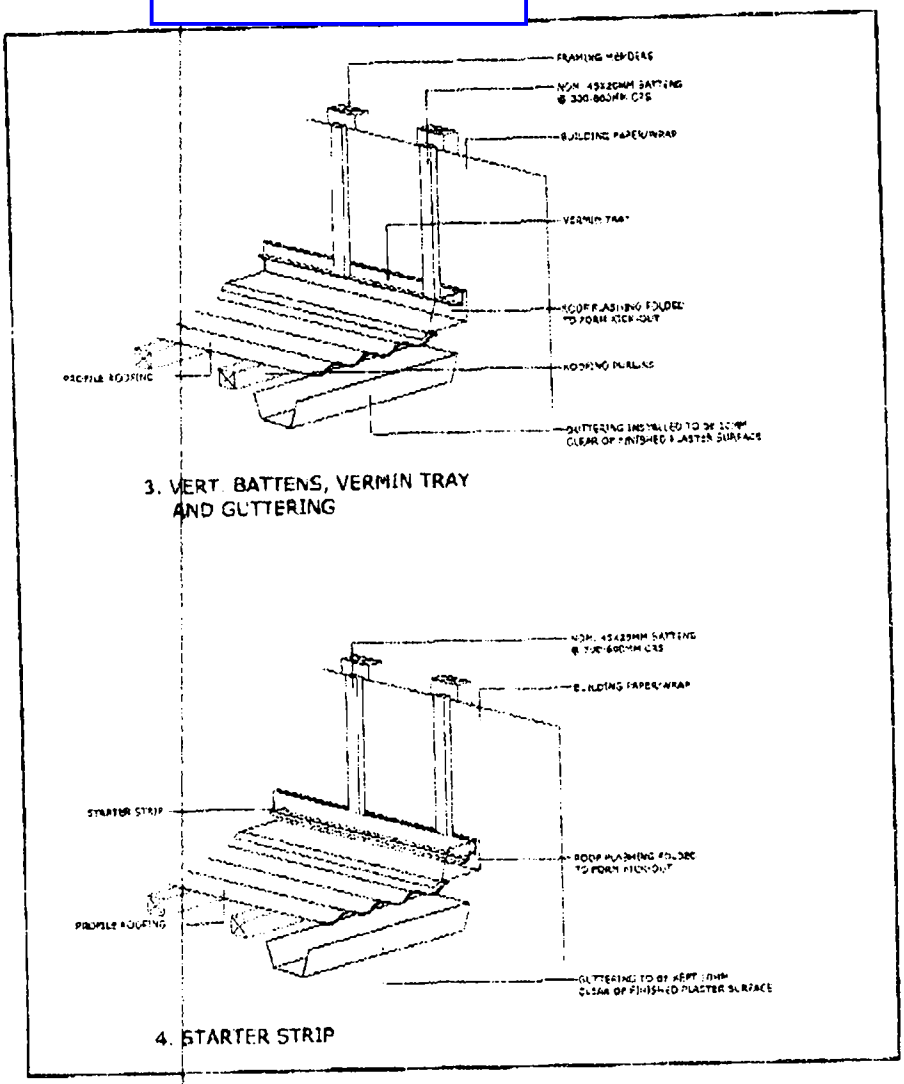


Diagram: Roof Kick-Out 3-4

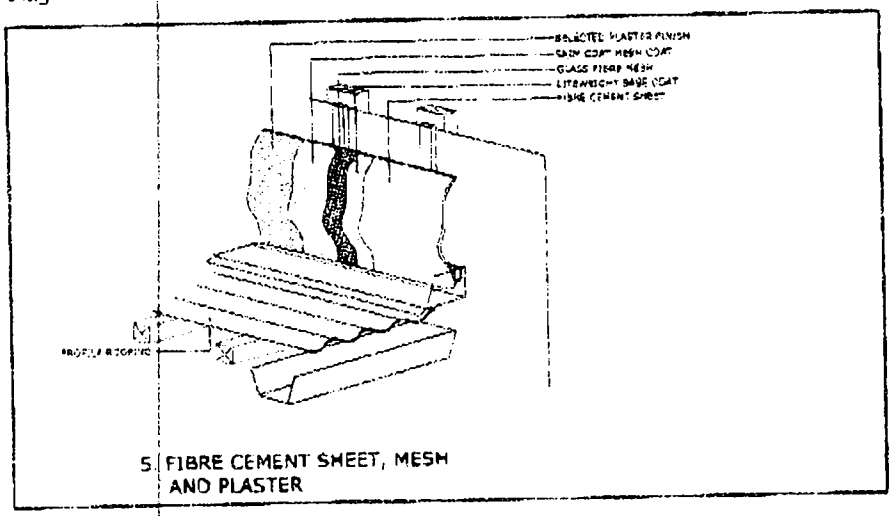


Diagram: Roof Kick-Out 5

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6.9 Mesh Layout

- Mesh can be run vertically or horizontally depending on size and shape of wall to be meshed.
- All laps in mesh to be 100mm min.
- Detail soft mesh to be installed on window sills and jambs (double on sills).
- 300x200mm mesh butterflies to be place on all external corners around openings and penetrations.

See detail 20 of Nu-lite Technical manual.

Note:
Do not run mesh over Control Joints.

6.10 Plaster

The Nu-Lite System is a 14-17mm thick cladding solution comprising of the following:

Levelling Coat of Liteweight Plaster
Liteweight Plaster can be trowel applied but for optimum results Nu-Age Plaster recommends pump application of nom. 10mm levelling coat of the product.

Reinforcement Coat of Skim Coat
This coat is 2-3mm thick and is spray pumped onto the wall or applied by trowel. Glass fibre mesh is imbedded into the outside surface of this coat.

Finishing Coat of Adobe Finish
A polymer modified Cement and Lime based plaster with additives this finish is applied 3-5mm thick and sculpted with a bull nosed trowel to achieve an undulating finish.

Finishing Coat of Sponge Finish
A polymer modified Cement and Lime base with additives this finish coat is applied 2-3mm thick by spray pump or trowel. The 1mm sponge is then hard floated to achieve a mosaic finish. The 2mm sponge is hard floated then sponged to achieve a sandy grit finish.

A Weather Protective Paint coat
See Nu-Age Plaster Paint Specification Sheet

Preparation Prior to application of plaster

- All external corners must be reinforced with Widra Stainless Steel corner beads and fixed to the substrate with Liteweight plaster.
- Wall plane should be checked with a straight edge and should comply with the tolerances set out on 3.4.
- All uPVC flashings should me coated with Flashing primer/Key Coat.

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Preparation Prior to application of plaster (continued)

- All external joinery must be fixed in place with flashings installed and sealant applied to all intersections where required.
- Wipe surface of all aluminium joinery with an appropriate product prior to application to ensure good adherence of sealants.
- Masking tape must be used to protect all joinery, soffit linings, guttering etc which may be subject to splashing and overspray.
- The surface of all fibre cement sheet must be clean, dry and free of dust (eg. Concrete cutting residues), laitance, release oils and soil before the application of plaster.
- If corners are to be rounded then EPS screed guides may be used to ensure correct thickness is applied.
- If EPS screed guides are used and left in place after plaster has been applied a Skim Coat containing mesh reinforcement must be applied.

Note:

Plastering should not take place when outside temperatures are or are considered to be within the next 24 hours outside the temperature range of 5-35°C.

Mixing of Plaster

- Nu-Age Plaster products are supplied in 25kg bags and must be mixed with clean fresh water.
- Mixing, if by hand must be carried out in accordance with NZS 4251 Clause 2.4.3.4 however machine mixing is recommended to produce a more consistent quality mix.
- Mixing must be carried out in accordance with the instructions on the back of each bag, together with those of the mixing machine manufacturer.
- All tools and mixing equipment to be washed cleaned frequently.

Application of Plaster – General

- Application must be carried out in accordance with the instruction on the back of each bag. All Nu-lite plasters may be trowel applied but machine application is recommended to give better quality results.
- Any plaster not used within one hour of mixing must be discarded.
- Plaster must be applied only if the air temperature is between 5°C and 35°C at the time of application and is likely to remain so for the 24 hours following the application. Plaster should be applied on the shady side of the building following the path of the sun. If this is not possible shade cloths must be used.
- Plaster surfaces must be protected from rain and hot drying winds for at least 24 hours following application.
- Each plaster coat must be cured in accordance with the instructions on the back of each bag, prior to the application of the next plaster coat. A controlled rate of drying is required to prevent cracking of the plaster.
- Fibreglass reinforcing mesh must not bridge control or expansion joints.
- Mesh "Butterflies" must be applied at corners of openings e.g. windows and doors. In addition to the full reinforcement mesh coat.

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Application of Plaster – General (continued)

- Following the commencement of plaster application it is essential that no vibration (e.g. nailing of internal linings) be permitted to the substrates supporting the plaster until at least seven days following application of the plaster.

Levelling Coat of Liteweight Plaster

- The Liteweight Plaster coat is applied directly onto the fibre cement sheet preferably pumped then screeded using an 'H' aluminium straight edge 1.2-2m long to a thickness of 11-12mm. Applying the liteweight levelling coat thicker than screed guides gives you a surface to cut back into a flat plane.
- Cutting back of the plaster can be done after sufficient drying has taken place using an aluminium trapeze edge 1.5-2m long.
- Carefully expose the stainless steel beads (or screed rails) using a grid plane then lightly run the grid plane over wall area taking care not to dig holes in fresh plaster. Complete the levelling with a trapezium, straight edge checking for straightness horizontally and vertically.
- One 25kg bag of Liteweight Plaster will cover an area of approximately 2msq. at a thickness of 10mm.
- Liteweight Plaster must be protected from rain for the first 24 hours and from hot drying winds and direct sun for the first 16 hours to aid curing.
- Follow instructions on back of the bag for curing times.

Reinforcing Coat of Skim Coat

- Skim Coat is applied approximately 3-5mm thick over the Liteweight Plaster levelling coat, fibre glass mesh is trowelled into this coat bedding the mesh, to ensure the mesh is fully encapsulated an additional skim coat may be required.
- A 25 kg bag of Skim Coat at a thickness of 2-3mm will cover approximately 5msq .
- Skim Coat must be protected from rain for the first 24 hours and from hot drying winds and direct sun for the first 16 hours to aid curing.
- Follow instructions on back of the bag for curing times.

Finishing Coats

These consist of:

- 1mm Finish
- 2mm Finish
- Adobe Finish

Applying 1mm finish

- This is done by applying the plaster over a determined set area.
- The plaster is lightly trowelled tight to the wall.
- A hard plastic float is then used to achieve a random or drag finish
- Alternatively a sponge can be used to finish the wall.
- A 25 kg bag of 1mm Sponge Finish at a thickness of 2-3mm will cover approximately 10msq .

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Applying 2mm Finish

- This is done by applying the plaster over a determined set area.
- The plaster is lightly trowelled tight to the wall.
- A sponge is then used to achieve a textured, sandy finish
- A 25 kg bag of 2mm Sponge Finish at a thickness of 2-3mm will cover approximately 6-7msq.
- All finisnes must be protected from rain for the first 24 hours and from hot drying winds and direct sun for the first 16 hours to aid curing.
- Follow instructions on back of the bag for curing times.

Applying Adobe Finish

- Adobe finish is applied over Skim Coat and used to create a variety of sculptured finishes. Application can be done by two methods

The first method:

- applying the Adobe over a determined set area at 3-5mm.
- then a trowel is used to create a sculptured trowel finish.

The second method:

- Utilise the same procedure as above, then use a sponge to create a textured sandy effect.

- A 25 kg bag of Adobe at a thickness of 3-5mm will cover approximately 3-4msq.
- All finishes must be protected from rain for the first 24 hours and from hot drying winds and direct sun for the first 16 hours to aid curing.
- Follow instructions on back of the bag for curing times.

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7. AREAS WHERE ADDITIONAL CARE IS REQUIRED

7.1 Windows

- Ensure the flashing tape is correctly installed as per manufacturer's instruction with no creases or gaps and is properly adhered to building paper/wrap.
- Ensure the uPVC window flashings are correctly installed, as per Section 6.6, and seal all intersections with an appropriate sealant.
- Check the window installer has installed a PEF rod and air seal around the internal face of the trim cavity.
- Check the window manufacturer has made the aluminium head flashing to suit the cavity size. The aluminium head flashing must sit back against the wall framing and flashing taped or a second layer of building paper/wrap must be installed over the upstand as per the specifications.
- Ensure a 3mm gap is maintained between face of fibre cement sheet and back face of aluminium joinery in order to install uPVC flashings.

7.2 Parapets/Balustrades

- All parapets and balustrades are to be sealed with flashing tape prior to plastering. Flexible flashing tapes to be used at intersections and change of direction, along majority of capped parapet, heavy duty polythene sheet may be used and installed over top and 50mm down sides. Tape laps. See detail 10.
- Parapets/balustrades which are exposed to the weather on both sides are to be constructed with H3.1 treated framing members.
- Parapets and balustrades must be protected with a metal parapet cap fixed through the sides. The metal parapet cap must provide min. 50mm cover down sides for low and medium wind zones and min. 70mm for high and very high wind zones. See details 8 and 9 of Nu-lite Technical Manual.
- Nu-age Plaster strongly recommends the use of metal capping to all parapets and balustrades. If plastered parapets/balustrades are required additional specifications and details are available from Nu-age Plaster.

7.3 Roofs

- At inter-storey roofs ensure the apron flashing extends a minimum of 100mm above the base of the foot flashings.

7.4 Intersection with other claddings

- Special care is required at junctions with other claddings. The accurate design of these junctions is critical to prohibit water from entering the building envelope. Guidance is given in the Nu-lite Technical Manuals for some cases. See details 21-28. These intersection details are for guidance only. These details and any others not shown in this manual are the responsibility of the building designer.

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7.5 Damage to cladding system

- Any damage or cracking of the cladding system will require immediate attention and repair in order to prohibit water entry.
- Damage to the paint coating system will provide a point of vulnerability to the cladding system and must be repaired immediately to avoid further damage.

7.6 Penetrations

- Any pipe, electrical or other penetrations must be sealed with flashing tape before cladding. In all cases conduit pipe should be installed to protect and seal penetrations through the cladding. See Detail 16 and 17 of Nu-lite Technical Manual.

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8. RESPONSIBILITIES

This section outlines the individual responsibilities throughout each stage of the cladding process and clarifies stages where inspections must be made to ensure roles have been fulfilled and workmanship remains of a high standard.

8.1 Designer

- Responsible for the building design.
- Contact Nu-Age Plaster for any updated details to the Nu-lite system.
- Inform window manufacturers of the window and door reveal dimensions.
- Inform window manufacturers of correct head flashing dimensions (the head flashing must extend across the cavity and sit against the wall framing not on top of the batten).

8.2 Builder

- Ensure walls are straight and true, braced and fixed appropriately.
- Install building paper/wrap ensuring the bottom edge of the wrap overhangs the bottom plate by min. 50 mm.
- Ensure all laps in building paper/wrap are minimum 200mm and are lapped to shed water down the cavity.
- Install flexible jamb and sill flashing tapes.
- Fix Polypropylene strapping vertically between the studs if span exceed 300mm. This strapping helps prevent the cavity from being closed off during the installation of insulation into the wall framing cavity.
- Where waterproofing agents are required (e.g. edges of concrete foundations etc), ensure the surface is coated with an appropriate product.
- Where lead flashings are used (at inter-storey roofs etc), planing of the timber studs may be required to recess the lead flashings to reduce the build-up of flashing thickness. (If the lead flashings are not recessed, the lead thickness can cause the base of the wall to bow out).

8.3 Batten Installer /Fibre cement sheet fixer

- At the base of the wall, ensure the bottom of the cavity battens are a minimum 30 mm below the bottom plate.
- Ensure horizontal packers are 100 mm maximum installed only where required for sheet fixing.
- Ensure the vermin strip and starter strips are fixed to the bottom plate.
- Joins and intersections in uPVC flashings are to be sealed with an appropriate flexible sealant.
- Ensure all vertical joints in fibre cement sheet are made over a vertical batten.
- Ensure battens are correctly installed at control joints and no fixing of fibre cement sheet is made to the inter-storey structure.
- Ensure flashings are installed according to Nu-lite detailed drawings and Technical Documentation.
- Ensure fibre cement sheet is installed as per manufacturer's instructions.

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8.4 Applicator

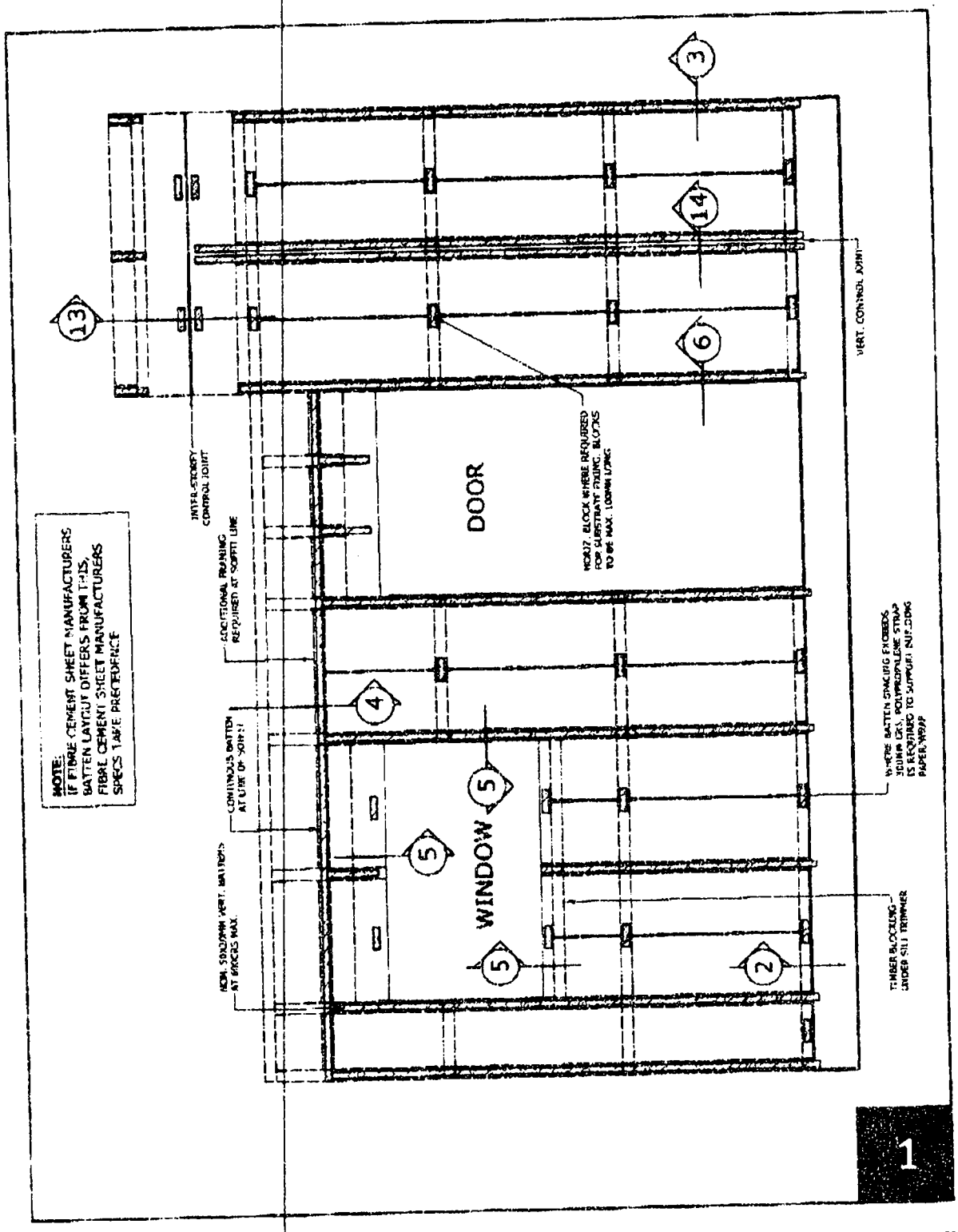
- Ensure plaster coats are applied to the correct thicknesses as stated in the Nu-lite technical manuals.
- Ensure mesh is applied at the appropriate stage and laps are minimum 100mm.
- Apply finishing coats as per the Nu-Age Plaster specifications.
- Ensure the plaster is adequately cured as per Nu-Age specifications
- Dispose of empty plaster bags correctly.

8.5 Paint Applicator

- Ensure the paint system being applied is consistent with the Nu-Age Plaster specifications.
- Ensure plaster system has undergone the adequate curing and drying period before applying paint finish.
- Gently brush down finished plastered areas with soft bristled broom to remove any loose particles before painting.
- Apply the paint system in accordance with the manufacturers instructions.

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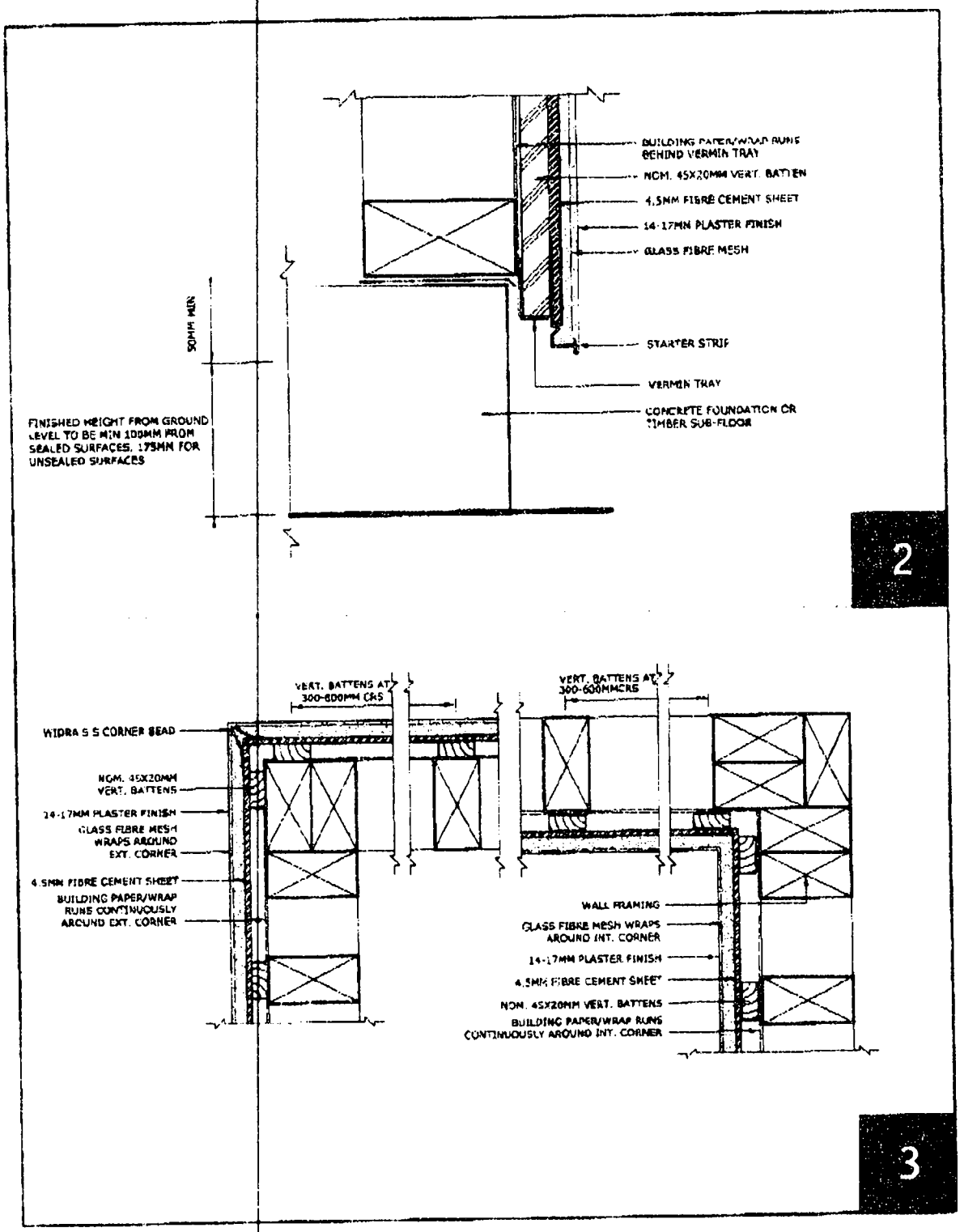


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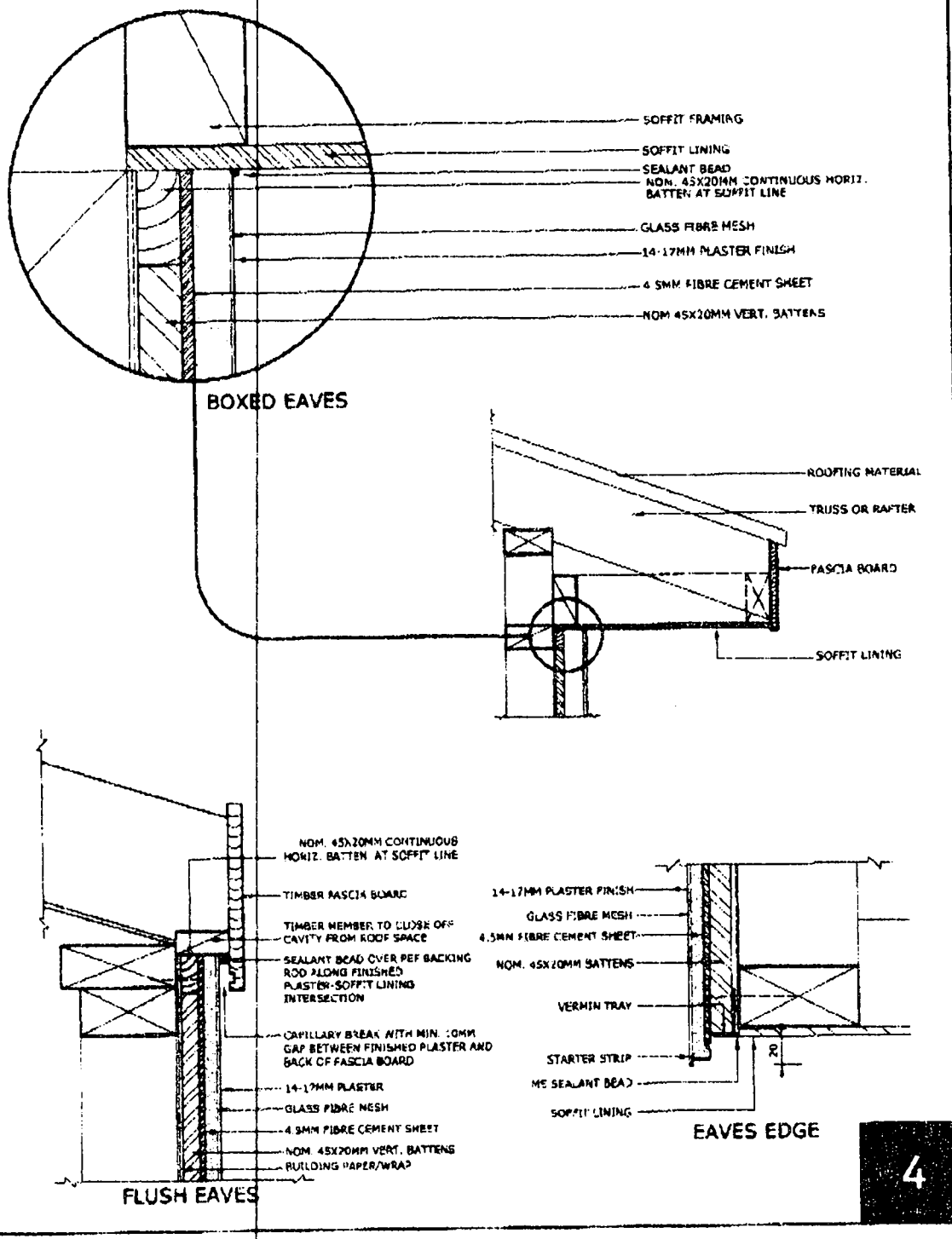
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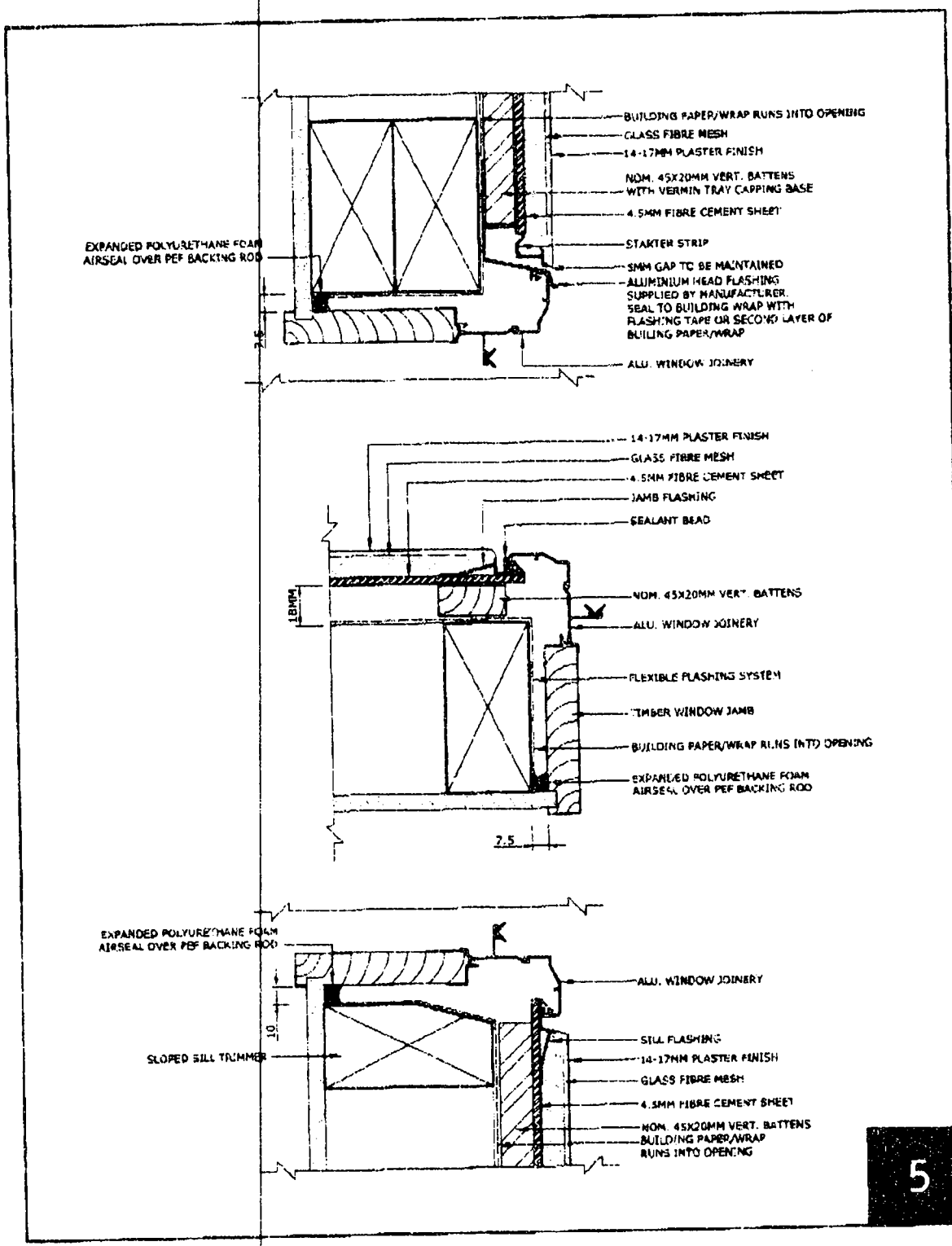
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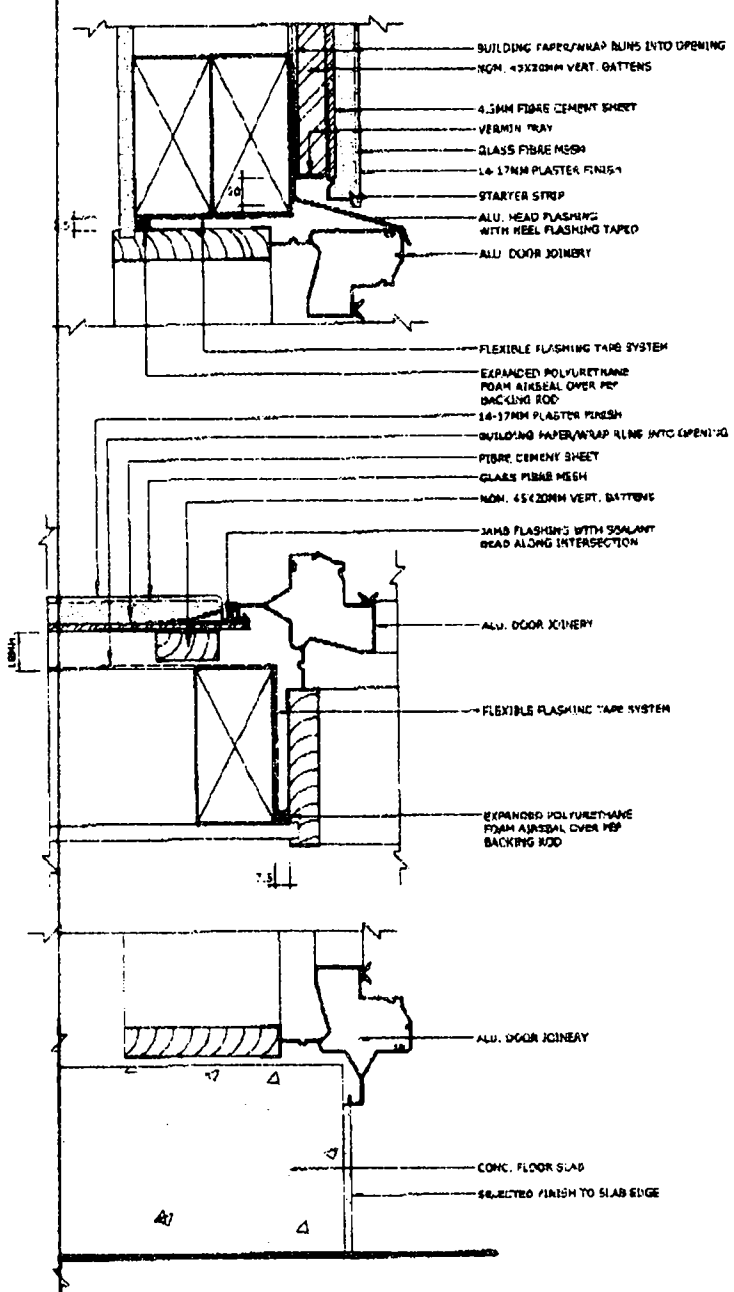


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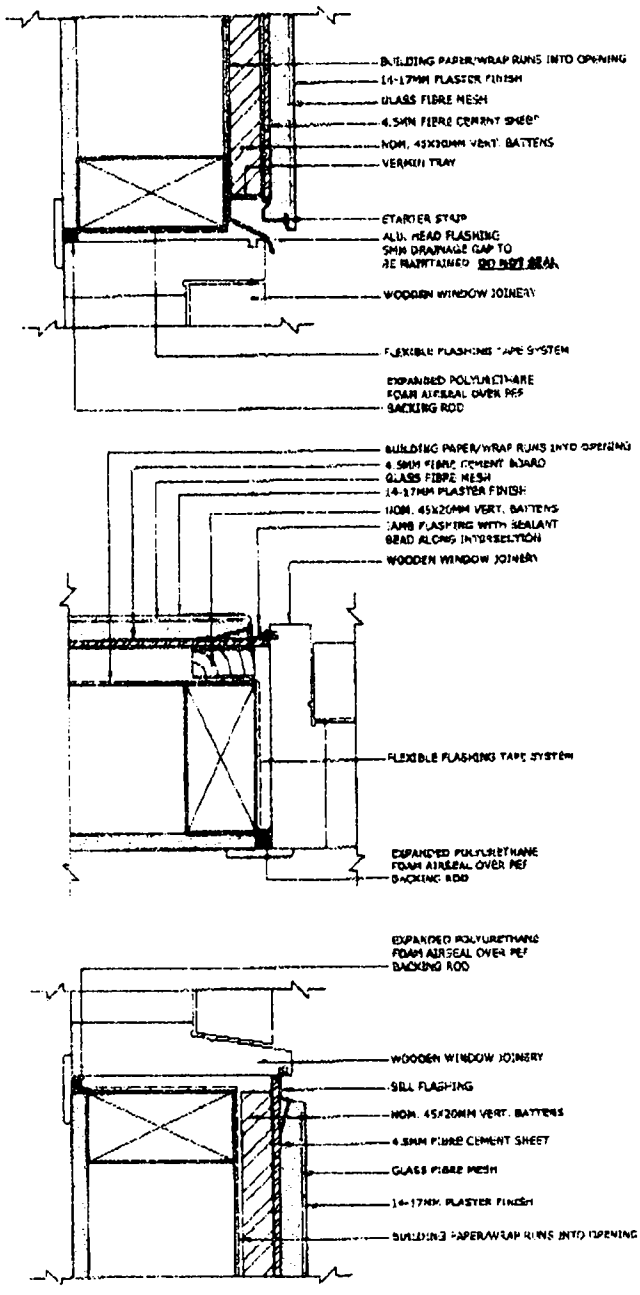


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FILE NAME: **NU-LITE ALUMINIUM DOOR DETAILS**

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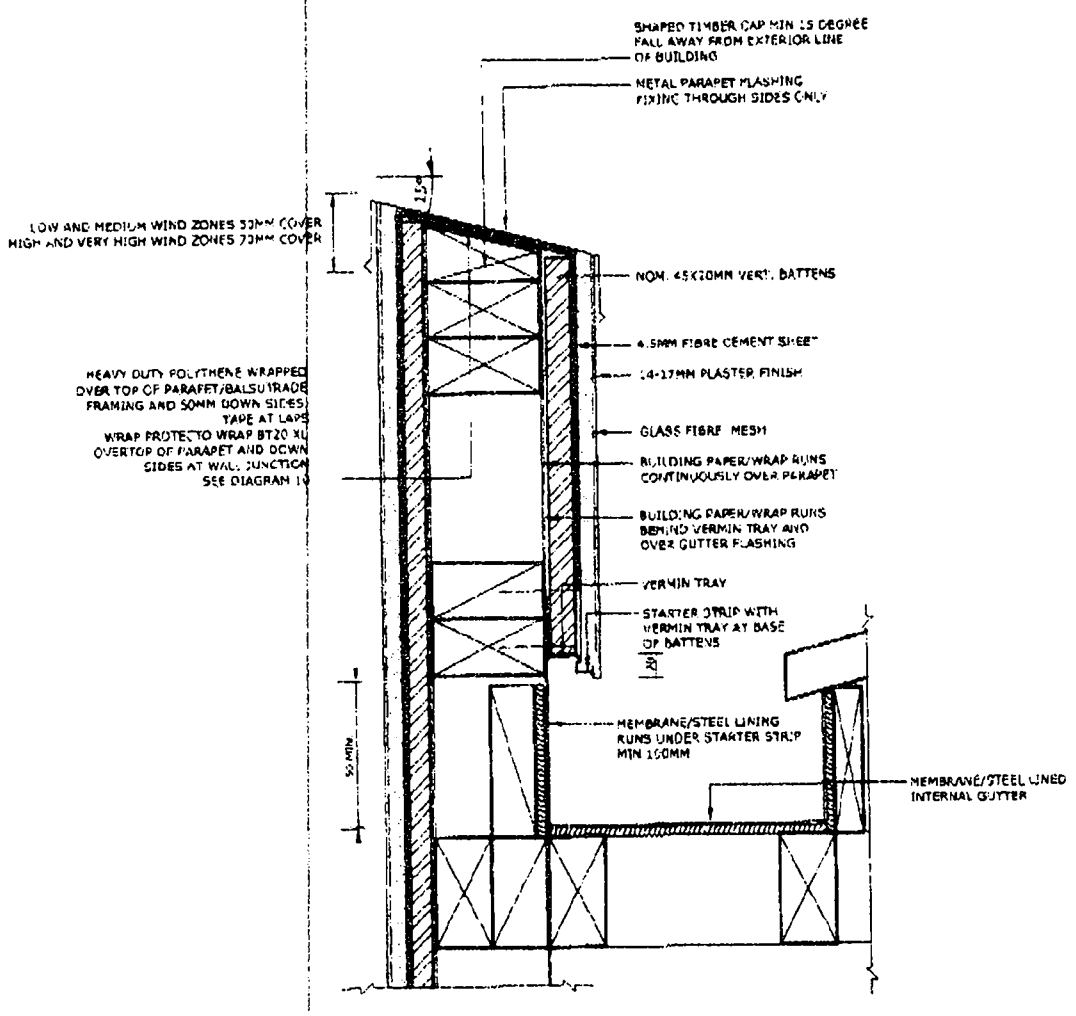
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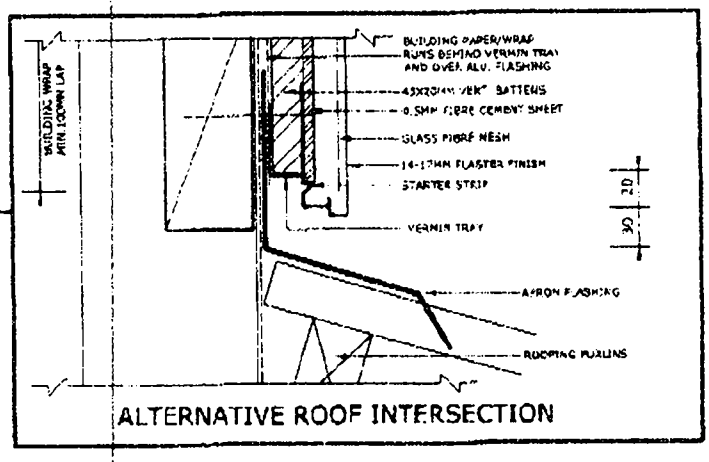


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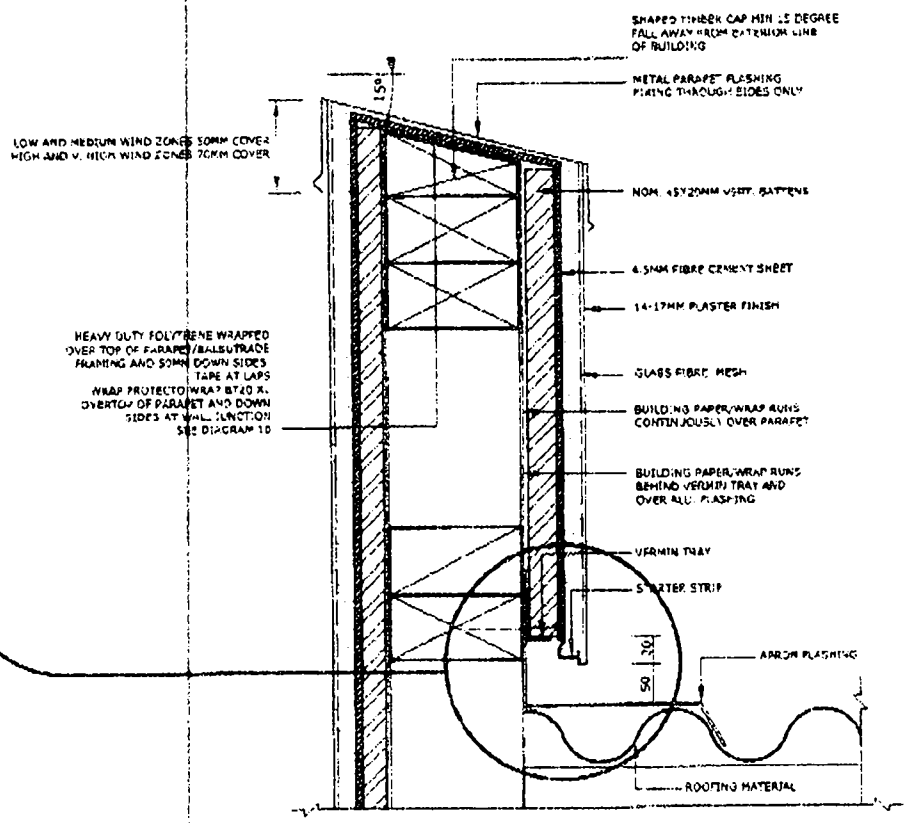
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ALTERNATIVE ROOF INTERSECTION

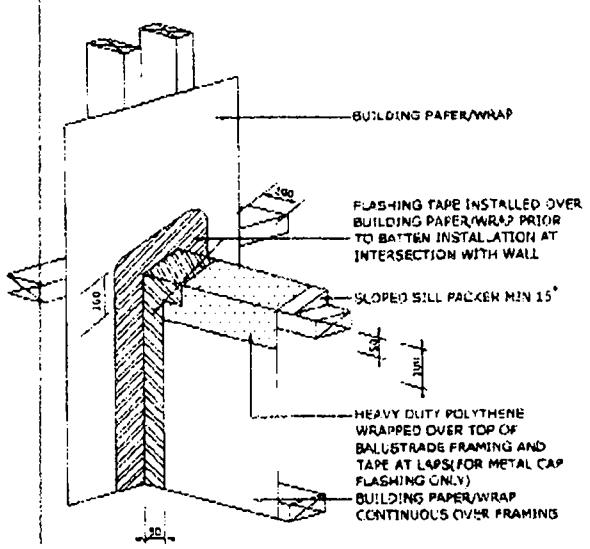


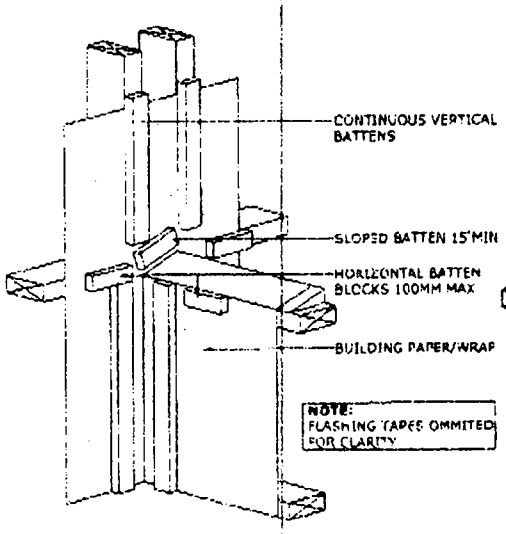
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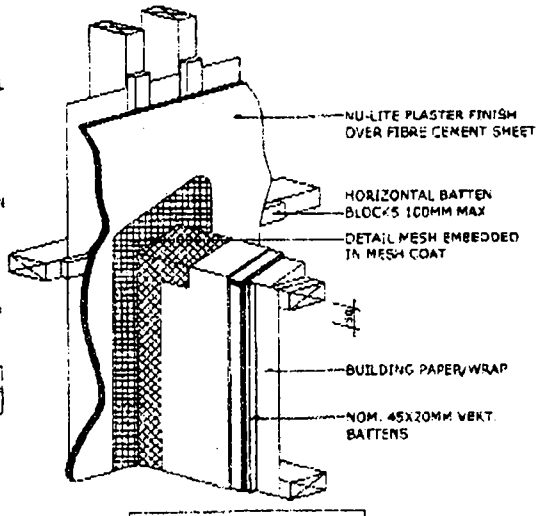
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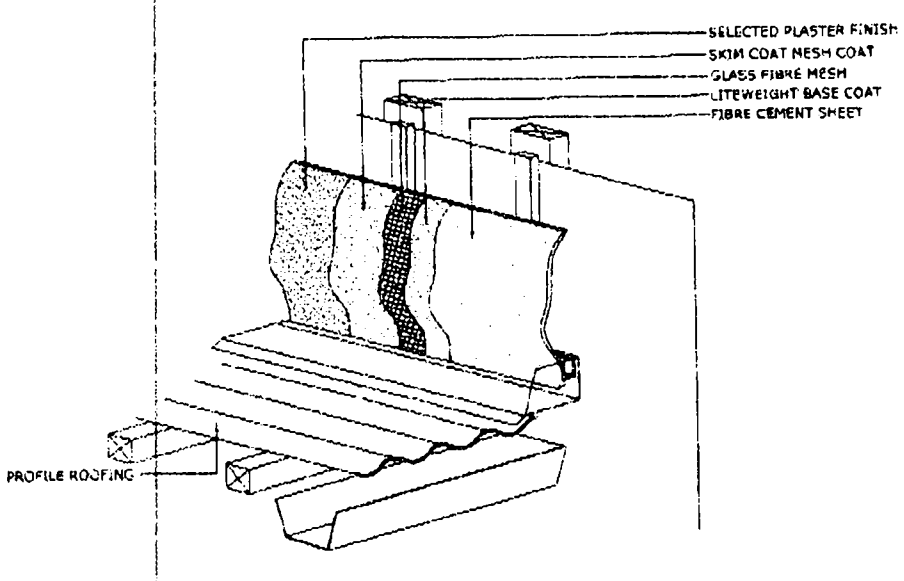


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FILE NAME: PARAPET/BALASTRADE SECONDARY WATERPROOFING & BATTEN LAYOUT

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5. FIBRE CEMENT SHEET, MESH AND PLASTER

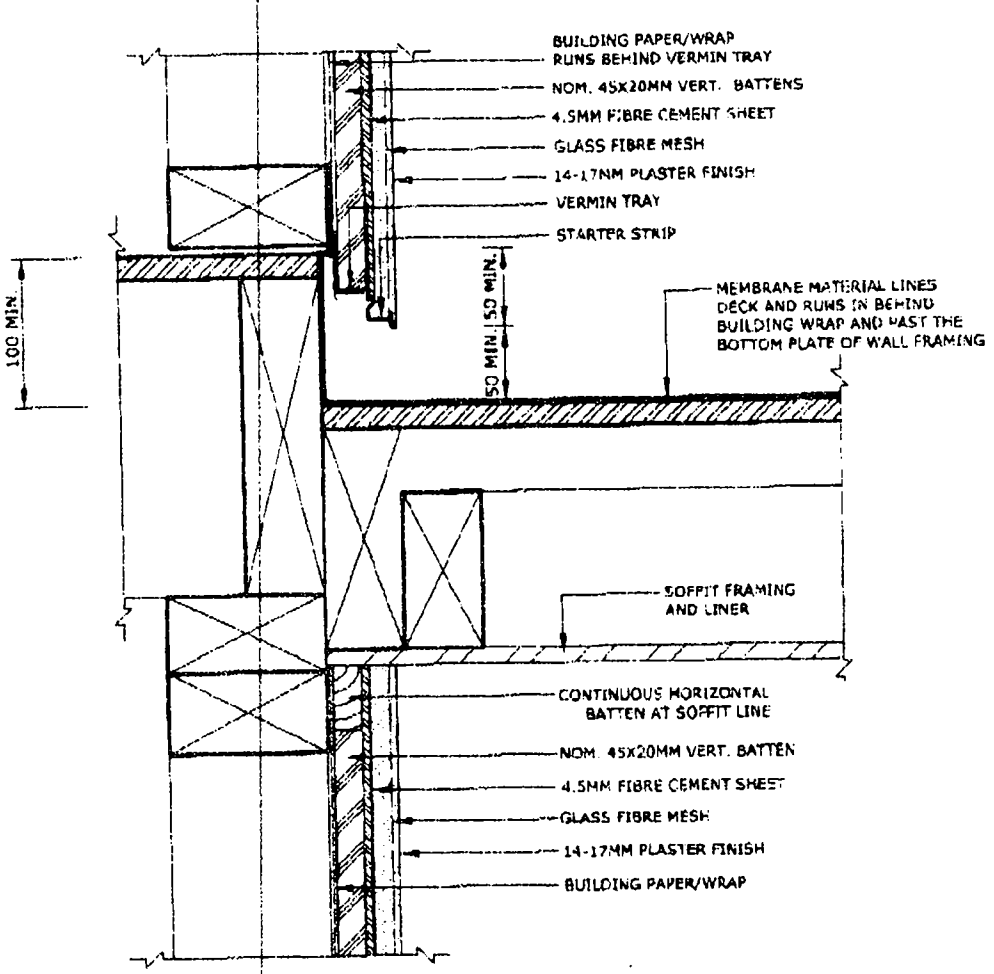
Note:
For additional information pertaining to this detail see installation instructions of Nu-lite Technical Manual.

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FILE NAME: ROOF FLASHING KICK-OUT DETAIL

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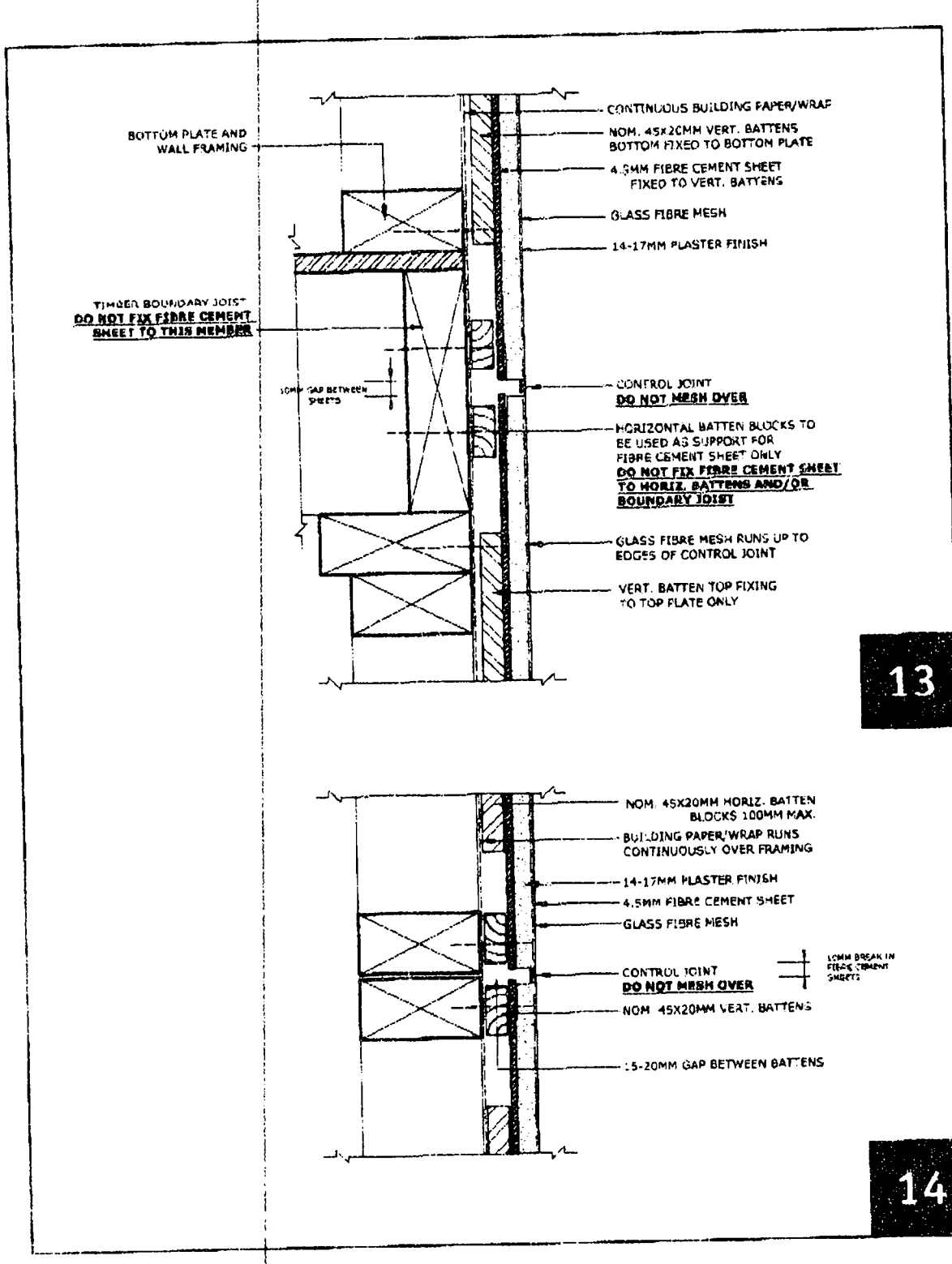


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FILE NAME: MEMBRANE DECK & SOFFIT DETAIL

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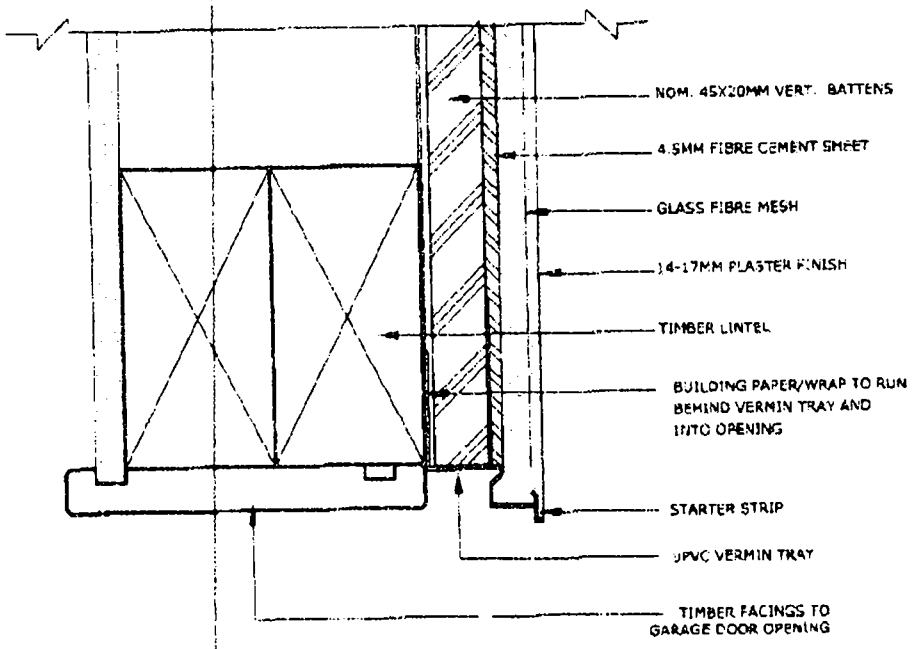
Nulite
Cladding Solution



FILE NAME: MID-FLOOR & VERTICAL CONTROL JOINT DETAIL

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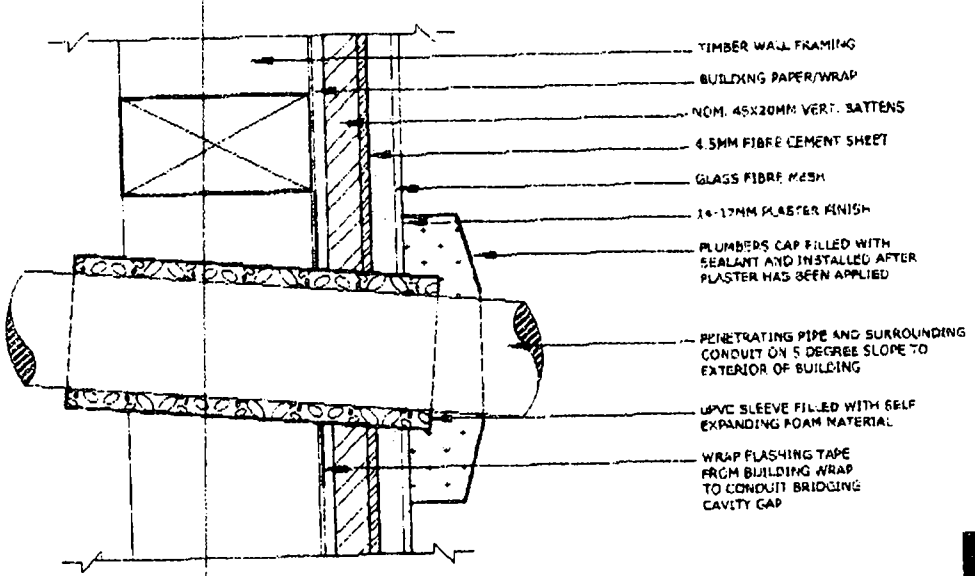


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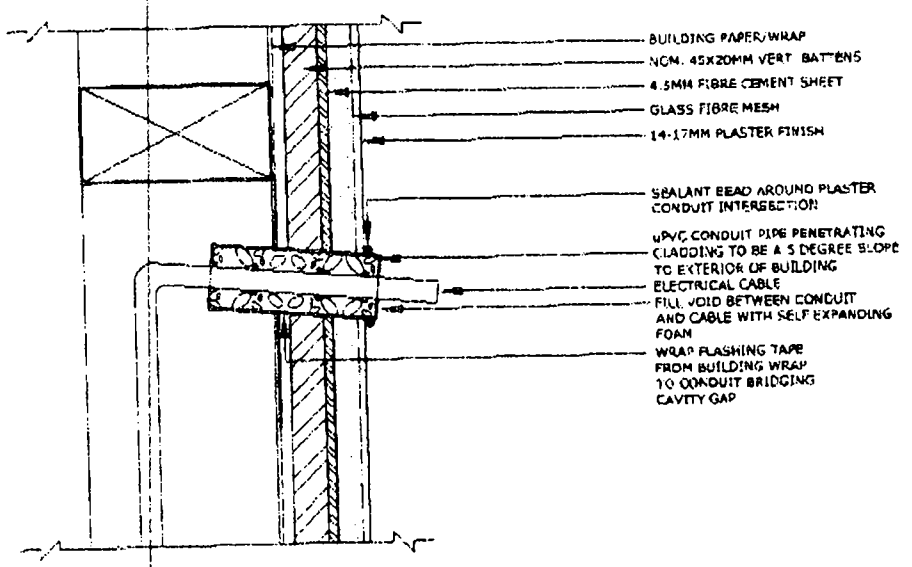
FILE NAME: GARAGE HEADER DETAIL

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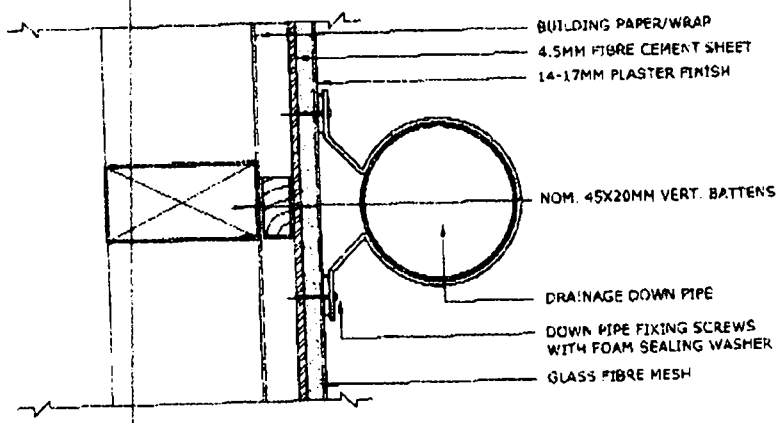


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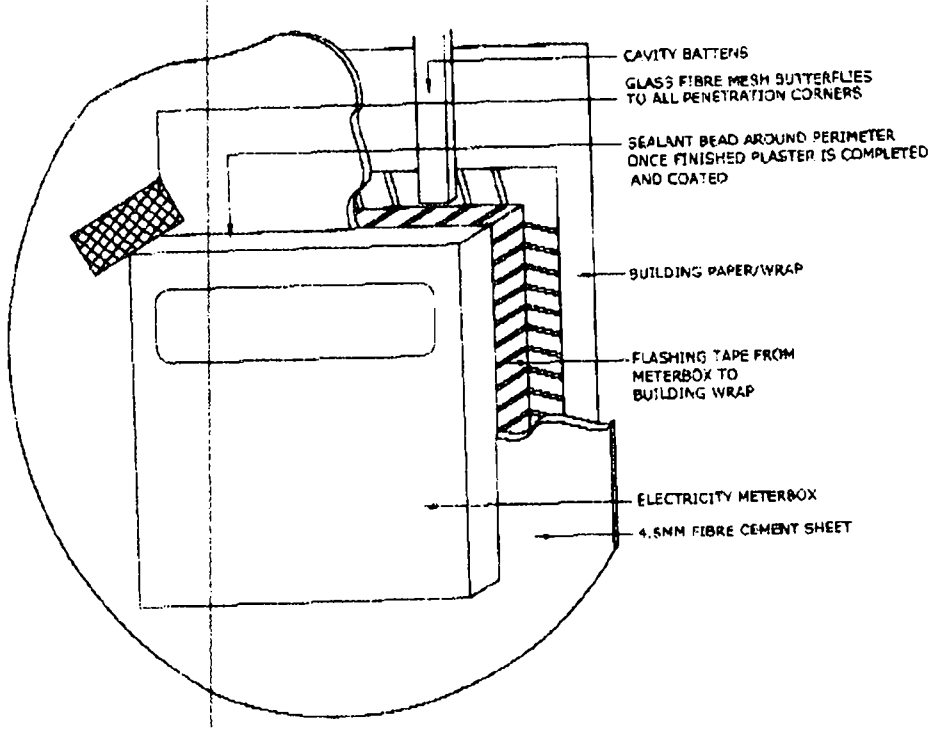
FILE NAME: PIPE & ELECTRICAL PENETRATIONS

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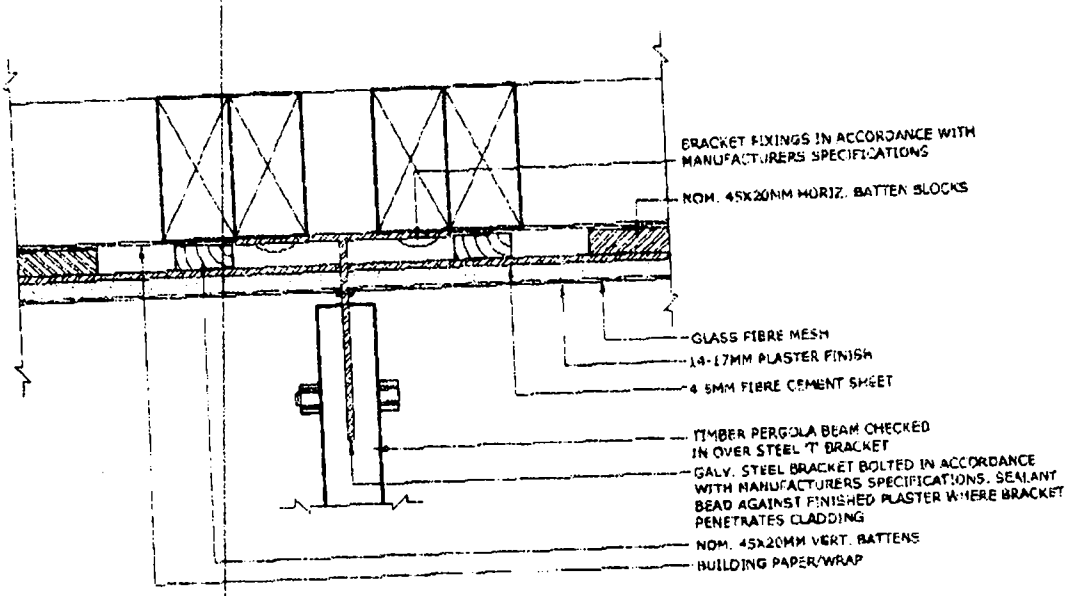


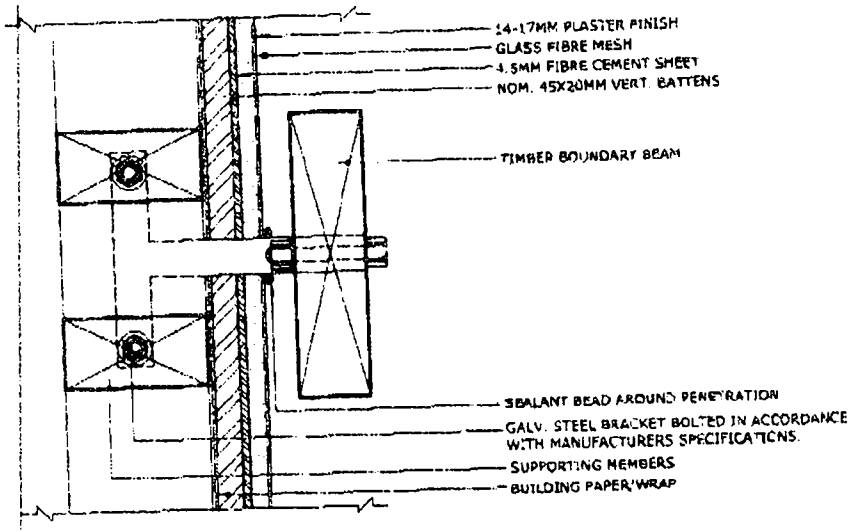
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FILE NAME: NU-LITE PENETRATION DETAILS

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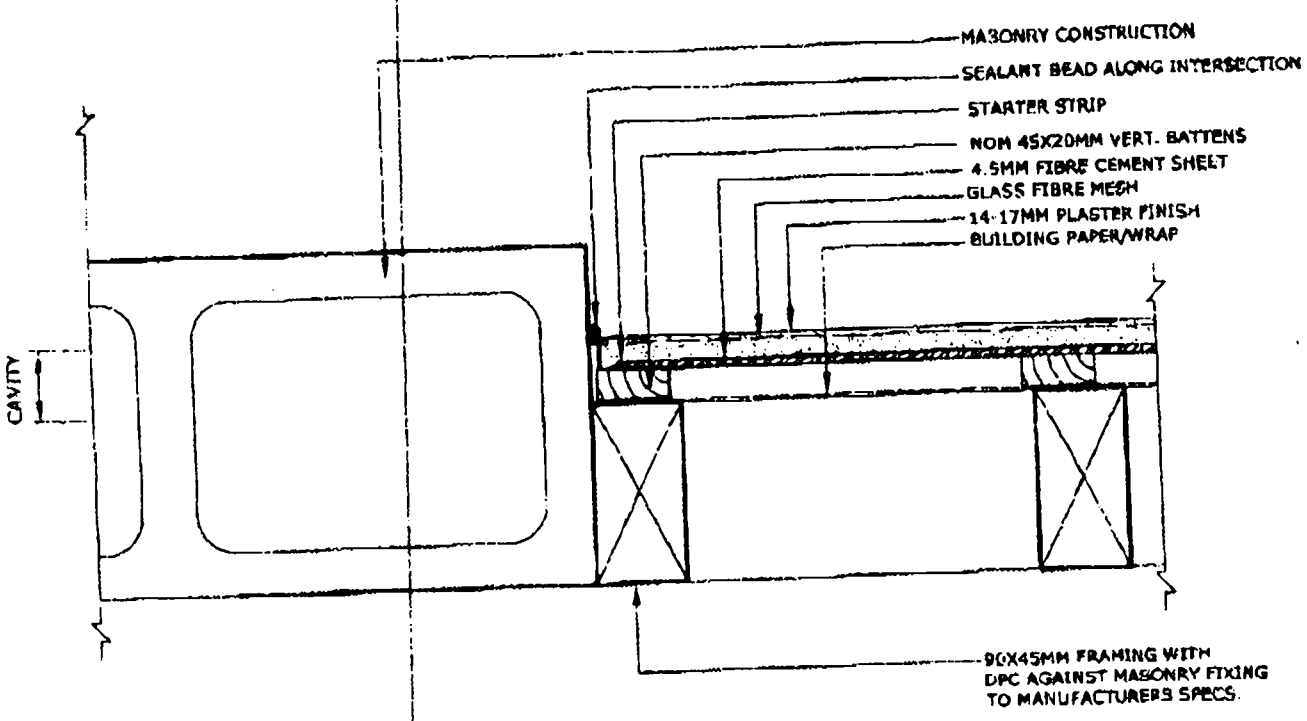


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FILE NAME: NU-LITE PENETRATION DETAILS

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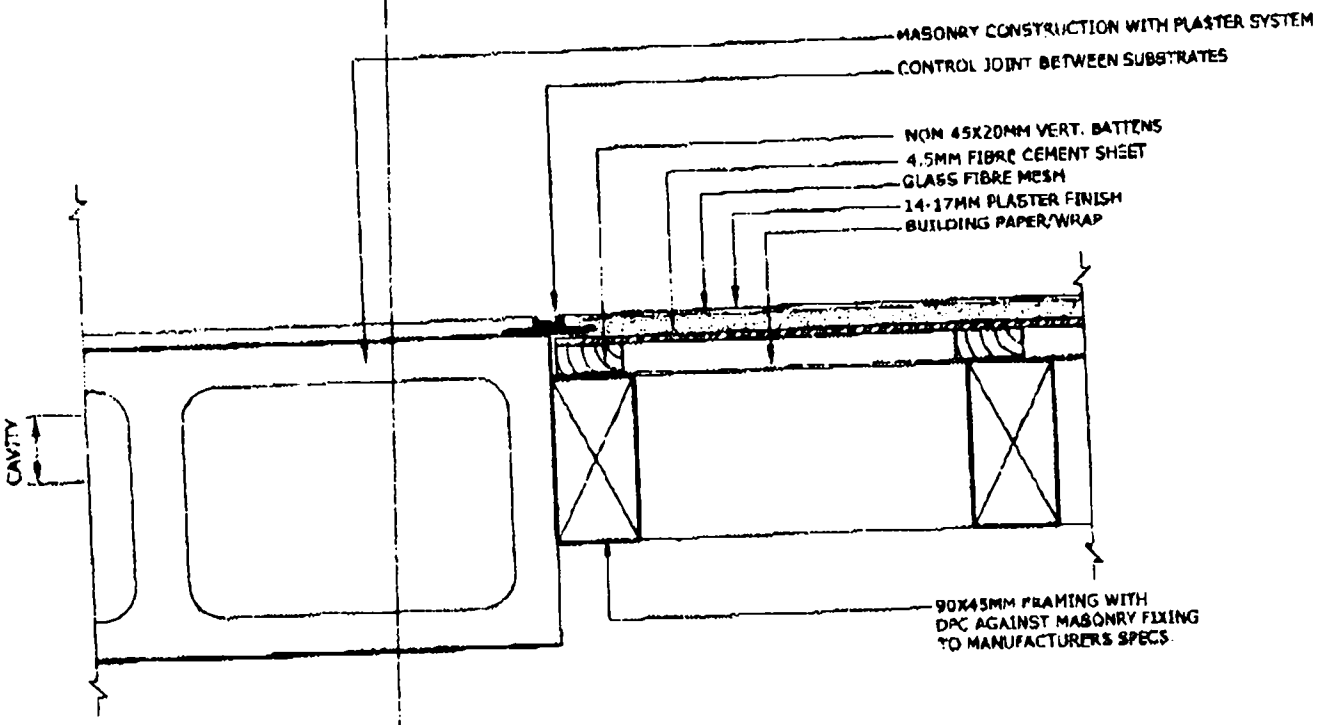
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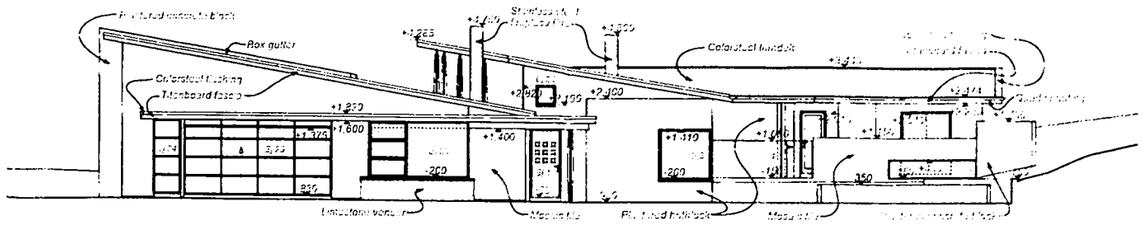
NU-LITE MASONRY TRANSITION DETAILS

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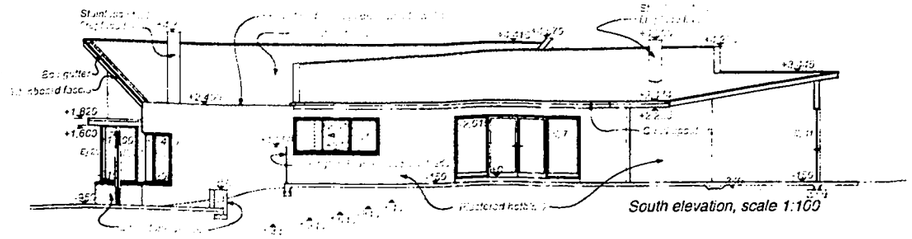
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NU-LITE MASONRY TRANSITION DETAILS



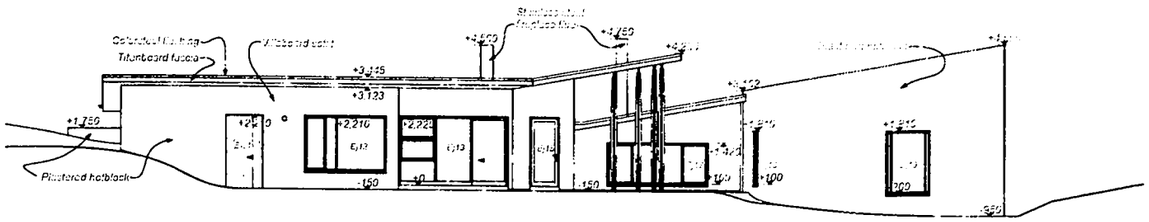
West elevation, scale 1:100



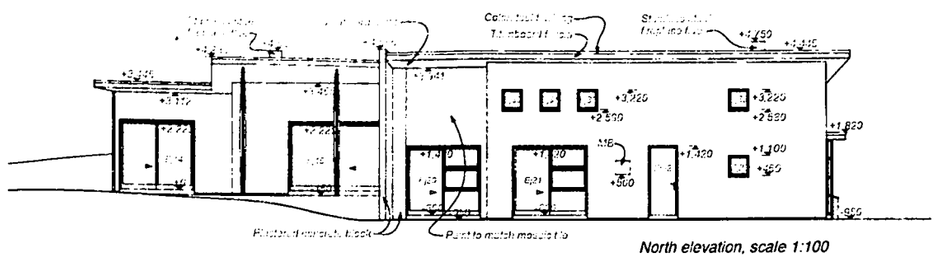
South elevation, scale 1:100

Index:

1. Site, Floor plan, Elevations, Roof
2. Slabs and drainage
3. Site works plan
4. Ground floor framing plan
5. High walls framing plan
6. Sections a,b, c, d
7. Section e, Details
8. Joinery kitchen
9. Joinery bathroom 1, laundry
10. Joinery bathroom 2
11. Electrical plan



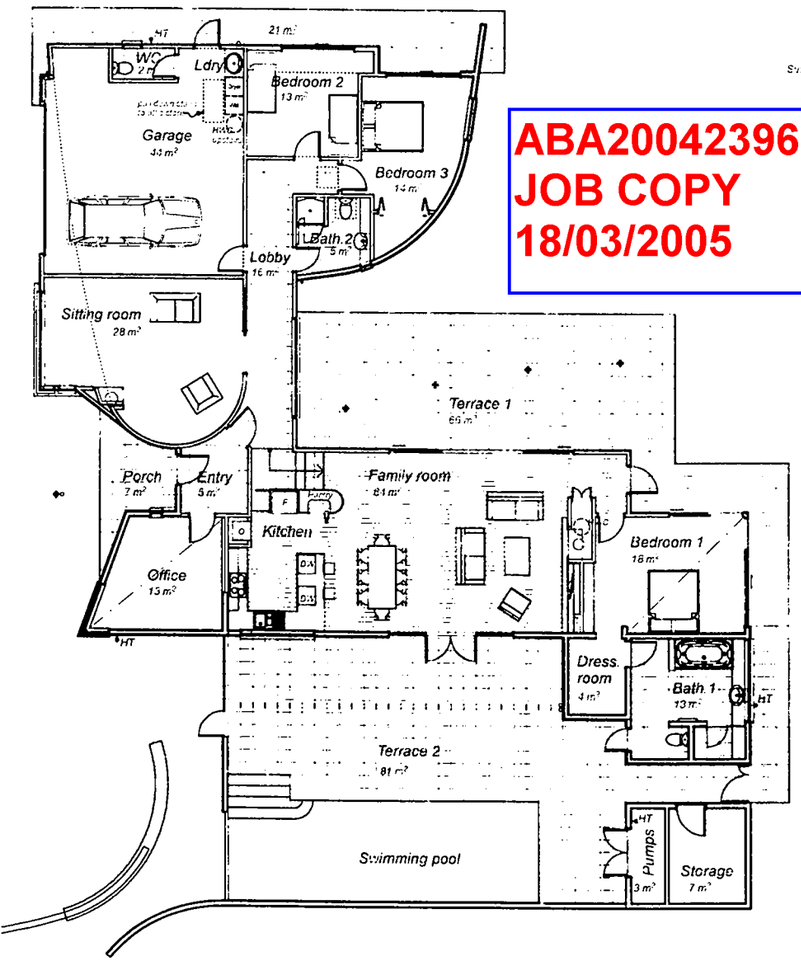
East elevation, scale 1:100



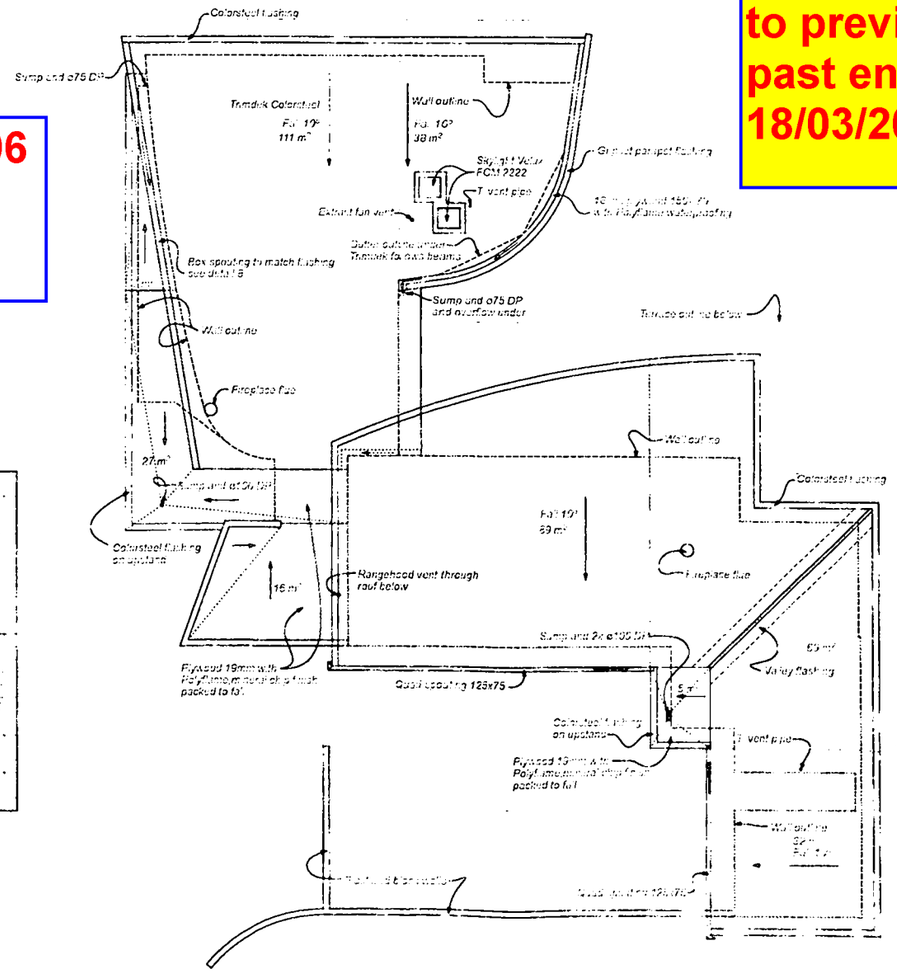
North elevation, scale 1:100

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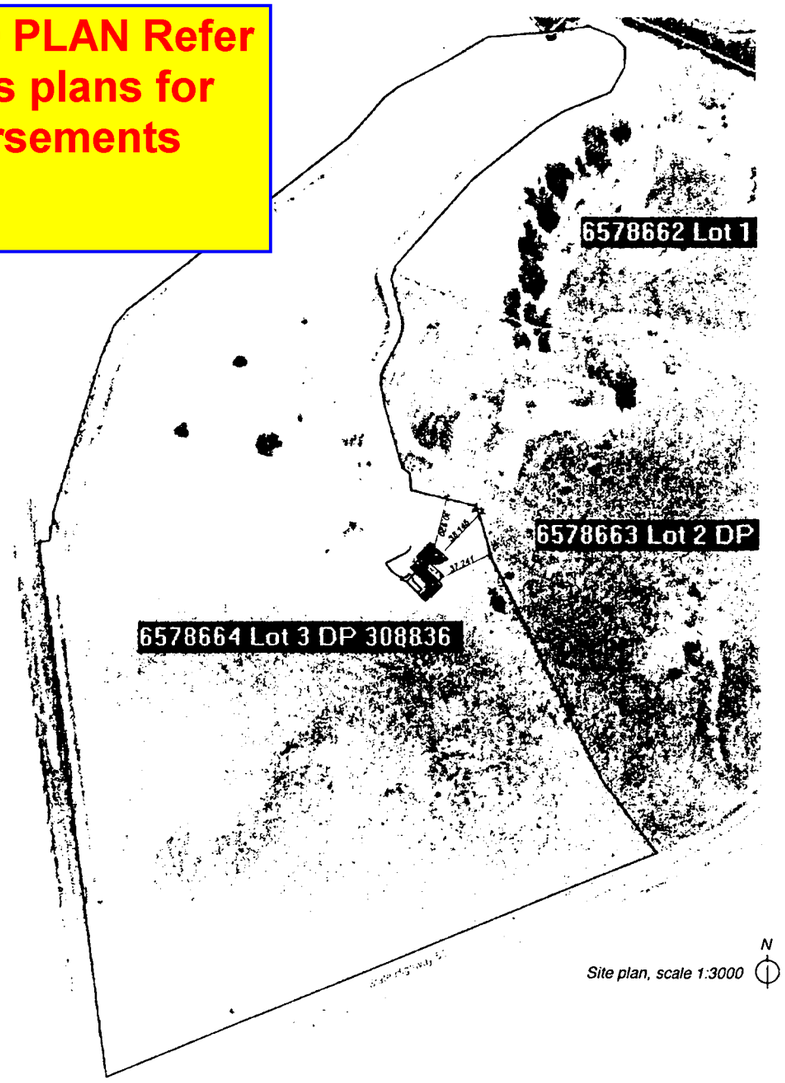
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Ground floor plan, scale 1:100



Roof plan, scale 1:100



Site plan, scale 1:3000

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Storm water is to be disposed of in a manner that does not cause a nuisance to others and does not cause any damage to the environment

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1:120

1:120

100ø PVC SS
100ø PVC Stormwater
Fall slab 6mm
Fall slab 12mm
Fall slab 20mm
WC
Wbsn
Sink
GT
T. vent
Note: back vent basin and shower into terminal vent
Sh
Bsin
Concrete block wall outline
Stone veneer outline
190 concrete blocks up to -200
90 concrete block from -200 to 0 flush with inside of 190 block
See also Section d
190 block outline under terrace slab
Column outline
Note: make blue area -30 to accomodate timber floor
63 m²
153 m²
ø100 DP
Spreader
Concrete block wall outline
190 concrete blocks under the slab from -800 up to -30
DW
Concrete block under the slab recessed back 60mm
±0 = +45.950 above sea level
Bath
Basin
Recess for shower 30mm
Fall slab to drain channel
For drain detail see section A
Sump
Concrete block under the slab recessed inside
Fall slab to channel
Biocycle septic tank
To effluent field. Ref. installers plan
Paved area outline - see Site works plan

Slab and drainage plan, scale 1:75

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Existing channel
43.000 43.500 44.000 44.500 45.000 45.500 42.500
45.500
45.000
Fence by owner
Building area limit line
R 3.419
710
45.000
HT
WC
Ldry
Bedroom 2
pull down stairs to attic store
Garage
HWC upstairs
Bedroom 3
Bath. 2
45.500
Lobby
45.800
Sitting room
Fall
R 6.431
5.200
483
Crown
2.946
Terrace 1
Storm water spreader
Porch
Entry
Family room
Pantry
±0
Kitchen
Office
Bedroom 1
R 19.810
3.024
3.990
HT
Dress. room
Bath.1
HT
Fall
-950
4.146
R 600
Bicycle septic tank
15.848
14.172
-150
13.460
ø1200 free grill with plastic sump under and ø100 PVC pipe do SW diffuser
Terrace 2
45.600
-350
R 4.200
R 4.310
3.613
Effluent field
Concrete block retaining wall see eng. drawings
Fall
Fall
4.200
HT
Pumps
Storage
48.000
46.500
Fence by owner
-950
3.534
Limestone retaining wall overlapping concrete wall where shown
18.120
6.840
5.683
5.337
42.500 43.000 43.500 44.000 44.500 45.000 45.500 46.000 46.500 47.000 47.500
47.500 47.000 46.500 46.000 45.500

Site works plan, scale 1:100

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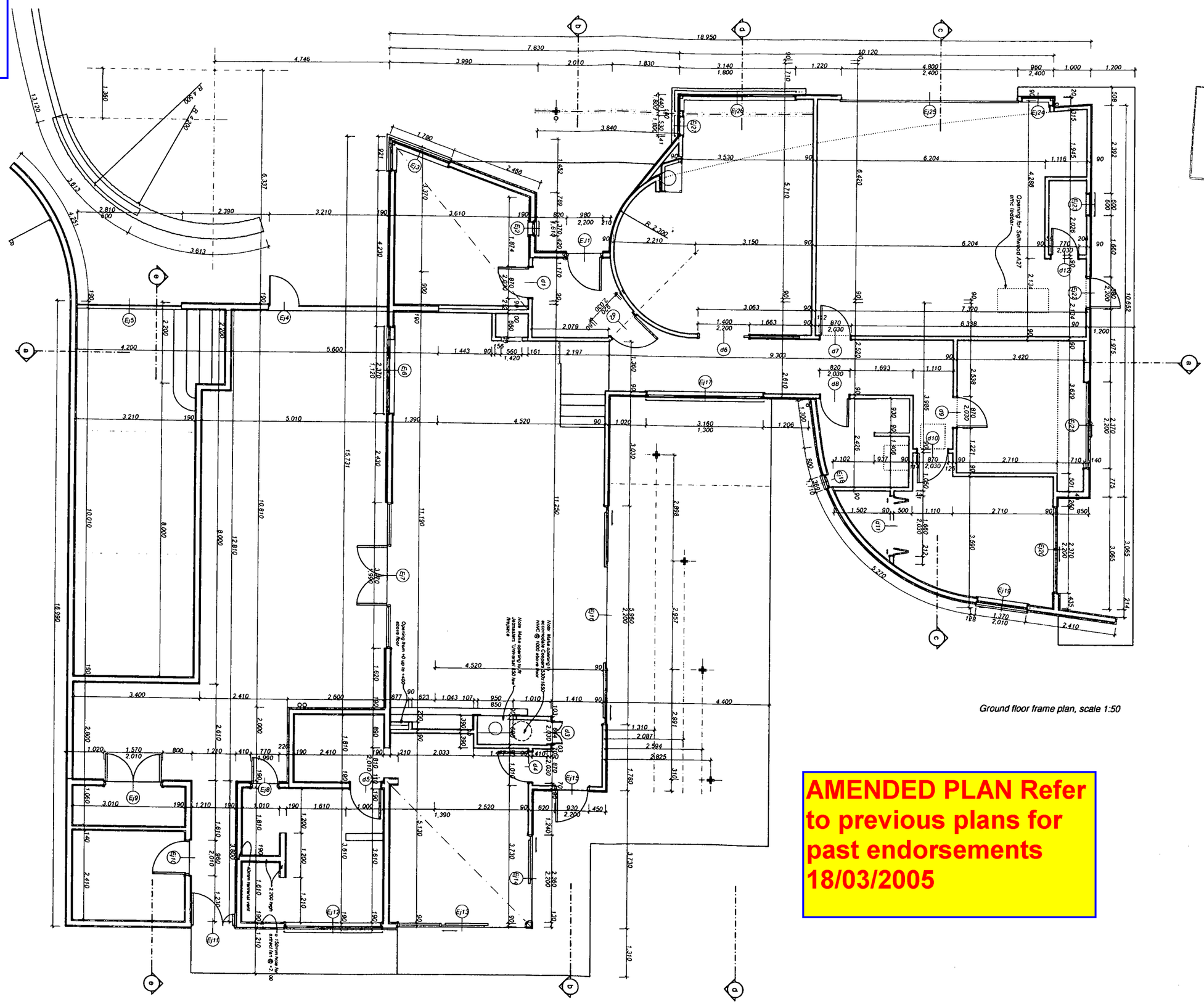
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Ground floor frame plan, scale 1:50

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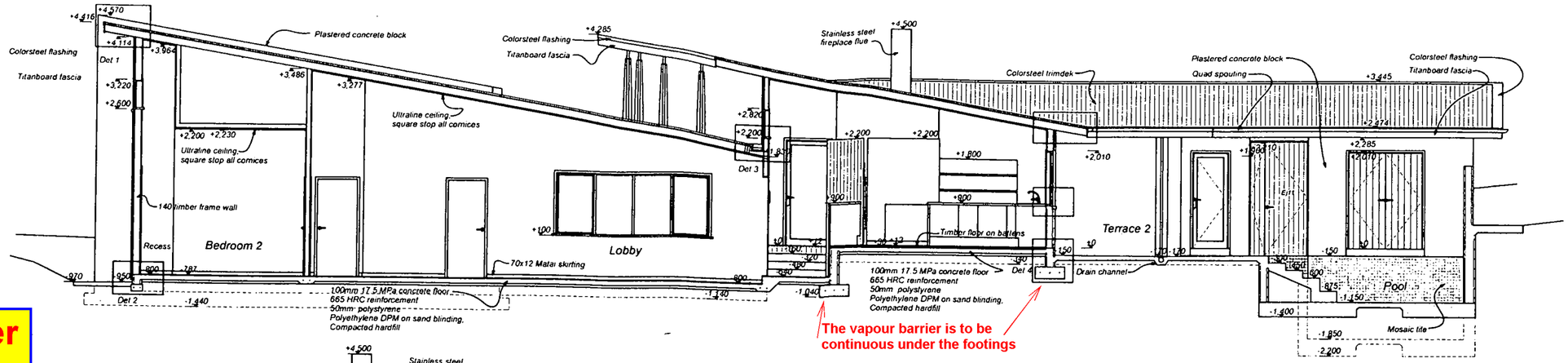
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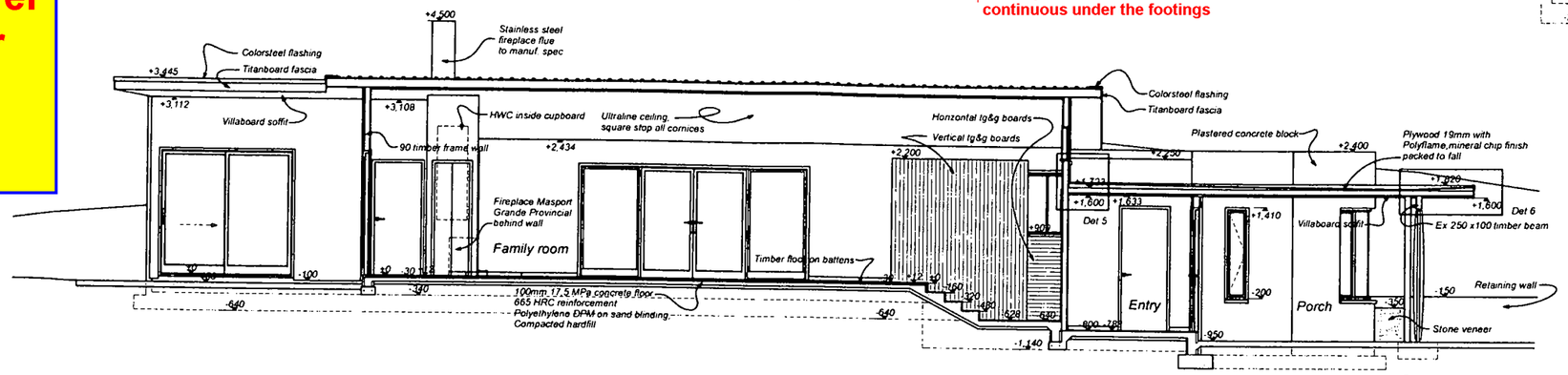
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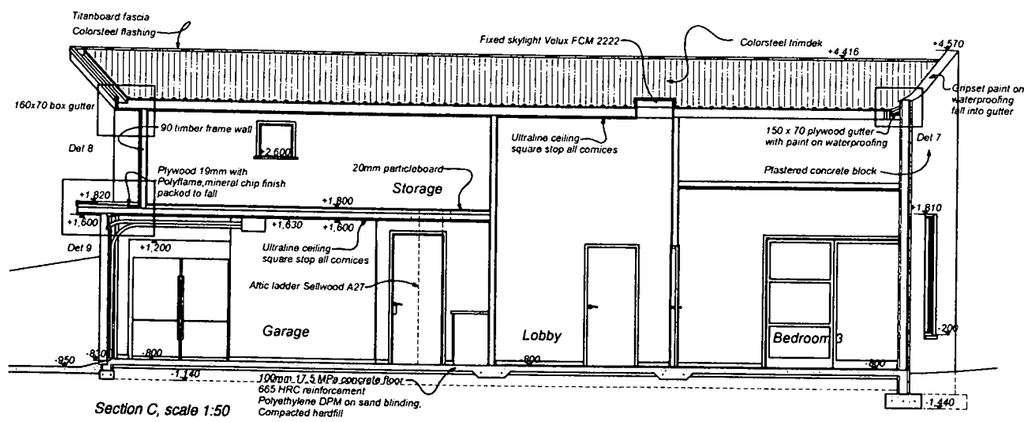
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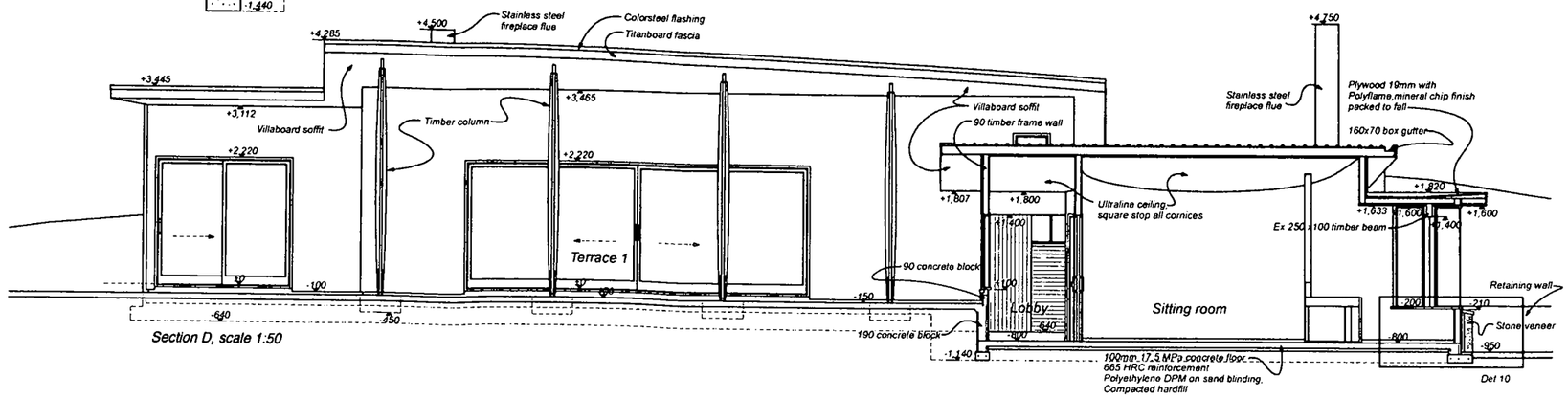
Section A, scale 1:50



Section B, scale 1:50



Section C, scale 1:50



Section D, scale 1:50

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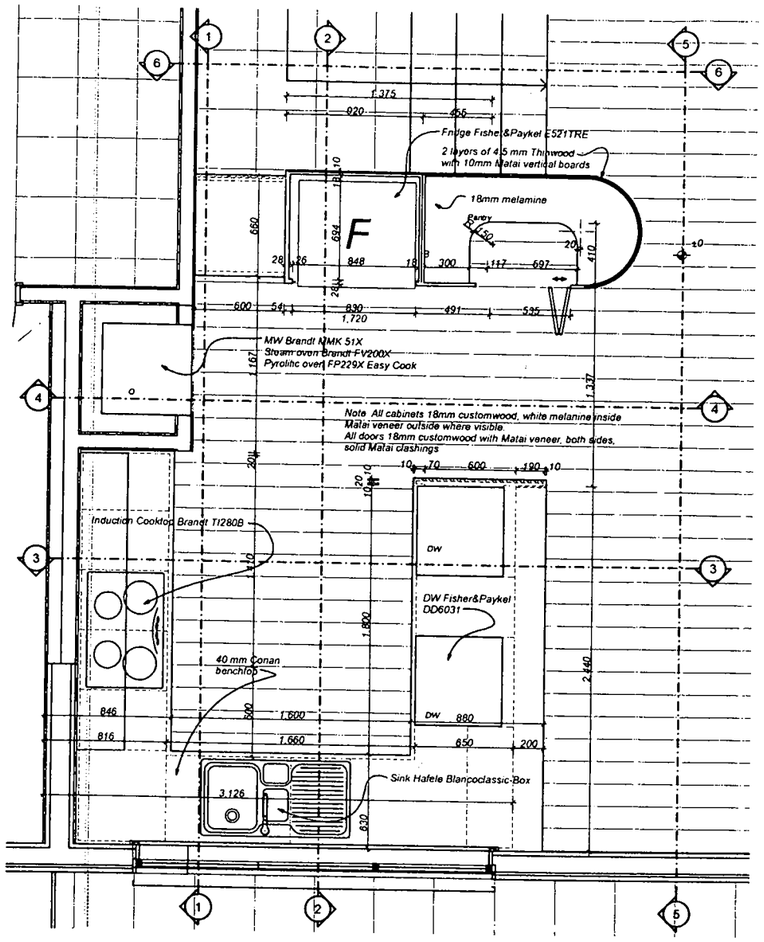
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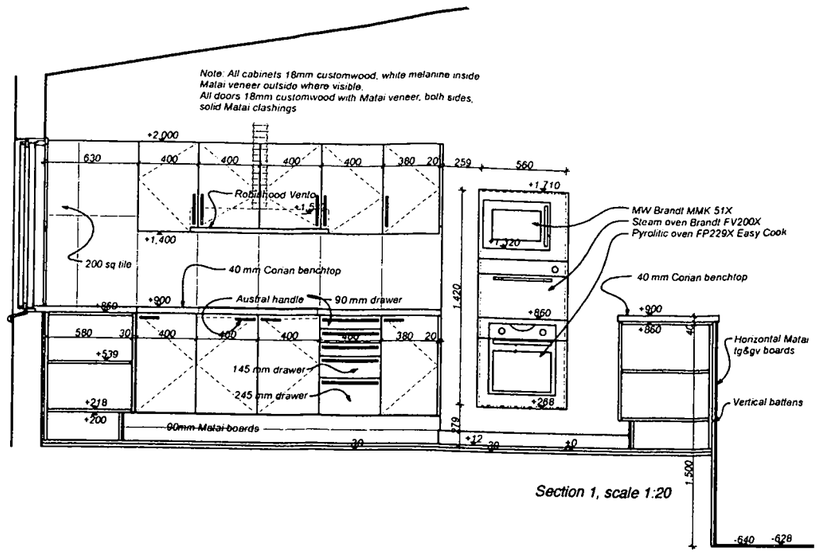
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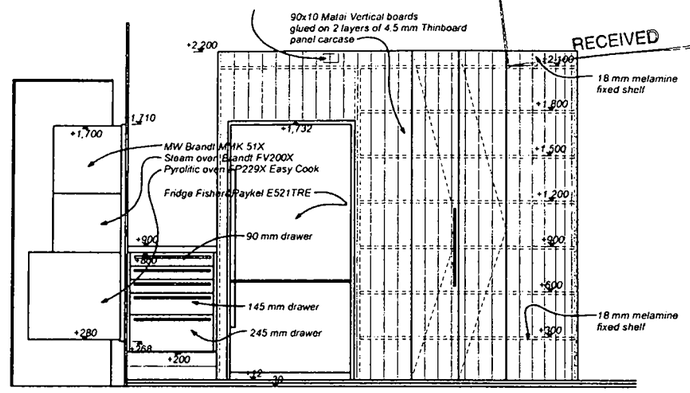
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Kitchen joinery plan, scale 1:20

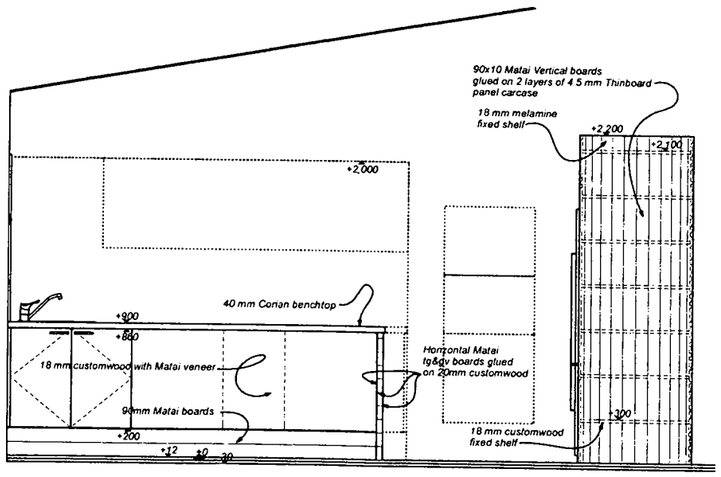


Section 1, scale 1:20

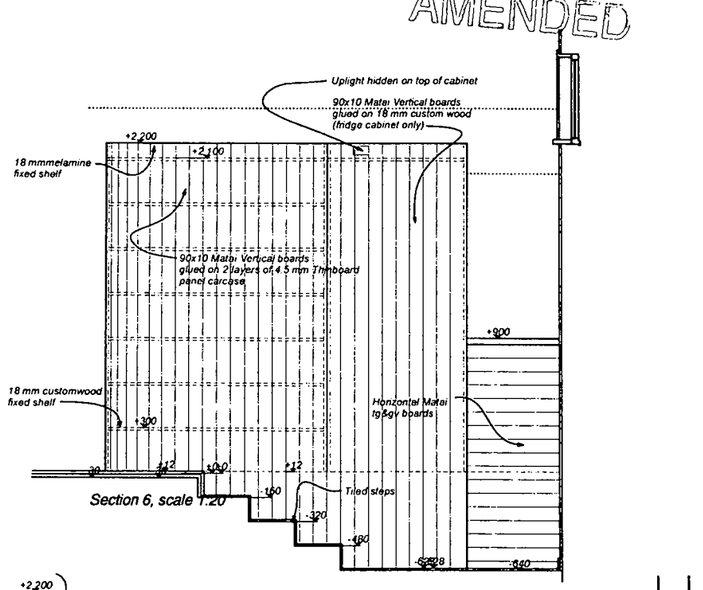


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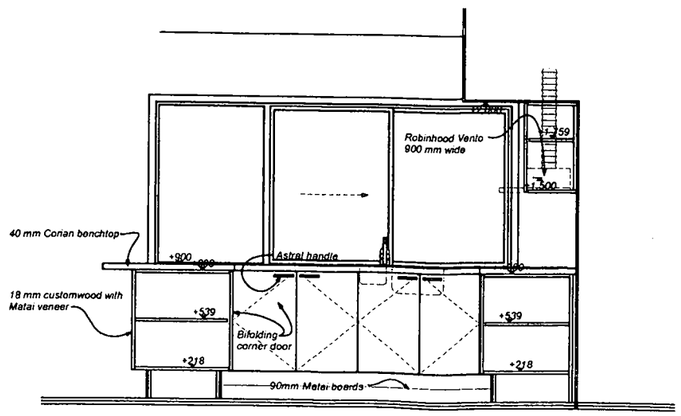
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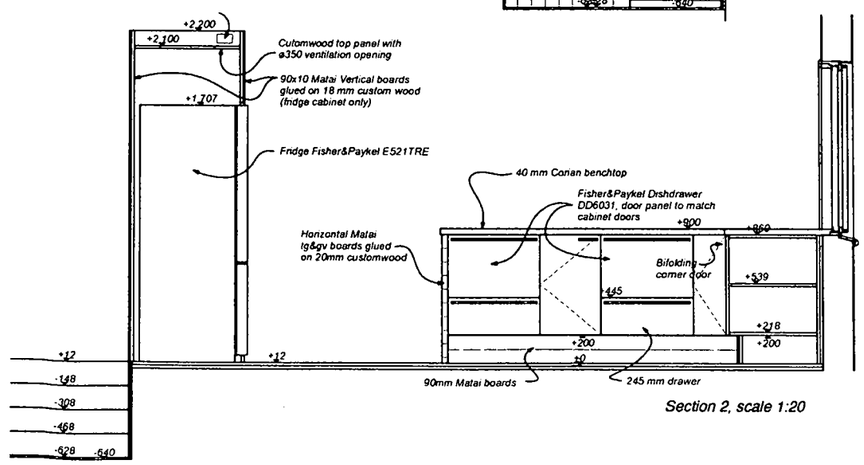
Section 5, scale 1:20



Section 6, scale 1:20



Section 3, scale 1:20



Section 2, scale 1:20

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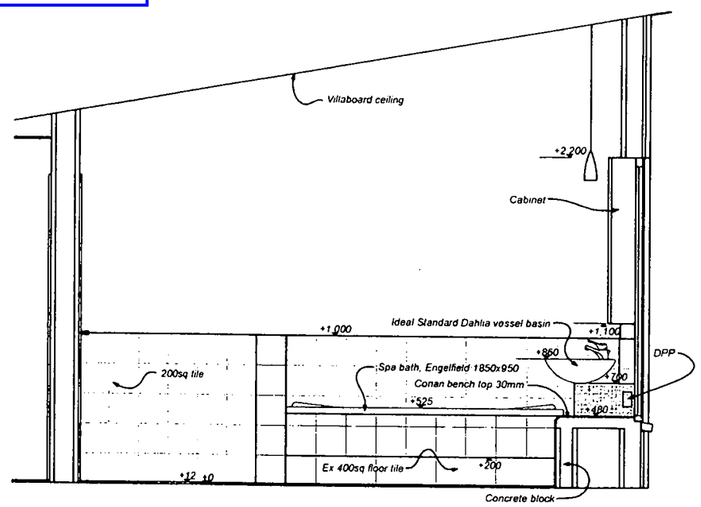
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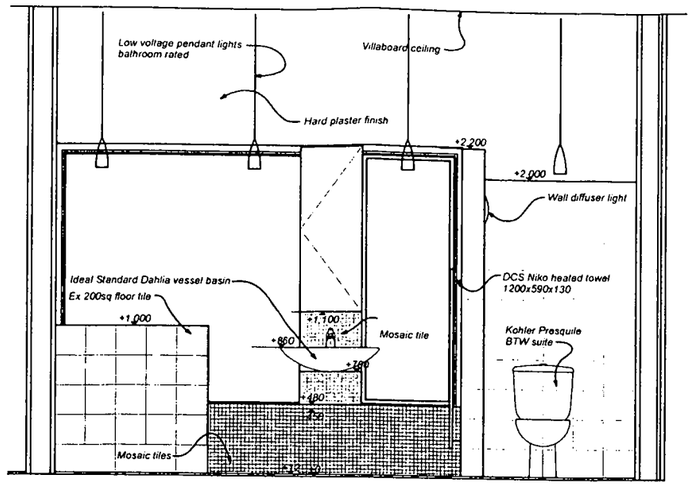
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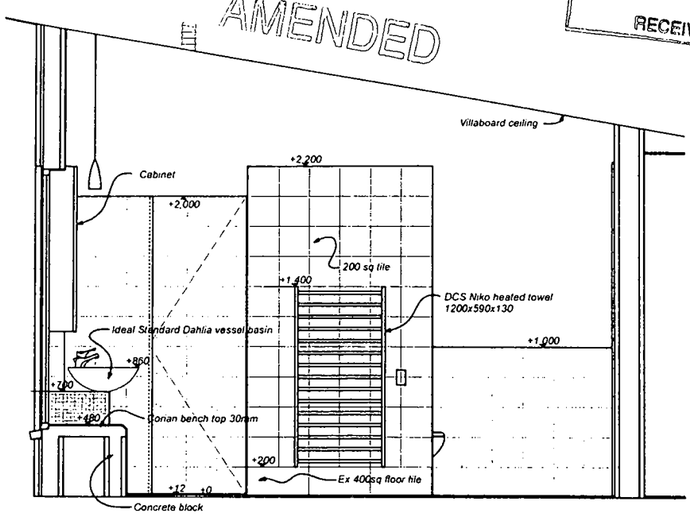
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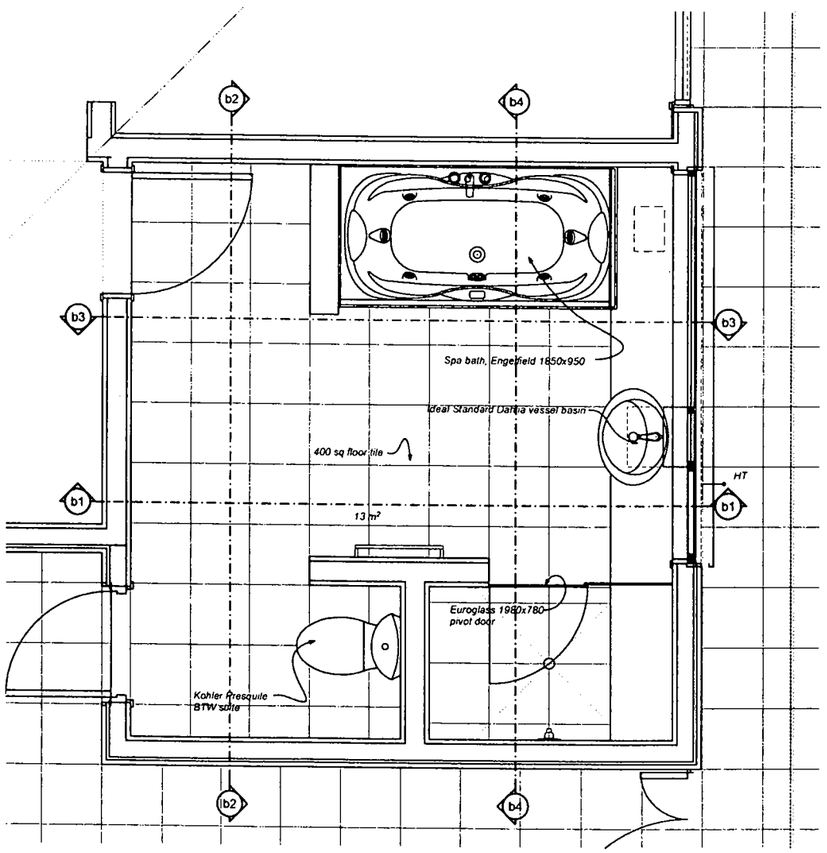
Section b1, scale 1:20



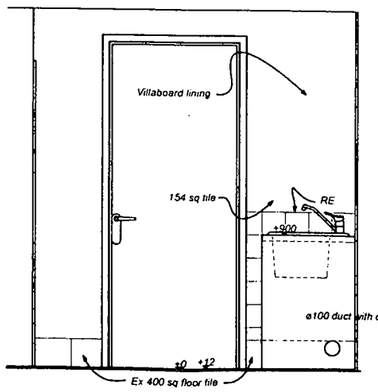
Section b2, scale 1:20



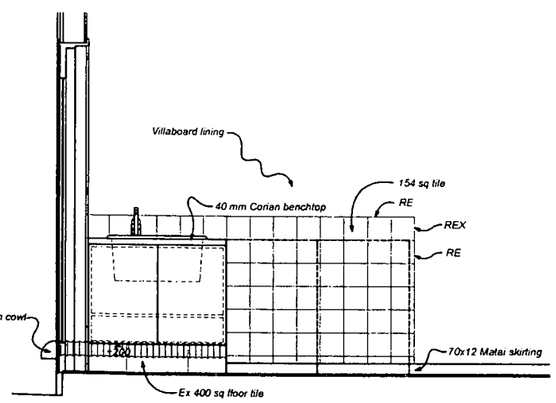
Section b3, scale 1:20



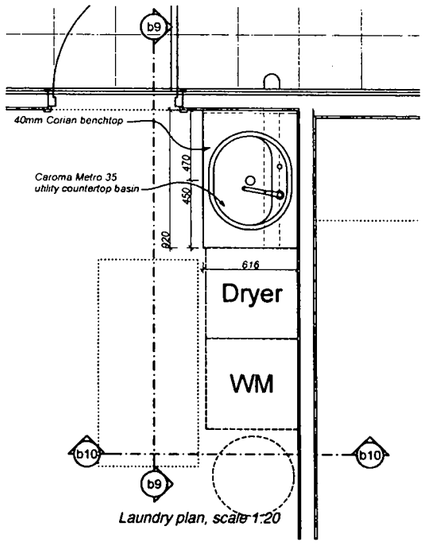
Bathroom 1 plan, scale 1:20



Section b10, scale 1:20



Section b9, scale 1:20



Laundry plan, scale 1:20

Note: Datum +0 for this drawing is actually at -800

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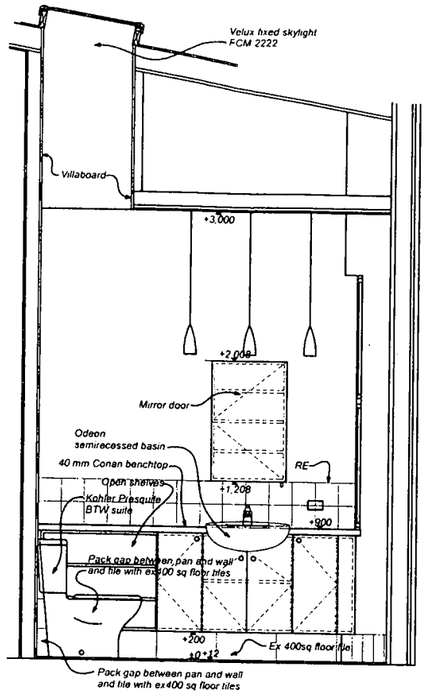
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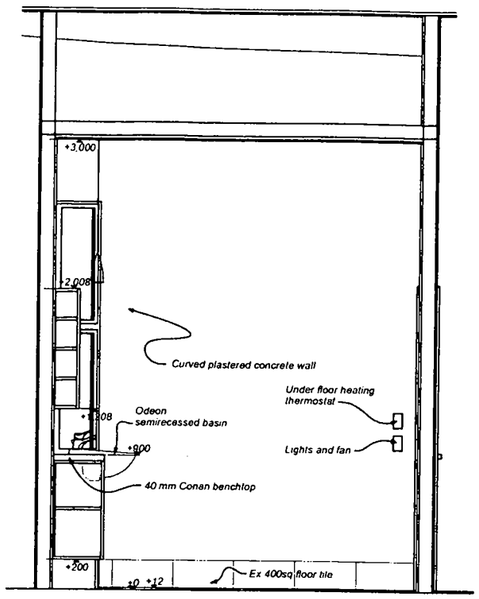
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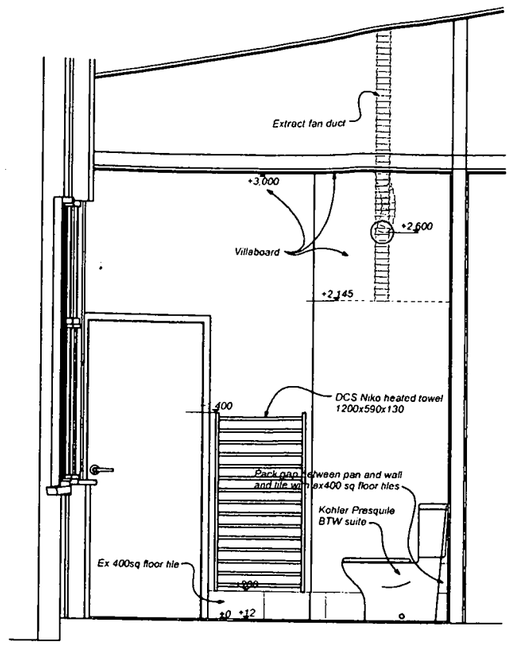
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email rallon@xtra.co.nz



Section b5, scale 1:20

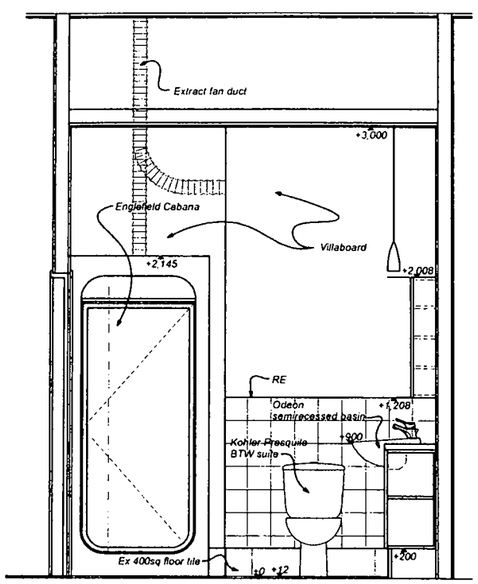


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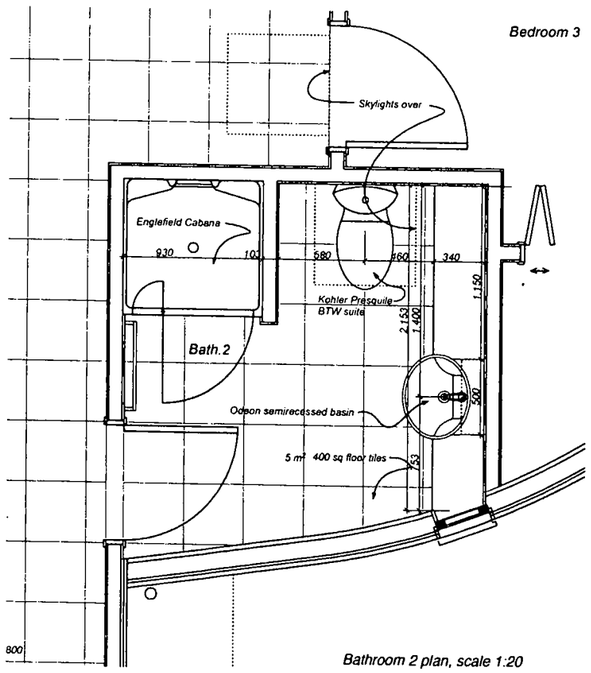


Section b7, scale 1:20

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Section b8, scale 1:20



Bathroom 2 plan, scale 1:20

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Note: Datum +0 for this drawing is actually at -800

AMENDED PLAN Refer to previous plans for past endorsements 18/03/2005

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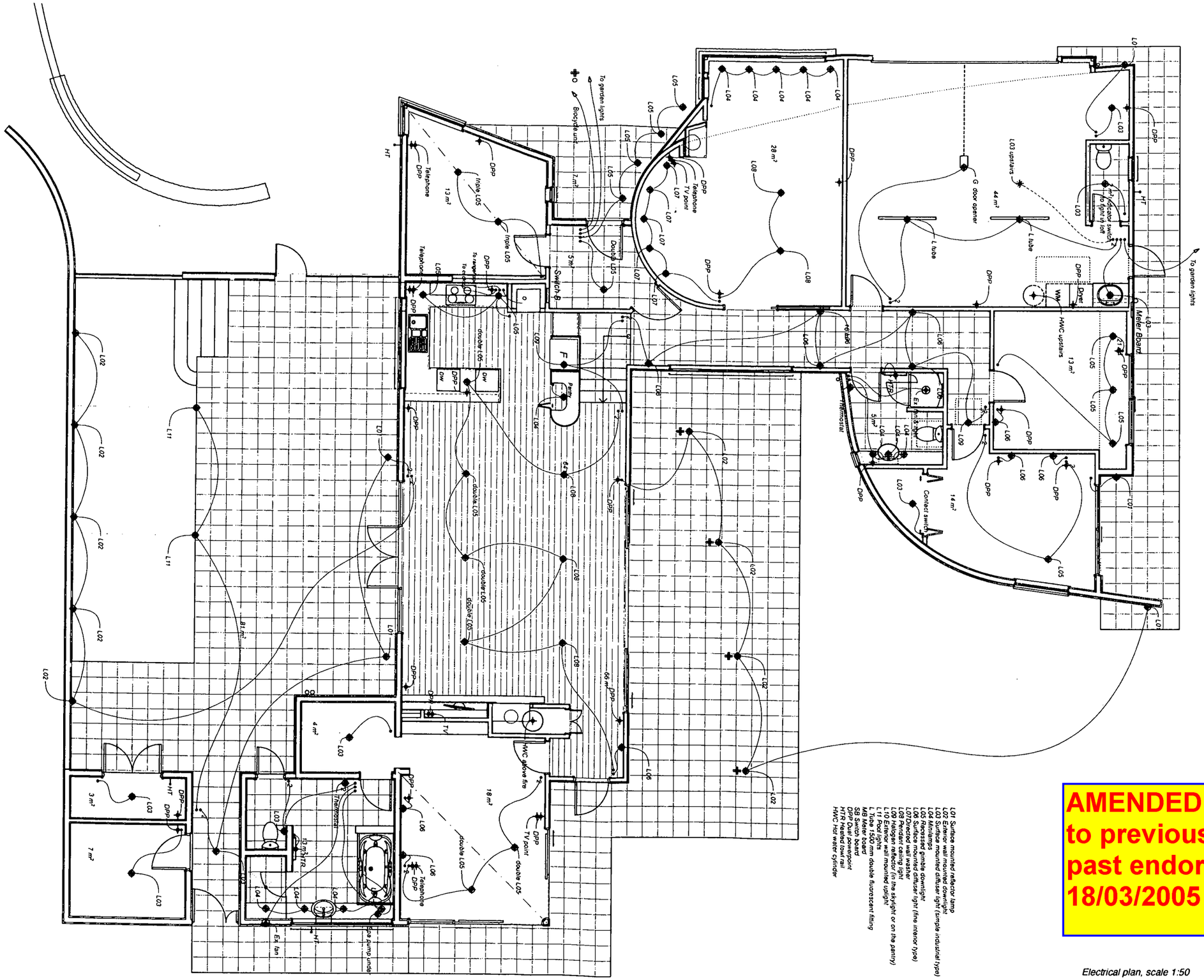
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L01 Surface mounted reflector lamp
L02 Exterior wall mounted downlight
L03 Surface mounted diffuser light (simple industrial type)
L04 Minilamps
L05 Recessed gimble downlight
L06 Recessed diffuser light (fine interior type)
L07 Corded wall washer
L08 Pendant ceiling light
L09 Halogen reflector (in the skylight or on the pantry)
L10 Exterior wall mounted uplight
L11 Track lights
LT Twin 36watt double fluorescent fitting
MB Meter board
SB Switch board
DPP Dual powerpoint
HTR Heated towl rail
HWC Hot water cylinder

AMENDED PLAN Refer to previous plans for past endorsements 18/03/2005

Electrical plan, scale 1:50

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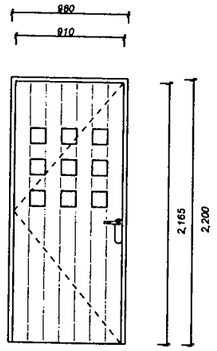
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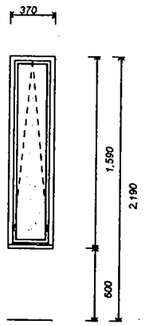
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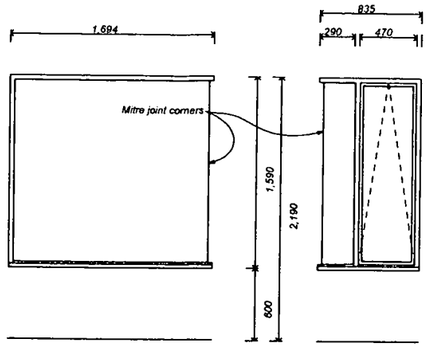
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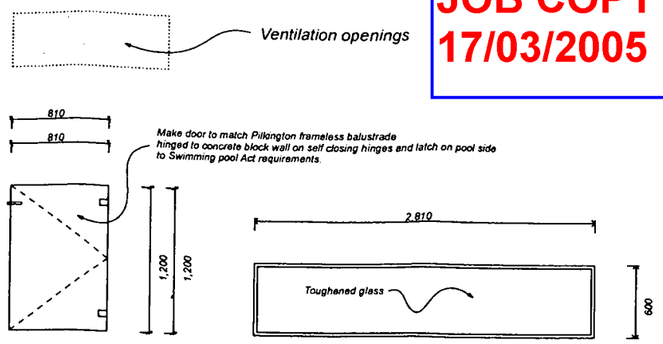
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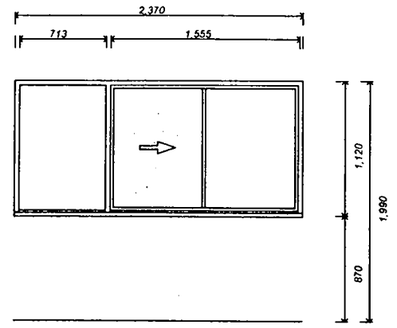
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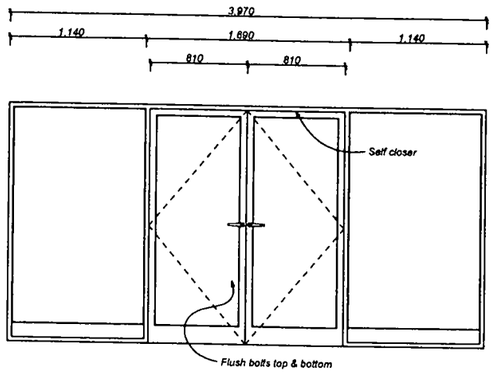


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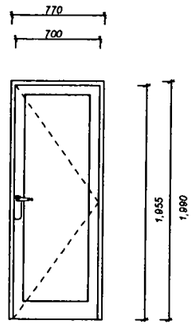


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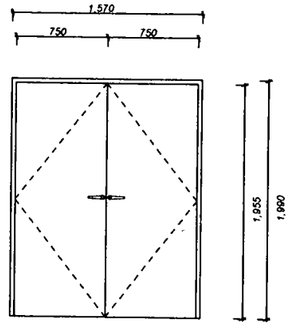
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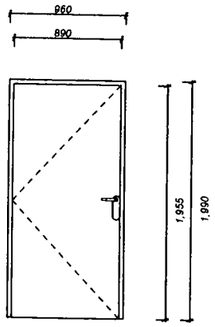
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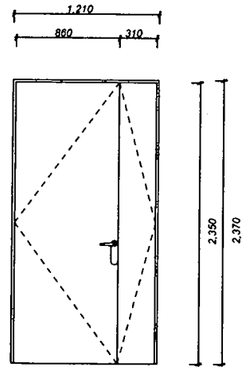
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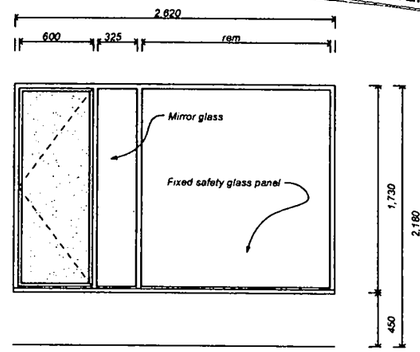
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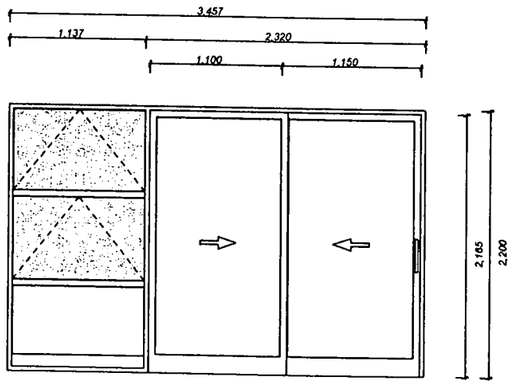
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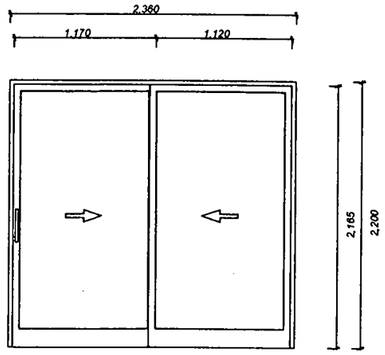
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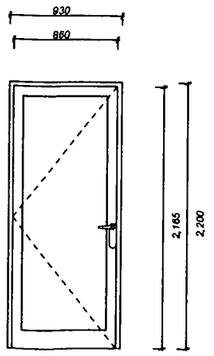
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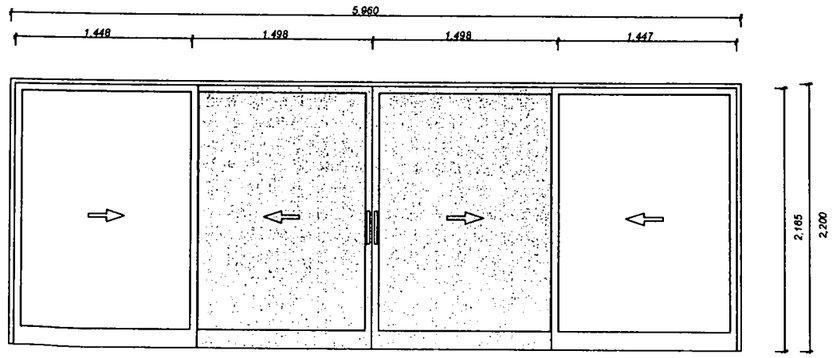
Ej13



Ej14



Ej15



Ej16 For frame finishes, glass and other details see Specification

Window schedule, scale 1:25

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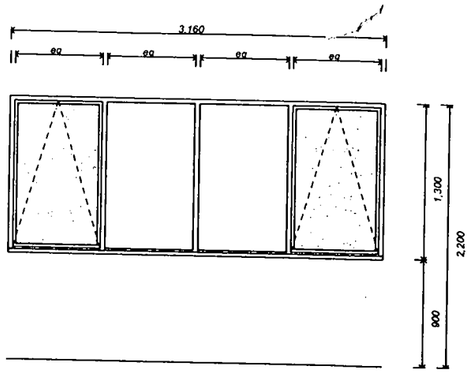
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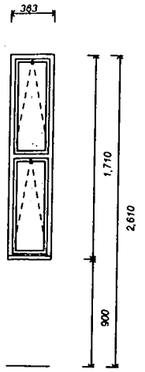
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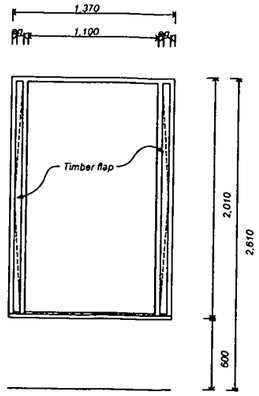
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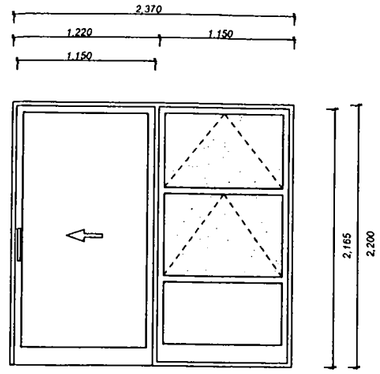
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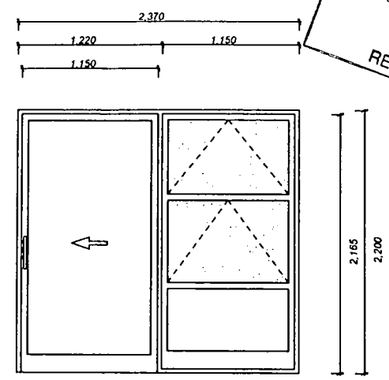
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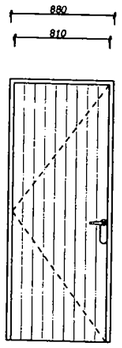
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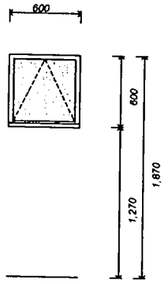
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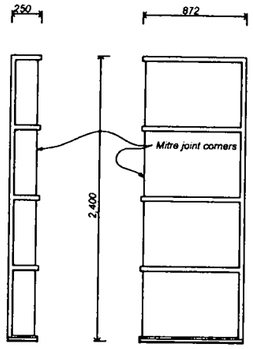
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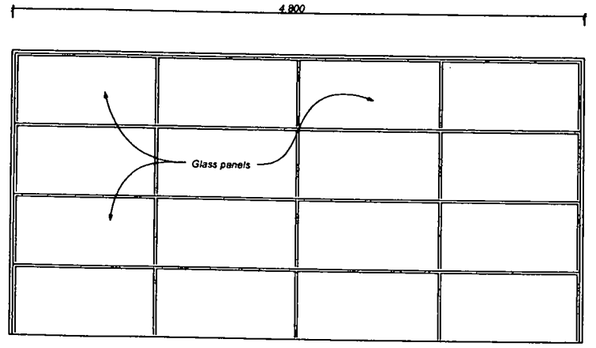
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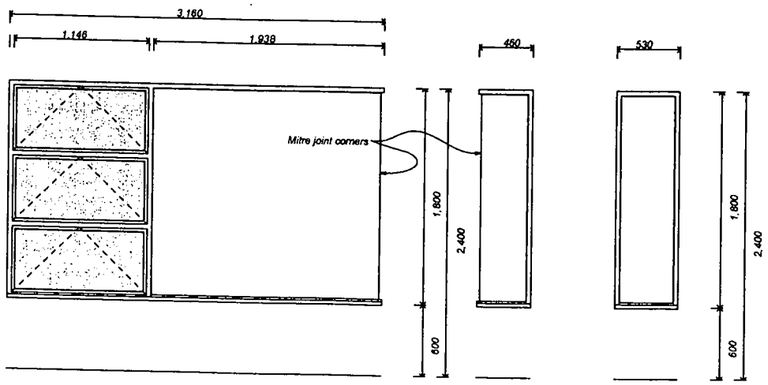
Ej24



Ej25

Ventilation schedule:

Room		ventilation avail.
Office	13.0 m2	1.28
Family room	64.0 m2	6.6
Bathroom 1	13.3 m2	1.02
Bedroom 1	18.3 m2	1.54
Lobby	15.9 m2	1.8
Bathroom 2	5.4 m2	0.5
Bedroom 2	12.6 m2	1.5
Bedroom 3	13.9 m2	1.7
WC	2.1 m2	0.3
Sitting room	28.1 m2	1.9



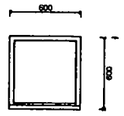
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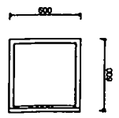
For frame finishes, glass and other details see Specification

Safety glass is to be used in all bathrooms and ensuites if within 2000mm of the floor

Ventilation openings

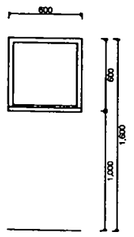


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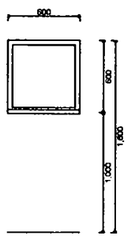


Ej29

Window schedule, scale 1:25



Ej30, Ej31, Ej32



Ej33

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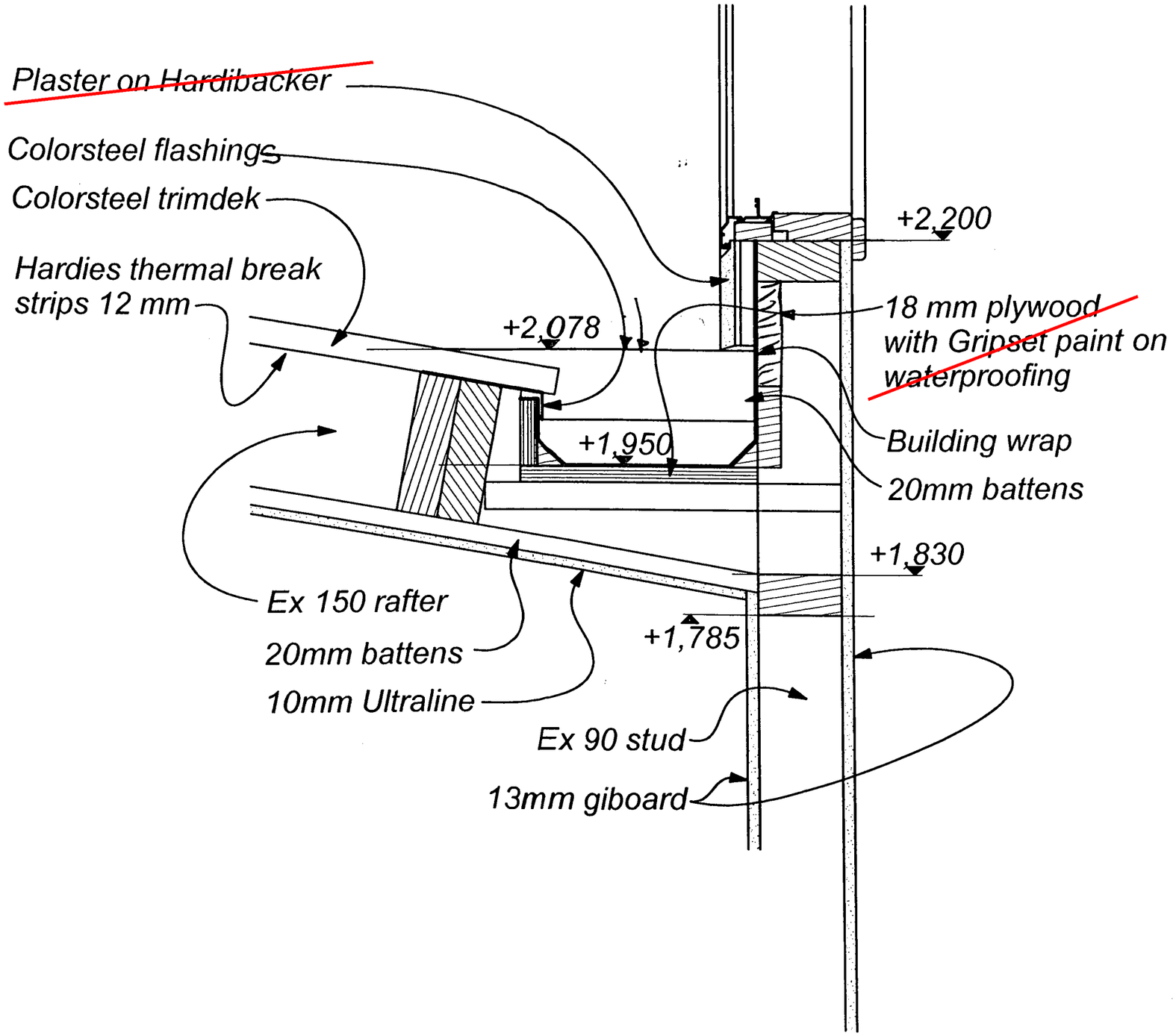
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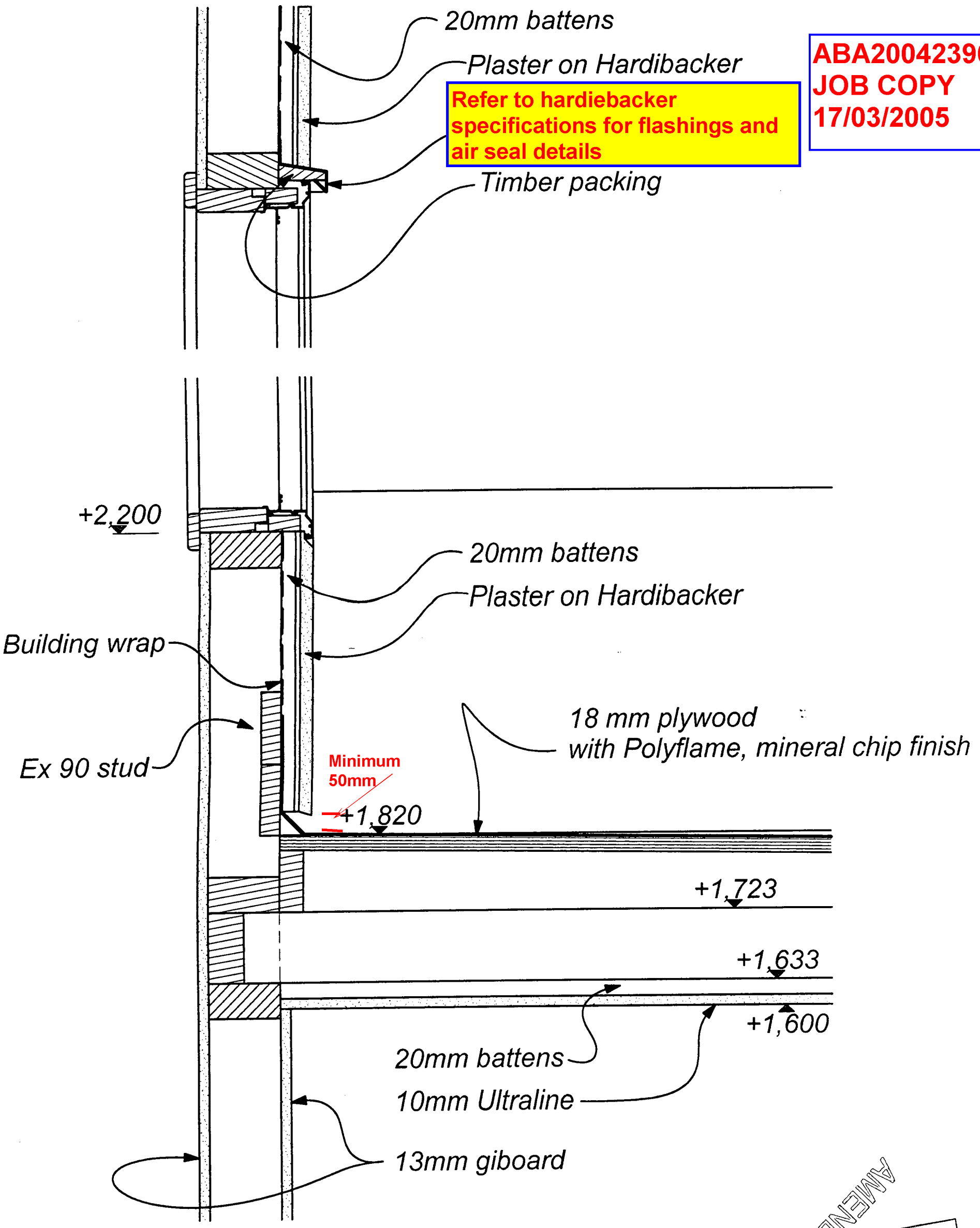
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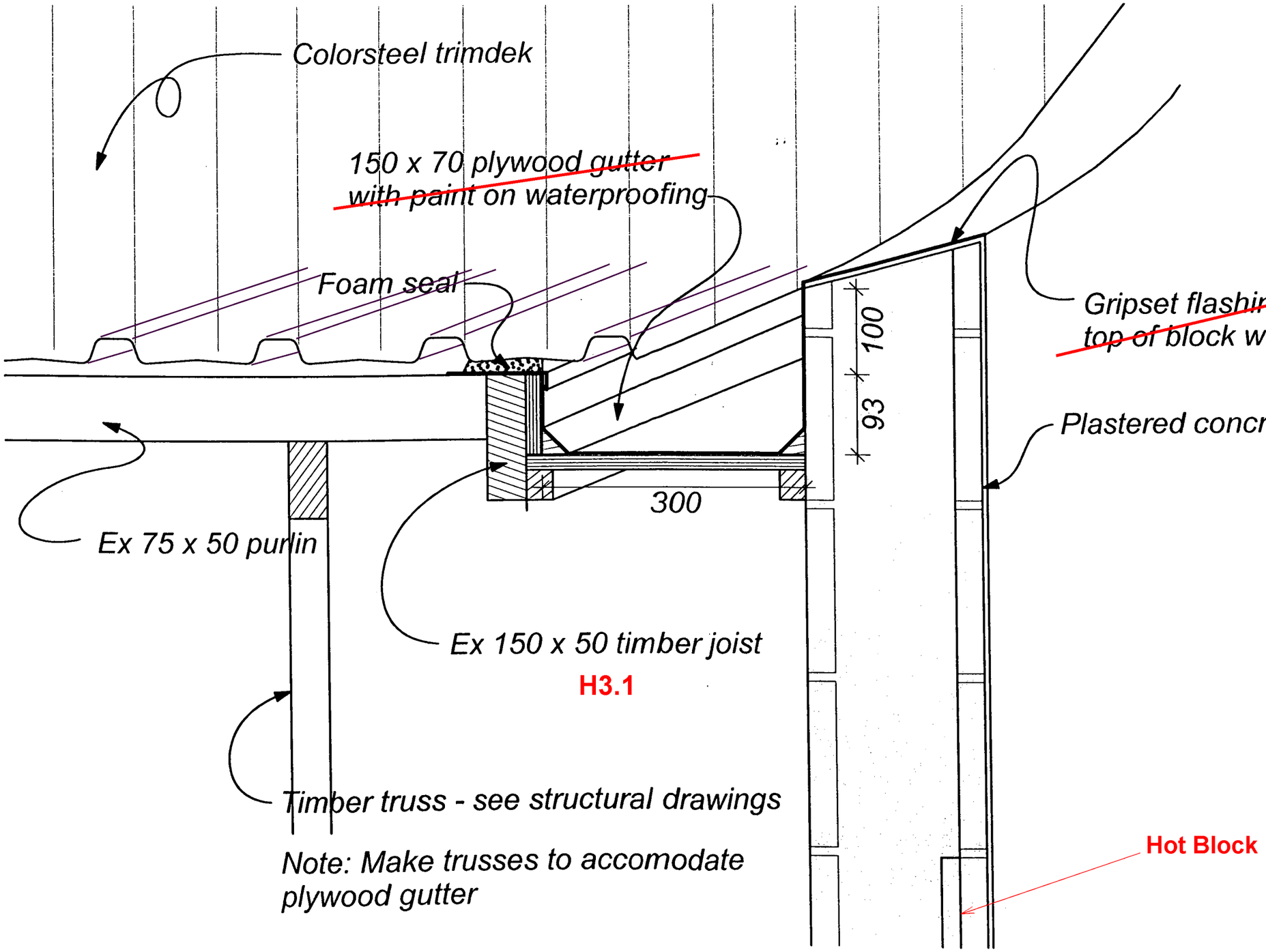


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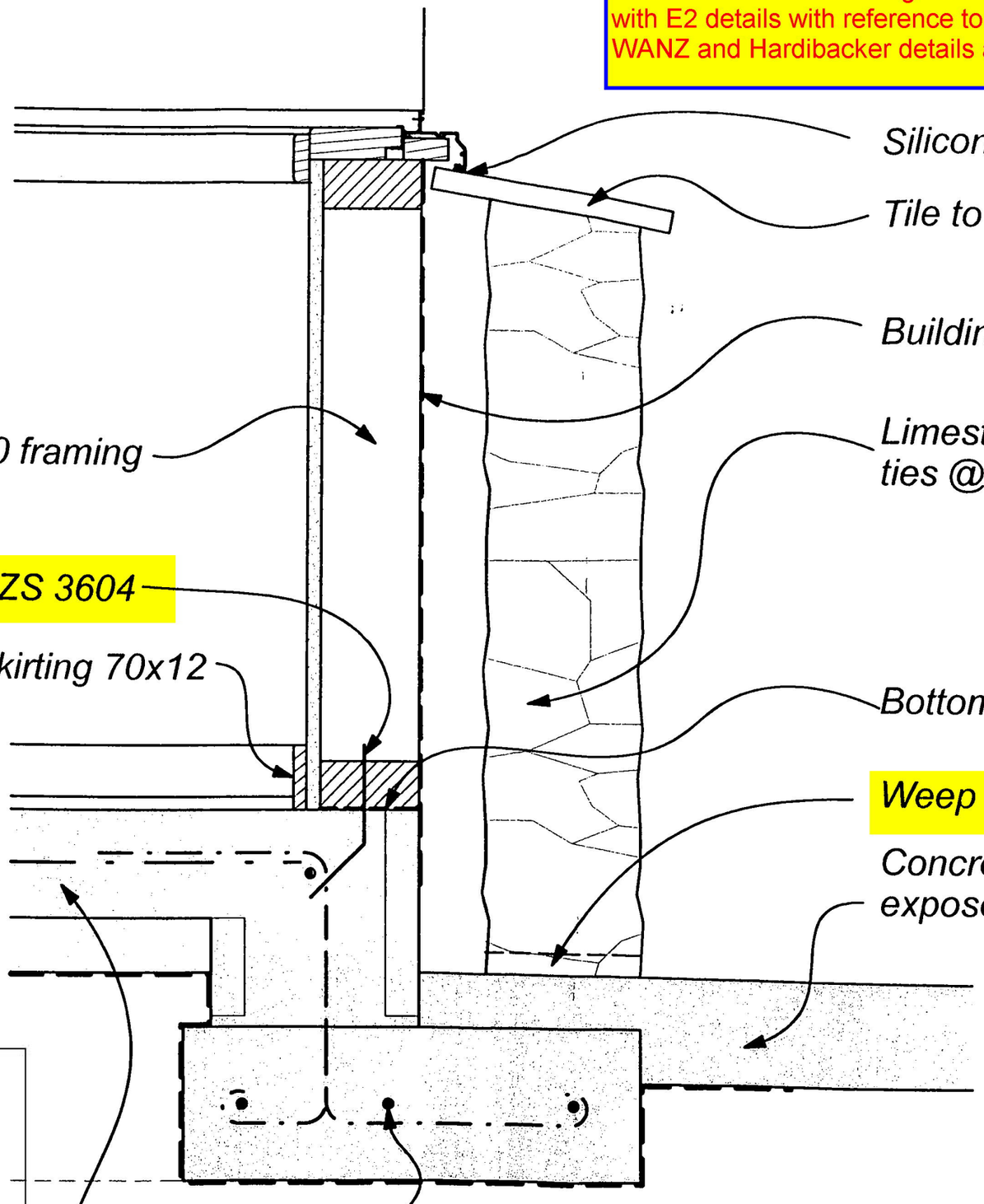
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Window and door flashings to comply with E2 details with reference to WANZ and Hardibacker details also.

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Silicone seal

Tile to match courtyard tiling

Building wrap

90 framing

Limestone veneer with masonry ties @ 600 crs both ways

R10 galv. bolt to NZS 3604

Matai skirting 70x12

Bottom plate on DPC

Weep holes @ 500mm crs

Concrete slab
exposed aggregate finish

D12 reinf. as shown

100mm 17.5 MPa concrete floor
665 HRC reinforcement
Polyethylene DPM on sand blinding,
Compacted hardfill

TIMBER TREATMENT

All timber for this application
To comply with
NZS3602 (2003)

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Detail 10

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Building Products

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CAVITY CONSTRUCTION GENERAL SPECIFICATION

The Specifier or other responsible party for the project is responsible to ensure that the information and details in this specification are appropriate for the intended application and specific design and detailing is undertaken for areas which falls outside this published scope and specification. All relevant information must be provided to the local TA for Permit application.

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This specification must be read in conjunction with Details 1 – 13 available at the back of this document.

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1.0 Application & Scope

1.1 Application

Hardibacker® is a multipurpose external wall backing material can be used for:

- A rigid backing (a substrate) for solid plaster exterior wall covering.
- A substrate for alternative proprietary high-build plaster coatings.
- A rigid backing behind the weatherboards as per the requirements of NZS 3604;1999.
- Construction of arches, buttresses, columns, parapets, spandrels and many other architectural features that are to be subsequently plastered.
- All or parts of external walls for structural bracing as required by NZS 3604:1999.

1.2 Scope

Hardbacker can be used for those structures which fall within the scope of NZS 3604: 1999 "Timber Framed Buildings". There are two methods of constructing Hardbacker cladding depending on the application:

- "*Direct-fixed*", where the cladding is fixed directly to the timber stud frame. For this method of fixing please refer to the James Hardie Hardibacker Technical information.
- "*Drained and Ventilated cavity*", where cladding is fixed onto timber battens fixed over the timber frame.

Refer www.bia.co.nz for latest information regarding the construction methods for exterior cladding.

1.3 Code Compliance

This specification has been developed in accordance with the requirements of the draft NZBC E2/AS1 cavity construction requirements.

2.0 Design

2.1 Responsibility

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

2.2 Site & Foundations

The site on which the building is situated must comply with the Acceptable Solution E1/AS1 of the Approved Document for the NZBC (New Zealand Building Code) Clause E1 *"Surface Water"*.

Foundation design, in all cases must be either timber pile (where the piles terminate at the underside of the floor level) or concrete slab in accordance with NZS 3604:1999.

2.3 Ground Clearances

The floor must have a minimum clearance to paved or unprotected ground as required by NZS 3604:1999.

Hardbacker backing sheet must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by NZS 3604: 1999.

The bottom edge of the Hardibacker sheet must be a minimum of 50mm above paved or unprotected ground and 20mm above drained decks or roofs.

2.4 Moisture Management

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

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Wall construction design must effectively manage moisture, accounting for 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 Acceptable Solution E2/AS1 of the Approved Documents for the NZBC Clause E2 "*External Moisture*". In addition all wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate appropriate flashing and waterproofing. Materials, components and their installation that are used to manage moisture in framed wall construction must, at a minimum, comply with the requirements of relevant standards and the NZBC.

2.5 Horizontal Surfaces

Roofs are defined by NZS 3604:1999 as "that part of a building exposed to the outside and at an angle of 60° or less to the horizontal".

It is not recommended that Hardibacker must not be used to create roofs or horizontal surfaces as per the above definition.

2.6 Structure

Timber-framed buildings must be designed in accordance with NZS 3604:1999. However the framing requirements for timber member sizes and spacing specified in this document are for the buildings which fall within the scope of this document.

2.7 Wind Loading

Hardibacker is suitable for use in all wind zones (including and up to VH) in New Zealand as defined by NZS 3604: 1999.
A specific design is required for all situations above VH wind zone.

2.8 Structural Bracing

Hardibacker cladding sheets can be used to achieve structural bracing when installed on cavity battens.
For Higher bracing capacities Hardiflex may be used.
In bracing applications 316 grade stainless steel nails must be used in all zones.
For further information on bracing please ring James Hardie Customer Helpline at 0800 808 868.

2.9 Fire Properties

Hardibacker sheet will not burn and has the following Early Fire Hazard indices 9 Tested to AS/NZS 1530 part 3, 1999.

Ignition Index	0
Flame Spread Index	0
Heat Evolved Index	0
Smoke Developed Index	0

2.10 Energy Efficiency

The R-Value of walls sheeted with Hardibacker, constructed in accordance with this manual, will comply with the "Schedule Method" of NZS 4218:1996 (*Energy Efficiency – Housing and Small Building Envelope*) and shown in Table 1. Calculation is based on a framing member size of 90mm x 45mm and internal linings of James Hardie Villaboard, plasterboard or timber with insulation as mentioned in the table.
As per the requirement of NZS 4218:1996

Table 1: Insulation Capability

Climate Zone*	R-Value Requirement	Cavity Insulation Infill Requirement
1 & 2	1.5 m^2°C/W	R1.8 Fibreglass batts.
3	1.9 m^2°C/W	R2.2 Fibreglass batts.

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3.0 Framing

3.1 Framing

A 45mm (nominal) minimum stud width is required at all sheet edges. A 35mm stud width may be used at intermediate studs.

3.2 Structural Grade

Minimum timber grade requirements are No.1 framing grade in accordance with NZS 3631:1978 *"New Zealand Timber Grading Rules"* or equivalent.

3.3 Durability

Refer to Acceptable Solution B2/AS1 of the Approved Documents for NZBC Clause B2 "Durability".

Note: this document is now being extensively revised and is due for publication during 2004. Refer to this draft document for latest information.

Framing must be treated (H1.2) to provide resistance to fungal growth due to moisture exposure.

For further timber selection guidance refer to framing manufacturers specifications.

Refer to www.bia.co.nz for the latest information regarding the timber frame durability.

3.4 Frame Construction

All edges of Hardibacker sheeting must be fully supported by the framing The framing must be rigid and not rely on the Hardibacker sheet for stability.

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

All timber framing sizes and set-out must comply with NZS 3604: 1999, and with stud and nog centres and timber widths required by this specification.

- Studs spacing must not exceed more than 600mm centers.
- Nogs must be provided at 800mm centers maximum.

Refer to DZ3602 for moisture content requirements. Framing must be kept as dry as possible at all times.

3.5 Special Framing Requirements

An extra stud is required at corners when the drained and ventilated cavity construction method is used.

James Hardie recommends that the timber frame is set-out for the cladding sheets to ensure minimum cutting and wastage.

3.6 Curved Walls

Hardibacker cladding sheet can be used in curved walls, fixing the boards horizontally with a minimum radius of **1500mm** for **4.5mm** sheet fixed on to studs at a maximum spacing of **400mm.** Commence fixing from the centre of the sheet and work outwards to avoid any possibility of drumminess. Penetrations in curved walls are outside the scope of this specification.

3.7 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 Section 2.2 of NZS 3604: 1999. Recommended framing tolerances are shown in Table 2. All framing shall be made flush.

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Table 2: Timber Frame Straightness Tolerances	
Straight Edge (mm)	Tolerances (mm)
1200	1 – 2
3000	3 – 4

4.0 Preparation

4.1 Building Wrap

Building wrap must be provided between the cavity battens and the framing which either complies with Acceptable Solution E2/AS1 of the Approved Document for NZBC clause E2 "External Moisture" and NZS 3604:1999, or is BRANZ Appraised breather type membrane. The building wrap must be fixed in accordance with the manufacturer's recommendations and the requirements of NZS 3604:1999.

4.2 Vent Strip

The James Hardie PVC cavity vent strip must be installed at the bottom of all walls constructed using the drained and ventilated cavity method of construction.

4.3 Cavity Battens

The battens provide an air space between the frame and the sheet and are considered a "packer" in this specification. The battens must be fixed over the building wrap.

All timber battens must be minimum 19mm Thick x 45mm wide with a variation not to exceed more than +/- 0.5mm over a 600mm length on the face and H3.1 treated in accordance with DZ 3640 (*Specification of the Minimum Requirements Of The NZ Timber Preservation Council Inc.*)

Note: The document DZ 3640 is being revised. Please refer to this document for the latest information.

Battens must be fixed over the building wrap to all studs as described below;

Where studs are at 600mm centers, the battens must be provided at 300mm centers vertically
(i.e. a batten on studs and one in between the two studs) and fixed to top & bottom plates and nogs.
Where studs are at 400mm centers, the battens must be provided on the studs only.

Battens must be fixed to the framing using 40 x 2.8mm Hardiflex nails at top & bottom plates and at nogs only.
(Batten fixing is required temporarily to keep them straight on the wall during construction.)

4.4 Junctions & Penetrations

Refer to Section 2.4 of this literature for moisture management requirements.

All windows and doors must be detailed as per the requirements of Acceptable Solution E2/AS1 of the Approved Document for NZBC Clause E2 "External Moisture". Refer also to the joinery provider.

The Window Association of New Zealand (WANZ) has specifications and details available for the treatment of window penetrations. Refer to www.wanz.co.nz.

Refer to Details 8 & 9 for generic Hardibacker window details.

4.5 Corners

At all external and internal corners the mesh and plaster is to be continuous around the corners; control joints are not required. See detail 7 and 8.

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5.0 Sheet Fixing

5.1 General

The Hardibacker cladding sheets must be kept dry as much as possible whilst in storage or during the fixing.

5.2 Fastener Durability

NZS 3604: 1999 has requirements for the fixing material relating to the exposure conditions as summarised in Table 3.

Table 3: Exposure Conditions & Nail Selection prescribed by NZS 3604:1999

Nail Material	
Sea Spray Zones*	Zone 1 outside sea spray zone and Zones 2 – 4 & Geothermal hot spots
Grade 316 Stainless	Hot-dipped galvanised or 316 stainless

**Zone 1 areas where local knowledge dictates that increased durability is required, appropriate selection shall be made.*

5.3 Fastener Size & Layout

Hardibacker sheets must be nail-fixed to timber as described below and as shown in Detail 2:

- Use 60 x 3.15 mm Hardiflex fibre cement nails.
- Nails at 200 mm centres along sheet edges as well as intermediate studs.
- Nails must be driven a minimum of 12 mm from the sheet edges and 50 mm from corners.

Do not overdrive nails below sheet surface.

Note: that special fixing arrangements are required for bracing systems – For more information contact James Hardie Helpline on 0800 808 868.

5.4 Sheet Layout

All sheet edges must be supported by the framing.

Hardibacker sheets must be fixed vertically except for on curved walls.

6.0 Jointing

6.1 Vertical Sheet Joint

Hardibacker sheets are butt jointed together at vertical joints.

6.2 Control Joints

Control joints shall be formed in the plaster to coincide with all locations and joins in the structure where movement is likely to occur. The control joint spacing as per NZS 4251:1998 shall not be greater than 4m both vertically and horizontally and be located at:

- Above and below the sides of door & window openings, and
- At the floor joist levels.

6.2.1 Vertical Control Joint

Vertical control joint must be provided in stucco at a distance as mentioned above. Refer to "Good Stucco Practice" (Feb.1996) by BRANZ for further information regarding creating a vertical control joint.

When a window or door opening is in the vicinity of the control joint then the edge of the opening is an ideal location for the control joint. As a good practice position the control joints so they are hidden by the building features where possible.

The vertical sheet joints do not need to coincide with plaster control joints.

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6.2.2 Horizontal Control joint

At floor joist levels a horizontal joint must be provided to accommodate the movements resulting due to structural deflections or due to timber joist shrinkage.

A horizontal control joint must be provided at 4 meters maximum centres.

A James Hardie uPVC 'h' mould is used to form a horizontal joint as one option. See Detail 7.

A purpose made metal 'Z' flashing could also be used to form a horizontal joint. The metals which could be used are stainless steel, powder-coated aluminum, powder-coated hot dipped galvanized steel and hot dipped galvanized steel. Also refer to NZS 4251:1998 for more information about the metals to be used with stucco plasters. *Refer Detail 10.*

Note: Zinc alum coated steel is not suitable as it deteriorates when in contact with Portland cement.

6.4 Expansion Joints

Expansion joints are provided to accommodate or allow structural movements. A vertical structural expansion joint must be provided at maximum 12 meters. They are generally required for larger commercial buildings only, and such buildings are outside the scope of this literature. Appropriate joint design shall be undertaken for this situation.

7.0 Finishing

7.1 Solid Plaster Finishes

7.1.1 General

Hardibacker is a rigid backing for solid plaster and proprietary plaster coatings and provides true straight backing to plaster.

An approved plastering system is to be applied which meets the requirements of NZBC and is in accordance with NZS 4251:1998.

The solid plaster must be finished and detailed to be waterproof. Useful guidance can be found in BS 5262:1991 and BRANZ " Good Stucco Practice" (Feb.1996).

7.1.2 Building Paper

Used in accordance with Acceptable Solution E2/AS1 clause 2.3, Hardibacker is an alternative to the 'rigid backings' specified in clause 2.3.3 of the NZBC .

Building paper over the face of the sheets must be fixed before the reinforcing mesh and plaster is applied.

A suitable building paper must comply with NZS 2295. The building paper must be run horizontally and lapped 75mm at joints, with the direction lap ensuring water is shed to the outer face of the paper.

7.1.3 Base Mould

A PVC base mould is available to finish the plaster against. Fix the base mould to the bottom plate or bearer and and over the Hardibacker before plastering commences.

7.1.4 Reinforcement

Fix reinforcement for solid plaster in accordance with NZS3604:1990 and NZS 4251:19974 Code of Practice for Solid Plaster.

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Alternatively proprietary solid plaster reinforcing mesh systems can be used. The mesh must be spaced in the plaster between 6mm and 9mm from the Hardibacker surface as required by clause 7.4.4 NZS 4251:1974. To achieve this spacing and adequately tension the mesh, use the Hardibacker PVC angle.

The Hardibacker PVC angle is fixed in a continuous strip vertically down each stud line at 600mm centers. The 1500mm spacers are fixed to the centre of each nog line. Fix to reference marks previously set out on the building paper face as all mesh fixings must penetrate the timber frame.

Use 40mm x 2.8mm galvanized large head clouts with 9mm diameter flat heads, to secure the reinforcing. Nail through or alongside every fourth hole in the spacers down each stud line and nail-fix the mesh at 150mm along the nogs. Slightly skew the nail from centre of the the sheet outwards to make taut.

Laps in reinforcing mesh must be 75mm minimum. Bend the mesh around corners at least 480mm-600mm to allow the lap to be located one standard spacing away from the corner.

The corner of openings must have extra reinforcement , as Clause 7.4.6 and 7.5.2 NZS 4251:1974. This is not required when a relief or a control joint is located at the side of the opening.

7.2 Sealants

All sealants must demonstrate to meet the relevant requirements of NZBC and hold a current BRANZ Appraisal Certificate. Application and use of sealants must comply with manufacturers instructions. Sealants, if coated, must be compatible with the paint system. Some sealant manufacturers do not recommend coating over their product.

7.3 Coating

Painting of plaster is essential to meet the durability requirements of New Zealand building code and product warranty requirements.

Before painting, remove any surface dirt, grim or other contaminants and ensure the plaster is dry.

Use only quality 100% acrylic high build paints. Economy paints are not recommended because generally they are less well bound, less moisture resistant and more prone to mould growth.

In all cases the manufacturer's specification for the selected paint must be followed. Note that some paints require undercoat before applying the finish coat.

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8.0 Maintenance

It is the responsibility of the specifier to determine normal maintenance requirements as per the requirements of 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 that may provide a means of moisture entry beyond the exterior cladding to comply with the requirements of NZBC clause E2.
- Cleaning out gutters, blocked pipes and overflows as required,
- Pruning back vegetation which is close to or touching the building.

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

9.0 Product Information

9.1 Manufacturing & Classification

James Hardie New Zealand is an ISO 9001 Telarc certified manufacturer. Hardibacker sheet is manufactured to meet the requirements of AS/NZS 2908.2: 2000 *'Cellulose-Cement Products'*.

The sheets are identified by its blue colour and the printing at regular intervals the name "HARDIBACKER" on the back face and embossed on the front face of the sheet.

9.2 Sheet Sizes

Available sizes of Hardibacker are provided in Table 4.

Table 4: Hardibacker sheet sizes

Thickness (mm)	Width (mm)	Length (mm)	
		2400	2700
4.5	1200	✓	✓

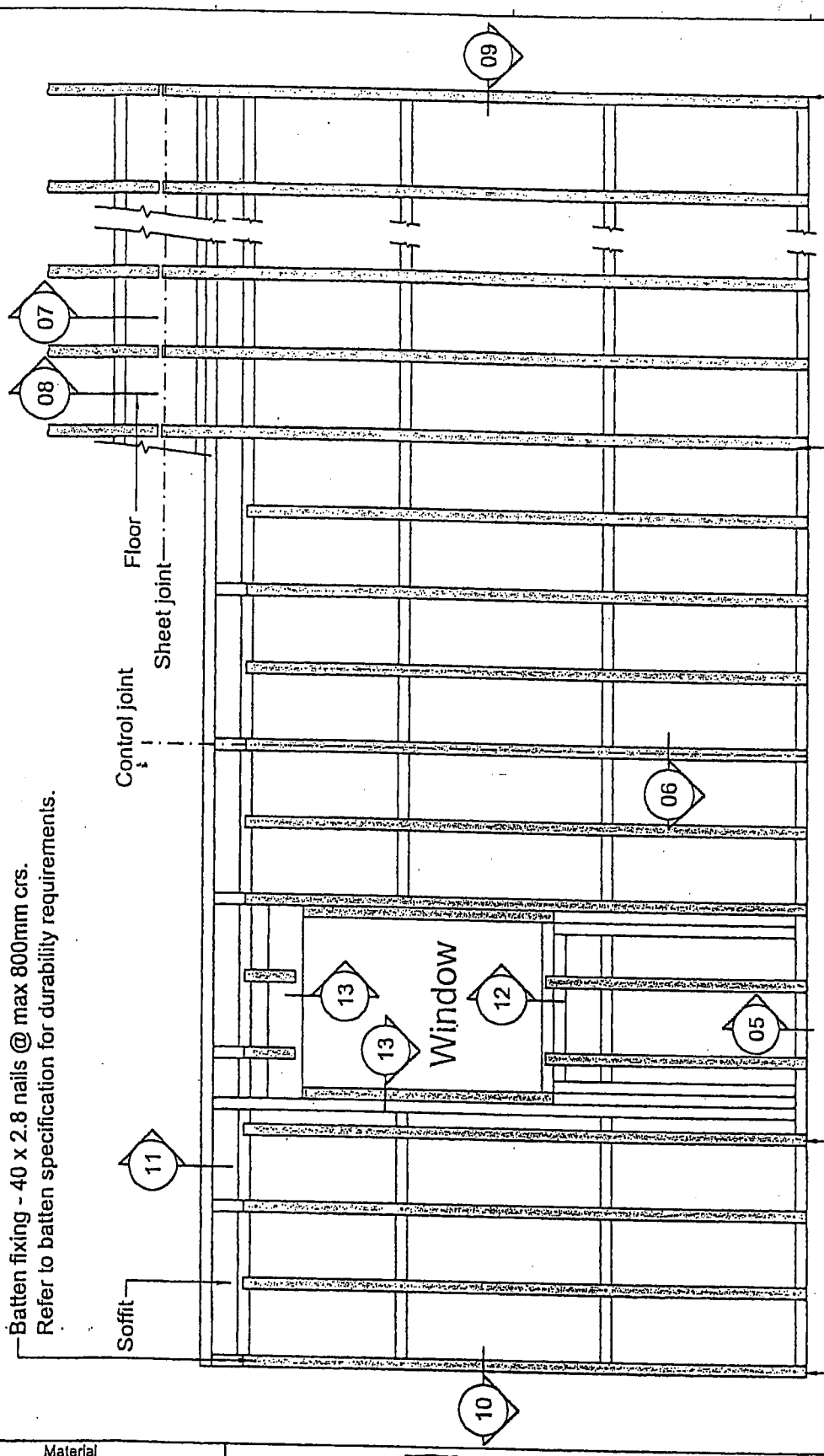
9.3 Product Mass

Hardibacker sheet has a product mass of 7kg/m^2 at EMC.

10.0 Safe Working Instructions

If you are unfamiliar with working safely with fibre-cement products and their accessories, please refer to the Safe Working Instructions literature that accompanies every pack of fibre-cement from James Hardie or alternatively ring customer service Helpline on 0800 808 868 for these instructions.

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Note!
Section notations refer to dwg numbers.

WALL ELEVATION

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

Material

Drawn to AS 1100

Dimensions in Millimetres

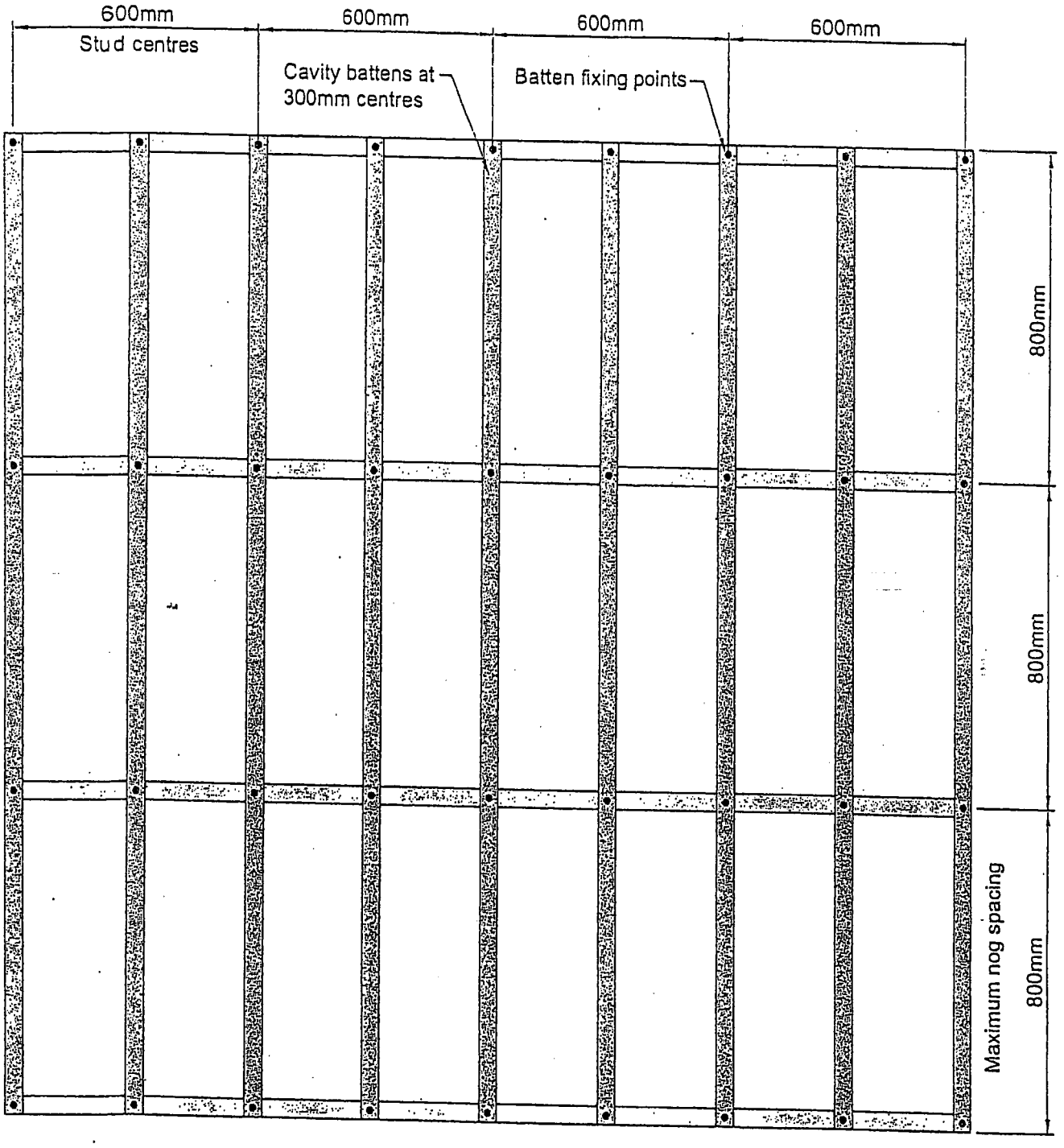
Do Not Scale

James Hardie
Building Products

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TECHNICAL PRODUCT DEVELOPMENT
NEW ZEALAND BUILDING PRODUCTS
RESIDENTIAL
HARDIBACKER
GENERAL SPECIFICATION
CAVITY TYPICAL FRAMING & BATTEN SETOUT

Drawn: SK	Date: 26.11.2003
Checked	Date
Approved	Date
Sheet Size: A4	Scale: NTS
Reference No: N_ZR-H_B-GSP	Detail: 01
Sht of Shts	Revision: A



Sheet joint studs 45mm wide
Other framing 45mm or 35mm wide

Note: No horizontal cavity battens required at nogs

Material

Drawn to AS 1100

Dimensions in Millimetres

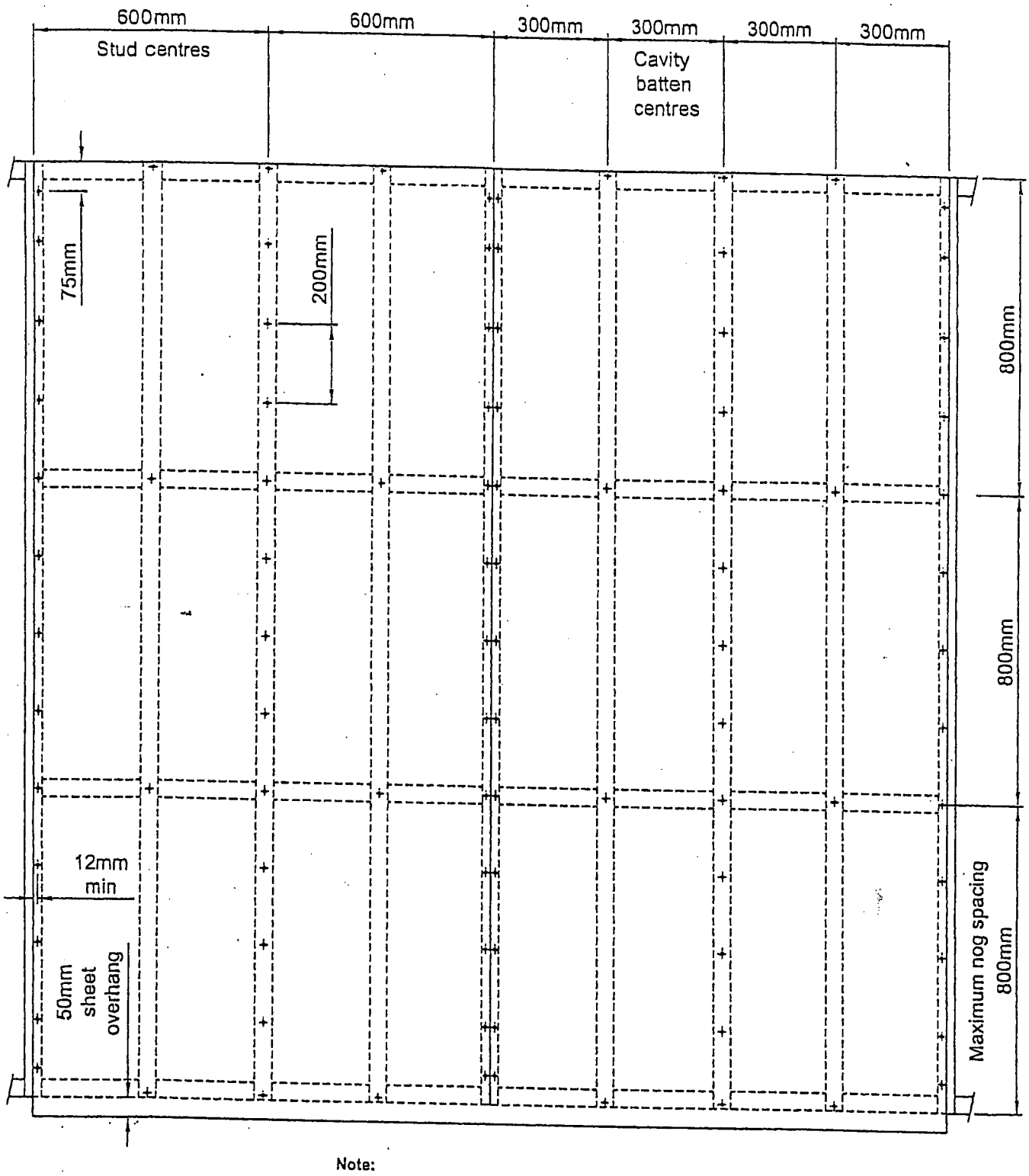
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TECHNICAL PRODUCT DEVELOPMENT
NEW ZEALAND BUILDING PRODUCTS
RESIDENTIAL
HARDIBACKER
GENERAL SPECIFICATION
CAVITY BATTEN FIXING

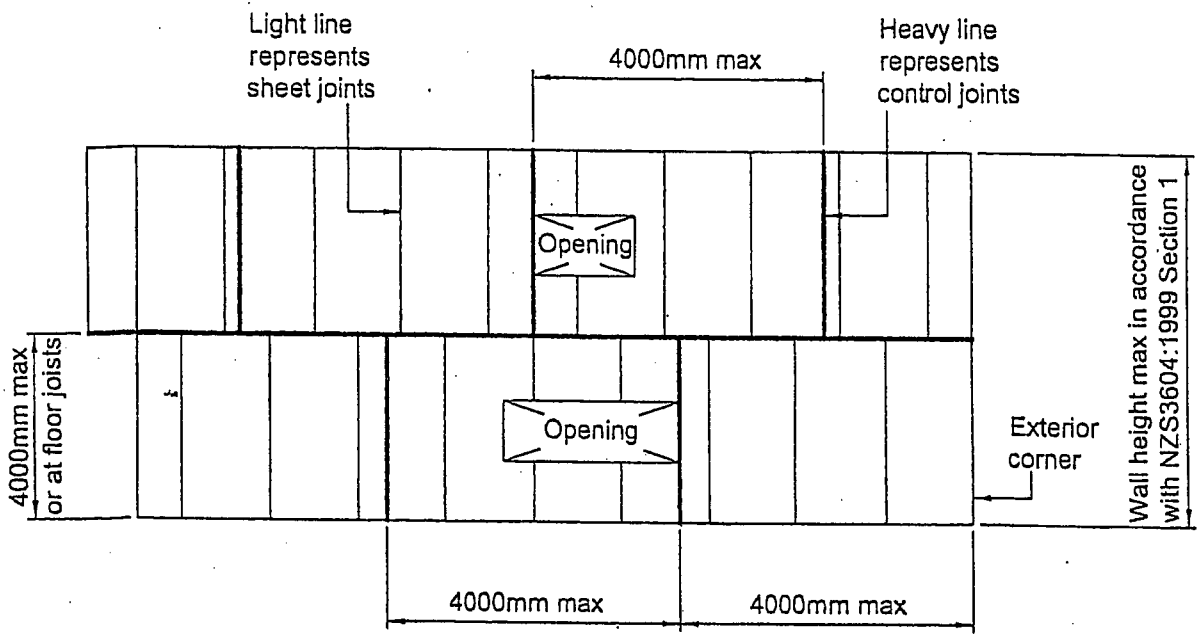
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Checked	Date
Approved	Date
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Reference No: N_ZR-H_B-GSP	Detail: 02
Sht of Shts	Revision: A



Note:
Hardibacker sheets must be fixed vertically except for at curves .

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		Approved	Date
Drawn to AS 1100 Dimensions in Millimetres Do Not Scale	TECHNICAL PRODUCT DEVELOPMENT NEW ZEALAND BUILDING PRODUCTS RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY TYPICAL SHEET FIXING SETOUT	Sheet Size: A4	Scale: NTS
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		Sht of Shts	Revision: A

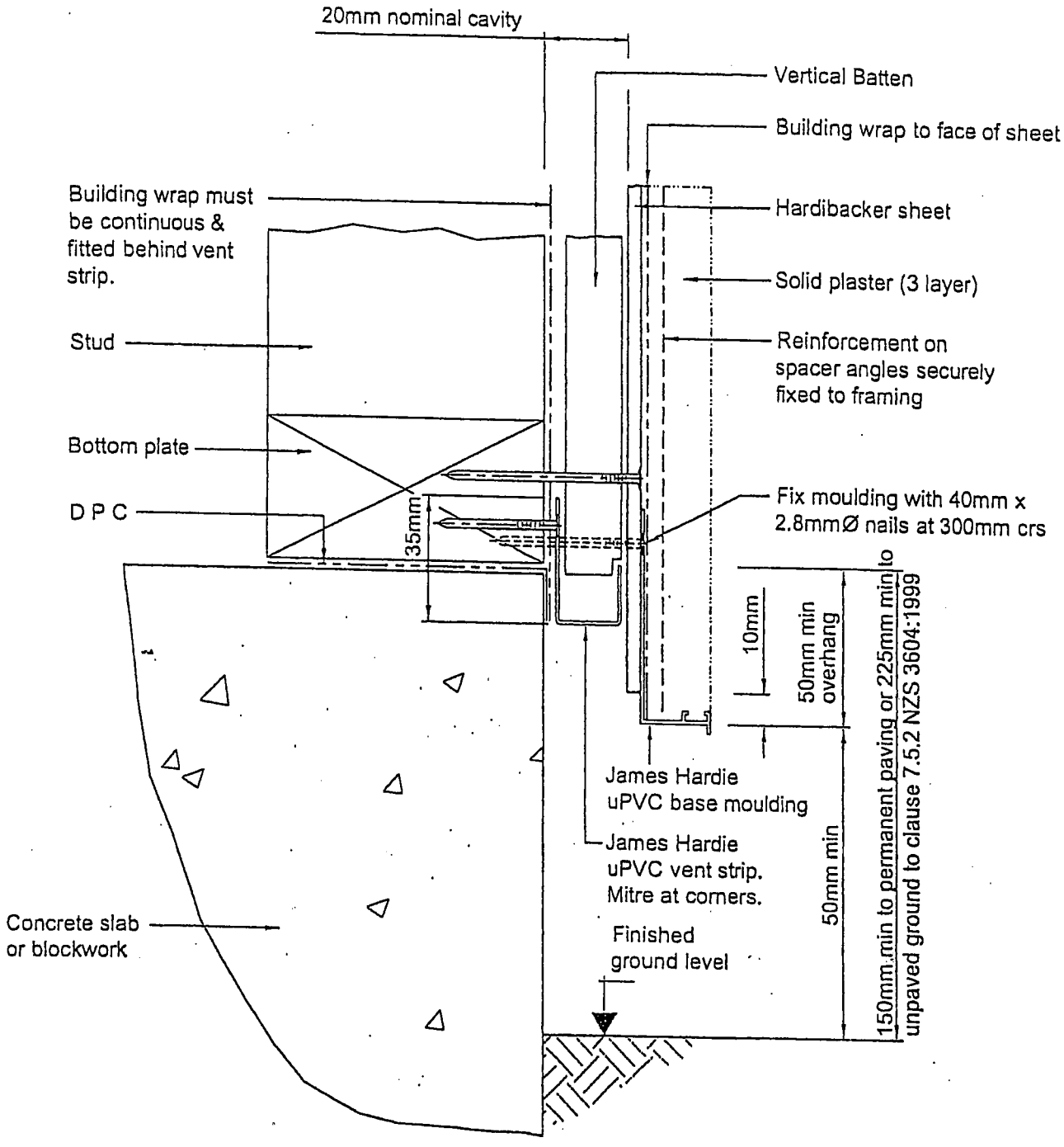
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Wall Elevation

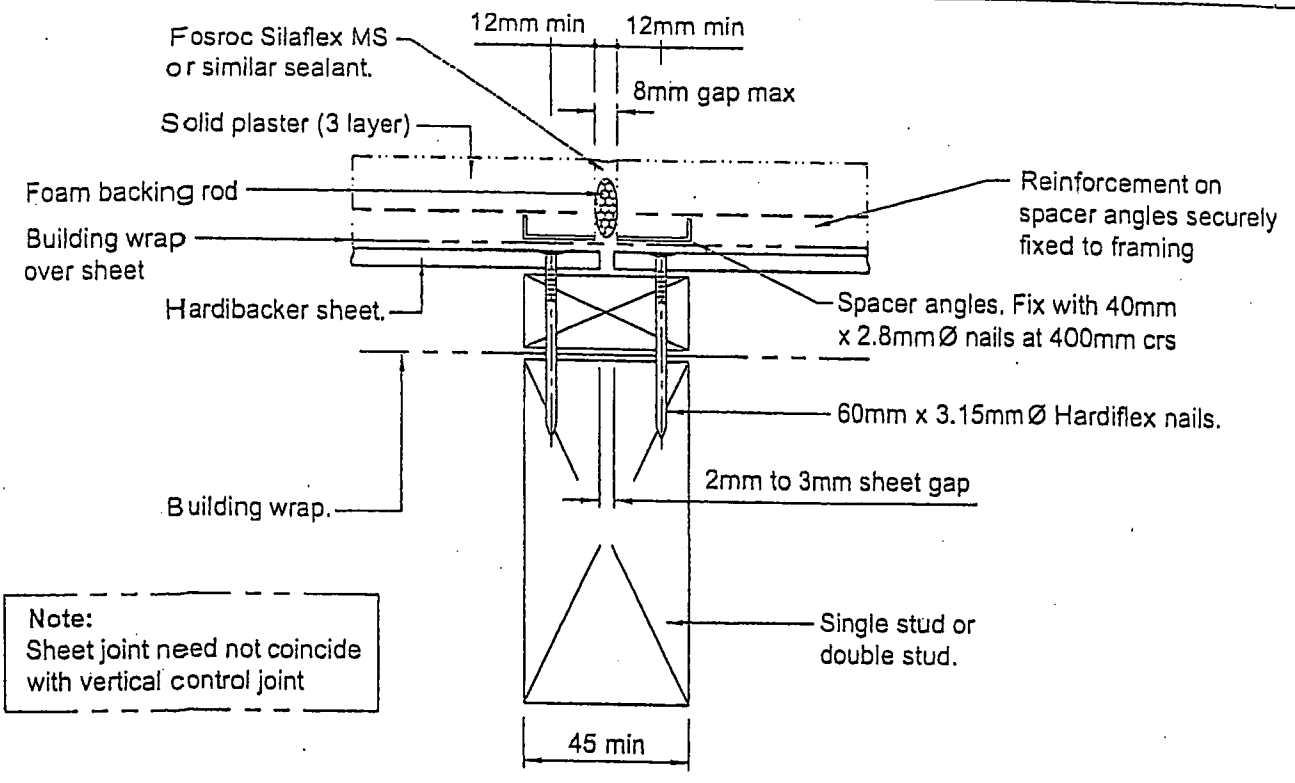
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Dimensions in Millimetres	NEW ZEALAND BUILDING PRODUCTS	Reference No: N_ZR-H_B-GSP	Detail: 04
Do Not Scale	RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY CONTROL JOINT SETOUT	Sht of Shts	Revision: A

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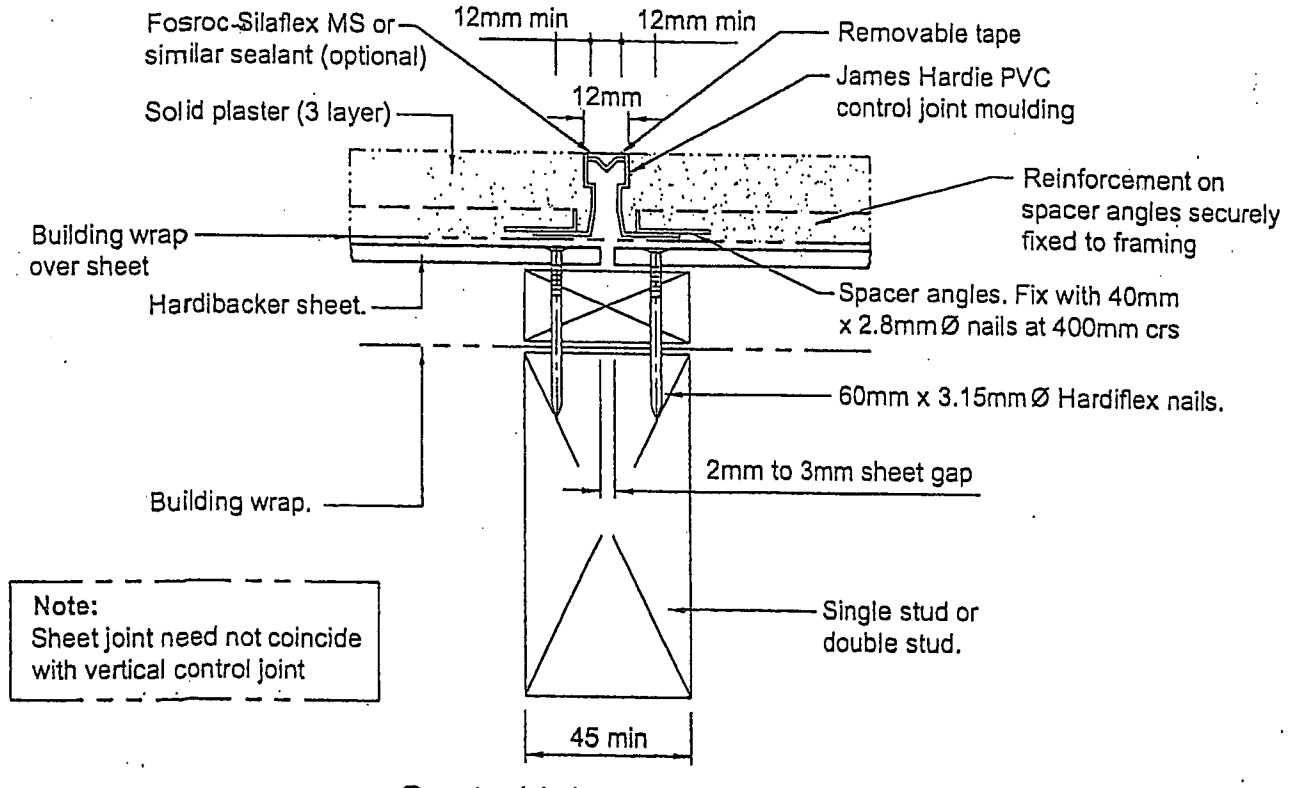
James Hardie Vent Strip Product Code:

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		Approved	Date
Drawn to AS 1100 Dimensions in Millimetres Do Not Scale	TECHNICAL PRODUCT DEVELOPMENT NEW ZEALAND BUILDING PRODUCTS RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY CONCRETE FOOTING	Sheet Size: A4	Scale: NTS
		Reference No: N_ZR-H_B-GSP	Detail: 05
		Sht of Shts	Revision: A



Note:
Sheet joint need not coincide with vertical control joint

Control joint

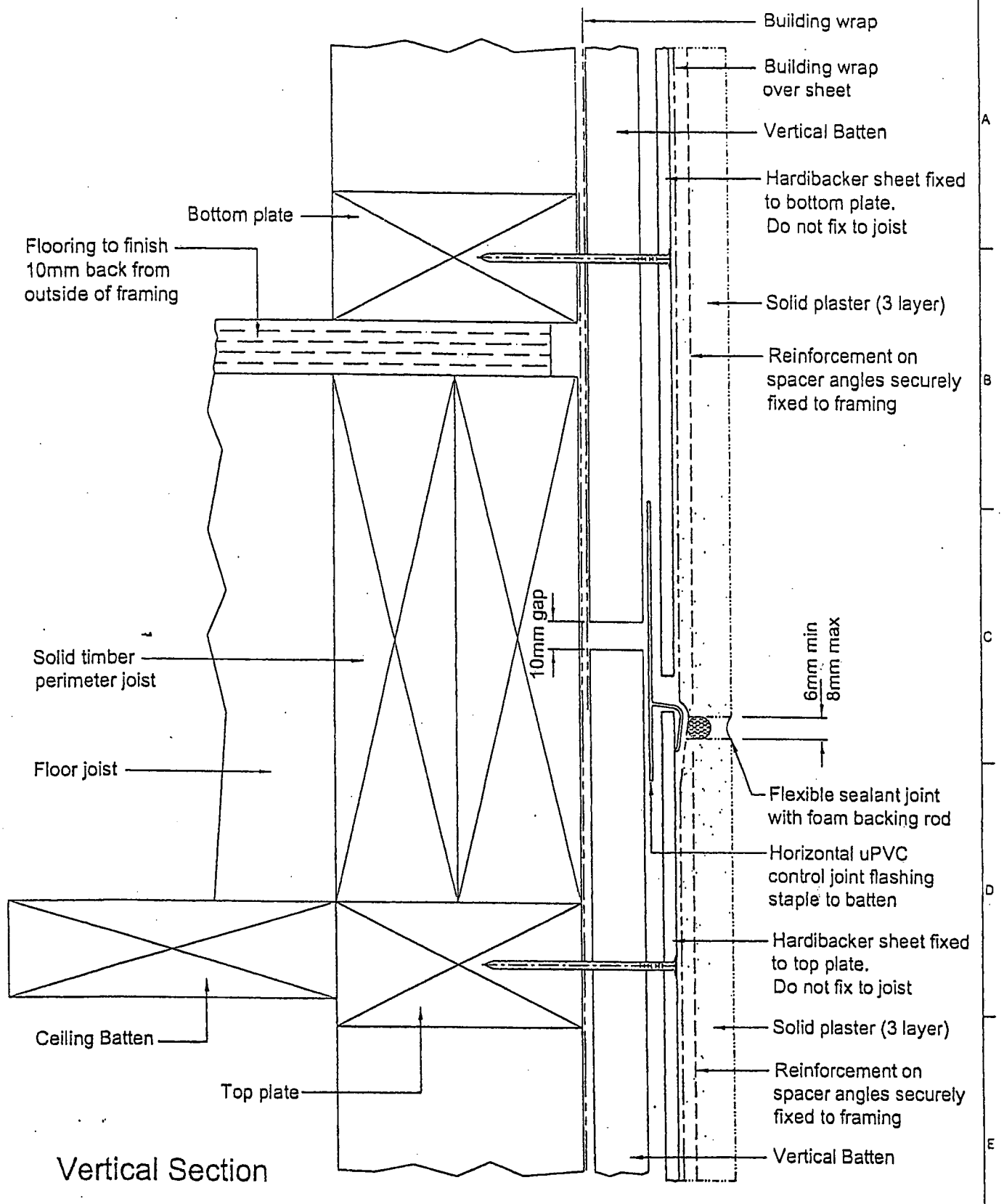


Note:
Sheet joint need not coincide with vertical control joint

Control joint alternative

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100 Dimensions in Millimetres Do Not Scale	TECHNICAL PRODUCT DEVELOPMENT NEW ZEALAND BUILDING PRODUCTS RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY VERTICAL JOINTS	Sheet Size: A4	Scale: NTS
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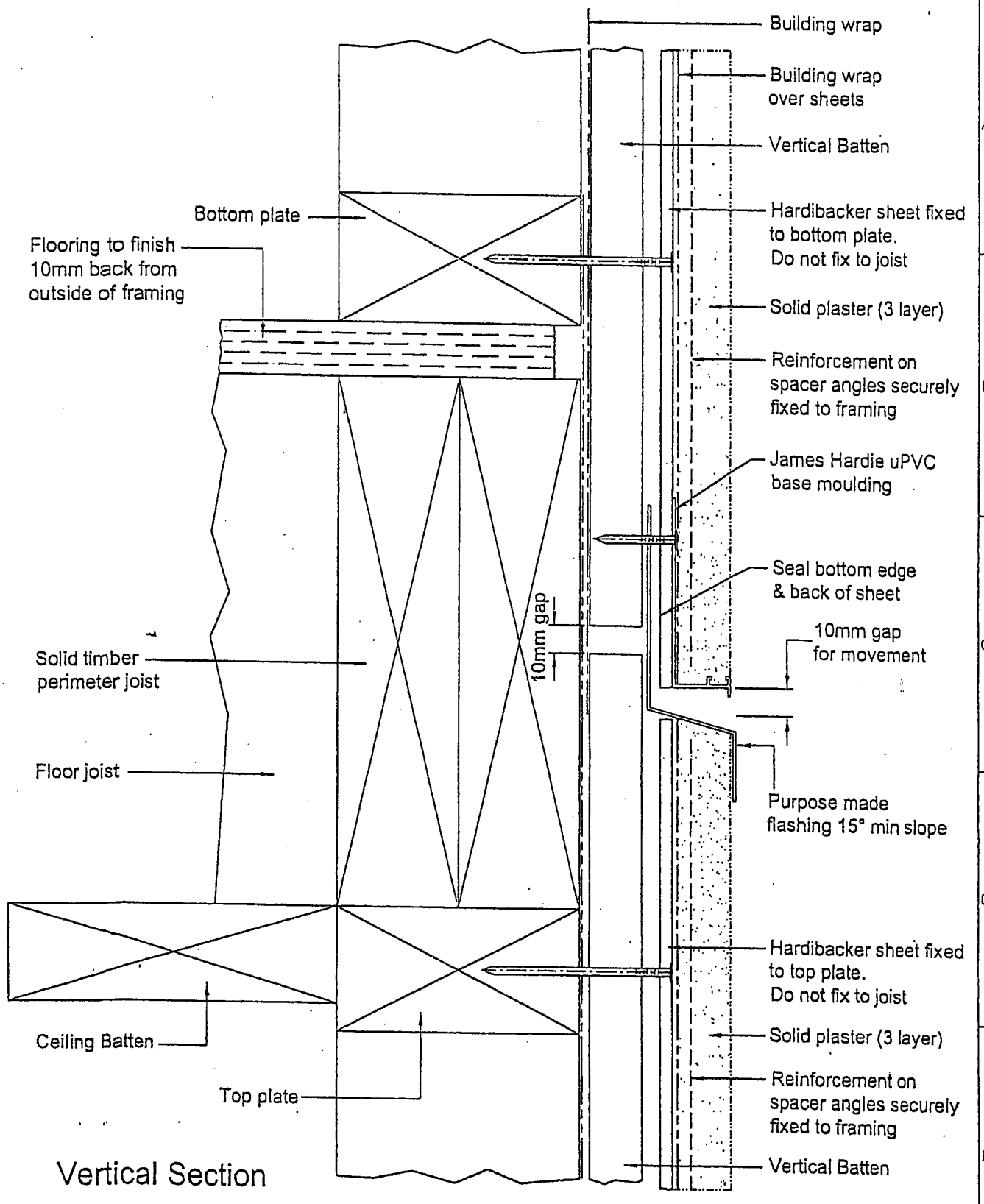
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Vertical Section

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100	TECHNICAL PRODUCT DEVELOPMENT	Sheet Size: A4	Scale: NTS
Dimensions in Millimetres	NEW ZEALAND BUILDING PRODUCTS	Reference No: N_ZR-H_B-GSP	Detail: 07
Do Not Scale	RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY HORIZONTAL CONTROL JOINT	Sht of Shts	Revision: A

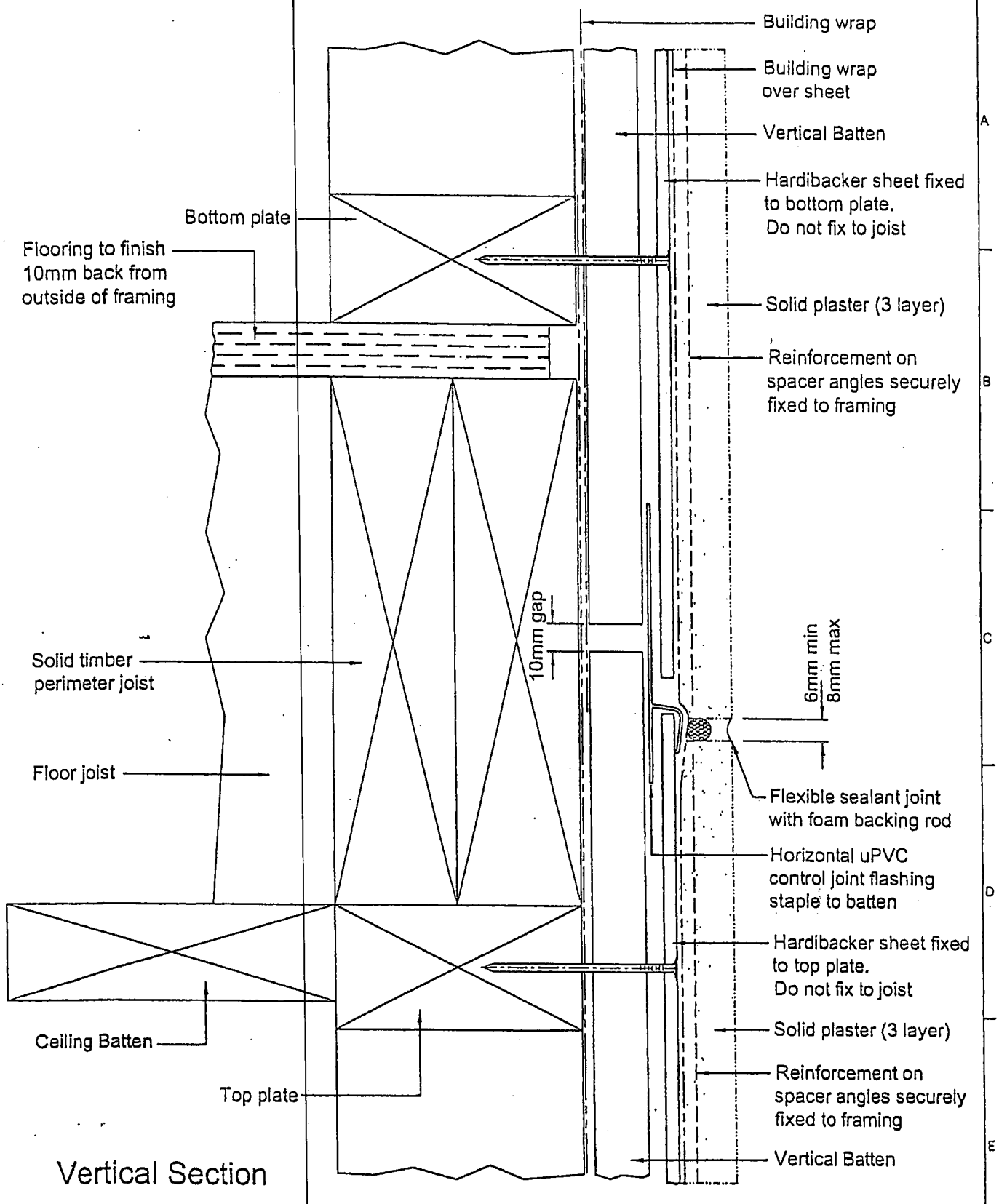
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Vertical Section

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100	TECHNICAL PRODUCT DEVELOPMENT	Sheet Size: A4	Scale: NTS
Dimensions in Millimetres	NEW ZEALAND BUILDING PRODUCTS	Reference No: N_ZR-H_B-GSP	Detail: 08
Do Not Scale	RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY HORIZONTAL JOINT	Sht of Shts	Revision: A

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Vertical Section

Material

Drawn to AS 1100

Dimensions in Millimetres

Do Not Scale

James Hardie Building Products

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TECHNICAL PRODUCT DEVELOPMENT

NEW ZEALAND BUILDING PRODUCTS

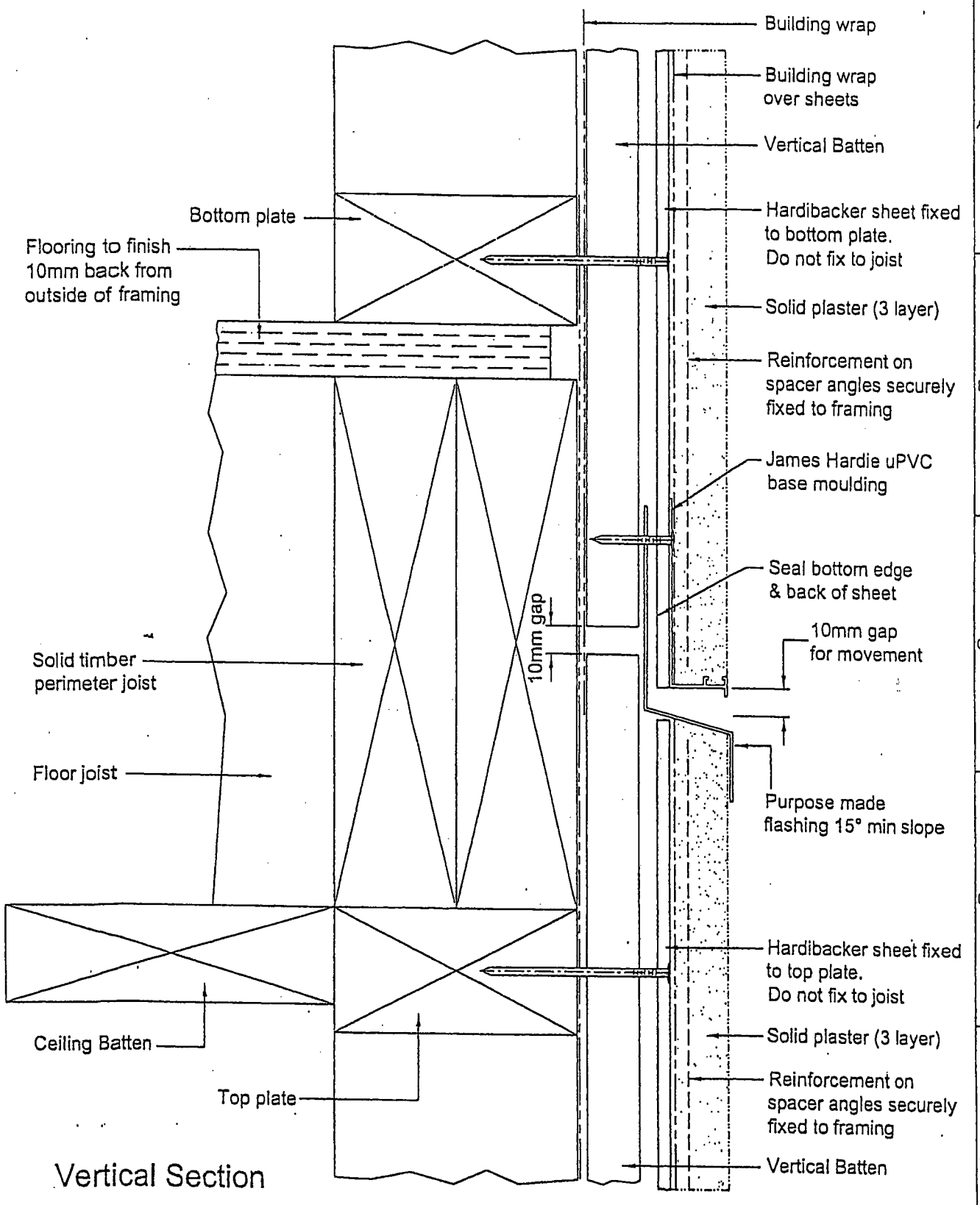
RESIDENTIAL

HARDIBACKER

GENERAL SPECIFICATION

CAVITY HORIZONTAL CONTROL JOINT

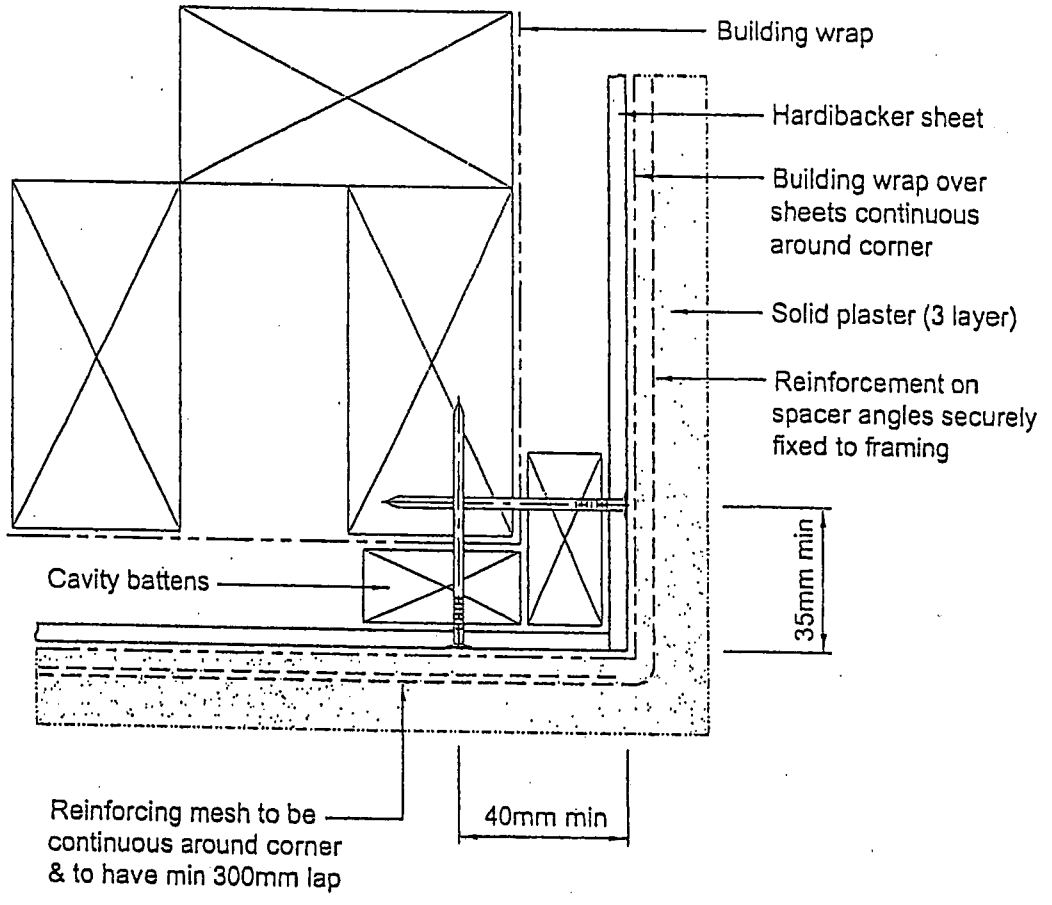
Drawn: SK	Date: 26.11.2003
Checked	Date
Approved	Date
Sheet Size: A4	Scale: NTS
Reference No: N_ZR-H_B-GSP	Detail: 07
Sht of Shts	Revision: A



Vertical Section

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100	TECHNICAL PRODUCT DEVELOPMENT	Sheet Size: A4	Scale: NTS
Dimensions in Millimetres	NEW ZEALAND BUILDING PRODUCTS	Reference No: N_ZR-H_B-GSP	Detail: 08
Do Not Scale	RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY HORIZONTAL JOINT	Sht of Shts	Revision: A

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Material

Drawn to AS 1100

Dimensions in Millimetres

Do Not Scale

James Hardie Building Products

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TECHNICAL PRODUCT DEVELOPMENT

NEW ZEALAND BUILDING PRODUCTS

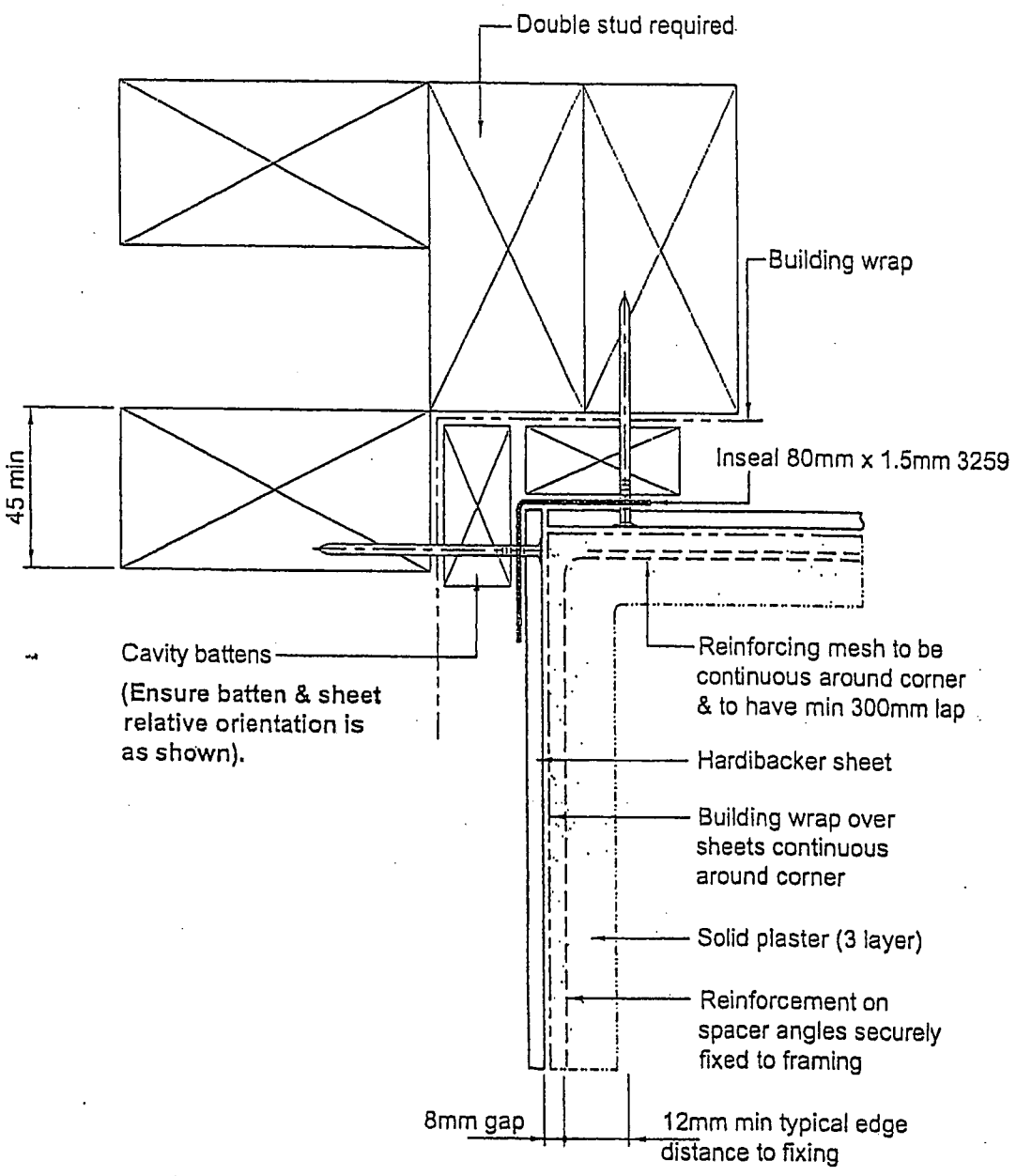
RESIDENTIAL

HARDIBACKER

GENERAL SPECIFICATION

CAVITY EXTERNAL CORNER

Drawn: SK	Date: 26.11.2003
Checked	Date
Approved	Date
Sheet Size: A4	Scale: NTS
Reference No: N_ZR-H_B-GSP	Detail: 09
Sht of Shts	Revision: A



Material

Drawn to AS 1100

Dimensions in Millimetres

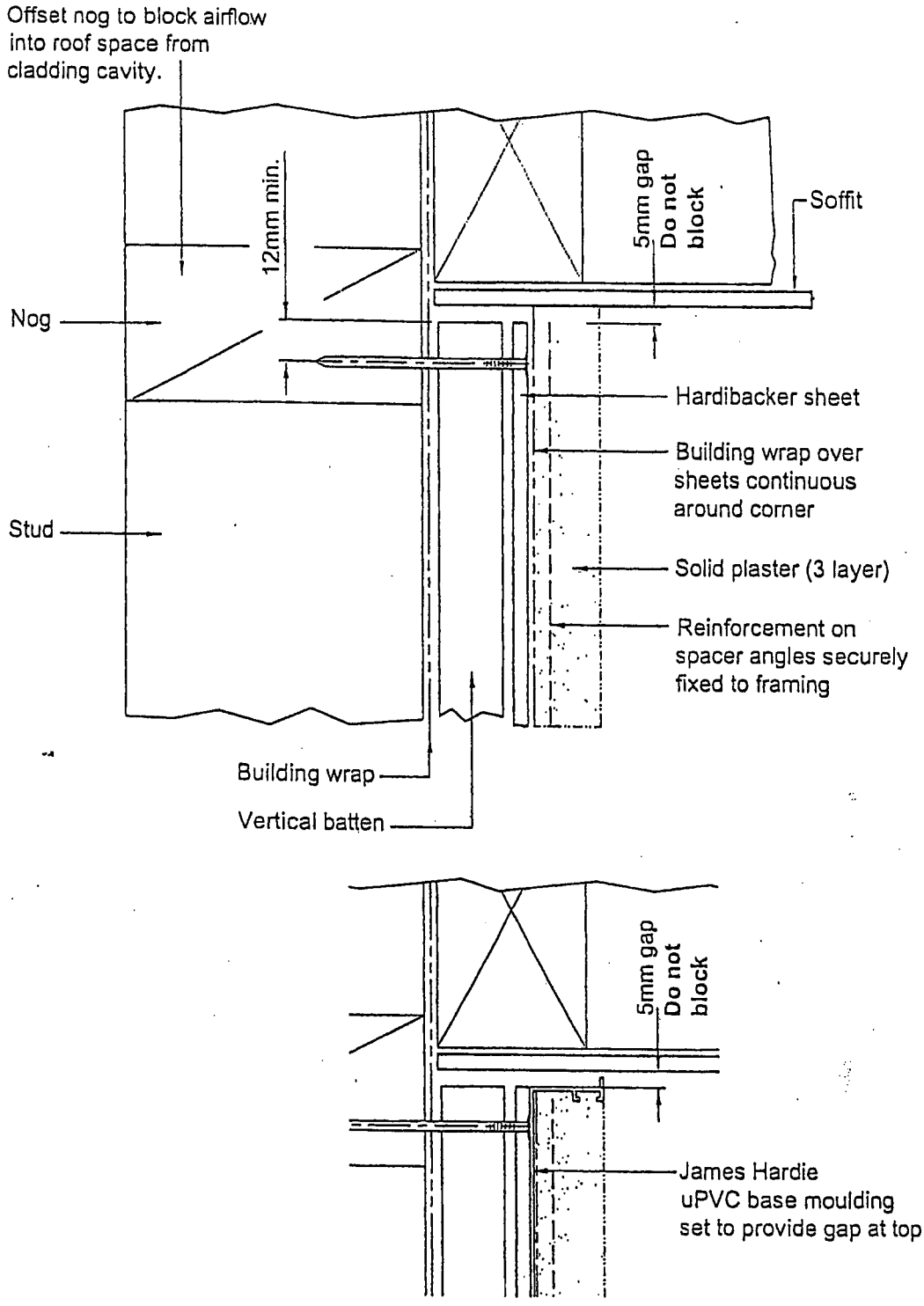
Do Not Scale

James Hardie
Building Products

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TECHNICAL PRODUCT DEVELOPMENT
NEW ZEALAND BUILDING PRODUCTS
RESIDENTIAL
HARDIBACKER
GENERAL SPECIFICATION
CAVITY INTERNAL CORNER

Drawn: SK	Date: 26.11.2003
Checked	Date
Approved	Date
Sheet Size: A4	Scale: NTS
Reference No: N_ZR-H_B-GSP	Detail: 10
Sht of Shts	Revision: A

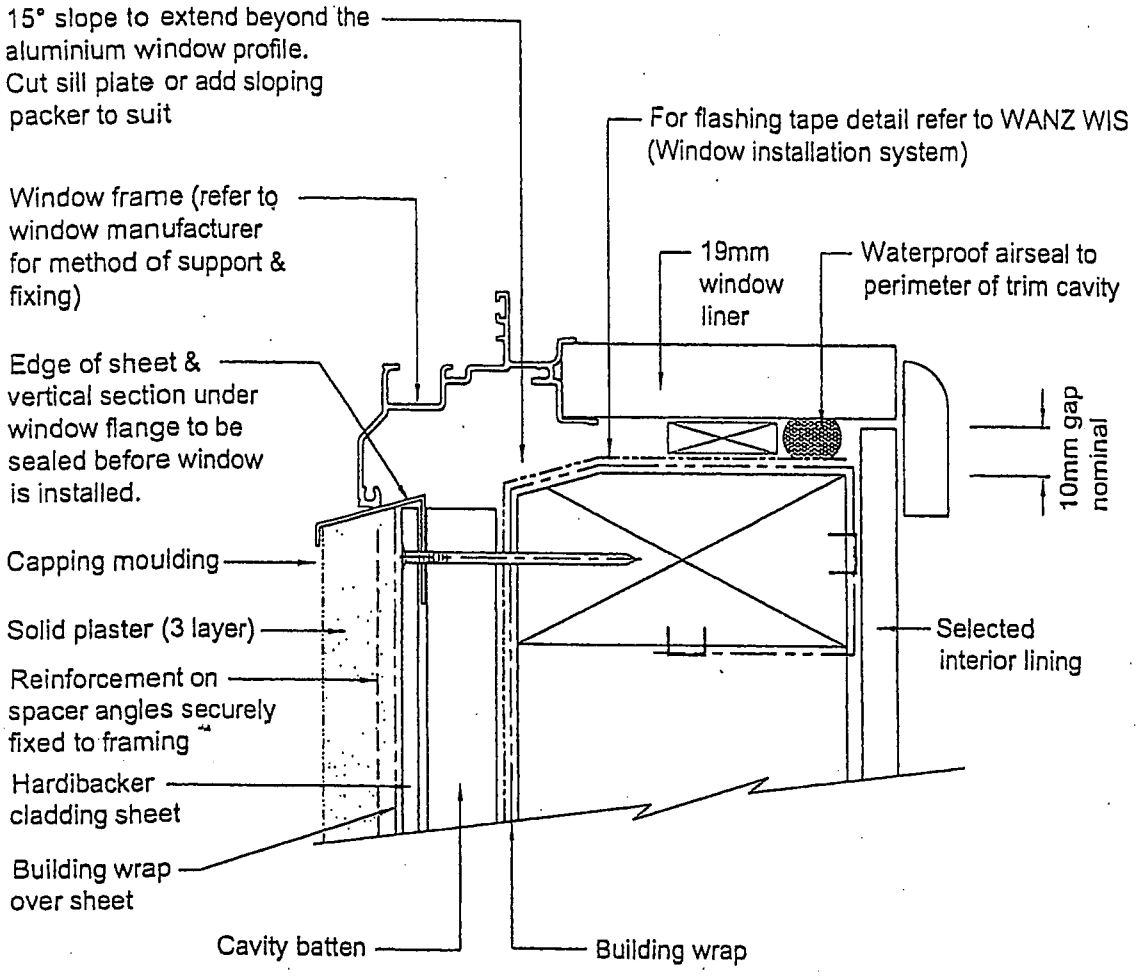


Alternative eaves mould fixing for ventilated cavity

All other details as above

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100	TECHNICAL PRODUCT DEVELOPMENT	Sheet Size: A4	Scale: NTS
Dimensions in Millimetres	NEW ZEALAND BUILDING PRODUCTS	Reference No: N_ZR-H_B-GSP	Detail: 11
Do Not Scale	RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY SOFFIT DETAIL	Sht of Shts	Revision: A

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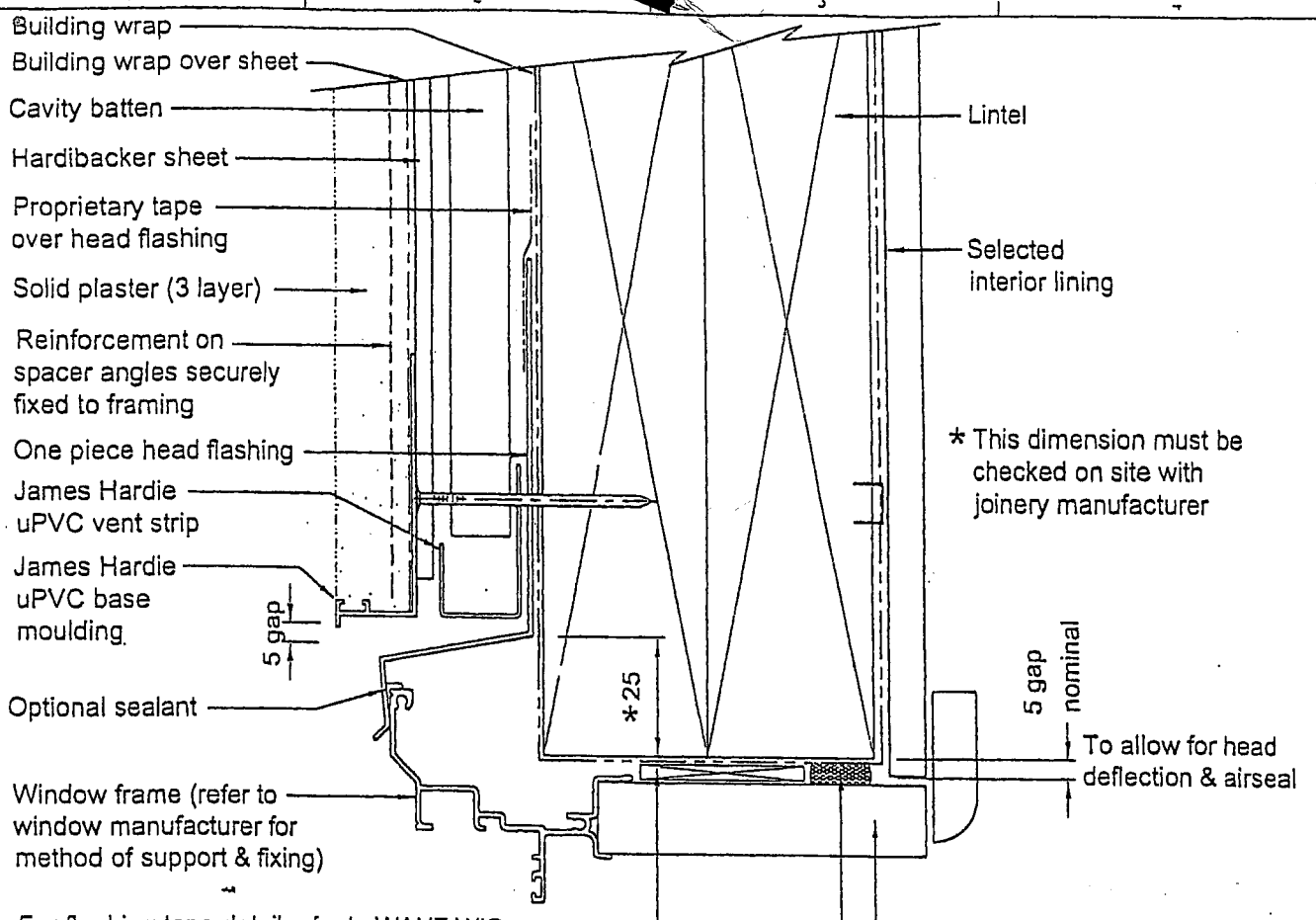
Section at Sill

General notes for materials selection

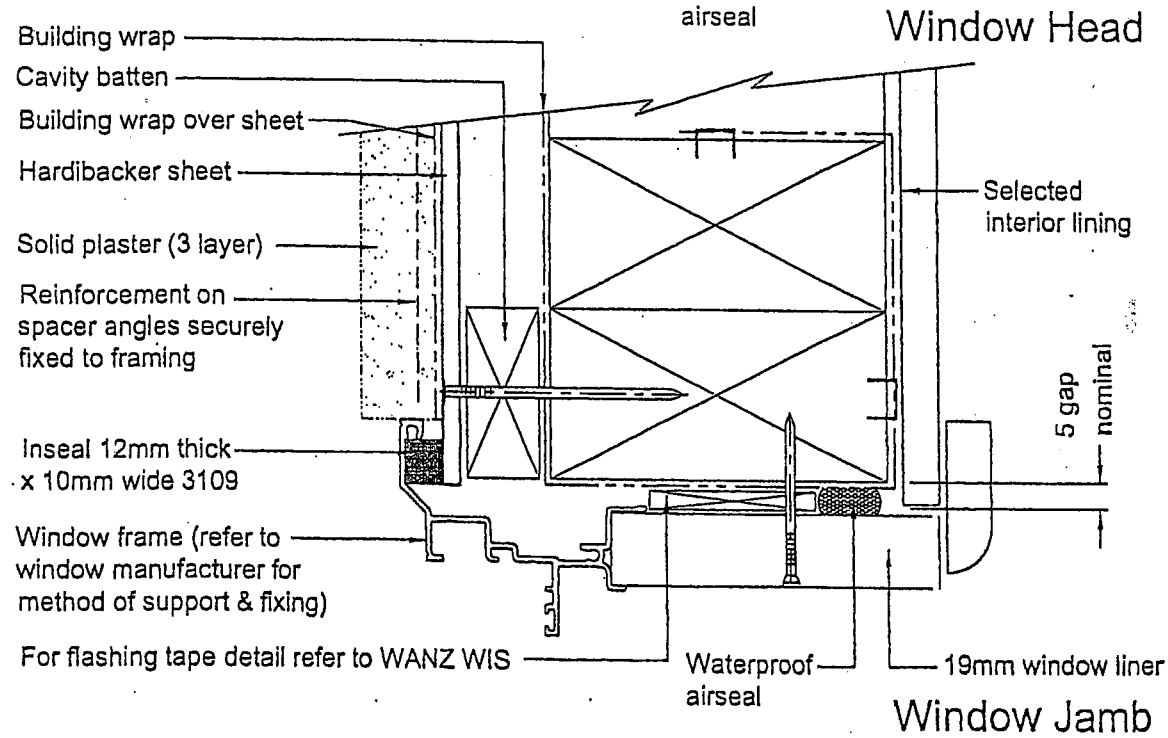
1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604: 1999
2. Building wrap must comply with acceptable solution E2/AS1 & NZS 3604:1999
3. Flashing tape must have proven compatibility with the selected building wrap & other materials with which it comes into contact

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

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
	Copyright in this information belongs to James Hardie and the reproduction of this material is only authorised for purposes connected with the specification or use of James Hardie's products. This information is intended to be informative and used as a guideline in conjunction with the relevant James Hardie literature. Due to the many variables affecting different projects it can not replace the judgement or advice of an architect, engineer or other relevant technical expert and such experts must be consulted to determine the suitability or otherwise of the details or the necessity for further design/detailing.	Checked	Date
		Approved	Date
	TECHNICAL PRODUCT DEVELOPMENT NEW ZEALAND BUILDING PRODUCTS RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY WINDOW SILL	Sheet Size: A4	Scale: NTS
Drawn to AS 1100 Dimensions in Millimetres Do Not Scale		Reference No: N_ZR-H_B-GSP	Detail: 12
		Sht of Shts	Revision: A



Window Head



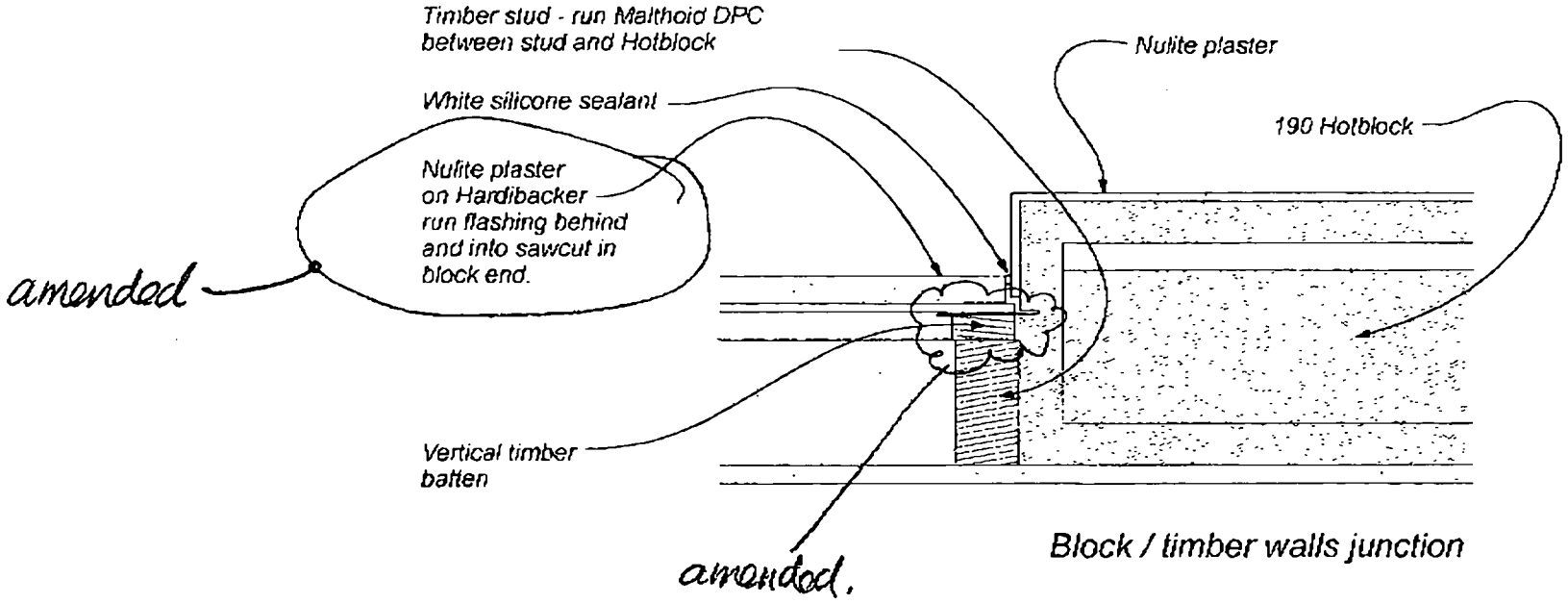
Window Jamb

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100 Dimensions in Millimetres Do Not Scale	TECHNICAL PRODUCT DEVELOPMENT NEW ZEALAND BUILDING PRODUCTS RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY WINDOW HEAD & JAMB	Sheet Size: A4	Scale: NTS
		Reference No: N_ZR-H_B-GSP	Detail: 13
		Sht of Shts	Revision: A

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PID 96665.
ABA 20042396.

Attn. Mr. Tony Hales.
@ HDC. 8780515.



Block / timber walls junction

Ralford Gardiner Architects
Box 1491, 212E Queen St
HASTINGS N.Z.
Tel 06-876 7601
Fax 06-876 2790

Barnes V5.pln; Det 6 ; 1 : 10; RG; 22/3/05 5:46 pm; 1/1

22/03 '05 TUE 17:39 FAX 64 6 8762790 HOLMES CONSULTING +++ HASTINGS DISTRICT CL 001/001

PART E : COMPLIANCE SCHEDULE DETAILS

E1 : SYSTEMS NECESSITATING A COMPLIANCE SCHEDULE

(Complete Part E1 for all new buildings and alterations, except single residential dwellings).

The building will contain the following (cross each applicable box and attach proposed inspection, maintenance, and reporting procedures):

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

E2 : OTHER SYSTEMS AND FEATURES TO BE INCLUDED IN THE COMPLIANCE SCHEDULE

(Complete Part E2 only if the building contains one or more of the systems listed in Part E1).

The building will contain the following (cross each applicable box and attach proposed inspection, maintenance, and reporting procedures):

- ☒ Means of escape from fire.
- ☒ Safety barriers.
- ☒ Means of access and facilities for use by persons with disabilities which meet the requirements of Section 47a of the Act.
- ☒ Hand-held hoses for fire fighting.
- ☒ Such signs as are required by the Building Code or Section 47a of the Act.

CONTACT (if applicable) Concept Building	**DEBTOR** (the person responsible for the account)
Name: Barry Keenders	Name: ~~[illegible]~~ As per Contact
Address: 369 State Highway 2 RD2 Hbn	Address:
Phone Number: 878 x 698	Phone Number:
Fax Number: 8762732	Fax Number:

☐ Application for building consent only, in accordance with Project Information Memorandum No.....

☐ Application for Building Consent and Project Information Memorandum

Signed by the owner (or on behalf, with written authority provided):	**OFFICE USE ONLY**
Signature:	**Deposit Fee Paid $** 800
Name: K PEARSON (PLEASE PRINT) **Date:** 13·12·04	15/12/04

APPLICATION FOR A BUILDING CONSENT

Section 33, Building Act 1991

HASTINGS DISTRICT COUNCIL

RESOURCE MANAGEMENT
13 DEC 2004
RECEIVED

APPLICATION NUMBER: ABA 20042396

PART A : GENERAL *(Complete Part A in all cases)*

1. OWNER (Applicant*)

Name: D & C Barnes	* Under section 33 of the Building Act 1991, the application must be the owner of the land on which building work is contemplated or a person who or which has agreed in writing, whether conditionally or unconditionally, to purchase the land or any leasehold estate or interest in the land, or to take a lease of the land, while the agreement remains in force.
Postal Address: 445 Ngatarawa Rd Hastings	NOTE: Council is required to publish information from this form in a monthly report that is made publicly available. Please advise our staff if you require your personal details to be produced in a specific format.
Phone Number: 8795270	
Fax Number: 8795271	

2. PROJECT LOCATION

Address: 2536 Highway 50 ~~Hastings~~ Hays Hill Rd Hastings

3. LEGAL DESCRIPTION

Valuation Number:		OFFICE USE ONLY Property ID: 54035 9665.
Lot:(s) (Section) 3	DP:/S (Block) 308836	Lot Area:(s) square ~~metres~~ hectares

4. CERTIFICATE OF TITLE AND DEPOSITED PLAN

☑ Certificate of Title and Deposited Plan (no more than one month old) is required/provided. Or: Please search title

(a) ☒ Sale of Purchase Agreement is provided (if Certificate of Title does not show applicant as owner)

(b) ☑ Subdivision Scheme Plan is provided (where a Certificate of Title is not yet available for a subdivision)

(c) ☐ Court Order from the Maori Land Court to show ownership share

5. PROJECT

5.1	5.2	5.3
New Building ☑	Intended Life:	Description of Work: New Dwelling
Alteration ☐	Indefinite, but not less than	5.4
Relocation ☐	50 yrs ☑ OR	Intended Use(s) (in detail): Residential
Demolition ☐	Specified as ..... yrs	5.5
		Estimated Value: $ 720,000-00 (GST Inclusive)

PART B : PROJECT DETAILS

6. (Complete Part B only if you have NOT applied separately for a Project Information Memorandum).

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

(a) ☑ Location, in relation to legal boundaries, and external dimensions of new, relocated, or altered buildings. (Site Plan with elevations, Topography, drawn to scale).

(b) ☒ Details of any known or potential erosion, avulsion, falling debris, filled ground, subsidence, slippage, alluvion, inundation, hazardous contaminants on or near the site.

(c) ☑ New provisions to be made for vehicular access, including parking. (To be shown on site plan).

(d) ☒ Provisions to be made in building over or adjacent to any road or public place.

(e) ☑ New provisions to be made for disposing of stormwater and wastewater. (To be shown on site plan).

(f) ☒ Precautions to be taken where building work is to take place over existing drains or sewers or in close proximity to wells or watermains.

(g) ☒ New connections to public utilities i.e. water supply, stormwater system, wastewater system.

(h) ☒ Provisions to be made in any demolition work for the protection of the public, suppression of dust, disposal of debris, disconnection from public utilities, and suppression of noise.

(i) ☒ Details of any cultural or heritage significance of the building or building site, including whether it is on a Marae, or Waahi Tapu.

(j) ☒ Copy or reference to, of any resource consent or planning approval for this project.

(k) ☑ Details of volume of Proposed Excavations: include volumes for Site Preparation, Basement and Driveway.

PART C : BUILDING DETAILS

Complete Part C in all cases

Tick each applicable box, attach relevant documents in duplicate (three copies of the proposed floor plans are required).

This application is accompanied by:

7. ☑ The drawings, specifications, and other documents according to which the building is proposed to be constructed to comply with the provisions of the Building Code, with supporting documents, if any, including:

(a) ☒ Building certificates

(b) ☒ Producer statements

(c) ☒ References to accreditation certificates issued by the Building Industry Authority

(d) ☒ References to determinations issued by the Building Industry Authority

8. ☒ Proposed procedures, if any, for inspection during construction.

PART D

Complete as far as possible in all cases.

9.

DESIGNER(S)

Name: Raford Gardiner Architects
Address: 212 Queen St East Hastings
Phone Number:
Fax Number:

BUILDER

Name: Concept Building
Address: 369 State Highway 2 RD2 Hbn
Phone Number: 878 4690
Fax Number: 876 2732

CLADDING INSTALLER Plaster To Concrete over blocks

Name:
Address:
Phone Number:
Fax Number:

ROOFER

Name: H. B. Longuet
Address:
Phone Number: 843659
Fax Number:

ELECTRICIAN

Name: Te Mata Electrical Services
Reg Number: T.A.G.A.S. 8629 H/Bay
Address: ~~Hwy 50 Omahu Rd Hbn~~
Phone Number: 8746657 / 025 442 119
Fax Number: 874 6659

GASFITTER

Name:
Reg Number:
Address:
Phone Number:
Fax Number:

PLUMBER

Name: K. Snee
Reg Number:
Address: 1409 Omahu Rd Hbn
Phone Number: 8797 621 / 027 447 0099
Fax Number:

DRAINLAYER

Name: As per plumber.
Reg Number:
Address:
Phone Number:
Fax Number:

BUILDING CERTIFIER

Name:
Reg Number:
Address:
Phone Number:
Fax Number:

OTHER

Name:
Reg Number:
Address:
Phone Number:
Fax Number:

FLOOR AREA OF PROPOSED WORK	AREA IN SQUARE METRES
Buildings other than Detached Accessory Buildings	
Floor	277 sq.m
Basement	sq.m
Ground Floor	sq.m
First Floor	sq.m
Second Floor	sq.m
Additional Floors (Total)	sq.m
Mezzanine	sq.m
Decks	222 sq.m
Total	499 **sq.m**
Detached accessory buildings	
Garage	sq.m
Carport	sq.m
Other Buildings	sq.m
Total	**sq.m**

Hastings District Council, Civic Administration Building, Private Bag 9002, Lyndon Rd East, Hastings. Telephone 06 878 0500. Fax 06 878 0515

7 December 2004

Mr and Mrs Derek Barnes
445 Ngatarawa Road
Bridge Pa
HASTINGS

Hastings District Council
Private Bag 9002
HASTINGS

Re: New House – Highway 50 Hastings

We here by give Concept Master Builders, permission to lodge the Building Consent on our behalf.

Signed .....

Mr & Mrs Derek Barnes

SITE QUESTIONNAIRE FOR NEW BUILDINGS AND MAJOR ADDITIONS

HASTINGS DISTRICT COUNCIL

10/12/04
(date)

This questionnaire is to accompany the application for a building consent to erect New Dwelling for D & C. Barnes at (site address): Lot 3 Highway 50 Hastings
Answer each question by a tick in the appropriate box:

1. Has, or is it intended that the building site be developed by cutting or excavation? Yes ☑ No ☐

2. Ascertain from the owner whether the building site contains fill of any description. Yes ☐ No ☑

3. If the answer of question 2 is Yes, describe the type and extent of the fill on a separate sheet.

4. Indicate which type of subsoil is at the building site:

Hard Clay	☑	Compact Gravel	☐	Compact Sand	☐
Medium Clay	☐	Loose Gravel	☐	Loose Sand	☐
Soft Clay	☐	Pumice	☐	Peat	☐
Silt	☐	Other	☑	Specify Lime stone in place	

5. Is the building site level? Yes ☐ No ☑

6. Indicate the general ground surface at the building site:
   (i) Open fetches of level or nearly level country with no shelter Top of Ridge ☑
   (ii) Flat or undulating country with obstructions such as hedges or walls around fields, scattered windbreaks and occasional buildings. ☐
   (iii) Surface covered with numerous large obstructions, for example forest areas, towns and cities. ☐

7. Is the building site on or near the top of an escarpment or a relatively sudden change in ground level? Yes ☑ No ☐

8. Ascertain from the owner or occupier if the building site is:
   (i) In a valley or gorge shaped to produce funnelling or wind. Yes ☐ No ☑
   (ii) On an exposed hillside, peak or ridge where extreme wind is known to occur? Yes ☑ No ☐
   (iii) An especially abnormal site? Yes ☐ No ☑
   If Yes, state reason: Ridge falls away both side of property

9. Is the building site above an elevation of 400 metres Yes ☐ No ☑

10. Indicate the distance to any stream-bed or watercourse N/A Metres

11. Is the area where the dwelling is to be built subject to flooding or inundation? Yes ☐ No ☑

TO BE SIGNED BY BUILDING CONSENT APPLICANT: [signature]

ABA20042396
JOB COPY
17/03/2005

ATTENTION CONSENT NOTICE

THIS SITE HAS BEEN SUBDIVIDED AND A CONSENT NOTICE PURSUANT TO SECTION 221 OF THE RESOURCE MANAGEMENT ACT 1991 WAS REGISTERED AGAINST THE TITLE

RMA	**20000526**
Lot Number	**2,3 and 4**
DETAILS OF THIS CONSENT ARE TO BE REFERRED TO:	**ENVIRONMENTAL PLANNERS (CONSENTS) PRIOR TO THE ISSUING OF ANY COUNCIL APPROVALS.**

CONSENT NOTICE:

UPON THE CREATION OF ANY "OFFSPRING" FILES A COPY OF THIS NOTICE AND THE SUBDIVISION DECISION IS TO BE PLACED ON THE NEW FILE.

ABA20042396
JOB COPY
17/03/2005

RESOURCE MANAGEMENT

Heretaunga Haro te Kahu

If Calling ask for:	Simon Hill
E-mail:	simonh@hdc.govt.nz
Our ref:	RMA 20000526

CONSENT NOTICE PURSUANT TO SECTION 221 OF THE RESOURCE MANAGEMENT ACT 1991

IN THE MATTER OF	LT 308836 Hawke's Bay Land District
AND	
IN THE MATTER OF	Consent Notice pursuant to Section 221 of the Resource Management Act 1991.

I hereby certify that under delegated authority the **HASTINGS DISTRICT COUNCIL**, in approving the subdivision of Lot 1 DP 16914 imposed a Condition on Lots 2 and 3, pursuant to Section 221 of the Resource Management Act 1991.

CONDITION:

THAT NO EARTHWORKS, BUILDING DEVELOPMENT OR ASSOCIATED WORKS, SERVICES OR STRUCTURES SHALL BE UNDERTAKEN EXCEPT IN ACCORDANCE WITH THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER IN RESPECT OF LOTS 2 & 3 HEREON. THE RECOMMENDATIONS SHALL BE PREPARED BY A REGISTERED ENGINEER WITH APPROPRIATE SPECIALIST KNOWLEDGE AND EXPERIENCE IN GEOTECHNICAL CIVIL ENGINEERING. THE REQUIREMENTS FOR SUCH A REPORT SHALL INCLUDE AS A MINIMUM:

- A PROJECT SPECIFIC REPORT FROM AN ENGINEER EXPERIENCED IN SOILS AND STRUCTURES FOR THE PROPOSED SITING OF ANY BUILDING AND ANY NECESSARY FOUNDATION DESIGN.

- EVAPO-TRANSPIRATION FIELDS WILL BE REQUIRED FOR SEWERAGE EFFLUENT DISPOSAL. THE FIELD LOCATIONS MUST BE APPROVED BY AN ENGINEER EXPERIENCED IN GEOTECHNICAL ENGINEERING.

ABA20042396
JOB COPY
17/03/2005

THAT A COPY OF THE GEOTECHNICAL REPORT SHALL BE SUBMITTED FOR VERIFICATION AND APPROVAL BY THE DIVISION MANAGER, RESOURCE MANAGEMENT DIVISION, HASTINGS DISTRICT COUNCIL, PRIOR TO ANY WORK COMMENCING

THAT ALL STORMWATER FROM HOUSE ROOFS NOT REQUIRED FOR DOMESTIC USE AND THAT STORMWATER COLLECTED FROM PAVED AREAS SHALL BE TAKEN VIA SEALED DRAINS FROM LOTS 2 & 3 TO THE BASE OF ADJACENT GULLIES ON THE NORTHERN (LOT 2) AND WESTERN (LOT 3) SIDE OF THE RIDGE AND DISCHARGED IN A CONTROLLED MANNER TO AN OVERLAND FLOWPATH. (AN ENERGY DISSIPATION STRUCTURE MAY BE REQUIRED AT THE POINT OF OUTFALL.)

DATED AT HASTINGS this 29th day of July 2002.

SIGNED BY:

P.A. MCKAY
AUTHORISED OFFICER
TEAM LEADER CONSENTS
RESOURCE MANAGEMENT

FORM 5
BUILDING CONSENT
Section 51, Building Act 2004

Building Consent Number ABA20042396

The Building

Street address of building: State Highway 50 HAWKES BAY

Legal description of land where building is located: LOT 3 DP 308836 CT 34327

Building name:

Location of building within site/block number:

Level/unit number:

The Owner

Name of owner: Derek Arthur Barnes & Carol Jennifer Barnes

*Contact person:

Mailing address: 445 Ngatarawa Road HASTINGS 4201

Street address/registered office:

Phone number:	Landline:	Mobile:
	Daytime:	After hours:
Facsimile number:		Email address:

Website:

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

Building Work

The following building work is authorised by this building consent:

Erect new dwelling

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 subject to the following conditions:

§(a) the building must be altered, removed, or demolished on or before the end of years from the date of issue of this consent (being the specified intended life of the building); and

Compliance Schedule

A compliance schedule is not required for the building. (change as appropriate)

‡The compliance schedule must contain the following specified systems and comply with the performance standards for those systems required by the building code:

‡Attachments

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

‡Project Information Memorandum
‡Certificate attached to project information memorandum (delete if not applicable)

Issued by Hastings District Council

8 March 2025

*Delete if the applicant is an individual.
†Contact details must be in New Zealand.
‡ Delete items not applicable.
§Delete if the building is intended to have a life of 50 years or more.

BUILDING CONSENT CONDITIONS ASSOCIATED WITH THIS CONSENT

PLUS INSPECTIONS TO BE UNDERTAKEN

HASTINGS DISTRICT COUNCIL

BC0001 Provide **Producer Statements** for construction review of all specific design components of this application. These must be on the HDC review form or approved PS4. This is to be provided prior to a Code Compliance Certificate being issued. Note that the engineer may have to therefore supervise that work.

BC0002 Any **changes** to the approved documents, of any type, are to be discussed with a Council Building Officer, as they **may require amended details** to be supplied. A new Building Consent Application may be required.

BC0003 **Full Compliance is required with** any Amendment, Alteration, Change or Notation made by any **Authorized Officer of Council** to the plans and specifications.

BC0004 **Full Payment of** all outstanding **Fees or Charges are to be paid** prior to the applicant commencing any work.

BC0005 Owner**/agents are to advise** in writing any **changes** of their **Agent or Trades-people.**

BC0006 **All inspections** as indicated on the attached inspection list are to be **signed off** by the Council Building Officer, if not signed, there may be a problem with receiving the Code Compliance Certificate. We require a minimum of **3 days** notice prior to an inspection.

Note: **Inspection times**, are not normally able to be booked for an exact time, so proposed concrete pours should not be arranged to follow immediately, the assumed time of inspection. **Note also that the inspection may not be passed**.

BC0007 All **Plumbing and Drainage** work must be done by **suitably qualified and registered trades-people** as set out in the Plumbers, Gasfitters and Drainlayers Act 1976. The trades-people involved, may be asked to produce proof of Current registration.

BC0008 The **Applicant** is to return to the Council, the **'Application for Code Compliance Certificate'** form when all work has been completed, so that a final inspection can be undertaken. A Code Compliance Certificate will only be issued, if all work is deemed to comply with the NZ Building Code and the approved building consent documents.

Note: You will also need to call for a building inspection on ph. (06) 878 0537 and arrange an appropriate time for the inspection.

The 2004 Building Act requires this to be done within two 2 years after the date on which the building consent was granted. This is the date which appears on the Building Consent Tax Invoice.

BC0009 The **Owner** of the property is responsible for the siting of the building and the location of the property boundary pegs. The enclosed confirmation of siting form is also to be signed and delivered to the Inspecting Officer at the time of the inspection.

BC0010 To ensure **warranties for materials** are met, ensure that manufacturers requirements are met, at all times. Any variation from the manufacturer's instructions should be approved in writing from the manufacturer of that product.

BC0011 Ensure that **finished ground or paved** or decked **levels** below floor and cladding levels, meet the minimum requirements of the building code, which should be indicated on approved plans.

BC0012 Approved **smoke detectors** with *hush buttons* are to be installed **in or within 3.0m of each sleeping space** and in the **escape routes** on all levels within the household unit.

BC0013 It is expected that "**the Contractor**" will **comply with all requirements** of the **Building Act**, Regulations and the **Occupational Safety and Health Act.** Provide a **safe working environment** and ensure the safety and continual access for the public to public amenities and walkways.

BC0015 **Safety Glass** is required in **all bathrooms** containing a shower or bath, with the windowsill being less than 2.0m above floor level.

BC0017 Note that the **fire is to be installed** as per the manufacturers specifications, if a change of model is proposed, then new details are required. Also note that if a second hand fire is to be installed, it needs to be certified by an approved member of the home heating association and be certified as safe to use for at least 5 years.

BC0022 Provide **subfloor ventilation** [requires 3500mm^{2}per M^2]as required in E2 of NZBC and NZS3604.

BC0025 A **fence** is to be constructed to comply with the requirements of the **'fencing of swimming pools act 1987'** prior to pool being filled.

BC0026 Method of filling Pool to include **Backflow Prevention** as per **NZBC G12 water supplies**.

BC0027 **Backwash from pool to discharge** to Sewer (**unless a septic tank system is involved** in which case backwash is to discharge to an appropriate outfall).

BC0028 A satisfactory **water analysis** of the **potable water supply** is required to be supplied to Hastings District Council before the Code Compliance Certificate is issued.

BC0030 The building or addition covered by this Consent is not approved for habitable use, for living, sleeping, eating or preparing food in.

BCSp01

BCR009 FRONTING A STATE HIGHWAY:-
Apply to Transit New Zealand for their requirements and conditions.

BCP100 This development complies with the relevant standards of the District Plan. Any changes to the approved plans will need to be reassessed against the provisions of the District Plan.

BCP300 This property is subject to the following Consent Notice:

(Insert Details)

The following Inspections are required for this consent

Please phone 8780537 to arrange each one when ready, quoting the Building Consent Number. 3 days notice is required and note that due to our large area, is not normally feasible to do at a specific time, other than early or late morning or afternoon.

201 Foundation Inspection for **ground bearing, reinforcing and foundation dimensions etc**, plus **location** to be confirmed and owners written confirmation of sitting to be given to Building Officer. For a copy of our checklists, please visit our web site or Council Offices.

201E Further Foundation Inspection same as initial Foundation but extra one required for size of this project.

204 Slab Inspection for Fill, vapor barrier, reinforcing and plumbing G13 system etc.

205 Framing Inspection for fixings, sizes, spacing, bracing, supports and plumbing etc.

208 Sheeting Inspection for sheet braces or fire rated linings.

207A Cladding Inspection for Plaster or Texture coating, battens for cavity.

207B Cladding Inspection for Plaster or Texture coating, Substrate and or netting, plus flashings etc.

207C Cladding Inspection for Plaster or Texture coating, for first coat.

207D Cladding Inspection for Plaster or Texture coating, for second coat.

209 Sewer and Stormwater Inspection for all drains prior to any **backfilling**.

202 Block Fill Inspections for correct reinforcing and cleared cavities etc.

212 Final Inspection for all items necessary for completion, including decorating and ground or paving finished levels, All **producer statements** *or* **certificates** are to be supplied to the Building Officer.

PROJECT INFORMATION MEMORANDUM
NUMBER: ABA20042396
Section 34, Building Act 2004

HASTINGS DISTRICT COUNCIL

The Applicant

Name: Derek Arthur Barnes & Carol Jennifer Barnes

Mailing Address: 445 Ngatarawa Road HASTINGS 4201

The Project

Street Address: State Highway 50 HAWKES BAY

Property No: 96665 Valuation Roll No: 0961019616

Legal Description LOT 3 DP 308836 CT 34327

New or Relocated Building ☐ Alteration ☐

Intended Use(s) in Detail: Erect new dwelling

This is: [Crossed boxes indicate applicable to this consent]

1. ☒ Confirmation that the proposed building work may be undertaken, subject to the provisions of the Building Act 2004 and any requirements of the building consent.
2. ☒ Building Consent Number is attached. ABA20042396
3. ☐ A Building Consent may not be able to be granted for the following reasons:
4. ☐ PIM ONLY.The Building Consent has not yet been applied for.
5. ☐ Notification that other authorisations must be obtained before a building consent will be issued.
6. ☐ Notification that the proposed building work may not be undertaken because a necessary authorisation has been refused.
7. ☐ There are no known special features relating to this property

Council Charges

The balance of the Council's fees and charges payable on the uplifting of this PIM, in accordance with the tax invoice are to be paid in full.

PIM Information

Refer information attached.

Issued by Hastings District Council

8 March 2025

PIM CONDITIONS ASSOCIATED WITH THIS APPLICATION

HASTINGS DISTRICT COUNCIL

BCP006 Confirmation that the proposed building work may be undertaken, subject to the **provisions of the building act 2004**, any requirements of the building consent and all other necessary authorizations being obtained.

This property is located in the Plains Zone which is a productive rural area. Residents live in an environment where agricultural management practices such as agrichemical spraying, use of farm machinery, the seasonal operation of bird scarers, odour and dust generation and night harvesting occur.

This area has been identified as a Significant Landscape Character Area. Certain activities, including building development, earthworks and plantations, may have an adverse effect on this landscape. The community seeks to ensure that a range of different landscape types, best representing each of the inland and coastal landscape units identified for the Hastings District, are retained and enhanced.

A Reserve Recreation Facility Fee of (insert amount) has been charged as part of this Building Consent. This fee contributes to Council maintenance and provision of reserves, open spaces and recreational facilities, such as parks, gardens, neighbourhood playgrounds, sports stadiums, libraries and swimming pools, given the potential for the additional occupants of the building to generate demand for these services.

Please note that this site adjoins a State Highway which has been declared a limited access road and legal access onto this Highway cannot be guaranteed. Access to the Highway will need the approval of Transit New Zealand under section 51 of the Transit New Zealand Act 1989. It is recommended that consent from Transit New Zealand be sought prior to the construction of any building. Contact the Regional Planner on (06) 835 1750.

FORM 6
APPLICATION FOR CODE COMPLIANCE CERTIFICATE
Section 92, Building Act 2004

HASTINGS DISTRICT COUNCIL

The Building Consent

Building consent number: ABA20042396

***The Owner**

Name of owner: _____

*Contact person: _____

Mailing address: _____

Street address/registered office: _____

Phone number: Landline: _____ Mobile: _____

Daytime: _____ After hours: _____

Facsimile number: _____ Email address: _____

Website: _____

The following evidence of ownership is attached to this application (required if different owner to original application):

_____

_____

†Agent

†Name of agent: _____

‡Contact person: _____

Mailing address: _____

Street address/registered office: _____

Phone number: Landline: _____ Mobile: _____

Daytime: _____ After hours: _____

Facsimile number: _____ Email address: _____

Website: _____

Relationship with owner:

_____

_____

First point of contact for communications with the council/building consent authority (if different to owner or agent):

_____

_____

_____

Application

All building work to be carried out under the above building consent was completed on _____.

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

_____

_____

The following specified systems are contained on the compliance schedule for the building and, in the opinion of the personnel who installed them, are capable of performing to the performance standards set out in the building consent:

_____

_____

_____

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

The code compliance certificate should be sent to:

_____
Signature of owner/agent on behalf of and with the authority of the owner

_____
Name of person signing

_____
Date

Attachments
The following documents are attached to this application:

¶Certificates from the personnel who carried out the work
¶Certificates that relate to the energy work
¶Evidence that specified systems are capable of performing to the performance standards set out in the building consent

*Delete this section if details have not changed from the building consent.
†Delete if owner is an individual.
‡Delete this section if the application is not being made on behalf of the owner.
§Delete if the agent is an individual.
‖Contact details must be in New Zealand.
¶Delete items not applicable.

CONFIRMATION OF CORRECT SITING OF BUILDING

HASTINGS DISTRICT COUNCIL

Building Consent No: ABA20042396
(Please quote this number when booking inspections)

This form is to be completed and available for collection by the Building Officer when the footing inspection is carried out.

The Code Compliance Certificate will **not** be issued at the completion of this project if this form has **not** been completed and received.

Name: (Owner / Builder) _____
(delete not applicable)

Project Address: State Highway 50 HAWKES BAY

Legal Description LOT 3 DP 308836 CT 34327

I hereby certify that I have checked that the building currently being constructed at the above stated address is the correct distance from the legal site boundaries and as per the approved Building Consent plans.

Signed: _____ Date: _____

ABA20042396
JOB COPY
16/03/2005

Hastings District Council
Private Bag
Hastings

Planning Department

As per building consent application No. ABA20042396. Derek and Carol Barnes of 445 Ngatarawa Road, owners of Lot 3 of DP 308836 wish to build over a 20 metre section of the water easement on that Lot.

The affected parties are the owners of Lots 1 and 4 being Les Cole, and Lot 2 being Leo and Anne-Marie Leader.

I have contacted Mr Cole and Mr and Mrs Leader, who by signing this letter and the attached copy of the site plan,have agreed to allowing Mr and Mrs Barnes to build over the easement.

All reasonable precautions shall be taken to ensure the integrity of the water supply.

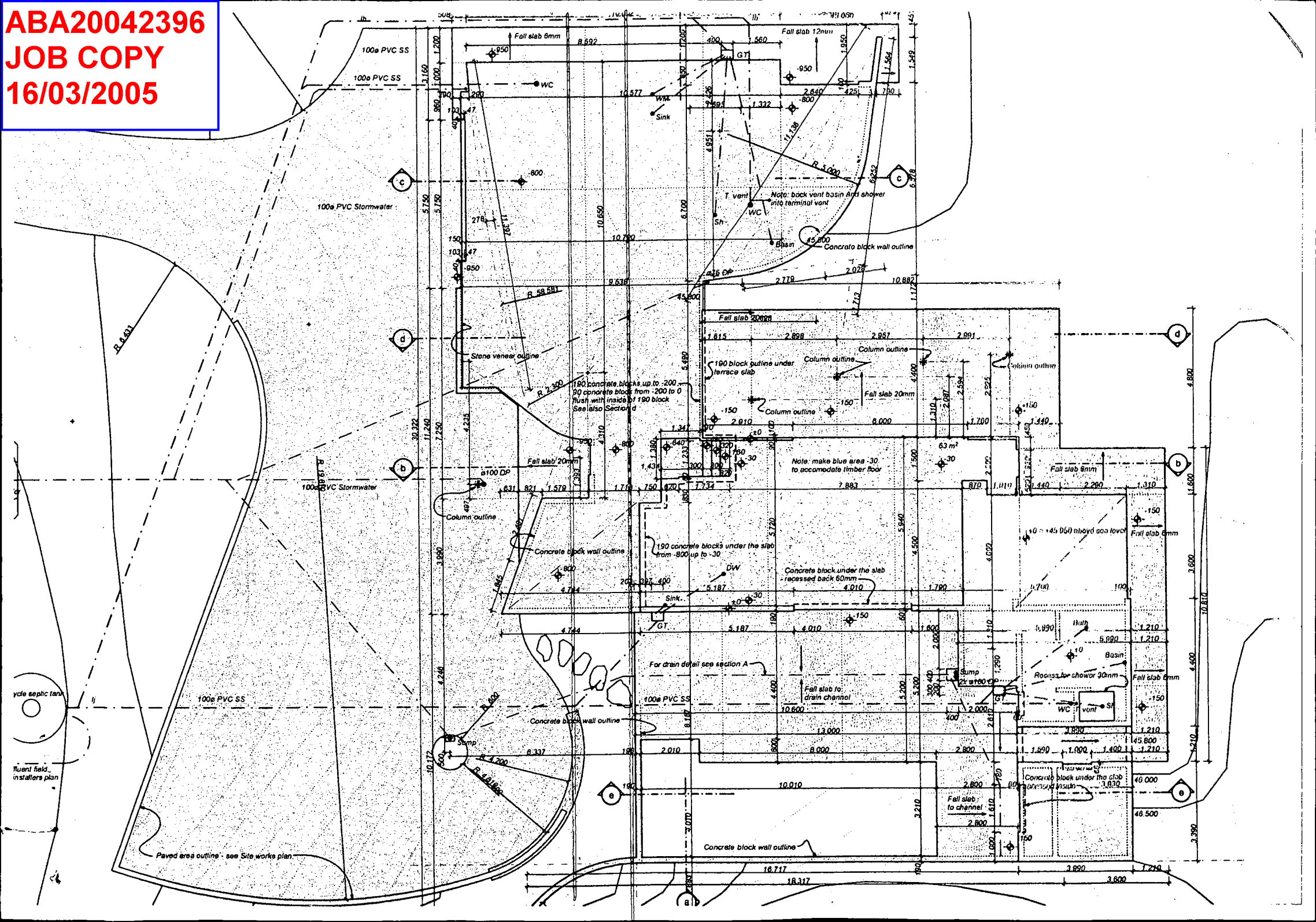
We, Les Cole and Leo Leader, having seen the site plan of the proposed works, have signed a copy of the said plan, and by signing this letter, agree to allowing the council to give approval to build over the 20 metre section of the easement.

JM Leader ..... dated 04/03/05

..... dated 04/03/05

Les Cole dated 4:3:05

ABA20042396
JOB COPY
16/03/2005



CODE COMPLIANCE CERTIFICATE
NO: ABA20042396
Section 43(3), Building Act 1991
ISSUED BY: HASTINGS DISTRICT COUNCIL

Derek Arthur Barnes & Carol Jennifer Barnes
445 Ngatarawa Road
HASTINGS 4201

PROJECT		PROJECT LOCATION
All Stage No. of an intended of stages	☒	Name: Derek Arthur Barnes & Carol Jennifer Barnes
New Building Alteration	☒ ☐	Street Address: 2538 State Highway 50 HAWKES BAY
Intended Use(s) in Detail: Erect New Dwelling & Swimming Pool		Postal Address: 445 Ngatarawa Road HASTINGS 4201
		LEGAL DESCRIPTION
Intended Life: Indefinite, not less than 50 years Specified as Demolition	☒ ☐ ☐	Property No: 96665
		Valuation Roll No: 0961019616
		Legal Description: Part LOT 3 DP 308836 CT 34327

This is:

☒ A final Code Compliance issued in respect of all the building work under the above building consent.

☐ This certificate is issued subject to the conditions specified on page 2 headed "Conditions of Code Compliance Certificate.

The Council charges payable on the uplifting of this Code Compliance, in accordance with the attached details are :

Signed for and on behalf of the Council

Edline Morrison
Administrative Support Officer 17 April 2008

ABA20042396
JOB COPY
17/03/2005

4/3/05

CONCEPT
MASTER BUILDERS

H.D. Consent AMENDED

RESOURCE MANAGEMENT
- 4 MAR 2005
RECEIVED

Att: Tony Hales

Re: Barnes Consent Application
ABA 2004 2396

Further to our meeting and Rexford Gardiners visit to you yesterday, Please find attached info.

Our Client is querying the need for a water softener which I forwarded an email to you on 21/2/05. Copy enclosed.

Regards Barry

Concept Building Limited Concept House 369 State Highway 2 RD2 Hastings
Tel 06 878 4690 Fax 06 876 2732 Email info@conceptmb.co.nz www.conceptmb.co.nz

ABA20042396
JOB COPY
17/03/2005

18/02/05

Att Bunclers AMENDED

att Barry.

Re Bairs House s/ Hway 50

Permit No 20042396.

Quote No 6117. Windows and doors

will be Constructed and

glazed in accordance with

NZS 4211 1985 Zone VH LEVEL 8.

as Quoted.

FIRST WINDOWS & DOORS

NZS 4211	ZONE	LEVEL
1985	VH	8

att This To Tony Hales

Hastings District Council

Thanks

Allan.

FIRST™
WINDOWS & DOORS
44 AUSTIN STREET - NAPIER
Ph 06 - 843 4191 Fax 06 - 843 4533

ABA20042396
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17/03/2005

Penguin

CERAMICS

AMENDED

To Barry - Carrpt.
From Daniel.
Date 23/2/05

Barnes Mosaic

Our methods for tiling mosaic over plastered walls is using Lata Flex, polymer modified cementitious adhesive with 4mm notched trowel. Grouted with Mapei, chemically setting grout. for water resistance.

Regards

Daniel

28 Havelock Road Havelock North PO Box 8233 Phone 06 877 6447 Fax 06 877 2944

23/02/2005 10:31 64-6-8772944 PENGUIN CERAMICS PAGE 01

ABA20042396
JOB COPY
17/03/2005

ems
Effluent Management Systems Ltd

AMENDED

EFFLUENT MANAGEMENT SYSTEM

DESIGN SPECIFICATION

Client:	Barns (C/- Concept Master Builders)
Site Location:	State Highway 50, Hastings
System Type:	Gould Enviroclear wastewater treatment plant.
Effluent Distribution Method:	Dripline (1.5 *l*/hr @ 0.6 m emitter spacings) Laid at 1 m centres
Total Lineal Length:	250 m
Design Loading Rate:	4.5 litres/m²/day
Design:	3 bedroom home = Potential occupancy of 6 people @ 200 litres each/day = 1200 litres/day potential effluent discharge
Land Area Required:	266.666 m²

Steve Crockford
Director

Registration No.: 12382
IPENZ No.: 254300

ABA20042396
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17/03/2005

GOULD
GT SYSTEMS

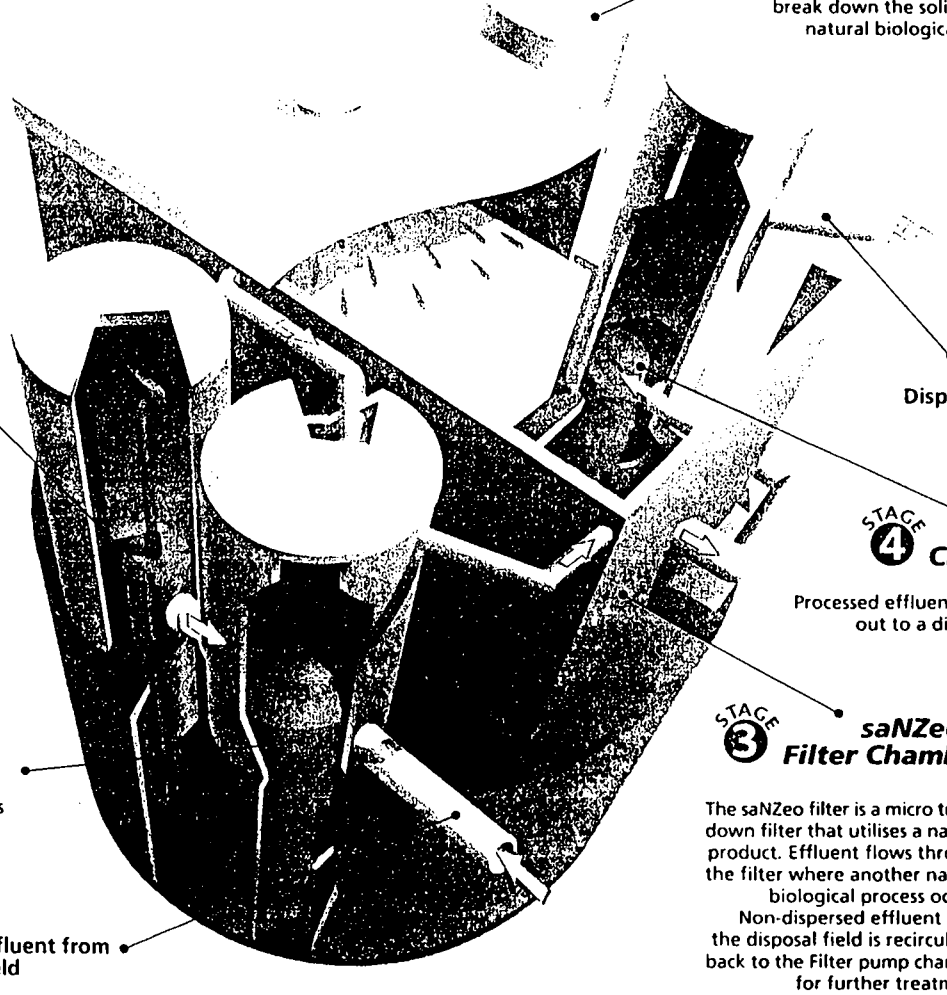
Specialist Manufacturers of Wastewater Treatment Plants and Septic Tank Filters

The Gould Enviroclear™ Sewage System

(Recirculating Progressive Filtration)

specifically has the following benefits:

- Less maintenance than other advanced systems.
- Fewer pumps, no air pumps.
- Requires less electricity than other similar systems.
- Includes a trickledown saNZeo™ filter.



STAGE 1 *Primary Chamber*

Solids enter the primary chamber and are filtered. Bacteria residing on the filter break down the solids using a natural biological process.

Solids are reduced to 1mm in diameter by the Gould GT150 filter.

Outlet to Disposal Field

STAGE 4 *Pump Chamber*

Processed effluent is pumped out to a disposal field.

STAGE 2 *Filter Pump Chamber*

Effluent now flows into this chamber and is then filter pumped over our saNZeo trickle down filter.

STAGE 3 *saNZeo™ Filter Chamber*

The saNZeo filter is a micro trickle down filter that utilises a natural product. Effluent flows through the filter where another natural biological process occurs. Non-dispersed effluent from the disposal field is recirculated back to the Filter pump chamber for further treatment.

Recycled Effluent from Disposal Field

FREEPHONE 0800 [illegible]

TEL: 64-6-353-6157 · FAX: 64-6-353-3020 · MOBILE: 021-505-198

ABA20042396
JOB COPY
17/03/2005

GOULD
GT SYSTEMS

Specialist Manufacturers of Wastewater Treatment Plants and Septic Tank Filters

The Gould Enviroclear™ Wastewater Treatment Plant

The Gould Enviroclear™ Wastewater Treatment Plant produces superior quality effluent and is ideal for use in environmentally sensitive locations or locations where high water table levels exist. The treatment plant uses the latest development in effluent filter technology, the Gould GT150 plus the Gould SaNZeo™ Filter.

The Gould Enviroclear™ Wastewater Treatment Plant offers:

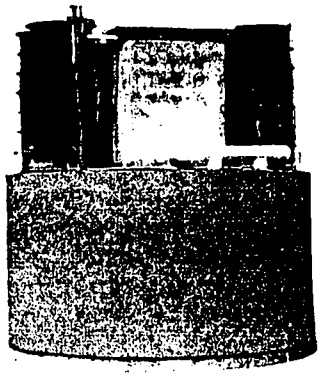
- The opportunity to recycle your own effluent by using it to irrigate gardens, trees, lawns and shelter belts.
- An environmentally friendly system that is easily installed.
- Low maintenance requirements.
- Large 8000 litre capacity suited for domestic and small commercial properties.
- A three year service to ensure your systems optimal performance.
- Prompt and ongoing support from Gould GT Systems.
- Resulting high-quality effluent at an affordable price.

Gould GT Systems (NZ) Limited is committed to producing the best effluent systems available. We contribute substantial resources to the development of superior wastewater treatment plants so that our clients are assured of owning systems that provide long term effective and environmentally friendly sewerage treatment.

Gould GT Systems (NZ) Limited, or their Approved Installers, deliver and install the Gould Enviroclear™ Wastewater Treatment Plant.

Dimensions:
Diameter: 2.5 metres
Height: 2.5 metres from base to top of inspection risers

Installed price $



The Gould Enviroclear™ ready for installation

This system is ideal for properties with limited amounts of topsoil, poor soakage and also for environmentally sensitive areas. The domestic plant caters for low flows up to 2000 litres per day and our commercial system for flows up to 100,000 litres per day.

FREEPHONE 0800 850 870 TEL: 64-6-353-6157 • FAX: 64-6-353-3020 • MOBILE: 021-505-198

FLETCHER ALUMINIUM

AWNING & CASEMENT WINDOW INSTALLATION DETAILS

Date: 01-02-04 Replaces: 05/03 Scale: 1:2 Cad : 1.26

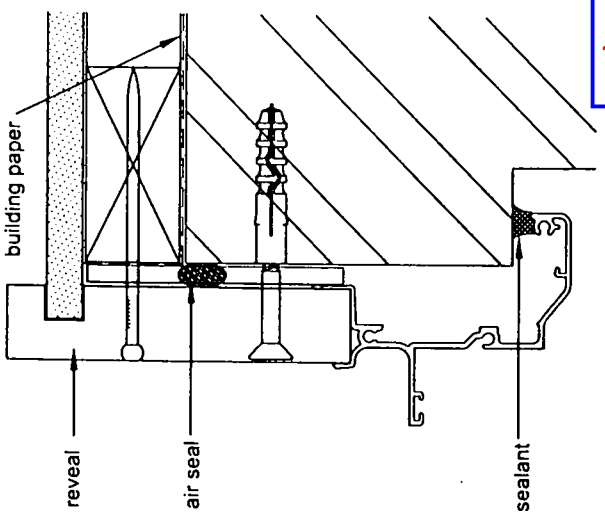
CONCRETE BLOCK

ABA20042396
JOB COPY
17/03/2005

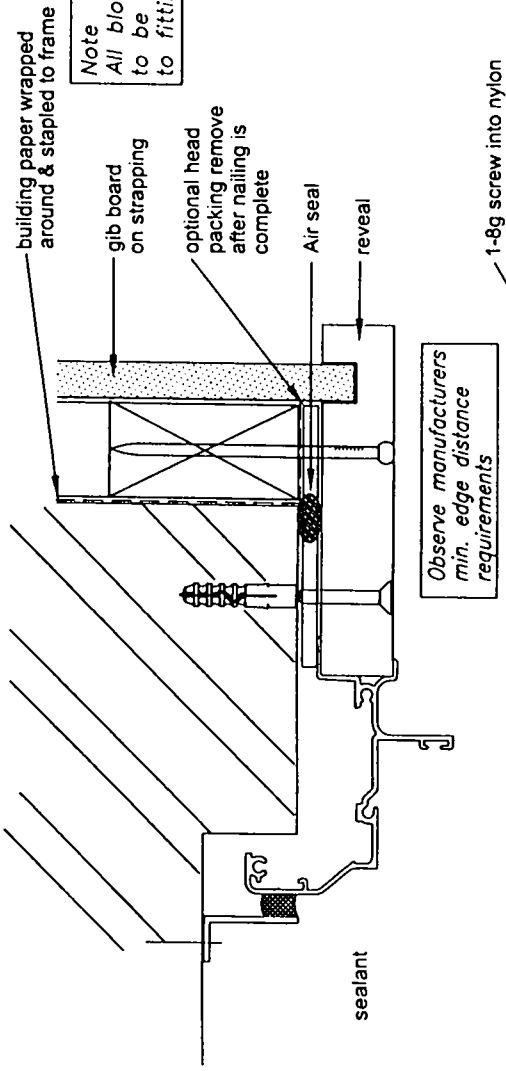
APPROVED
PLUMBING AND BUILDING
TONY HALES
18/03/2005

AMENDED PLAN Refer to previous plans for past endorsements 18/03/2005

Jamb Detail



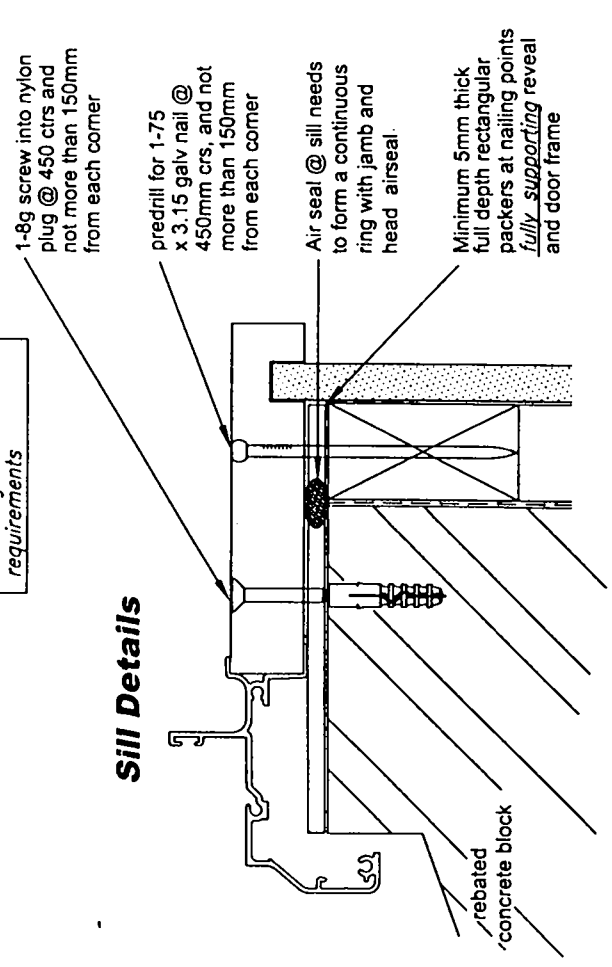
Head Details



Note All blockwork needs to be sealed prior to fitting window

Observe manufacturers min. edge distance requirements

Sill Details



Note:
1. Check with cladding manufacturers if additional properietary sill flashings are required
2. To be read in conjuction with WANZ WIS Stage 1: Pre Cladding Trim Preparation

FLETCHER ALUMINIUM SPECIFIER'S GUIDE 2003: © Fletcher Aluminium, a division of Fletcher Building Products Limited. Standards, Technical Specifications & Installation Details subject to change without prior notice

For Technical Assistance Call 0800 55 11 00

FLETCHER ALUMINIUM

AWNING & CASEMENT WINDOW INSTALLATION DETAILS

ABA20042396
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17/03/2005

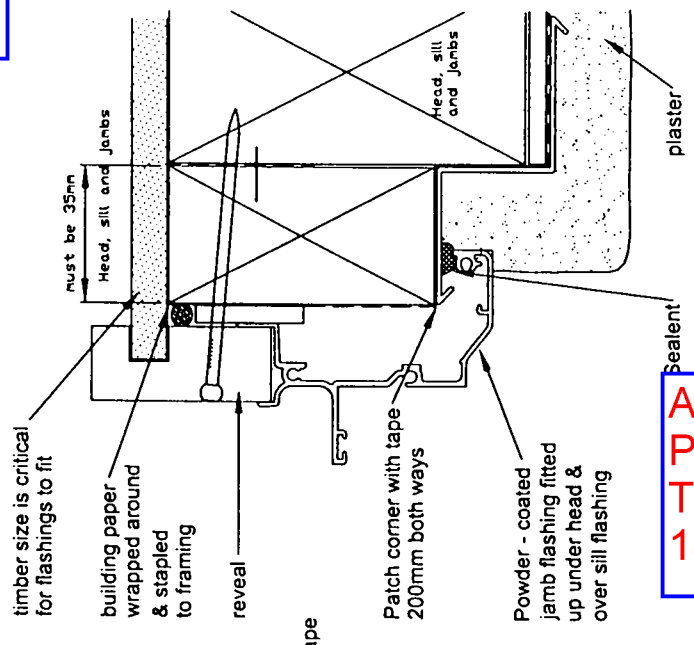
Date: 01-02-04 Replaces: 05/03 Scale: 1:2 Cad : 1.25

FULLY RECESSED PLASTER

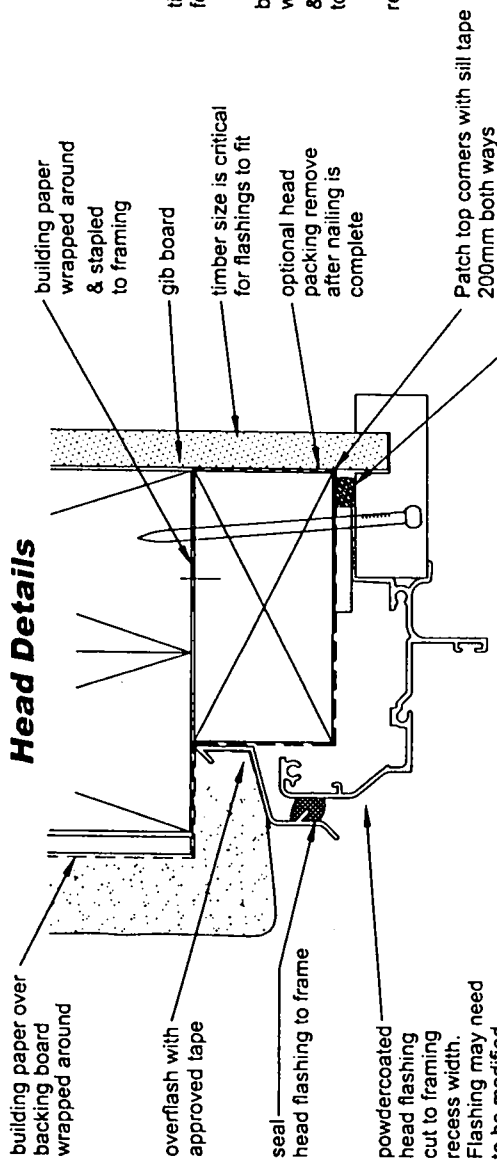
AMENDED PLAN Refer to previous plans for past endorsements 18/03/2005

APPROVED
PLUMBING AND BUILDING
TONY HALES
18/03/2005

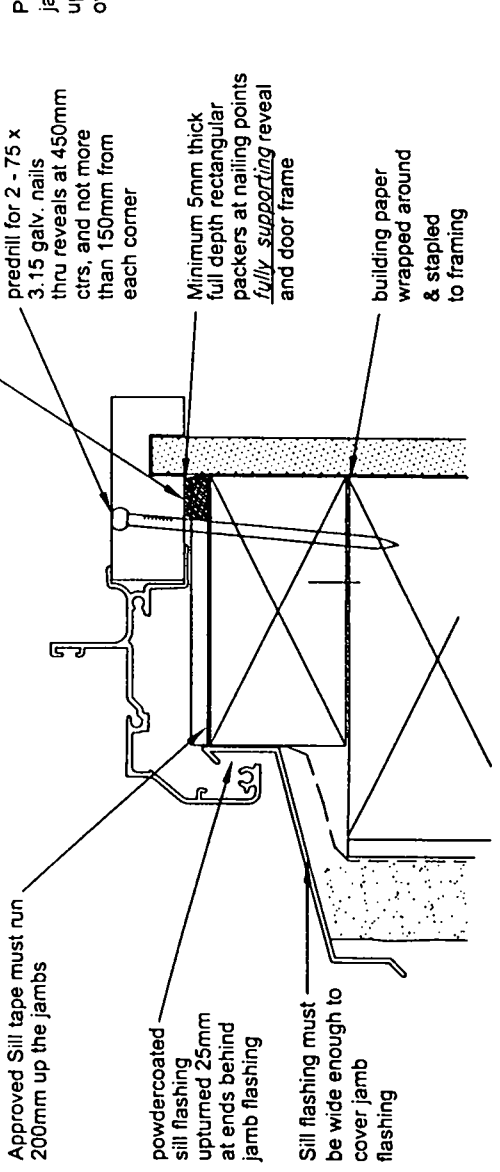
Jamb Details



Head Details



Sill Details



Note:
1. Check with cladding manufacturers if additional properietary sill flashings are required
2. To be read in conjuction with WANZ WIS Stage 1: Pre Cladding Trim Preparation

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For Technical Assistance Call 0800 55 11 00

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17/03/2005

From: Barry Koenders - Concept <barry@conceptmb.co.nz>
To: Tony Hales <tonyh@hdc.govt.nz>
Date: Monday, 21 February, 2005 4:21 PM
Subject: Fw: Water Test

Tony

I have had this reply from Derek Barnes regarding the water softener. Can you shed any light on his request?

Thanks Barry
-----Original Message-----
From: Derek and Carol <d.c.barnes@xtra.co.nz>
To: Barry Koenders - Concept <barry@conceptmb.co.nz>
Date: Monday, 21 February, 2005 12:18 PM
Subject: Water Test

Hi Barry,
Re: need for water softener. Can you please check if the rules have changed in the last 12 months. The water test was done for our neighbours (Leader) in May 04 and they were not required by council to fit a water softener or any other treatment facility.
Regards,
Derek

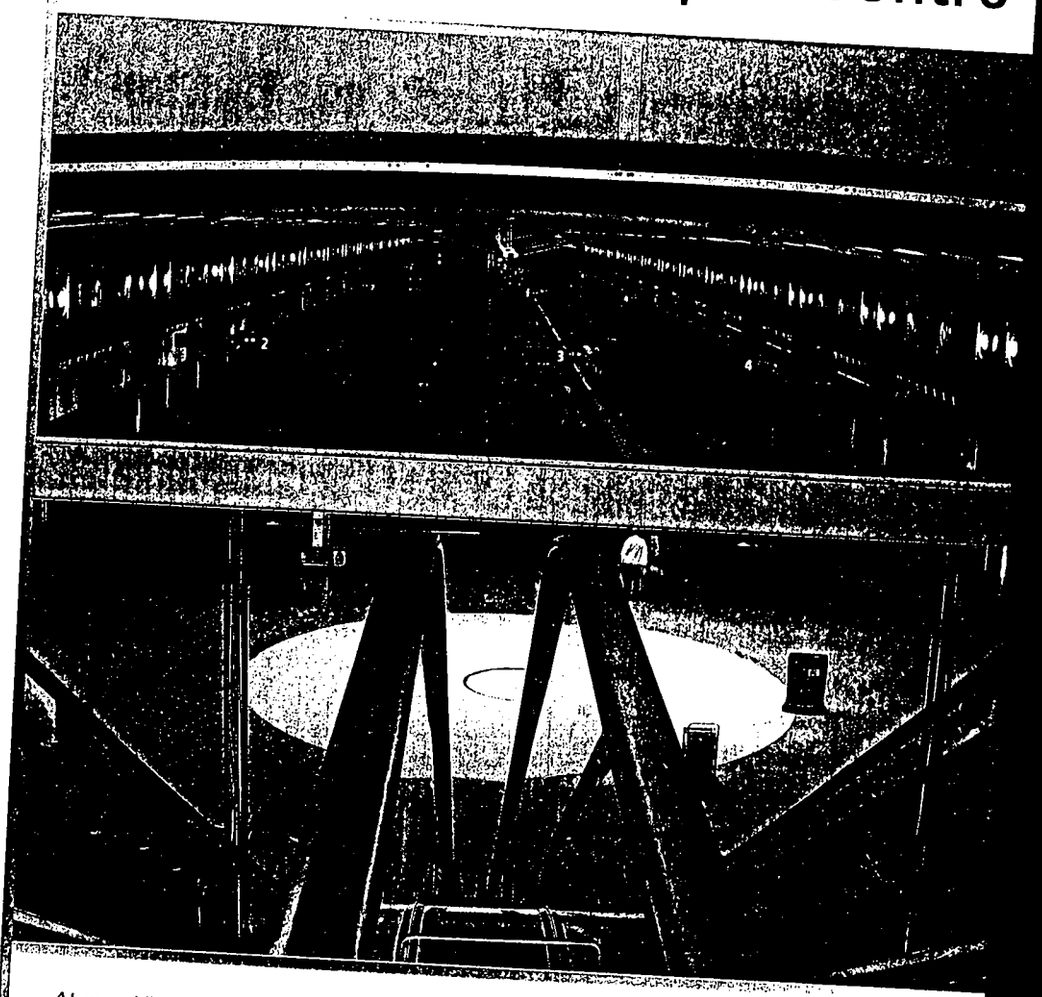
Reply sent 16/3/2005

24/2/05

ABA20042396
JOB COPY
17/03/2005

Britomart ...

a world class transport centre



The new state-of-the-art Britomart Railway Station is now operational. The first train's arrival is the culmination of months of hard construction work that started in November 2001 - a construction project that Waterproofing Systems Ltd was able to make a substantial contribution to.

Above: View of main tunnel from top of escalator.

"As one of the youngest waterproofing companies working in the construction industry at the moment, it was great for such trust to have been placed in us so early. This opportunity to demonstrate our technical capabilities has helped lift our market profile and build our credibility. It also highlighted our ability as a company to access leading edge products from around the world. Now that we have this big project under our belt, it will certainly open doors in other project areas as well."

Tony McMurtrie
Managing Director
Waterproofing Systems Ltd

waterproofing
SYSTEMS LTD

Providing the Britomart project with durable waterproofing solutions

Waterproofing the tunnels

Rawmat Type S membrane & Rawseal waterstops



ABA20042396
JOB COPY
17/03/2005

Waterproofing a concrete structure that sits only about 100m from the sea and 6 metres below sea level creates a challenge - a challenge that Waterproofing Systems Ltd was able to address with their Rawmat bentonite membrane system.

This unique system of pre-hydrated, self-healing membrane and waterstops, provided the Britomart project with the ultimate durable waterproofing solution... and because Rawmat can be installed in all weather conditions, no installation time was lost. Opus International Consultants specified that a bentonite product should be used, but only Waterproofing Systems had the right kind of product.

How does Bentonite Work?

Bentonite is a natural clay formed from volcanic ash which can swell to form an impermeable mass, preventing the passage of liquid. Natural sodium bentonite clay will absorb water and expand up to 16 times its dry volume when in contact with water. When confined, e.g. between the ground and the floor slab, this tendency to swell generates substantial swell pressures, preventing the passage of water.

When correctly installed, the Rawmat/Rawseal acts as an effective hydrostatic seal. An important factor affecting the amount of swell achieved, is the quality of water hydrating the bentonite. The significant advantage of the pre-hydrated system is that the initial hydration occurs under factory-controlled conditions.



Above: Rawmat membrane being installed to the roof of the main tunnel and covered by concrete.

Why Bentonite for Britomart?

1. **The Britomart site was a wet site - other products were not suitable for this project.**

   Being so far below sea level, it was almost impossible to provide the sufficiently dry substrate required by other products or systems. Given the construction programme, and the hydrostatic pressures on site, these other systems would not have performed to the same level as the pre-hydrated bentonite system.

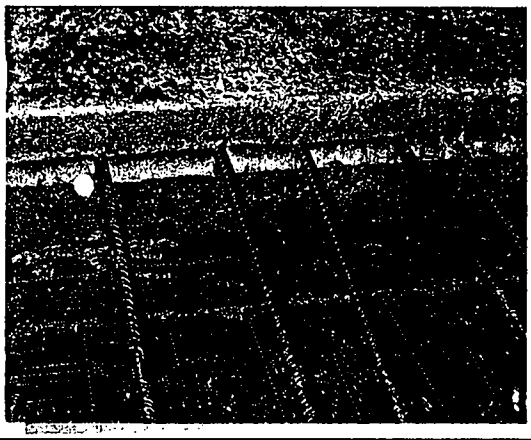
2. **A variety of substrates were required**

   In much of the tunnel it was not possible to install the waterproofing system directly to the building substrate. For much of the tunnel the pre-hydrated bentonite was installed to the excavated clay. Bentonite is one of the few products that can be installed on a variety of substrates including rock face, concrete and sacrificial steel shutters.

3. **A non weather-dependent solution was necessary to keep the project timeline on track.**

   The programme for construction of the tunnel was very tight. Much of the waterproofing was scheduled for the winter months, which would have been a problem with conventional waterproofing systems. No weather-related "down time" occurred during the bentonite installation.

Below: Floor slab construction detail. Rawseal TR35 triangular and RC50 slab waterstops used.



ABA20042396
JOB COPY
17/03/2005

THE TIMELINE

late 2001

Waterproofing Systems Ltd begins supplying the Rawmat pre-hydrated bentonite to the Britomart main tunnel.

early 2002

Beca Carter, Jasmax and Downer Engineering are impressed by the Waterproofing Systems product range and applicator. Additional contracts are awarded for work on the basement, roof and parapets of the Central Post Office.

late 2002

Waterproofing Systems secures the Concourse Tunnel using Rawmat/Rawseal.

early 2003

The project continues to grow. Waterproofing Systems commences work on the Streetscapes contract using Polyflame, Rawmat and a variety of Gripset Liquid membranes.

"The Britomart project was challenging right from the start. We had to show that our product was superior and that it had more advantages over other specified products. We felt confident that Waterproofing Systems would always be a strong contender, but it was not always straightforward and one or two issues had to be overcome.

This was probably the most demanding waterproofing job in New Zealand for the past 10 years, so I feel confident that we can address the requirements of any other project coming up in the future."

John Stallard
Technical Director
Waterproofing Systems Ltd

Why the Rawmat Syste

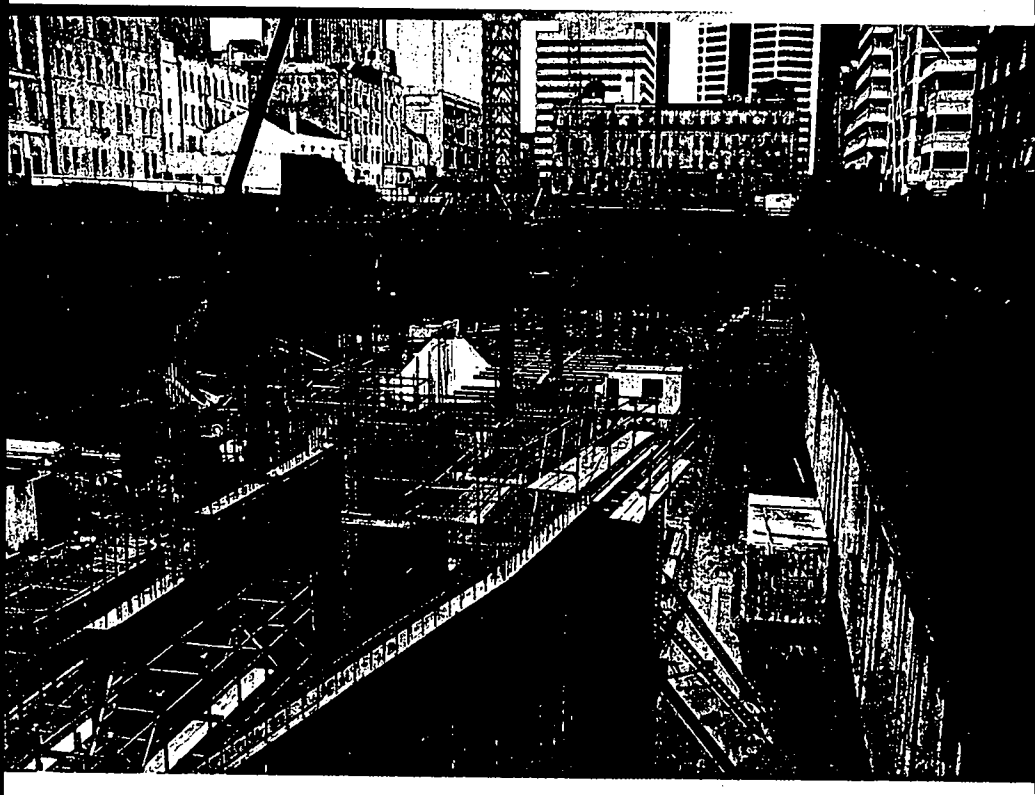
Rawmat pre-hydrated bentonite membranes and Rawseal w
quality sodium bentonite clay. Unlike dry bentonite systems, the pre-hydrated products are supplied in an impermeable state and don't require on-site wetting to become an impermeable barrier.

Unlike dry systems, which are prone to shrinkage and cracking, the Rawmat pre-hydrated bentonite is highly resistant to the effects of water contaminants. These contaminants can induce cationic exchange in dry bentonite systems causing them to have a reduced swell, shrink and crack as the clay converts from sodium bentonite to the calcium form. Additionally, unlike dry systems, there is no loss of bentonite with the Rawmat membranes, when they are cut during detailing work.

"We found that the tanking material could be easily applied and consider that the pre-hydrated product supplied by Rawmat was superior, in this application, to other bentonite products on the market."

Principal Engineer
Opus International Consultants

As the construction of the main tunnel was progressing, a variety of other waterproofing needs arose. What started out as one contract using Rawmat membrane and Rawseal waterstops, grew to supplying a wide variety of products with three other substantial contracts being secured.



Above: View of the main tunnel under construction. The Central Post Office (CPO) building is at the far end.

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The Project Grows!

CPO Roof Restoration

Perforated base sheet/Glasflame 2mm/Polyflame 4mm sand/Sungard

The existing roof was comprised of an asphalt membrane, covered in a concrete screed and pavers. The roof area of 1800 m² required complete renovation. The pavers/screed was removed and substrate repairs were completed. A perforated base sheet was installed followed by the Glasflame 2mm/ Polyflame 4mm torch-on system. A Sungard UV coat was then applied. Laterno roof vents were also installed to allow moisture to escape from the concrete substrate.

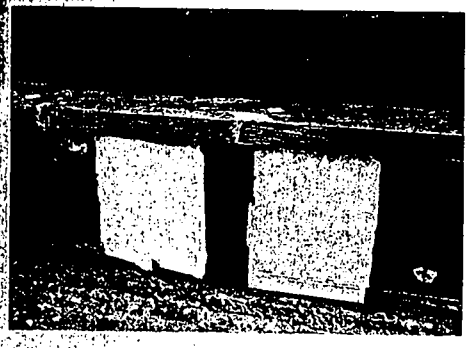


Above: Glasflame 2mm base sheet being installed on the CPO roof.

CPO Roof Parapets

Gripset 51/Gripset RD

The CPO roof has a 1.8 metre high parapet around its perimeter which had previously been waterproofed with an asphalt sheet. This old membrane was removed and the parapets were cleaned. Gripset 51 bituminous rubber membrane was used as a primer, onto which the Gripset RD acrylic membrane was applied. Gripset RD is a flexible elastomeric liquid membrane designed to waterproof a variety of external and exposed surfaces, and provides maximum long term protection by forming a tough and durable film.

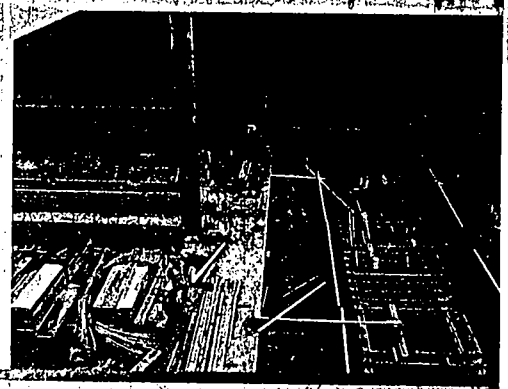


Above: Test areas of Gripset 51/Gripset RD on the parapets of the CPO roof.

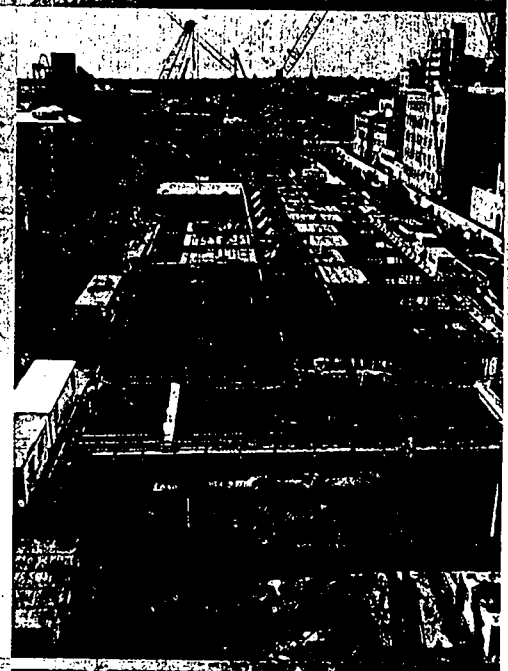
Secant Piles of Main Tunnel

Edplug/Edseal Ultra

The specification for the secant piles was originally for bentonite strips to be installed to all the junctions between the piles. However, the Edplug/Edseal Ultra range of cementitious waterproofing components was used instead to waterproof these areas. These products have a particularly aggressive crystallization quality making them very effective in this application. Edplug is a single component hydraulic cement, that instantly stops running water or seepage through cracks or holes in concrete. Edseal Ultra's aggressive crystalisation prevents dampness coming through the concrete surface.



Right: Secant piles on main tunnel to be waterproofed with Edplug/Edseal Ultra.



Right: View of site under construction, showing the "volcanoes" located down the centre. These provide some natural light to the tunnel.

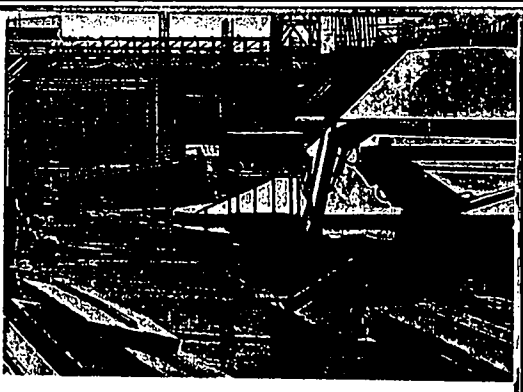


Right: Substrate renovation on the CPO roof commences.

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concourse entry to the main tunnel, waterproofed with a double layer Polyflame 4mm system.





the Project grows and grows...

Below: Internal gardens waterproofed with Gripset 51/Dry Mix.



Street Scapes: planter boxes / treepits / canopies

Polyflame 4mm

The streetscapes contract covered the ground level works including planter boxes, tree pits, pedestrian paving etc. Our Polyflame 4mm torch-on membrane was used to waterproof the more critical areas such as the tree pits. Gripset 51 was used in the lower specification areas as a damp-proofing solution. Polyflame has many outstanding product features, making it the ultimate choice when selecting torch-on products. Its superior qualities of tensile strength, elongation and tear resistance, sets Polyflame apart as the ideal durable solution for your waterproofing requirements.

Flashing "Volcanoes"

Gripset 2P liquid membrane

Down the middle of the main tunnel, large "volcanoes" were installed to provide natural lighting to the tunnel.

Above: "Volcanoes" being craned into place along the centre of the roof to the main tunnel.

Each of these needed a flashing system around the perimeter where the pre-hydrated bentonite membrane terminated. Gripset 2P, a two-part latex rubber liquid membrane, was used as a termination flashing.

Internal gardens

Gripset 51/Dry Mix

On both sides of the main exit from the tunnel, large garden and waterfeatures have been developed. Our Gripset 51/Dry Mix system was used to waterproof the garden pits. These pits were approximately 2 meters deep. The Dry Mix component creates a hard cementitious finish which protects the waterproofing membrane from root penetration.

In addition, Gripset 51 was used to waterproof the water collection areas that make up the waterfeature.

"This was a demanding project in regard to physical application as some of the access was difficult. But we had the type of material that made it a whole lot easier.

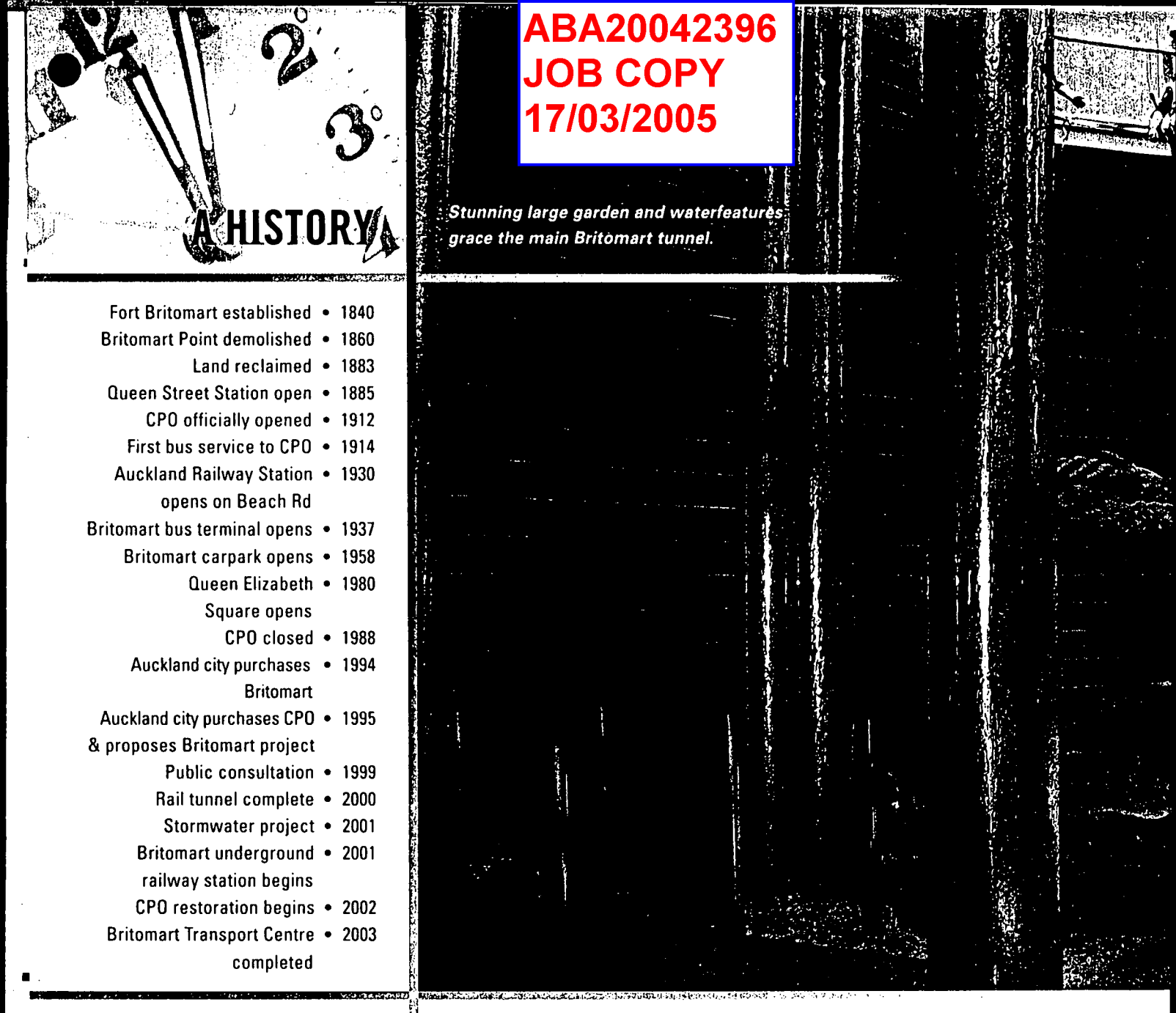
No other waterproofer in New Zealand would have had such a big project - we ended up laying 24,000 square metres of material. There are a lot of large projects that we would not have tackled before, but are now tackling, because we have the confidence to do so."

Fred Alarcon
Director
Waterproofing Services Ltd



Above: Tunnel under construction - inside view.

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A HISTORY

Stunning large garden and waterfeatures grace the main Britomart tunnel.

Fort Britomart established	•	1840
Britomart Point demolished	•	1860
Land reclaimed	•	1883
Queen Street Station open	•	1885
CPO officially opened	•	1912
First bus service to CPO	•	1914
Auckland Railway Station opens on Beach Rd	•	1930
Britomart bus terminal opens	•	1937
Britomart carpark opens	•	1958
Queen Elizabeth Square opens	•	1980
CPO closed	•	1988
Auckland city purchases Britomart	•	1994
Auckland city purchases CPO & proposes Britomart project	•	1995
Public consultation	•	1999
Rail tunnel complete	•	2000
Stormwater project	•	2001
Britomart underground railway station begins	•	2001
CPO restoration begins	•	2002
Britomart Transport Centre completed	•	2003

When your project demands durable waterproofing solutions you can trust, work with the right company who can specify the right products for the job.

Ph +64 6 357 9148
Fax +64 6 357 9410
Email info@waterproofing.co.nz

waterproofing SYSTEMS LTD
we're watertight
www.waterproofing.co.nz

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ACCEPTABLE SOLUTION G13/AS1 SANITARY PLUMBING

1.0 SCOPE

1.0.1 This acceptable solution applies to above-ground non-pressure (gravity flow) sanitary plumbing for *buildings* having 3 storeys or less. The term above-ground includes all pipework within, or on the *building*, including any basement(s).

1.0.2 The solution does not include:

a) Specialised types of *sanitary fixtures* or *sanitary appliances* used within *buildings* such as hospitals, laboratories and factories, or

b) The conveyance of industrial liquid wastes, chemical or toxic wastes and other wastes which cannot be discharged to a *sewer*.

1.0.3 Protection of water seals

Water seals shall be protected from pressure fluctuations within the sanitary pipework so as to prevent foul air and gases entering the *building*. The methods described in this acceptable solution for protecting *water seals* generally require each *fixture discharge pipe* to be vented.

Comment:

Individually venting each fixture discharge pipe provides the greatest flexibility in the arrangement and lengths of discharge pipes.

2.0 WATER TRAPS

2.1 Water trap requirements

2.1.1 All discharge points to the *plumbing system* shall have a *water trap* to prevent foul air from the *plumbing system* entering the *building*.

2.2 Water trap dimensions

2.2.1 The depth of the *water seal* (see Figure 1) shall be:

a) For *waste pipes* connected indirectly to the drainage system by discharging over a *gully trap*: no less than 40 mm.

b) For *discharge pipes* connected either to a *discharge stack* or directly to the drainage system; no less than 70 mm.

Comment:

G1/AS1 permits a 50 mm water seal depth for WC pans - refer to Figure 1 of G1/AS1.

2.2.2 The diameter of the water trap shall be no less than that given in Table 1.

Table 1: **Fixture water trap & fixture discharge pipe sizes**
Paragraphs 2.2.2 and 4.3.2

Sanitary fixture or appliance	Minimum diameter (mm)
Drinking fountain	25
Bidet Urinal (bowl type) Basin	32
Cleaner's sink Clothes washing machine Kitchen sink (domestic) Laundry tub (single or double) Shower tray Bath	40
Kitchen sink (commercial) Urinal (1 or 2 stall)	50
Urinals (3 or more stalls) Water closet pan	80

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BRANZ APPRAISED

SPECIFY WITH CONFIDENCE

BRANZ APPRAISAL CERTIFICATE No. 404 (2000)

POLYFLAME AND GLASFLAME ROOF MEMBRANE SYSTEMS

Waterproofing Systems Ltd
PO Box 1113
Palmerston North
Tel: 0-6-357 9148
Fax: 0-6-357 9410
Email: info@waterproofing.co.nz

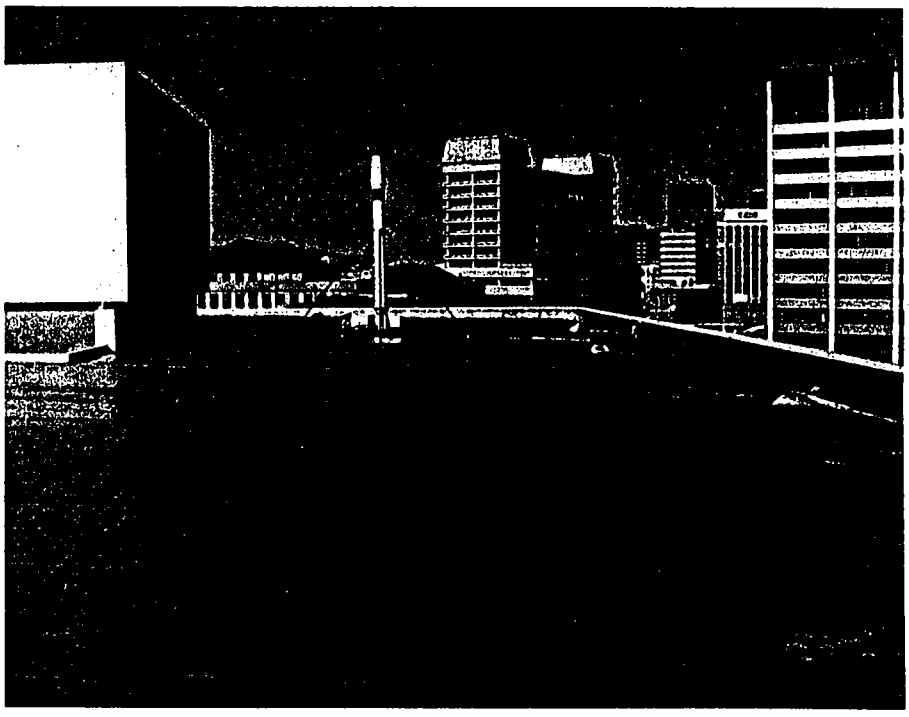
Manufactured by:
Bitumat Co. Ltd
PO Box 7487
Dammam 31462
Kingdom of Saudi Arabia

Readers are advised to check that this Certificate has not been amended, withdrawn or superseded by a later issue. Refer to the "Valid Certificates Index" in BUILD magazine published by BRANZ, the Certificate Listing on the BRANZ Internet Site, or contact BRANZ.

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Porirua City
New Zealand
Telephone: +64-4-235 7600
Fax: +64-4-235 6070
http://www.branz.org.nz

Product

- *This Certificate relates to Polyflame and Glasflame Roof Membrane Systems, which consist of modified bitumen membranes applied over a continuous substrate. The systems are installed by Waterproofing Systems Ltd, or its approved applicators.*
- *The products have been appraised for use as single and two-layer waterproof membrane systems for use on nominally flat and sloping roofs, gutters and parapets, when fixed to a continuous substrate of concrete or plywood on new or existing buildings. Details of other uses of the products, such as for deck membranes and tanking are available from Waterproofing Systems Ltd, but have not been assessed and are outside the scope of this Certificate.*
- *The products must be used, installed and maintained in accordance with the marketer's technical literature 'Torch-on Membrane Systems – Bitumat Specification', dated 3 May 1999. Unless stated otherwise, reference to 'technical literature' shall be taken as this document.*



Completed roof membrane system

Building Regulations

1. New Zealand Building Code (NZBC)

In the opinion of BRANZ, Polyflame and Glasflame Roof Membrane Systems, if 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 for the relevant physical conditions of B1.3.3. See Section 9.

Clause B2 DURABILITY: Performance B2.3.1(b), 15 years. See Section 10.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2 and E2.3.6. See Section 13.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The product will not be harmful to people.

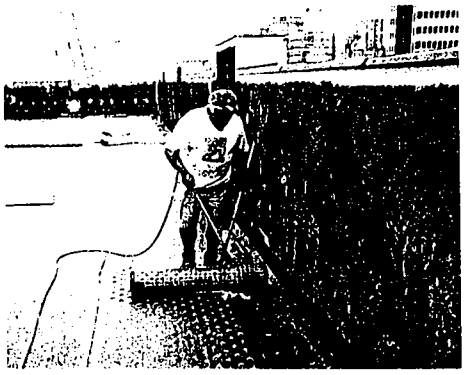
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The Project Grows!

CPO Roof Restoration

[illegible] base sheet/Glasflame [illegible] Polyflame 4mm sand/Sungard

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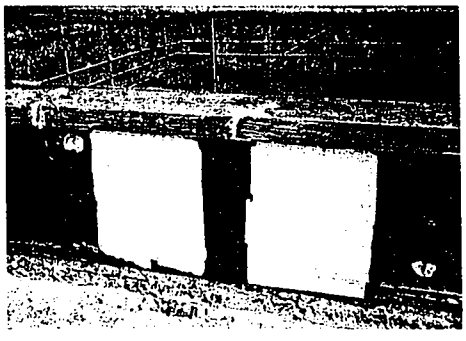


Above: Glasflame 2mm base sheet being installed on the CPO roof.

CPO Roof Parapets

Gripset 51/Gripset RD

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Above: Test areas of Gripset 51/Gripset RD on the parapets of the CPO roof.

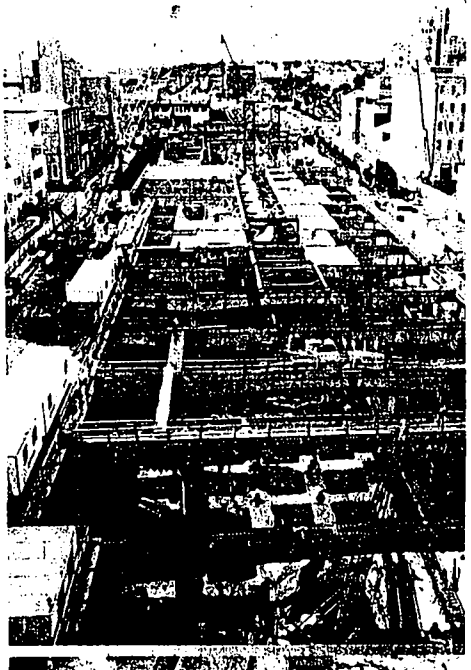
Secant Piles of Main Tunnel

Edplug/Edseal Ultra

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Right: Secant piles on main tunnel to be waterproofed with Edplug/Edseal Ultra.



Right: View of site under construction, showing the "volcanoes" located down the centre. These provide some natural light to the tunnel.



Right: Substrate renovation on the CPO roof commences.

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Table 10.2 – Rafters (continued) (see 10.2.1.3.2)

(d) Light roof for very high wind zone

Rafter size	Rafter spacing (mm)					
	600		900		1200	
	Rafter span	Fixing type	Rafter span	Fixing type	Rafter span	Fixing type
(mm x mm)	(m)		(m)		(m)	
75 x 40	1.6	B	1.4	B	1.3	B
100 x 40	2.3	B	2.0	B	1.8	B
125 x 40	2.6	B	2.2	B	2.0	B
150 x 40	2.8	B	2.3	B	2.1	B
75 x 50	1.8	B	1.6	B	1.4	B
100 x 50	2.5	B	2.1	B	1.9	B
125 x 50	3.1	B	2.7	B	2.5	B
150 x 50	3.5	B	3.1	B	2.7	C
200 x 50	4.1	B	3.4	C	2.9	C
250 x 50	4.6	B	3.8	C	3.2	C
300 x 50	5.1	C	4.1	C	3.6	C
100 x 75	2.8	B	2.5	B	2.2	B
125 x 75	3.6	B	3.1	B	2.8	C
150 x 75	4.3	B	3.8	C	3.4	C
200 x 75	5.6	C	5.1	C	4.6	D
250 x 75	6.8	C	5.6	C	4.9	D
300 x 75	7.6	C	6.2	D	5.4	D

Fixing type	Fixing to resist uplift	Alternative fixing capacity (kN)
B	2/100 x 3.75 skewed nails + 1 wire dog	2.7
C	2/100 x 3.75 skewed nails + 2 wire dogs	4.7
D	2/100 x 3.75 skewed nails + 3 wire dogs	6.7

NOTE –

(1) Rafter spans may be increased by 10 % for rafters continuous over 2 or more spans that have not been birdsmouthed at intermediate supports.

(2) Fixing types at intermediate supports for rafters running continuously over those supports shall have double the capacity of the fixing types given in this table.

(3) For the full range of fixing types and capacity see table 10.13.

423 Sitting Room Fireplace

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Warmington INDUSTRIES 1994 LTD



Corner Wood Open Fire
Left & Right Hand

Ensure that you have the correct installation details for the Warmington that is to be installed.

Prior to Construction and Installation — Important Notes:

1) Install to AS/NZS 2918: 2001.
2) Install to manufacture's specifications.
3) All new installations require a permit.
4) For special requirements concerning materials (timber mantle and surrounds) within close proximity of Warmington products, please contact your local Warmington Technical Consultant.

Stage 1: Frame Construction Procedure by Builder.

5) Mark out flue centre.
6) Mark out heat cell clearance requirements.
7) Build timber framing to heat cell clearances and chimney chase clearance requirements.
8) Ensure that front face of heat cell clearance alcove is left open and unframed to enable installation of the firebox and adaptor. The chimney chase is left unlined for installation of the flue.
9) Construct plinth only, to required height. *

Stage 2: Install Procedure by Certified "Warmington Installer" only.

10) Fit fire to plinth.
11) Fit adaptor to Firebox.
12) Fit heat cell cabinet to firebox.
13) Fit flue system.
14) Fit cowl and flashing system.
15) Fit fascia kit.
16) Fit vents to heat cell alcove and chimney chase, to cool the heat cell and ensure efficiency of CAITEC™ Technology.

Stage 3: Finishing Procedure by Builder.

17) Construct hearth to required thickness. *
18) Finish framing of heat cell alcove.
19) Close in heat cell alcove and chimney chase.
20) Finish heat cell alcove and hearth to customer's requirements (e.g. paint / tiles).

*** Note: certified installer can install hearth and plinth.**

Maintenance.

1) Ensure that the Warmington and flue system is swept annually or more frequently if required.
2) To sweep flue and firebox: 1) Open damper fully.
   2) Cover front of fire with sheets.
   3) Remove cowl from top of chimney.
   4) Sweep from the top, down the flue.
   5) Remove all soot and ash.
   6) Ensure cowl and bird protection is clean and replaced.
3) Visually inspect fireplace and flue system.

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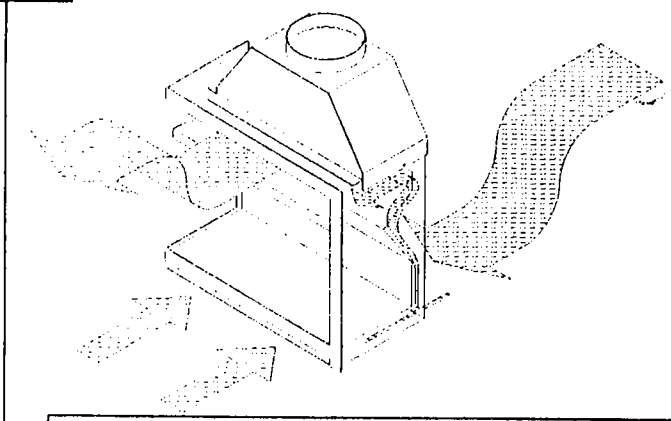
Corner Wood Open Fire

Caitec & mantle Clearances

Caitec™ Technology

Warmington's innovative solution to introduce replacement combustion air back into the home via the unique Warmington multi duct heat exchanger.

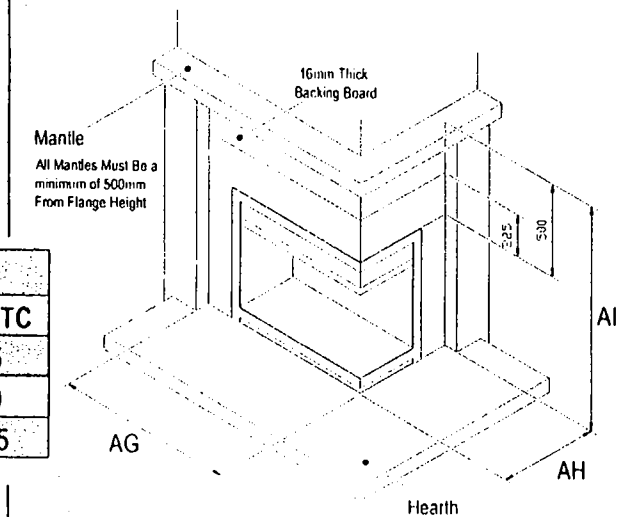
Air Flow



Caitec™ Technology

Caitec ™ draws air from an external air source to ensure that the open fire has pre-heated combustion air maximizing efficiency while maintaining the home at constant pressure equilibrium, reducing the risk of back drafting

Mantle



Mantle Clearances		
Firebox		SI 780TC
Front Width	AG	955
Side Width	AH	530
Height	AI	1205

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Warmington

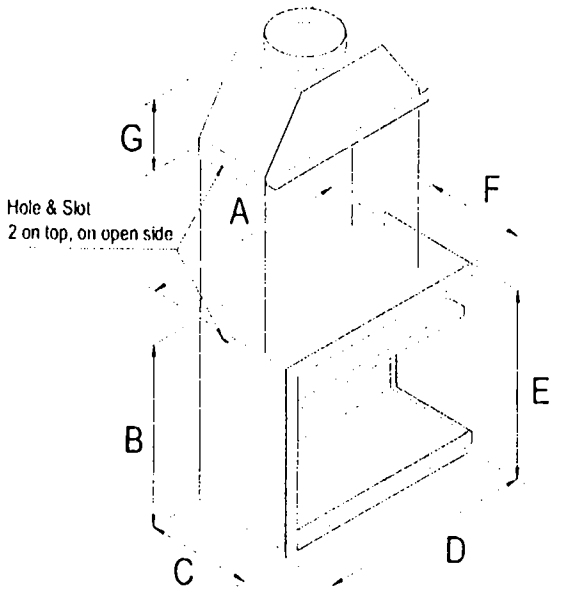
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Flue & Fire to comply to - NZS 7421 : 1990 / ASNZS 2918 : 2001

Corner Wood Open Fire
Left Hand

All dimensions in millimeters (mm)
All dimensions are minimums

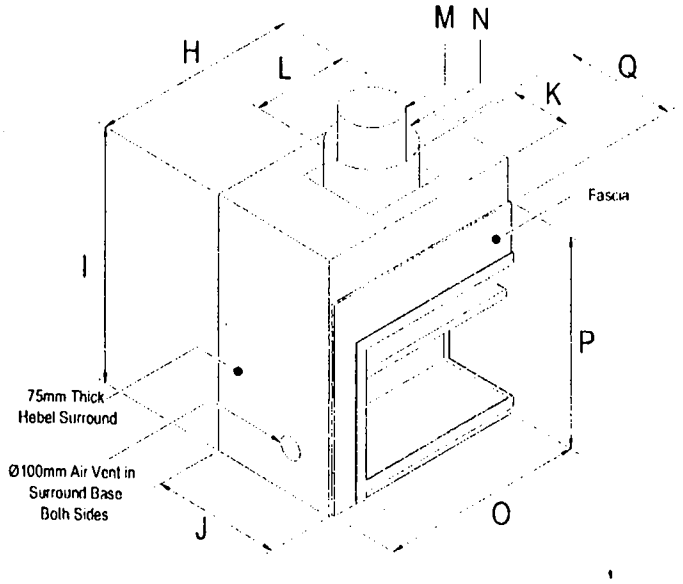
Firebox and Adaptor



Firebox		SI 780TC
Firebox Width	A	780
Firebox Height	B	680
Firebox Depth	C	400
Flange Front Width	D	805
Flange Height	E	705
Flange Side Width	F	380
Adaptor Height	G	260
Surround Width	H	925
Surround Height	I	1120
Surround Depth	J	585
Centre of Flue from front	K	280
Centre of flue from Side	L	450
Flue	M	250
Flue Liner	N	350
Fascia Front Width	O	910
Fascia Height	P	925
Fascia Side Width	Q	585
Heat Output		
Peak - Estimated		19
Range - Estimated		12-14

Minimum Flue Height	
Flue Height	3600
Measured From Top of Adaptor	B + G

Firebox with Heat Cell Cabinet



Check List	
Firebox	
Adaptor (Fastenings)	
Ash pan	
Badge	
Damper Handle	
Packed By	

Adaptor Fitting
Seal adaptor to firebox using high-temp gasket sealant. Bolt through holes provided.
Seismic restraint
Secure firebox through anchor positions provided.

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Warmington

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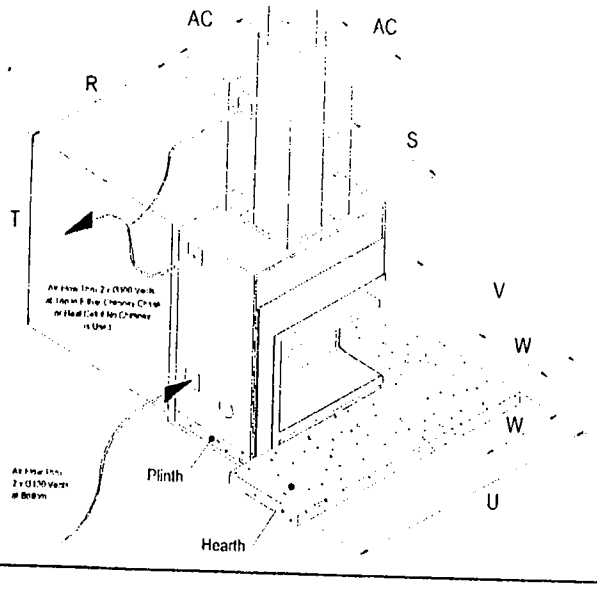
Flue & Fire to comply to - NZS 7421 : 1990 / ASNZS 2918 : 2001

Corner Wood Open Fire

Left Hand

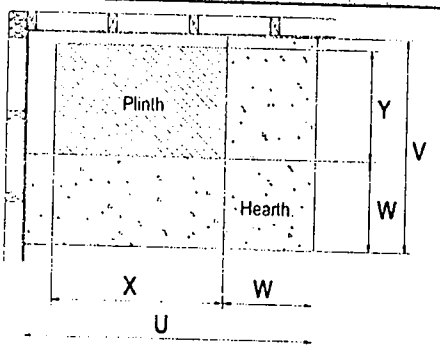
View of Heat Cell clearances (Alcove)

All dimensions in millimeters (mm)
All dimensions are minimums

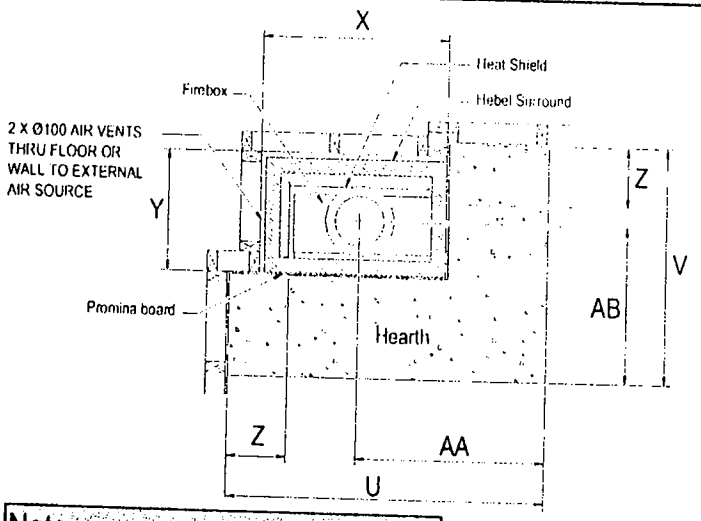


Firebox		SI 780TC
Heat cell Clearance Width	R	950
Heat Cell Clearance Depth	S	610
Heat Cell Clearance Height	T	1145
Hearth Width	U	1605
Hearth Depth	V	1175
Hearth Projection	W	500
Plinth Width	X	950
Plinth Depth	Y	610
To Wall Clearance	Z	300
Hearth to Flue Centre Width	AA	945
Hearth to Flue Centre Depth	AB	780
Chimney Chase Clearance	AC	450
Window Height	AD	1145
Window Width	AE	950
Window Depth	AF	610

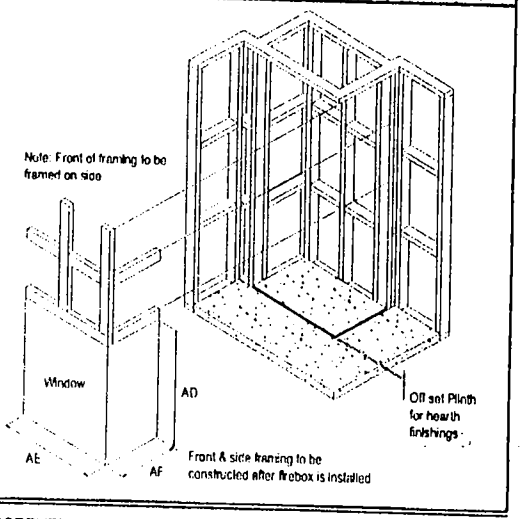
Plinth Position for Corner Install



Plan View of Heat Cell clearances (Alcove)



Framing Out Details (Alcove)



Note:

Centre Line of Flue is 'NOT' in Centre of Alcove

Note: Hearth and Plinth Construction.

For combustible flooring an insulating hearth and plinth of 75mm hebel is required.
Plinth to be off set above hearth by the hearth finishing's (e.g. tiles / granite / plaster / etc)

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Warmington

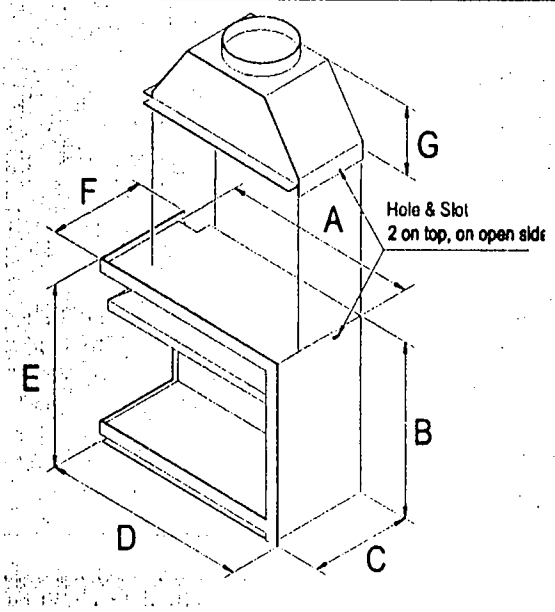
INDUSTRIES 1994 LTD

Corner Wood Open Fire
Right Hand

Flue & Fire to comply to - NZS 7421 : 1990 / ASNZS 2918 : 2001

Firebox and Adaptor

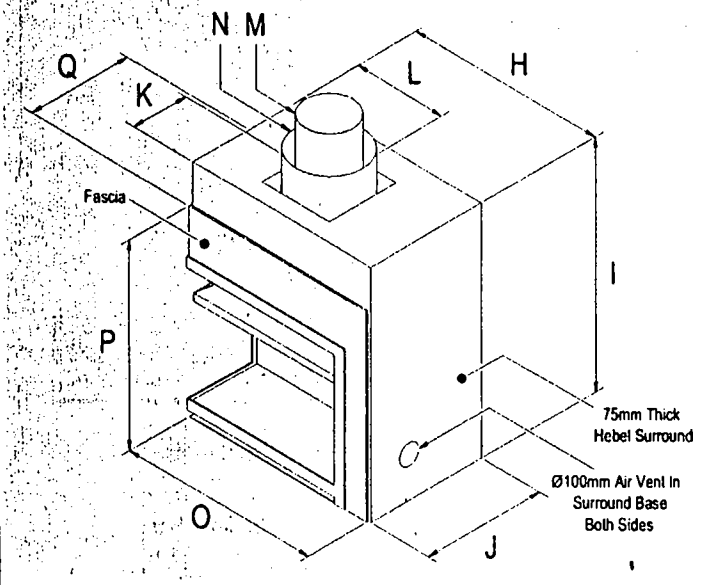
All dimensions in millimeters (mm)
All dimensions are minimums



Firebox		SI 780TC
Firebox Width	A	780
Firebox Height	B	680
Firebox Depth	C	400
Flange Front Width	D	805
Flange Height	E	705
Flange Side Width	F	380
Adaptor Height	G	260
Surround Width	H	925
Surround Height	I	1120
Surround Depth	J	585
Centre of Flue from front	K	280
Centre of flue from Side	L	450
Flue	M	250
Flue Liner	N	350
Fascia Front Width	O	910
Fascia Height	P	925
Fascia Side Width	Q	585
Heat Output		
Peak - Estimated		19
Range - Estimated		12-14

Minimum Flue Height	
Flue Height	3600
Measured From Top of Adaptor	B + G

Firebox with Heat Cell Cabinet



Check List	
Firebox	
Adaptor (Fastenings)	
Ash pan	
Badge	
Damper Handle	
Packed By	

Adaptor Fitting

Seal adaptor to firebox using high-temp gasket sealant. Bolt through holes provided.

Seismic restraint

Secure firebox through anchor positions provided.

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Warmington

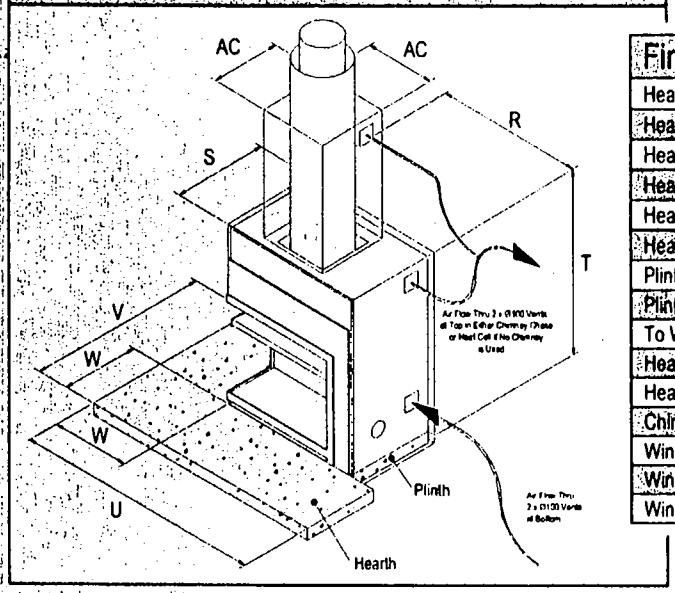
INDUSTRIES 1994 LTD

Flue & Fire to comply to - NZS 7421 : 1990 / ASNZS 2918 : 2001

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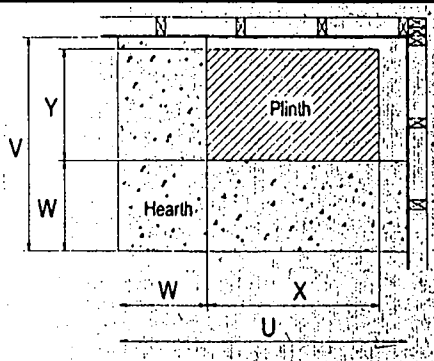
All dimensions in millimeters (mm)
All dimensions are minimums

View of Heat Cell clearances (Alcove)

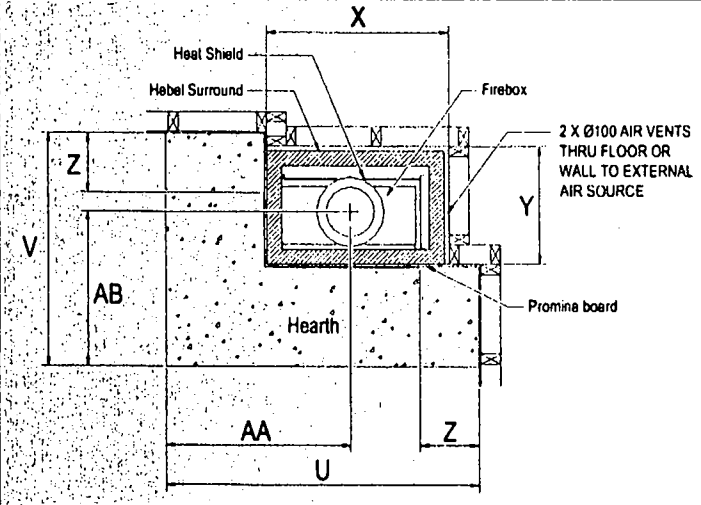


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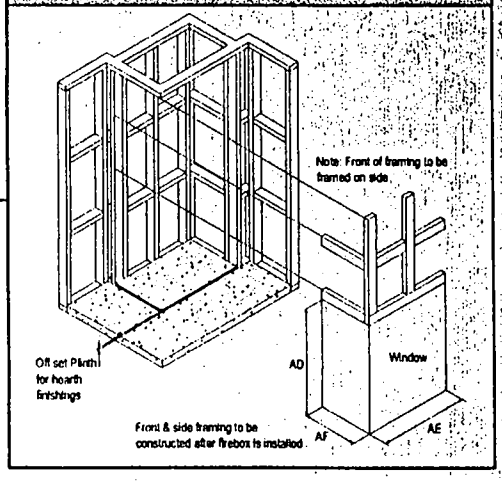
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Framing Out Details (Alcove)



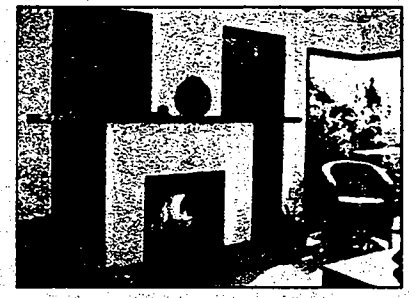
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For combustible flooring an insulating hearth and plinth of 75mm hebel is required.
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Q23
Family Room Fireplace

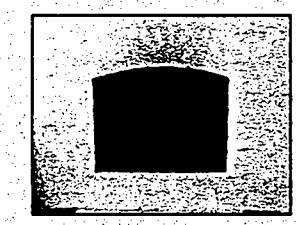
Everybody's idea of **Elegance**







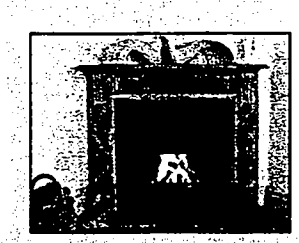
Jetmasters fit into existing fireplaces



1. Awaiting transformation

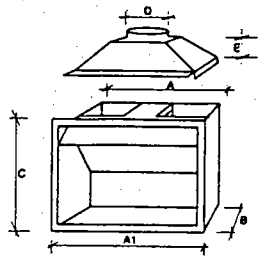


2. Select the right firebox to suit



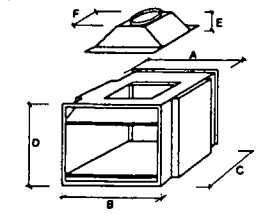
3. The installation complete

JETMASTER UNIVERSAL



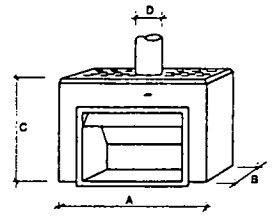
MODEL	A	A1	B	C	D	E	Heating Capacity Cu. Metres Wood	Gas
440	470	510	320	610	200	185	75	75
500	550	600	350	650	200	200	85	75
600	650	700	350	650	200	200	100	75
600 LOW	650	700	350	600	200	200	100	75
700 SH	750	800	350	650	200	200	130	75
700 SH LOW	750	800	350	600	200	200	130	75
700 D	750	800	400	700	225	200	160	
850	900	950	460	750	250	230	180	
850 LOW	900	950	460	700	250	230	180	
1050	1100	1150	510	800	300	250	220	

JETMASTER DOUBLE-SIDED



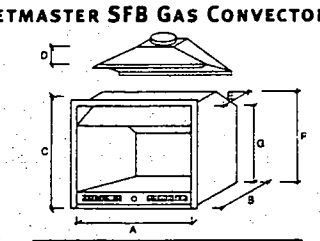
MODEL	A	B	C	D	E	F	Heating Capacity Cu. Metres Wood
700	850	800	610	700	220	345	180

JETMASTER FREESTANDING



MODEL	A	B	C	D	Heating Capacity Cu. Metres Wood	Gas
700SH	1050	390	810	200	180	80

JETMASTER SFB GAS CONVECTOR



MODEL		700
Frame Width	A	700
Box Width		730
Box Depth	B	295
Frame Height	C	650
Gather Height	D	200
Behind Frame	E	115
Box Height	F	630
Back Height	G	440
Flange To Flue ℄	Y	300
Flue Size		200
Heating Capacity (Cu.m)		85-100

Gas Connection (I.D.)	LPG 8mm Copper NG 12.5mm Copper
Gas Input LPG/NG	45/50 MJ/HR
Min. Flue Height	3.6 metres standard

All dimensions shown in millimetres.

THE FIREPLACE LTD

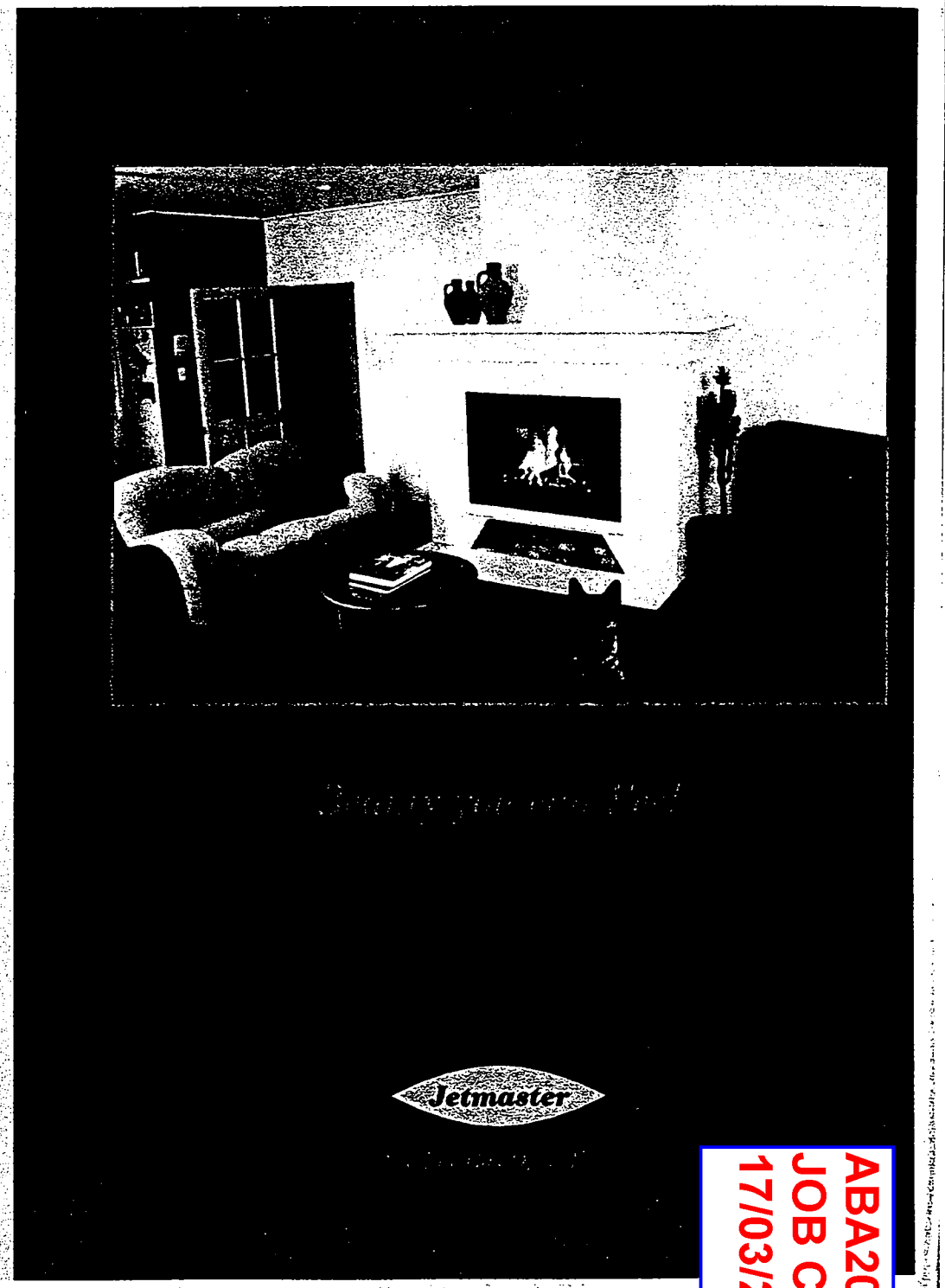
AUCKLAND
12 Tawari Street, Mt Eden
Telephone (09) 623 6990
Fax (09) 623 6994

WELLINGTON
133 Thorndon Quay
Telephone (04) 473 7207
Fax (04) 473 7213

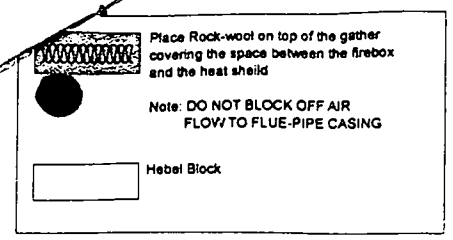
CHRISTCHURCH
54 Mandeville Street
Telephone (03) 348 8011
Fax (03) 348 8023

DUNEDIN
477 Princes Street
Telephone (03) 479 0041
Fax (03) 479 0042

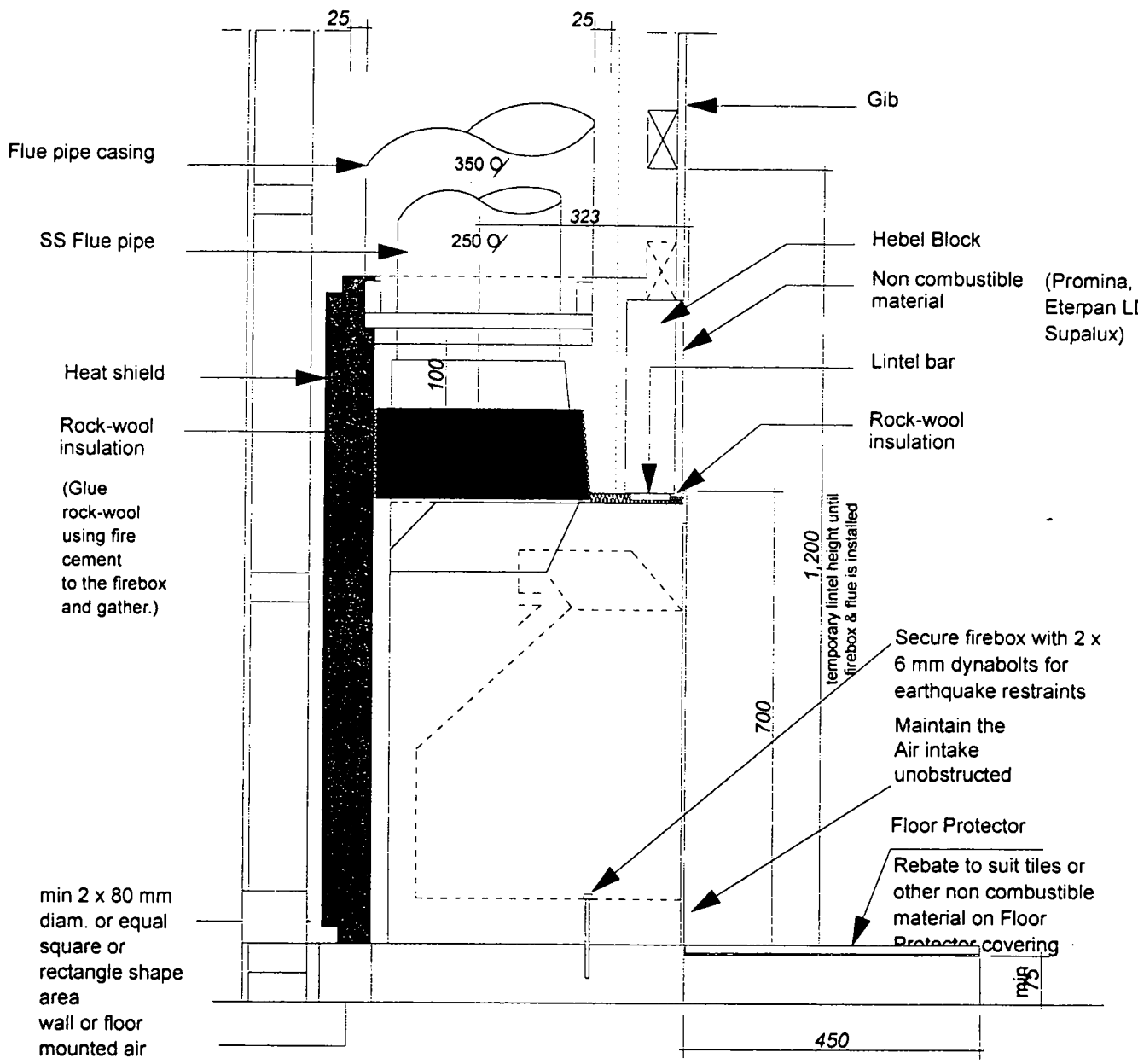
YOUR LOCAL JETMASTER DEALER



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min 25 mm. from flue pipe casing to combustible material



All external air vents & ceiling penetrations must be bird and rodent proofed with permanently fixed screen.

It is important to ensure the Jetmaster firebox is seated at the required finished Floor Protector level.

The Fireplace Ltd specifies that allowances must be made for Air Replacement Vents. Please refer to specific Installation Instructions.

Title: JM 850 Low installation into Timber Framing		Drg No:	WD01
Scale: 1:10	Drawn: AB		
Revision: JM850Lowtimva	Date: 16/08/2004		

The Fireplace Ltd

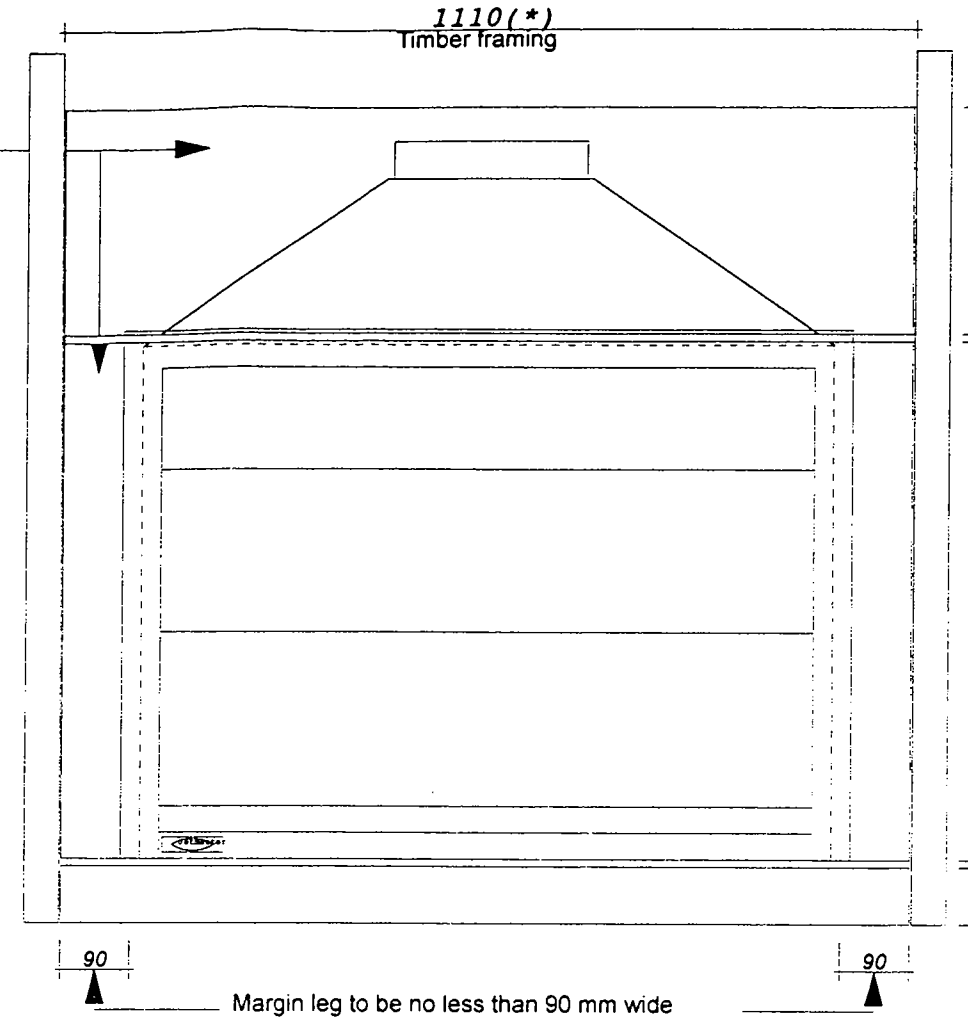
Barnes V5.pln; 0. Story: 1 : 10; 25/2/05 3:37 pm; 1/1

Non combustible material
(Promina, Eterpan LD, Supalux)

IMPORTANT

Where an internal wall board finish is required around the fireplace, ensure allowance is made to place non combustible internal wall lining (e.g. Promina, Eterpan LD, Supalux) to cover the extent of the Hebel Block surround.

Directly touching the firebox with any board or plaster will cause cracking from heat expansion.
Allow 2 mm minimum space away from the firebox.
Under no circumstance is the width of vertical margins legs to be less than 90 mm and the height of the margin lintel to be less than 300 mm.

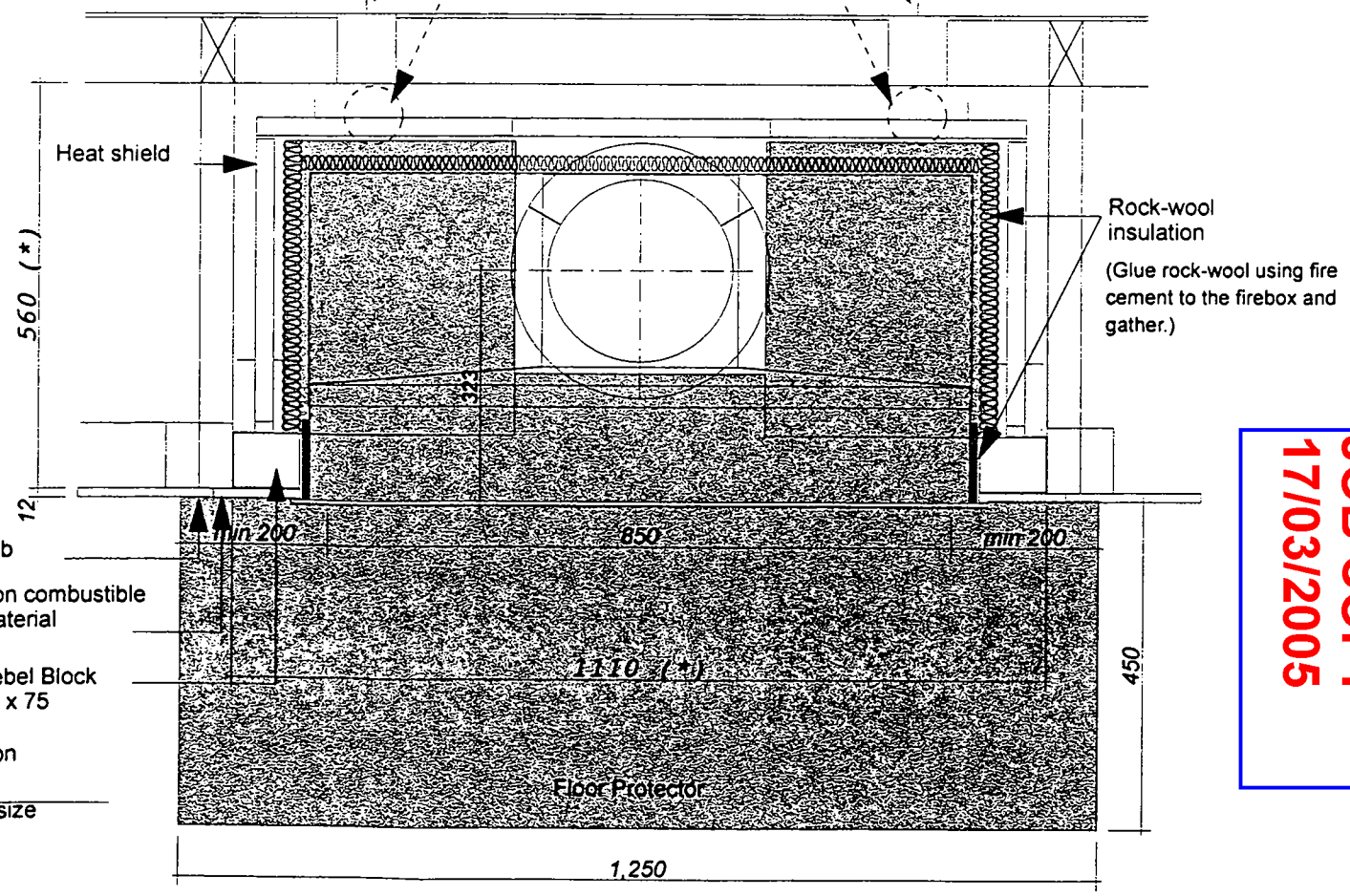


Bond Hebel Blocks together using appropriate adhesive (e.g. Gorilla Grip or similar) and secure with screws for added strength

Lintel bar

Ensure allowance made for firebox to sit on finished Floor Protector

min 2 x 80 mm diam. or equal square or rectangle shape area wall or floor mounted air vents.



(*) Please note that these dimension (Based on Hebel Block margins) are the absolute minimum size - widths and depths may be increased if desired.

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Matamata
New Zealand
Factory Road
Waharoa
New Zealand

Nu-Age Plaster

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Ph: 0800 4 NUAGE
Fax: +64 (7) 888 4328
Email: mike.james@nu-age.co.nz

Attn: Concept Builders

Marc Lucas has asked me to forward this information pertaining to the Nu-Lite Cladding Solution.

The councils have all up to date information on the systems as I gave it to them myself [illegible]

Any Further questions don't hesitate to call.

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Yours Truly,

Mike James

.....

Technical Administrator
Nu-Age Plaster

Nu-Age Plaster

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Version 4 Printed September 2004

Author
Mike James

Design Layout
Margaret Kennedy, Envision Design

Publisher
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Printed by
Kale Print, Tauranga

A special thanks to all who had a part in the compilation of this manual and corresponding literature pertaining to the Nu-therm, Nu-Lite and Nu-Solid Cladding Solutions.

For further information contact Nu-Age Plaster
0800 4NUAGE
www.nu-age.co.nz

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Nu-Age Plaster

Nu-Age Plaster is New Zealand's number one Dry Mortar supplier.
It was founded in 1995 for the express purpose of bringing
from Germany to New Zealand the worlds leading dry mortar products,
application technology and application techniques.

Nu-Age has spent nearly 10 years working with the top German firms:

- Researching the best ingredients and blends using the very latest computerised batching and mixing equipment to ensure that you get the best quality plaster every time.

- Searching out the best application technology. Nu-Age has distribution rights for the M-Tec range of plaster pumps and mixers, recognised throughout the world as setting the industry standard.

- Studying application techniques so that they can teach you how to get it right every time.

- Testing, experimenting and adapting their learnings to produce a package perfectly matched to New Zealand building techniques and climatic conditions.

Research shows that using Nu-Age Plaster products, application techniques and M-Tec application technology regularly reduces application time to about one quarter of that required for conventional techniques at higher levels of quality.

And if that's not enough, check out the after sales and technical back up services. You won't find better.

Nu-Age Plaster - endeavouring to find a better solution

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Nu-Age Plaster

Disclaimer

The information contained within this manual is solely to provide a general description and instructions for application for all Nu-Age Plaster cladding solutions when being applied to standard construction techniques in conjunction with the NZBC and all relevant NZ Standards. The focus of information pertains to the extensity of the scope as outlined in the manual for the individual Nu-Age Plaster Cladding Solutions. Users of any Nu-Age Plaster Cladding Solution are required to carry out their own investigations as to the specific requirements that the Cladding Solution is to be applied to. All information in this Technical Manual is believed to be accurate at the time of compilation. no warrantee or representation, express or implied(other than as may be implied by law) is made by Nu-Age Plaster Ltd as to its accuracy, reliability or completeness. Nu-Age Plaster reserves the right to modify and/or update information and details contained in this Technical Manual. The onus remains on the user of any Nu-Age Plaster Cladding Solution to ensure the most recent information available is followed. The most recent version of the Nu-Age Plaster Technical Manual and details are available from the website at www.nu-age.co.nz

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15 YEAR WARRANTEE

- Nu-Age Plaster Cladding Solutions have been designed, tested, appraised for New Zealand conditions.
- Over 3000 residential and commercial buildings in New Zealand have been clad with a Nu-Age Plaster Cladding Solution ranging from homes to high-rise apartments to commercial applications all with successful results across the board.
- A Telarc Q Base registered company Nu-Age Plaster follows strict guidelines in quality control to ensure consistently good product goes out the door every time.
- Nu-Age Plaster Cladding Solutions are only installed by Nu-Age Plaster Approved Applicators who have undergone specific training and quality control regimes to ensure you get the best job done.

Nu-Age Plaster is so confident in our Cladding Solutions we are prepared to offer a **15 year Manufacturers Warrantee** on all systems. For all these reasons and more choose Nu-Age Plaster Cladding Solutions and we'll Guarantee 'your peace of mind'

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Nulite
Cladding Solution

Introduction

Nu-Age Plasters Nu-Lite exterior cladding solution is a revolutionary new monolithic cladding offering a comprehensive range of solutions for the building industry. With smooth clean lines and the versatility to achieve complex shapes and features demanded by today's Architects and designers, Nu-lite cladding solution is the logical choice for your home, office or business to provide a light crack resistant, aesthetically pleasing weatherproof seal for your building.

Nu-Age Plaster is so confident in the Nu-Lite cladding solution they can offer a 15 Year Manufacturers Warrantee.

System Description

The Nu-lite cladding solution is a cavity based monolithic plaster cladding system installed over fibre cement substrate. A 10mm coat of polystyrene saturated polymer based plaster is applied to the substrate followed by a 2-3mm coat of Skim Coat with glass fibre mesh embedded, then finished with a 2-5mm finishing coat, providing either a grit sponge finish or undulating Adobe finish.

This system contains 4x4mm or 6x6mm reinforced alkali-resistant glass fibre mesh to enhance the strength and resist surface cracking of the plaster.
Nu-Lite is designed to be applied on residential to light commercial structures where domestic construction teqniques are applied.

An acrylic-based exterior paint system is required over the Nu-Lite finishing plasters to ensure weather tightness and give the desired finish colour.

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Nulite™
Cladding Solution

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Nulite™
Cladding Solution

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26. Nu-lite Weatherboard Corner Details
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28. Nu-lite Profile Transition Detail

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1. SCOPE AND LIMITATIONS

1.1. Scope

Nu-lite is a Monolithic Proprietary cladding system for use within the following scope:

- On residential and light commercial timber frame buildings.
- On buildings built within the scope limitations set out in NZS 3604 in regard to building height, number of storeys, shape and size.
- On buildings situated in NZS 3604 Building Wind Zones up to, and including 'Very High'.
- With aluminium and timber window and door joinery.
- With installation carried out only by Nu-Age Plaster Ltd approved applicators.

1.2 Site and Structural Requirements

All sites where buildings clad with Nu-Age Plaster Nu-lite are to comply with Acceptable Solution E1/AS1.
Clearances below floor level to finished ground are to comply with requirements of NZS 3604:1999
Foundation design to comply with requirements of NZS 3604:1999 or be designed and approved by Structural Engineer.
The Nu-lite system is to be fixed over H3.1 Timber Battens.
Timber framed buildings to be clad with Nu-lite are to be designed in accordance with NZS 3604:1999 or be designed and approved by a structural engineer.

1.3 Bracing

All bracing for structures must comply with NZS 3604:1999 or Designed and approved by structural engineer.

1.4 Wind Loading

Nu-lite is suitable for use in wind zones up to and including Very High (VH) as defined in NZS 3604:1999 in terms of performance relating to external moisture and structure.

2. BUILDING REGULATIONS

The Nu-lite System if used, designed, installed and maintained in accordance with the statements and specifications provided in this manual, will meet, or contribute to meeting the following provisions of the NZBC:

Clause B1 Structure
Performance B1.3.1, B1.3.2 and B.1.3.4 for the relevant physical conditions of B1.3.3.

Clause B2 Durability
Performance B2.3.1 (b), 15 years.

Clause E2 External Moisture
Performance E2.3.2.

Clause F2 Hazardous Building Materials
Performance F2.3.1. This product will not present a health hazard to people.

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3. NU-LITE DESIGN INFORMATION

Nu-lite will provide a seamless monolithic finish to the exterior of a building provided sensible design methods are followed.

As Nu-Lite is installed over fibre cement sheet substrate, the substrate manufacturer's instructions must be followed.

3.1 Large wall areas

Avoid large expanses of unbroken exterior wall. Windows, doors and feature components can be incorporated to hide imperfections, which will create a better finish.

3.2 Large Eaves and projecting trim

The addition of eaves dramatically reduces the effects on a buildings elements from sun, wind and rain which can contribute to damage of the exterior cladding. Protection of openings and intersections is recommended by Nu-Age Plaster to extend the lifespan of the cladding and to reduce the maintenance requirements of the cladding at these points.

3.3 Timber Framing - General

- Timber wall framing must be treated as required by NZS 3602 and 82/AS1.
- Studs must be at a maximum 600 mm centres.
- Dwangs/nogs must be at maximum 800 mm centres.
- All new timber framing must comply with NZS 3604: 1999 timber framed buildings or be to a specific structural design.
- Timber framing must have a moisture content of no more than 24% at the time of application of the plaster.
- Wall framing behind battens where substrate sheets are joined must be nominal 50 mm thickness (i.e. 45 mm minimum finished thickness).

3.4 Tolerances

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

3.5 Control Joints

- Horizontal and vertical control joints must be located over structural supports.
- Horizontal control joints in walls clad with Nu-lite must be provided at maximum 5 m vertical centres and at all mid-floor intersections.
- Vertical control joints in the Nu-lite system must be provided at intervals not exceeding 5.4 m in length, aligned with any control joint in the structural framing, where building frame movement is likely, or where the system abuts other construction.

NOTE:

Compressed cement manufacturers installation specifications including control joints to be followed at all times. Any statements made in this documentation that differ from the documentation from fibre cement sheet suppliers will result in fibre cement sheet documentation taken precedence.

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3.6 Sloping Surfaces

The slope of surfaces such as sills and parapets must be a minimum of 15° from the horizontal. Tops of sills, parapets and balustrades that are more than 250mm wide must have a minimum 30° slope.

3.7 Electrical Cables

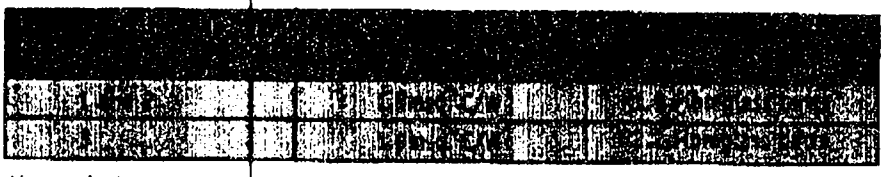
Cables penetrating the cladding system must be installed in conduits or ducts to ensure that any PVC sheathing does not come in contact with the cladding system.

3.8 Fire Protection

- Nu-lite must be separated from heating appliances, flues and chimneys, in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9 for the protection of combustible materials.
- The system is suitable for use as an external wall cladding system when restricted to:
  - Single storey buildings 1 m or more from the boundary for all purpose groups.
  - Buildings up to 7 m high, 1 m or more from the boundary, for all purpose groups other than SC and SD.
  - Fully sprinklered buildings up to 25 m high, 1 m or more from the boundary for all purpose groups other than SC, SD, SA and SR.
  - Buildings containing purpose group SH, with a building height less than 10 m and located 1 m or more from the boundary.

3.9 Insulation

The Nu-lite system alone does not meet NZBC Acceptable Solution E3/AS1. Additional wall insulation must be added as specified in the following table.



Alternatively, a specific thermal design may be carried out.

3.10 Impact Resistance

- Nu-lite has adequate resistance to hard and soft body impacts likely to occur in normal residential or light commercial use. Where a greater level of impact protection is required a heavier grade of mesh may be used.
- The likelihood of impact damage to the product when used in commercial situations must be considered at the design stage, and appropriate protection such as bollards or barriers provided in vulnerable areas.

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3.11 Minimum ground clearances

- At ground level, the bottom edge of the Nu-lite system must be kept clear of paved surfaces, such as footpaths and mowing strips, by a minimum of 100 mm and unpaved surfaces by 175 mm.
- The ground clearances to finished floor levels as set out in NZS 3604 must be adhered to at all times.
- At balcony, deck or low pitch roof/wall junctions, the bottom edge of the Nu-lite system must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 50 mm.

3.12 Handling and Storage

- Bags of plaster, coatings, and other materials or components must be kept dry and protected from damage, preferably stored off the floor on timber pallets or dunnage.
- Bags of Nu-Age Plaster must be used within the designated shelf life of six months from date of manufacture.

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4. NU-LITE UPVC COMPONENT RANGE

Starter Strips (LW-STARTER)



Nu-Age Plaster incorporates Nu-Lite Starter Strips into their Nu-lite system. These flashings are located at the base of the wall and cap the compressed cement sheets shielding the edge from the elements and providing screed guides for the applicators. This component sits on top of the cavity battens and is fixed through its back wall into the bottom plate of the wall framing.

Vermin Tray (VERMIN)



This uPVC flashing works in conjunction with the starter strips at the base of the wall. Fitted behind the fibre cement sheet the vermin tray acts as a barrier from the penetration of vermin into the drained and ventilated cavity created by the cladding system. This component is fixed through its back wall into the bottom plate prior to batten installation and is hidden as it sits 20mm above the base of the starter strip. The punchings in the vermin tray provide a ventilation opening area of 1000mm sq. per lineal metre of wall.

Jamb (LW-JAMB)



This component is fixed vertically over the fibre cement sheet up the side of the windows. This flashing is designed to clip into the aluminium window frame providing a weather barrier, preventing water from penetrating the building envelope at the jamb position.

Sill (LW-Sill)



This component is fixed horizontally over the fibre cement sheet along the bottom of the windows. This flashing is designed to clip into the aluminium window frame providing a weather barrier, preventing water from penetrating the building envelope at the sill position.

Control Joint(CONTROL 12)



As the Nu-lite system is installed over fibre cement sheets, the manufacturers specifications must be followed for control joint locations.
These control joints allow for shrinkage of the framing, expansion and contraction of the cladding substrate. These control joints are put in place to allow controlled movement of the cladding by allowing the rubber centre section of the control joint to flex laterally reducing surface cracking of the plaster.

Widra S.S Corner Bead



This stainless steel component sits on top of the fibre cement sheet at external corner positions and reinforces the plaster at these points from impact damage. The bead is adhered to the external corner with adhesive mortar or liteweight plaster and is set at 10mm allowing applicators to finish the liteweight base coat against the ribs while providing a straight edge to the corner.

Note: Text in brackets following component name refer to order description.
Utilise these component descriptions for ordering purposes.

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5. NU-LITE SYSTEM SPECIFICATIONS

5.1 Fibre Cement Sheet Substrate

Nu-Age Plaster accepts the following fibre cement sheet substrates for use with the Nu-Lite cladding solution.

- 4.5mm James Hardies Hardibacker
- 4.5mm CSR Stucco Backer sheet
- 4.5mm BGC Fibre Cement Durabacker
- 4.5mm Eterpan

5.2 Cavity Battens

Timber cavity battens are nominal 20 mm thick (minimum 18 mm) by 45 mm wide timber treated to H3.1.

5.3 uPVC Components

Refer to section 4.

Note: A 3mm gap must be maintained between face of fibre cement sheet and back face of aluminium joinery in order to install uPVC flashings.

5.4 Building Paper/Wrap

Building paper or wrap complying with NZBC Acceptable Solution E2/AS1 or NZS 3604, or other BRANZ Appraised breather-type membranes may be used with Nu-Lite.

Building wrap support - Polypropylene strap must be used where vertical batten spacing exceeds 300mm centres for securing the building wrap in place and preventing bulging of the bulk insulation into the drainage cavity.

Note: additional vertical battens may also be installed to provide support.

5.5 Plasters

Levelling Coat of Liteweight Plaster

A Portland Cement-based plaster, comprising of coarse sand, polystyrene beads and additives, supplied in 25kg bags. Nu-Lite can be trowel applied but for optimum results Nu-Age Plaster recommends pump application of a 10mm levelling coat of the product.

Reinforcing Coat of Skim Coat

A fine sand and cement-based plaster, supplied in 25 kg bags. It can be trowel applied but preferably spray applied in a 2-3 mm thick layer followed by embedment of fibreglass mesh reinforcement into the outside surface.

Finishing Coat of Adobe Finish

A sand, cement and lime based plaster, supplied in 25 kg bags. It is trowel applied to give a sculptured finish 3-5 mm in thickness.

Finishing Coat of Sponge Finish

A sand, cement and lime based plaster. supplied in 25 kg bags. It is trowel or spray-applied to a thickness of 2-3 mm.

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5.6 Reinforcing Mesh

Alkali-resistant fibreglass mesh supplied by Nu-Age Plaster must be used with the Nu-lite system. The fibreglass mesh is available in two grades:

4 x 4 mm Green Mesh (150 g/m2), 1200 mm x 50 m rolls
6 x 6 mm Blue Mesh (150 g/m2), 1200 mm x 50 m rolls

5.7 Fixings

Fixing of the fibre cement sheet substrate must be in accordance with the substrate sheet manufacturer's instructions.

Nom. 45x20mm Batten fixings to be min. 50mm in length to provide a 30mm penetration into substrate framing.

5.8 Flashing Tapes

Nu-Age Plaster accepts all BRANZ appraised flashing tapes for use with the Nu-lite system. The use of flashing tapes around openings, balcony abutments and parapets creates a secondary weather shield acting as a concealed barrier against water penetration through the building envelope.

5.9 Flexible Sealant

BRANZ Appraised flexible sealants must be used to seal control joints and openings, as and where required and stated in Nu-Age Plaster Technical Manuals.

5.10 Window and Door Trim Cavity Airseals

BRANZ Appraised self expanding, moisture cure polyurethane foam airseals suitable for this use must be used to create airseals at the interior face of the window and door joinery trim cavity.

5.11 Weather Protective Paint Coat

See Nu-Age Plaster Paint Specification Sheet

Application must be carried out in accordance with the paint manufacturer's instructions and must meet the performance requirements of the NZBC.

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6. INSTALLATION INSTRUCTIONS

6.1 Building paper/wrap

- Exterior timber framed walls to be wrapped with building paper/wrap and fixed in accordance with NZBC Clause E2 External Moisture.
- Polypropylene strap to be used where batten spacings exceed 300mm centres. See detail 1 of Nu-lite Technical Manual

6.2 Window Flashing Tapes

Prior to the installation of the cavity battens, proprietary flexible sill and jamb flashing tapes must be installed around the opening in accordance with the manufacturer's instructions.

6.3 Battens

- A continuous horizontal member can be fixed along the line of the soffit. Alternatively 100mm horizontal batten blocks can be used along the soffit line.
- Vertical members fixed over studs run up to horizontal members at soffit line and min. 30mm below finished floor level. Vertical battens at a maximum of 600mm centres.
- Horizontal packers 100mm long max. are installed on the dwangs, bottom plate, sill trimmers and lintels and where required for sheet fixing.
- Alternatively additional vertical battens may be used in place of horizontal batten blocks.
- At openings a continuous vertical batten must be installed and fixed with its edge hard against end of aluminium head flashing, providing a stop-end to the head flashing.
- Battens to be fixed to framing every 300mm max. This can be achieved using fibre cement sheet fixings. Battens may be tacked in place until fibre cement sheet is fitted and fixed through fibre cement sheet and batten combined. For fixing sizes see 5.7.
- If additional horizontal batten blocks are required to achieve fixing centres they may be introduced between vertical battens with a min. of 50mm clearance between end of 100mm max. batten block and any other member.

Note:
All battens to be nominal 20mm. Timber battens to be treated in accordance with NZS 3602. See Detail 1 of Nu-lite Technical manuals.

6.4 Compressed Cement Sheet

See manufacturers documentation for installation instructions.

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Quotation ... skylights, chimneys, flues and vents etc.

..."

Tags : ... "KB Longrun Corrugate" ex NZ Steel Ltd
Colours are as per the standard Colorsteel Endura Colour chart.
Colours required outside our standard colour range may incur a surcharge.
Roofing underlay will be laid Vertically with Iron not Horizontally.

6.5 uPVC Flashings

Vermin strip

- Vermin strip is to be installed along bottom edge of the vertical battens with back heel against timber bottom plate and the base covering the ends of the battens. Base of Vermin Strip to be installed min. 30mm below finished floor level. Vermin strip fixed to bottom plate through battens and at intermediate positions if required.

Starter Strip

- Starter Strip to be installed over top of battens at base of wall with its lowest point min. 50mm below finished floor level and fixed through the back heel at 300mm centres min.
- Height from finished ground level is to comply with NZS 3604:1999

6.6 Window flashings

Sill Flashing

- Measure window length and allow an additional 50mm flashing length each side of window.
- On top of the fibre cement sheet, force sill flashing up under window until the flashing return clips into the joinery groove.
- Fix sill flashing in place through back wall using staples, alternatively utilise fibre cement sheet fixings to fix through fibre cement sheet, batten and flashing combined.
- All joins in flashings are to be sealed and flashing taped where possible.

Jamb flashing

- Measure height of window and cut flashing allowing an additional 50mm in jamb flashing length.
- Remove the return clip and depth stop portion of the jamb flashing 50 from the top. This allows the jamb flashing to continue past the aluminium head flashing.
- Install jamb flashings on top of fibre cement sheet, overlapping sill flashing at bottom and with the flashing return clipped into the aluminium window joinery.
- Fix jamb flashings in place through back wall using staples, alternatively utilise fibre cement sheet fixings to fix through fibre cement sheet, batten and flashing combined.

Note:
Where a door opening occurs in an exterior wall, a junction between the jamb flashing and starter strip is required.

Head Flashing

- Install head flashing with back heel hard against timber framing and building paper/wrap. Ends of head flashing must finish against the vertical batten edge and uPVC jamb flashing.
- Flashing tape heel of head flashing to building paper/wrap.
- Run sealant bead along head-batten/jamb intersection.

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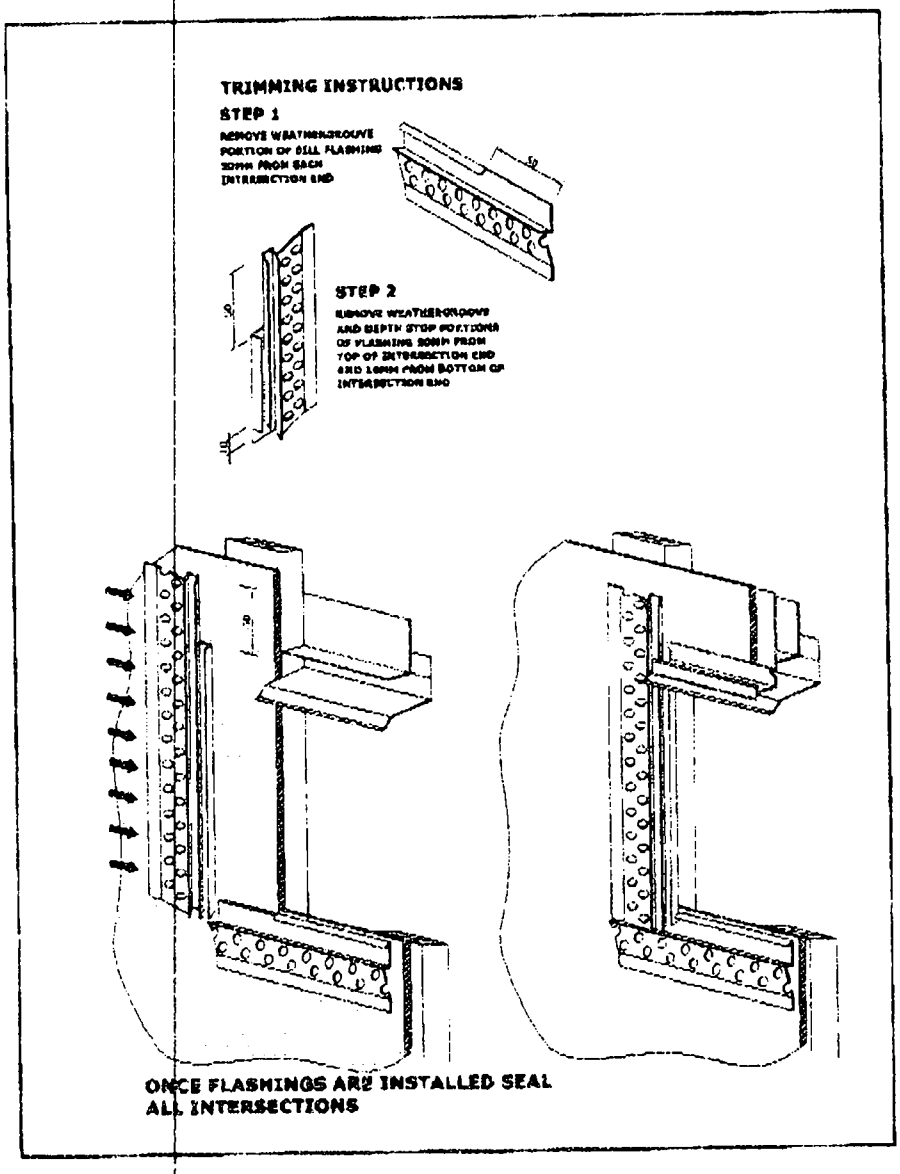


Diagram: Nu-lite Recessed Window Detail

Note:

Above windows, a vermin tray is required to cap base of battens and prohibit the entry of vermin.

See diagram.

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6.7 Stainless Steel Corner Beads

- Widra Stainless Steel corner beads are positioned on external corners to provide additional reinforcing of the plaster at these high risk impact points.
- The beads are cut to length and adhered to the external corner on top of the fibre cement sheet using adhesive mortar or liteweight plaster by dabbing the product through the bead and onto the wall 50mm from the top and approx. 500mm thereafter.
- Widra corner beads are set to protrude 10mm from adjacent wall planes and give the applicator screed guides for the liteweight levelling coat.
- 10mm screed guides may be glued on to assist in achieving required thicknesses at soffits and at base of the wall.

6.8 Kick-Out Flashings

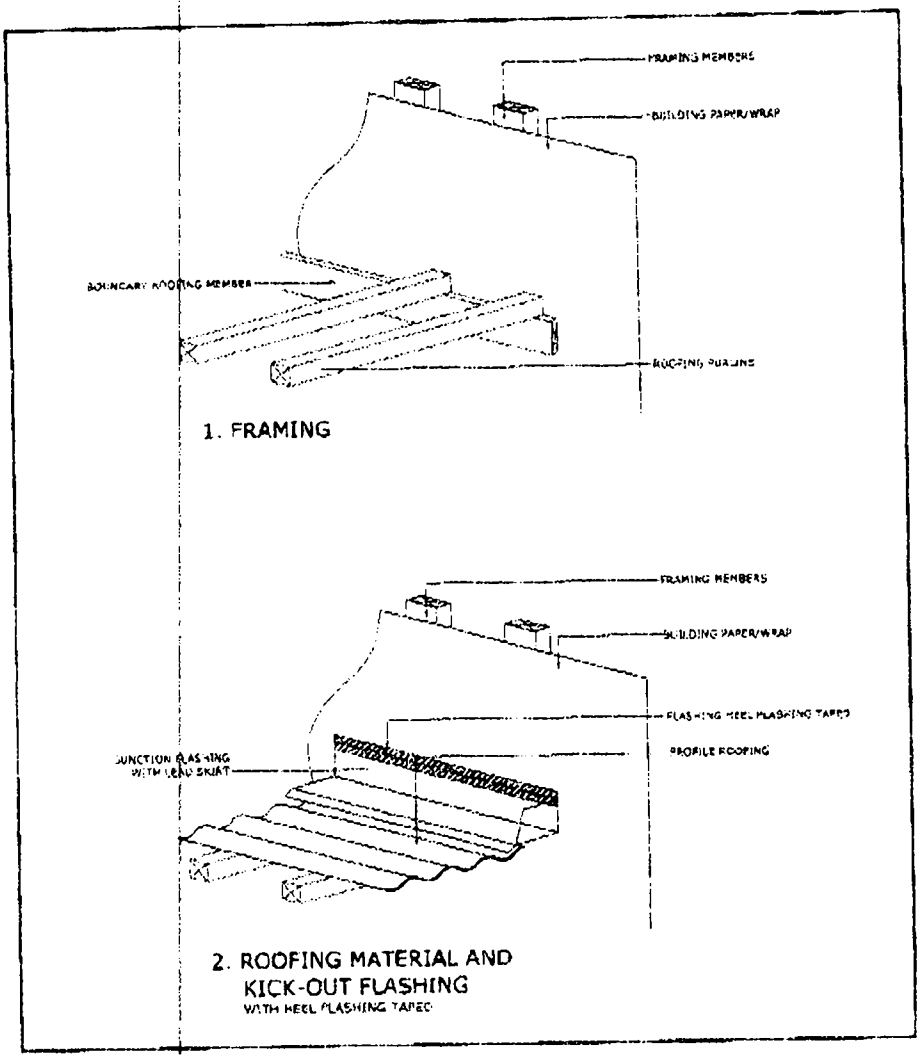


Diagram: Roof Kick-Out 1-2

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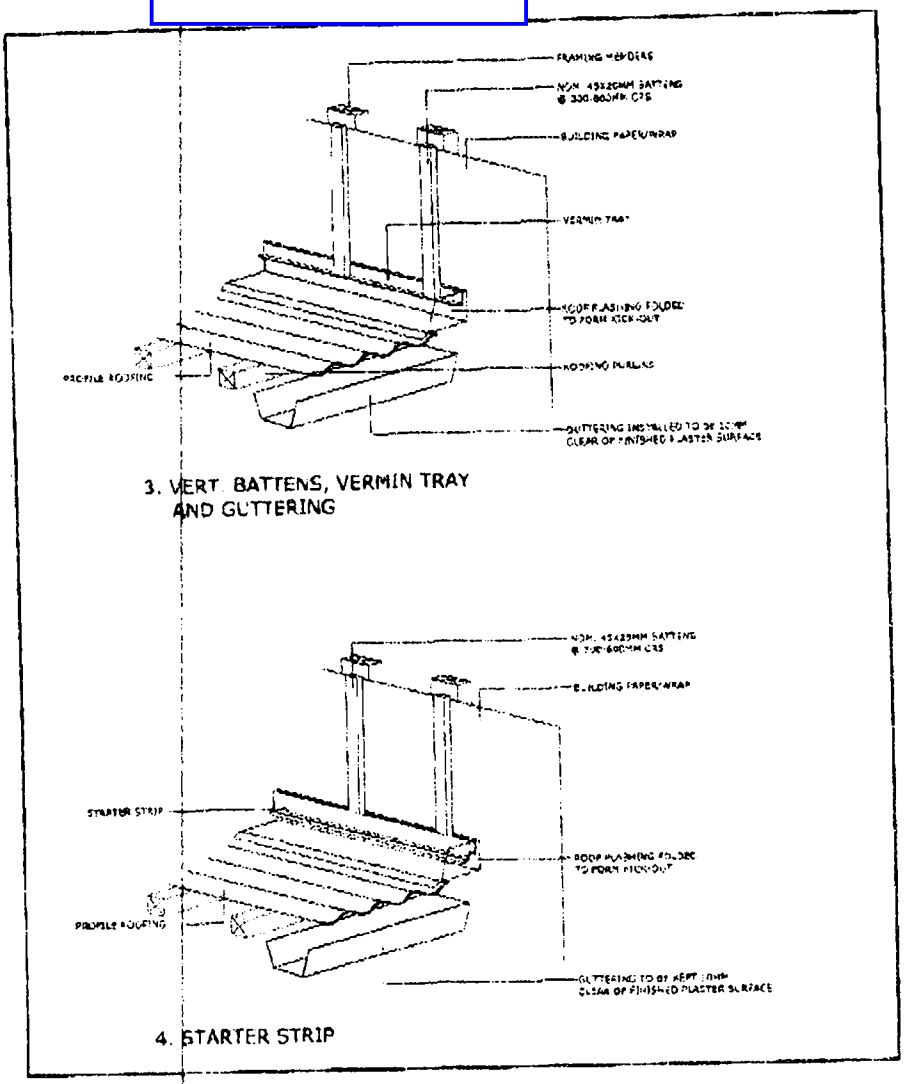


Diagram: Roof Kick-Out 3-4

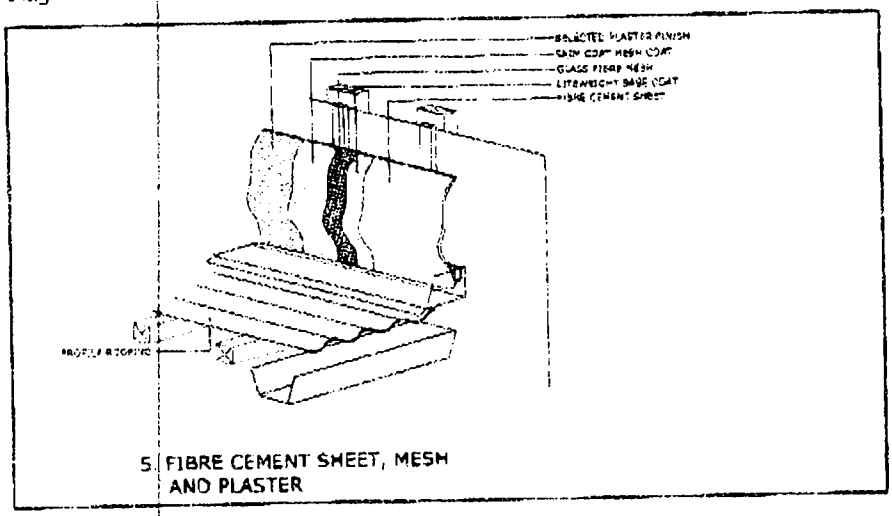


Diagram: Roof Kick-Out 5

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6.9 Mesh Layout

- Mesh can be run vertically or horizontally depending on size and shape of wall to be meshed.
- All laps in mesh to be 100mm min.
- Detail soft mesh to be installed on window sills and jambs (double on sills).
- 300x200mm mesh butterflies to be place on all external corners around openings and penetrations.

See detail 20 of Nu-lite Technical manual.

Note:
Do not run mesh over Control Joints.

6.10 Plaster

The Nu-Lite System is a 14-17mm thick cladding solution comprising of the following:

Levelling Coat of Liteweight Plaster
Liteweight Plaster can be trowel applied but for optimum results Nu-Age Plaster recommends pump application of nom. 10mm levelling coat of the product.

Reinforcement Coat of Skim Coat
This coat is 2-3mm thick and is spray pumped onto the wall or applied by trowel. Glass fibre mesh is imbedded into the outside surface of this coat.

Finishing Coat of Adobe Finish
A polymer modified Cement and Lime based plaster with additives this finish is applied 3-5mm thick and sculpted with a bull nosed trowel to achieve an undulating finish.

Finishing Coat of Sponge Finish
A polymer modified Cement and Lime base with additives this finish coat is applied 2-3mm thick by spray pump or trowel. The 1mm sponge is then hard floated to achieve a mosaic finish. The 2mm sponge is hard floated then sponged to achieve a sandy grit finish.

A Weather Protective Paint coat
See Nu-Age Plaster Paint Specification Sheet

Preparation Prior to application of plaster

- All external corners must be reinforced with Widra Stainless Steel corner beads and fixed to the substrate with Liteweight plaster.
- Wall plane should be checked with a straight edge and should comply with the tolerances set out on 3.4.
- All uPVC flashings should me coated with Flashing primer/Key Coat.

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Preparation Prior to application of plaster (continued)

- All external joinery must be fixed in place with flashings installed and sealant applied to all intersections where required.
- Wipe surface of all aluminium joinery with an appropriate product prior to application to ensure good adherence of sealants.
- Masking tape must be used to protect all joinery, soffit linings, guttering etc which may be subject to splashing and overspray.
- The surface of all fibre cement sheet must be clean, dry and free of dust (eg. Concrete cutting residues), laitance, release oils and soil before the application of plaster.
- If corners are to be rounded then EPS screed guides may be used to ensure correct thickness is applied.
- If EPS screed guides are used and left in place after plaster has been applied a Skim Coat containing mesh reinforcement must be applied.

Note:

Plastering should not take place when outside temperatures are or are considered to be within the next 24 hours outside the temperature range of 5-35°C.

Mixing of Plaster

- Nu-Age Plaster products are supplied in 25kg bags and must be mixed with clean fresh water.
- Mixing, if by hand must be carried out in accordance with NZS 4251 Clause 2.4.3.4 however machine mixing is recommended to produce a more consistent quality mix.
- Mixing must be carried out in accordance with the instructions on the back of each bag, together with those of the mixing machine manufacturer.
- All tools and mixing equipment to be washed cleaned frequently.

Application of Plaster – General

- Application must be carried out in accordance with the instruction on the back of each bag. All Nu-lite plasters may be trowel applied but machine application is recommended to give better quality results.
- Any plaster not used within one hour of mixing must be discarded.
- Plaster must be applied only if the air temperature is between 5°C and 35°C at the time of application and is likely to remain so for the 24 hours following the application. Plaster should be applied on the shady side of the building following the path of the sun. If this is not possible shade cloths must be used.
- Plaster surfaces must be protected from rain and hot drying winds for at least 24 hours following application.
- Each plaster coat must be cured in accordance with the instructions on the back of each bag, prior to the application of the next plaster coat. A controlled rate of drying is required to prevent cracking of the plaster.
- Fibreglass reinforcing mesh must not bridge control or expansion joints.
- Mesh "Butterflies" must be applied at corners of openings e.g. windows and doors. In addition to the full reinforcement mesh coat.

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Application of Plaster – General (continued)

- Following the commencement of plaster application it is essential that no vibration (e.g. nailing of internal linings) be permitted to the substrates supporting the plaster until at least seven days following application of the plaster.

Levelling Coat of Liteweight Plaster

- The Liteweight Plaster coat is applied directly onto the fibre cement sheet preferably pumped then screeded using an 'H' aluminium straight edge 1.2-2m long to a thickness of 11-12mm. Applying the liteweight levelling coat thicker than screed guides gives you a surface to cut back into a flat plane.
- Cutting back of the plaster can be done after sufficient drying has taken place using an aluminium trapeze edge 1.5-2m long.
- Carefully expose the stainless steel beads (or screed rails) using a grid plane then lightly run the grid plane over wall area taking care not to dig holes in fresh plaster. Complete the levelling with a trapezium, straight edge checking for straightness horizontally and vertically.
- One 25kg bag of Liteweight Plaster will cover an area of approximately 2msq. at a thickness of 10mm.
- Liteweight Plaster must be protected from rain for the first 24 hours and from hot drying winds and direct sun for the first 16 hours to aid curing.
- Follow instructions on back of the bag for curing times.

Reinforcing Coat of Skim Coat

- Skim Coat is applied approximately 3-5mm thick over the Liteweight Plaster levelling coat, fibre glass mesh is trowelled into this coat bedding the mesh, to ensure the mesh is fully encapsulated an additional skim coat may be required.
- A 25 kg bag of Skim Coat at a thickness of 2-3mm will cover approximately 5msq .
- Skim Coat must be protected from rain for the first 24 hours and from hot drying winds and direct sun for the first 16 hours to aid curing.
- Follow instructions on back of the bag for curing times.

Finishing Coats

These consist of:

- 1mm Finish
- 2mm Finish
- Adobe Finish

Applying 1mm finish

- This is done by applying the plaster over a determined set area.
- The plaster is lightly trowelled tight to the wall.
- A hard plastic float is then used to achieve a random or drag finish
- Alternatively a sponge can be used to finish the wall.
- A 25 kg bag of 1mm Sponge Finish at a thickness of 2-3mm will cover approximately 10msq .

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Applying 2mm Finish

- This is done by applying the plaster over a determined set area.
- The plaster is lightly trowelled tight to the wall.
- A sponge is then used to achieve a textured, sandy finish
- A 25 kg bag of 2mm Sponge Finish at a thickness of 2-3mm will cover approximately 6-7msq.
- All finisnes must be protected from rain for the first 24 hours and from hot drying winds and direct sun for the first 16 hours to aid curing.
- Follow instructions on back of the bag for curing times.

Applying Adobe Finish

- Adobe finish is applied over Skim Coat and used to create a variety of sculptured finishes. Application can be done by two methods

The first method:

- applying the Adobe over a determined set area at 3-5mm.
- then a trowel is used to create a sculptured trowel finish.

The second method:

- Utilise the same procedure as above, then use a sponge to create a textured sandy effect.

- A 25 kg bag of Adobe at a thickness of 3-5mm will cover approximately 3-4msq.
- All finishes must be protected from rain for the first 24 hours and from hot drying winds and direct sun for the first 16 hours to aid curing.
- Follow instructions on back of the bag for curing times.

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7. AREAS WHERE ADDITIONAL CARE IS REQUIRED

7.1 Windows

- Ensure the flashing tape is correctly installed as per manufacturer's instruction with no creases or gaps and is properly adhered to building paper/wrap.
- Ensure the uPVC window flashings are correctly installed, as per Section 6.6, and seal all intersections with an appropriate sealant.
- Check the window installer has installed a PEF rod and air seal around the internal face of the trim cavity.
- Check the window manufacturer has made the aluminium head flashing to suit the cavity size. The aluminium head flashing must sit back against the wall framing and flashing taped or a second layer of building paper/wrap must be installed over the upstand as per the specifications.
- Ensure a 3mm gap is maintained between face of fibre cement sheet and back face of aluminium joinery in order to install uPVC flashings.

7.2 Parapets/Balustrades

- All parapets and balustrades are to be sealed with flashing tape prior to plastering. Flexible flashing tapes to be used at intersections and change of direction, along majority of capped parapet, heavy duty polythene sheet may be used and installed over top and 50mm down sides. Tape laps. See detail 10.
- Parapets/balustrades which are exposed to the weather on both sides are to be constructed with H3.1 treated framing members.
- Parapets and balustrades must be protected with a metal parapet cap fixed through the sides. The metal parapet cap must provide min. 50mm cover down sides for low and medium wind zones and min. 70mm for high and very high wind zones. See details 8 and 9 of Nu-lite Technical Manual.
- Nu-age Plaster strongly recommends the use of metal capping to all parapets and balustrades. If plastered parapets/balustrades are required additional specifications and details are available from Nu-age Plaster.

7.3 Roofs

- At inter-storey roofs ensure the apron flashing extends a minimum of 100mm above the base of the foot flashings.

7.4 Intersection with other claddings

- Special care is required at junctions with other claddings. The accurate design of these junctions is critical to prohibit water from entering the building envelope. Guidance is given in the Nu-lite Technical Manuals for some cases. See details 21-28. These intersection details are for guidance only. These details and any others not shown in this manual are the responsibility of the building designer.

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7.5 Damage to cladding system

- Any damage or cracking of the cladding system will require immediate attention and repair in order to prohibit water entry.
- Damage to the paint coating system will provide a point of vulnerability to the cladding system and must be repaired immediately to avoid further damage.

7.6 Penetrations

- Any pipe, electrical or other penetrations must be sealed with flashing tape before cladding. In all cases conduit pipe should be installed to protect and seal penetrations through the cladding. See Detail 16 and 17 of Nu-lite Technical Manual.

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8. RESPONSIBILITIES

This section outlines the individual responsibilities throughout each stage of the cladding process and clarifies stages where inspections must be made to ensure roles have been fulfilled and workmanship remains of a high standard.

8.1 Designer

- Responsible for the building design.
- Contact Nu-Age Plaster for any updated details to the Nu-lite system.
- Inform window manufacturers of the window and door reveal dimensions.
- Inform window manufacturers of correct head flashing dimensions (the head flashing must extend across the cavity and sit against the wall framing not on top of the batten).

8.2 Builder

- Ensure walls are straight and true, braced and fixed appropriately.
- Install building paper/wrap ensuring the bottom edge of the wrap overhangs the bottom plate by min. 50 mm.
- Ensure all laps in building paper/wrap are minimum 200mm and are lapped to shed water down the cavity.
- Install flexible jamb and sill flashing tapes.
- Fix Polypropylene strapping vertically between the studs if span exceed 300mm. This strapping helps prevent the cavity from being closed off during the installation of insulation into the wall framing cavity.
- Where waterproofing agents are required (e.g. edges of concrete foundations etc), ensure the surface is coated with an appropriate product.
- Where lead flashings are used (at inter-storey roofs etc), planing of the timber studs may be required to recess the lead flashings to reduce the build-up of flashing thickness. (If the lead flashings are not recessed, the lead thickness can cause the base of the wall to bow out).

8.3 Batten Installer /Fibre cement sheet fixer

- At the base of the wall, ensure the bottom of the cavity battens are a minimum 30 mm below the bottom plate.
- Ensure horizontal packers are 100 mm maximum installed only where required for sheet fixing.
- Ensure the vermin strip and starter strips are fixed to the bottom plate.
- Joins and intersections in uPVC flashings are to be sealed with an appropriate flexible sealant.
- Ensure all vertical joints in fibre cement sheet are made over a vertical batten.
- Ensure battens are correctly installed at control joints and no fixing of fibre cement sheet is made to the inter-storey structure.
- Ensure flashings are installed according to Nu-lite detailed drawings and Technical Documentation.
- Ensure fibre cement sheet is installed as per manufacturer's instructions.

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Cladding Solution

8.4 Applicator

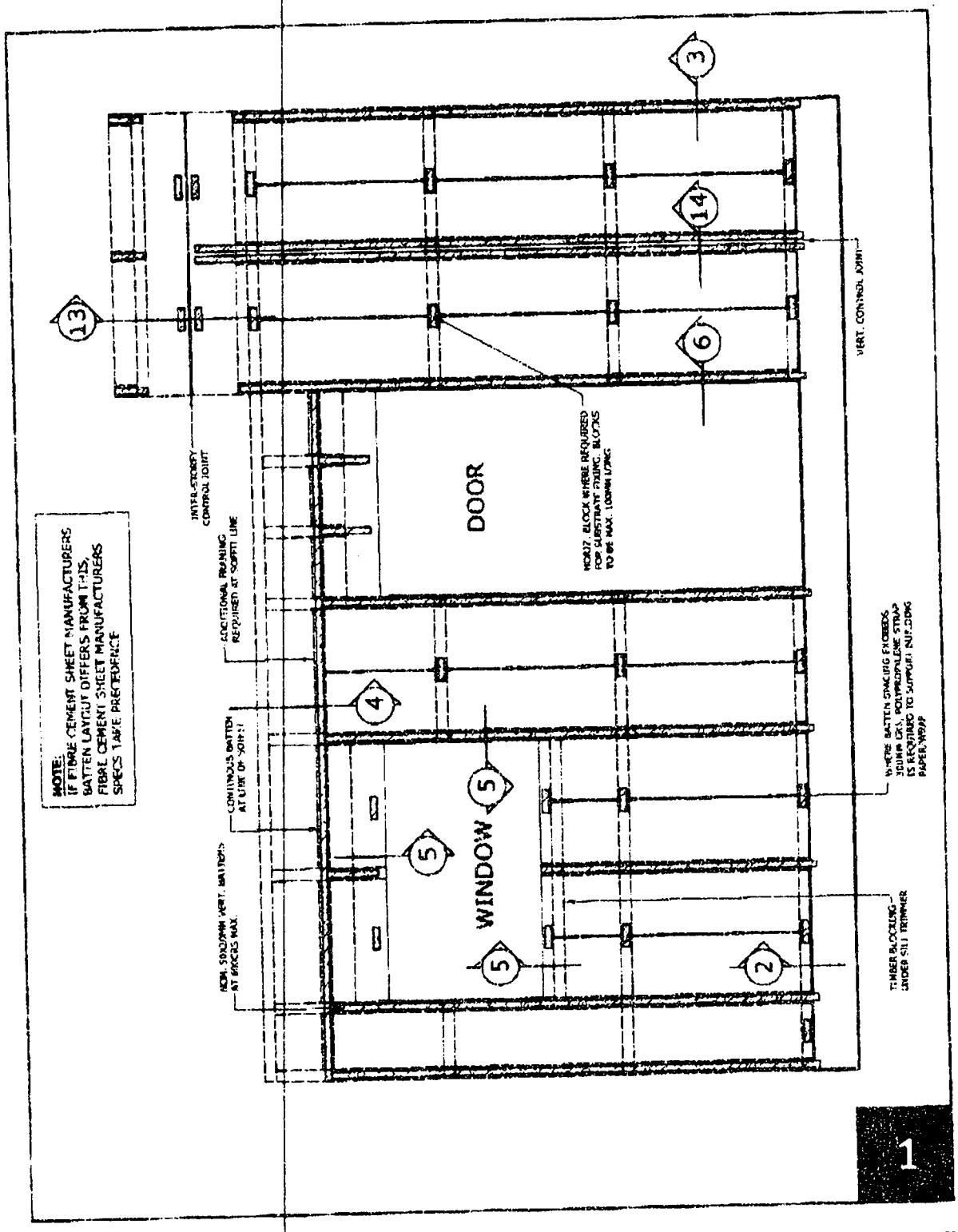
- Ensure plaster coats are applied to the correct thicknesses as stated in the Nu-lite technical manuals.
- Ensure mesh is applied at the appropriate stage and laps are minimum 100mm.
- Apply finishing coats as per the Nu-Age Plaster specifications.
- Ensure the plaster is adequately cured as per Nu-Age specifications
- Dispose of empty plaster bags correctly.

8.5 Paint Applicator

- Ensure the paint system being applied is consistent with the Nu-Age Plaster specifications.
- Ensure plaster system has undergone the adequate curing and drying period before applying paint finish.
- Gently brush down finished plastered areas with soft bristled broom to remove any loose particles before painting.
- Apply the paint system in accordance with the manufacturers instructions.

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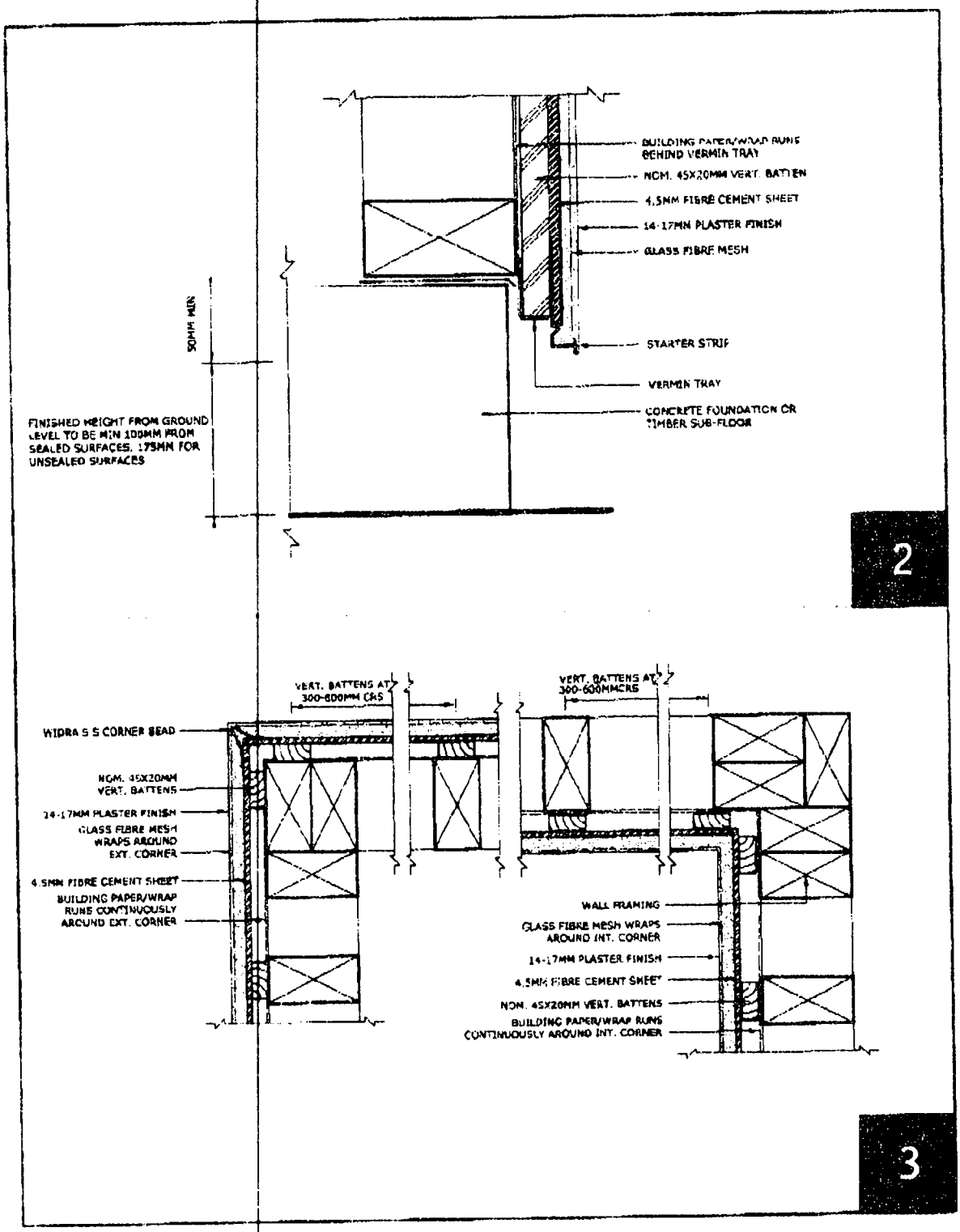


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FILE NAME: BATTEN LAYOUT

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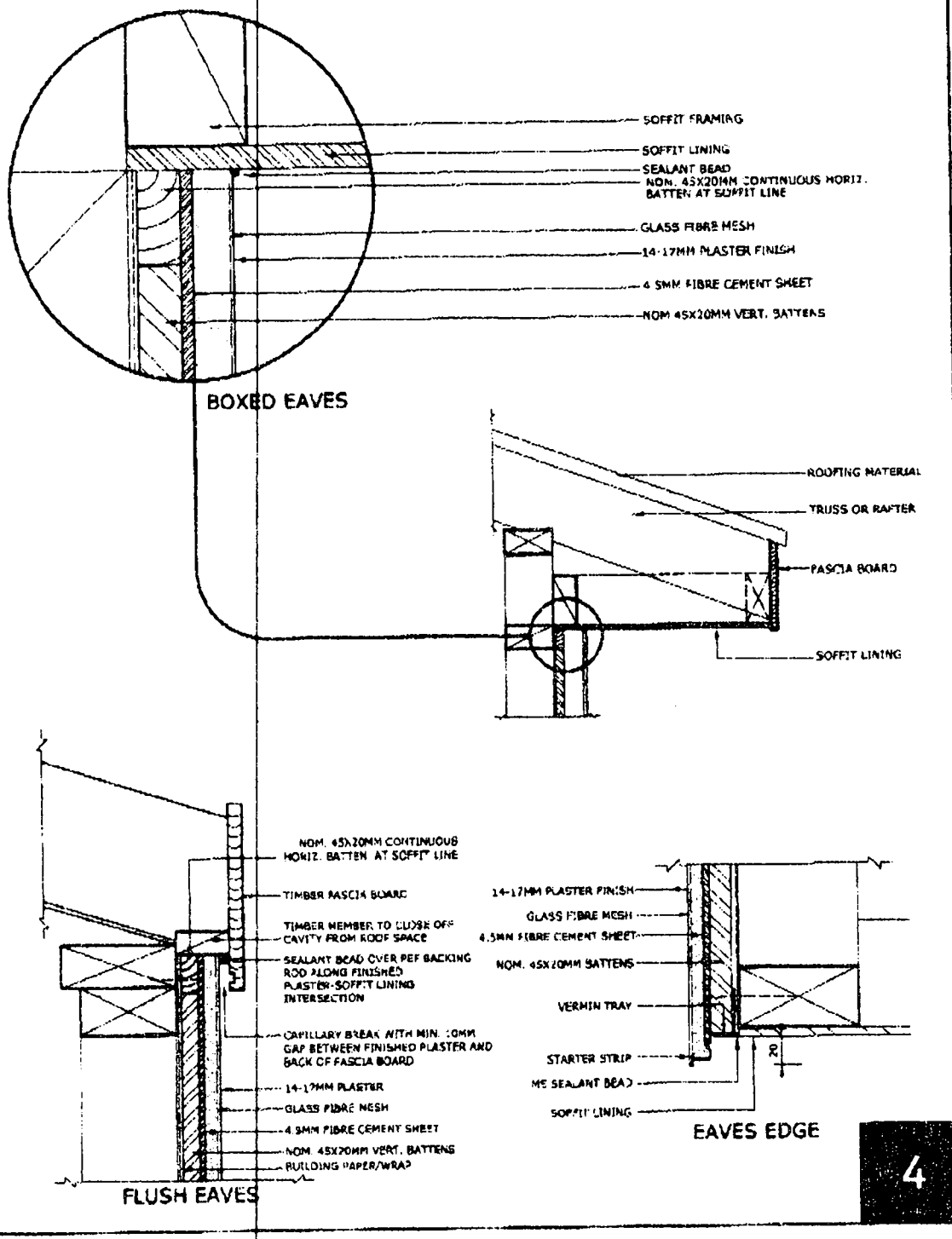
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FILE NAME: **BASE & CORNER DETAILS**

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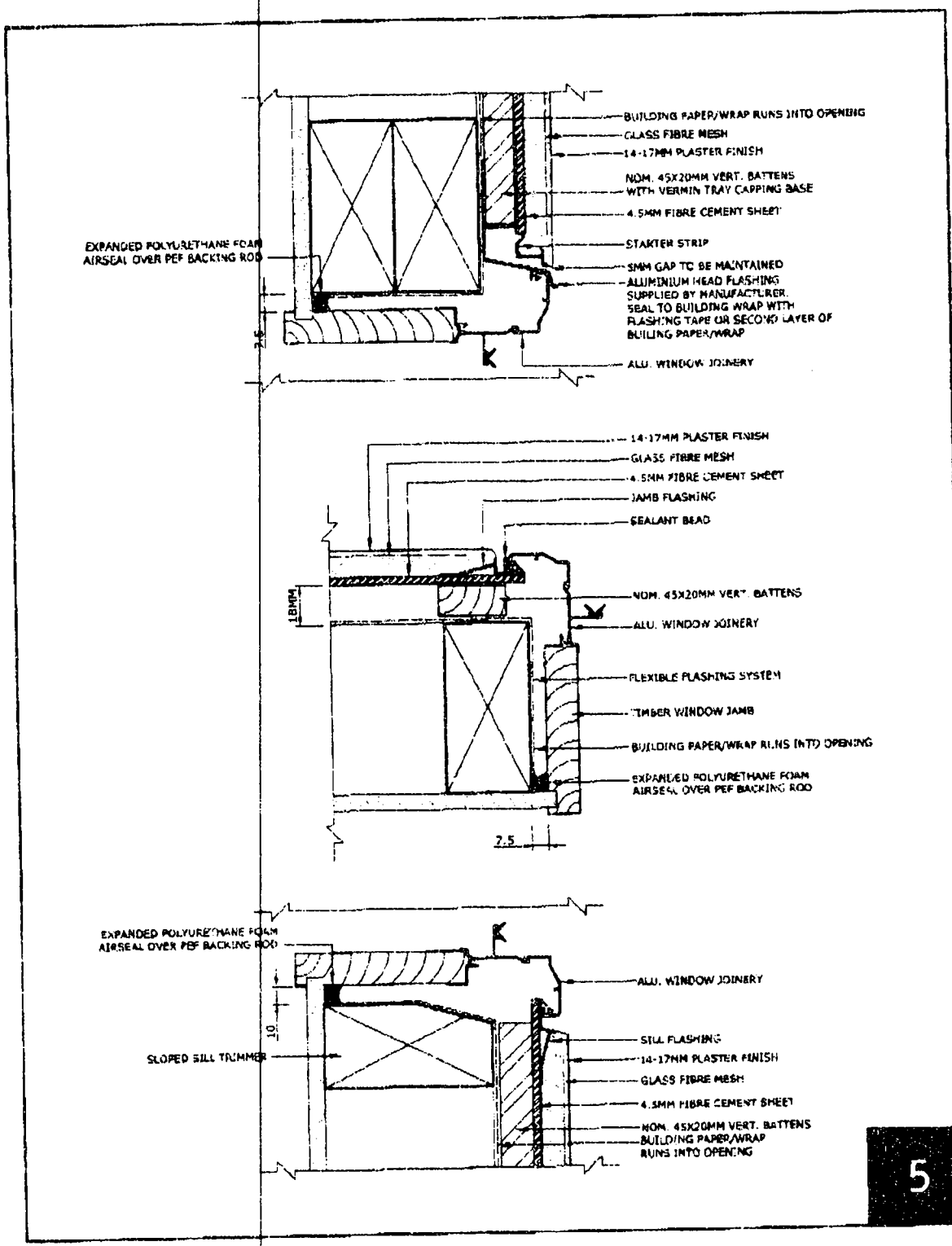
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FILE NAME: **EAVES DETAILS**

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Cladding Solution

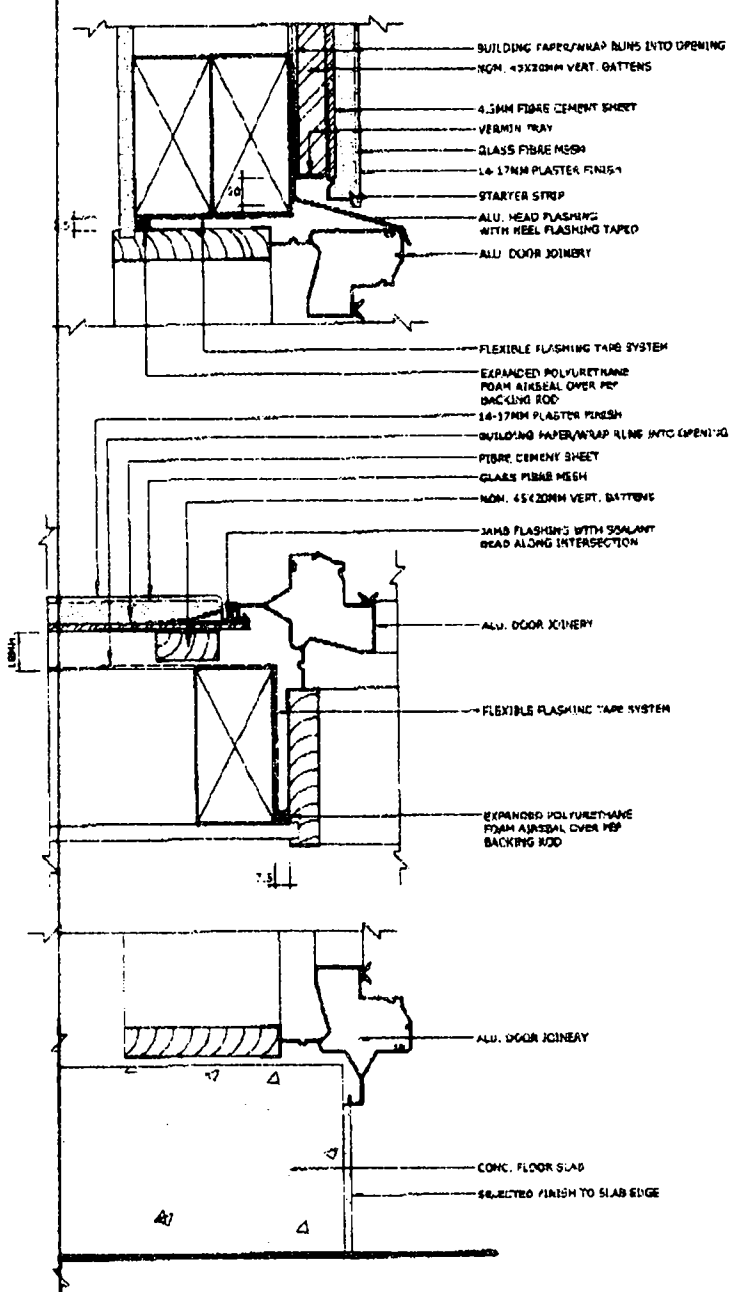


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FILE NAME: FLUSH WINDOW DETAILS

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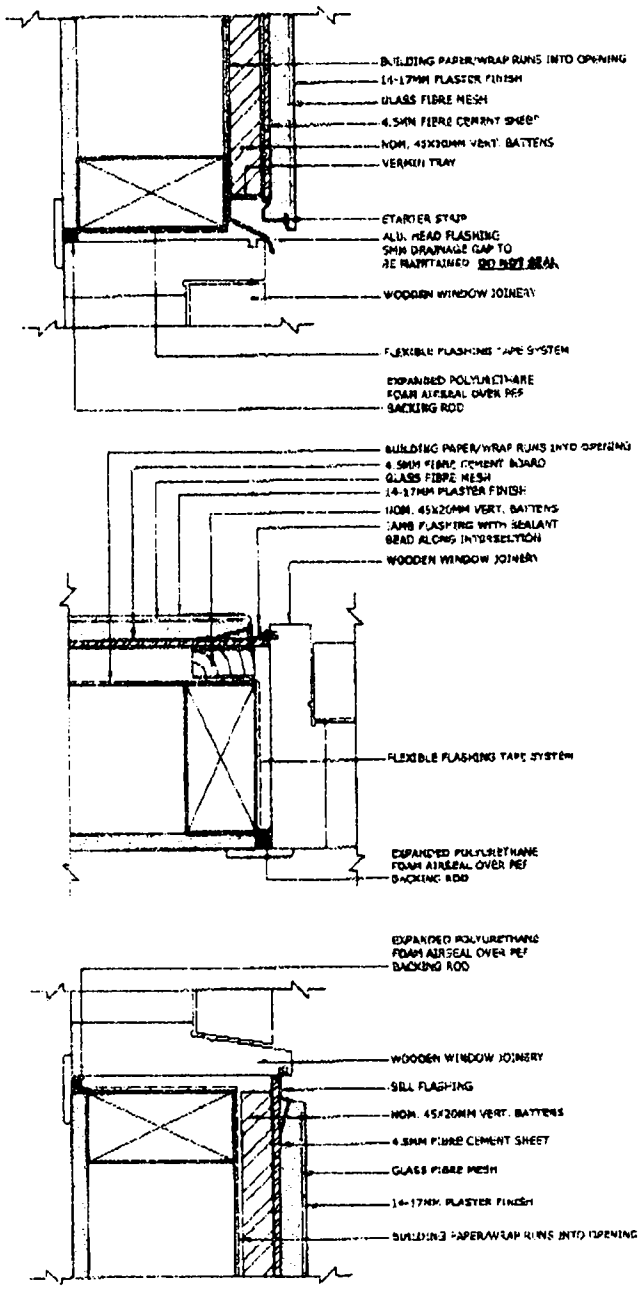


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FILE NAME: **NU-LITE ALUMINIUM DOOR DETAILS**

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Cladding Solution



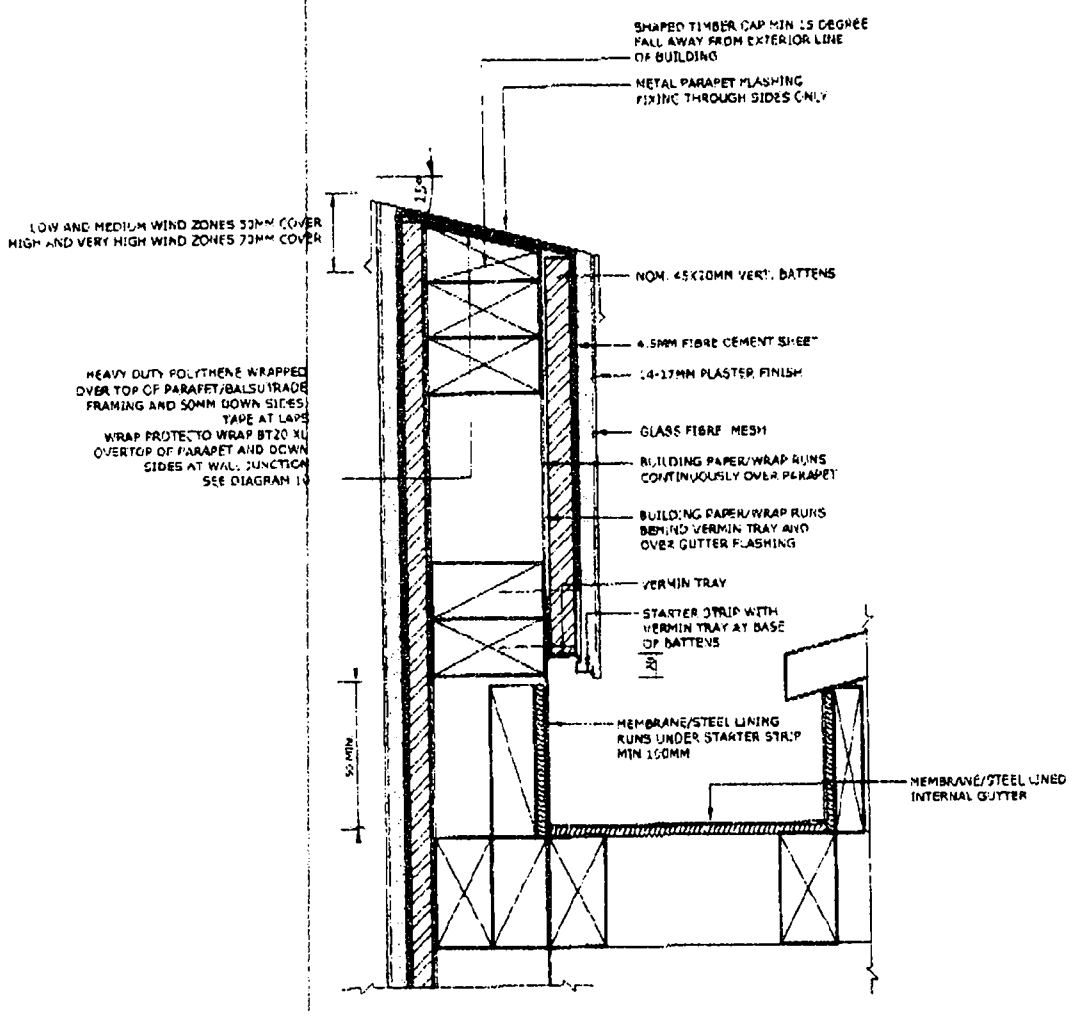
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FILE NAME: NU-LITE WOODEN JOINERY DETAILS

Nu-Age Plaster Version 4

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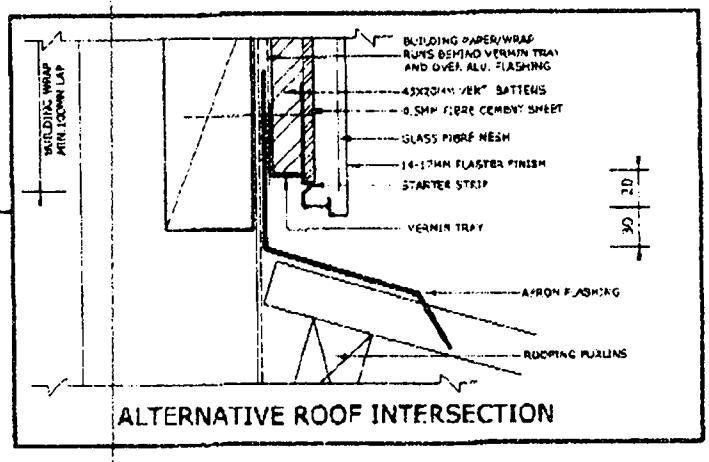


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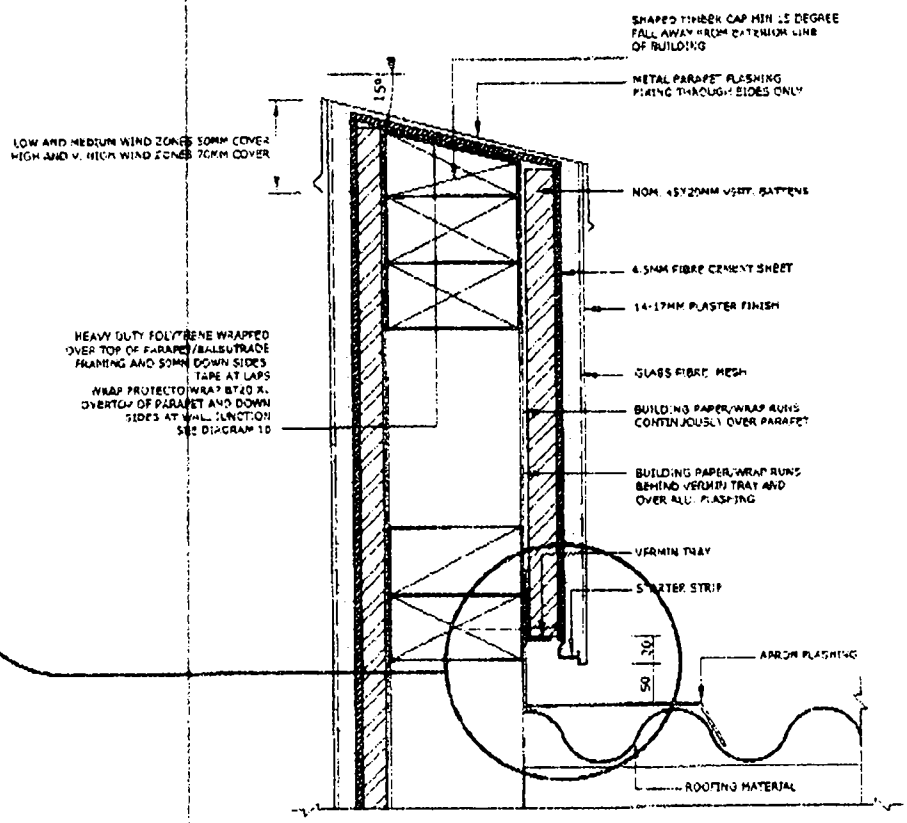
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ALTERNATIVE ROOF INTERSECTION

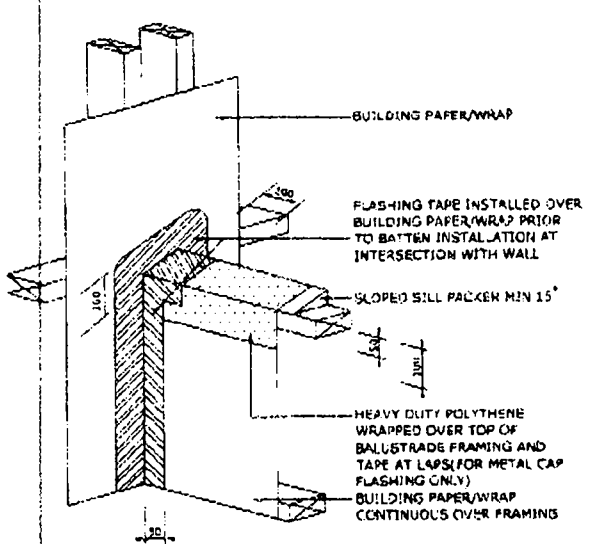


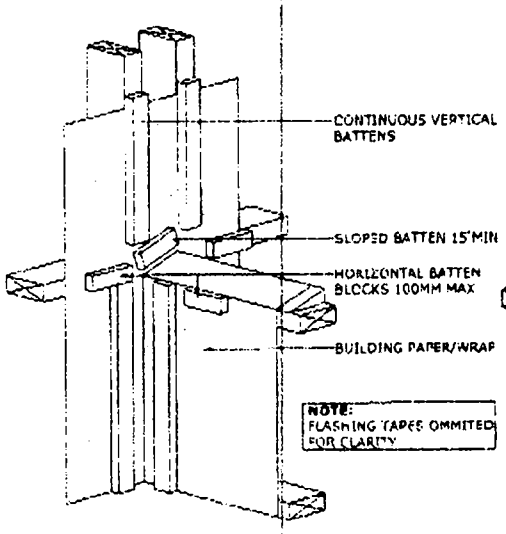
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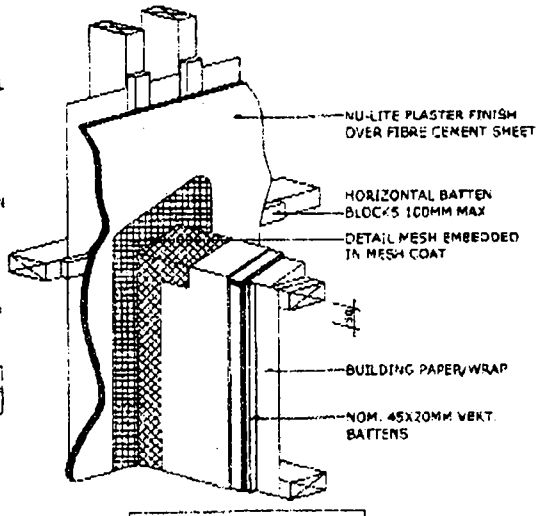
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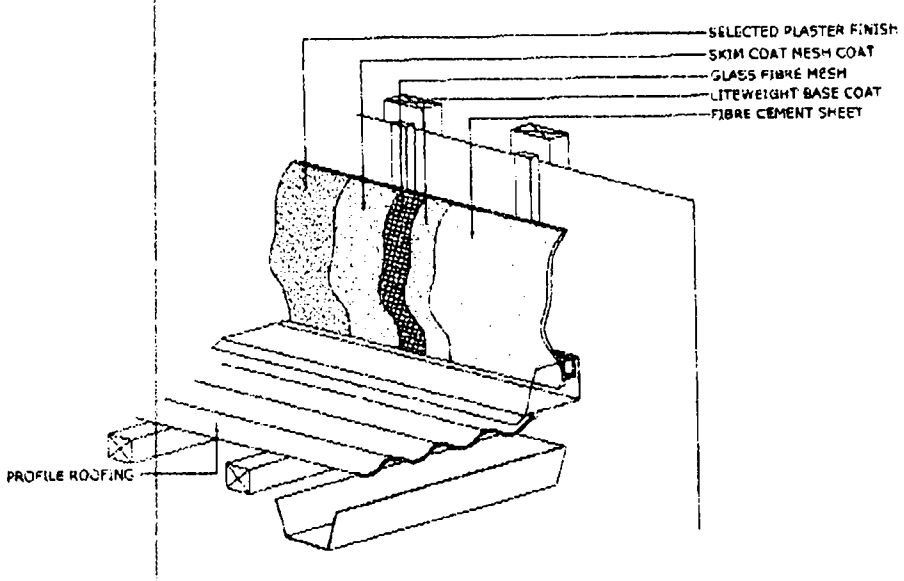


10

FILE NAME: PARAPET/BALASTRADE SECONDARY WATERPROOFING & BATTEN LAYOUT

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5. FIBRE CEMENT SHEET, MESH AND PLASTER

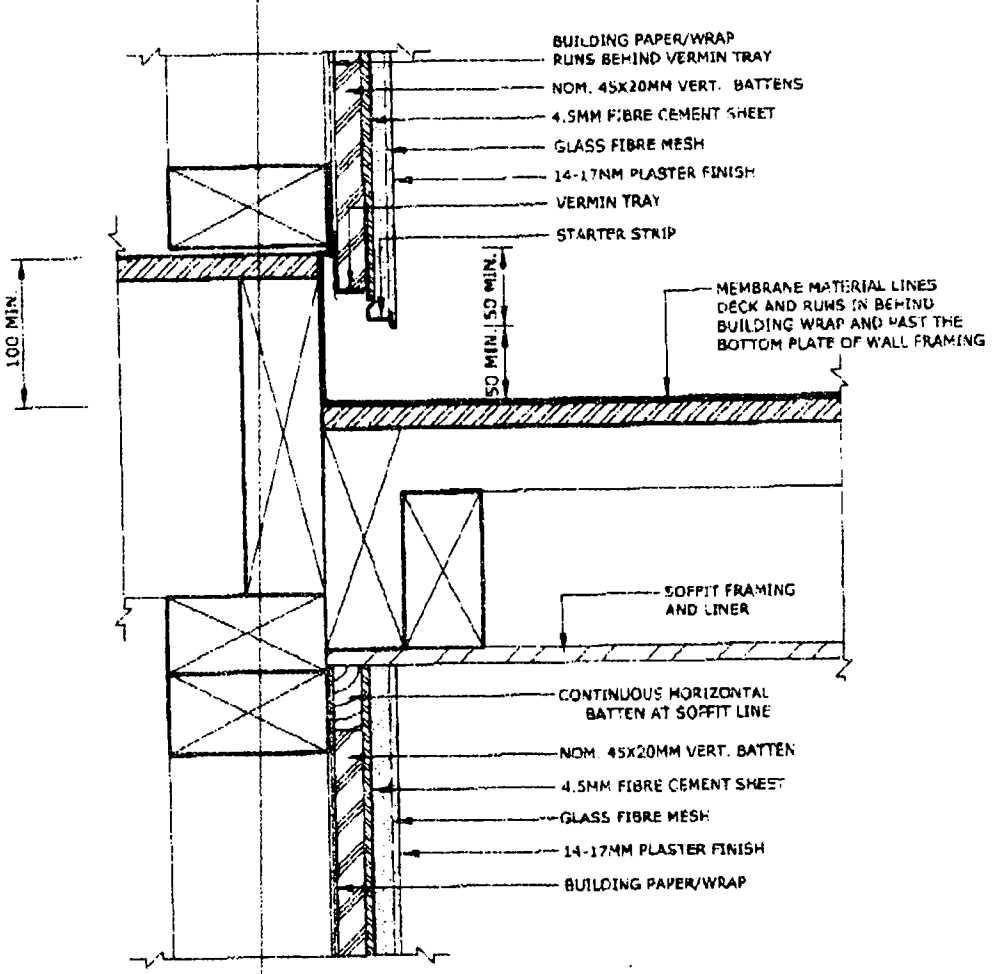
Note:
For additional information pertaining to this detail see installation instructions of Nu-lite Technical Manual.

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FILE NAME: ROOF FLASHING KICK-OUT DETAIL

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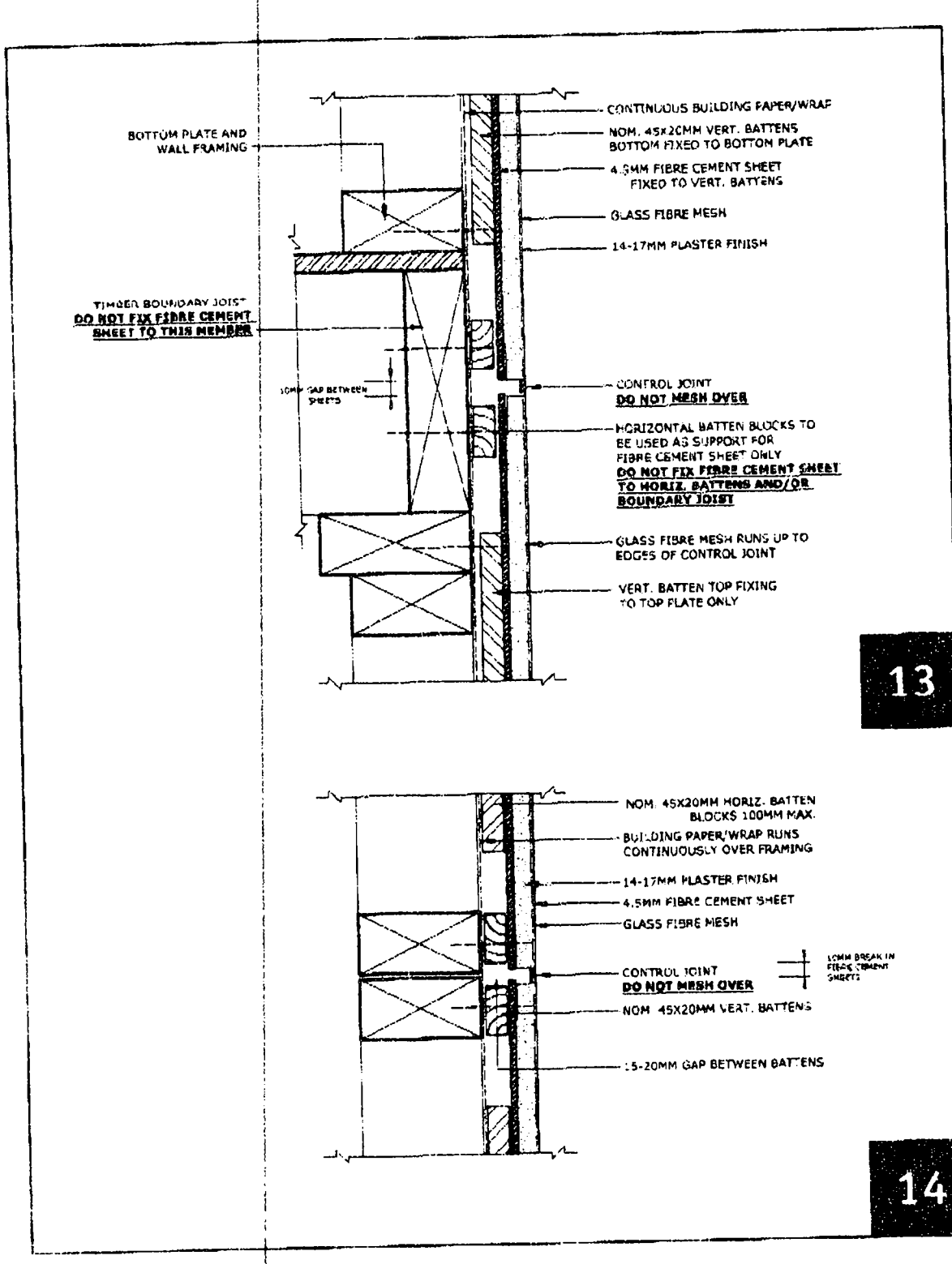


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FILE NAME: MEMBRANE DECK & SOFFIT DETAIL

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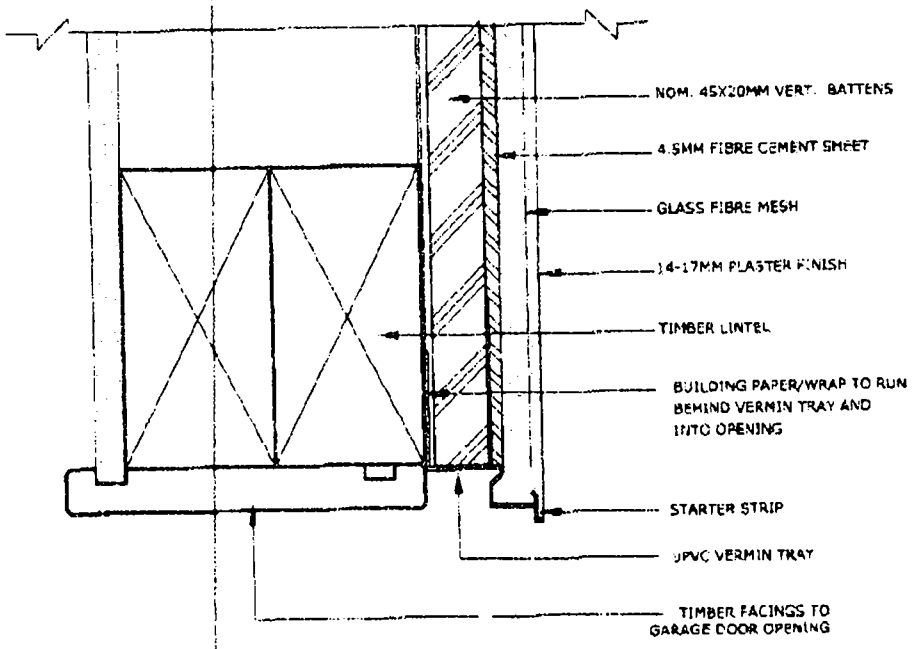
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FILE NAME: MID-FLOOR & VERTICAL CONTROL JOINT DETAIL

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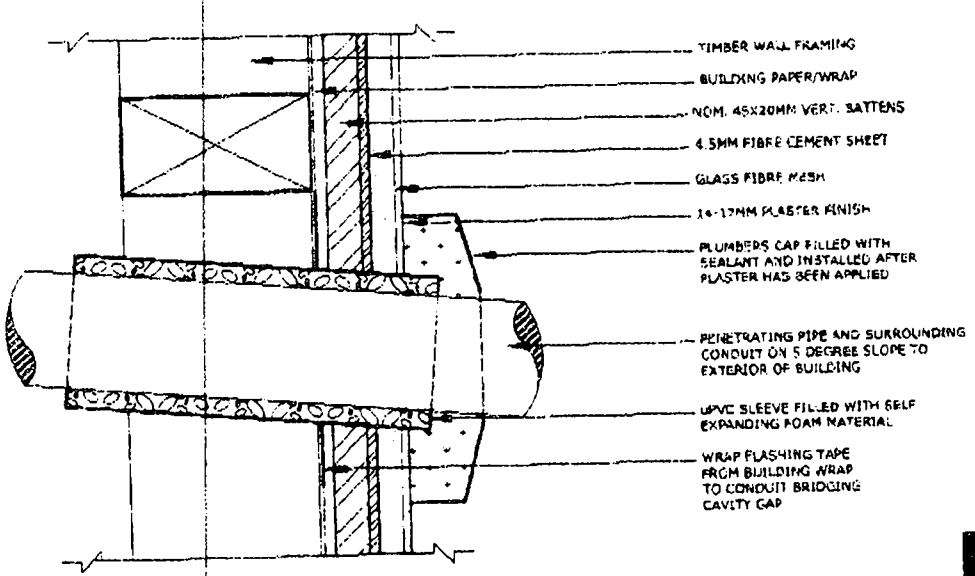


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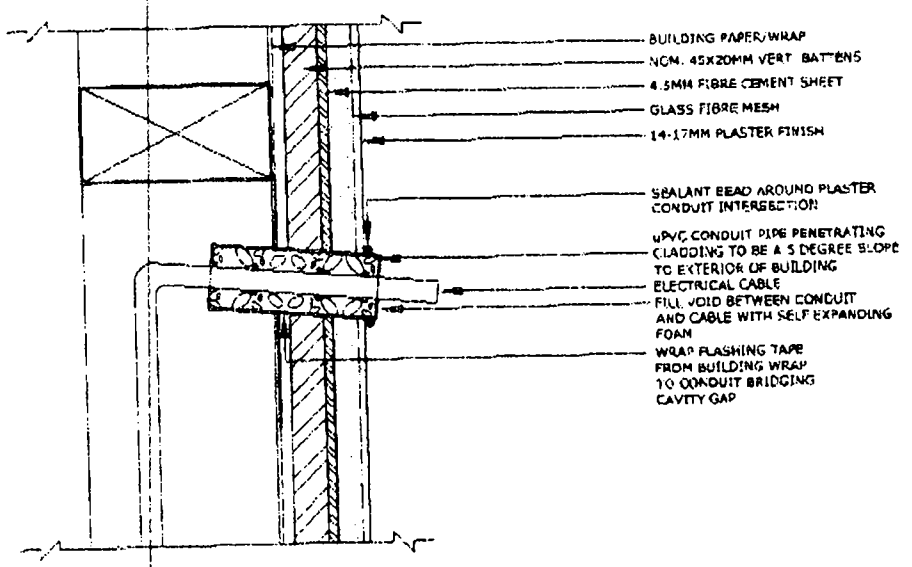
FILE NAME: GARAGE HEADER DETAIL

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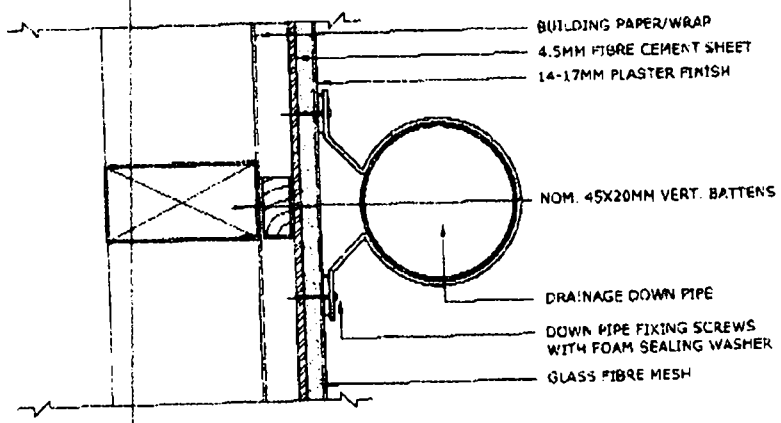


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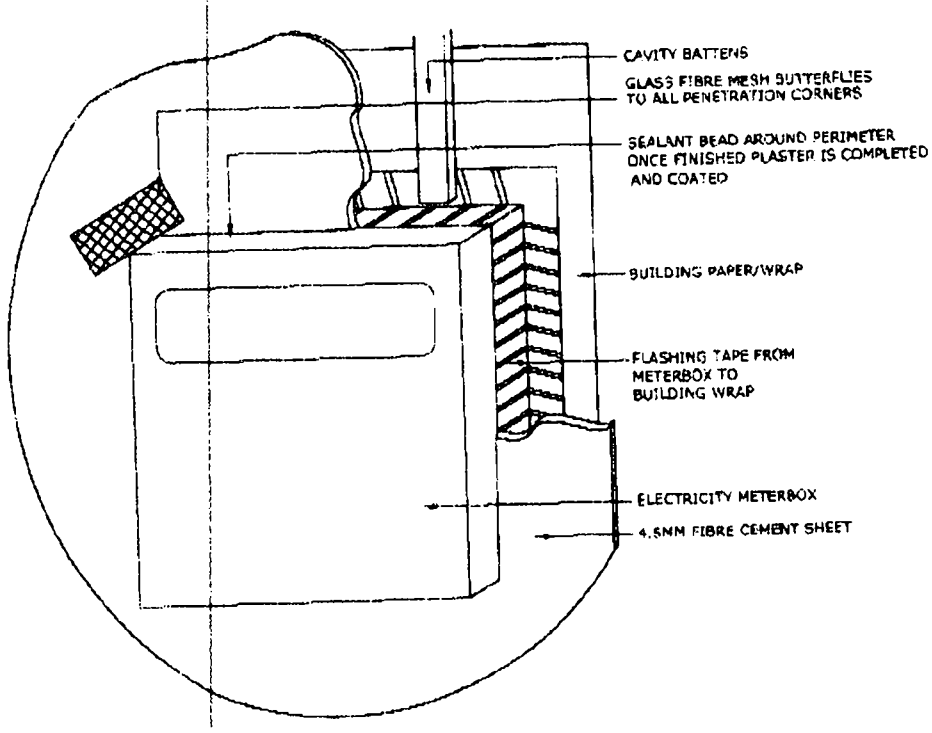
FILE NAME: PIPE & ELECTRICAL PENETRATIONS

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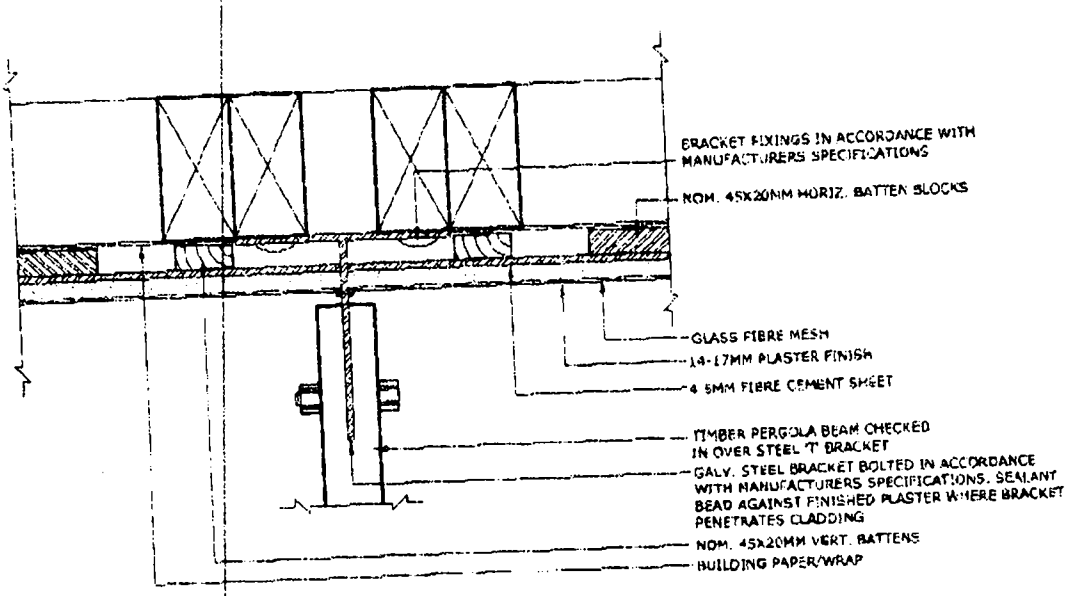


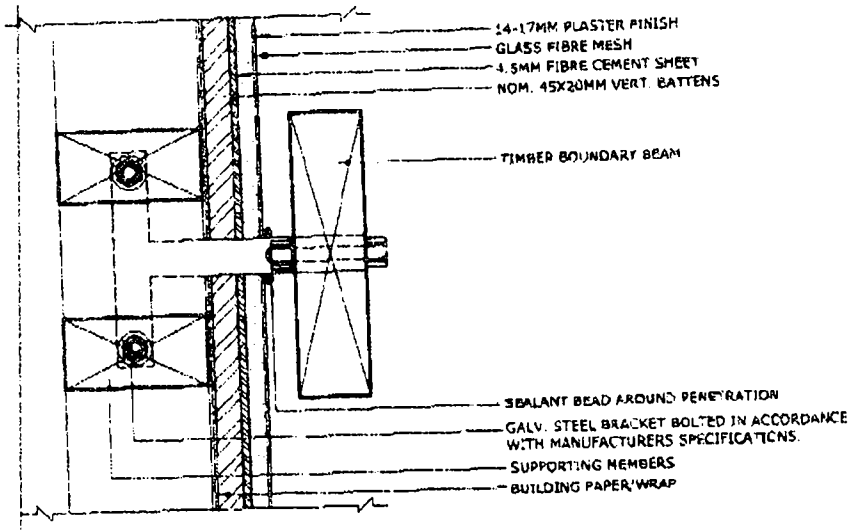
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FILE NAME: NU-LITE PENETRATION DETAILS

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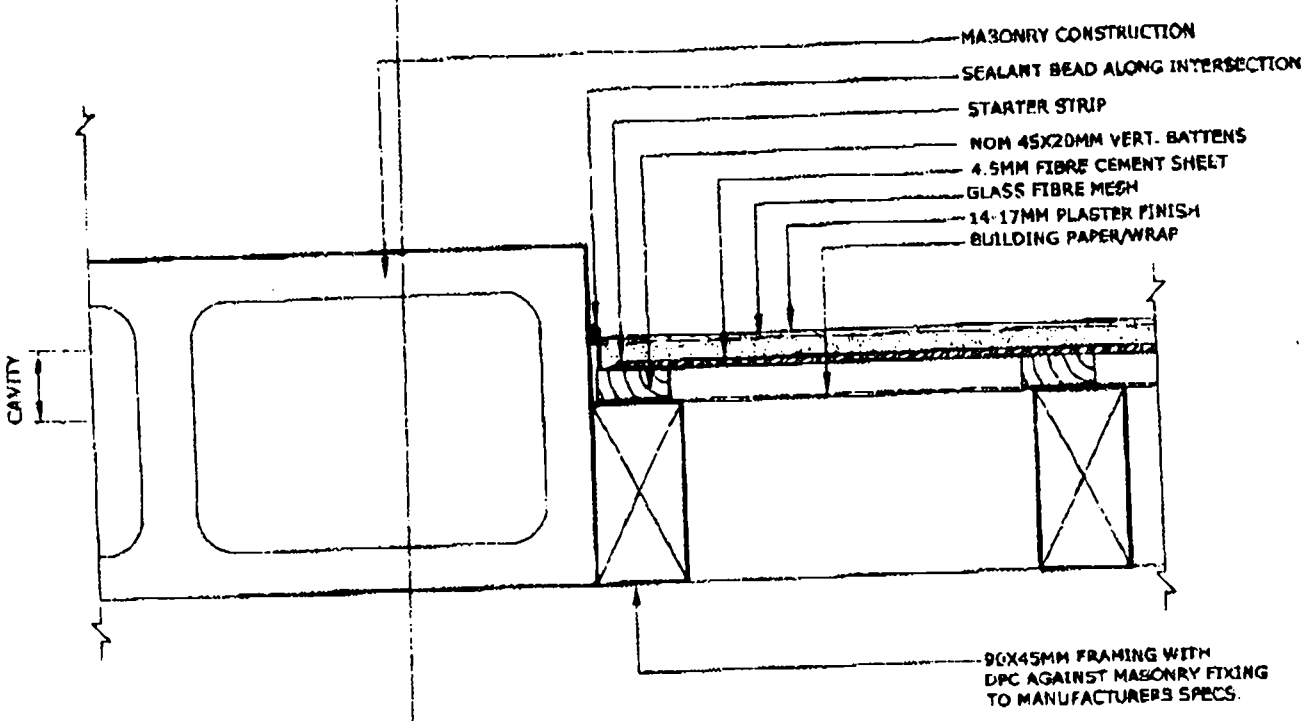


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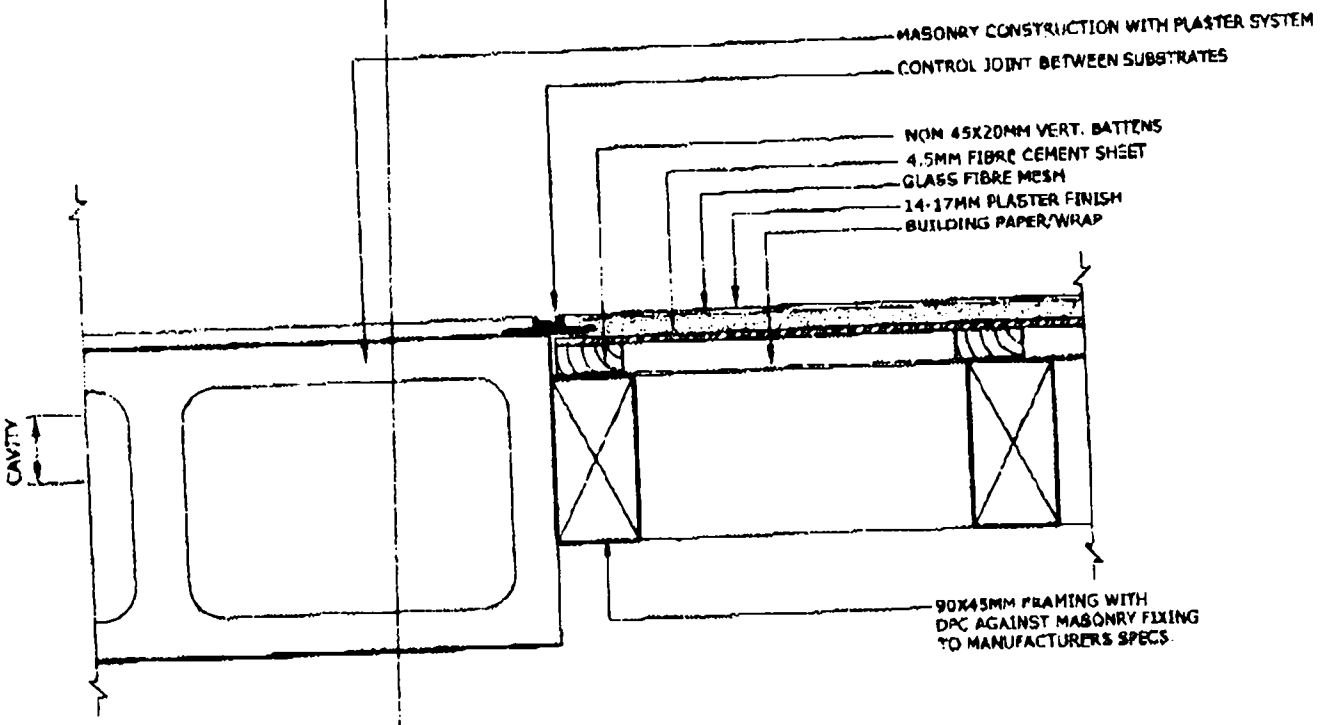
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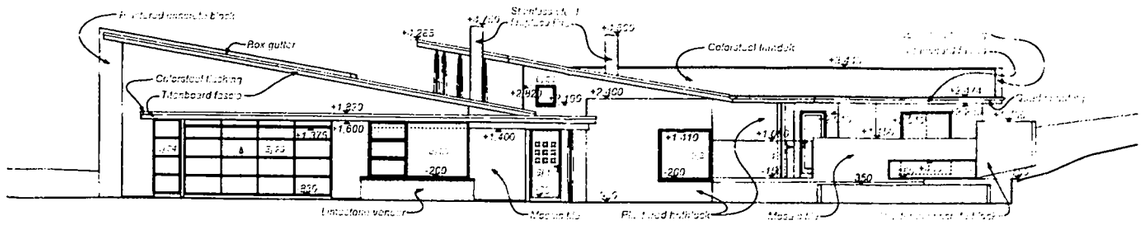
NU-LITE MASONRY TRANSITION DETAILS

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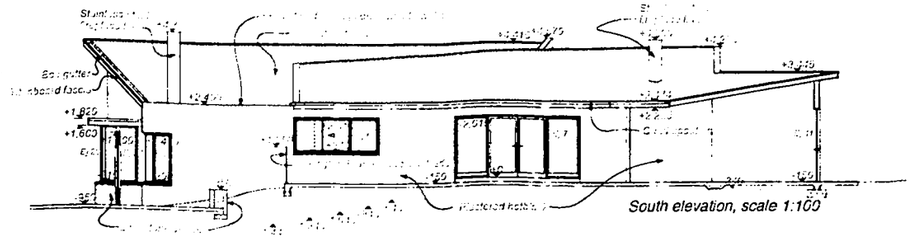
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NU-LITE MASONRY TRANSITION DETAILS



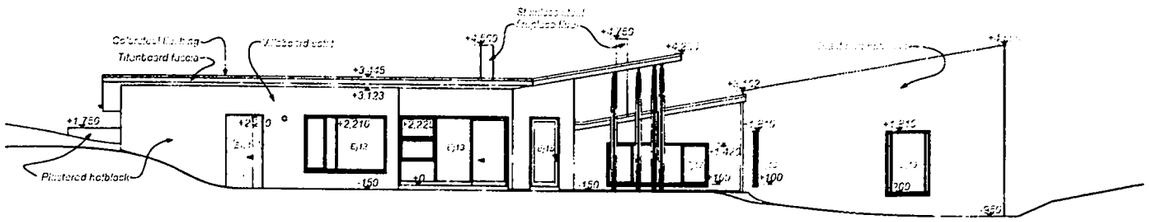
West elevation, scale 1:100



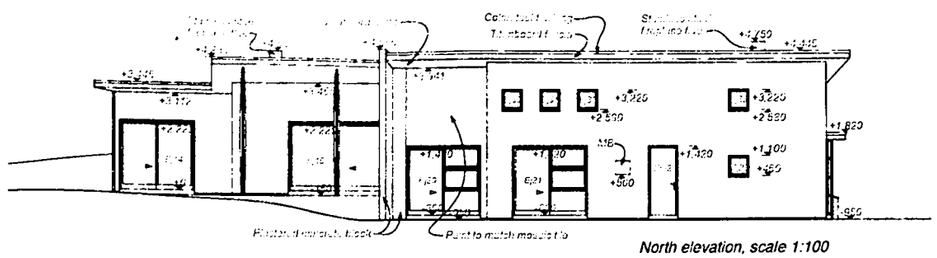
South elevation, scale 1:100

Index:

1. Site, Floor plan, Elevations, Roof
2. Slabs and drainage
3. Site works plan
4. Ground floor framing plan
5. High walls framing plan
6. Sections a,b, c, d
7. Section e, Details
8. Joinery kitchen
9. Joinery bathroom 1, laundry
10. Joinery bathroom 2
11. Electrical plan



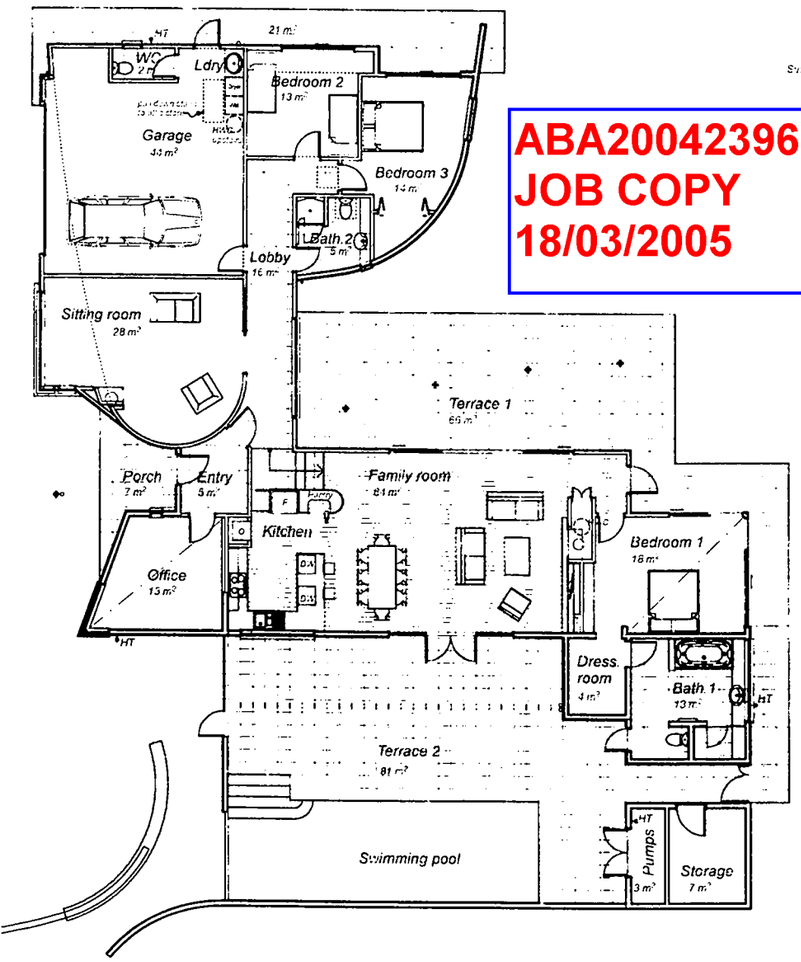
East elevation, scale 1:100



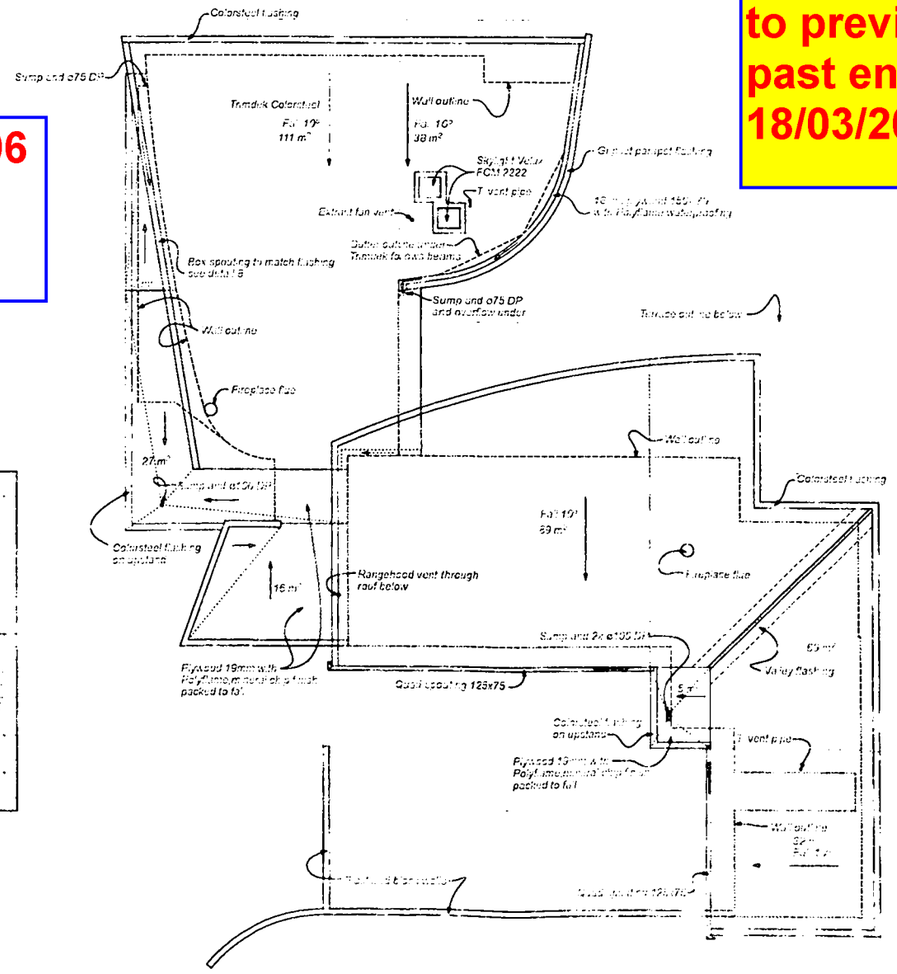
North elevation, scale 1:100

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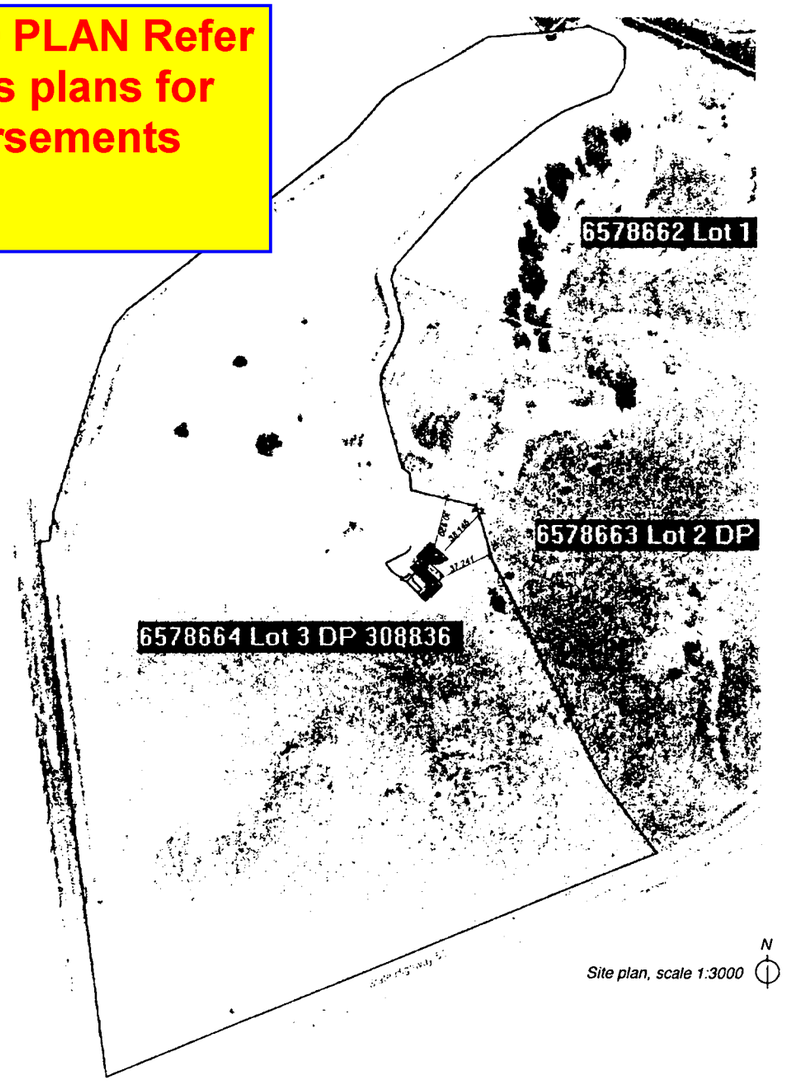
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Ground floor plan, scale 1:100



Roof plan, scale 1:100



Site plan, scale 1:3000

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House for Mr & Mrs Barnes
State Highway 50, Hastings district
Hawke's Bay

SHEET 1 OF 13
DATE 3/4/05
SCALE AS SHOWN
JOB A0417

Raiford Gardiner Architects Ltd
212 Queen Street E, Hastings, NZ
PO Box 1232
Fax 64 6 870 2700
Cell 64 021 431827
email rgarch@xtra.co.nz

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Storm water is to be disposed of in a manner that does not cause a nuisance to others and does not cause any damage to the environment

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1:120

1:120

100ø PVC SS
100ø PVC Stormwater
Fall slab 6mm
Fall slab 12mm
Fall slab 20mm
WC
Wbsn
Sink
GT
T. vent
Note: back vent basin and shower into terminal vent
Sh
Bsin
Concrete block wall outline
Stone veneer outline
190 concrete blocks up to -200
90 concrete block from -200 to 0 flush with inside of 190 block
See also Section d
190 block outline under terrace slab
Column outline
Note: make blue area -30 to accomodate timber floor
63 m²
153 m²
ø100 DP
Spreader
Concrete block wall outline
190 concrete blocks under the slab from -800 up to -30
DW
Concrete block under the slab recessed back 60mm
±0 = +45.950 above sea level
Bath
Basin
Recess for shower 30mm
Fall slab to drain channel
For drain detail see section A
Sump
Concrete block under the slab recessed inside
Fall slab to channel
Biocycle septic tank
To effluent field. Ref. installers plan
Paved area outline - see Site works plan

Slab and drainage plan, scale 1:75

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Existing channel
43.000 43.500 44.000 44.500 45.000 45.500 42.500
45.500
45.000
Fence by owner
Building area limit line
R 3.419
710
45.000
HT
WC
Ldry
Bedroom 2
pull down stairs to attic store
Garage
HWC upstairs
Bedroom 3
Bath. 2
45.500
Lobby
45.800
Sitting room
Fall
R 6.431
5.200
483
Crown
2.946
Terrace 1
Storm water spreader
Porch
Entry
Family room
Pantry
±0
Kitchen
Office
Bedroom 1
R 19.810
3.024
3.990
HT
Dress. room
Bath.1
HT
Fall
-950
4.146
R 600
Bicycle septic tank
15.848
14.172
-150
13.460
ø1200 free grill with plastic sump under and ø100 PVC pipe do SW diffuser
Terrace 2
45.600
-350
R 4.200
R 4.310
3.613
Effluent field
Concrete block retaining wall see eng. drawings
Fall
Fall
4.200
HT
Pumps
Storage
48.000
46.500
Fence by owner
-950
3.534
Limestone retaining wall overlapping concrete wall where shown
18.120
6.840
5.683
5.337
42.500 43.000 43.500 44.000 44.500 45.000 45.500 46.000 46.500 47.000 47.500
47.500 47.000 46.500 46.000 45.500

Site works plan, scale 1:100

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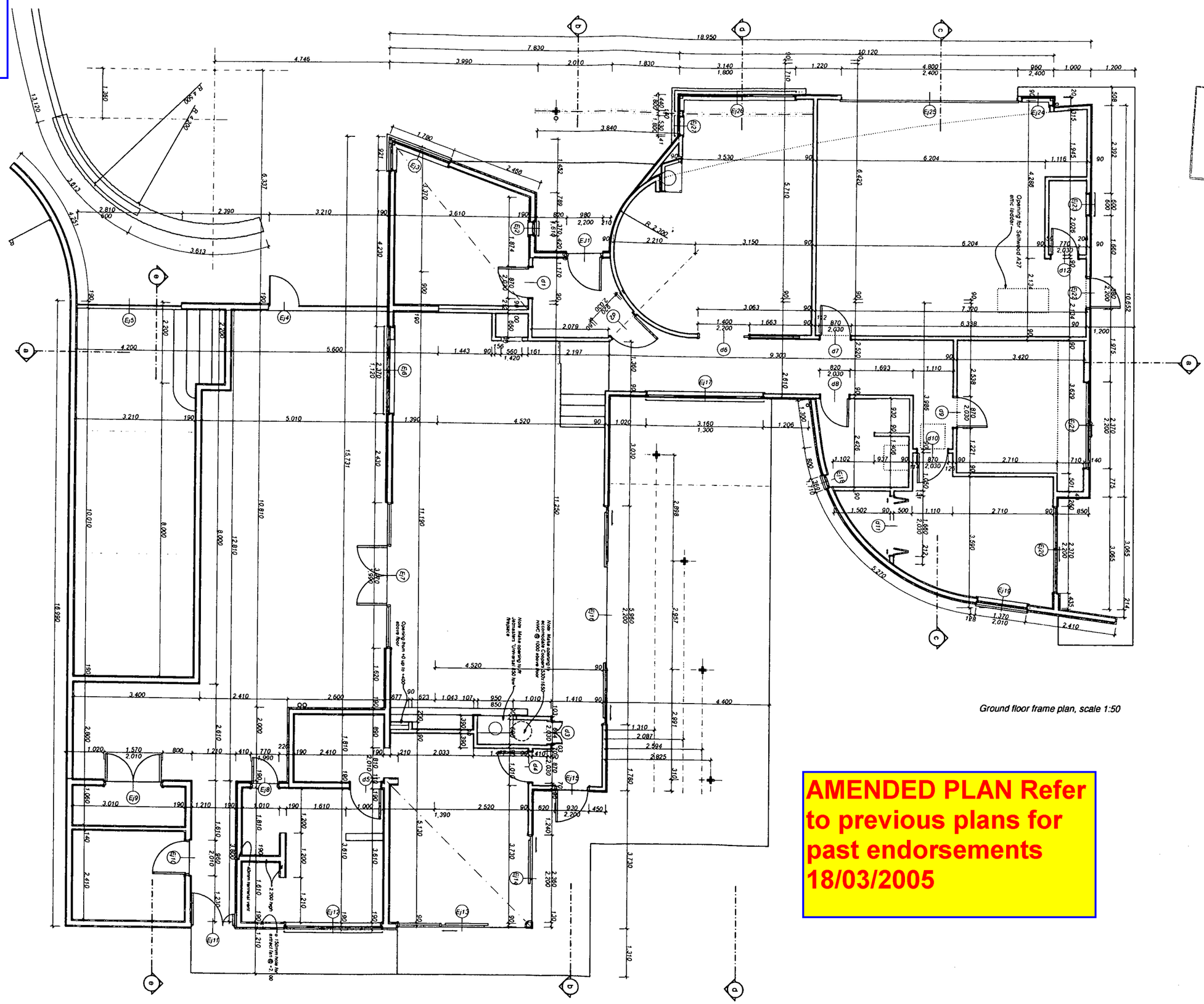
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Ground floor frame plan, scale 1:50

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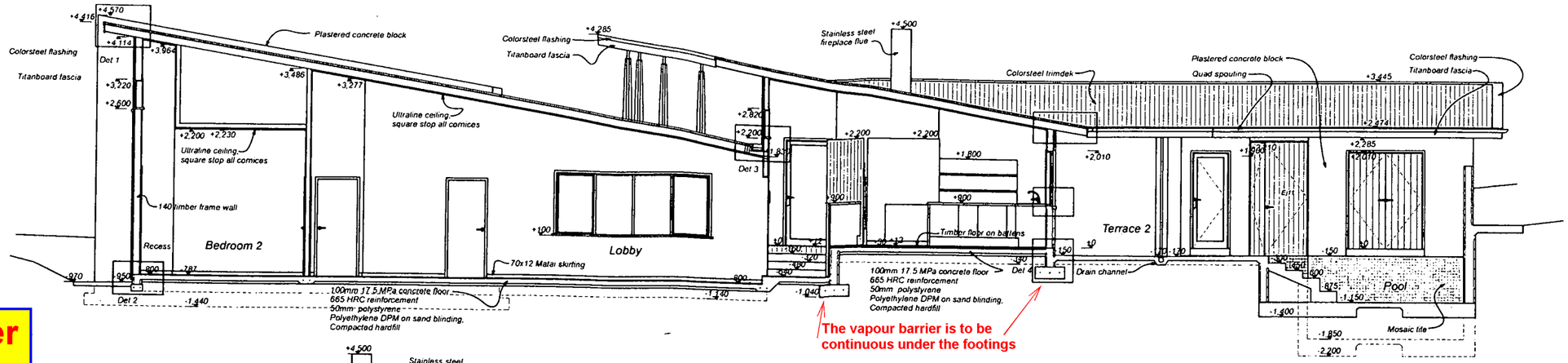
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Hawke's Bay

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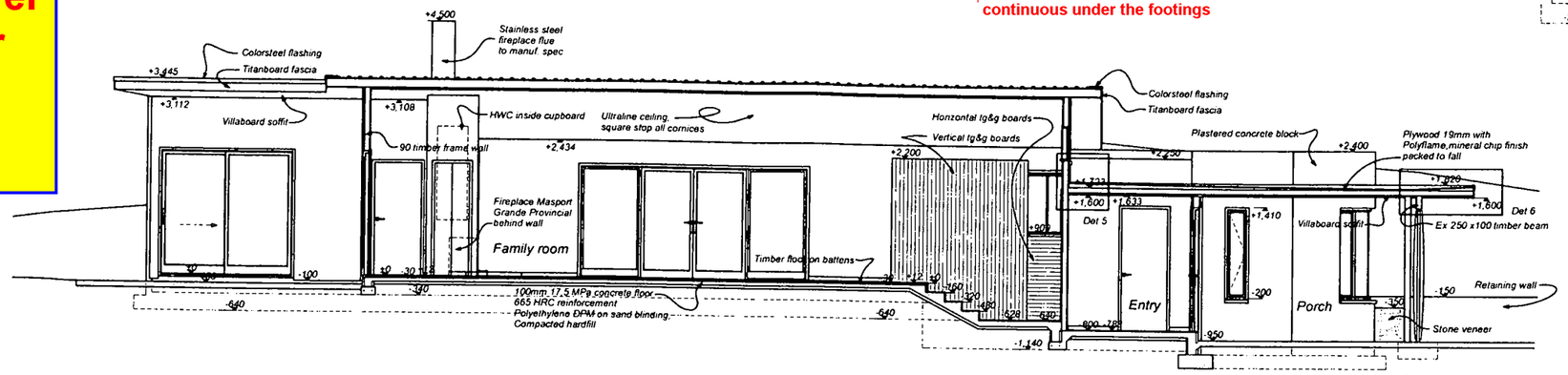
Ralford Gardiner Architects
212 Queen Street E, HASTINGS. NZ.
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Cell 64-025-491277
email ralbord@xtra.co.nz

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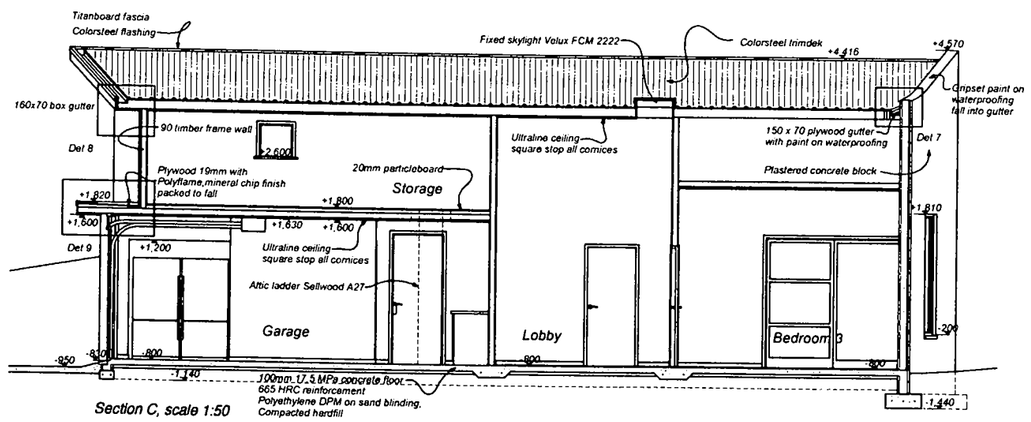
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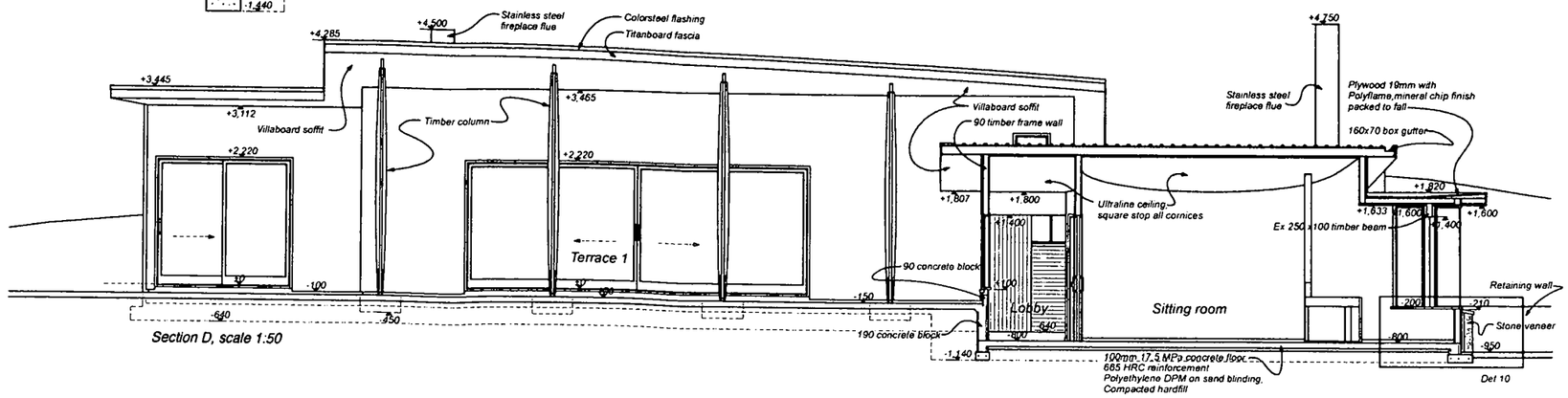
Section A, scale 1:50



Section B, scale 1:50



Section C, scale 1:50



Section D, scale 1:50

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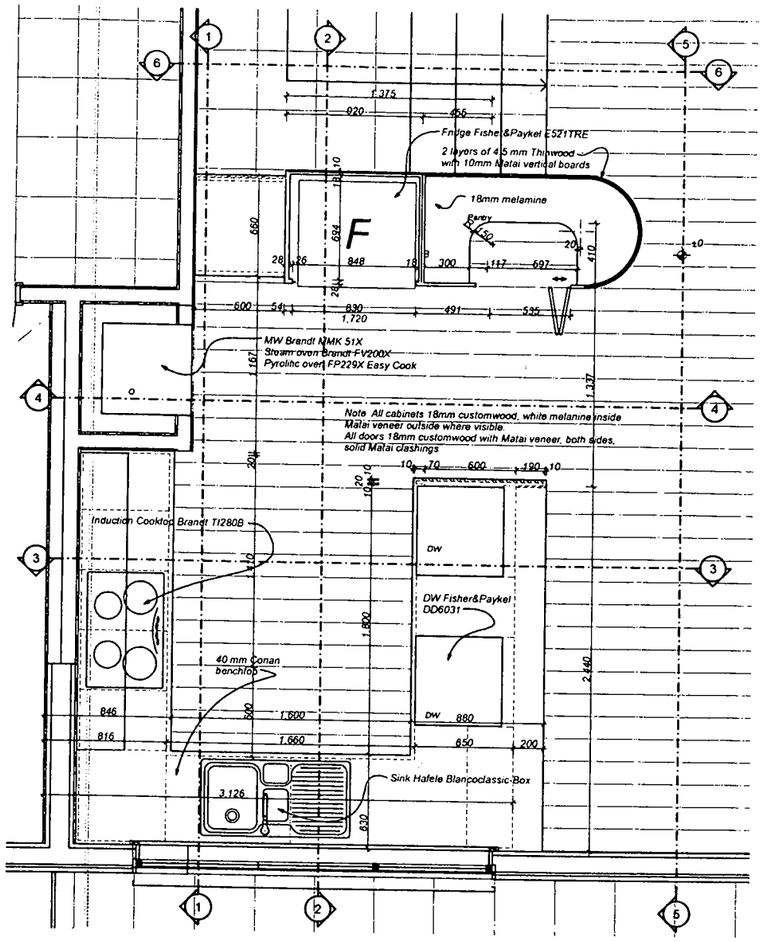
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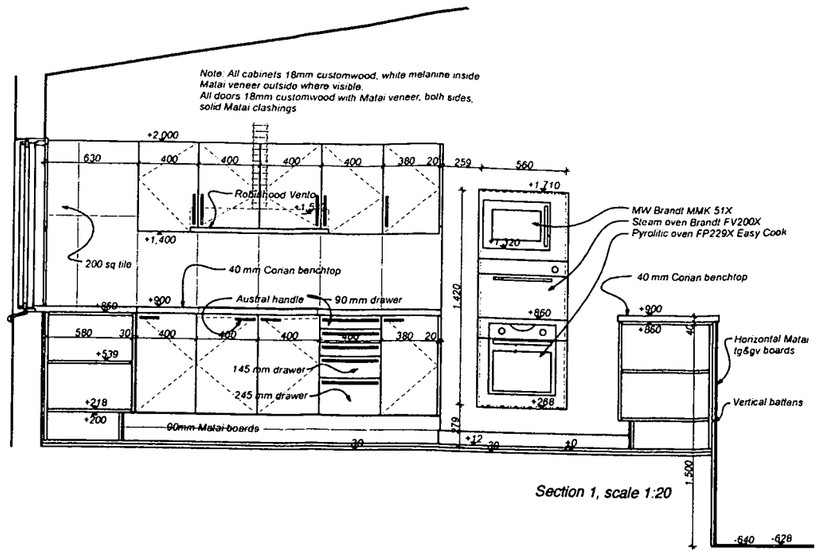
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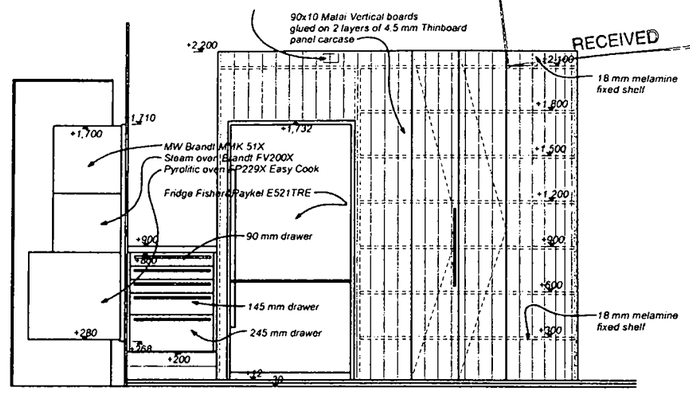
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Kitchen joinery plan, scale 1:20

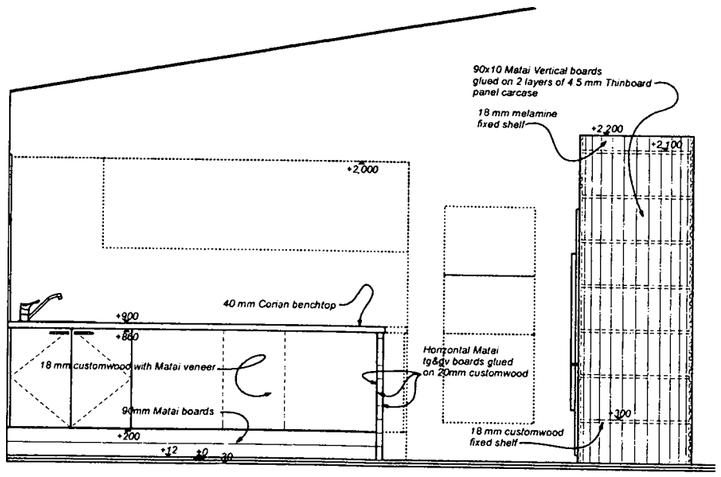


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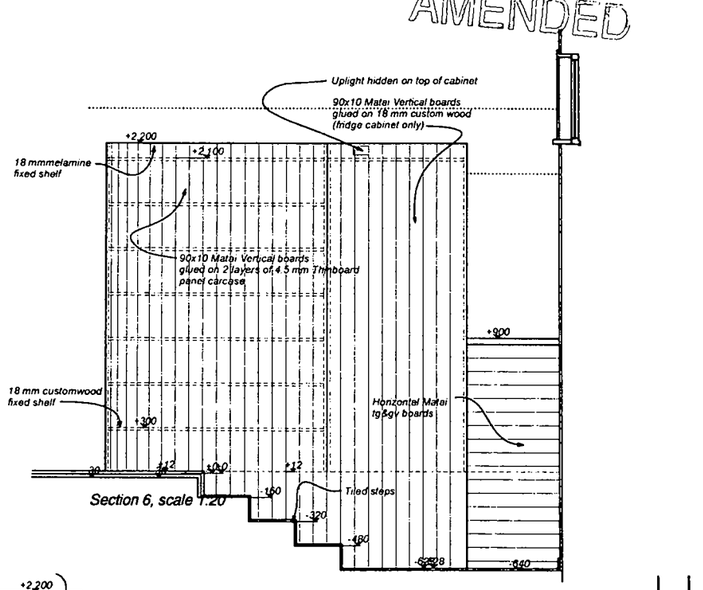


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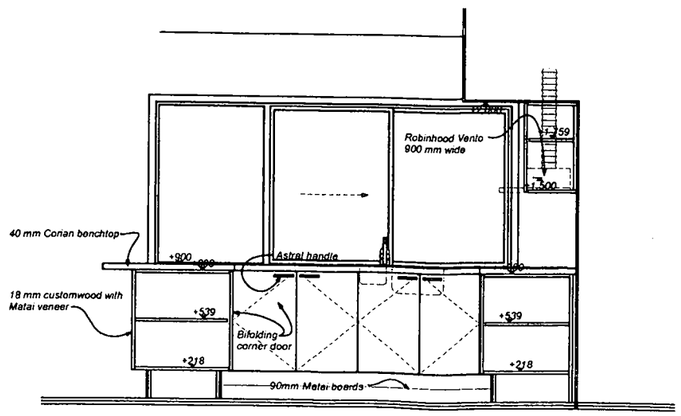
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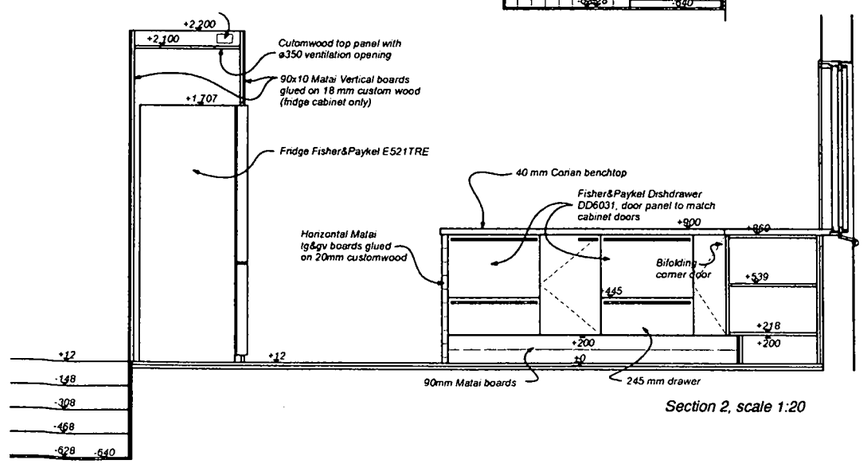
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Section 6, scale 1:20



Section 3, scale 1:20



Section 2, scale 1:20

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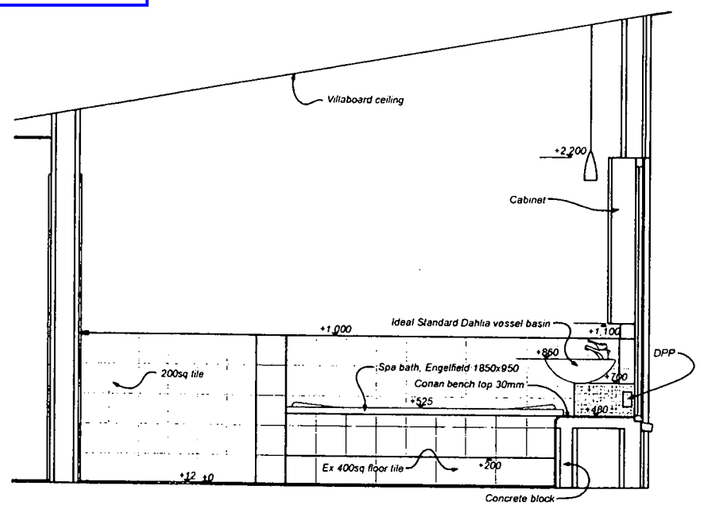
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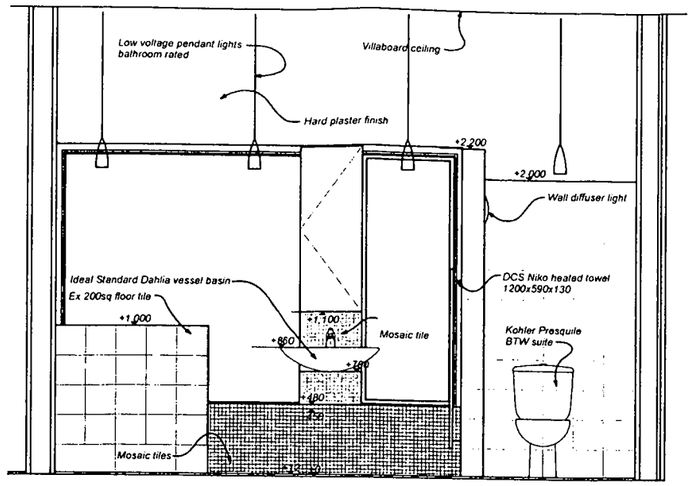
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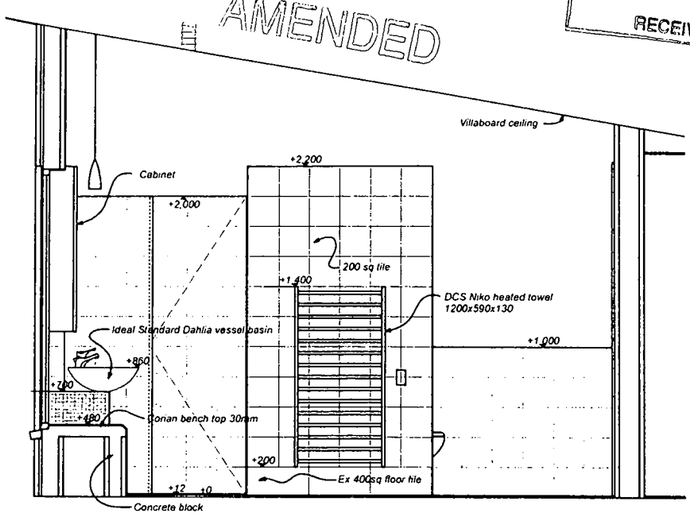
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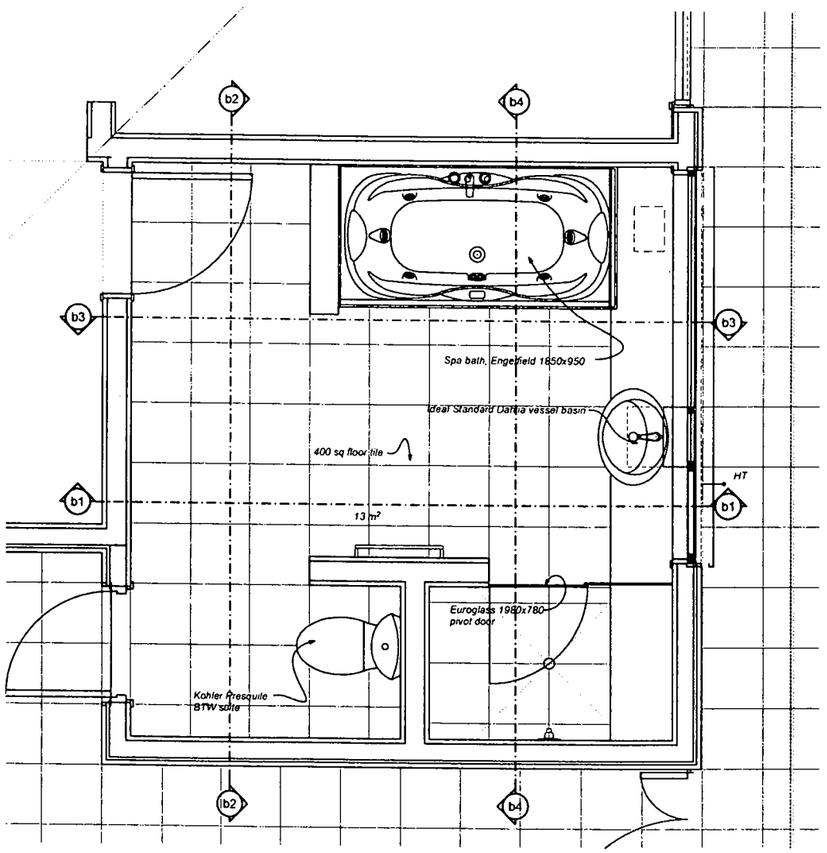
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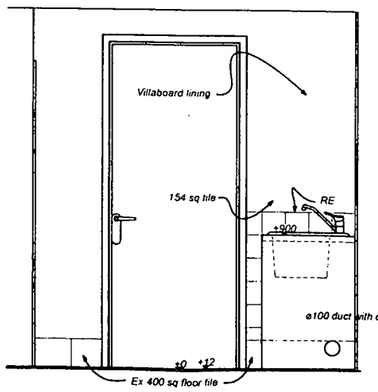
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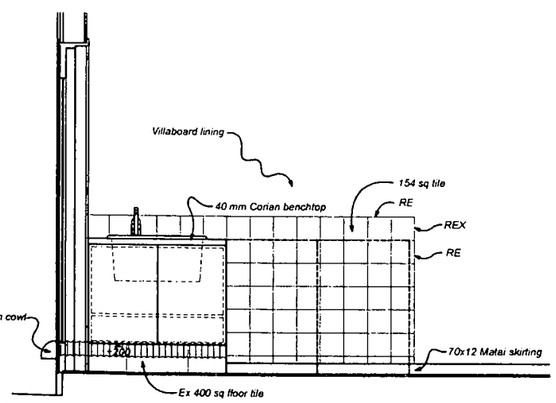
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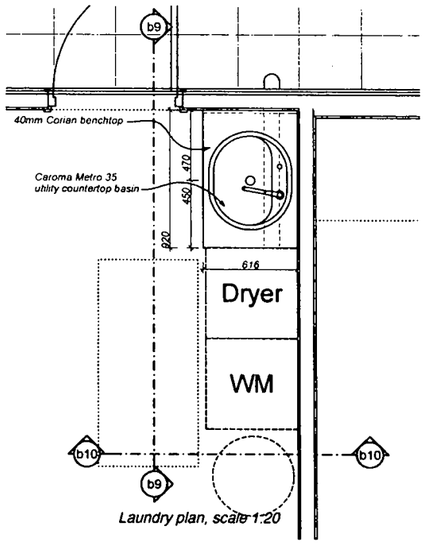
Bathroom 1 plan, scale 1:20



Section b10, scale 1:20



Section b9, scale 1:20



Laundry plan, scale 1:20

Note: Datum +0 for this drawing is actually at -800

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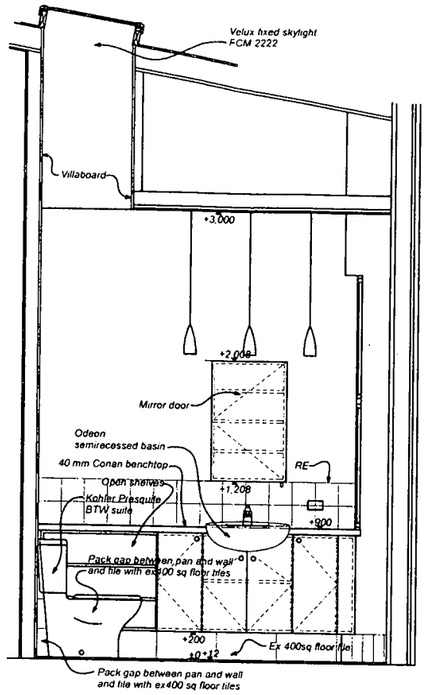
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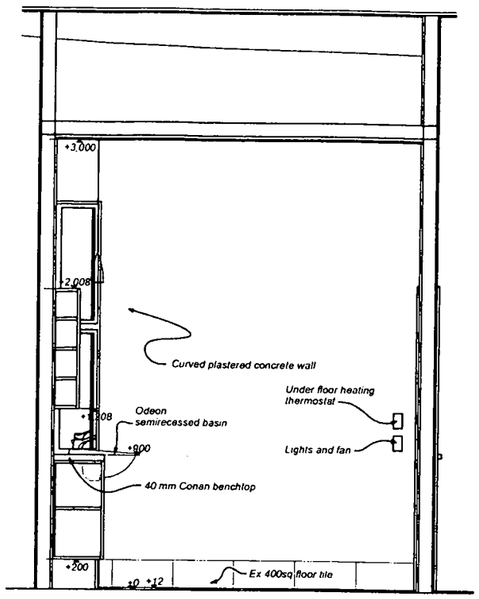
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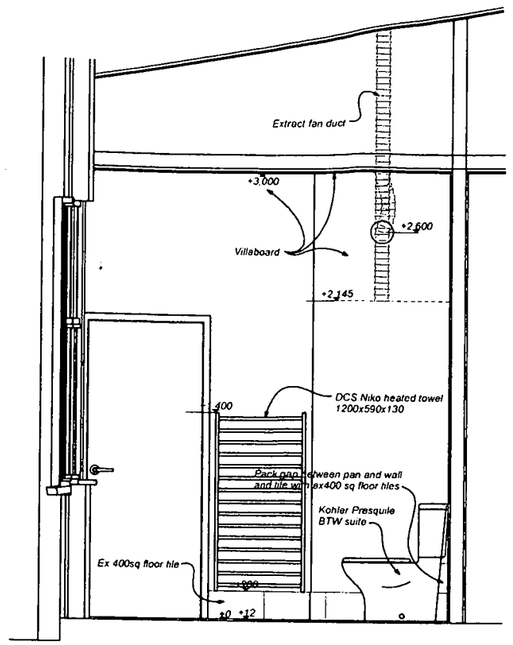
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Section b5, scale 1:20

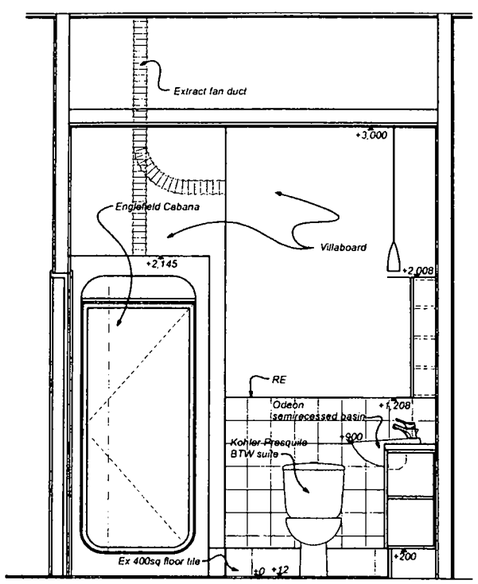


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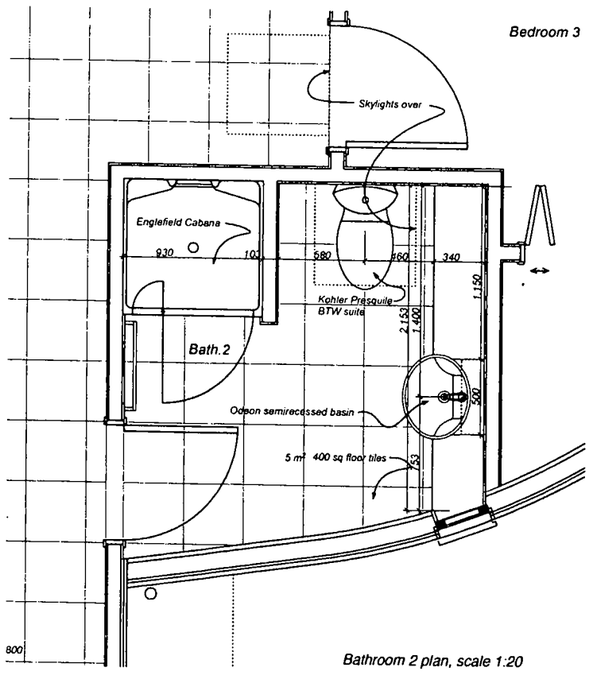


Section b7, scale 1:20

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Section b8, scale 1:20



Bathroom 2 plan, scale 1:20

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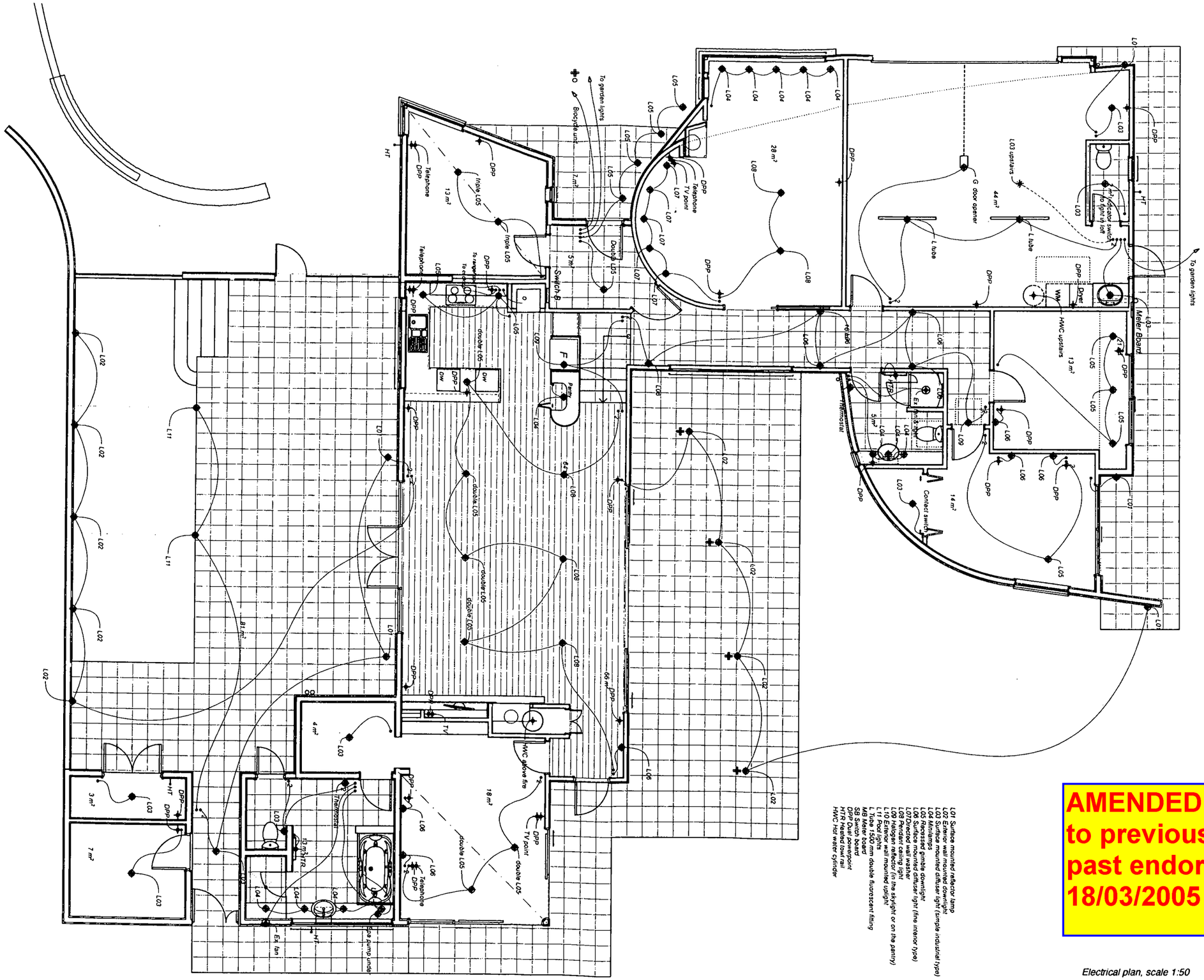
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L01 Surface mounted reflector lamp
L02 Exterior wall mounted downlight
L03 Surface mounted diffuser light (simple industrial type)
L04 Minilamps
L05 Recessed gimble downlight
L06 Recessed diffuser light (fine interior type)
L07 Corded wall washer
L08 Pendant ceiling light
L09 Halogen reflector (in the skylight or on the pantry)
L10 Exterior wall mounted uplight
L11 Track lights
LT Twin 36watt double fluorescent fitting
MB Meter board
SB Switch board
DPP Dual powerpoint
HTR Heated towl rail
HWC Hot water cylinder

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Electrical plan, scale 1:50

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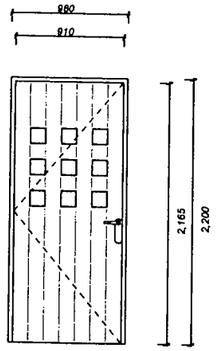
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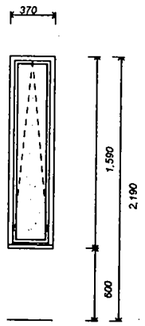
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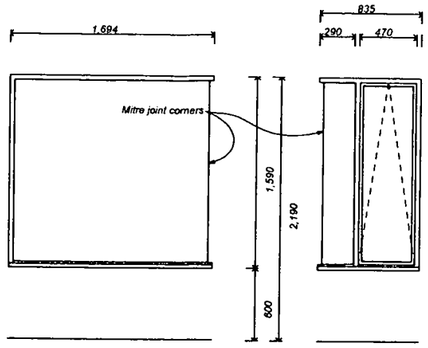
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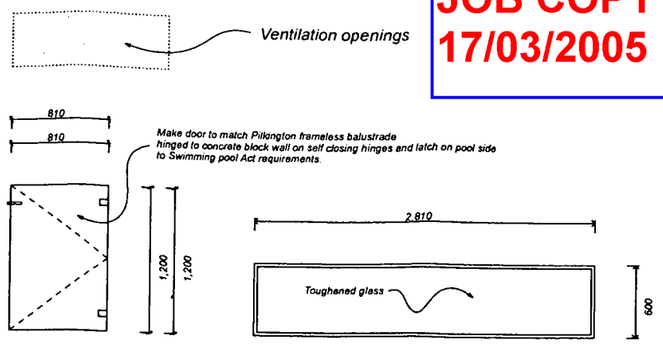
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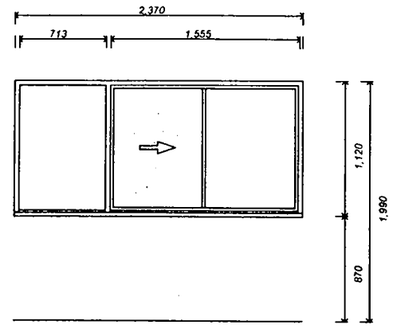
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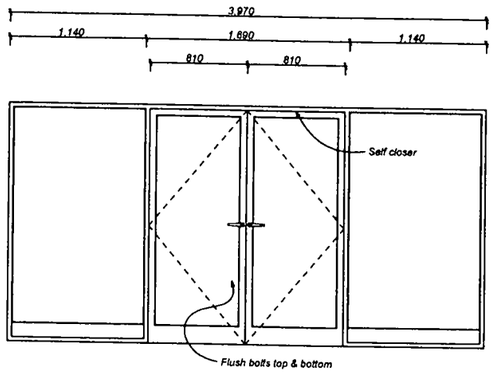


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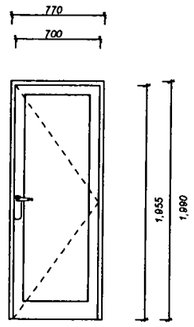


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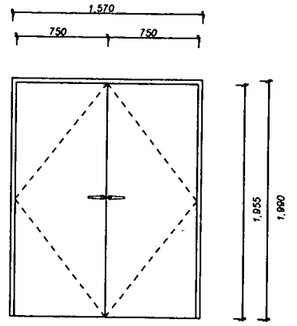
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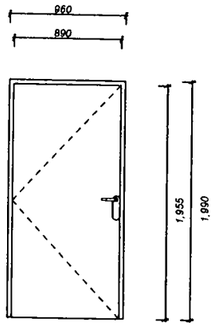
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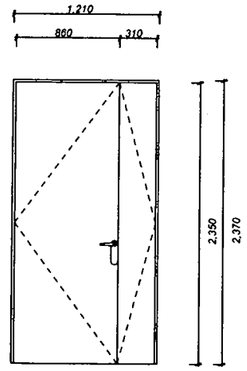
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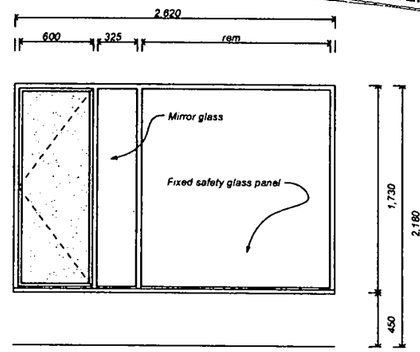
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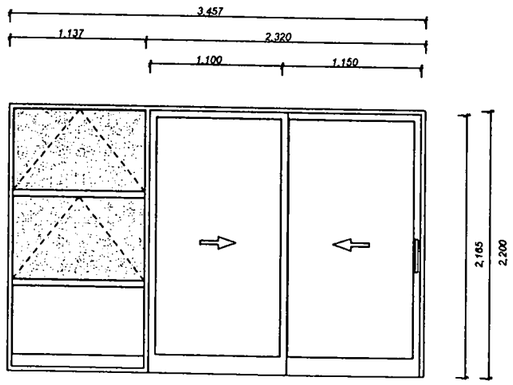
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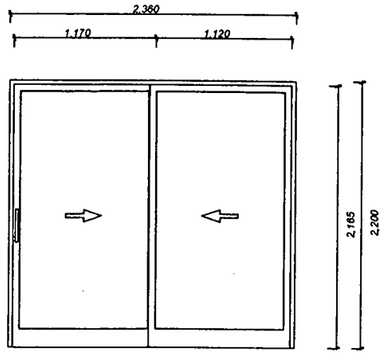
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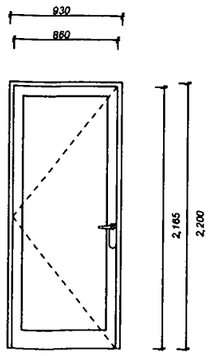
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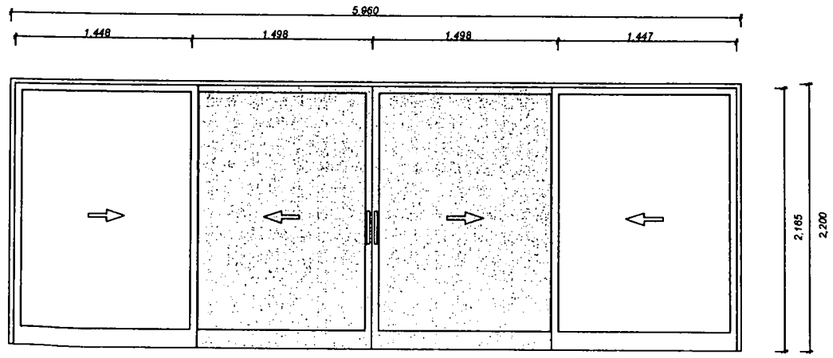
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Ej14



Ej15



Ej16 For frame finishes, glass and other details see Specification

Window schedule, scale 1:25

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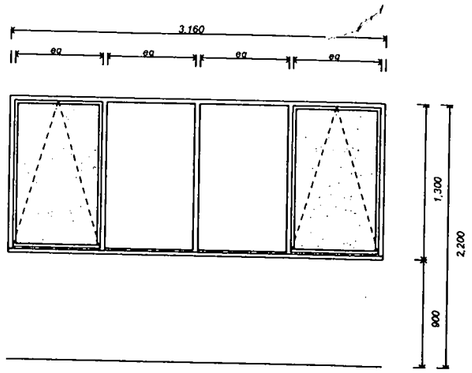
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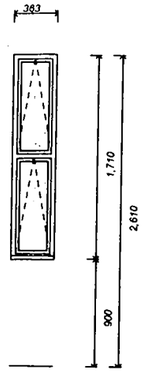
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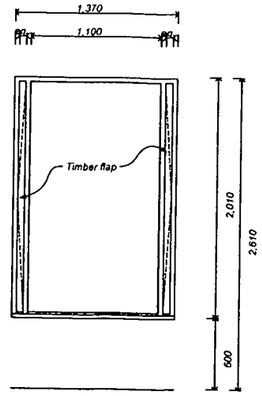
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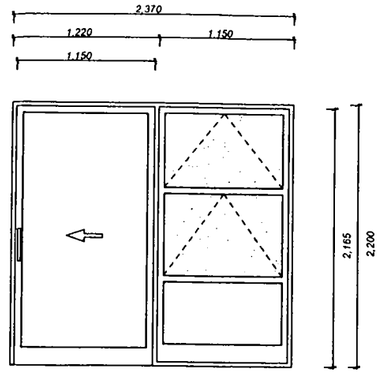
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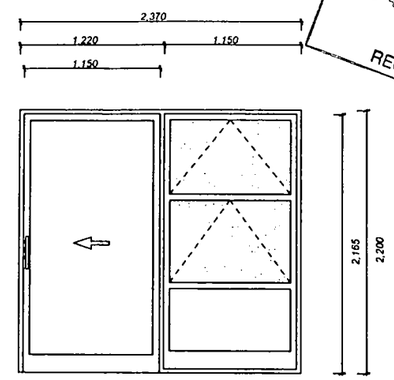
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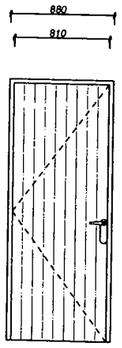
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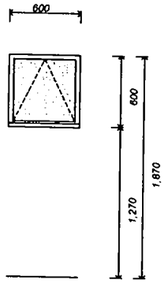
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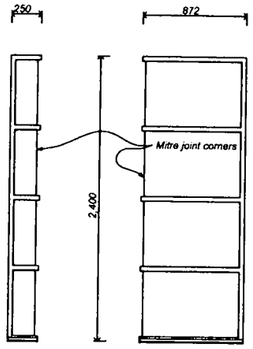
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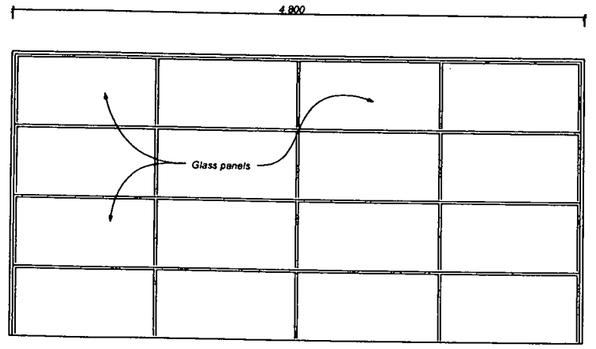
Ej22



Ej23



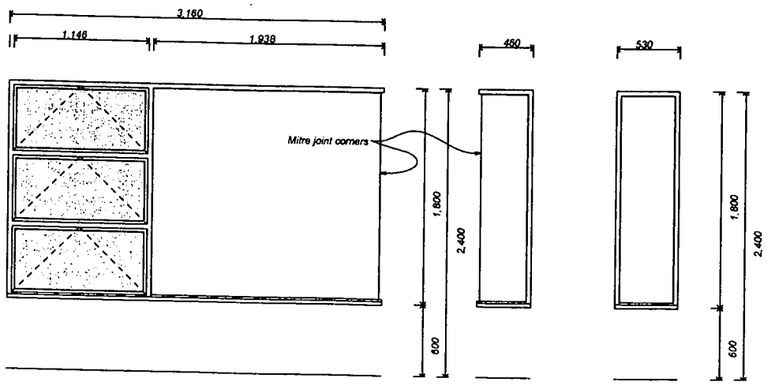
Ej24



Ej25

Ventilation schedule:

Room		ventilation avail.
Office	13.0 m2	1.28
Family room	64.0 m2	6.6
Bathroom 1	13.3 m2	1.02
Bedroom 1	18.3 m2	1.54
Lobby	15.9 m2	1.8
Bathroom 2	5.4 m2	0.5
Bedroom 2	12.6 m2	1.5
Bedroom 3	13.9 m2	1.7
WC	2.1 m2	0.3
Sitting room	28.1 m2	1.9

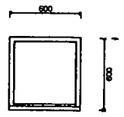


Ej26

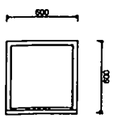
Ej27

For frame finishes, glass and other details see Specification

Safety glass is to be used in all bathrooms and ensuites if within 2000mm of the floor

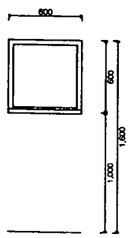


Ej28

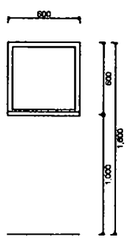


Ej29

Window schedule, scale 1:25



Ej30, Ej31, Ej32



Ej33



Ventilation openings

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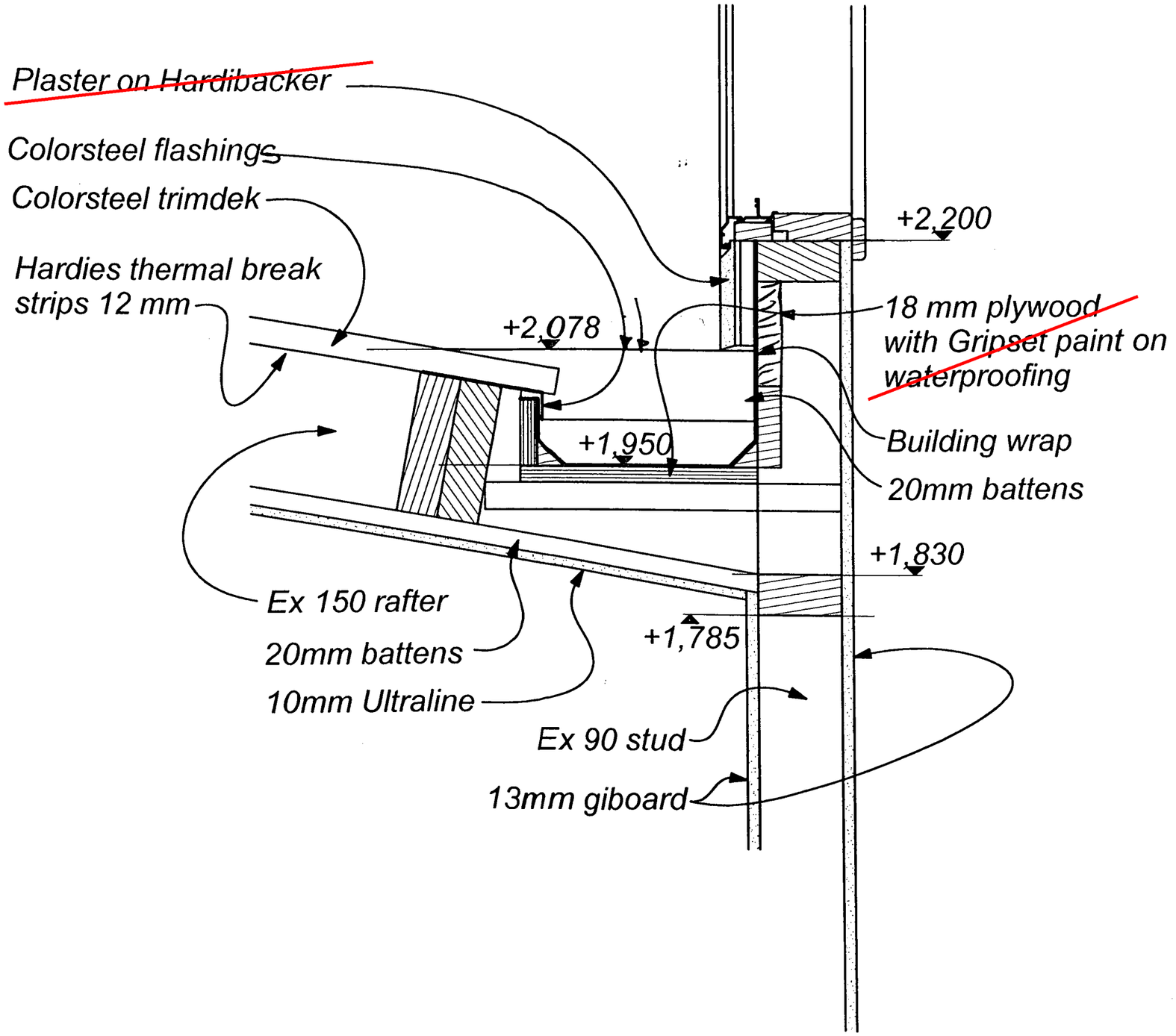
Building Consent Document A1 Original.

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The Contractor shall check and verify all dimensions on site.

House for Mr & Mrs Barnes
State Highway 50, Hastings district
Hawke's Bay

SHEET 13 OF 13
DATE 3/3/05
SCALE AS SHOWN
JOB A0417

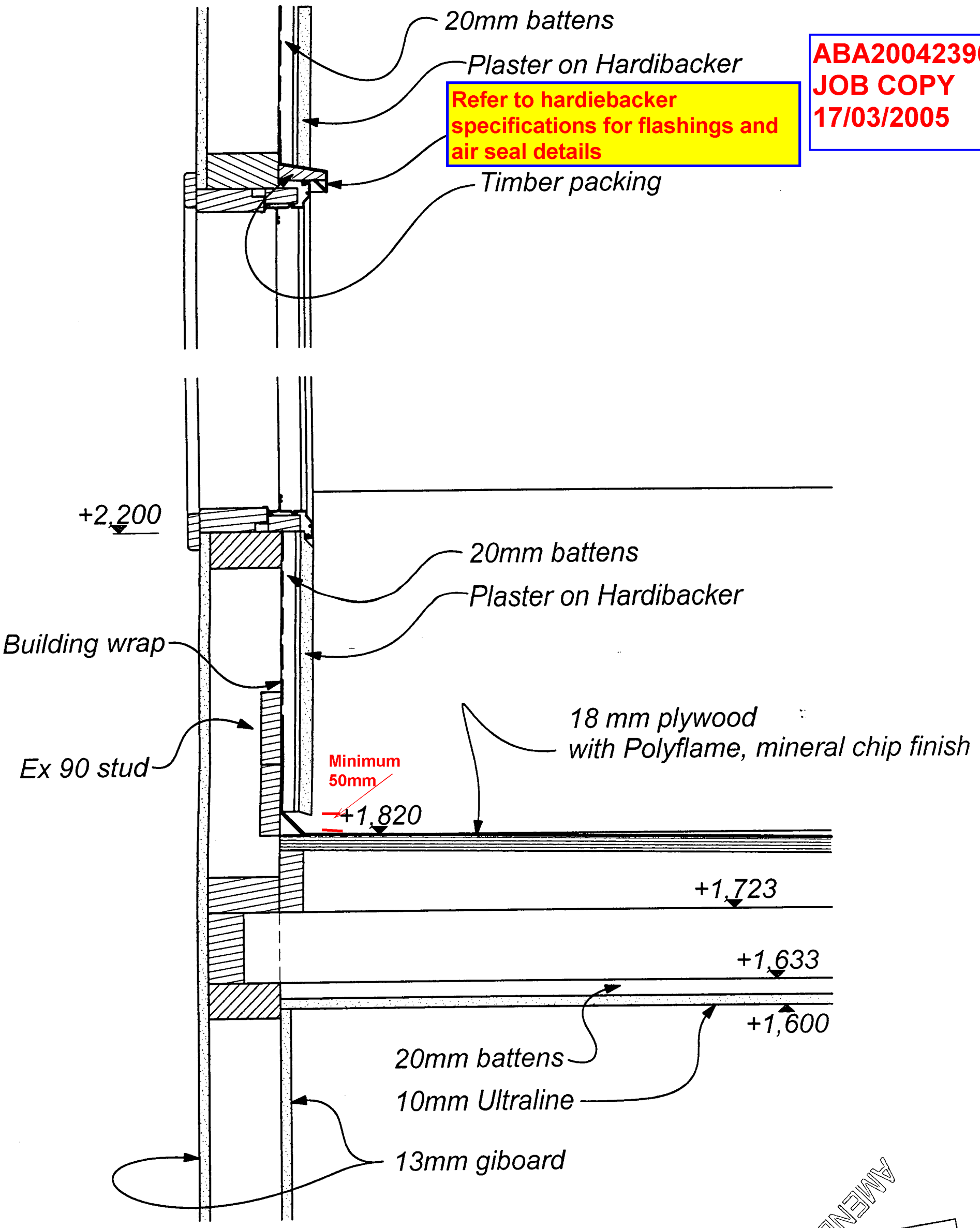
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212 Queen Street E, HASTINGS, NZ.
Tel 64-6-878-7801
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email ralford@xtra.co.nz



RESOURCE MANAGEMENT
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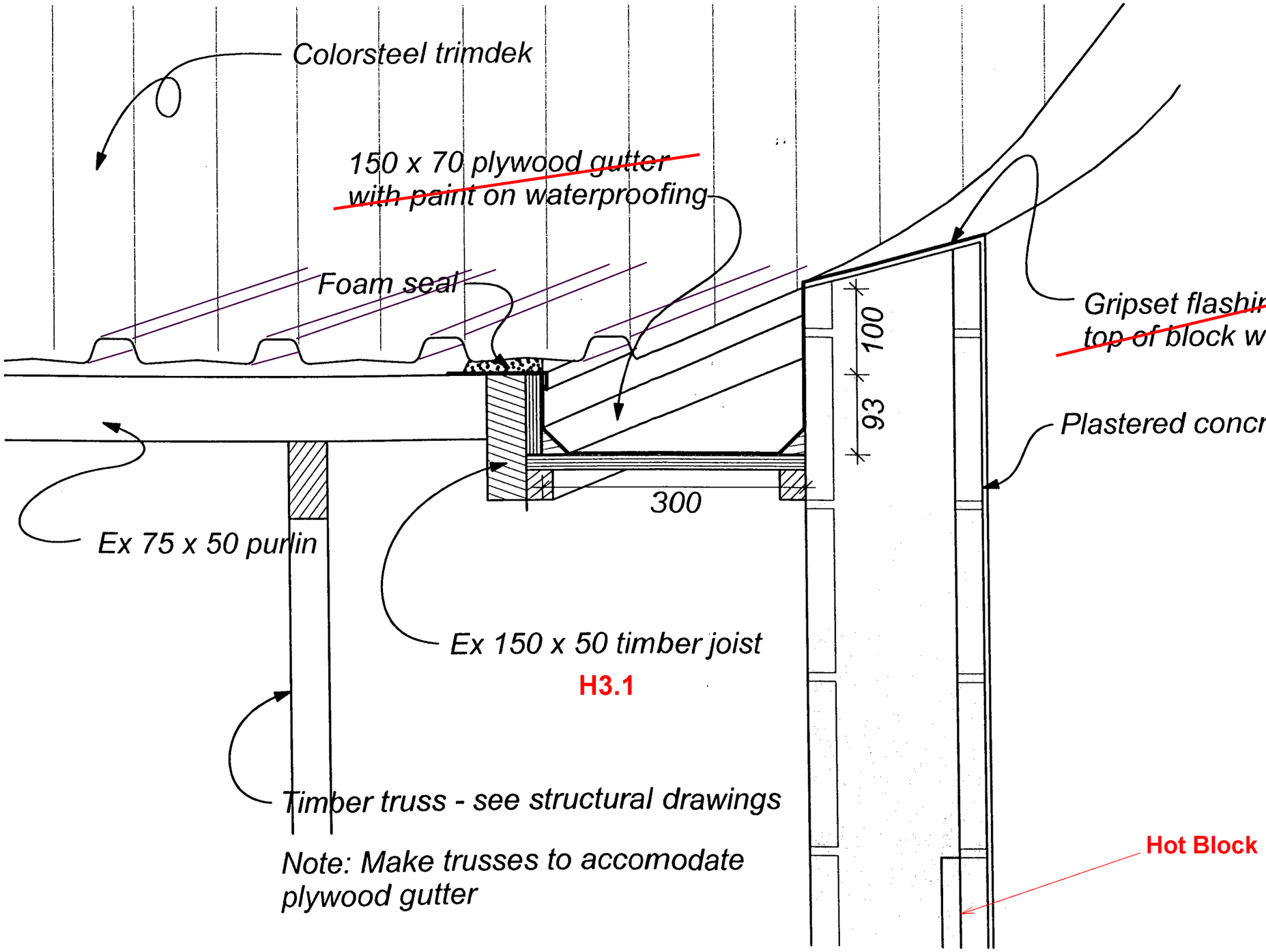


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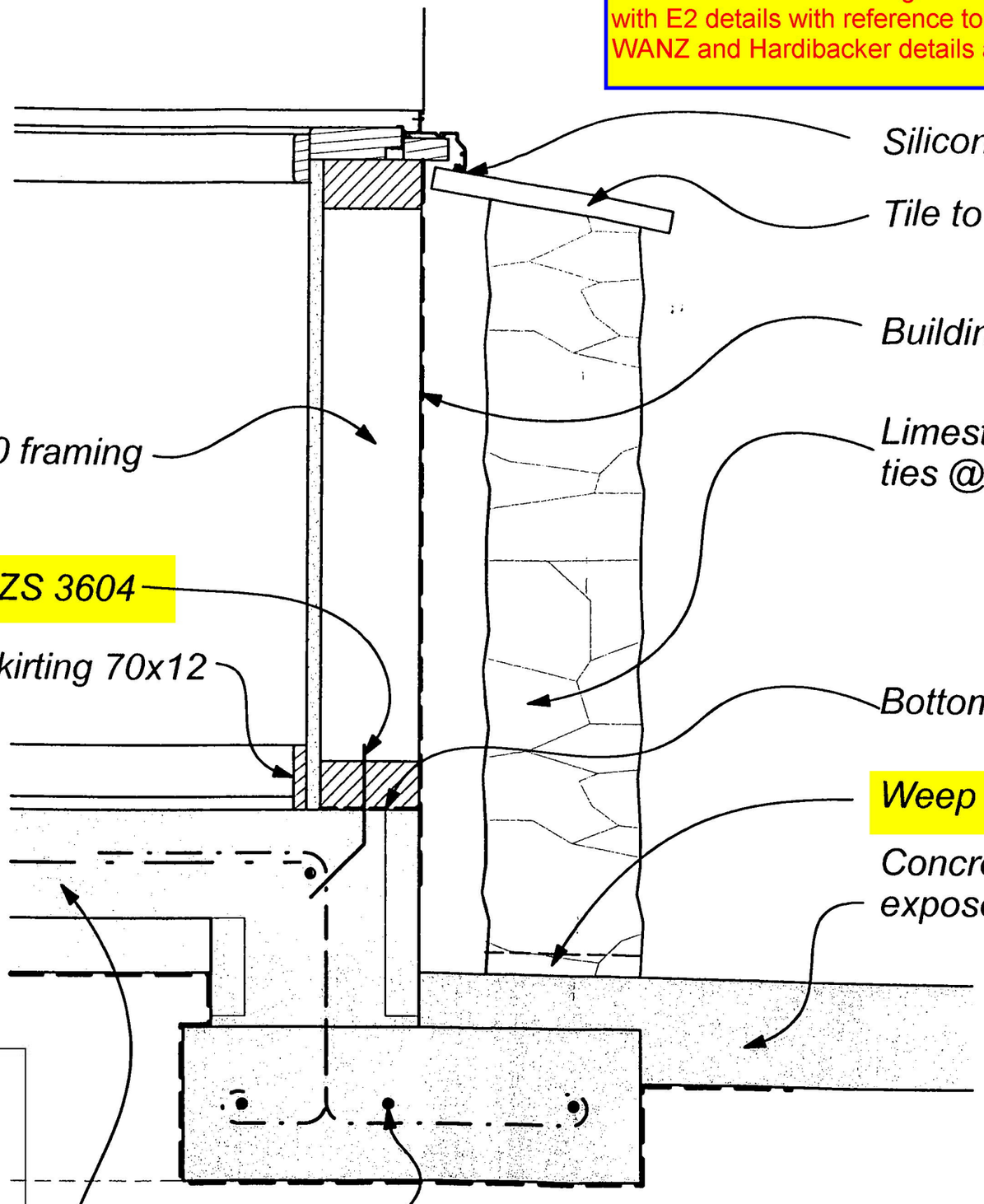
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Window and door flashings to comply with E2 details with reference to WANZ and Hardibacker details also.

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Silicone seal

Tile to match courtyard tiling

Building wrap

90 framing

Limestone veneer with masonry ties @ 600 crs both ways

R10 galv. bolt to NZS 3604

Matai skirting 70x12

Bottom plate on DPC

Weep holes @ 500mm crs

Concrete slab
exposed aggregate finish

D12 reinf. as shown

100mm 17.5 MPa concrete floor
665 HRC reinforcement
Polyethylene DPM on sand blinding,
Compacted hardfill

TIMBER TREATMENT

All timber for this application
To comply with
NZS3602 (2003)

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Detail 10

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Building Products

HARDIBACKER®

CAVITY CONSTRUCTION GENERAL SPECIFICATION

The Specifier or other responsible party for the project is responsible to ensure that the information and details in this specification are appropriate for the intended application and specific design and detailing is undertaken for areas which falls outside this published scope and specification. All relevant information must be provided to the local TA for Permit application.

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This specification must be read in conjunction with Details 1 – 13 available at the back of this document.

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:

James Hardie Building Products
Customer Service Centre FAX 0800 808 988

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1.0 Application & Scope

1.1 Application

Hardibacker® is a multipurpose external wall backing material can be used for:

- A rigid backing (a substrate) for solid plaster exterior wall covering.
- A substrate for alternative proprietary high-build plaster coatings.
- A rigid backing behind the weatherboards as per the requirements of NZS 3604;1999.
- Construction of arches, buttresses, columns, parapets, spandrels and many other architectural features that are to be subsequently plastered.
- All or parts of external walls for structural bracing as required by NZS 3604:1999.

1.2 Scope

Hardbacker can be used for those structures which fall within the scope of NZS 3604: 1999 "Timber Framed Buildings". There are two methods of constructing Hardbacker cladding depending on the application:

- "*Direct-fixed*", where the cladding is fixed directly to the timber stud frame. For this method of fixing please refer to the James Hardie Hardibacker Technical information.
- "*Drained and Ventilated cavity*", where cladding is fixed onto timber battens fixed over the timber frame.

Refer www.bia.co.nz for latest information regarding the construction methods for exterior cladding.

1.3 Code Compliance

This specification has been developed in accordance with the requirements of the draft NZBC E2/AS1 cavity construction requirements.

2.0 Design

2.1 Responsibility

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

2.2 Site & Foundations

The site on which the building is situated must comply with the Acceptable Solution E1/AS1 of the Approved Document for the NZBC (New Zealand Building Code) Clause E1 *"Surface Water"*.

Foundation design, in all cases must be either timber pile (where the piles terminate at the underside of the floor level) or concrete slab in accordance with NZS 3604:1999.

2.3 Ground Clearances

The floor must have a minimum clearance to paved or unprotected ground as required by NZS 3604:1999.

Hardbacker backing sheet must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by NZS 3604: 1999.

The bottom edge of the Hardibacker sheet must be a minimum of 50mm above paved or unprotected ground and 20mm above drained decks or roofs.

2.4 Moisture Management

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

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Wall construction design must effectively manage moisture, accounting for 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 Acceptable Solution E2/AS1 of the Approved Documents for the NZBC Clause E2 "*External Moisture*". In addition all wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate appropriate flashing and waterproofing. Materials, components and their installation that are used to manage moisture in framed wall construction must, at a minimum, comply with the requirements of relevant standards and the NZBC.

2.5 Horizontal Surfaces

Roofs are defined by NZS 3604:1999 as "that part of a building exposed to the outside and at an angle of 60° or less to the horizontal".

It is not recommended that Hardibacker must not be used to create roofs or horizontal surfaces as per the above definition.

2.6 Structure

Timber-framed buildings must be designed in accordance with NZS 3604:1999. However the framing requirements for timber member sizes and spacing specified in this document are for the buildings which fall within the scope of this document.

2.7 Wind Loading

Hardibacker is suitable for use in all wind zones (including and up to VH) in New Zealand as defined by NZS 3604: 1999.
A specific design is required for all situations above VH wind zone.

2.8 Structural Bracing

Hardibacker cladding sheets can be used to achieve structural bracing when installed on cavity battens.
For Higher bracing capacities Hardiflex may be used.
In bracing applications 316 grade stainless steel nails must be used in all zones.
For further information on bracing please ring James Hardie Customer Helpline at 0800 808 868.

2.9 Fire Properties

Hardibacker sheet will not burn and has the following Early Fire Hazard indices 9 Tested to AS/NZS 1530 part 3, 1999.

Ignition Index	0
Flame Spread Index	0
Heat Evolved Index	0
Smoke Developed Index	0

2.10 Energy Efficiency

The R-Value of walls sheeted with Hardibacker, constructed in accordance with this manual, will comply with the "Schedule Method" of NZS 4218:1996 (*Energy Efficiency – Housing and Small Building Envelope*) and shown in Table 1. Calculation is based on a framing member size of 90mm x 45mm and internal linings of James Hardie Villaboard, plasterboard or timber with insulation as mentioned in the table.
As per the requirement of NZS 4218:1996

Table 1: Insulation Capability

Climate Zone*	R-Value Requirement	Cavity Insulation Infill Requirement
1 & 2	1.5 m^2°C/W	R1.8 Fibreglass batts.
3	1.9 m^2°C/W	R2.2 Fibreglass batts.

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3.0 Framing

3.1 Framing

A 45mm (nominal) minimum stud width is required at all sheet edges. A 35mm stud width may be used at intermediate studs.

3.2 Structural Grade

Minimum timber grade requirements are No.1 framing grade in accordance with NZS 3631:1978 *"New Zealand Timber Grading Rules"* or equivalent.

3.3 Durability

Refer to Acceptable Solution B2/AS1 of the Approved Documents for NZBC Clause B2 "Durability".

Note: this document is now being extensively revised and is due for publication during 2004. Refer to this draft document for latest information.

Framing must be treated (H1.2) to provide resistance to fungal growth due to moisture exposure.

For further timber selection guidance refer to framing manufacturers specifications.

Refer to www.bia.co.nz for the latest information regarding the timber frame durability.

3.4 Frame Construction

All edges of Hardibacker sheeting must be fully supported by the framing The framing must be rigid and not rely on the Hardibacker sheet for stability.

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

All timber framing sizes and set-out must comply with NZS 3604: 1999, and with stud and nog centres and timber widths required by this specification.

- Studs spacing must not exceed more than 600mm centers.
- Nogs must be provided at 800mm centers maximum.

Refer to DZ3602 for moisture content requirements. Framing must be kept as dry as possible at all times.

3.5 Special Framing Requirements

An extra stud is required at corners when the drained and ventilated cavity construction method is used.

James Hardie recommends that the timber frame is set-out for the cladding sheets to ensure minimum cutting and wastage.

3.6 Curved Walls

Hardibacker cladding sheet can be used in curved walls, fixing the boards horizontally with a minimum radius of **1500mm** for **4.5mm** sheet fixed on to studs at a maximum spacing of **400mm.** Commence fixing from the centre of the sheet and work outwards to avoid any possibility of drumminess. Penetrations in curved walls are outside the scope of this specification.

3.7 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 Section 2.2 of NZS 3604: 1999. Recommended framing tolerances are shown in Table 2. All framing shall be made flush.

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Table 2: Timber Frame Straightness Tolerances	
Straight Edge (mm)	Tolerances (mm)
1200	1 – 2
3000	3 – 4

4.0 Preparation

4.1 Building Wrap

Building wrap must be provided between the cavity battens and the framing which either complies with Acceptable Solution E2/AS1 of the Approved Document for NZBC clause E2 "External Moisture" and NZS 3604:1999, or is BRANZ Appraised breather type membrane. The building wrap must be fixed in accordance with the manufacturer's recommendations and the requirements of NZS 3604:1999.

4.2 Vent Strip

The James Hardie PVC cavity vent strip must be installed at the bottom of all walls constructed using the drained and ventilated cavity method of construction.

4.3 Cavity Battens

The battens provide an air space between the frame and the sheet and are considered a "packer" in this specification. The battens must be fixed over the building wrap.

All timber battens must be minimum 19mm Thick x 45mm wide with a variation not to exceed more than +/- 0.5mm over a 600mm length on the face and H3.1 treated in accordance with DZ 3640 (*Specification of the Minimum Requirements Of The NZ Timber Preservation Council Inc.*)

Note: The document DZ 3640 is being revised. Please refer to this document for the latest information.

Battens must be fixed over the building wrap to all studs as described below;

Where studs are at 600mm centers, the battens must be provided at 300mm centers vertically
(i.e. a batten on studs and one in between the two studs) and fixed to top & bottom plates and nogs.
Where studs are at 400mm centers, the battens must be provided on the studs only.

Battens must be fixed to the framing using 40 x 2.8mm Hardiflex nails at top & bottom plates and at nogs only.
(Batten fixing is required temporarily to keep them straight on the wall during construction.)

4.4 Junctions & Penetrations

Refer to Section 2.4 of this literature for moisture management requirements.

All windows and doors must be detailed as per the requirements of Acceptable Solution E2/AS1 of the Approved Document for NZBC Clause E2 "External Moisture". Refer also to the joinery provider.

The Window Association of New Zealand (WANZ) has specifications and details available for the treatment of window penetrations. Refer to www.wanz.co.nz.

Refer to Details 8 & 9 for generic Hardibacker window details.

4.5 Corners

At all external and internal corners the mesh and plaster is to be continuous around the corners; control joints are not required. See detail 7 and 8.

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5.0 Sheet Fixing

5.1 General

The Hardibacker cladding sheets must be kept dry as much as possible whilst in storage or during the fixing.

5.2 Fastener Durability

NZS 3604: 1999 has requirements for the fixing material relating to the exposure conditions as summarised in Table 3.

Table 3: Exposure Conditions & Nail Selection prescribed by NZS 3604:1999

Nail Material	
Sea Spray Zones*	Zone 1 outside sea spray zone and Zones 2 – 4 & Geothermal hot spots
Grade 316 Stainless	Hot-dipped galvanised or 316 stainless

**Zone 1 areas where local knowledge dictates that increased durability is required, appropriate selection shall be made.*

5.3 Fastener Size & Layout

Hardibacker sheets must be nail-fixed to timber as described below and as shown in Detail 2:

- Use 60 x 3.15 mm Hardiflex fibre cement nails.
- Nails at 200 mm centres along sheet edges as well as intermediate studs.
- Nails must be driven a minimum of 12 mm from the sheet edges and 50 mm from corners.

Do not overdrive nails below sheet surface.

Note: that special fixing arrangements are required for bracing systems – For more information contact James Hardie Helpline on 0800 808 868.

5.4 Sheet Layout

All sheet edges must be supported by the framing.

Hardibacker sheets must be fixed vertically except for on curved walls.

6.0 Jointing

6.1 Vertical Sheet Joint

Hardibacker sheets are butt jointed together at vertical joints.

6.2 Control Joints

Control joints shall be formed in the plaster to coincide with all locations and joins in the structure where movement is likely to occur. The control joint spacing as per NZS 4251:1998 shall not be greater than 4m both vertically and horizontally and be located at:

- Above and below the sides of door & window openings, and
- At the floor joist levels.

6.2.1 Vertical Control Joint

Vertical control joint must be provided in stucco at a distance as mentioned above. Refer to "Good Stucco Practice" (Feb.1996) by BRANZ for further information regarding creating a vertical control joint.

When a window or door opening is in the vicinity of the control joint then the edge of the opening is an ideal location for the control joint. As a good practice position the control joints so they are hidden by the building features where possible.

The vertical sheet joints do not need to coincide with plaster control joints.

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6.2.2 Horizontal Control joint

At floor joist levels a horizontal joint must be provided to accommodate the movements resulting due to structural deflections or due to timber joist shrinkage.

A horizontal control joint must be provided at 4 meters maximum centres.

A James Hardie uPVC 'h' mould is used to form a horizontal joint as one option. See Detail 7.

A purpose made metal 'Z' flashing could also be used to form a horizontal joint. The metals which could be used are stainless steel, powder-coated aluminum, powder-coated hot dipped galvanized steel and hot dipped galvanized steel. Also refer to NZS 4251:1998 for more information about the metals to be used with stucco plasters. *Refer Detail 10.*

Note: Zinc alum coated steel is not suitable as it deteriorates when in contact with Portland cement.

6.4 Expansion Joints

Expansion joints are provided to accommodate or allow structural movements. A vertical structural expansion joint must be provided at maximum 12 meters. They are generally required for larger commercial buildings only, and such buildings are outside the scope of this literature. Appropriate joint design shall be undertaken for this situation.

7.0 Finishing

7.1 Solid Plaster Finishes

7.1.1 General

Hardibacker is a rigid backing for solid plaster and proprietary plaster coatings and provides true straight backing to plaster.

An approved plastering system is to be applied which meets the requirements of NZBC and is in accordance with NZS 4251:1998.

The solid plaster must be finished and detailed to be waterproof. Useful guidance can be found in BS 5262:1991 and BRANZ " Good Stucco Practice" (Feb.1996).

7.1.2 Building Paper

Used in accordance with Acceptable Solution E2/AS1 clause 2.3, Hardibacker is an alternative to the 'rigid backings' specified in clause 2.3.3 of the NZBC .

Building paper over the face of the sheets must be fixed before the reinforcing mesh and plaster is applied.

A suitable building paper must comply with NZS 2295. The building paper must be run horizontally and lapped 75mm at joints, with the direction lap ensuring water is shed to the outer face of the paper.

7.1.3 Base Mould

A PVC base mould is available to finish the plaster against. Fix the base mould to the bottom plate or bearer and and over the Hardibacker before plastering commences.

7.1.4 Reinforcement

Fix reinforcement for solid plaster in accordance with NZS3604:1990 and NZS 4251:19974 Code of Practice for Solid Plaster.

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Alternatively proprietary solid plaster reinforcing mesh systems can be used. The mesh must be spaced in the plaster between 6mm and 9mm from the Hardibacker surface as required by clause 7.4.4 NZS 4251:1974. To achieve this spacing and adequately tension the mesh, use the Hardibacker PVC angle.

The Hardibacker PVC angle is fixed in a continuous strip vertically down each stud line at 600mm centers. The 1500mm spacers are fixed to the centre of each nog line. Fix to reference marks previously set out on the building paper face as all mesh fixings must penetrate the timber frame.

Use 40mm x 2.8mm galvanized large head clouts with 9mm diameter flat heads, to secure the reinforcing. Nail through or alongside every fourth hole in the spacers down each stud line and nail-fix the mesh at 150mm along the nogs. Slightly skew the nail from centre of the the sheet outwards to make taut.

Laps in reinforcing mesh must be 75mm minimum. Bend the mesh around corners at least 480mm-600mm to allow the lap to be located one standard spacing away from the corner.

The corner of openings must have extra reinforcement , as Clause 7.4.6 and 7.5.2 NZS 4251:1974. This is not required when a relief or a control joint is located at the side of the opening.

7.2 Sealants

All sealants must demonstrate to meet the relevant requirements of NZBC and hold a current BRANZ Appraisal Certificate. Application and use of sealants must comply with manufacturers instructions. Sealants, if coated, must be compatible with the paint system. Some sealant manufacturers do not recommend coating over their product.

7.3 Coating

Painting of plaster is essential to meet the durability requirements of New Zealand building code and product warranty requirements.

Before painting, remove any surface dirt, grim or other contaminants and ensure the plaster is dry.

Use only quality 100% acrylic high build paints. Economy paints are not recommended because generally they are less well bound, less moisture resistant and more prone to mould growth.

In all cases the manufacturer's specification for the selected paint must be followed. Note that some paints require undercoat before applying the finish coat.

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8.0 Maintenance

It is the responsibility of the specifier to determine normal maintenance requirements as per the requirements of 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 that may provide a means of moisture entry beyond the exterior cladding to comply with the requirements of NZBC clause E2.
- Cleaning out gutters, blocked pipes and overflows as required,
- Pruning back vegetation which is close to or touching the building.

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

9.0 Product Information

9.1 Manufacturing & Classification

James Hardie New Zealand is an ISO 9001 Telarc certified manufacturer. Hardibacker sheet is manufactured to meet the requirements of AS/NZS 2908.2: 2000 *'Cellulose-Cement Products'*.

The sheets are identified by its blue colour and the printing at regular intervals the name "HARDIBACKER" on the back face and embossed on the front face of the sheet.

9.2 Sheet Sizes

Available sizes of Hardibacker are provided in Table 4.

Table 4: Hardibacker sheet sizes

Thickness (mm)	Width (mm)	Length (mm)	
		2400	2700
4.5	1200	✓	✓

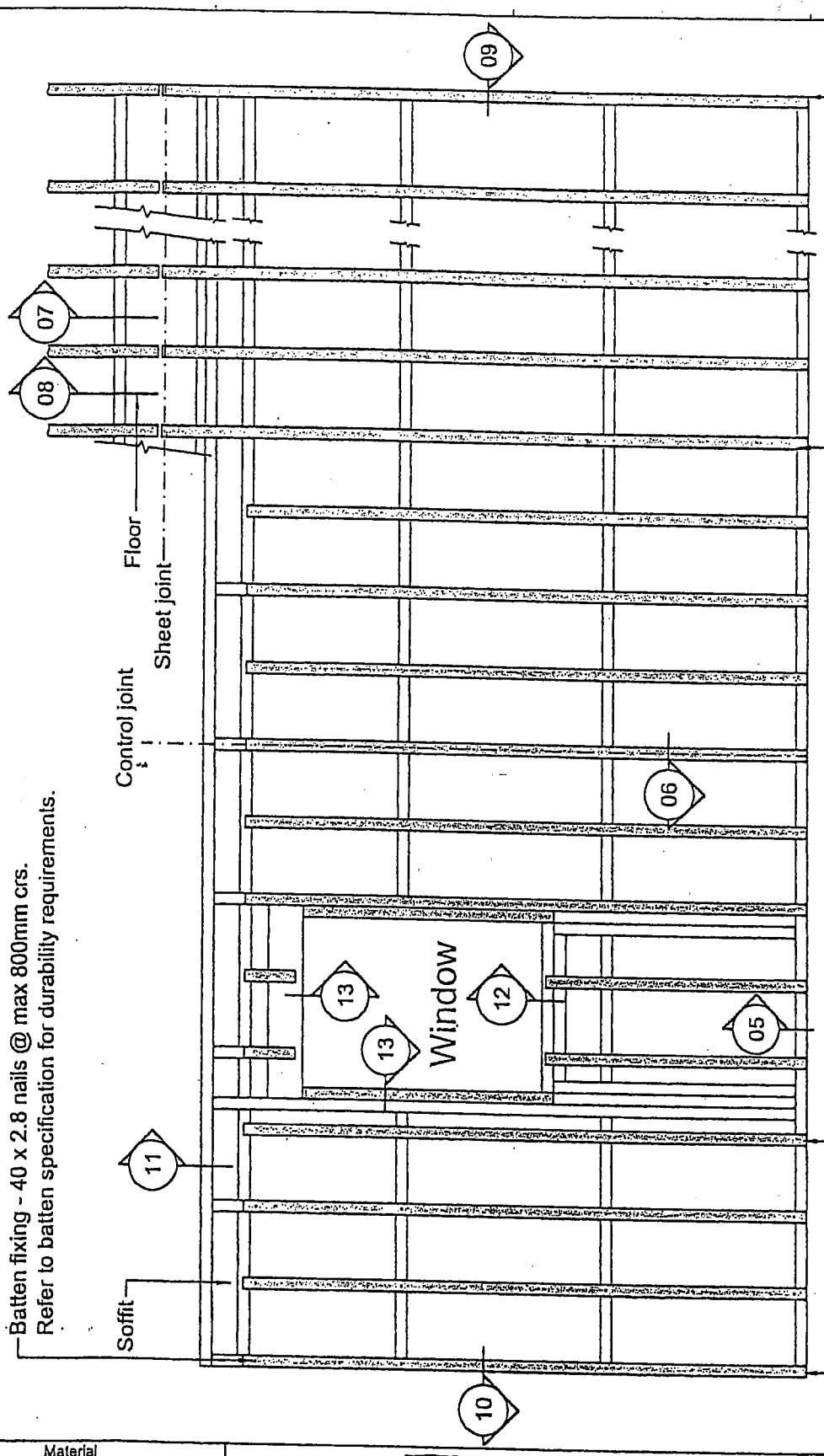
9.3 Product Mass

Hardibacker sheet has a product mass of 7kg/m^2 at EMC.

10.0 Safe Working Instructions

If you are unfamiliar with working safely with fibre-cement products and their accessories, please refer to the Safe Working Instructions literature that accompanies every pack of fibre-cement from James Hardie or alternatively ring customer service Helpline on 0800 808 868 for these instructions.

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Note!
Section notations refer to dwg numbers.

WALL ELEVATION

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

Material

Drawn to AS 1100

Dimensions in Millimetres

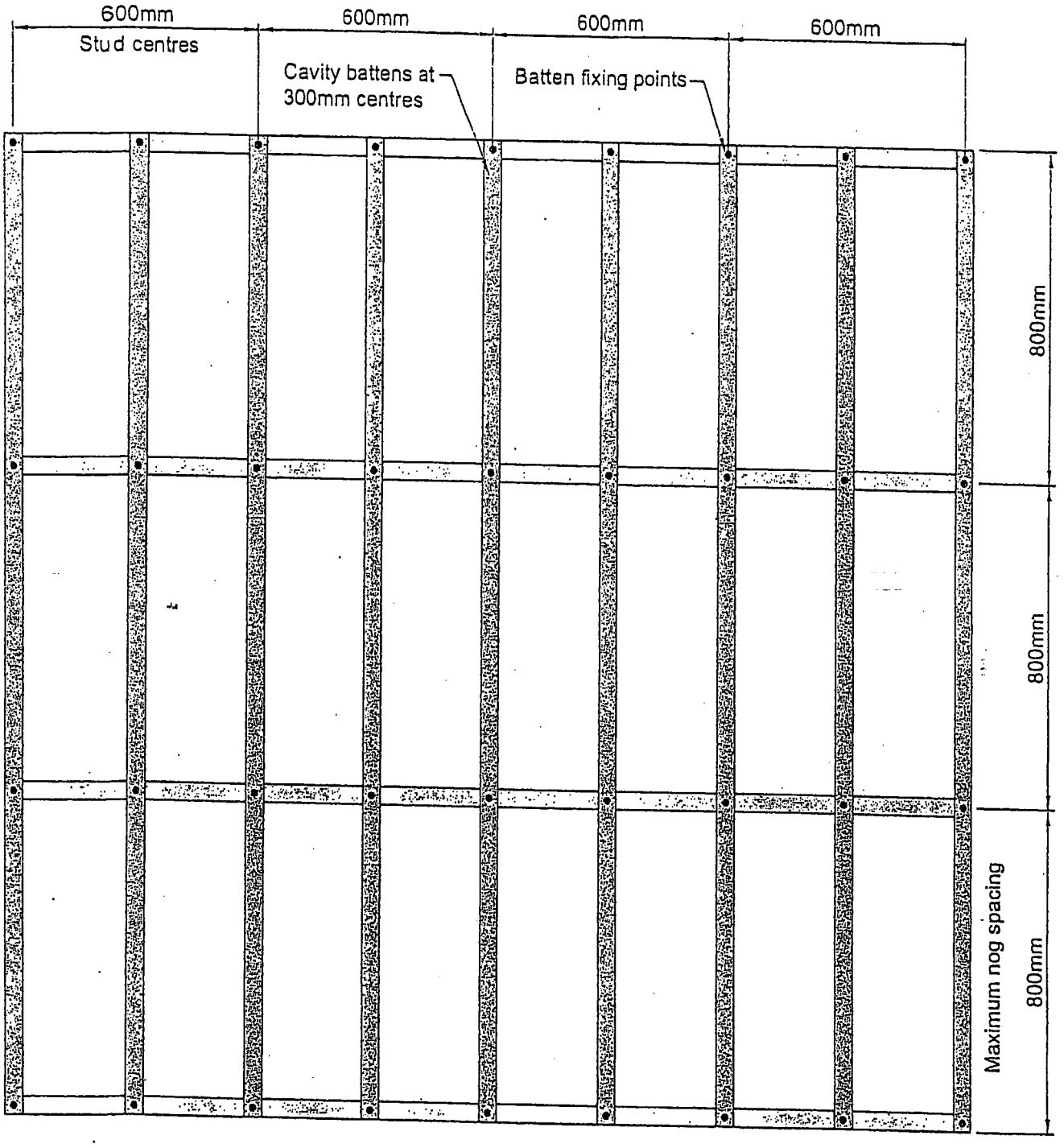
Do Not Scale

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TECHNICAL PRODUCT DEVELOPMENT
NEW ZEALAND BUILDING PRODUCTS
RESIDENTIAL
HARDIBACKER
GENERAL SPECIFICATION
CAVITY TYPICAL FRAMING & BATTEN SETOUT

Drawn: SK	Date: 26.11.2003
Checked	Date
Approved	Date
Sheet Size: A4	Scale: NTS
Reference No: N_ZR-H_B-GSP	Detail: 01
Sht of Shts	Revision: A



Sheet joint studs 45mm wide
Other framing 45mm or 35mm wide

Note: No horizontal cavity battens required at nogs

Material

Drawn to AS 1100

Dimensions in Millimetres

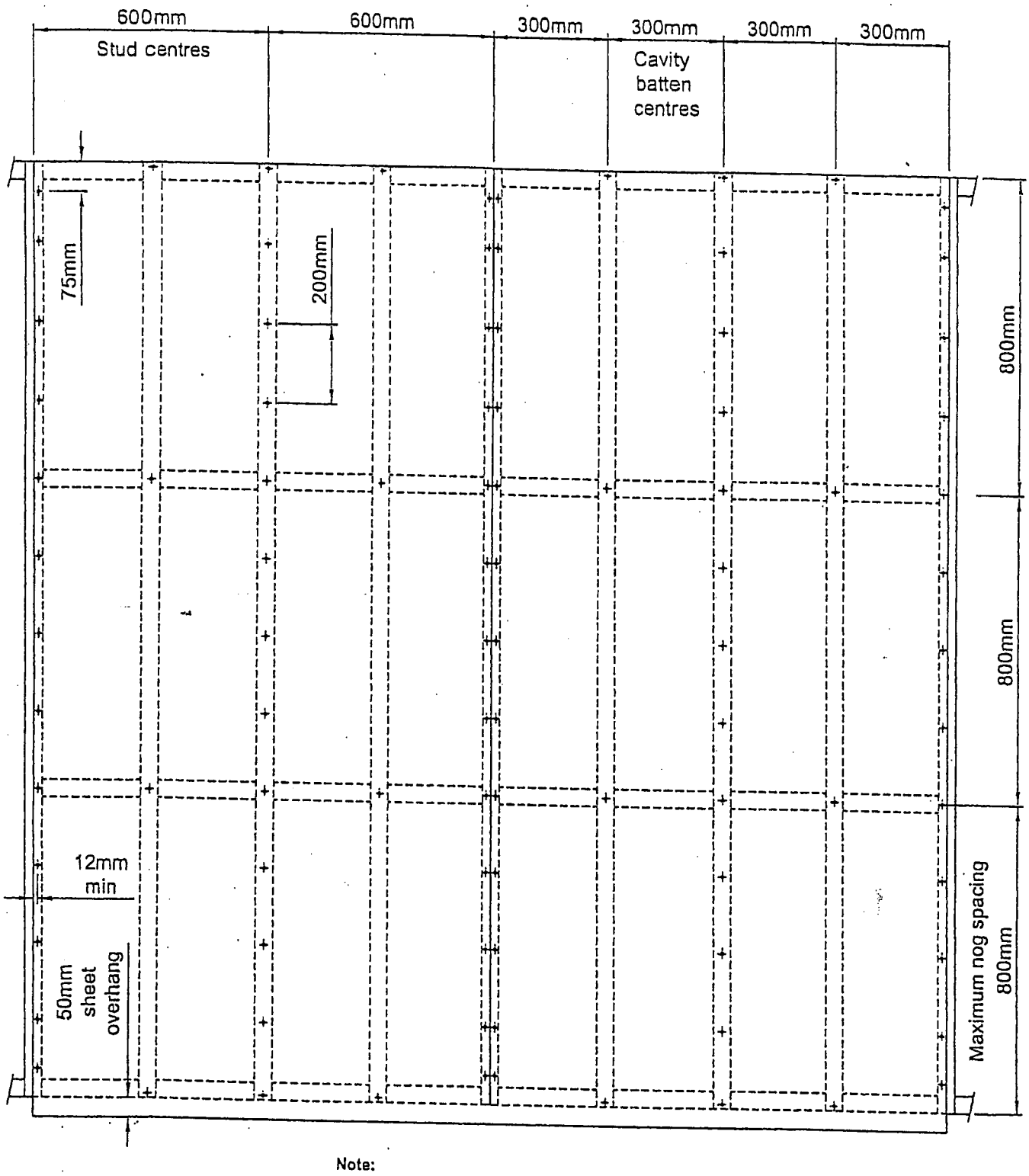
Do Not Scale

James Hardie
Building Products

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TECHNICAL PRODUCT DEVELOPMENT
NEW ZEALAND BUILDING PRODUCTS
RESIDENTIAL
HARDIBACKER
GENERAL SPECIFICATION
CAVITY BATTEN FIXING

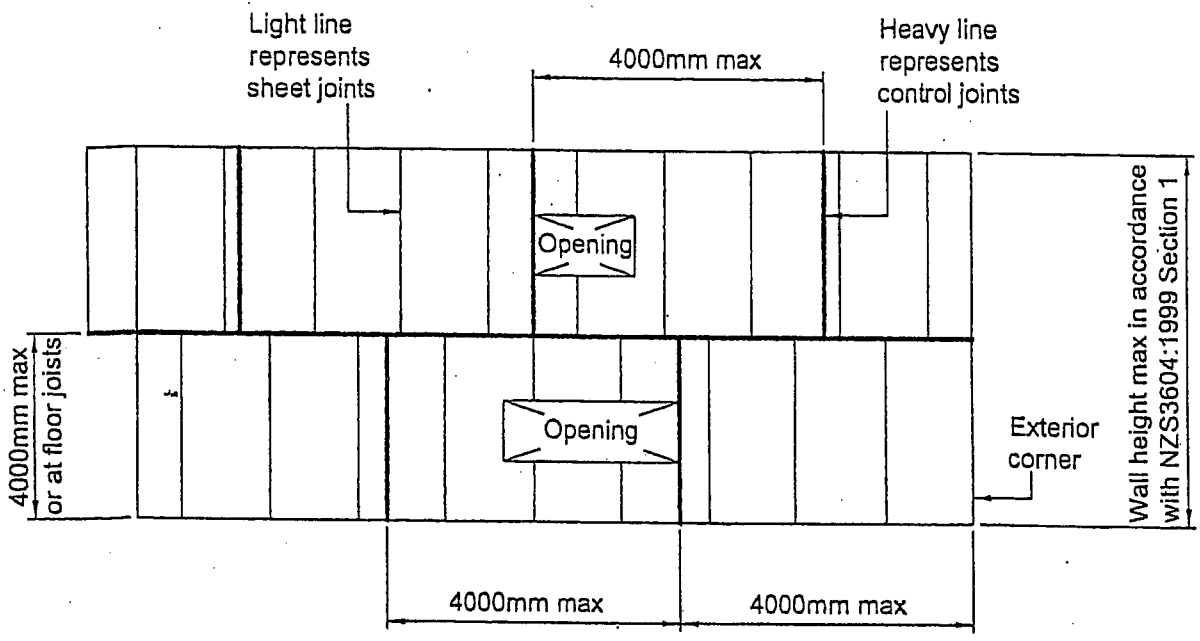
Drawn: SK	Date: 26.11.2003
Checked	Date
Approved	Date
Sheet Size: A4	Scale: NTS
Reference No: N_ZR-H_B-GSP	Detail: 02
Sht of Shts	Revision: A



Note:
Hardibacker sheets must be fixed vertically except for at curves .

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100 Dimensions in Millimetres Do Not Scale	TECHNICAL PRODUCT DEVELOPMENT NEW ZEALAND BUILDING PRODUCTS RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY TYPICAL SHEET FIXING SETOUT	Sheet Size: A4	Scale: NTS
		Reference No: N_ZR-H_B-GSP	Detail: 03
		Sht of Shts	Revision: A

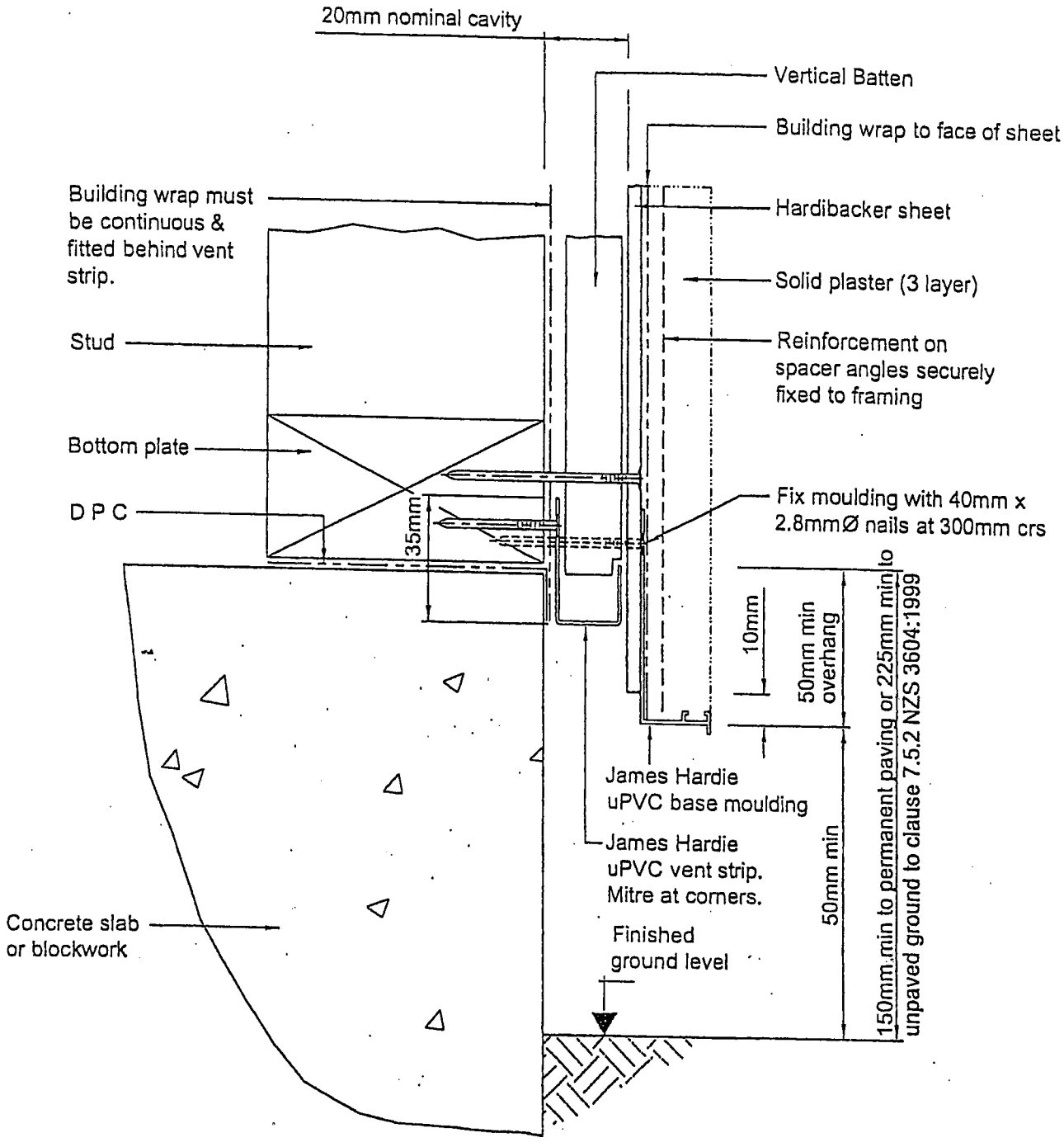
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Wall Elevation

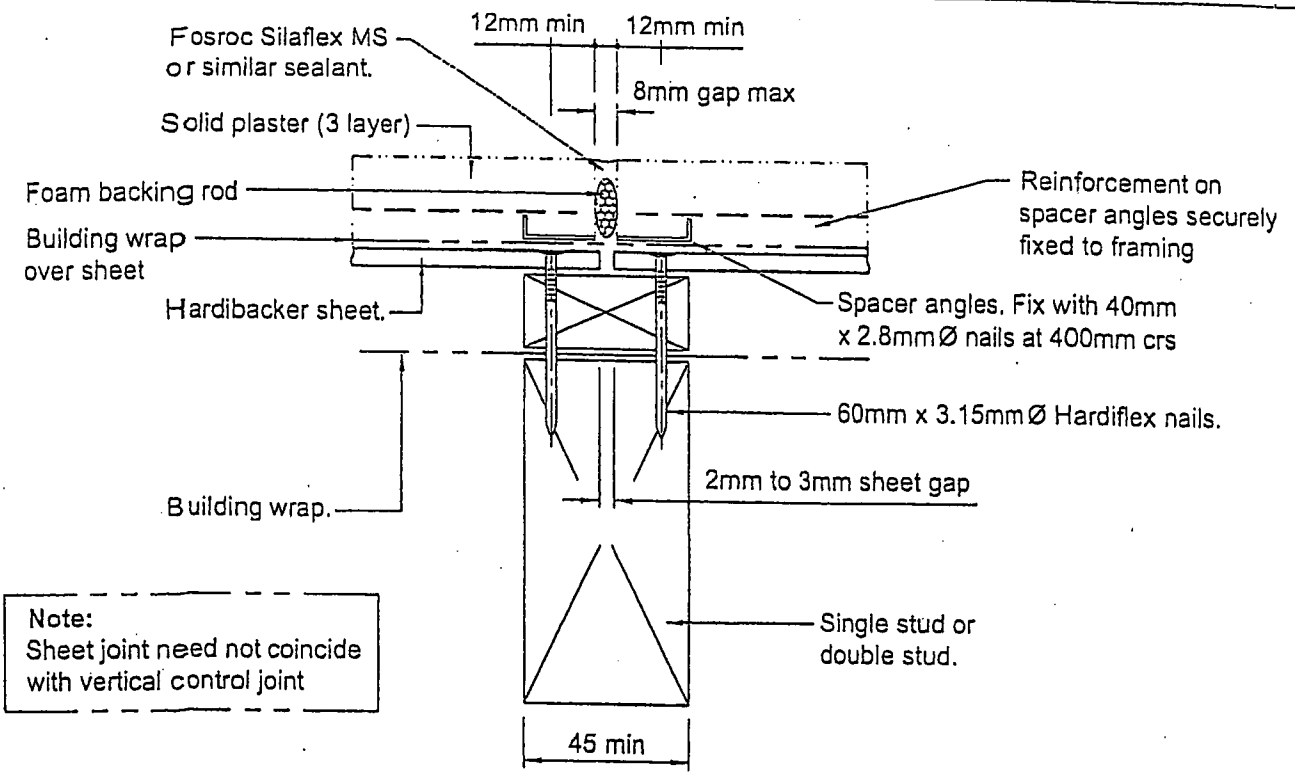
Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100	TECHNICAL PRODUCT DEVELOPMENT	Sheet Size: A4	Scale: NTS
Dimensions in Millimetres	NEW ZEALAND BUILDING PRODUCTS	Reference No: N_ZR-H_B-GSP	Detail: 04
Do Not Scale	RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY CONTROL JOINT SETOUT	Sht of Shts	Revision: A

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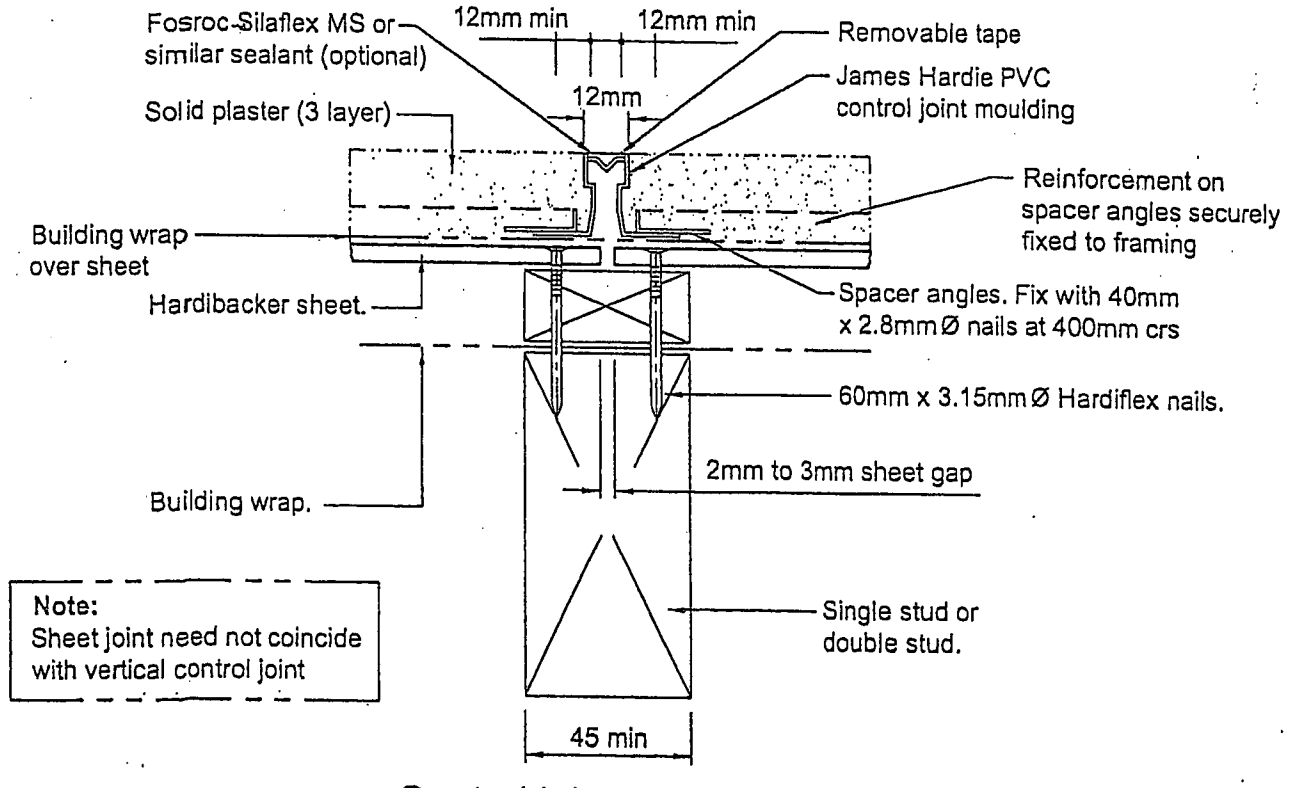
James Hardie Vent Strip Product Code:

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
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		Approved	Date
Drawn to AS 1100 Dimensions in Millimetres Do Not Scale	TECHNICAL PRODUCT DEVELOPMENT NEW ZEALAND BUILDING PRODUCTS RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY CONCRETE FOOTING	Sheet Size: A4	Scale: NTS
		Reference No: N_ZR-H_B-GSP	Detail: 05
		Sht of Shts	Revision: A



Note:
Sheet joint need not coincide with vertical control joint

Control joint

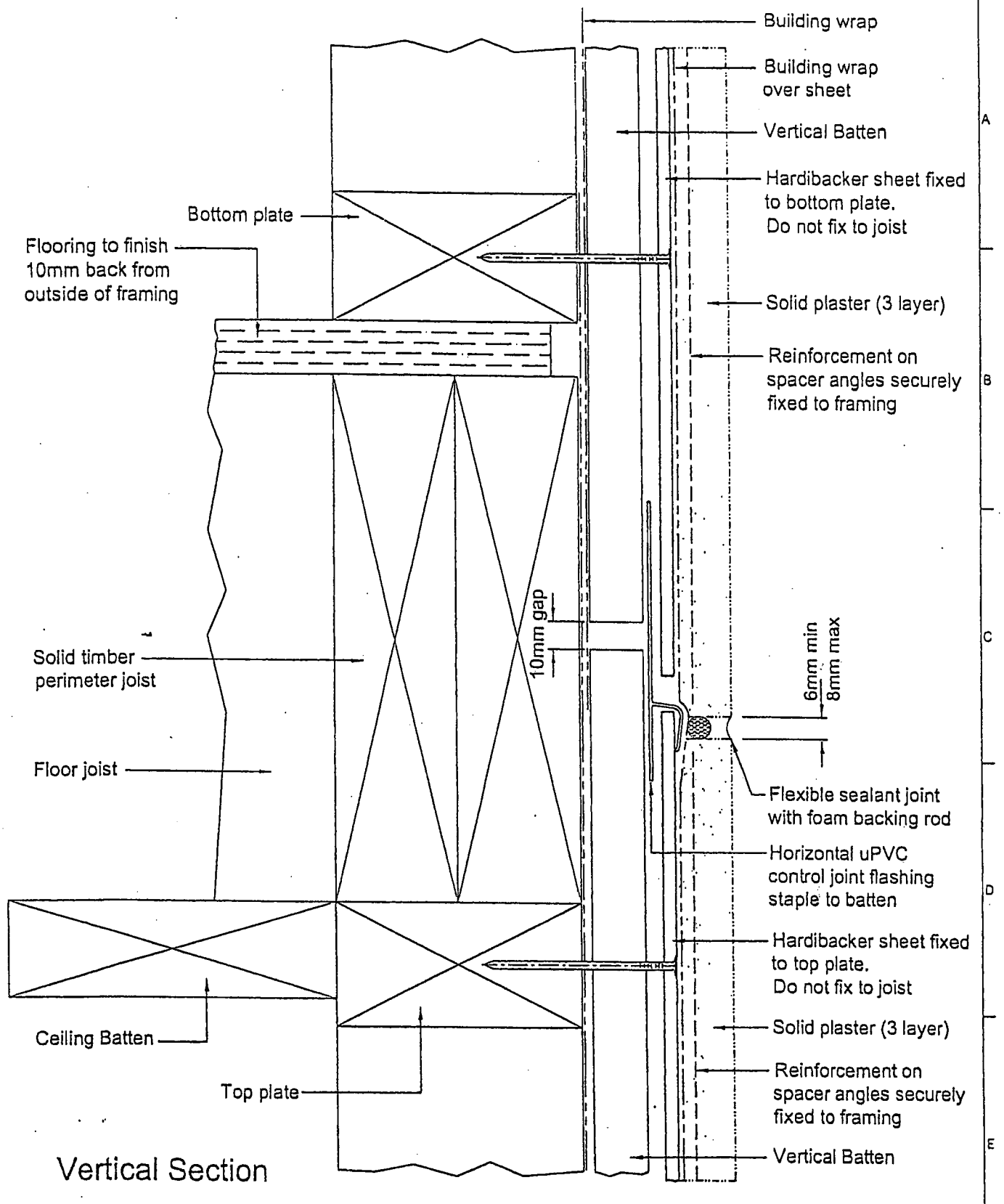


Note:
Sheet joint need not coincide with vertical control joint

Control joint alternative

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100 Dimensions in Millimetres Do Not Scale	TECHNICAL PRODUCT DEVELOPMENT NEW ZEALAND BUILDING PRODUCTS RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY VERTICAL JOINTS	Sheet Size: A4	Scale: NTS
		Reference No: N_ZR-H_B-GSP	Detail: 06
		Sht of Shts	Revision: A

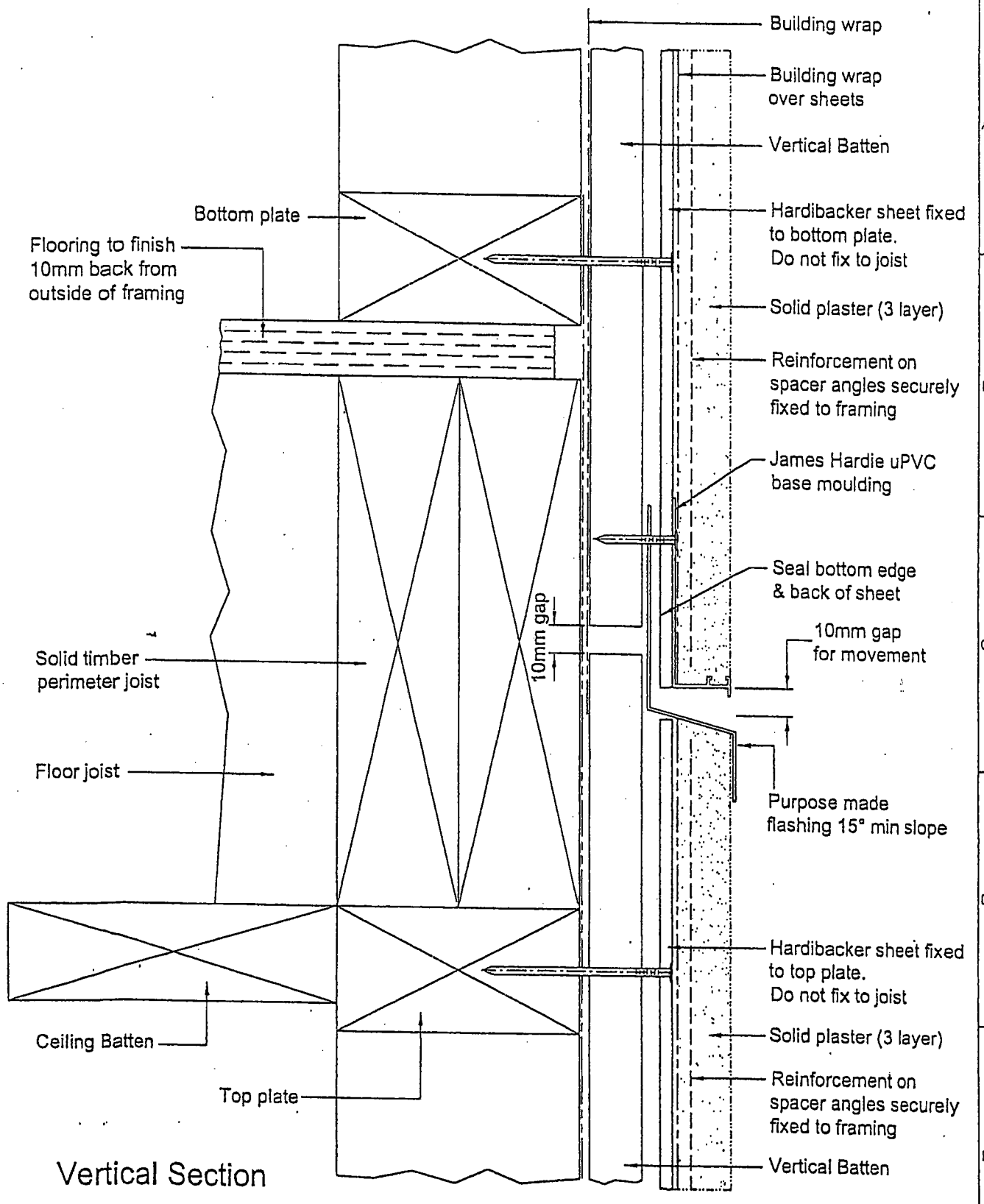
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Vertical Section

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100	TECHNICAL PRODUCT DEVELOPMENT	Sheet Size: A4	Scale: NTS
Dimensions in Millimetres	NEW ZEALAND BUILDING PRODUCTS	Reference No: N_ZR-H_B-GSP	Detail: 07
Do Not Scale	RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY HORIZONTAL CONTROL JOINT	Sht of Shts	Revision: A

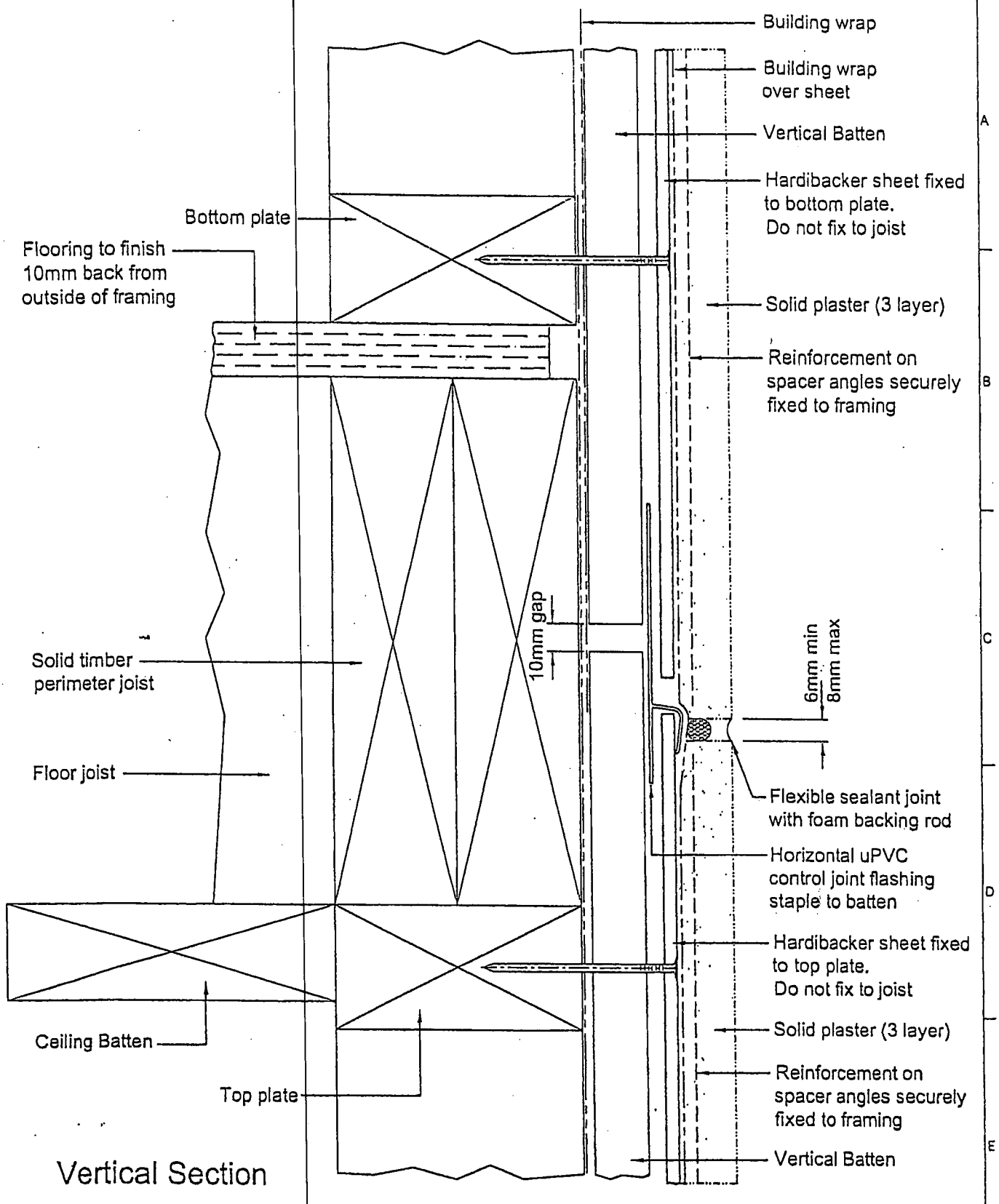
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Vertical Section

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100	TECHNICAL PRODUCT DEVELOPMENT	Sheet Size: A4	Scale: NTS
Dimensions in Millimetres	NEW ZEALAND BUILDING PRODUCTS	Reference No: N_ZR-H_B-GSP	Detail: 08
Do Not Scale	RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY HORIZONTAL JOINT	Sht of Shts	Revision: A

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Vertical Section

Material

Drawn to AS 1100

Dimensions in Millimetres

Do Not Scale

James Hardie Building Products

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TECHNICAL PRODUCT DEVELOPMENT

NEW ZEALAND BUILDING PRODUCTS

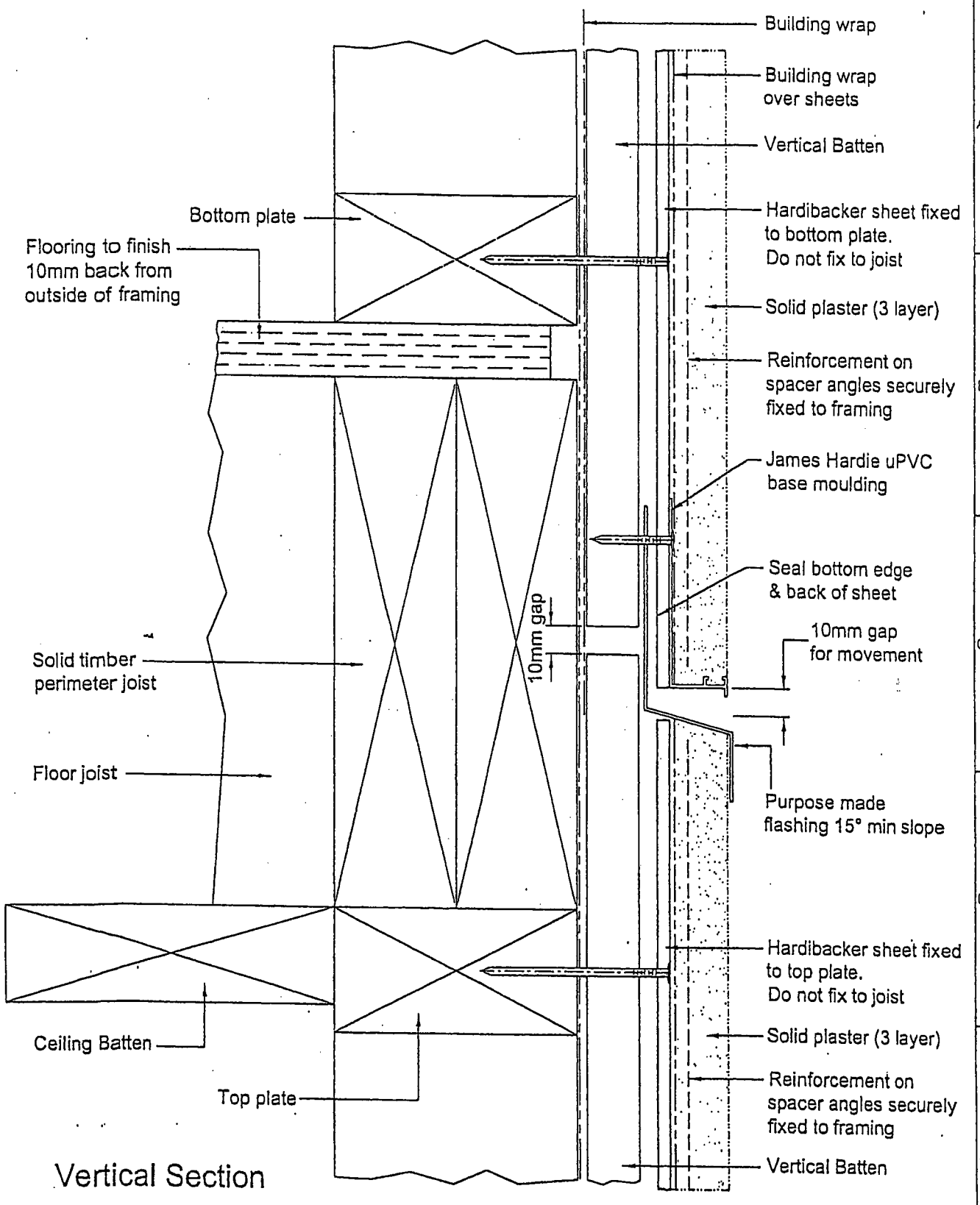
RESIDENTIAL

HARDIBACKER

GENERAL SPECIFICATION

CAVITY HORIZONTAL CONTROL JOINT

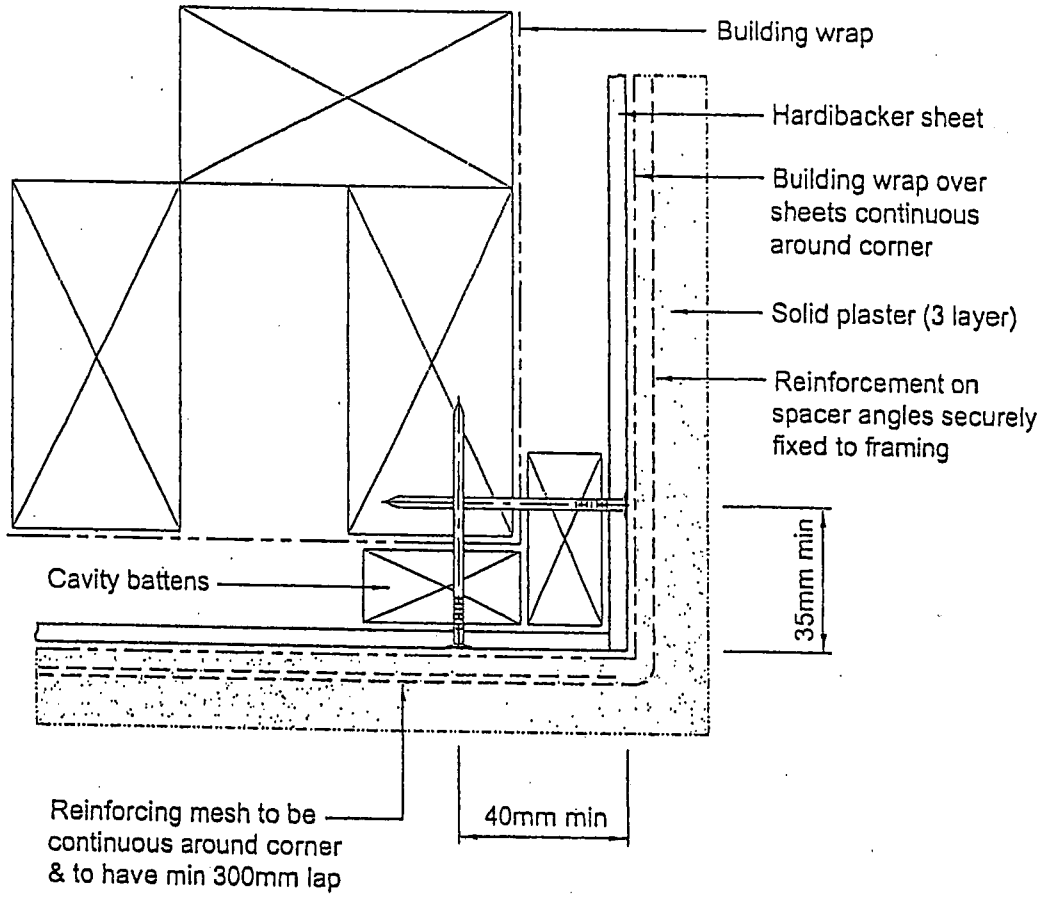
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Checked	Date
Approved	Date
Sheet Size: A4	Scale: NTS
Reference No: N_ZR-H_B-GSP	Detail: 07
Sht of Shts	Revision: A



Vertical Section

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100	TECHNICAL PRODUCT DEVELOPMENT	Sheet Size: A4	Scale: NTS
Dimensions in Millimetres	NEW ZEALAND BUILDING PRODUCTS	Reference No: N_ZR-H_B-GSP	Detail: 08
Do Not Scale	RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY HORIZONTAL JOINT	Sht of Shts	Revision: A

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Material

Drawn to AS 1100

Dimensions in Millimetres

Do Not Scale

James Hardie Building Products

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TECHNICAL PRODUCT DEVELOPMENT

NEW ZEALAND BUILDING PRODUCTS

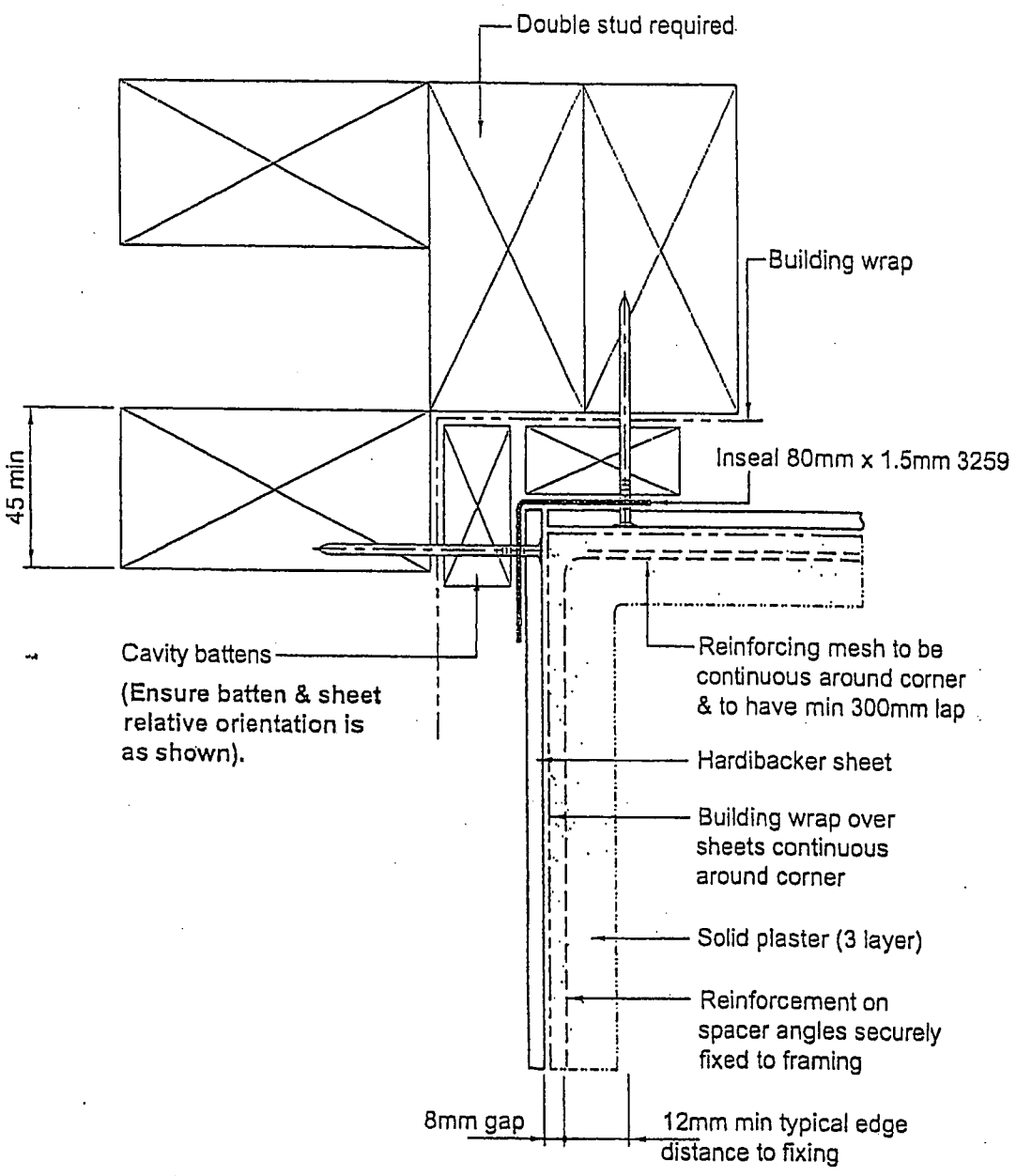
RESIDENTIAL

HARDIBACKER

GENERAL SPECIFICATION

CAVITY EXTERNAL CORNER

Drawn: SK	Date: 26.11.2003
Checked	Date
Approved	Date
Sheet Size: A4	Scale: NTS
Reference No: N_ZR-H_B-GSP	Detail: 09
Sht of Shts	Revision: A



Material

Drawn to AS 1100

Dimensions in Millimetres

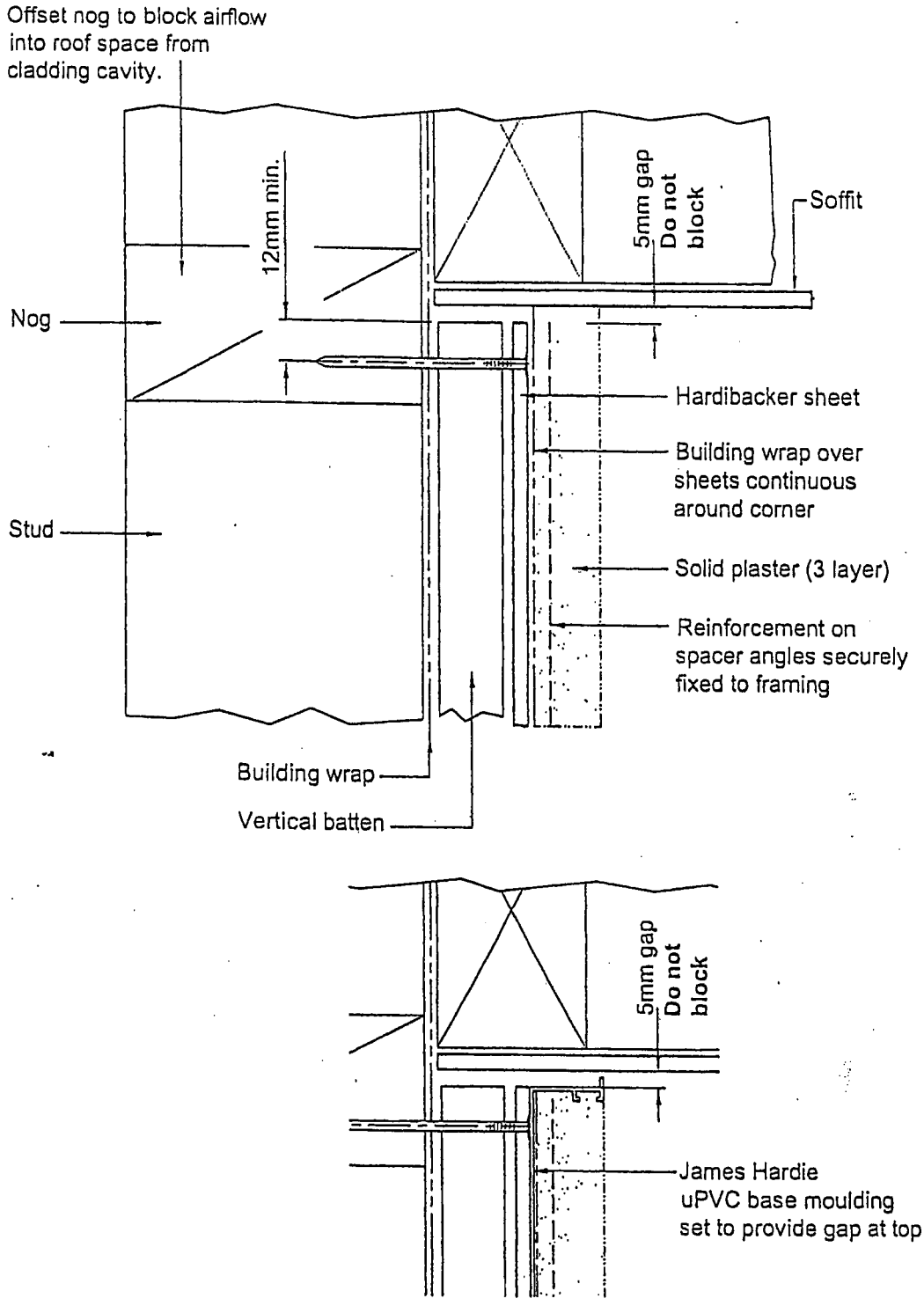
Do Not Scale

James Hardie
Building Products

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TECHNICAL PRODUCT DEVELOPMENT
NEW ZEALAND BUILDING PRODUCTS
RESIDENTIAL
HARDIBACKER
GENERAL SPECIFICATION
CAVITY INTERNAL CORNER

Drawn: SK	Date: 26.11.2003
Checked	Date
Approved	Date
Sheet Size: A4	Scale: NTS
Reference No: N_ZR-H_B-GSP	Detail: 10
Sht of Shts	Revision: A

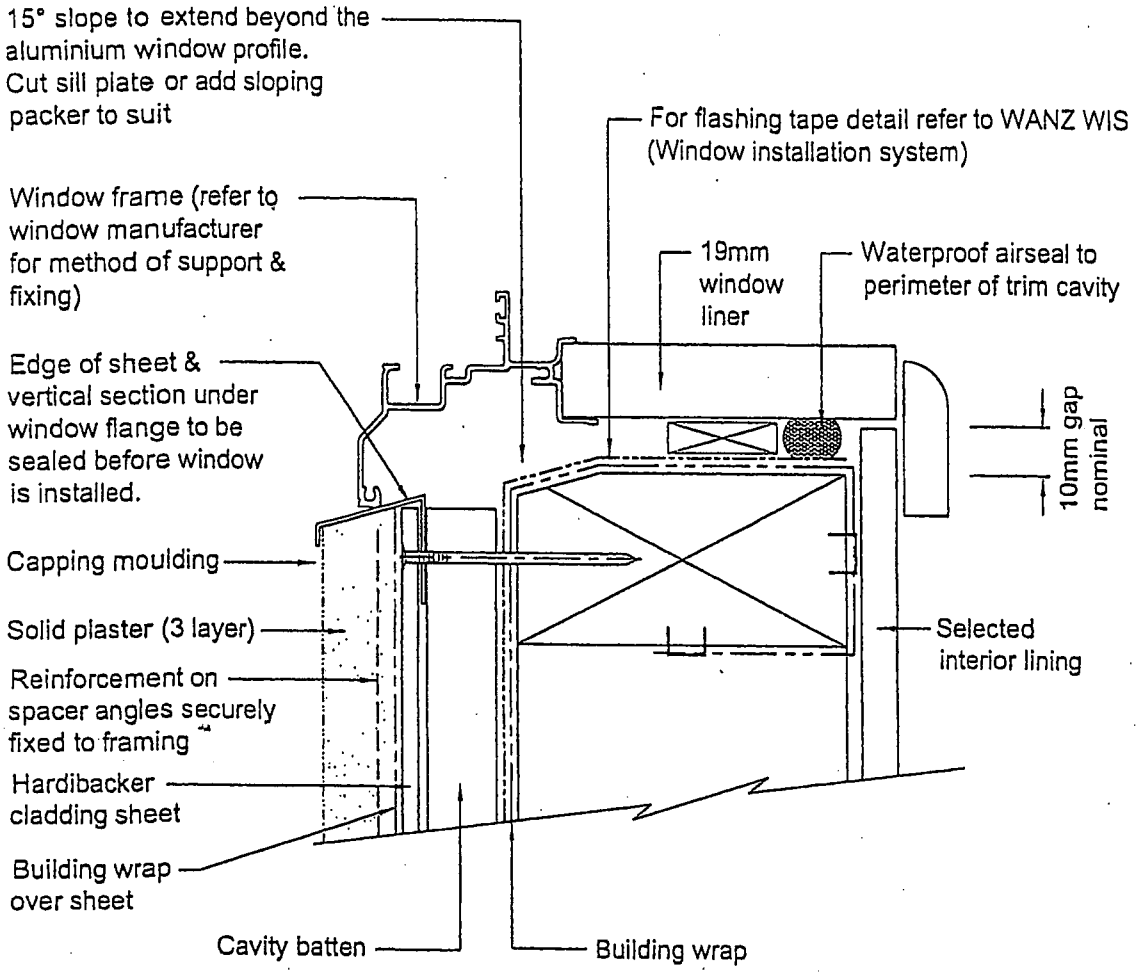


Alternative eaves mould fixing for ventilated cavity

All other details as above

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100	TECHNICAL PRODUCT DEVELOPMENT	Sheet Size: A4	Scale: NTS
Dimensions in Millimetres	NEW ZEALAND BUILDING PRODUCTS	Reference No: N_ZR-H_B-GSP	Detail: 11
Do Not Scale	RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY SOFFIT DETAIL	Sht of Shts	Revision: A

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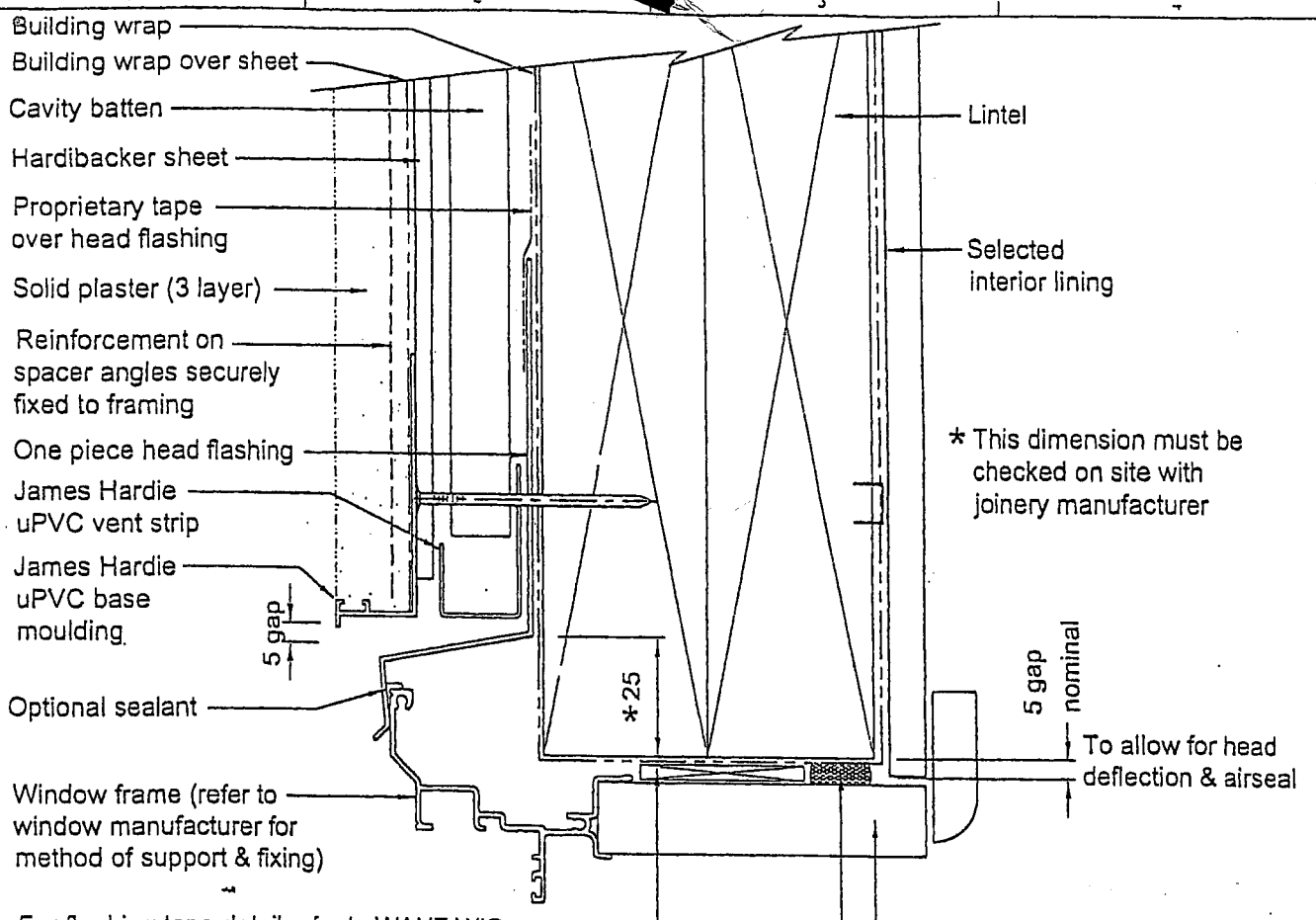
Section at Sill

General notes for materials selection

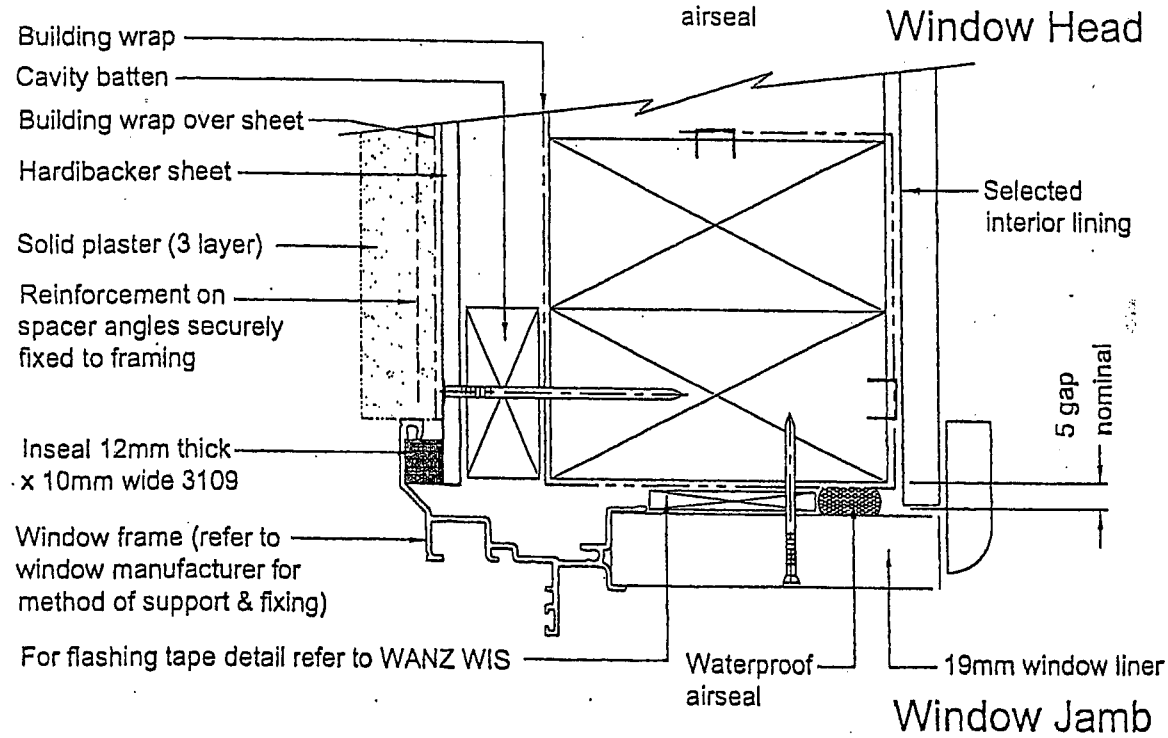
1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604: 1999
2. Building wrap must comply with acceptable solution E2/AS1 & NZS 3604:1999
3. Flashing tape must have proven compatibility with the selected building wrap & other materials with which it comes into contact

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

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		Approved	Date
	TECHNICAL PRODUCT DEVELOPMENT NEW ZEALAND BUILDING PRODUCTS RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY WINDOW SILL	Sheet Size: A4	Scale: NTS
Drawn to AS 1100 Dimensions in Millimetres Do Not Scale		Reference No: N_ZR-H_B-GSP	Detail: 12
		Sht of Shts	Revision: A



Window Head



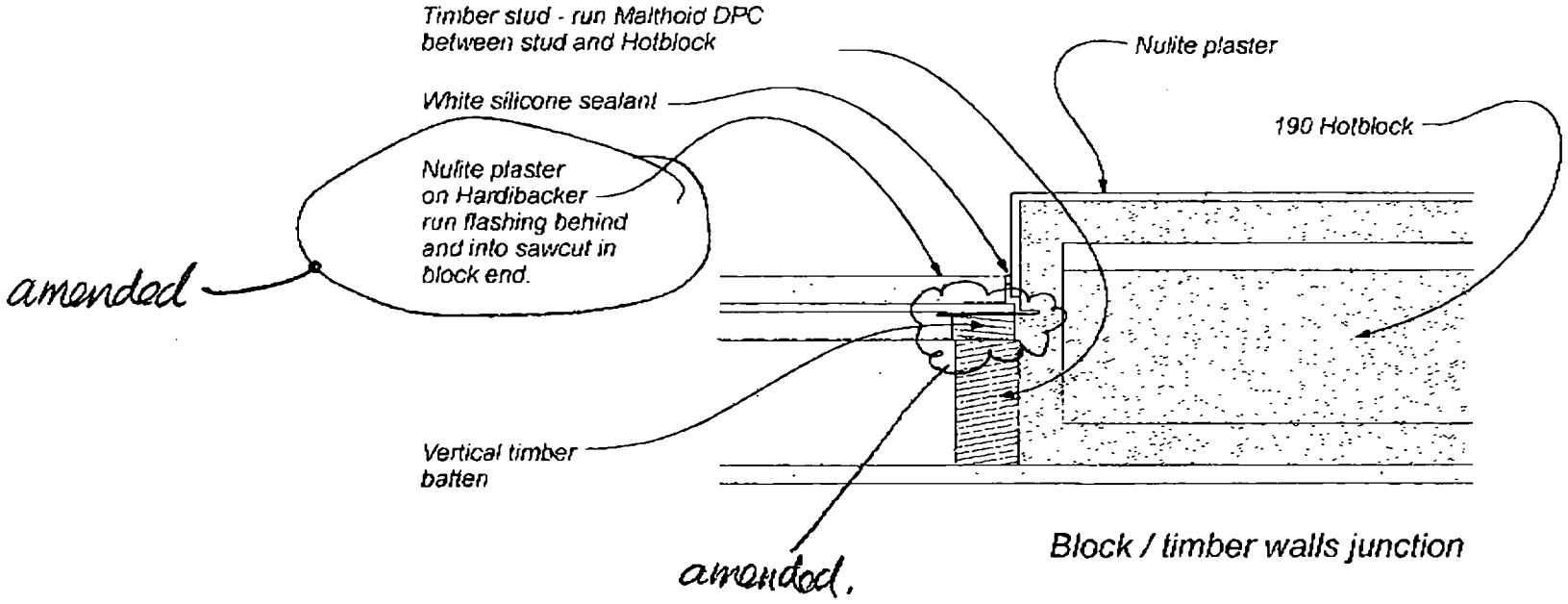
Window Jamb

Material	James Hardie Building Products	Drawn: SK	Date: 26.11.2003
		Checked	Date
		Approved	Date
Drawn to AS 1100 Dimensions in Millimetres Do Not Scale	TECHNICAL PRODUCT DEVELOPMENT NEW ZEALAND BUILDING PRODUCTS RESIDENTIAL HARDIBACKER GENERAL SPECIFICATION CAVITY WINDOW HEAD & JAMB	Sheet Size: A4	Scale: NTS
		Reference No: N_ZR-H_B-GSP	Detail: 13
		Sht of Shts	Revision: A

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PID 96665.
ABA 20042396.

Attn. Mr. Tony Hales.
@ HDC. 8780515.



Block / timber walls junction

Ralford Gardiner Architects
Box 1491, 212E Queen St
HASTINGS N.Z.
Tel 06-876 7601
Fax 06-876 2790

Barnes V5.pln; Det 6 ; 1 : 10; RG; 22/3/05 5:46 pm; 1/1

22/03 '05 TUE 17:39 FAX 64 6 8762790 HOLMES CONSULTING +++ HASTINGS DISTRICT CL 001/001

ABA20042396
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16/03/2005

Tony Ha

CONCEPT
MASTER BUILDERS

Revised [illegible] Architect.

ABA 2004 2396, plus other info requested. The council have the Wolite Plaster System on file.

WITH COMPLIMENTS

Regards Barry

Concept Building Limited Concept House 369 State Highway 2 RD2 Hastings
Tel 06 878 4690 Fax 06 876 2732 Email info@conceptmb.co.nz www.conceptmb.co.nz

Registered Master Builders

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16/03/2005

ASTEWATER DISPOSAL
SSMENT, SUBSOIL INVESTIGATION
AND SITE EVALUATION CHECKLIST

RECEIVED
14 FEB 2005
H.D.C.

HASTINGS DISTRICT COUNCIL

1.0 SITE EVALUATOR

1.1	Name: Steve Crockford	Registration Number: 12382
	Company: Effluent Management Systems Ltd	Address: PO Box 8361, Havelock North
	Phone: 870 3701 Fax: 870 3702	Mobile: 021 926 364

2.0 SITE INFORMATION

2.1	Location Address:		
	Owner:	Address:	
	Phone:	Fax:	Mobile:
2.2	Legal Description	Lot No: DP:	Valuation No:
	Area of Site:	Ha:	

2.3	Shape/Layout of site-Sketch plans attached?	Y / N (circle one)
2.4	Photographs of site attached?	Y / N (circle one)
2.5	Percolation Test Results Attached?	Y / N (circle one)
2.6	Illustration of Soil Structure Attached?	Y / N (circle one)
2.7	Photograph of Soil Structure Attached?	Y / N (circle one)

3.0 HYDRAULIC LOADING INFORMATION

3.1	Number of Bedrooms: 3	Number of Persons: 6	Design Loading Rate Per Person (1/day): .200
3.2	Waste Disposal Unit Installed? Yes/No		
3.3	Water Saving Devices Fitted? Yes/No		
3.4	Water Supply - Rain Water – Bore/Well – Reticulated		

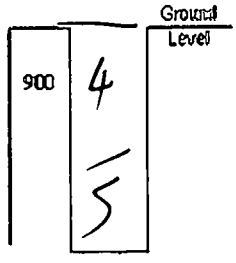
4.0 SITE ASSESSMENT

4.1	Have Plans / Photographs of the Site been supplied? Y / N (circle one) IF NO WHY NOT!
4.2	Topography of Site – Flat / Sloping / Rolling / Steep
4.3	Give details if different from 4.2
4.4	Does the site contain fill? Yes/No
4.5	Does the site Contain Drainage Flow Paths? Yes/No
4.6	Any Visible or Known Stormwater Problems? Yes/No
4.7	Need for Ground Water/Surface Water "Cut-Off / Collector Drains" Yes/No
4.8	Is the winter High Watertable known? Yes/No

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16/03/2005

	ed Disposal and Reserve area, Distance from Boundaries ay NA Well/Bore >30m Buildings >6m
4.10	Local Experience – (Existing on-site Systems) Either Comment or circle one Is performance Satisfactory? Y/N unknown N/A If answer is No – Comments please

5.0 SUB SOIL INVESTIGATION

5.1	How was Soil Profile Determined? Bore Holes / Dig Test Holes / Earlier Site Excavations/ Other – (Please specify)
5.2	Have the soils been assessed by an Independent Party? Yes/No If so please specify
5.3	Has the soil structure Profile been completed? Yes/No Have photographs been supplied? Y / N (circle one) 
5.4	Has Percolation Testing been carried out? Yes/No If YES specify method
5.5	Are Percolation test results attached? Yes/No
5.6	SOIL CATEGORY - show the estimated soil category from the descriptions below: Tick box that applies
	1. Gravel, coarse sand, rapid draining ☐
	2. Coarse to medium sand; free draining ☐
	3. Medium-fine and loamy sand; good drainage ☐
	4. Sandy loam, loam and silt loam; moderate drainage ☑
	5. Sandy clay-loam, clay-loam and silty clay-loam, moderate to slow drainage ☐
	6. Sandy clay, non-swelling clay and silty clay; slowly draining ☐
	7. Swelling clay, grey clay, hardpan; poorly or non-draining ☐

6.0 SITE EVALUATION

6.1	Design Considerations
	Any environmental constraints? Yes/No
	Any soil constraints? Yes/No
	Any site constraints? Yes/No if yes please specify (see 5.6)
	Any Hawke's Bay Regional Council (HBRC) constraints? Yes/No

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	Sewer Treatment System considered best suited for the site Enclosed WWTP BY R.GARDINER
6.3	Type of Disposal System considered best suited for the site DRIPLINE
6.4	Minimum disposal area recommended 266m²
6.5	Minimum size of reserve area (See HBRC & HDC Requirements) AS ABOVE
6.6	Are sewer treatment system and disposal system calculations and design plans attached? (Y) / N (circle one). IF NO WHY NOT!
6.7	Other comments:

7.0 GENERAL COMMENTS

7.1	AS/NZS 1547:2000 "On-site domestic wastewater management" can be used for guidance in On-site evaluation and soil assessment. This Standard can provide options for on-site wastewater treatment and land application systems.
7.2	AS/NZS 1546:1998 "Septic tanks" has been adopted by the Hastings District Council. Unless a manufacturer has built his tanks to comply with this Standard and had an engineer verify that the tanks comply with the Standard, that particular manufacturer of tank is not permitted to be installed within the Hastings District Council. (A list of manufacturers that comply can be viewed at the Hastings District Council.
7.3	Where it is necessary to make contact with the Hawke's Bay Regional Council in relation to On-site Waste Water Disposal Mr Tim Waugh (06) 835 9200 is the person to whom you should direct enquires.
	NAME Steve Crockford
	SIGNATURE
	DATE 24 02 05

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16/03/2005

Effluent Management Systems Ltd

EFFLUENT MANAGEMENT SYSTEM

DESIGN SPECIFICATION

Client:	Barns (C/- Concept Master Builders)
Site Location:	State Highway 50, Hastings
System Type:	Proprietary compliant secondary wastewater treatment plant.
Effluent Distribution Method:	Dripline (1.5 *l*/hr @ 0.6 m emitter spacings) Laid at 1 m centres
Total Lineal Length:	250 m
Design Loading Rate:	4.5 litres/m^2/day
Design:	3 bedroom home = Potential occupancy of 6 people @ 200 litres each/day = 1200 litres/day potential effluent discharge
Land Area Required:	266.666 m^2

Steve Crockford
Director

Registration No.: 12382
IPENZ No.: 254300

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HILL LABORATORIES 04 7 858 2001 P.01/04

Hill Laboratories

R J Hill Laboratories Limited

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Email:
mail@hill-labs.co.nz
Internet:
www.hill-labs.co.nz

Client: Layer Mamey Olives Ltd
Address: 2534 State Highway 50, R D 5, Roys Hill Rd
HAWKES BAY
Contact: Leo Leader

Laboratory No: 341308
Date Registered: 4/05/2004
Date Completed: 7/05/2004
Page Number: 1 of 4

Water Source for 2535 Roys Hill Rd (Barnes)

The results for the analyses you requested are as follows: Shared Bore

Sample Type: Water, Potable

Sample Name		Water Sample
Lab No		341308/1
pH [7.0 - 8.5]	(pH units)	7.4
Electrical Conductivity [<150]	(mS/m)	69.1
Electrical Conductivity [<1500]	(uS/cm)	691
Approx Total Dissolved Salts [<1000]	(g.m-3)	483
Alkalinity [No Guideline]	(g.m-3 as CaCO3)	237
Free carbon dioxide [No Guideline]	(g.m-3)	20
Calcium [No Guideline]	(g.m-3)	90.9
Magnesium [No Guideline]	(g.m-3)	9.03
Total Hardness [<200]	(g.m-3 as CaCO3)	264
Sodium [<200]	(g.m-3)	32.0
Potassium [No Guideline]	(g.m-3)	3.2
Nitrate-N [<11.3]	(g.m-3)	10.4
Chloride [<250]	(g.m-3)	42.1
Sulphate [<250]	(g.m-3)	23.2
Boron [<1.4]	(g.m-3)	0.013
Total Iron [<0.2]	(g.m-3)	< 0.01
Total Manganese [<0.05]	(g.m-3)	< 0.005
Total Copper [<1]	(g.m-3)	< 0.005
Total Zinc [<3]	(g.m-3)	0.203
Faecal Coliforms [<1]	(cfu/100 mL)	< 1

Note: Values given in square brackets in the result tables above are Guideline values taken from the publication 'Drinking Water Standards for New Zealand', Dept of Health (2000).

Note that the units $g.m^{-3}$ are the same as mg/L and ppm.

This Laboratory is accredited by International Accreditation New Zealand (previously known as TELARC). The tests reported herein have been performed in accordance with its terms of accreditation, with the exception of tests marked *, which are not accredited.
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Client:Layer Mamey Olives Ltd Laboratory No:341308

Routine Water Assessment for Sample Nr 341308/1

pH/Alkalinity and Corrosiveness Assessment
The pH of a water sample is a measure of its acidity or basicity. Waters with a low pH can be corrosive and those with a high pH can promote scale formation in pipes and hot water cylinders. The guideline level for pH in drinking water is 7.0-8.5. Below this range the water will be corrosive and may cause problems with disinfection if such treatment is used.

The alkalinity of a water is a measure of its acid neutralising capacity and is usually related to the concentration of carbonate, bicarbonate and hydroxide. Low alkalinities (<25 $g.m^{-3}$) promote corrosion and high alkalinities can cause problems with scale formation in metal pipes and tanks.

The pH of this water is within the NZ Drinking Water Guidelines, the ideal range being 7.0 to 8.0. With the pH and alkalinity levels found, it is unlikely this water will be corrosive towards metal piping and fixtures. The high alkalinity of this water may cause an increase in the pH in the root zones of plants which are irrigated using this water.

Hardness/Total Dissolved Salts Assessment
The water contains a moderate amount of dissolved solids and would be regarded as being very hard. There will be difficulty in forming a lather with soap, and a 'scum' will form in baths, showers, etc. The high value for hardness (200 is considered excessive) indicates that this water may promote scale build-up in pipes and cylinders, and that irrigation systems using this water may be prone to scale build-up and blockage of narrow irrigation capillaries and jets.

Nitrate Assessment
Nitrate-nitrogen at elevated levels is considered undesirable in natural waters as this element can cause a health disorder called methaemaglobinaemia. Very young infants (less than six months old) are especially vulnerable, and the World Health Organisation suggests a maximum permissible level of 10 $g.m^{-3}$.

Nitrate-nitrogen was detected at a moderate level.

The presence of nitrate-nitrogen at this level may indicate contamination from nearby septic tanks or effluent ponds. If this is a possibility then the water should also be checked for the presence of pathogenic bacteria. We cannot provide this analysis ourselves but can recommend appropriate laboratories if you so wish.

Boron Assessment
Boron may be present in natural waters and if present at high concentrations can be toxic to plants.

Boron was found at a low level in this water but would not give any cause for concern.

Metals Assessment
Iron and manganese are two problem elements that commonly occur in natural waters. These elements may cause unsightly stains and produce a brown/black precipitate. Iron is not toxic but manganese, at concentrations above 0.5 $g.m^{-3}$, may adversely affect health. At concentrations below this it may cause stains on clothing and sanitary ware.

Neither element was detected in this water, which is a pleasing feature. Treatment to remove iron and/or manganese should not be necessary.

Copper and zinc at low levels are both essential elements for people, animals and plants.

Bacteriological Tests
The NZ Drinking Water Standards state that there should be no faecal coliforms or E coli in water used for human consumption. The presence of these organisms would indicate that other pathogens of faecal origin may be present.

No faecal coliform organisms were detected in this sample.

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Client:Layer Mamey Olives Ltd Laboratory No:341308

Final Assessment
The parameter Hardness did NOT meet the guidelines laid down in the publication 'Drinking Water Standards for New Zealand' published by the NZ Department of Health, Wellington, NZ (2000) for water which is suitable for drinking purposes.

Sample Containers

The following table shows the sample containers that were associated with this job.

Container Description	Container Size (mL)	Number of Containers
PET, microbial testing, leave 1cm air gap (400 mL)	400	1
Nitric Preserved (100 mL)	100	1

Details of sample bottle preparation procedures are available upon request.

Summary of Methods Used and Detection Limits

The following table(s) gives a brief description of the methods used to conduct the analyses for this job.
The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Substance Type: Water

Parameter	Method Used	Detection Limit
Sample filtration for general testing	Sample filtration through 0.45µm membrane filter.	N/A
Total (nitric acid) digest	Boiling nitric acid digestion.	N/A
pH [7.0 - 8.5]	pH meter APHA 4500-H$^+$ B 20th ed. 1998	0.1 pH units
Electrical Conductivity [<150]	Conductivity meter, 25°C APHA 2510 B 20th ed. 1998	0.1 mS/m
Electrical Conductivity [<1500]	Conductivity meter, 25°C APHA 2510 B 20th ed. 1998	1 uS/cm
Approx Total Dissolved Salts [<1000]	Calculation: from Electrical Conductivity	2 g.m-3
Alkalinity [No Guideline]	Titration to pH 4.5 APHA 2320 B (Modified for alk <20) 20th ed. 1998	1 g.m-3 as CaCO3
Free carbon dioxide [No Guideline]	Calculation: from alkalinity and pH, valid where TDS is not >500 mg/L and alkalinity is almost entirely due to hydroxides, carbonates or bicarbonates. APHA 4500-CO_2 D 20th ed. 1998	1 g.m-3
Calcium [No Guideline]	Boiling nitric acid digestion. ICP-OES	0.02 g.m-3
Magnesium [No Guideline]	Boiling nitric acid digestion. ICP-OES	0.005 g.m-3
Total Hardness [<200]	Calculation: from Ca and Mg APHA 2340 B 20th ed. 1998	1 g.m-3 as CaCO3
Sodium [<200]	Boiling nitric acid digestion. ICP-OES	0.5 g.m-3
Potassium [No Guideline]	Boiling nitric acid digestion. ICP-OES	0.1 g.m-3
Nitrate-N [<11.3]	Filtered sample. Ion Chromatography. APHA 4110 B 20th ed. 1998	0.05 g.m-3
Chloride [<250]	Filtered sample. Ion Chromatography. APHA 4110 B 20th ed. 1998	0.5 g.m-3
Sulphate [<250]	Filtered sample. Ion Chromatography. APHA 4110 B 20th ed. 1998	0.2 g.m-3
Boron [<1.4]	Boiling nitric acid digestion. ICP-OES	0.005 g.m-3
Total Iron [<0.2]	Boiling nitric acid digestion. ICP-OES	0.01 g.m-3
Total Manganese [<0.05]	Boiling nitric acid digestion. ICP-OES	0.005 g.m-3
Total Copper [<1]	Boiling nitric acid digestion. ICP-OES	0.005 g.m-3
Total Zinc [<3]	Boiling nitric acid digestion. ICP-OES	0.005 g.m-3
Faecal Coliforms [<1]	Membrane Filtration, Count on mFC Agar at 44.5°C after 24 hours, Analysed at BioTest Laboratories, A division of Hill Laboratories. APHA 9222 B, 20th ed. 1998	1 cfu/100 mL

Analyst's Comments:

These samples were collected by yourselves and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the submitter.

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Peter Robinson, MSc(Hons), PhD FNZIC
Environmental Division Manager

Terry Cooney, MSc(Hons), PhD MNZIC
General Manager

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Nulite™

Cladding Solution

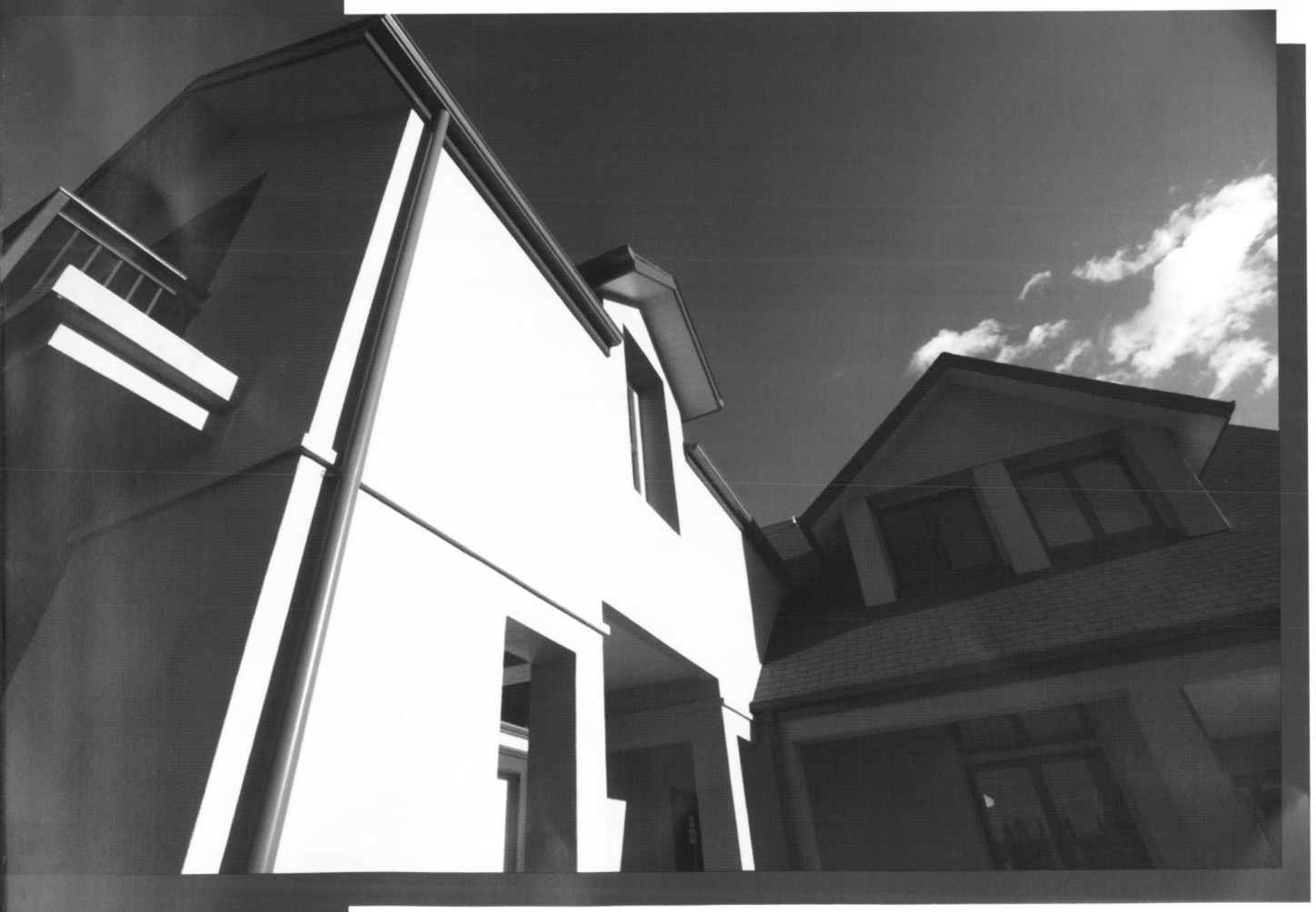
Demanding the best

Architects, developers and builders demand the best quality products to incorporate into their designs. Aesthetics is essential for these specifiers and the ability of a product to conform to the difficult details associated with today's trends is imperative for the longevity of the product in the market place. The expectations of the designer and client are of equal importance in achieving an outstanding result in both form and function of the finished product.



A Range of Systems

Nu-Age Plaster recognises the delicate balance required between appearance and practicality and has developed a range of systems to achieve a solution that will not only satisfy, but also surpass the expectations of the designer and client combined.

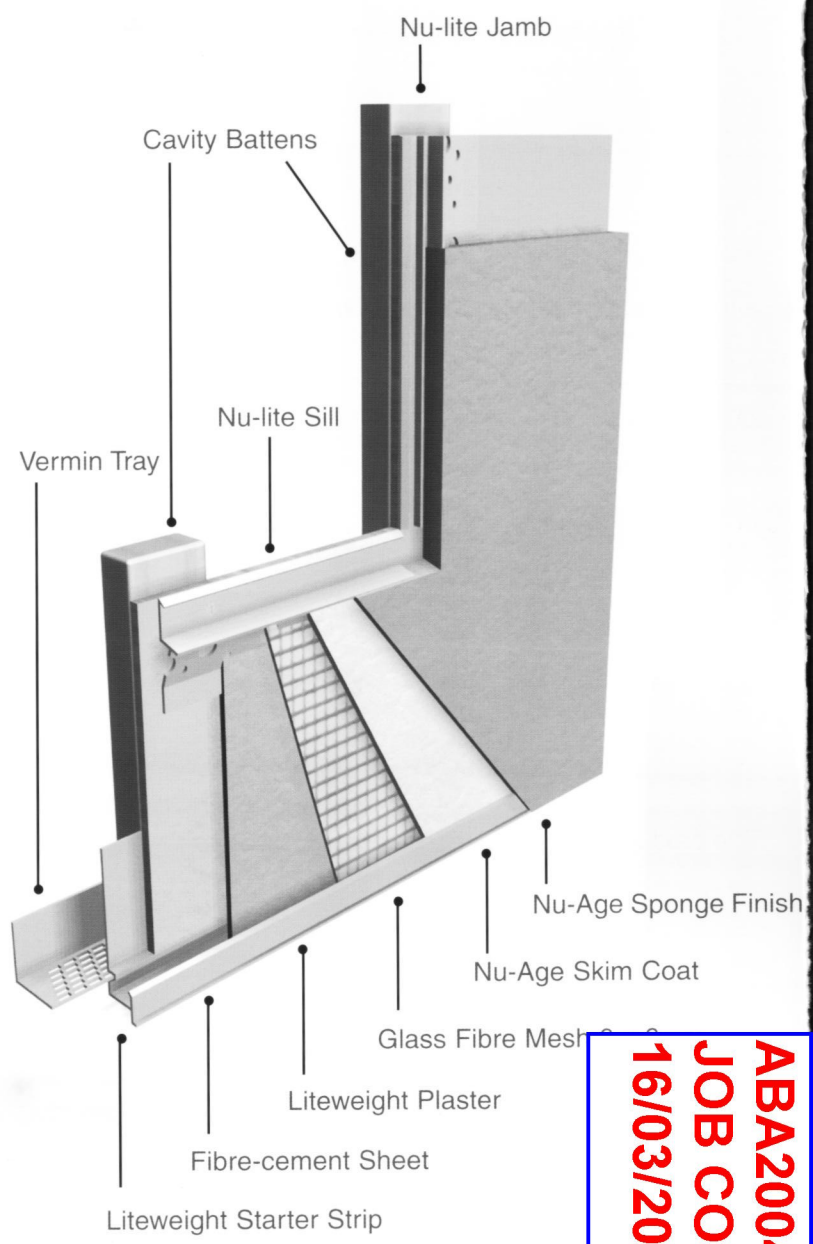


Nu-Age introduces Nu-lite

Innovation of construction methods and products highlight the ability of a company to adapt to the ever changing market requirements. Nu-Age prides itself as a company at the forefront of advancement in the field of proprietary cladding solutions for the construction industry. Working in conjunction with partner companies in Germany Nu-Age Plaster has developed a liteweight durable cladding solution ideal for New Zealand conditions.

Nu-Age Plaster has created a Cladding system which harnesses the light weight properties of expanded polystyrene with the 'tried and true' method of solid plaster and combines the two over a fibre cement substrate to provide a cost effective cladding solution. Nu-Lite utilises the strong solid characteristics of conventional methods with the enhanced versatility of sheet substrate installed over a nominal 20mm cavity creating a product which will out perform rival products in a multitude of applications.

Utilising compressed cement sheet as a substrate Nu-Lite adds not only aesthetic value but essential (BU's) bracing units to your buildings structural integrity.



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Appraised by BRANZ

Nu-lite can be specified with confidence in the knowledge that the system has been tested and scrutinised by New Zealand's leading professionals, scientists and technicians at BRANZ who have appraised the Nu-lite system.

For all these reasons and more the Nu-lite cladding system is the logical choice for your home, office or business to provide a tough, aesthetically pleasing weatherproof seal for your building.

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Top Quality Materials

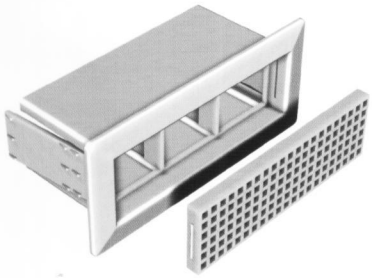
Nu-Age provides quality consistent product mixes every time enabled by our advanced weighing and batching plant. Top quality sand is sourced from a reputable pit, extracted and thoroughly washed, the sand is dried by Nu-Age Plaster allowing us to carefully control moisture levels.

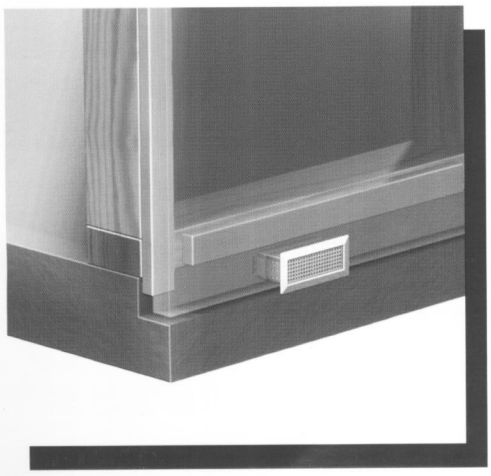
From this point the sand goes through the sieve process where any oversize particles are excluded to produce top quality sand of correct size.

Exact quantities of additives are individually weighed and combined to create precise mineral plaster recipes unique to Nu-Age Plaster.

The product is sealed in double skin 25kg bags to protect from external moisture sources and delivered to your site anywhere in New Zealand ready for application.

Utilising this pre-mixed plaster system ensures guaranteed consistent mixes every time, providing a superior cladding solution for your building.





The Revolutionary Nu-Vent

For those who prefer the look of clean same plane walls to ground level Nu-Age has developed the revolutionary Nu-Vent. Nu-Vent is an aesthetically pleasing solution to ventilate and drain cavity system claddings while providing a seamless wall plane to ground level. Complying with NZBC by allowing the cladding to terminate the required distance above ground level, draining and ventilating at that point, then continuing the wall plane with solid plastered floor slab edges, concrete blocks or other non-cavity based monolithic finishes.

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Quality product and quality components equals quality system.

All Nu-Age Plasters cladding system component range are manufactured from the best quality uPVC or Stainless steel, eliminating the risk of corrosion and resultant plaster damage at reinforcing areas. The majority of these are derived from European countries such as Germany, where building standards and requirements are higher than in New Zealand.





Lower building costs with time and labour savings

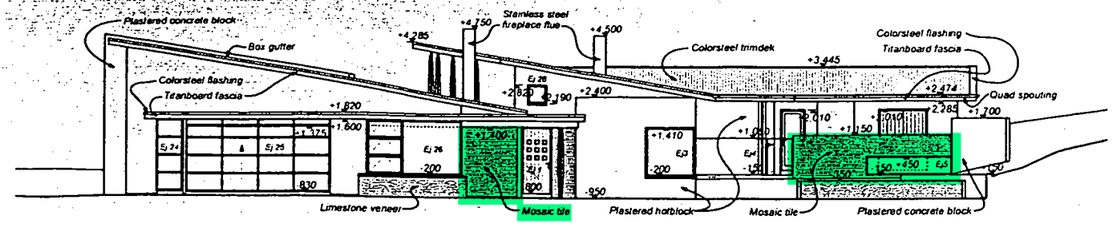
Nu-Age Plaster imports M-Tec plaster mixers and pumps to refine the application process even further. This machinery provides accurate water flow to the dry bagged plaster mixes, and pumps the plaster on to the wall in a fraction of the time it takes to trowel on the product. For example, a standard three bedroom home could take a gang of 4-6 plasterers 2-3 days to apply the base and mesh coats, whereas utilising an M-Tec mixing and pumping machine will take a team of 3 plasterers half a day to complete the same job with far superior application of the plaster. This results in lower building costs with time and labour savings.

We guarantee 'your peace of mind'

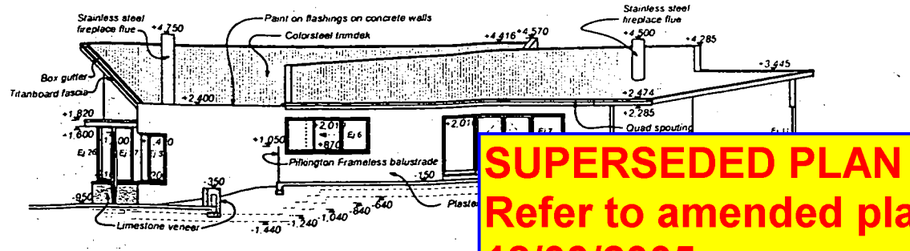
All of this collates to providing the best in plaster cladding solutions for your home, office or factory with results that can't be argued with. For the right choice in Plaster cladding solutions, trust Nu-Age Plaster and we'll guarantee 'your peace of mind'.



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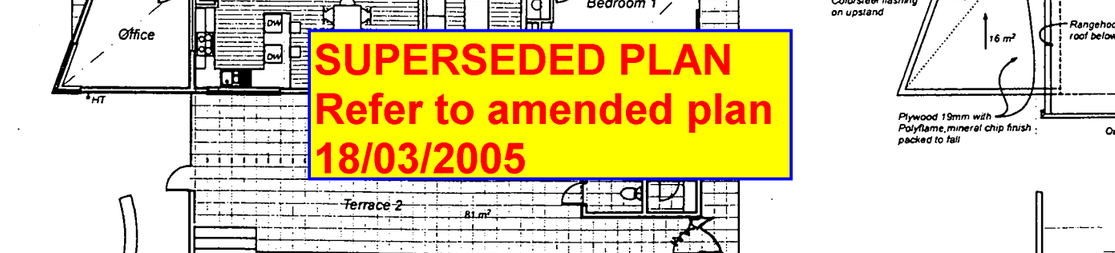
West elevation, scale 1:100



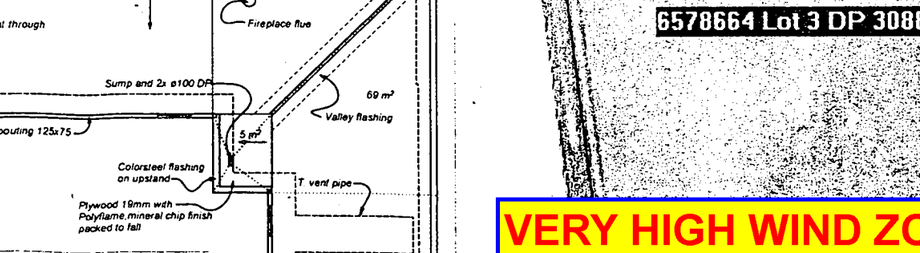
SUPERSEDED PLAN
Refer to amended plan
18/03/2005

Index:

1. Site, Floor plan, Elevations, Roof
2. Slabs and drainage
3. Site works plan
4. Ground floor framing plan
5. High walls framing plan
6. Sections a,b, c, d
7. Section e, Details
8. Joinery kitchen
9. Joinery bathroom 1, laundry
10. Joinery bathroom 2
11. Electrical plan

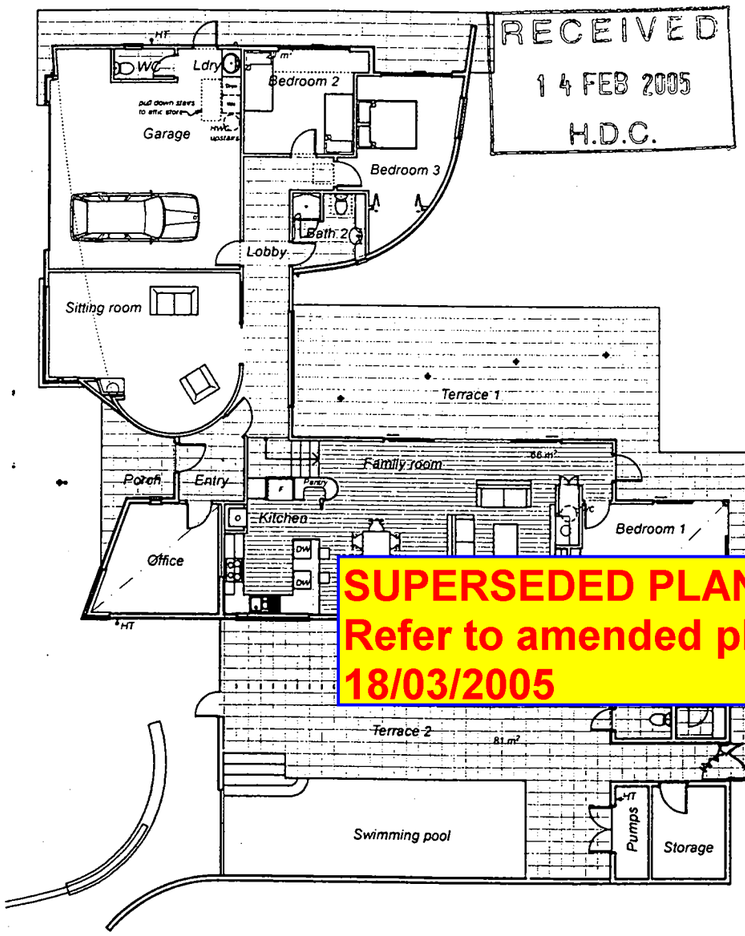


East elevation, scale 1:100



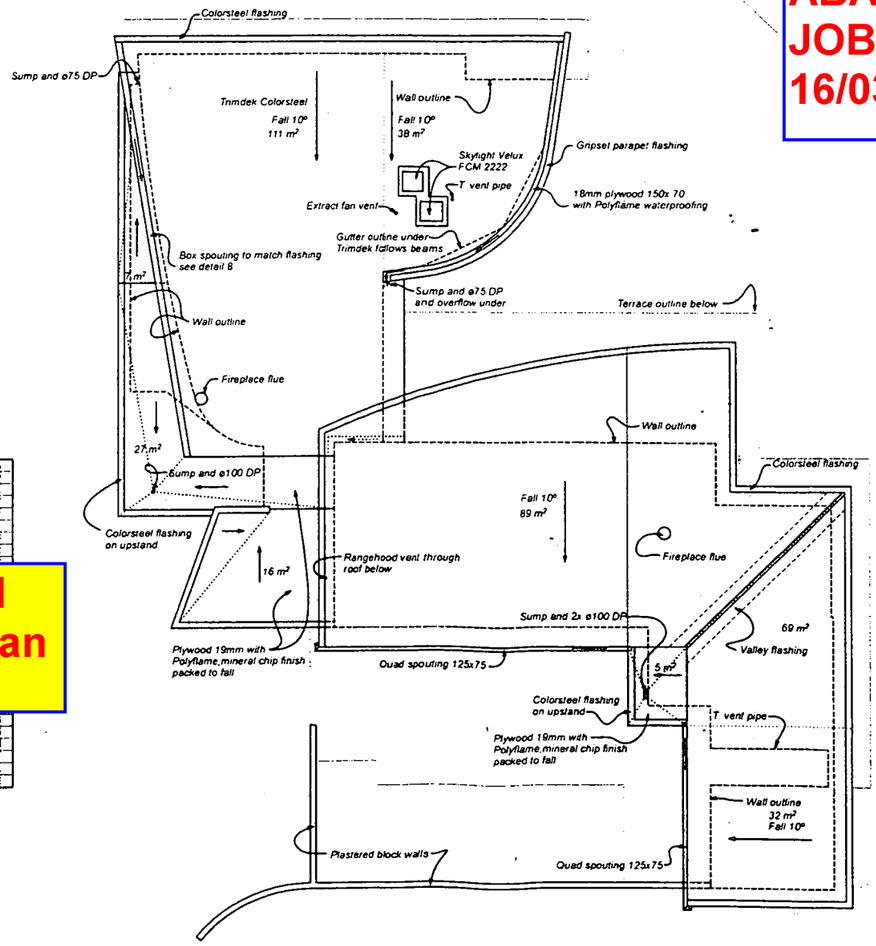
North elevation, scale 1:100

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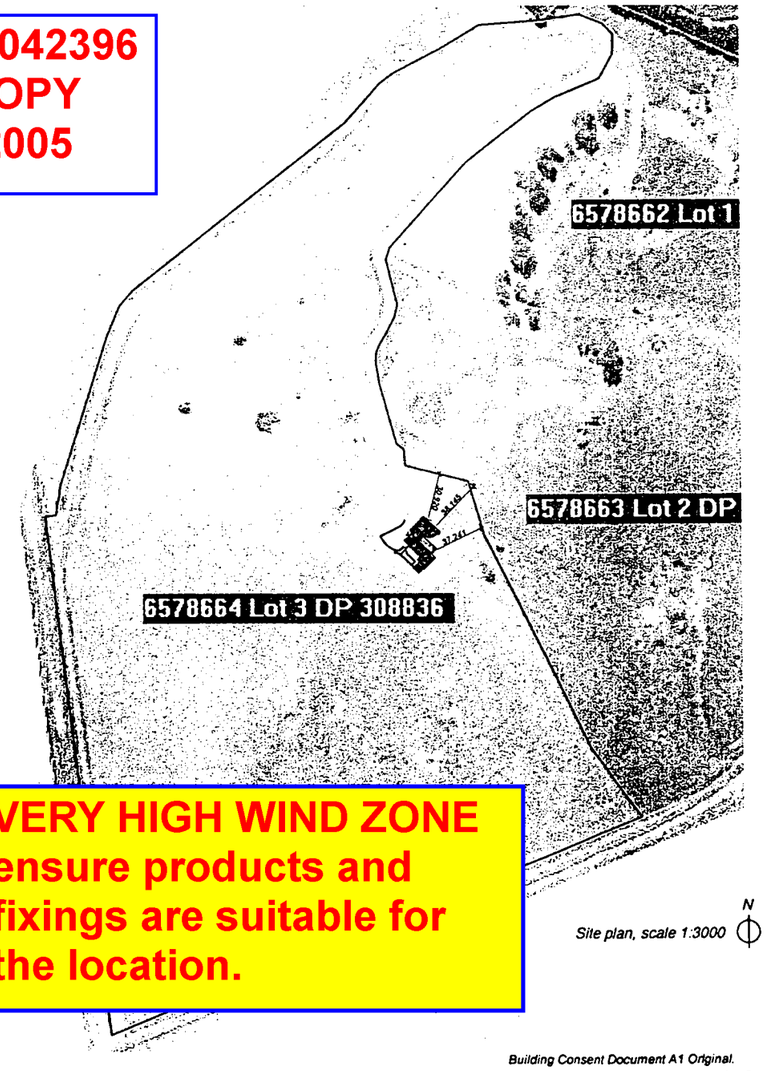


SUPERSEDED PLAN
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Ground floor plan, scale 1:100



Roof plan, scale 1:100



Site plan, scale 1:3000

VERY HIGH WIND ZONE
ensure products and fixings are suitable for the location.

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The Contractor shall check and verify all dimensions on site.

House for Mr & Mrs Barnes
State Highway 50, Hastings district
Hawke's Bay

SHEET 1 OF 11
DATE 2/8/05
SCALE AS SHOWN
JOB A0417

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Slab and drainage plan, scale 1:75

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SUPERSEDED PLAN
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18/03/2005

Existing channel
Storm water spreader
Effluent field
Concrete block retaining wall see eng. drawings
Limestone retaining wall overtopping concrete wall where shown
Fence by owner
Building area limit line
Garage
pull down stairs to attic above
HWC upstairs
WC
Ldry
Bedroom 2
Bedroom 3
Bath.2
Lobby
Sitting room
Porch
Entry
Office
Kitchen
Family room
Terrace 1
Bedroom 1
Dress. room
Bath.1
Terrace 2
Swimming pool
Pumps
Storage
Fall
Crown
HT
DW
Pantry
R 19.910
R 6.633
R 4.200
R 4.310
R 600
-950
5.200
13.120
6.840
5.683
5.337
42.500
43.000
43.500
44.000
44.500
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Site works plan scale 1:100

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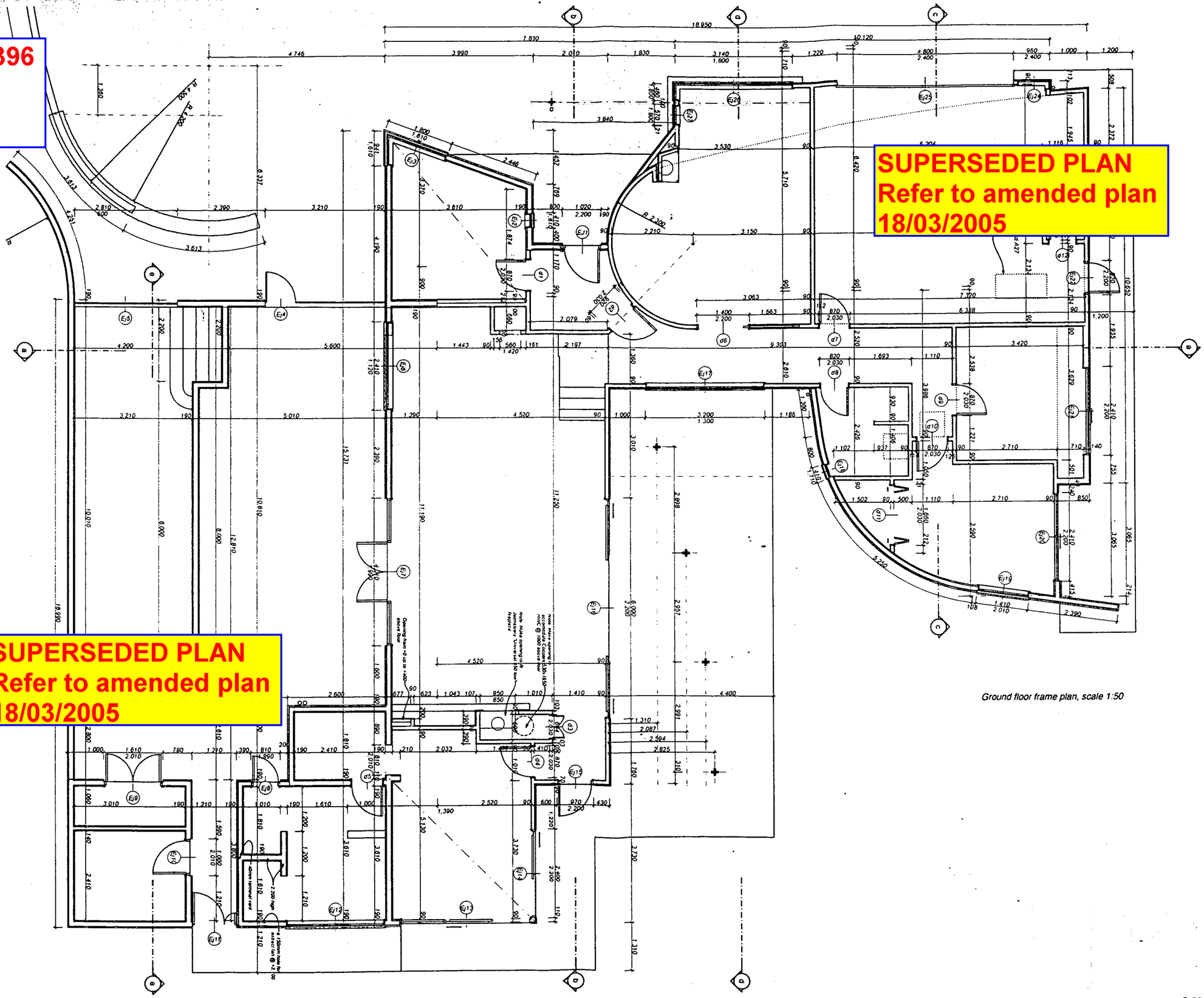
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Ground floor frame plan, scale 1:50

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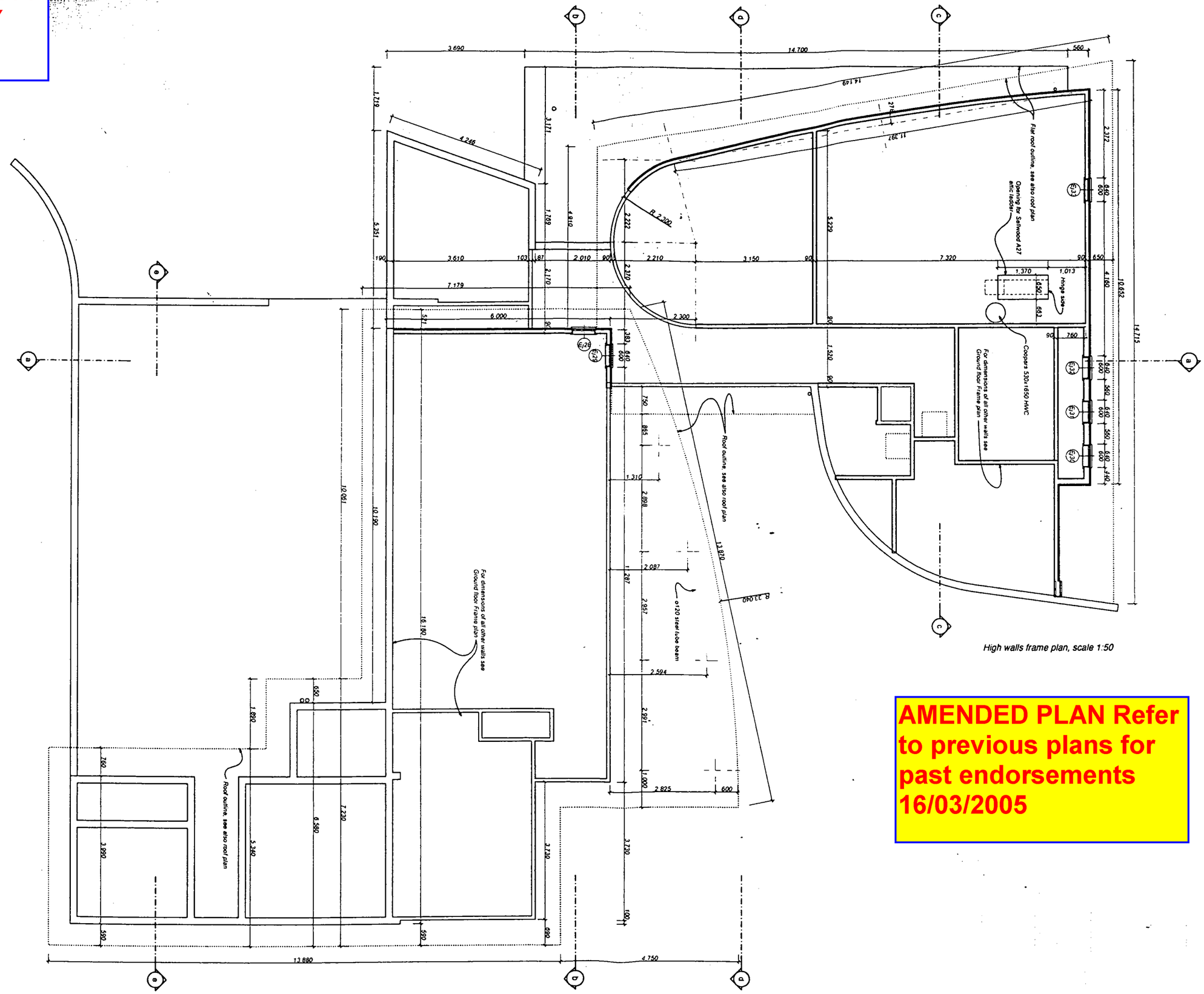
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High walls frame plan, scale 1:50

AMENDED PLAN Refer to previous plans for past endorsements 16/03/2005

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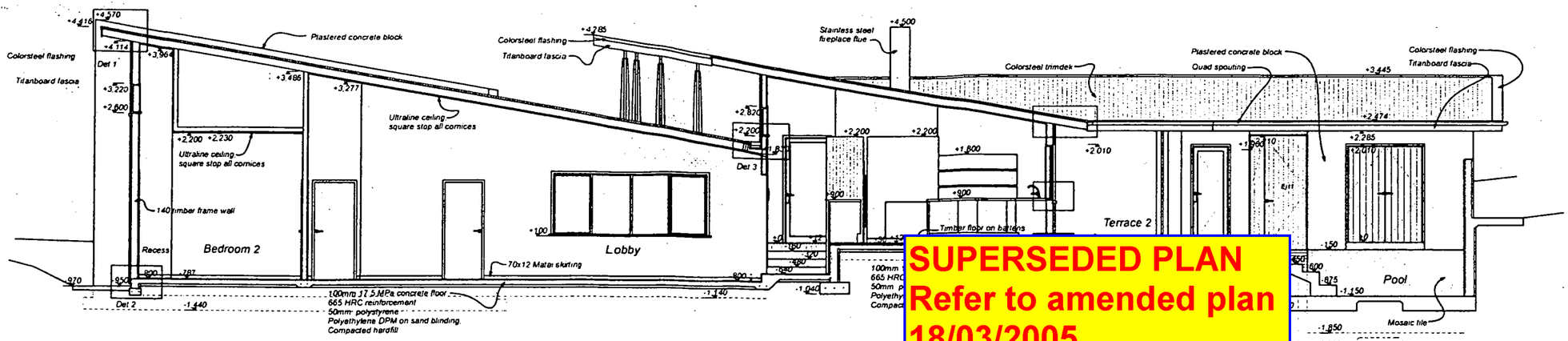
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House for Mr & Mrs Barnes
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Hawke's Bay

SHEET 5 OF 11
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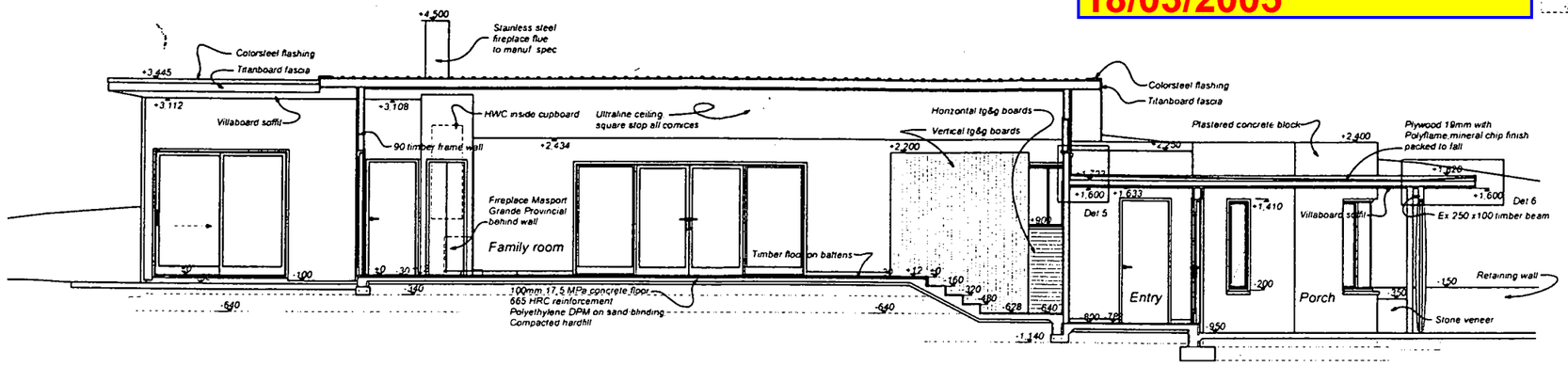
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Cell 64-025-491227
email ralford@xtra.co.nz

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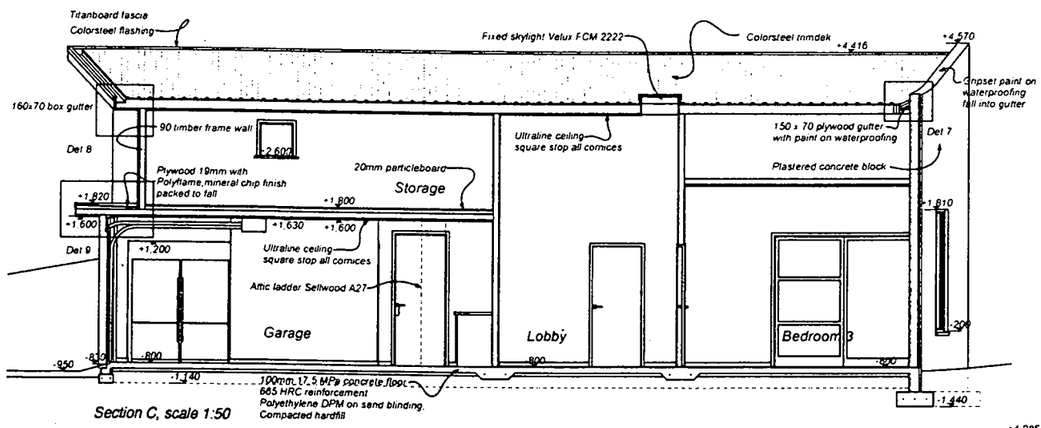


Section A, scale 1:50

SUPERSEDED PLAN
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18/03/2005

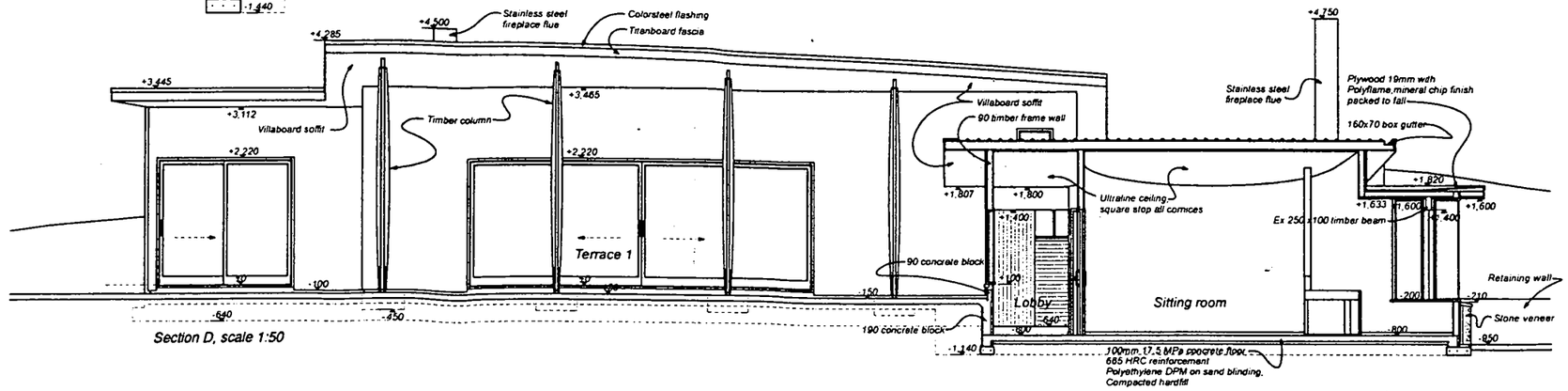


Section B, scale 1:50



Section C, scale 1:50

SUPERSEDED PLAN
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Section D, scale 1:50

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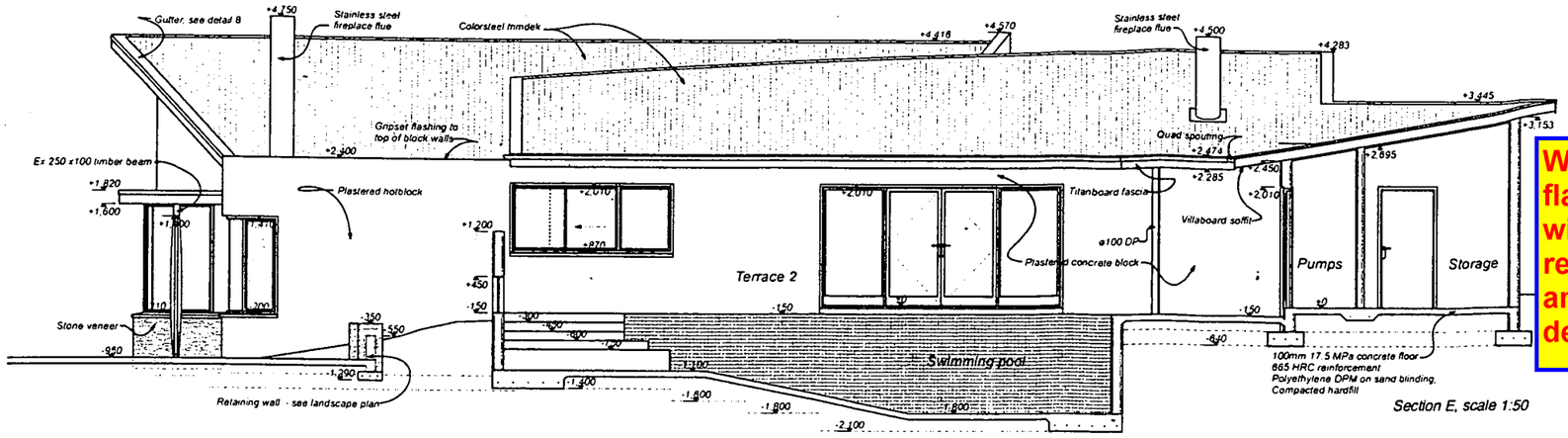
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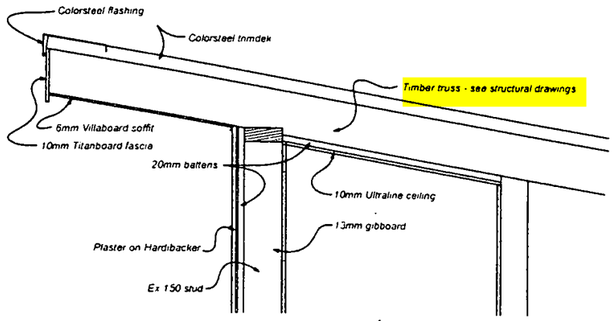
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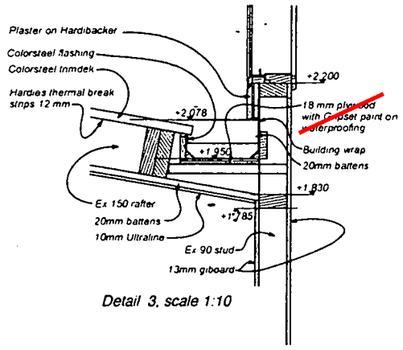


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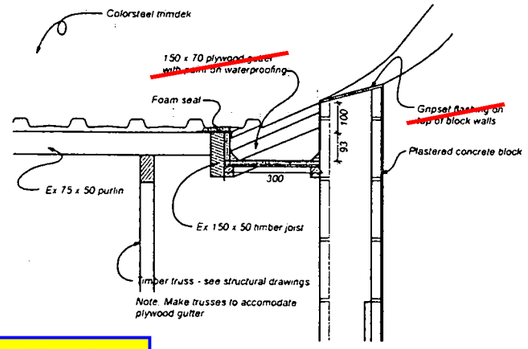
Window and door flashings to comply with E2 details with reference to WANZ and Hardibacker details also.



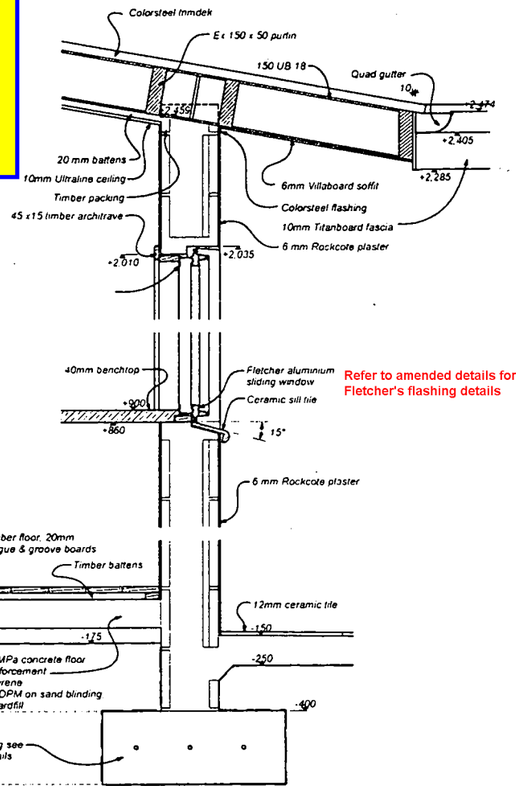
Detail 1, scale 1:10



Detail 3, scale 1:10

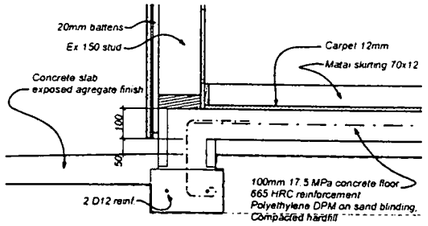


Detail 7, scale 1:10



Refer to amended details for Fletcher's flashing details

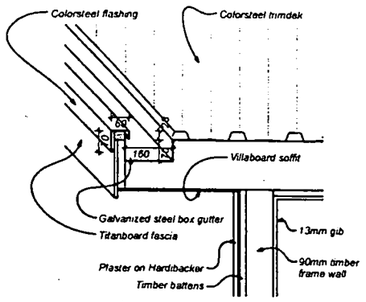
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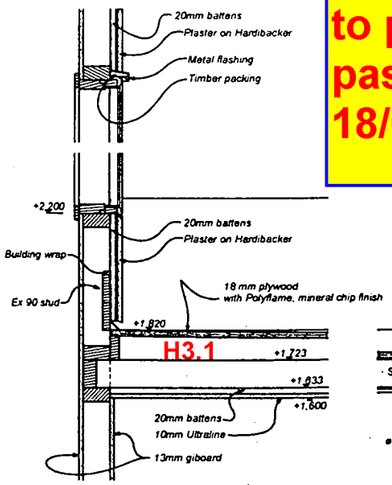
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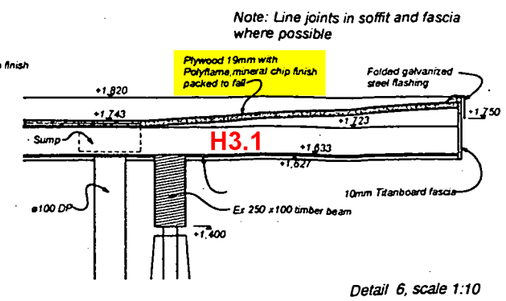
Refer to the engineering plans for foundation details



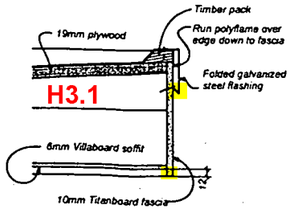
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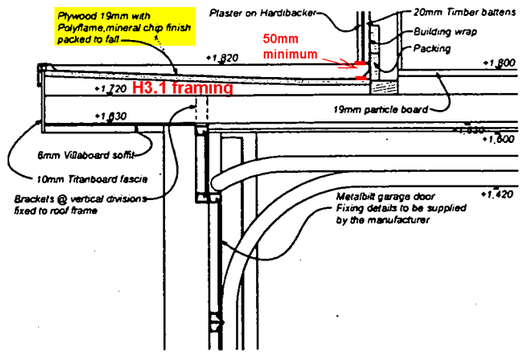


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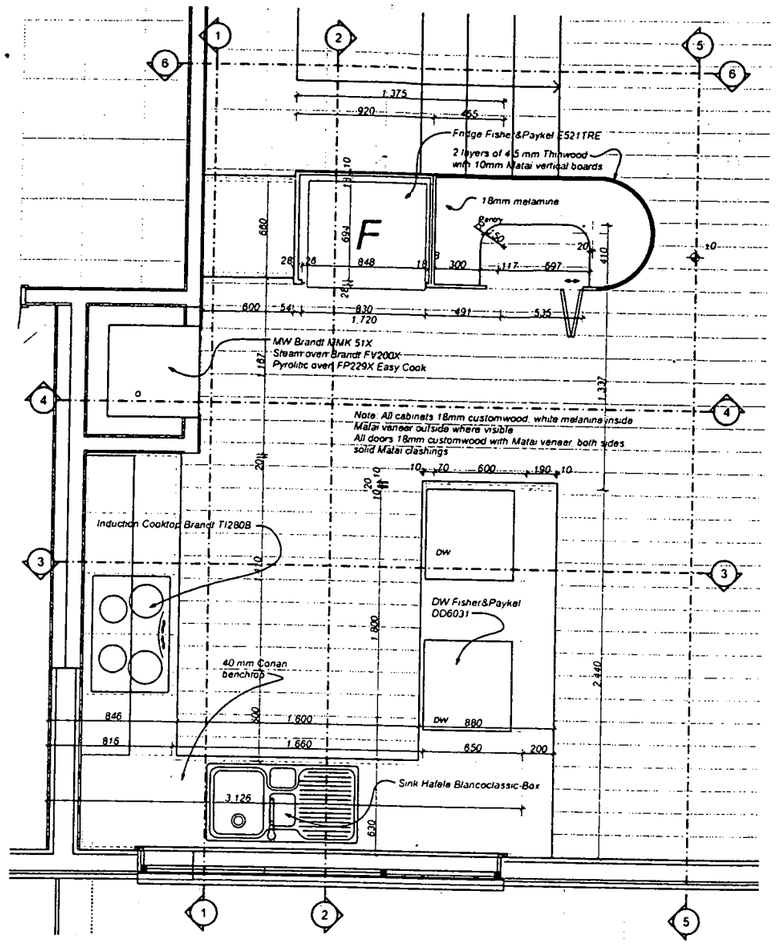
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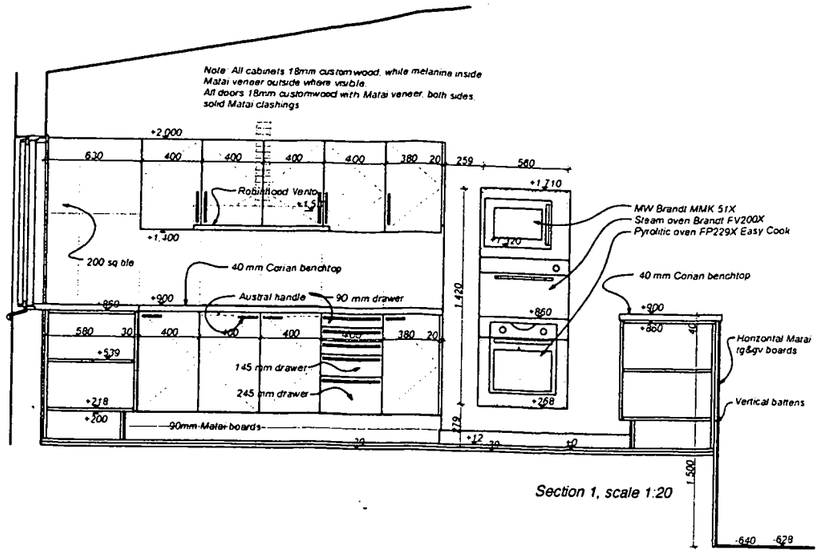


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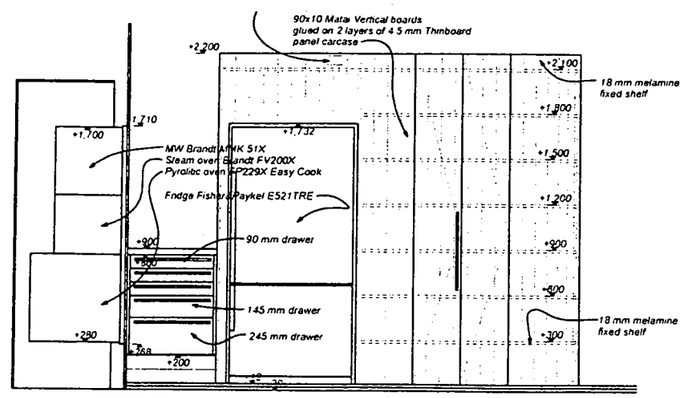
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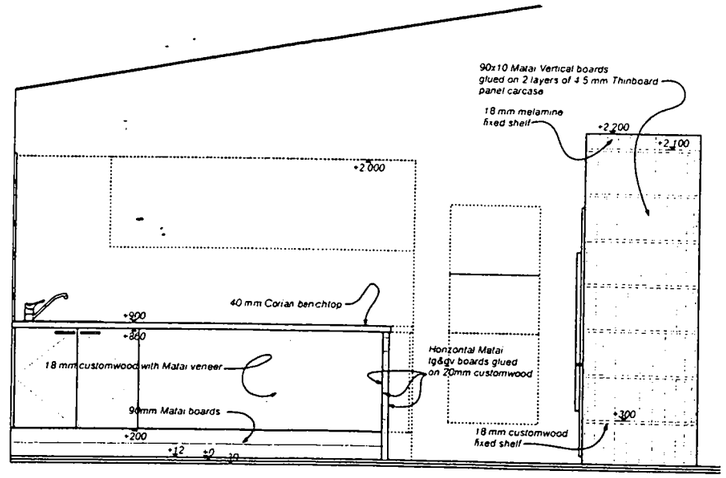
Kitchen joinery plan, scale 1:20



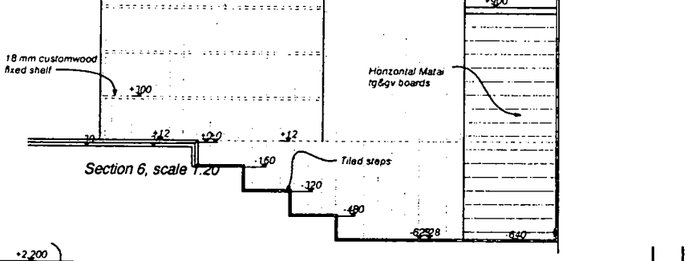
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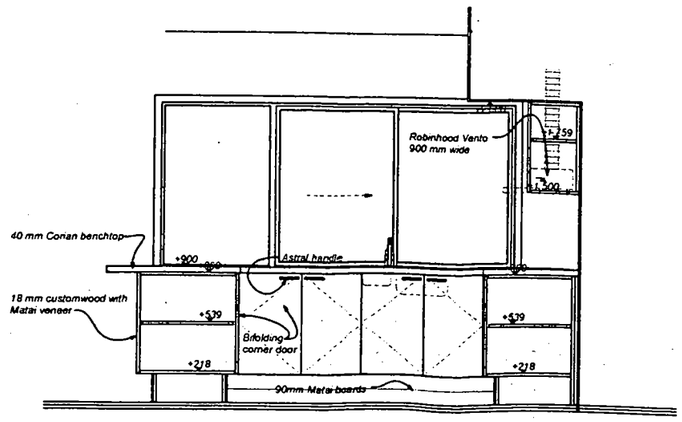
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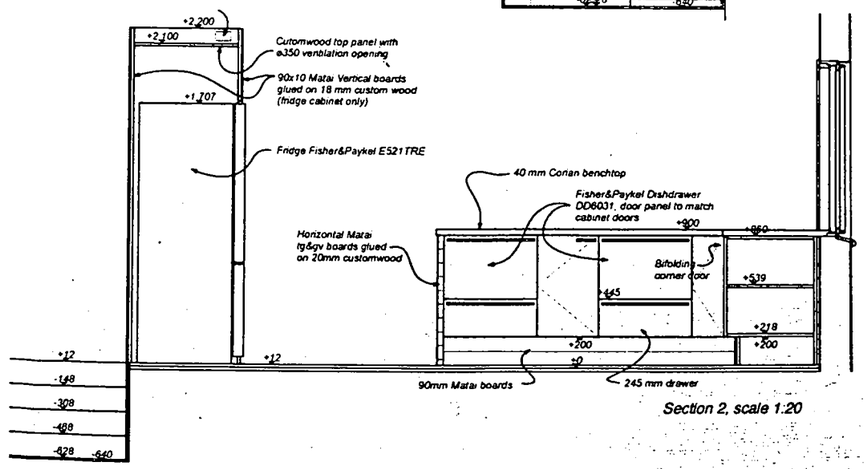
Section 5, scale 1:20



Section 6, scale 1:20



Section 3, scale 1:20



Section 2, scale 1:20

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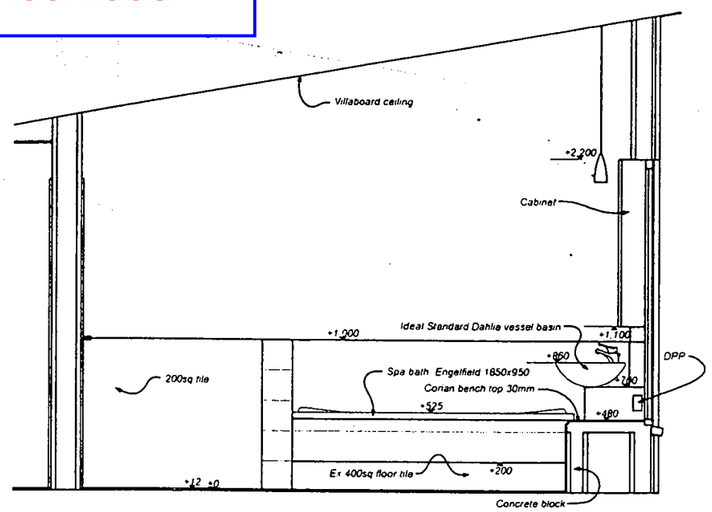
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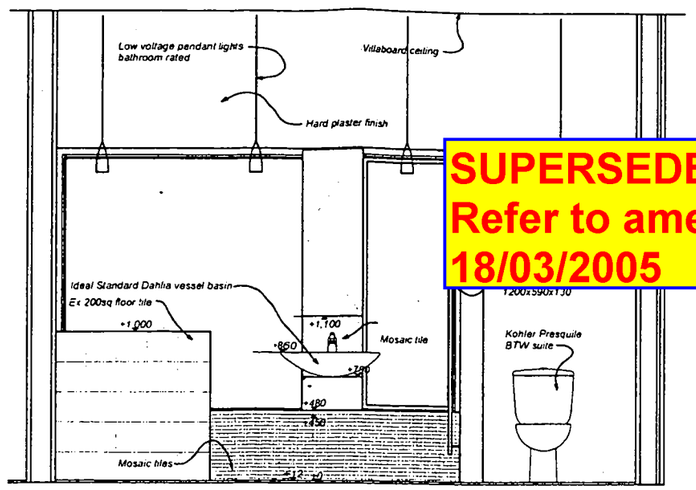
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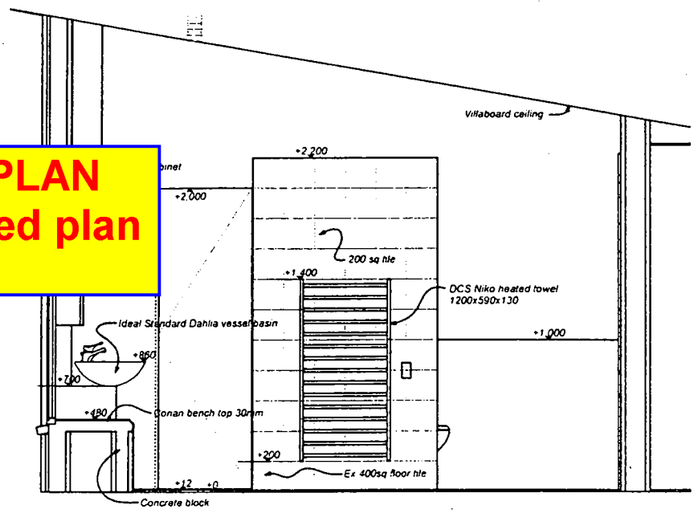


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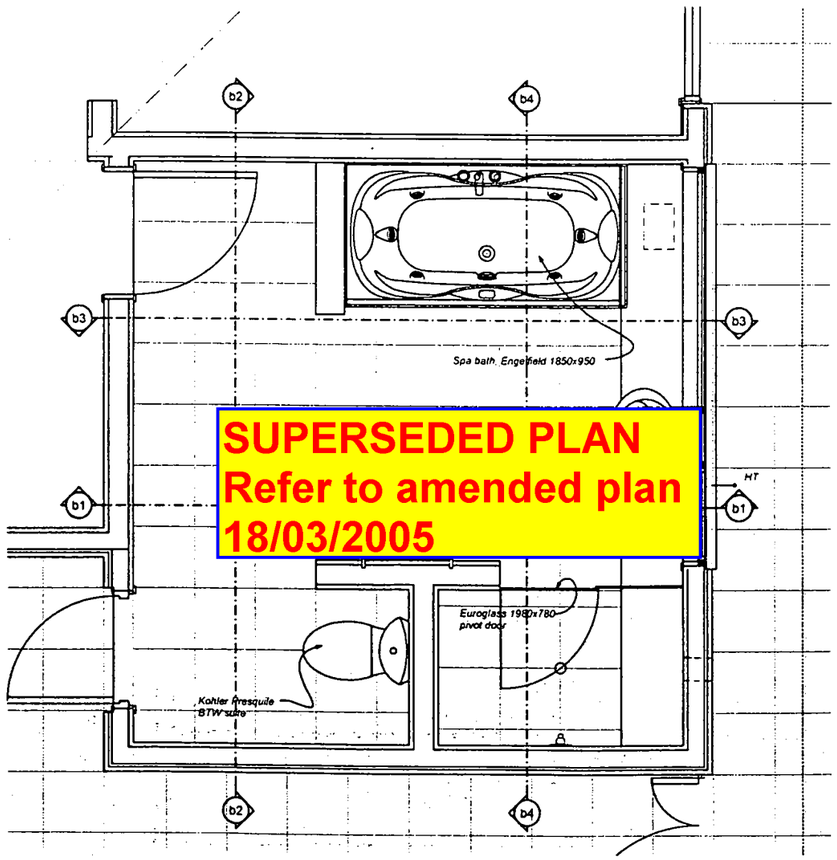


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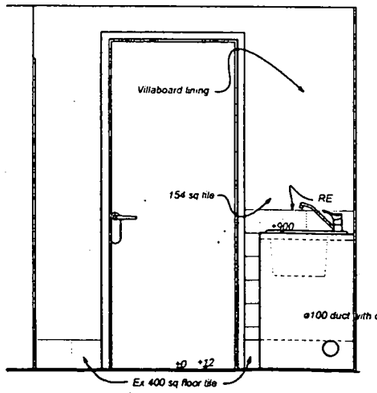


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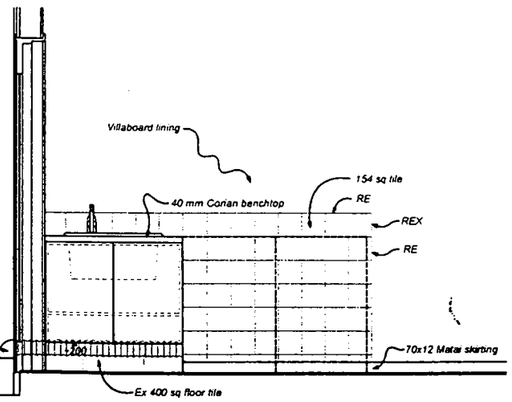


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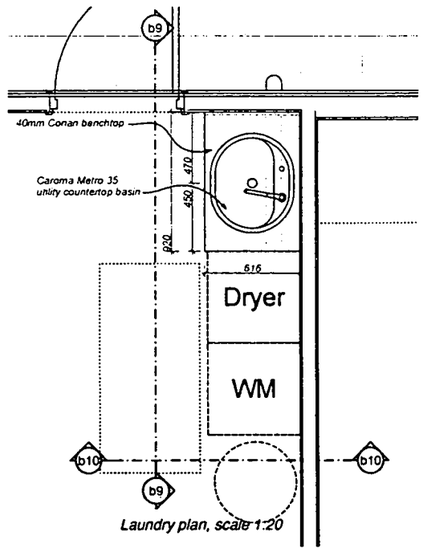
Bathroom 1 plan, scale 1:20



Section b10, scale 1:20



Section b9, scale 1:20



Laundry plan, scale 1:20

Note: Datum +0 for this drawing is actually at -800

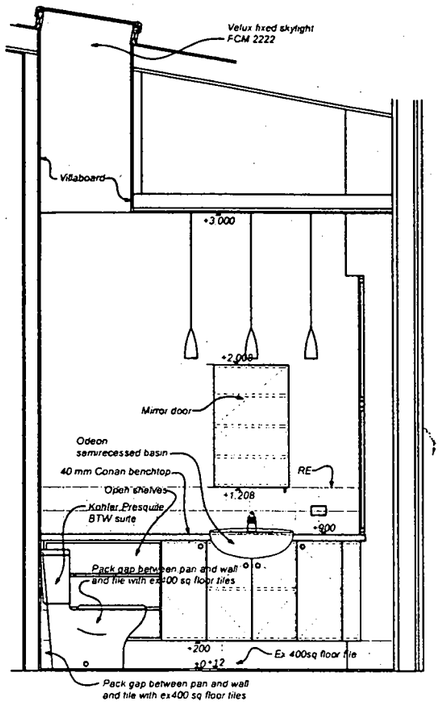
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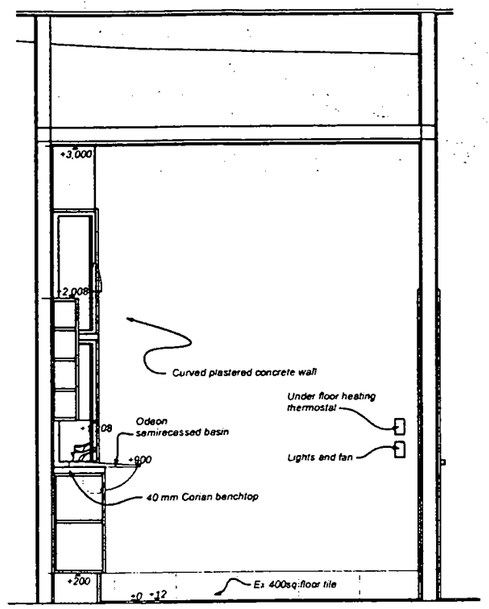
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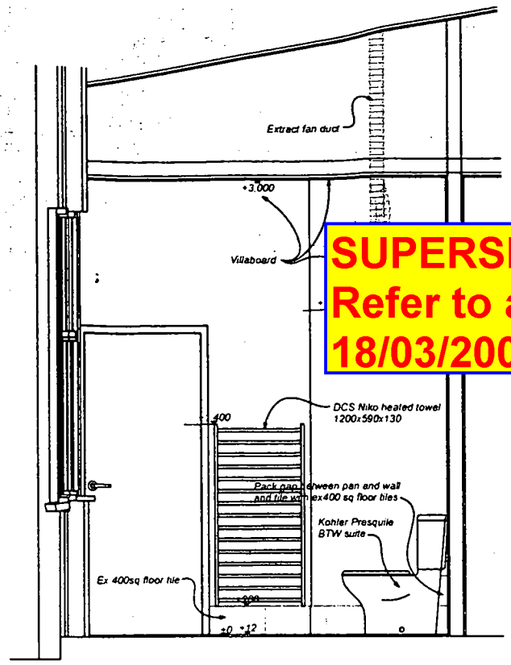
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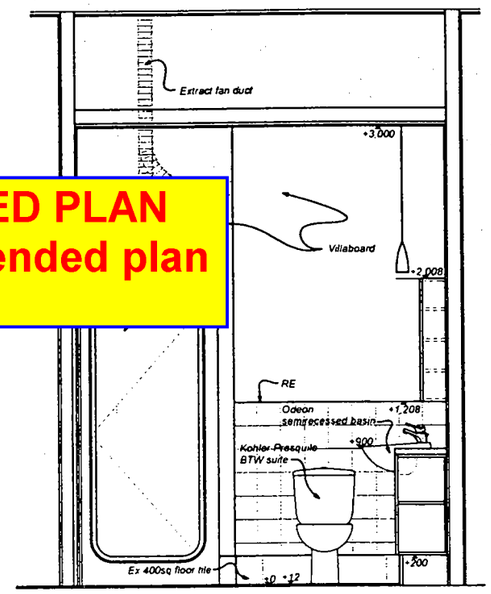
Section b5, scale 1:20



Section b6, scale 1:20

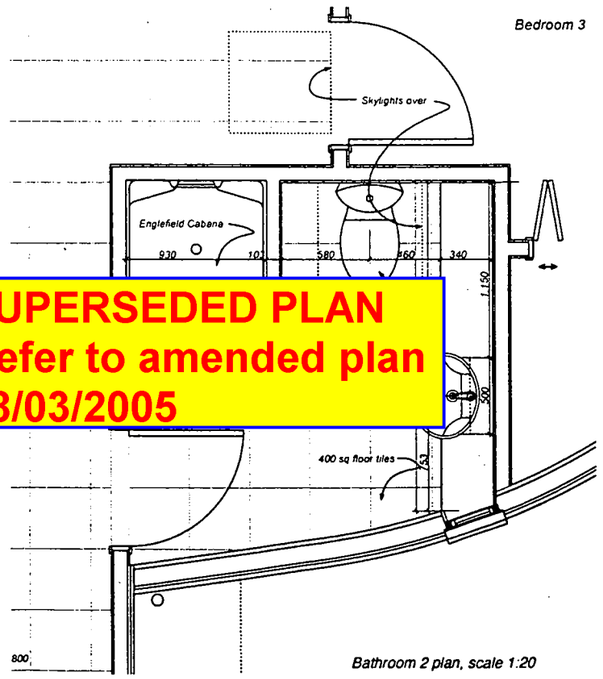


Section b7, scale 1:20



Section b8, scale 1:20

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Refer to amended plan
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Bathroom 2 plan, scale 1:20

Note: Datum +0 for this drawing is actually at -800

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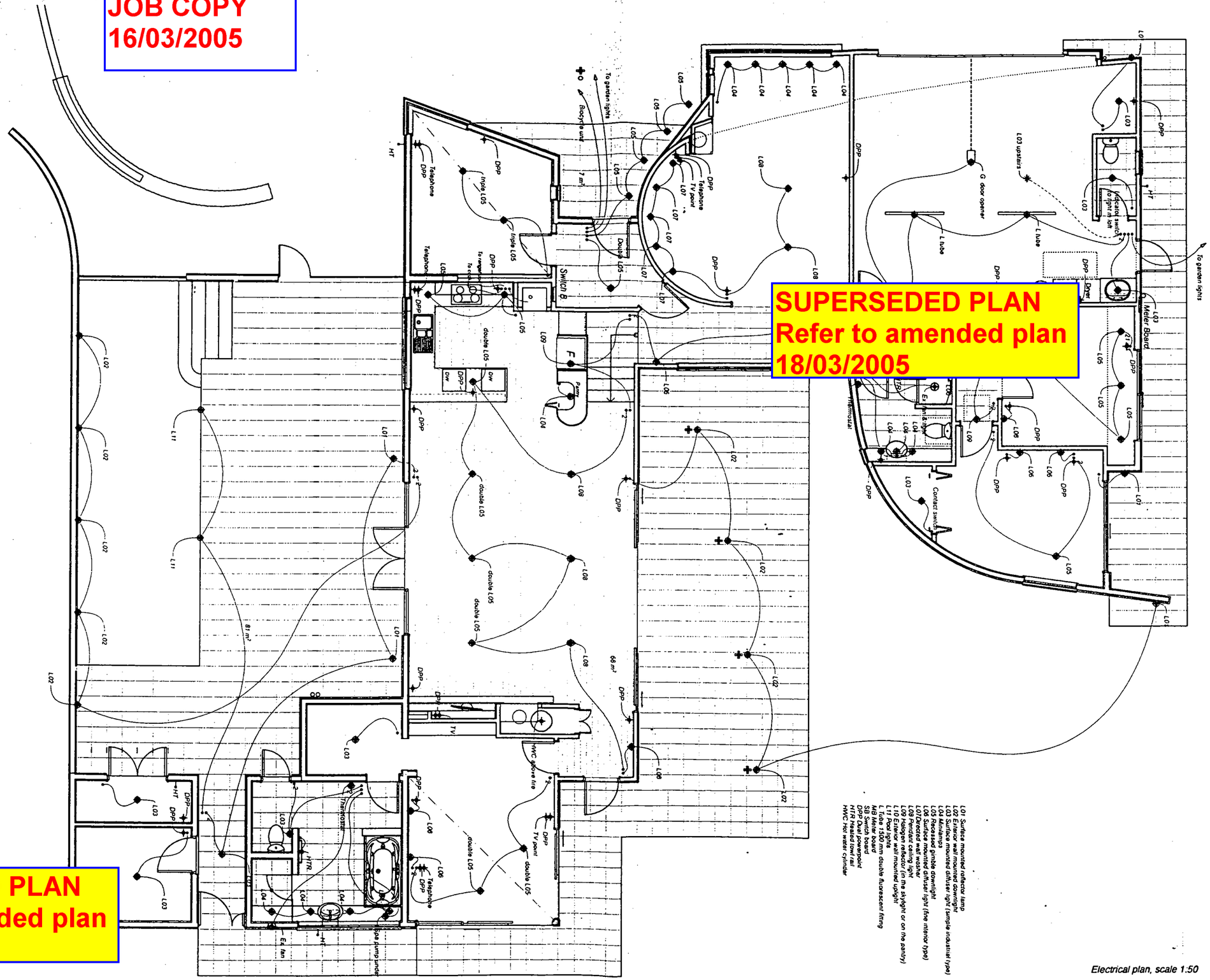
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Electrical plan, scale 1:50

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WANZ WIS™ (Window Installation System)

Stage 1 : Pre Cladding Trim Preparation

Contact: **Stewart Knowles**
Window Association of NZ (Inc)
P.O. Box 11-464
Manners Street
Wellington 6034

Disclaimer

Neither the Window Association of NZ (Inc), nor any of its members accept direct or consequential liability of any kind, howsoever arising, associated with the use, application or modification of the WANZ Window Installation System (WANZ WIS) described herein or any losses, costs or expenses associated therewith

The information and suggestions contained in this report and the accompanying independent BRANZ Opinion are offered in good faith, but independent product appraisals (such as BRANZ Appraisal Certificates) have not yet been published. The performance of the system will always be dependant upon the necessary care and trade skill of the on-site workers involved.

WANZ strongly endorses the BRANZ recommendation of the use of traditional sill trays in addition to the WANZ WIS.

WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

Date
18 Oct 02

Introduction

Why this report is prepared:

This is a report on the work undertaken by the WANZ Technical Committee to fundamentally improve the installation of windows. The project began in early 2001 and fortuitously coincided with a call from the Building Industry Authority (BIA), for all sectors of the New Zealand Building Industry to assist with addressing the current "leaking buildings" issue.

History

The New Zealand homeowners desire for new styles of construction, using new materials, in more demanding locations, at rock bottom prices makes huge demands on the entire NZ building industry.

Increasingly there are reports of buildings leaking and rotting. Although roofs, balconies, and cladding junctions are known to be the prime areas of concern, the Building Industry Authority has strongly urged all sectors of the NZ building industry to assist with addressing the issues. Attention to detail is vital for ensuring good weathertightness for buildings in New Zealand.

An overview of what WANZ has done:

There are two major aspects to weathertightness of windows:

1. The weathertightness of the window unit itself.

2. The weathertightness of the installation of the window into the building structure.

1. The weathertightness of the window itself is addressed by laboratory certification of window designs manufactured to NZS 4211, Performance Standards for Windows. WANZ rules require its members to label each window unit with a NZS 4211 compliance label that certifies that the window is designed and manufactured for the stated wind zone. These IANZ registered laboratory tests meet all the requirements of the NZ Building Code.

2. The weathertightness of the installation is reliant on the skill of the builder installing the window into the building. The building industry has relied on longstanding traditional methods of installation using flashings. BRANZ (Building Research Association of New Zealand) has published many flashing details over the years and these have always been widely available to the construction trades.

The problem is identified:

The WANZ Technical Committee noted that issues related to leaks around window installations were caused mainly by inadequate installation.

A major reason for builders not installing flashings, is the expense involved getting special flashings made, and the extra time it takes to install them in accordance with the best available trade practice. Often sealants are used as a substitute solution, but sealants have proven to be inadequate.

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The WANZ Project Brief:

The WANZ Technical Committee set about finding a quick and easy pre cladding window trim opening preparation method that would be applicable for all residential window and door installations regardless of wind zone.

Principles of water leakage

The wind and rain that is part of New Zealand's temperate climate mean that water can be blown on to almost any external surfaces of a building. In windy areas, water is often driven upwards.

Water leakage will occur when:

- There is water on the surface, and
- Water leakage paths are present, and
- Air pressure differences (airflow), gravity, capillary action or surface tension moves the water along the leakage path.

In this demanding environment, sound detailing is a necessary part of weathertightness. Sealant alone cannot guarantee the integrity of the building envelope.

Background work for this report included extensive simulated weather testing of joinery units in accredited industry test laboratories.

WANZ WIS Window Installation System: Stage 1 - Pre Cladding

New Direction for Weathertight Openings

One of the key recommendations arising from the industry tests is the incorporation of 'pressure equalization' principles in the installation of joinery units, especially in relation to the "trim" cavity that separates window units from the building structure. This interface has previously relied upon traditional methodology and detailing without further research. The tests associated with this report demonstrate the importance of this interface.

If a good air seal can be obtained between internal wall linings and the reveals of installed joinery units then a pressure equalized, ventilated trim cavity can be achieved around window and door frames. A pressure equalized ventilated trim cavity can resist water entry through the outer cladding/window interface and also allow for free drainage.

The practices outlined in this report chart a new direction in weathertightness. It moves away from the use of critical external face seals to an emphasis on an effective internal air seal creating a pressure equalized trim cavity, and a simpler system of providing trim cavity moisture barriers.

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Summary of New Direction

The system is designed as a back up or secondary line of defence to the primary weathering detail recommended or specified by the cladding manufacturer or building designer.

Testing has been carried out to in excess of the very high wind zone requirements, of the code, with no primary external weather seals. Test reports are available on request from your local window fabricator/proprietary window systems supplier.

The attached BRANZ opinion reports on their testing of this WANZ WIS, Stage 1, Pre-cladding trim preparation. The BRANZ opinion determines a number of issues related to the WNZ WIS and the performance characteristics of the WANZ WIS components.

This system will be suitable for buildings designed and constructed in accordance to NZS 3604.

Key Components of the System

- Building wrap.
- Flexible sill flashing.
- Head flashing.
- Pressure equalization of trim cavity between window and framing.
- External gap between aluminium frame sill and cladding.
- Internal air seal.

Explanation of the Components

Building Wrap
- Revised method of cutting preparing and fixing building wrap around window and door openings.
- Wrapped around into framed opening providing moisture barrier to framing

Flexible Sill Flashing
- Continuous Flexible sill flashing used in lieu of rigid (traditional) flashings.
- Provides moisture barrier to trim cavity framing trimmer.
- No stop ends or joints required.
- Allows for considerable expansion and contraction.
- Quick installation, less labour to apply.

Head Flashing
- Revised method of installation of head flashings.
- Head flashing applied to face of wrap and over flashed with approved tape.
- Problems encountered with existing traditional method of fitting head flashings under wrap.

Pressure Equalization
- Equalising the trim cavity pressure to external pressure prevents water crossing the cladding/window interface. Water will not easily travel across equal pressure zones.
- Less reliance on primary external seal.

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External Air gap

- 5mm gap required between back of joinery facing and cladding (window stands off cladding 5mm).
- Air gap mandatory at sill, at jambs must be sealed.
- Provides air feed to pressure equalise trim cavity.

Internal Air Seal

- Air seal required to trim gap between joinery reveal and framing, back at the internal edge of framing line.
- Air seal is important to hold pressure in trim cavity and enable pressure equalization to be achieved.
- Air seal must be complete and without gaps ensuring that any imperfections in the fitting of the building wrap over the trimmers (i.e. wrinkles, folds etc.) are sealed. This ensure folds do not act as conduits for water penetration.
- The trim gap must be a minimum of 5mm.

Proposed Installation Steps

This report contains installation instructions for the WANZ Window Installation System, Stage 1. Pre Cladding, Refer steps 1 to 8 in the installation guide. Please refer to the BRANZ opinion for definitions of "suitable" components.

A brief explanation.

1. Building Wrap Preparation
   A suitable building wrap is applied, as standard, to all walls. At window and door openings it is cut and folded back around the framing on all four sides and stapled in place.

2. Flexible Sill Flashing
   A strip of suitable sill flashing tape is then applied to the sill trimmer over the top of the building wrap and is folded up each jamb to a minimum height of 200mm.

3. Upper Corners
   Apply short strips of a suitable flexible flashing tape to exposed timber at upper corners.

4. Proprietary Flashings
   Fit any proprietary cladding systems flashing components that require fitting before window installation. BRANZ state that this flashing, if on top of the sill trimmer, will need to be sloped.

5. Window Installation
   Fit window to opening on 5mm spacers on top of flexible flashing at sill, to maintain a reasonable sealable gap for the air seal. Maintain a 5mm gap between back of frame facing and cladding outer surface. (Window stands 5mm off the cladding face). This gap must be sealed or filled at jambs, but a **5mm GAP MUST REMAIN OPEN AT SILL.**

6. Air Seal
   A suitable expandable foam air seal is applied on the inside between the joinery units reveal and wrapped timber framing around the full perimeter of the unit. The trim gap for the air seal must be a minimum of 5mm.

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7. Head Flashing
   Face fit the head flashing above the window to the building wrap. The top edge of the flashing is fixed and sealed by taping to the wrap with a suitable tape. **DO NOT** cut the wrap.
   NB. The flashing is fitted **over** the building wrap rather than cut in and under it.
   Add an additional piece of building wrap over the top of the flashing to complete the weathering of this detail.

8. Cladding
   The cladding and its associated flashings if required are then applied around the joinery unit to cladding manufacturers recommendations

Where to from here

This report is for the purpose of preparing a bare trim opening to receive a window or door unit and providing a means of achieving near pressure equalisation of the trim opening to resist water ingress.
Flashings, proprietary or otherwise, may need to be applied to the WANZ WIS prepared opening. This shall be in accordance to the cladding manufacturers recommendations.

This part 1. Pre cladding report will be followed by;
Part 2. Cladding Details.
Part 3. Installation and training program.

BRANZ are developing an appraisal system for the components of WANZ WIS for product suppliers to achieve compliance.

The outcome of the BRANZ work will enable component suppliers of wrap, sill tape, air seals etc to obtain a BRANZ appraisal on the products they supply and thus may be accepted by Territorial Authorities as an Alternative Solution.

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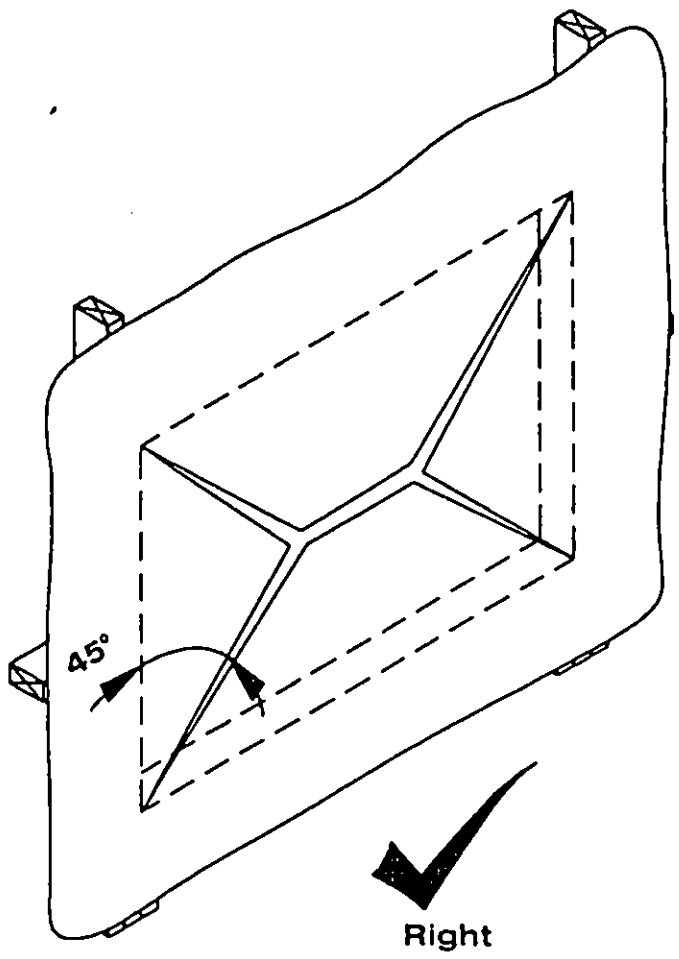
WANZ WIS (WINDOW INSTALLATION SYSTEM)

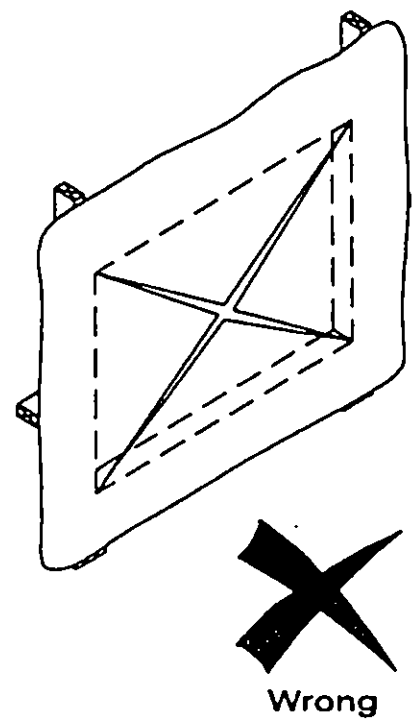
Stage 1 - Pre Cladding Trim Preparation

Installation Step No. 1 - Building Wrap Preparation

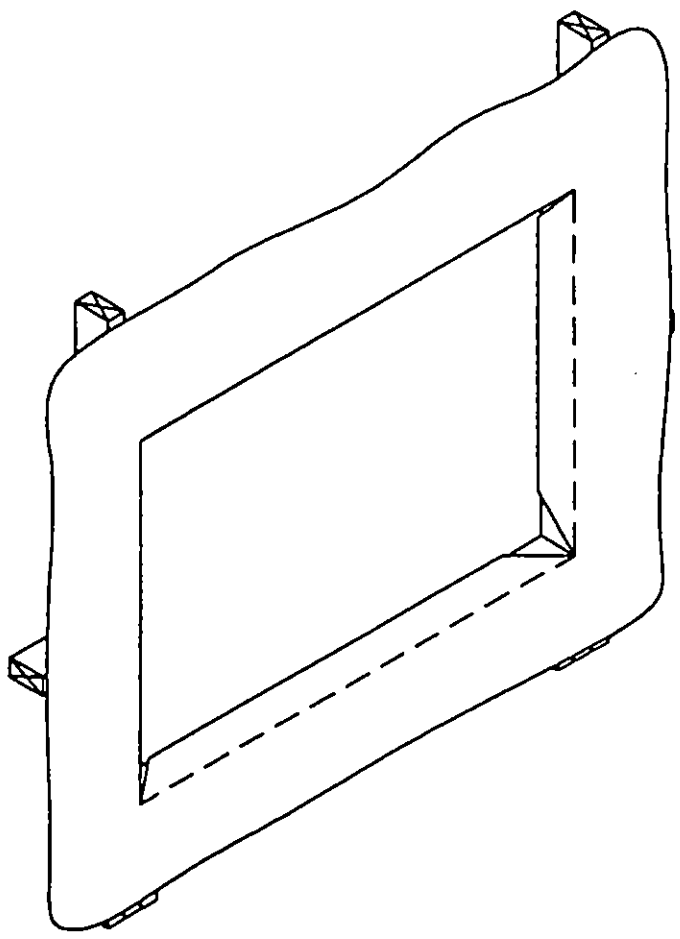
Date
18 Oct 02

Scale
NTS



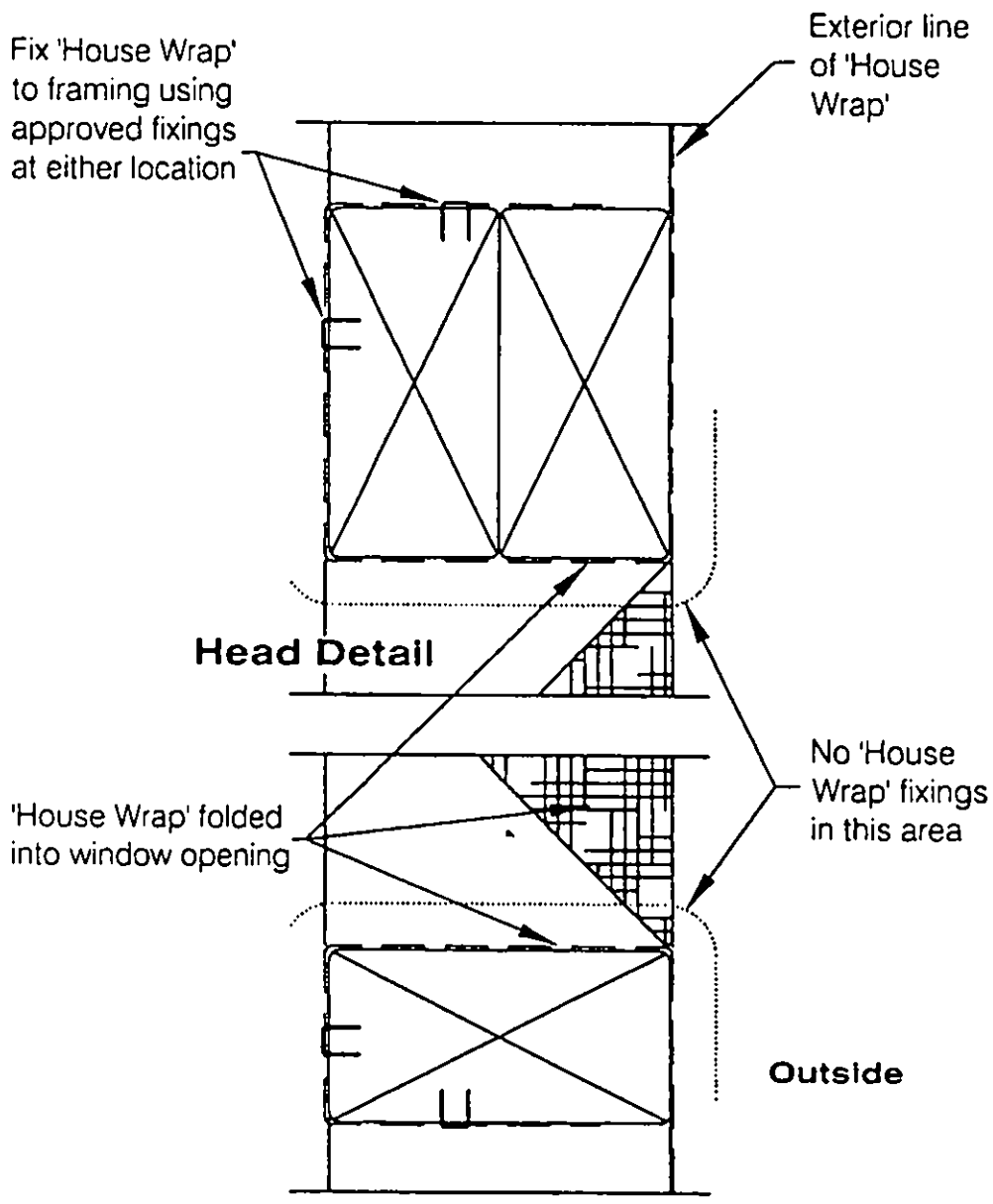


6.1 Cut 'House Wrap' at 45° away from each corner



6.2 Fold flaps into opening and secure on all sides

6.3 Trim off excess after fixing



Sill Detail - Jamb Similar

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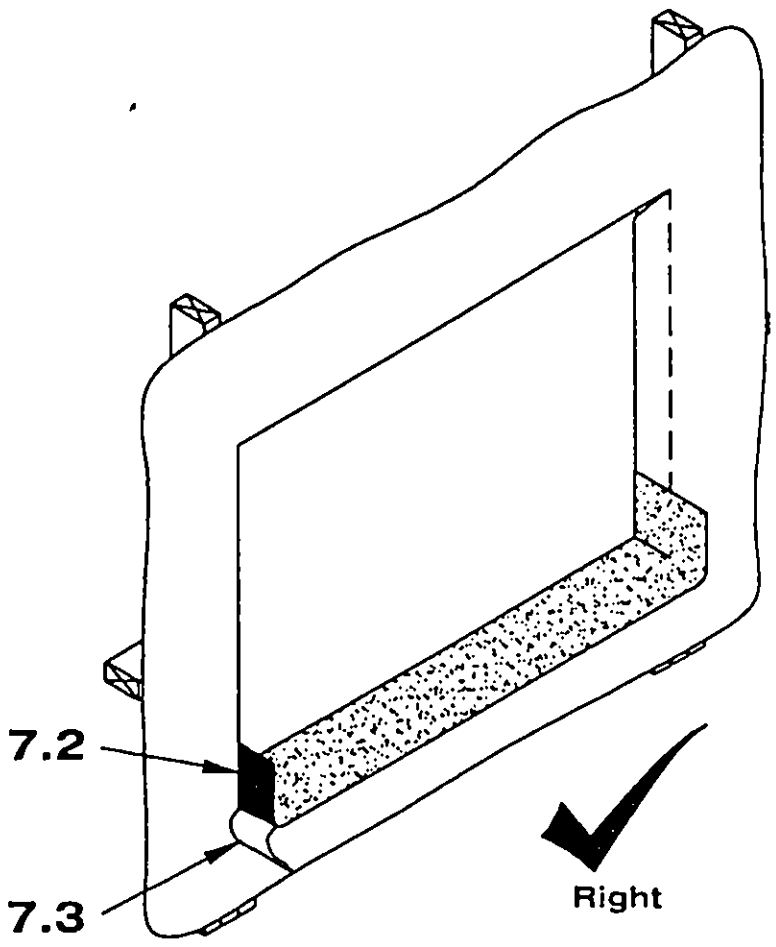
WANZ WIS (WINDOW INSTALLATION SYSTEM)

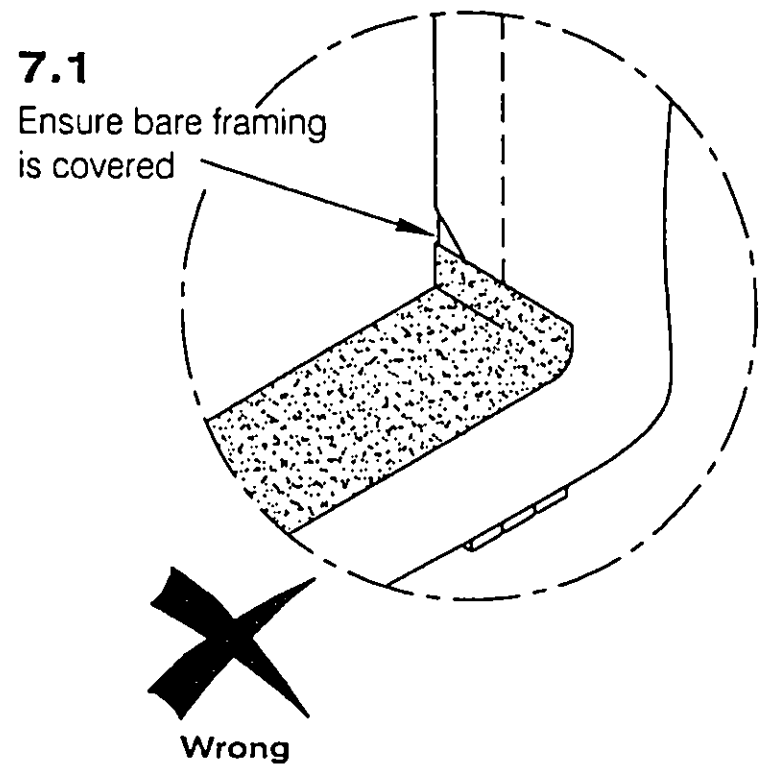
Stage 1 - Pre Cladding Trim Preparation

Installation Step No. 2 - Flexible Sill Flashing

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NTS

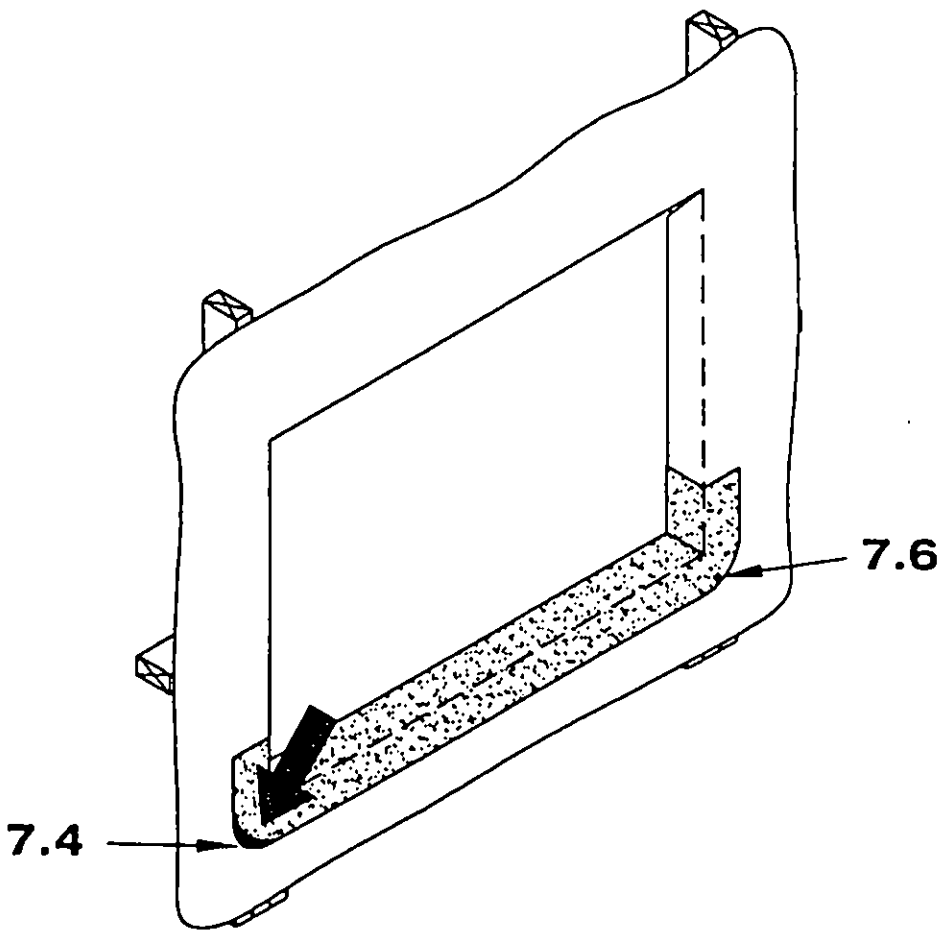




7.1 Cut sill flashing tape at least 400mm longer than the opening width, to ensure bare framing is covered.

7.2 Remove first piece of release paper, align edge of sill flashing tape with inside edge of sill, and adhere into opening across sill and up each jamb (min. 200mm).
Note - Sill flashing should not wrap onto the interior surface of the framing.

7.3 Remove second release paper.



7.4 Fan sill flashing tape at bottom corners onto face of house wrap.

7.5 Firmly press sill flashing tape onto all surfaces to ensure full adhesion.

7.6 Secure edges of bottom corners with a clout through the flashing tape into the stud.

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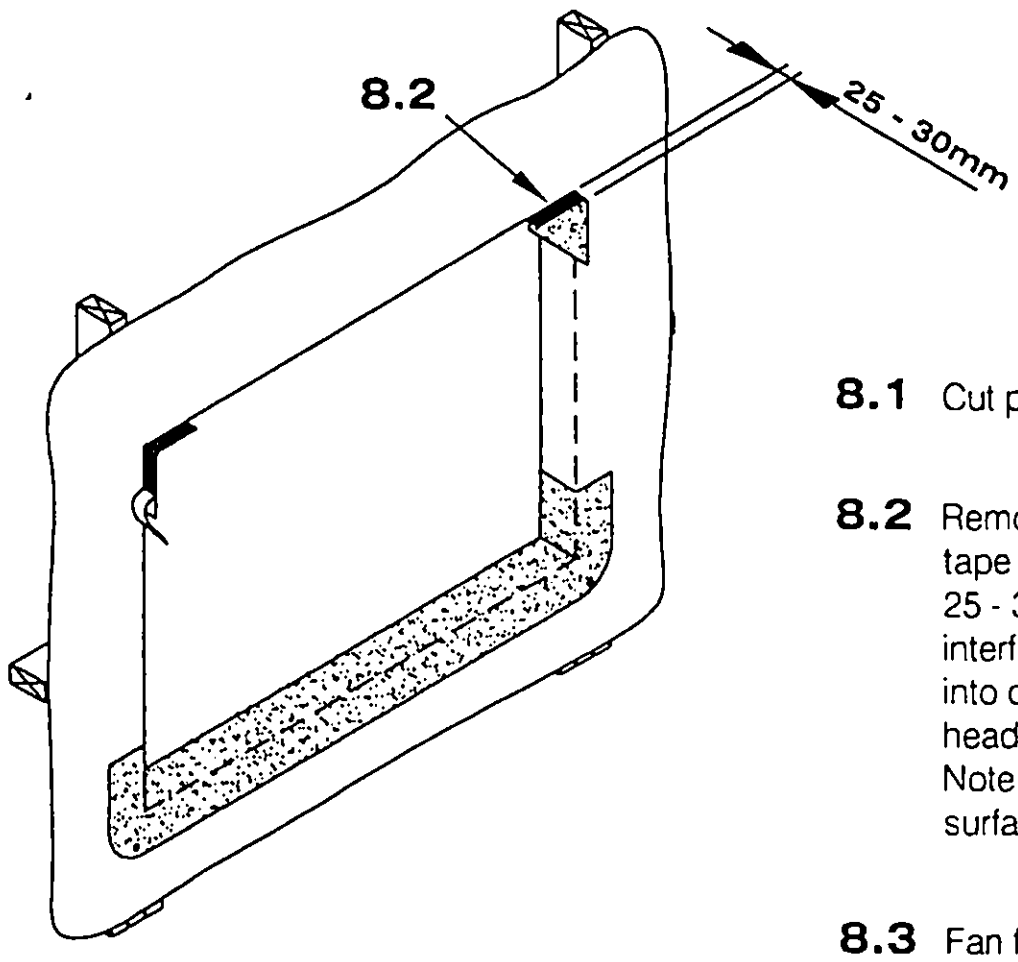
WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

Installation Step No. 3 - Upper Corners

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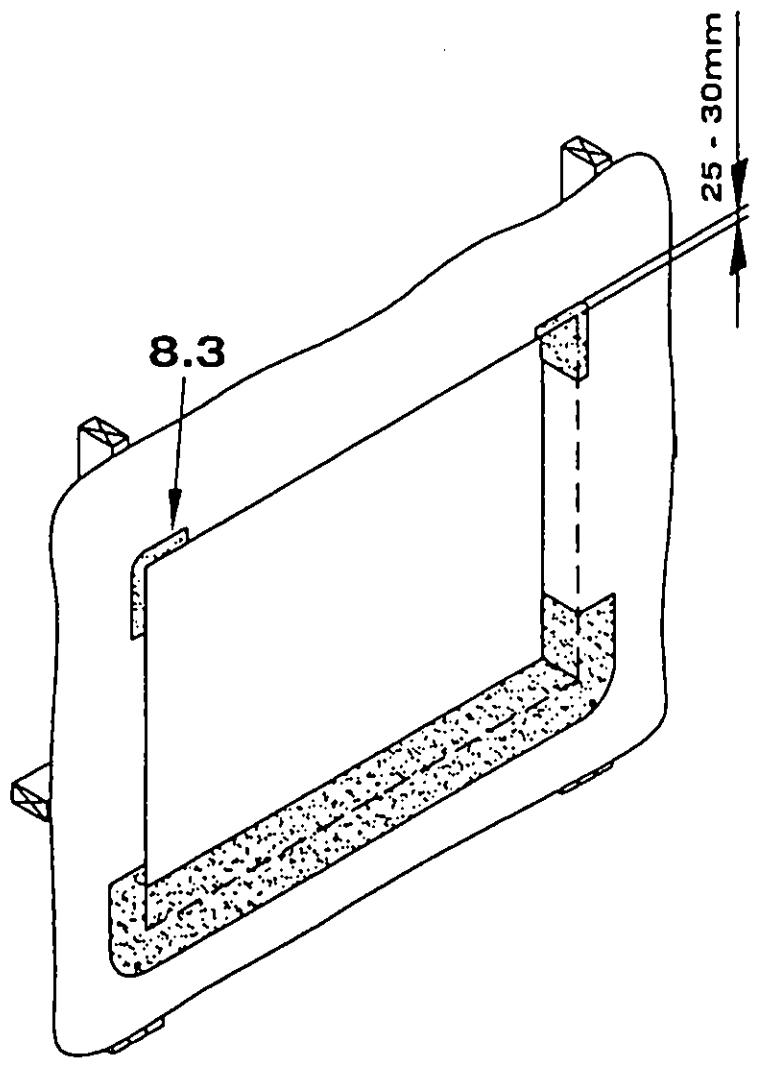
8.1 Cut pieces of flashing tape at least 400mm long.

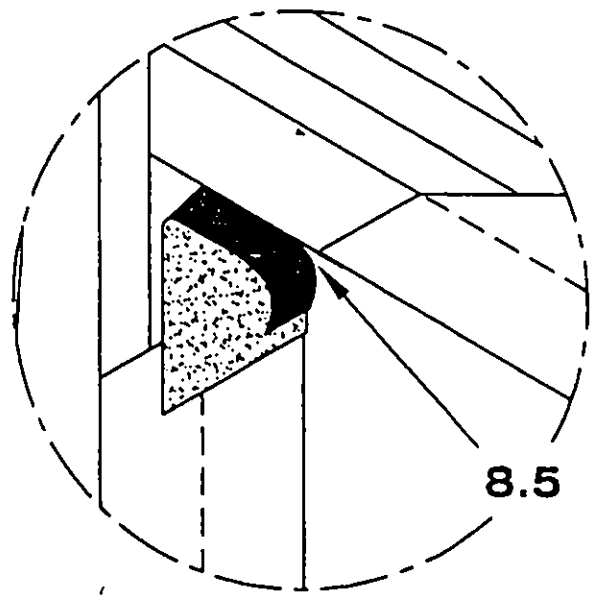
8.2 Remove release paper, and set flashing tape with the edge projecting approximately 25 - 30mm outside the cavity, to prevent interference with the head flashing. Adhere into opening up each jamb and across the head a minimum of 200mm in each direction. Note - Do not wrap flashing tape onto the interior surface of the framing.

8.3 Fan flashing tape at top corners onto face of house wrap.

8.4 Firmly press flashing tape onto all surfaces to ensure full adhesion.

8.5 Trim excess tape from inside, flush with face of framing. Care must be taken not to cut house wrap.





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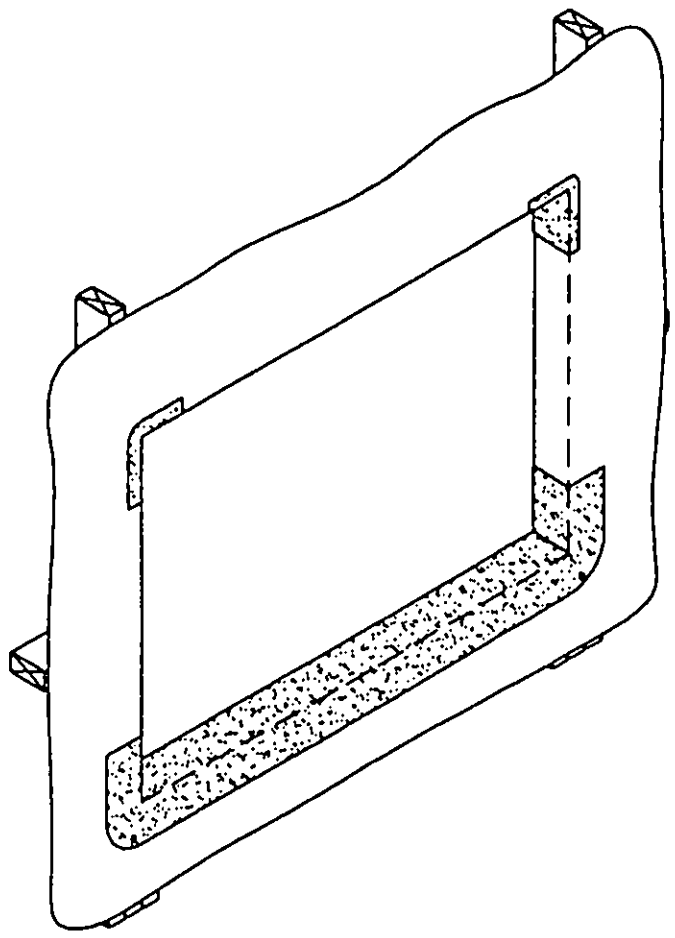
WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

Installation Step No. 4 - Proprietary Flashings

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9.1 With cladding systems that require the fitting of proprietary flashing components, prior to the installation of the window, these should be fitted at this stage.

9.2 A sill tray, sloped sill or other means of removing water to the outside of the cladding may be required on some claddings.

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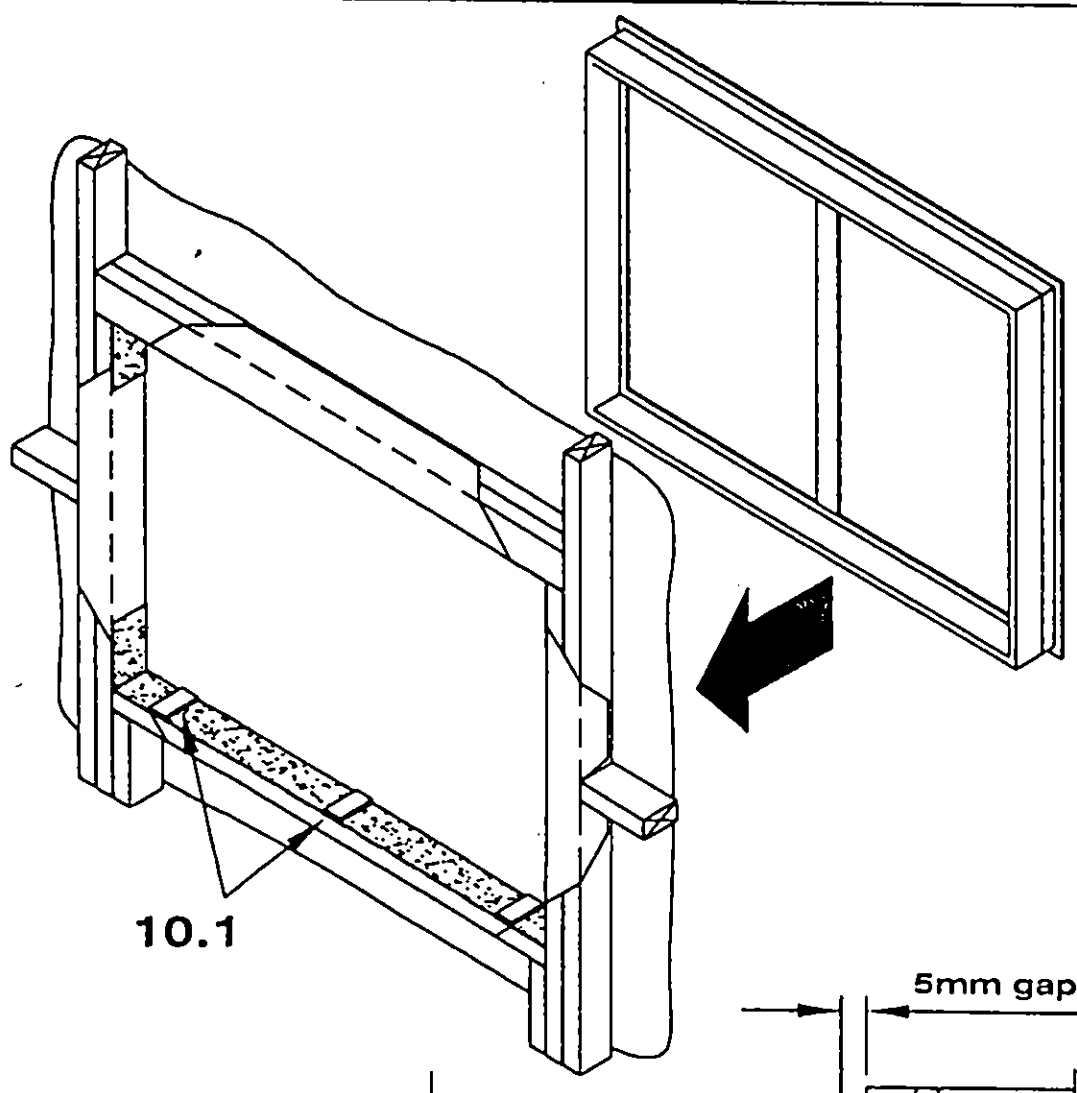
WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

Installation Step No. 5 - Window Installation

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Scale
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10.1

10.1 Position 5mm thick spacers on the sill flashing tape at fixing centres, 150mm from each jamb and 450mm centres between.

10.2 Position window into opening and secure with nails or other approved fixing method.

10.3 Ensure window is positioned so that;

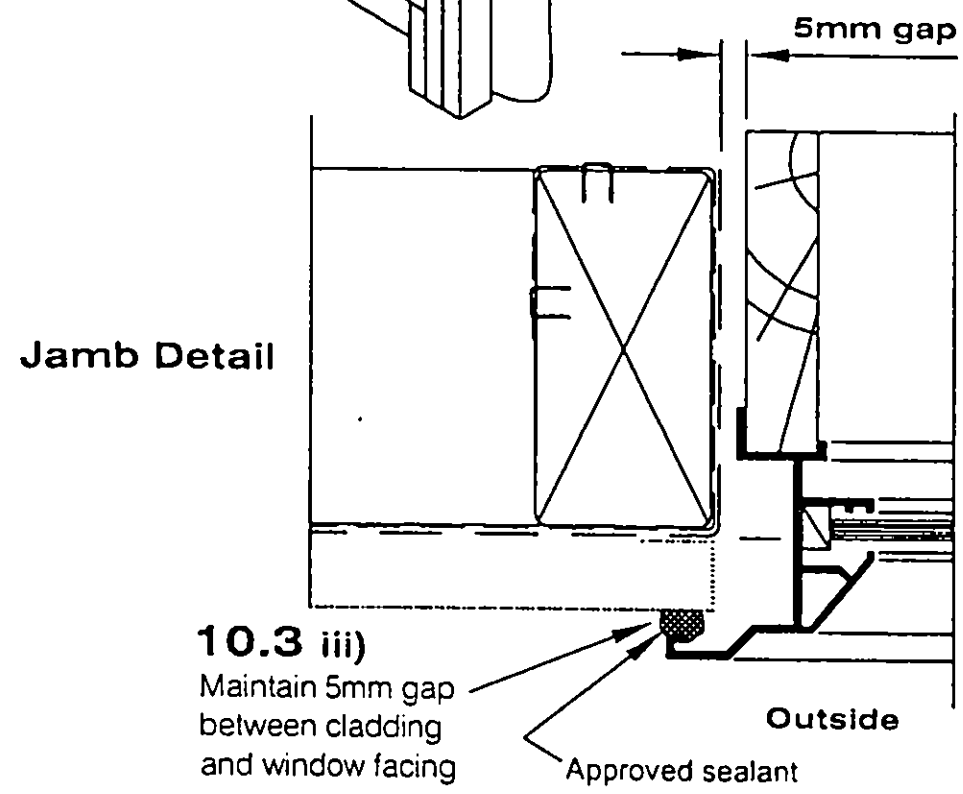
i) interior linings finish in the correct plane.

ii) a 5mm gap must be maintained between window reveal and wrapped trim cavity. This 5mm gap is essential to allow the trim cavity to pressurize. Too narrow a gap will induce leakage.

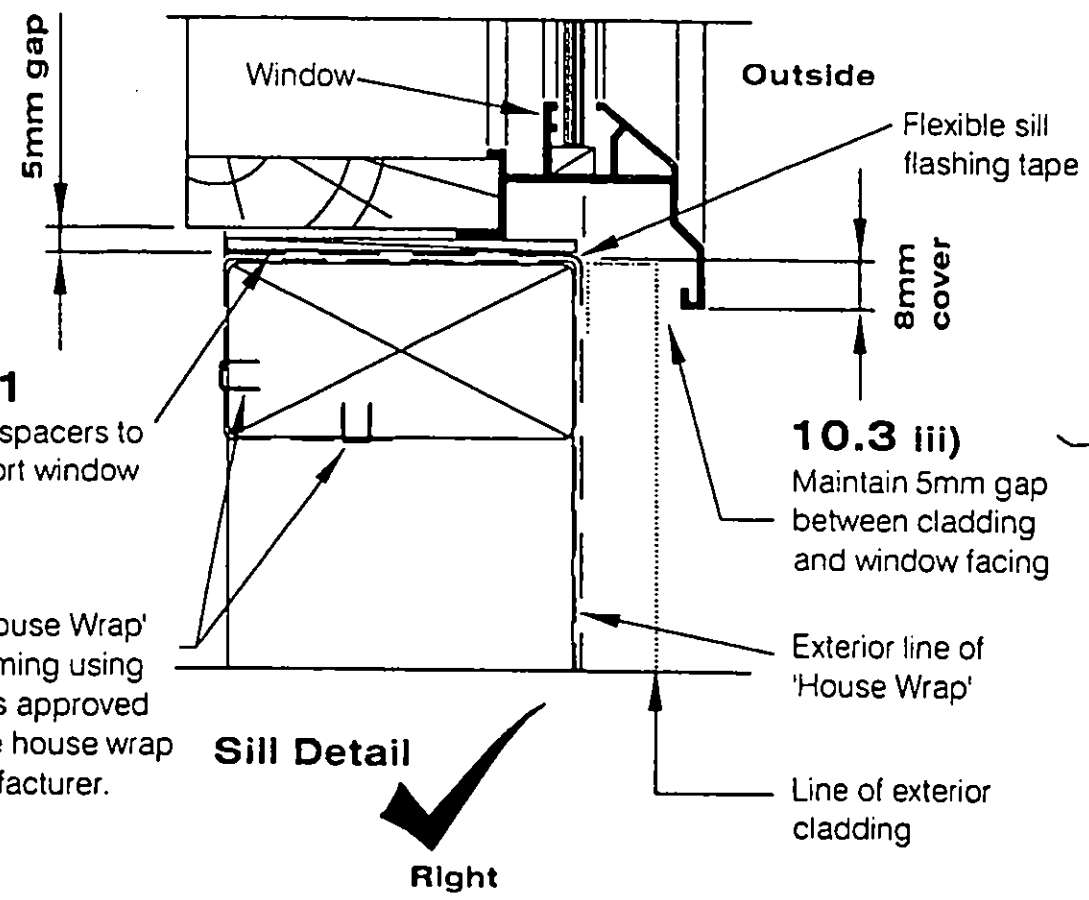
iii) a 5mm gap must be maintained between cladding and window facing. This 5mm gap is essential to admit outside air pressure to the cavity and provide a pathway for drainage to the exterior. This gap provides essential drying / ventilation.

iv) 8mm of frame cover is maintained over the cladding at the sill.

v) The cladding below the sill trimmer shall not extend above the sill trimmer across the window opening.

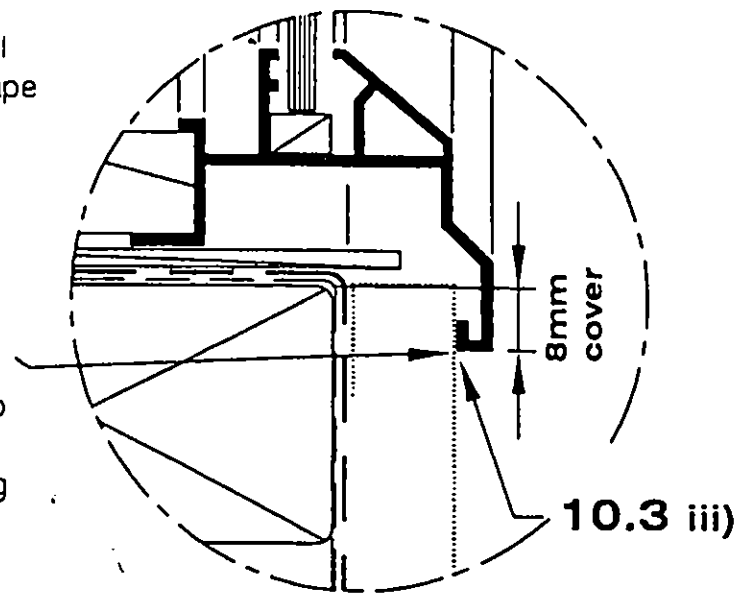


Jamb Detail



Sill Detail

Right



Wrong

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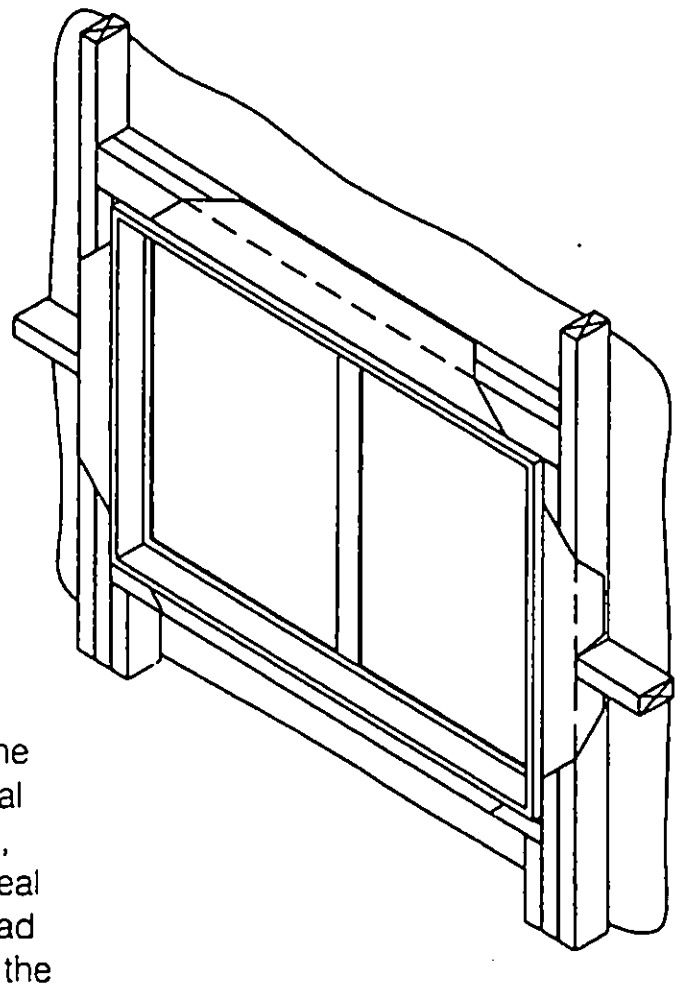
WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

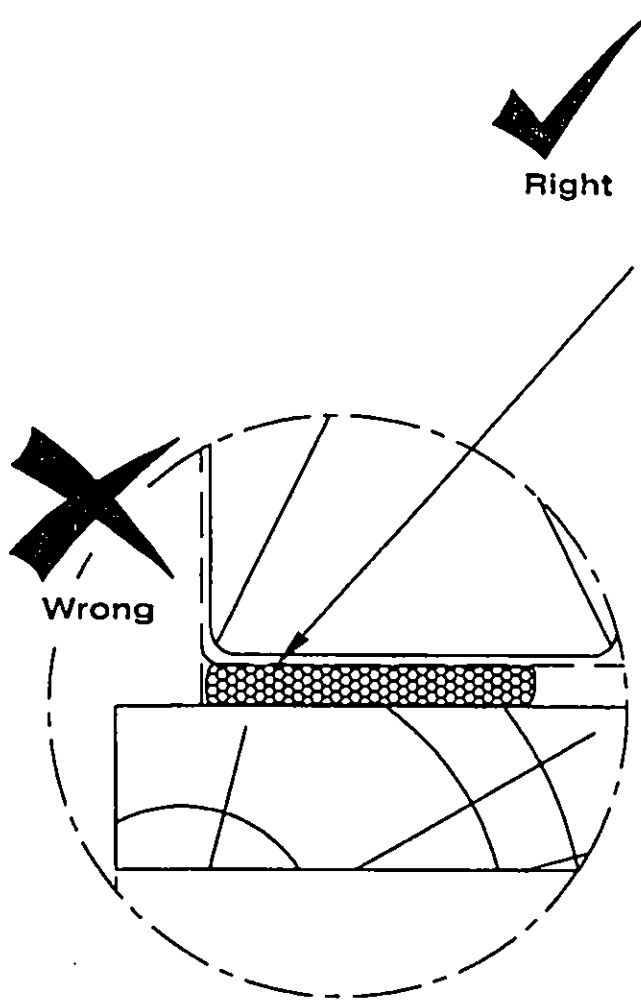
Installation Step No. 6 - Air Seal

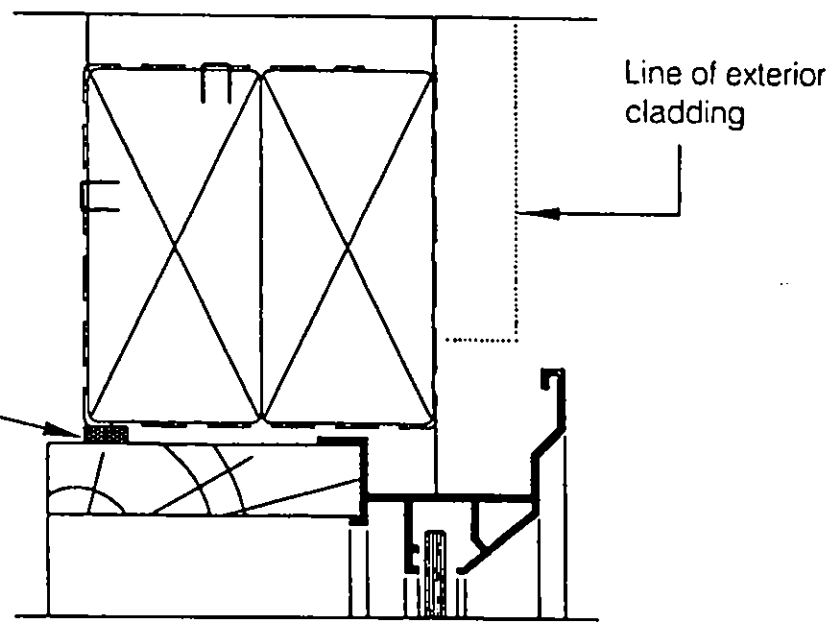
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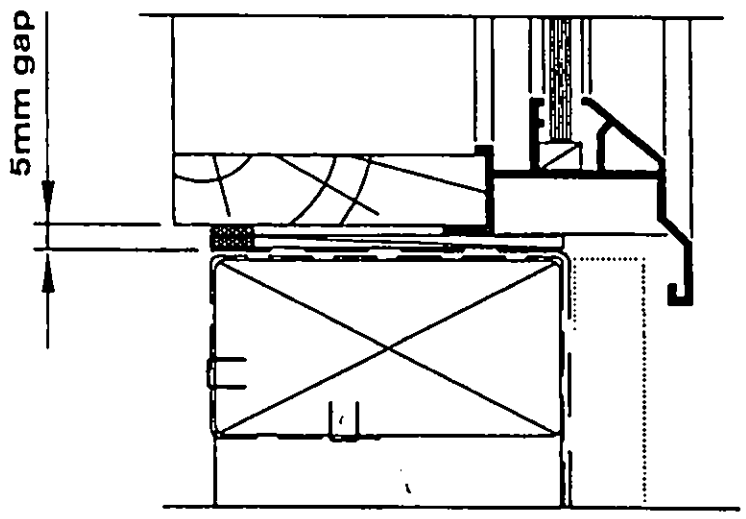


11.1 Apply a continuous bead of a suitable approved, water resistant 'Air Seal' to the perimeter of the trim cavity. Run the seal along the inside edge of the trim cavity, ensuring contact with both window reveal and house wrap so that the air seal bead extends approximately 10 - 12mm into the cavity space.
Note - Do Not fill the cavity with the air seal product as doing so effects the cavity created in step 10.3 ii - (please refer back for the reasons).





Head Detail



Sill Detail - Jamb Similar

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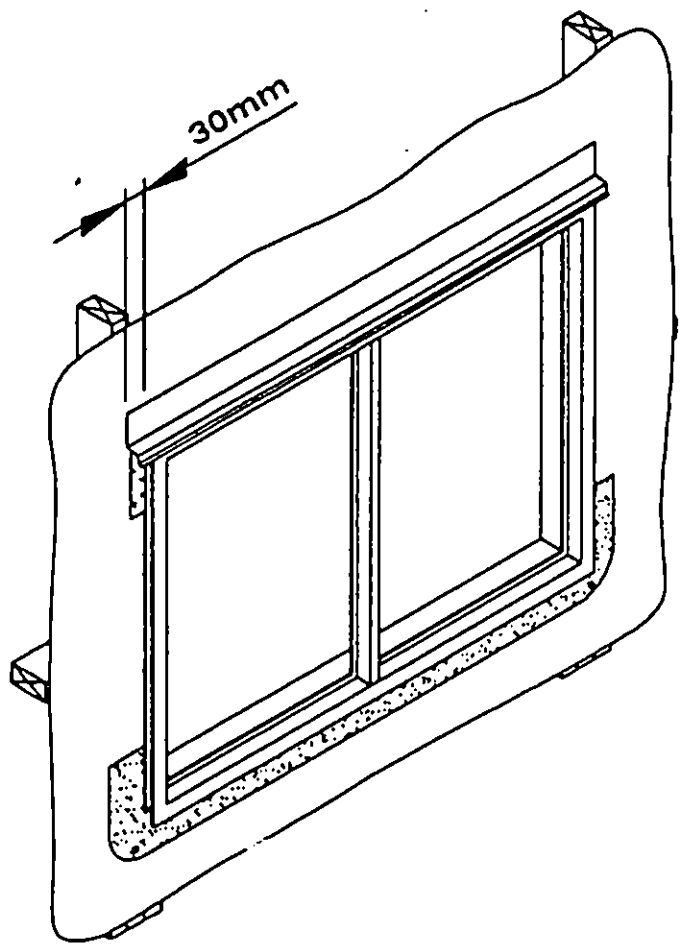
WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

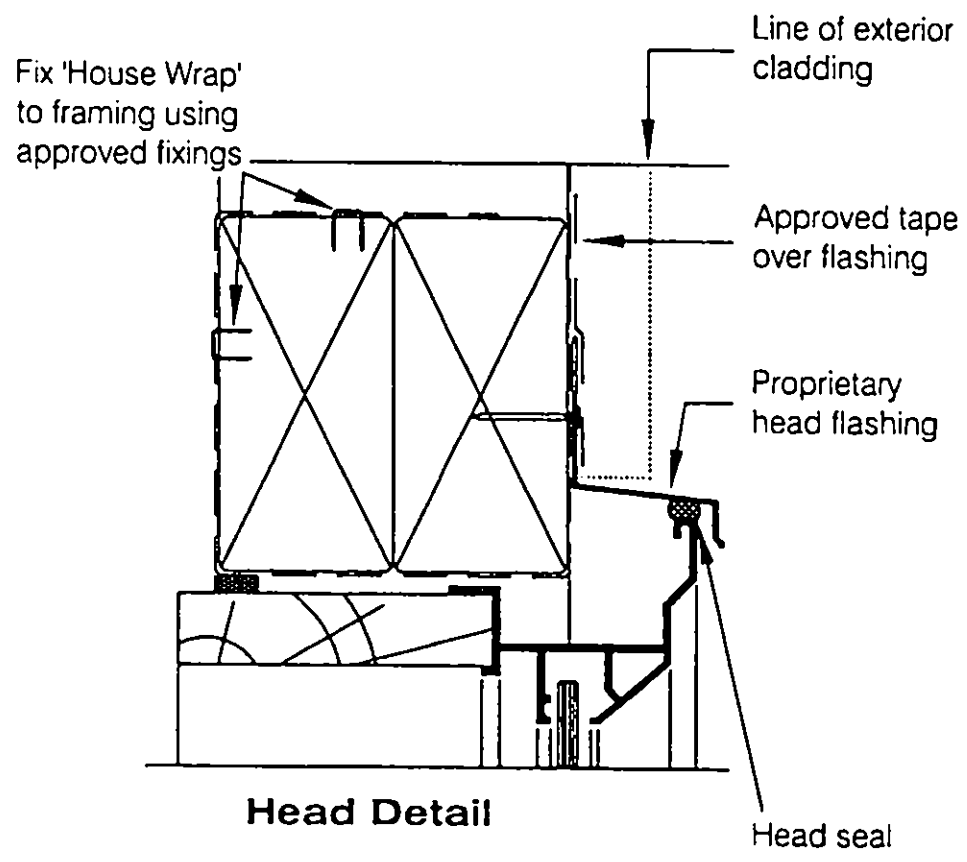
Installation Step No. 7 - Head Flashing

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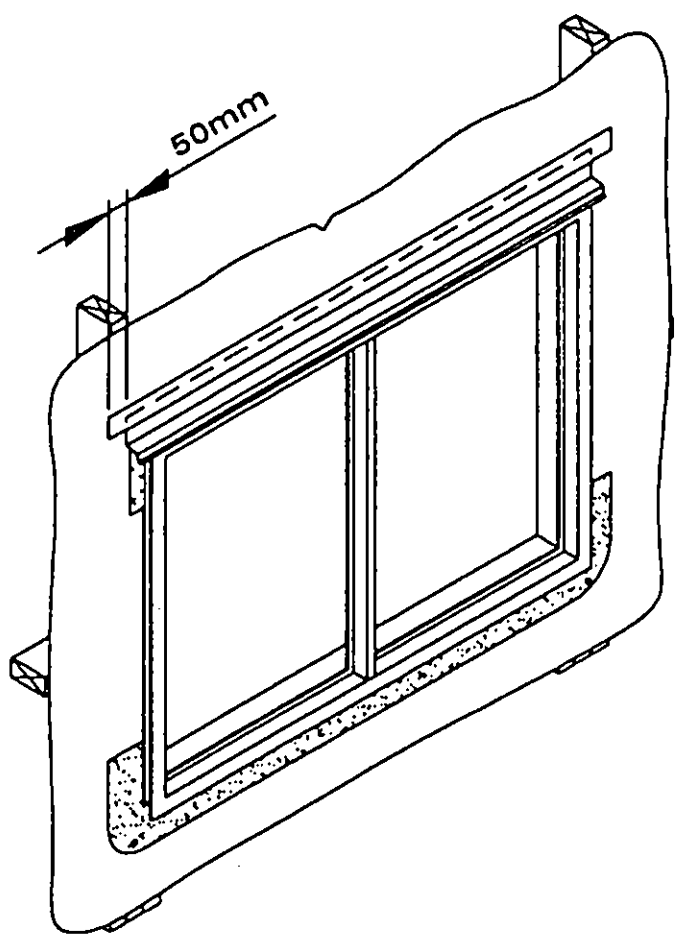
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12.1 Cut head flashing at least 60mm wider than the window and fix *over* 'House Wrap'. Position centrally to sit on top of window facing.



Head Detail



12.2 Install approved adhesive tape over upper edge of head flashing to assist with water diversion. Run past each end by at least 50mm.

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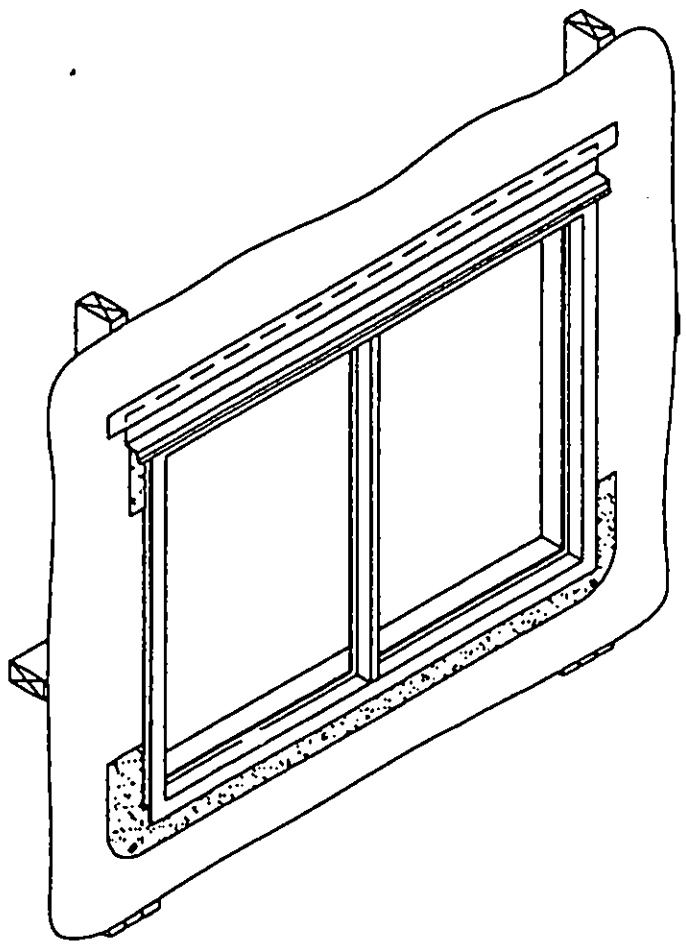
WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

Installation Step No. 8 - Cladding

Date
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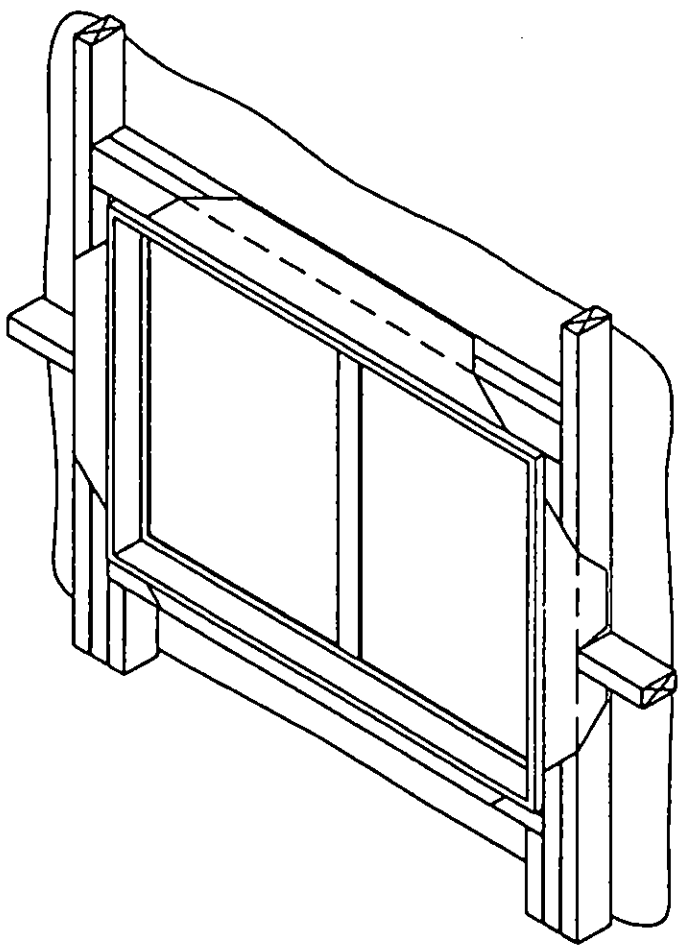


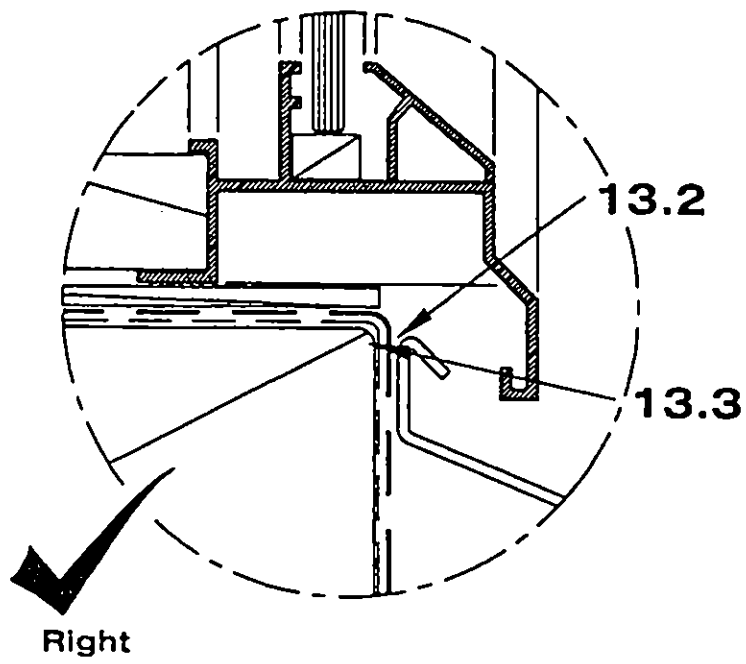
13.1 Install exterior cladding in accordance with the 'Manufacturers Recommendations'.

'DO NOT SEAL EXTERIOR SILL GAP'
The sill must be left open to allow the trim cavity to pressure equalize and drain.

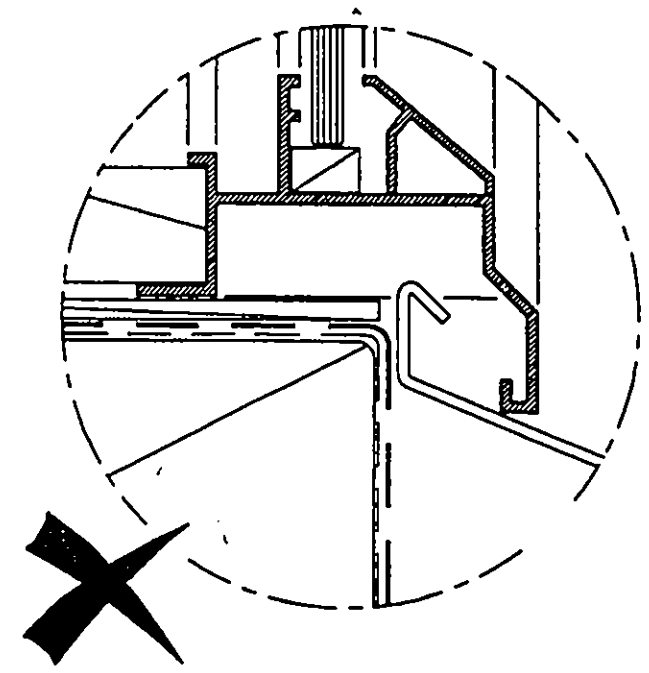
13.2 Some proprietary flashings will require 'laminating', i.e. using a wet seal or similar, to the sill flashing tape to guard against water seepage between house wrap and cladding.
Please ensure the compatibility of the seal with the sill tape by using only a suitable approved material.

13.3 Ensure any proprietary sill flashings are fitted level with or below the line of the sill framing, to avoid water damming on sill.





Right



Wrong

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Appendix

BRANZ Report : EC0610

Weathertightness testing of Direct Fixed Cladding with the WANZ WIS.

BRANZ
BUILDING ON KNOWLEDGE

EC0610

Weathertightness testing of Direct Fixed Cladding with the WANZ WIS.

Author: John Burgess
Scientist

Reviewer: Mark Bassett
Principal Scientist

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Tel: +64 4 237 1170
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Quality System
Quality Endorsed Company
ISO 9001 Lic 2437
Standards Australia

5. RESULTS

The Window Association of New Zealand's Window Installation system (the WANZ WIS) is a window installation system that provides a means for installing aluminium-based windows into low-rise domestic cladding systems in the New Zealand environment.
The WANZ WIS includes the following:

- building wrap (or housewrap) installed over timber framing, which is cut over window openings and wrapped around the trimmers.
- A flexible, waterproof adhesive tape installed across the sill, and at the jamb/lintel joints to cover any bare timber that is not covered by the building wrap, to complete the airtightness of the trim cavity.
- A head flashing taped over the building wrap, and windows installed standing proud off the cladding by 5mm.
- An internal airseal applied to the trim gap between the joinery reveal and the framing.

The WANZ WIS provided a weathertight joint between the cladding and the window when subjected to typical air pressures within the New Zealand low-rise domestic environment if the following points were adhered to:

- Jambs were sealed
- The internal airseal remained intact
- Window offset was at least 5mm.
- Window trim cavity was at least 5mm.
- Cover of the aluminium window flange extended at least 8mm over the cladding.

6. CONCLUSION

The WANZ WIS is a fundamental advance in the weathertight performance of the junction between cladding systems and windows in the low-rise domestic New Zealand market. The WANZ WIS offers the first verifiable means of ensuring the weathertightness of the junction between the cladding and the window.

The WANZ WIS does not include proprietary cladding system flashings, but may be improved by their installation, or by the use of sill trays or wrapped, sloped sill trimmers. These are likely to add significantly to the ability of the WANZ WIS system to cope with water leaks attributed to workmanship and building tolerance issues.

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16/03/2005

Tony Ha

CONCEPT
MASTER BUILDERS

Revised [illegible] Architect.

ABA 2004 2396, plus other info requested. The council have the Wolite Plaster System on file.

WITH COMPLIMENTS

Regards Barry

Concept Building Limited Concept House 369 State Highway 2 RD2 Hastings
Tel 06 878 4690 Fax 06 876 2732 Email info@conceptmb.co.nz www.conceptmb.co.nz

Registered Master Builders

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ASTEWATER DISPOSAL
SSMENT, SUBSOIL INVESTIGATION
AND SITE EVALUATION CHECKLIST

RECEIVED
14 FEB 2005
H.D.C.

HASTINGS DISTRICT COUNCIL

1.0 SITE EVALUATOR

1.1	Name: Steve Crockford	Registration Number: 12382
	Company: Effluent Management Systems Ltd	Address: PO Box 8361, Havelock North
	Phone: 870 3701 Fax: 870 3702	Mobile: 021 926 364

2.0 SITE INFORMATION

2.1	Location Address:		
	Owner:	Address:	
	Phone:	Fax:	Mobile:
2.2	Legal Description	Lot No: DP:	Valuation No:
	Area of Site:	Ha:	

2.3	Shape/Layout of site-Sketch plans attached?	Y / N (circle one)
2.4	Photographs of site attached?	Y / N (circle one)
2.5	Percolation Test Results Attached?	Y / N (circle one)
2.6	Illustration of Soil Structure Attached?	Y / N (circle one)
2.7	Photograph of Soil Structure Attached?	Y / N (circle one)

3.0 HYDRAULIC LOADING INFORMATION

3.1	Number of Bedrooms: 3	Number of Persons: 6	Design Loading Rate Per Person (1/day): .200
3.2	Waste Disposal Unit Installed? Yes/No		
3.3	Water Saving Devices Fitted? Yes/No		
3.4	Water Supply - Rain Water – Bore/Well – Reticulated		

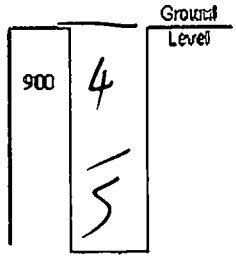
4.0 SITE ASSESSMENT

4.1	Have Plans / Photographs of the Site been supplied? Y / N (circle one) IF NO WHY NOT!
4.2	Topography of Site – Flat / Sloping / Rolling / Steep
4.3	Give details if different from 4.2
4.4	Does the site contain fill? Yes/No
4.5	Does the site Contain Drainage Flow Paths? Yes/No
4.6	Any Visible or Known Stormwater Problems? Yes/No
4.7	Need for Ground Water/Surface Water "Cut-Off / Collector Drains" Yes/No
4.8	Is the winter High Watertable known? Yes/No

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	ed Disposal and Reserve area, Distance from Boundaries ay NA Well/Bore >30m Buildings >6m
4.10	Local Experience – (Existing on-site Systems) Either Comment or circle one Is performance Satisfactory? Y/N unknown N/A If answer is No – Comments please

5.0 SUB SOIL INVESTIGATION

5.1	How was Soil Profile Determined? Bore Holes / Dig Test Holes / Earlier Site Excavations/ Other – (Please specify)
5.2	Have the soils been assessed by an Independent Party? Yes/No If so please specify
5.3	Has the soil structure Profile been completed? Yes/No Have photographs been supplied? Y / N (circle one) 
5.4	Has Percolation Testing been carried out? Yes/No If YES specify method
5.5	Are Percolation test results attached? Yes/No
5.6	SOIL CATEGORY - show the estimated soil category from the descriptions below: Tick box that applies
	1. Gravel, coarse sand, rapid draining ☐
	2. Coarse to medium sand; free draining ☐
	3. Medium-fine and loamy sand; good drainage ☐
	4. Sandy loam, loam and silt loam; moderate drainage ☑
	5. Sandy clay-loam, clay-loam and silty clay-loam, moderate to slow drainage ☐
	6. Sandy clay, non-swelling clay and silty clay; slowly draining ☐
	7. Swelling clay, grey clay, hardpan; poorly or non-draining ☐

6.0 SITE EVALUATION

6.1	Design Considerations
	Any environmental constraints? Yes/No
	Any soil constraints? Yes/No
	Any site constraints? Yes/No if yes please specify (see 5.6)
	Any Hawke's Bay Regional Council (HBRC) constraints? Yes/No

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	Sewer Treatment System considered best suited for the site Enclosed WWTP BY R.GARDINER
6.3	Type of Disposal System considered best suited for the site DRIPLINE
6.4	Minimum disposal area recommended 266m²
6.5	Minimum size of reserve area (See HBRC & HDC Requirements) AS ABOVE
6.6	Are sewer treatment system and disposal system calculations and design plans attached? (Y) / N (circle one). IF NO WHY NOT!
6.7	Other comments:

7.0 GENERAL COMMENTS

7.1	AS/NZS 1547:2000 "On-site domestic wastewater management" can be used for guidance in On-site evaluation and soil assessment. This Standard can provide options for on-site wastewater treatment and land application systems.
7.2	AS/NZS 1546:1998 "Septic tanks" has been adopted by the Hastings District Council. Unless a manufacturer has built his tanks to comply with this Standard and had an engineer verify that the tanks comply with the Standard, that particular manufacturer of tank is not permitted to be installed within the Hastings District Council. (A list of manufacturers that comply can be viewed at the Hastings District Council.
7.3	Where it is necessary to make contact with the Hawke's Bay Regional Council in relation to On-site Waste Water Disposal Mr Tim Waugh (06) 835 9200 is the person to whom you should direct enquires.
	NAME Steve Crockford
	SIGNATURE
	DATE 24 02 05

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Effluent Management Systems Ltd

EFFLUENT MANAGEMENT SYSTEM

DESIGN SPECIFICATION

Client:	Barns (C/- Concept Master Builders)
Site Location:	State Highway 50, Hastings
System Type:	Proprietary compliant secondary wastewater treatment plant.
Effluent Distribution Method:	Dripline (1.5 *l*/hr @ 0.6 m emitter spacings) Laid at 1 m centres
Total Lineal Length:	250 m
Design Loading Rate:	4.5 litres/m^2/day
Design:	3 bedroom home = Potential occupancy of 6 people @ 200 litres each/day = 1200 litres/day potential effluent discharge
Land Area Required:	266.666 m^2

Steve Crockford
Director

Registration No.: 12382
IPENZ No.: 254300

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HILL LABORATORIES 04 7 858 2001 P.01/04

Hill Laboratories

R J Hill Laboratories Limited

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Private Bag 3205,
Hamilton, New Zealand

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+64 (7) 858-2000
Facsimile:
+64 (7) 858-2001

Email:
mail@hill-labs.co.nz
Internet:
www.hill-labs.co.nz

Client: Layer Mamey Olives Ltd
Address: 2534 State Highway 50, R D 5, Roys Hill Rd
HAWKES BAY
Contact: Leo Leader

Laboratory No: 341308
Date Registered: 4/05/2004
Date Completed: 7/05/2004
Page Number: 1 of 4

Water Source for 2535 Roys Hill Rd (Barnes)

The results for the analyses you requested are as follows: Shared Bore

Sample Type: Water, Potable

Sample Name		Water Sample
Lab No		341308/1
pH [7.0 - 8.5]	(pH units)	7.4
Electrical Conductivity [<150]	(mS/m)	69.1
Electrical Conductivity [<1500]	(uS/cm)	691
Approx Total Dissolved Salts [<1000]	(g.m-3)	483
Alkalinity [No Guideline]	(g.m-3 as CaCO3)	237
Free carbon dioxide [No Guideline]	(g.m-3)	20
Calcium [No Guideline]	(g.m-3)	90.9
Magnesium [No Guideline]	(g.m-3)	9.03
Total Hardness [<200]	(g.m-3 as CaCO3)	264
Sodium [<200]	(g.m-3)	32.0
Potassium [No Guideline]	(g.m-3)	3.2
Nitrate-N [<11.3]	(g.m-3)	10.4
Chloride [<250]	(g.m-3)	42.1
Sulphate [<250]	(g.m-3)	23.2
Boron [<1.4]	(g.m-3)	0.013
Total Iron [<0.2]	(g.m-3)	< 0.01
Total Manganese [<0.05]	(g.m-3)	< 0.005
Total Copper [<1]	(g.m-3)	< 0.005
Total Zinc [<3]	(g.m-3)	0.203
Faecal Coliforms [<1]	(cfu/100 mL)	< 1

Note: Values given in square brackets in the result tables above are Guideline values taken from the publication 'Drinking Water Standards for New Zealand', Dept of Health (2000).

Note that the units $g.m^{-3}$ are the same as mg/L and ppm.

This Laboratory is accredited by International Accreditation New Zealand (previously known as TELARC). The tests reported herein have been performed in accordance with its terms of accreditation, with the exception of tests marked *, which are not accredited.
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Client:Layer Mamey Olives Ltd Laboratory No:341308

Routine Water Assessment for Sample Nr 341308/1

pH/Alkalinity and Corrosiveness Assessment
The pH of a water sample is a measure of its acidity or basicity. Waters with a low pH can be corrosive and those with a high pH can promote scale formation in pipes and hot water cylinders. The guideline level for pH in drinking water is 7.0-8.5. Below this range the water will be corrosive and may cause problems with disinfection if such treatment is used.

The alkalinity of a water is a measure of its acid neutralising capacity and is usually related to the concentration of carbonate, bicarbonate and hydroxide. Low alkalinities (<25 $g.m^{-3}$) promote corrosion and high alkalinities can cause problems with scale formation in metal pipes and tanks.

The pH of this water is within the NZ Drinking Water Guidelines, the ideal range being 7.0 to 8.0. With the pH and alkalinity levels found, it is unlikely this water will be corrosive towards metal piping and fixtures. The high alkalinity of this water may cause an increase in the pH in the root zones of plants which are irrigated using this water.

Hardness/Total Dissolved Salts Assessment
The water contains a moderate amount of dissolved solids and would be regarded as being very hard. There will be difficulty in forming a lather with soap, and a 'scum' will form in baths, showers, etc. The high value for hardness (200 is considered excessive) indicates that this water may promote scale build-up in pipes and cylinders, and that irrigation systems using this water may be prone to scale build-up and blockage of narrow irrigation capillaries and jets.

Nitrate Assessment
Nitrate-nitrogen at elevated levels is considered undesirable in natural waters as this element can cause a health disorder called methaemaglobinaemia. Very young infants (less than six months old) are especially vulnerable, and the World Health Organisation suggests a maximum permissible level of 10 $g.m^{-3}$.

Nitrate-nitrogen was detected at a moderate level.

The presence of nitrate-nitrogen at this level may indicate contamination from nearby septic tanks or effluent ponds. If this is a possibility then the water should also be checked for the presence of pathogenic bacteria. We cannot provide this analysis ourselves but can recommend appropriate laboratories if you so wish.

Boron Assessment
Boron may be present in natural waters and if present at high concentrations can be toxic to plants.

Boron was found at a low level in this water but would not give any cause for concern.

Metals Assessment
Iron and manganese are two problem elements that commonly occur in natural waters. These elements may cause unsightly stains and produce a brown/black precipitate. Iron is not toxic but manganese, at concentrations above 0.5 $g.m^{-3}$, may adversely affect health. At concentrations below this it may cause stains on clothing and sanitary ware.

Neither element was detected in this water, which is a pleasing feature. Treatment to remove iron and/or manganese should not be necessary.

Copper and zinc at low levels are both essential elements for people, animals and plants.

Bacteriological Tests
The NZ Drinking Water Standards state that there should be no faecal coliforms or E coli in water used for human consumption. The presence of these organisms would indicate that other pathogens of faecal origin may be present.

No faecal coliform organisms were detected in this sample.

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Client:Layer Mamey Olives Ltd Laboratory No:341308

Final Assessment
The parameter Hardness did NOT meet the guidelines laid down in the publication 'Drinking Water Standards for New Zealand' published by the NZ Department of Health, Wellington, NZ (2000) for water which is suitable for drinking purposes.

Sample Containers

The following table shows the sample containers that were associated with this job.

Container Description	Container Size (mL)	Number of Containers
PET, microbial testing, leave 1cm air gap (400 mL)	400	1
Nitric Preserved (100 mL)	100	1

Details of sample bottle preparation procedures are available upon request.

Summary of Methods Used and Detection Limits

The following table(s) gives a brief description of the methods used to conduct the analyses for this job.
The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Substance Type: Water

Parameter	Method Used	Detection Limit
Sample filtration for general testing	Sample filtration through 0.45µm membrane filter.	N/A
Total (nitric acid) digest	Boiling nitric acid digestion.	N/A
pH [7.0 - 8.5]	pH meter APHA 4500-H$^+$ B 20th ed. 1998	0.1 pH units
Electrical Conductivity [<150]	Conductivity meter, 25°C APHA 2510 B 20th ed. 1998	0.1 mS/m
Electrical Conductivity [<1500]	Conductivity meter, 25°C APHA 2510 B 20th ed. 1998	1 uS/cm
Approx Total Dissolved Salts [<1000]	Calculation: from Electrical Conductivity	2 g.m-3
Alkalinity [No Guideline]	Titration to pH 4.5 APHA 2320 B (Modified for alk <20) 20th ed. 1998	1 g.m-3 as CaCO3
Free carbon dioxide [No Guideline]	Calculation: from alkalinity and pH, valid where TDS is not >500 mg/L and alkalinity is almost entirely due to hydroxides, carbonates or bicarbonates. APHA 4500-CO_2 D 20th ed. 1998	1 g.m-3
Calcium [No Guideline]	Boiling nitric acid digestion. ICP-OES	0.02 g.m-3
Magnesium [No Guideline]	Boiling nitric acid digestion. ICP-OES	0.005 g.m-3
Total Hardness [<200]	Calculation: from Ca and Mg APHA 2340 B 20th ed. 1998	1 g.m-3 as CaCO3
Sodium [<200]	Boiling nitric acid digestion. ICP-OES	0.5 g.m-3
Potassium [No Guideline]	Boiling nitric acid digestion. ICP-OES	0.1 g.m-3
Nitrate-N [<11.3]	Filtered sample. Ion Chromatography. APHA 4110 B 20th ed. 1998	0.05 g.m-3
Chloride [<250]	Filtered sample. Ion Chromatography. APHA 4110 B 20th ed. 1998	0.5 g.m-3
Sulphate [<250]	Filtered sample. Ion Chromatography. APHA 4110 B 20th ed. 1998	0.2 g.m-3
Boron [<1.4]	Boiling nitric acid digestion. ICP-OES	0.005 g.m-3
Total Iron [<0.2]	Boiling nitric acid digestion. ICP-OES	0.01 g.m-3
Total Manganese [<0.05]	Boiling nitric acid digestion. ICP-OES	0.005 g.m-3
Total Copper [<1]	Boiling nitric acid digestion. ICP-OES	0.005 g.m-3
Total Zinc [<3]	Boiling nitric acid digestion. ICP-OES	0.005 g.m-3
Faecal Coliforms [<1]	Membrane Filtration, Count on mFC Agar at 44.5°C after 24 hours, Analysed at BioTest Laboratories, A division of Hill Laboratories. APHA 9222 B, 20th ed. 1998	1 cfu/100 mL

Analyst's Comments:

These samples were collected by yourselves and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the submitter.

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Peter Robinson, MSc(Hons), PhD FNZIC
Environmental Division Manager

Terry Cooney, MSc(Hons), PhD MNZIC
General Manager

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Nulite™

Cladding Solution

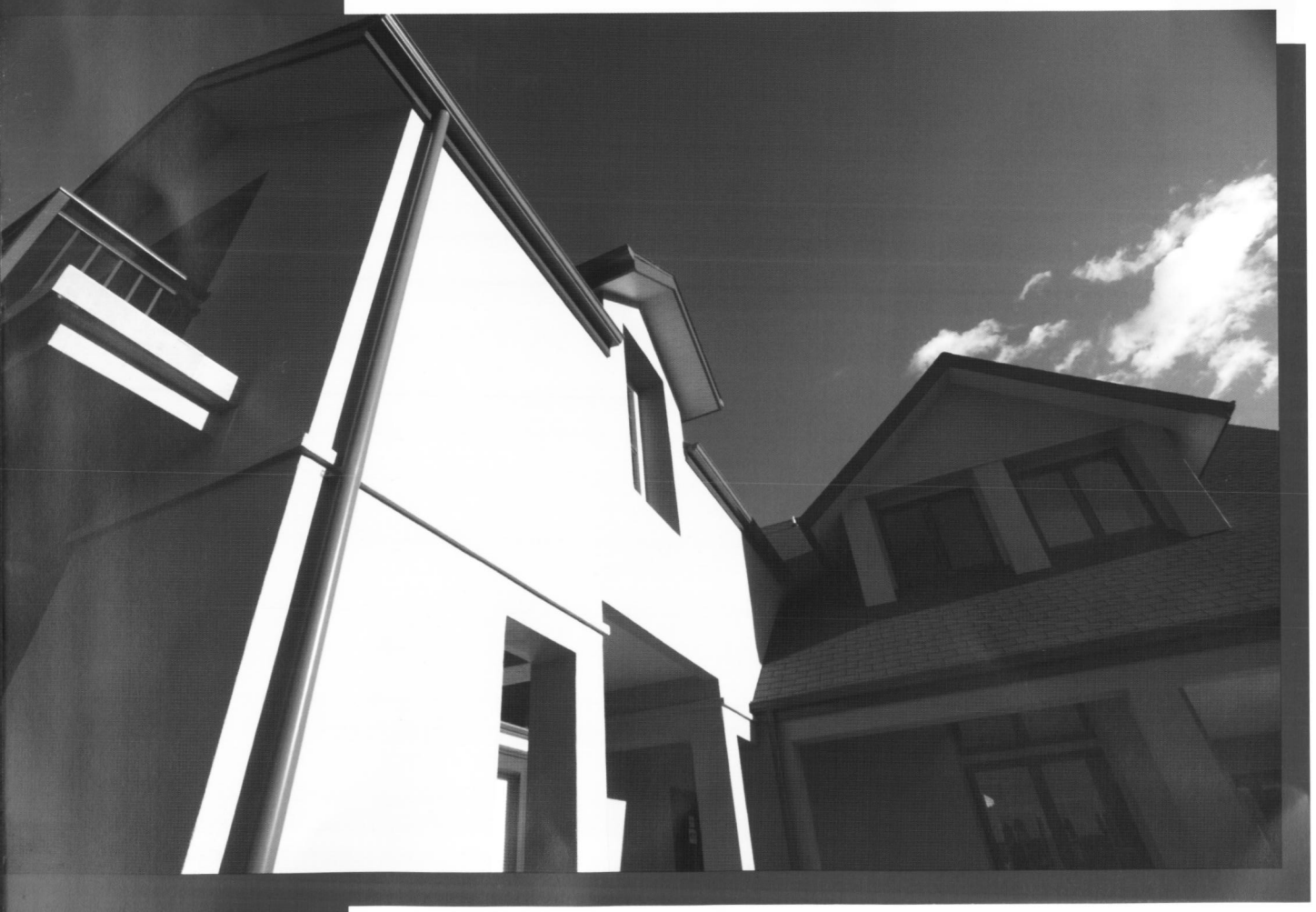
Demanding the best

Architects, developers and builders demand the best quality products to incorporate into their designs. Aesthetics is essential for these specifiers and the ability of a product to conform to the difficult details associated with today's trends is imperative for the longevity of the product in the market place. The expectations of the designer and client are of equal importance in achieving an outstanding result in both form and function of the finished product.



A Range of Systems

Nu-Age Plaster recognises the delicate balance required between appearance and practicality and has developed a range of systems to achieve a solution that will not only satisfy, but also surpass the expectations of the designer and client combined.

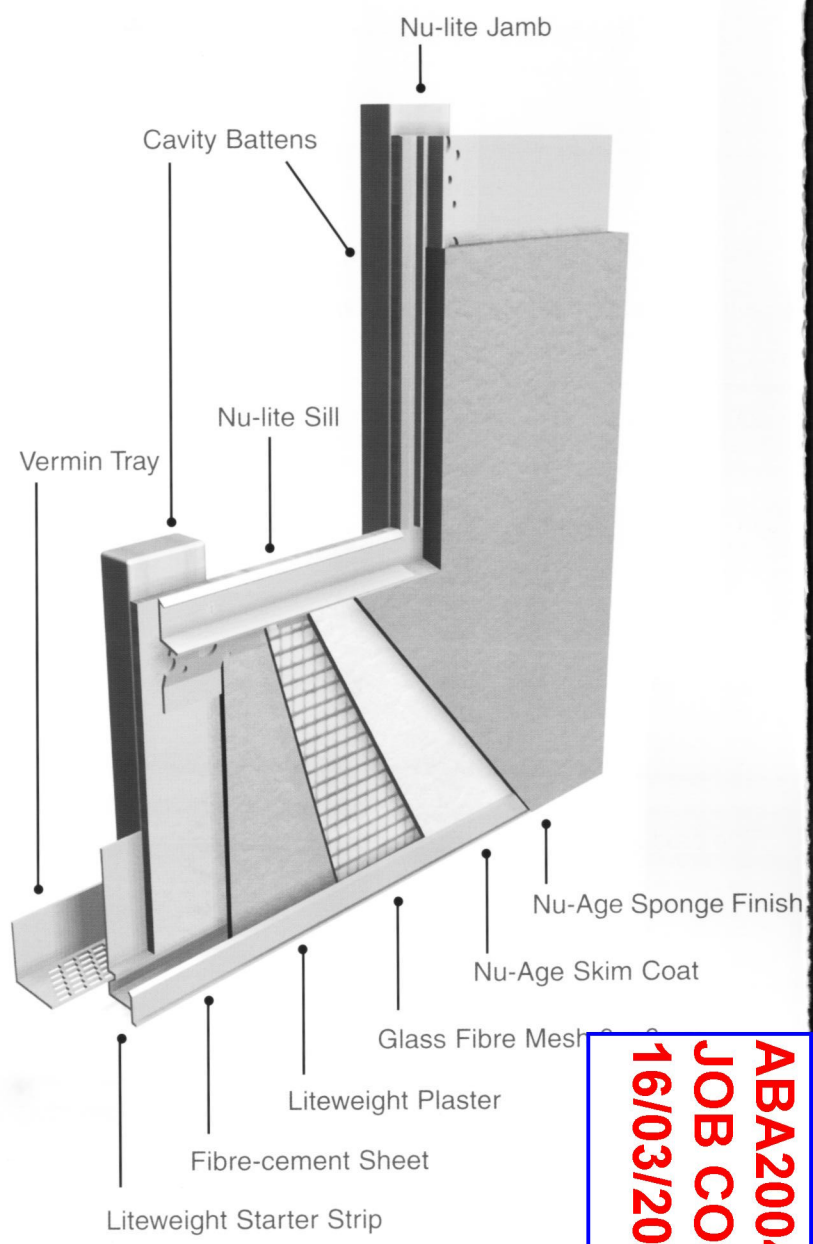


Nu-Age introduces Nu-lite

Innovation of construction methods and products highlight the ability of a company to adapt to the ever changing market requirements. Nu-Age prides itself as a company at the forefront of advancement in the field of proprietary cladding solutions for the construction industry. Working in conjunction with partner companies in Germany Nu-Age Plaster has developed a liteweight durable cladding solution ideal for New Zealand conditions.

Nu-Age Plaster has created a Cladding system which harnesses the light weight properties of expanded polystyrene with the 'tried and true' method of solid plaster and combines the two over a fibre cement substrate to provide a cost effective cladding solution. Nu-Lite utilises the strong solid characteristics of conventional methods with the enhanced versatility of sheet substrate installed over a nominal 20mm cavity creating a product which will out perform rival products in a multitude of applications.

Utilising compressed cement sheet as a substrate Nu-Lite adds not only aesthetic value but essential (BU's) bracing units to your buildings structural integrity.



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Appraised by BRANZ

Nu-lite can be specified with confidence in the knowledge that the system has been tested and scrutinised by New Zealand's leading professionals, scientists and technicians at BRANZ who have appraised the Nu-lite system.

For all these reasons and more the Nu-lite cladding system is the logical choice for your home, office or business to provide a tough, aesthetically pleasing weatherproof seal for your building.

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Top Quality Materials

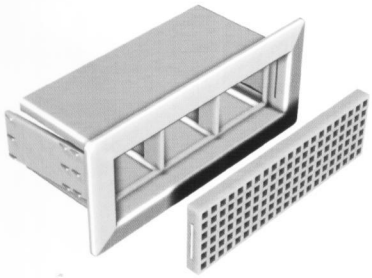
Nu-Age provides quality consistent product mixes every time enabled by our advanced weighing and batching plant. Top quality sand is sourced from a reputable pit, extracted and thoroughly washed, the sand is dried by Nu-Age Plaster allowing us to carefully control moisture levels.

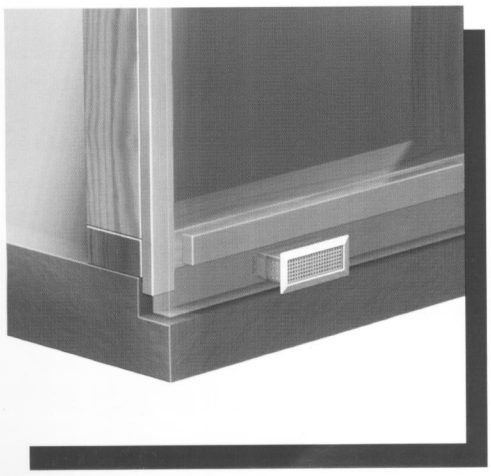
From this point the sand goes through the sieve process where any oversize particles are excluded to produce top quality sand of correct size.

Exact quantities of additives are individually weighed and combined to create precise mineral plaster recipes unique to Nu-Age Plaster.

The product is sealed in double skin 25kg bags to protect from external moisture sources and delivered to your site anywhere in New Zealand ready for application.

Utilising this pre-mixed plaster system ensures guaranteed consistent mixes every time, providing a superior cladding solution for your building.





The Revolutionary Nu-Vent

For those who prefer the look of clean same plane walls to ground level Nu-Age has developed the revolutionary Nu-Vent. Nu-Vent is an aesthetically pleasing solution to ventilate and drain cavity system claddings while providing a seamless wall plane to ground level. Complying with NZBC by allowing the cladding to terminate the required distance above ground level, draining and ventilating at that point, then continuing the wall plane with solid plastered floor slab edges, concrete blocks or other non-cavity based monolithic finishes.

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Quality product and quality components equals quality system.

All Nu-Age Plasters cladding system component range are manufactured from the best quality uPVC or Stainless steel, eliminating the risk of corrosion and resultant plaster damage at reinforcing areas. The majority of these are derived from European countries such as Germany, where building standards and requirements are higher than in New Zealand.





Lower building costs with time and labour savings

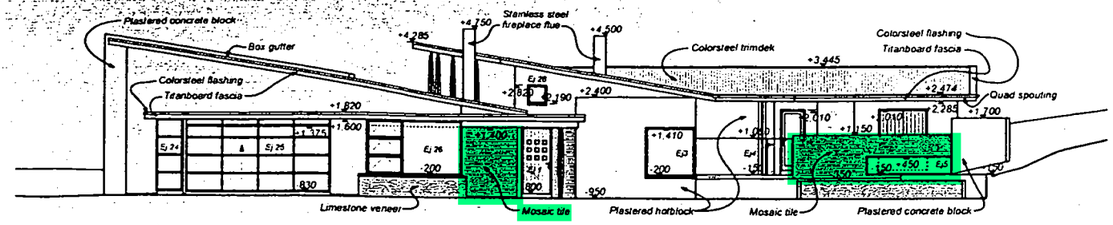
Nu-Age Plaster imports M-Tec plaster mixers and pumps to refine the application process even further. This machinery provides accurate water flow to the dry bagged plaster mixes, and pumps the plaster on to the wall in a fraction of the time it takes to trowel on the product. For example, a standard three bedroom home could take a gang of 4-6 plasterers 2-3 days to apply the base and mesh coats, whereas utilising an M-Tec mixing and pumping machine will take a team of 3 plasterers half a day to complete the same job with far superior application of the plaster. This results in lower building costs with time and labour savings.

We guarantee 'your peace of mind'

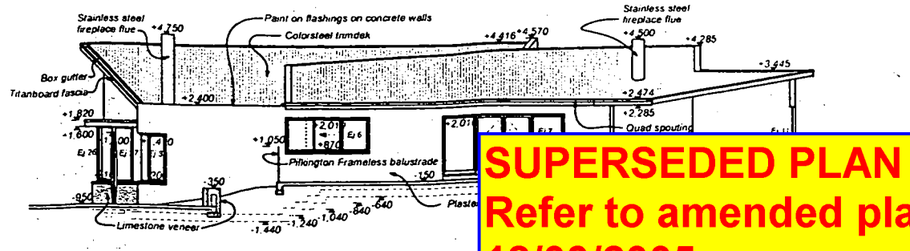
All of this collates to providing the best in plaster cladding solutions for your home, office or factory with results that can't be argued with. For the right choice in Plaster cladding solutions, trust Nu-Age Plaster and we'll guarantee 'your peace of mind'.



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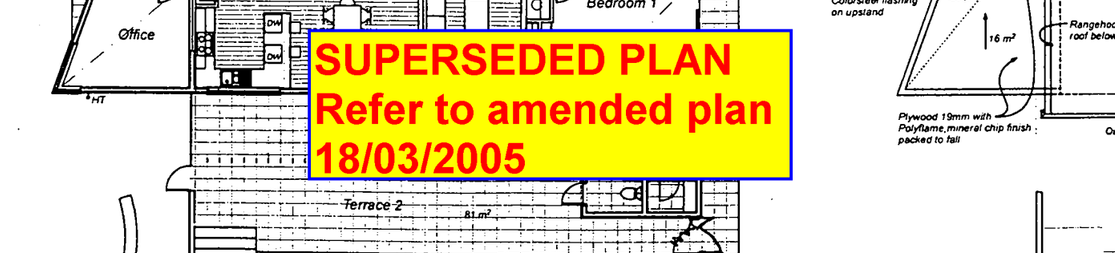
West elevation, scale 1:100



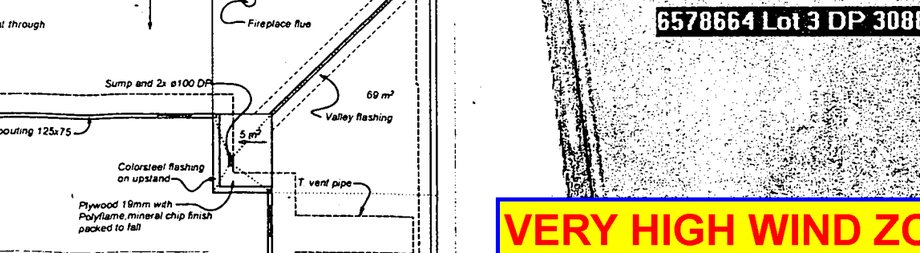
SUPERSEDED PLAN
Refer to amended plan
18/03/2005

Index:

1. Site, Floor plan, Elevations, Roof
2. Slabs and drainage
3. Site works plan
4. Ground floor framing plan
5. High walls framing plan
6. Sections a,b, c, d
7. Section e, Details
8. Joinery kitchen
9. Joinery bathroom 1, laundry
10. Joinery bathroom 2
11. Electrical plan

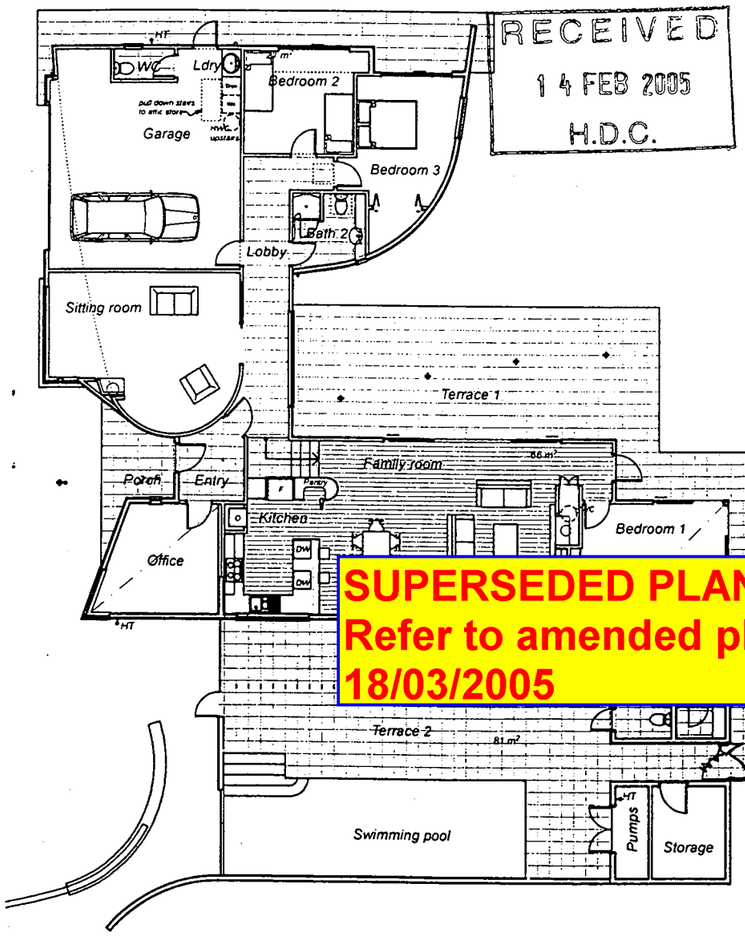


East elevation, scale 1:100



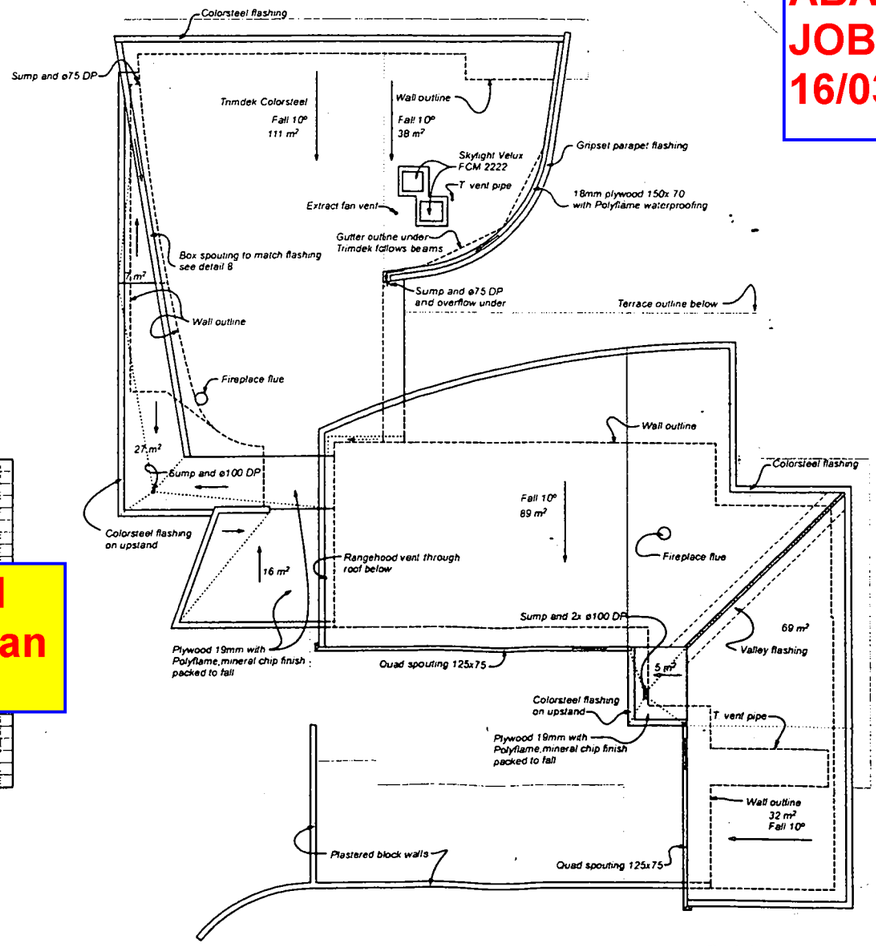
North elevation, scale 1:100

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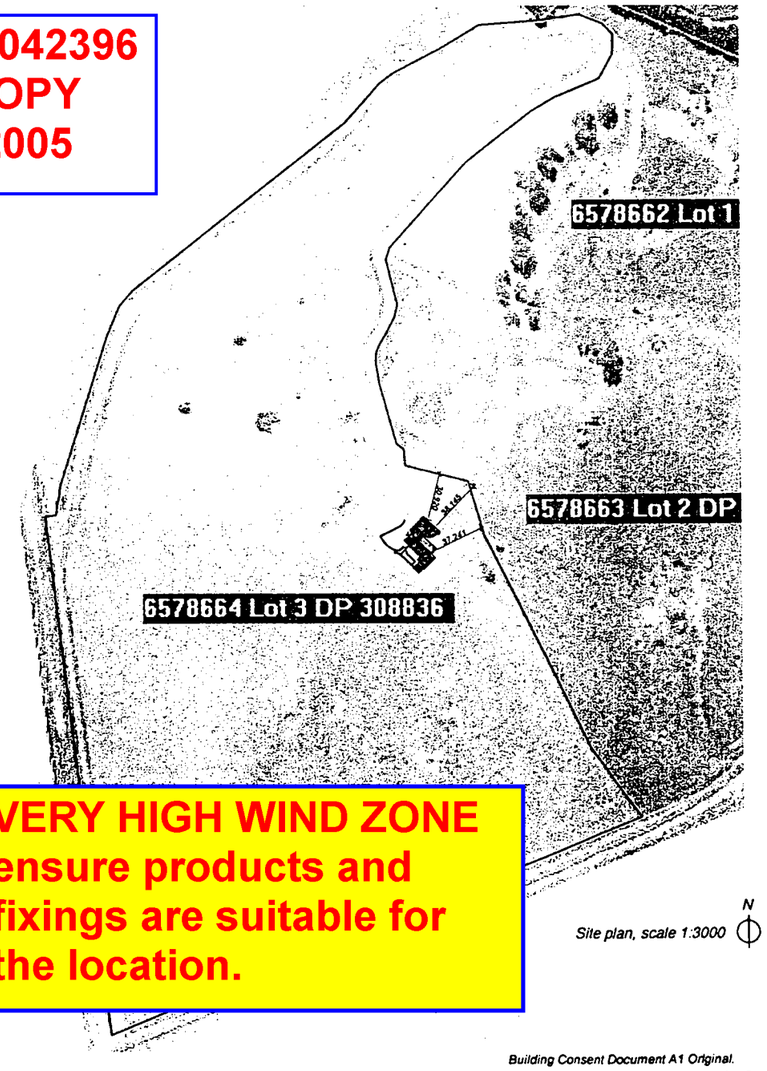


SUPERSEDED PLAN
Refer to amended plan
18/03/2005

Ground floor plan, scale 1:100



Roof plan, scale 1:100



Site plan, scale 1:3000

VERY HIGH WIND ZONE
ensure products and fixings are suitable for the location.

Building Consent Document A1 Original.

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The Contractor shall check and verify all dimensions on site.

House for Mr & Mrs Barnes
State Highway 50, Hastings district
Hawke's Bay

SHEET 1 OF 11
DATE 2/8/05
SCALE AS SHOWN
JOB A0417

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email ralford@xtra.co.nz

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SUPERSEDED PLAN
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Slab and drainage plan, scale 1:75

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SUPERSEDED PLAN
Refer to amended plan
18/03/2005

Existing channel
Storm water spreader
Effluent field
Concrete block retaining wall see eng. drawings
Limestone retaining wall overtopping concrete wall where shown
Fence by owner
Building area limit line
Garage
pull down stairs to attic above
HWC upstairs
WC
Ldry
Bedroom 2
Bedroom 3
Bath.2
Lobby
Sitting room
Porch
Entry
Office
Kitchen
Family room
Terrace 1
Bedroom 1
Dress. room
Bath.1
Terrace 2
Swimming pool
Pumps
Storage
Fall
Crown
HT
DW
Pantry
R 19.910
R 6.633
R 4.200
R 4.310
R 600
-950
5.200
13.120
6.840
5.683
5.337
42.500
43.000
43.500
44.000
44.500
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Site works plan scale 1:100

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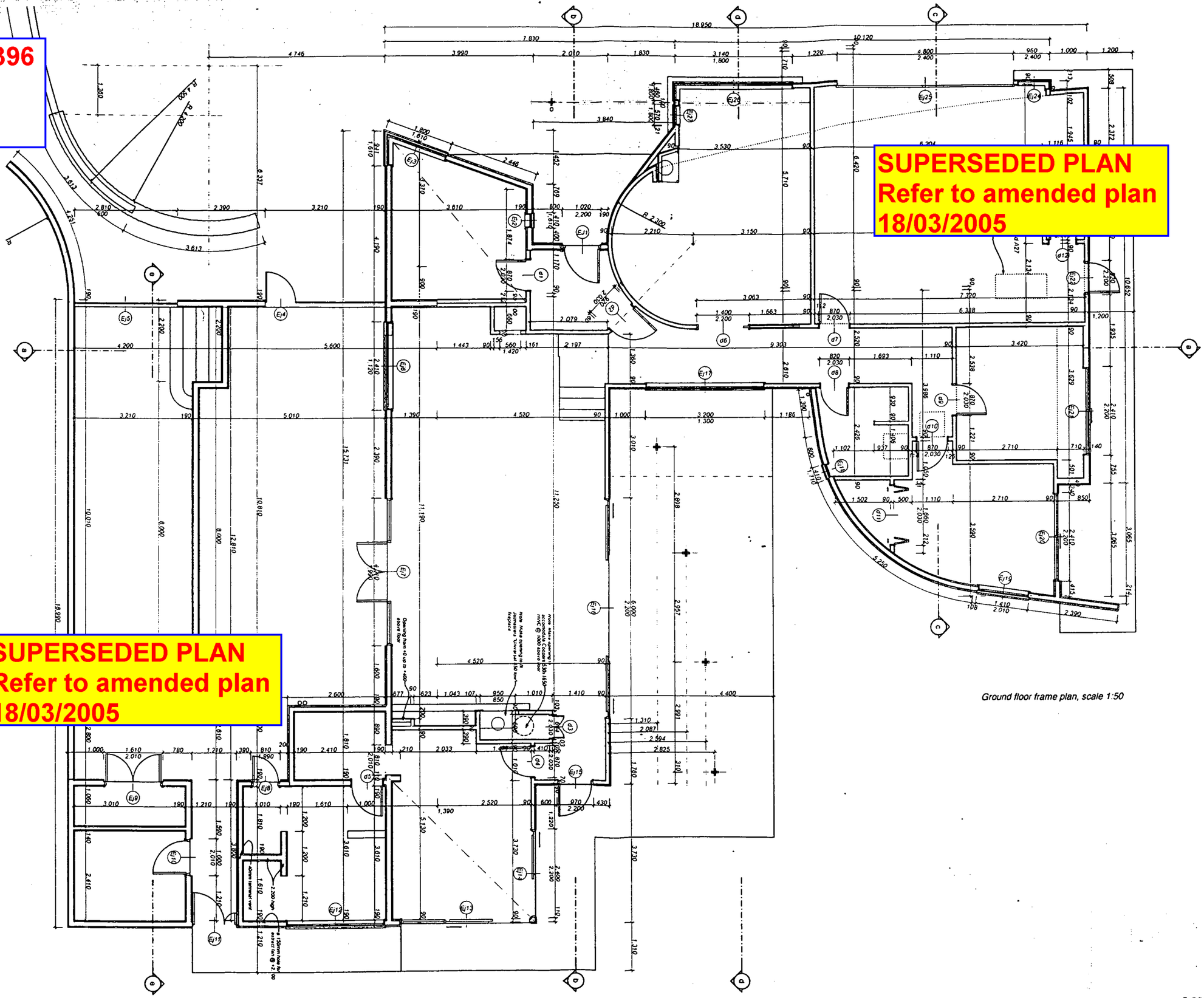
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Hawke's Bay

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DATE 2/8/05
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Ground floor frame plan, scale 1:50

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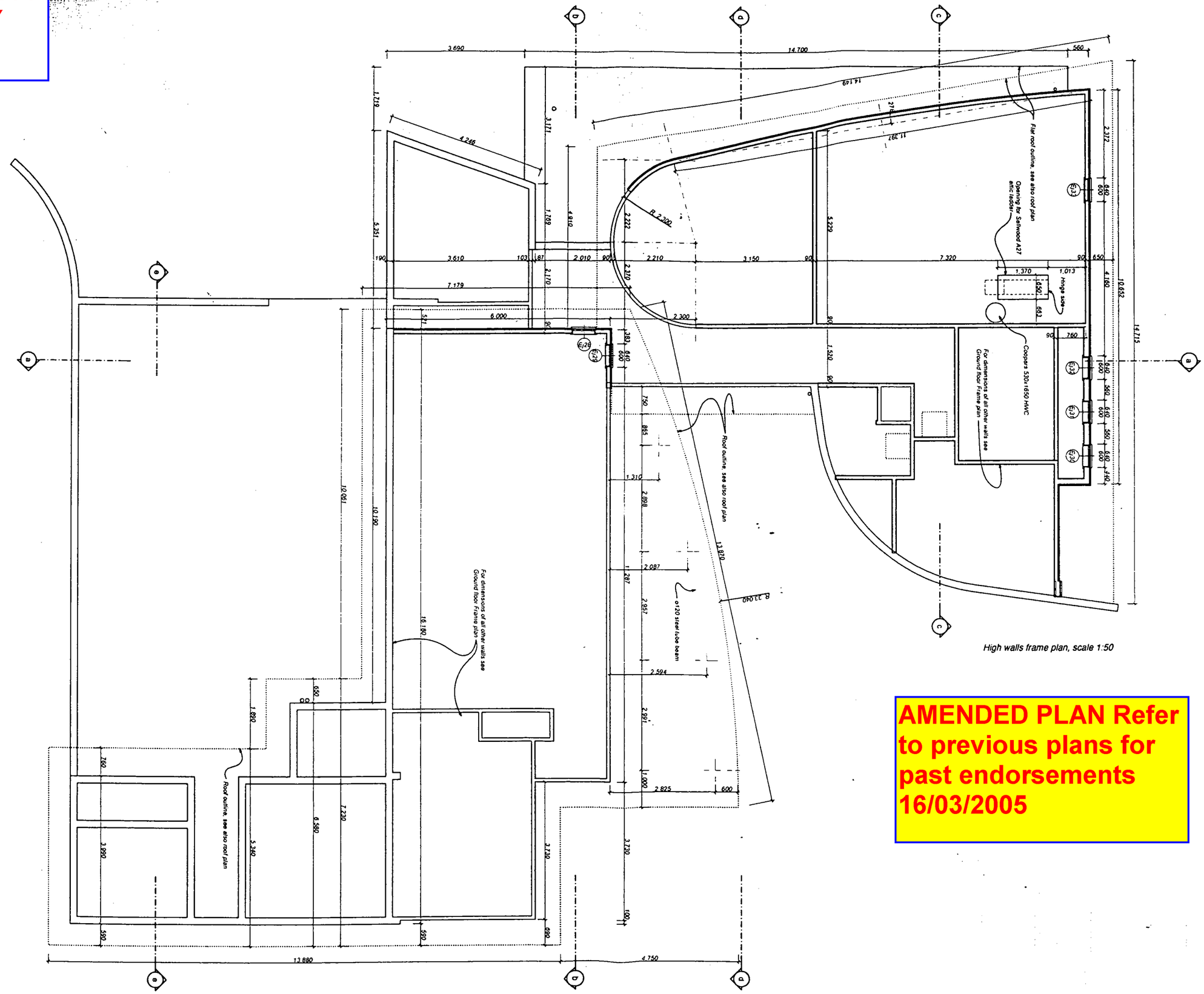
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House for Mr & Mrs Barnes
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Hawke's Bay

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High walls frame plan, scale 1:50

AMENDED PLAN Refer to previous plans for past endorsements 16/03/2005

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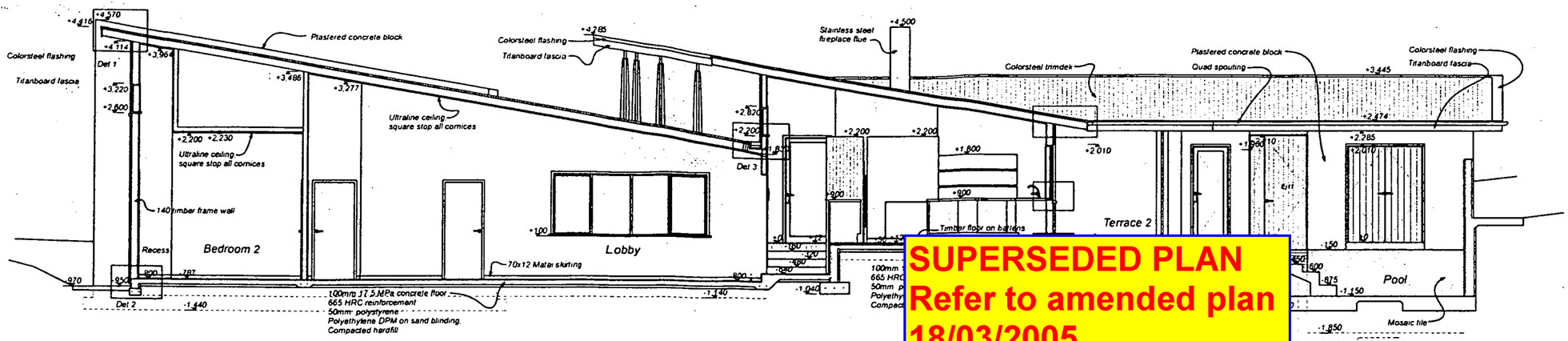
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House for Mr & Mrs Barnes
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Hawke's Bay

SHEET 5 OF 11
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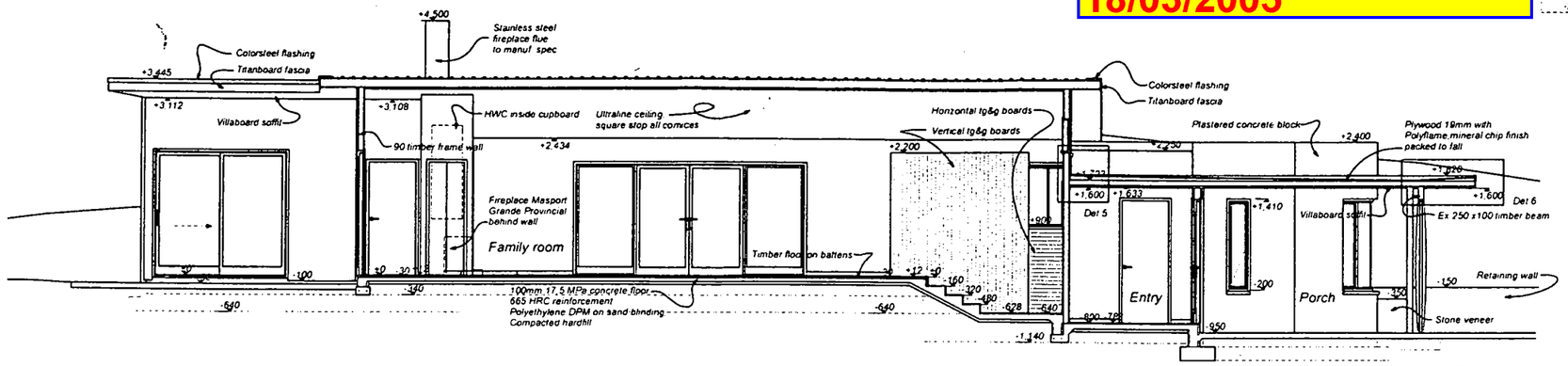
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Cell 64-025-491227
email ralford@xtra.co.nz

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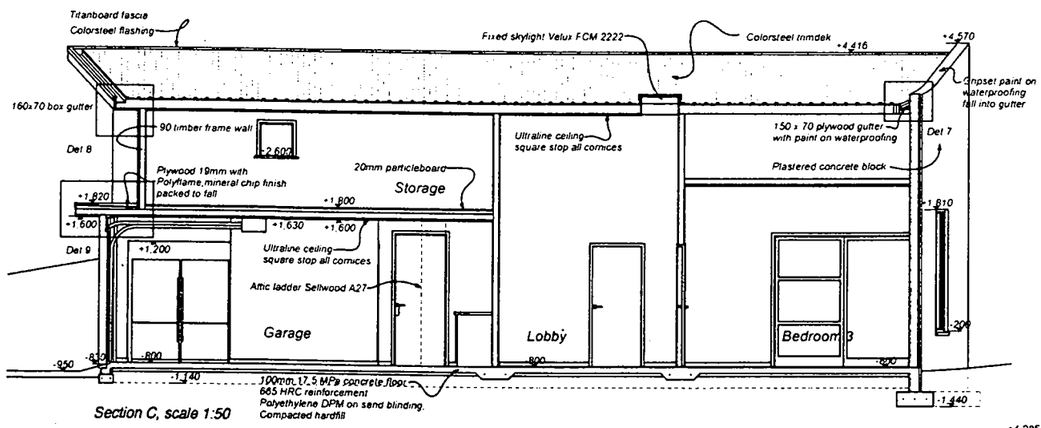


Section A, scale 1:50

SUPERSEDED PLAN
Refer to amended plan
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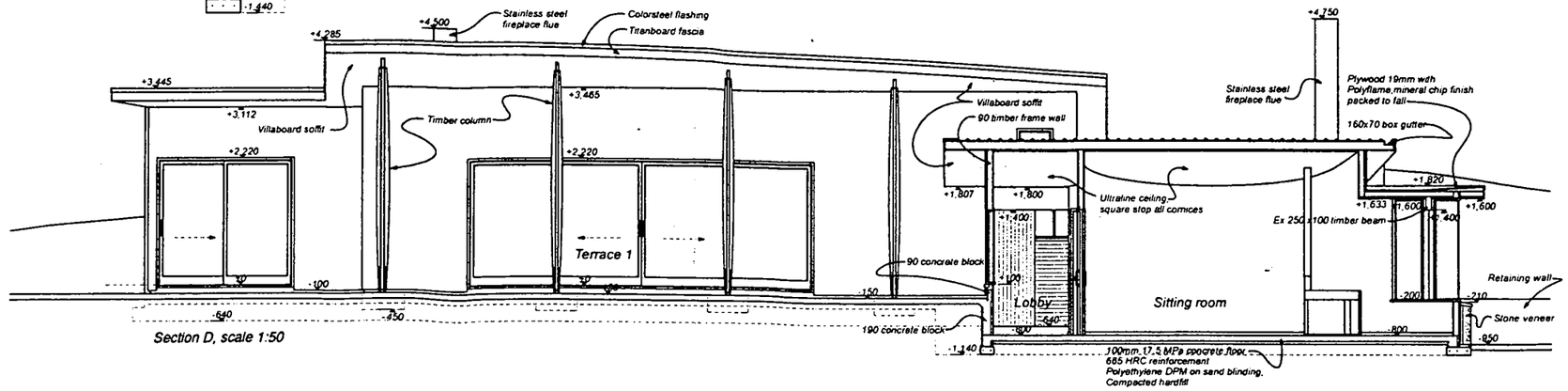


Section B, scale 1:50



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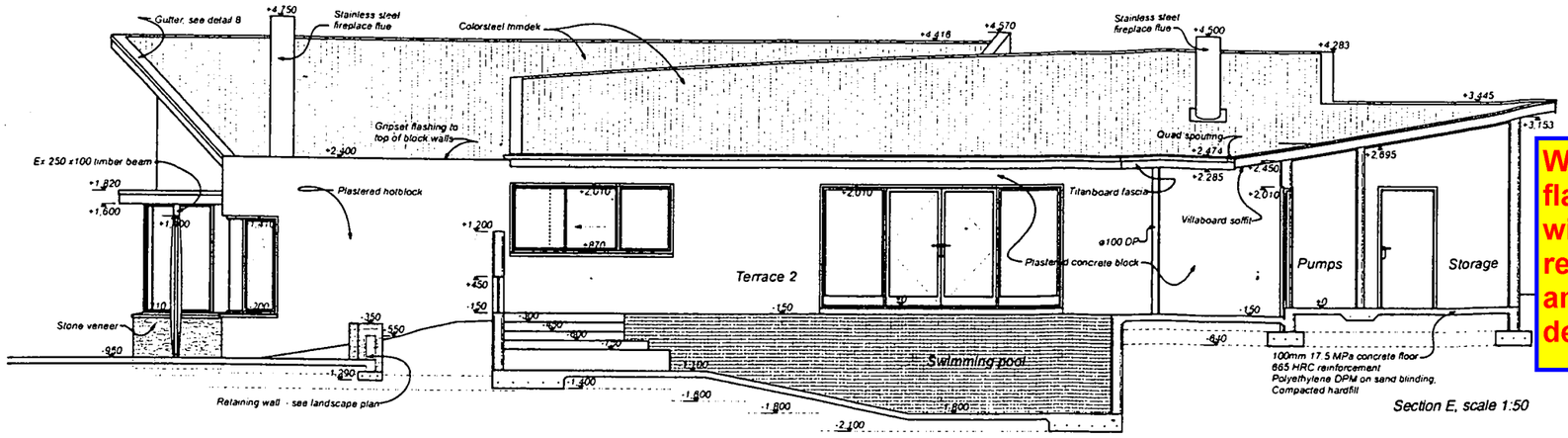
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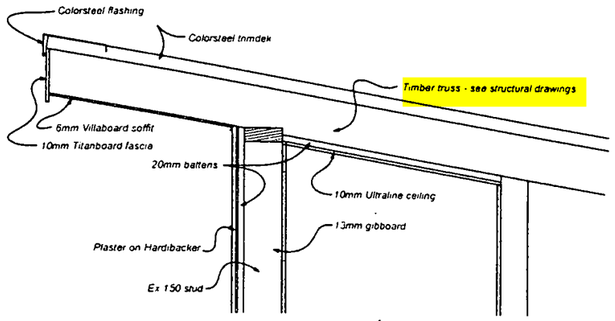
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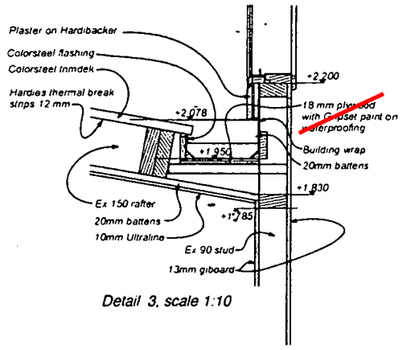


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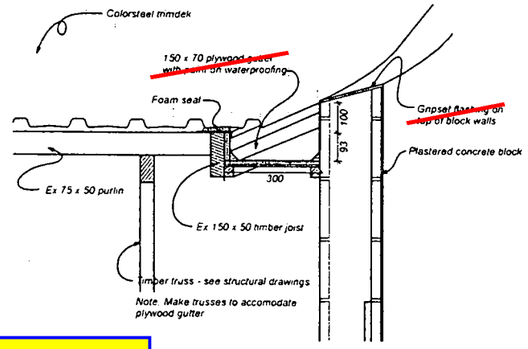
Window and door flashings to comply with E2 details with reference to WANZ and Hardibacker details also.



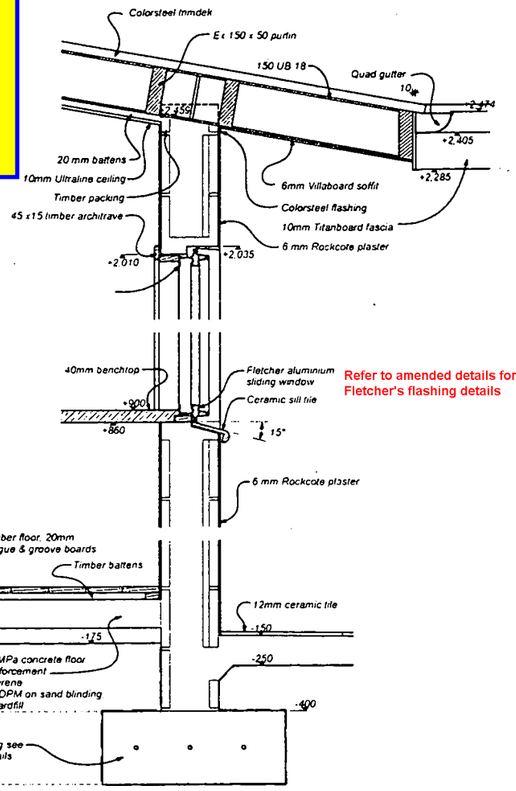
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Detail 3, scale 1:10

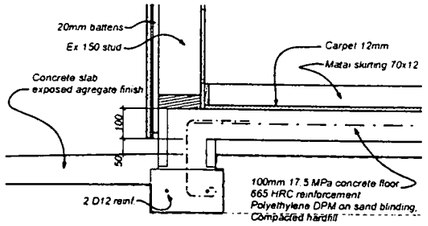


Detail 7, scale 1:10



Refer to amended details for Fletcher's flashing details

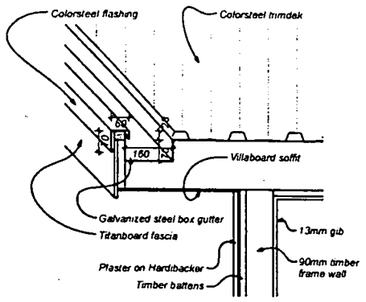
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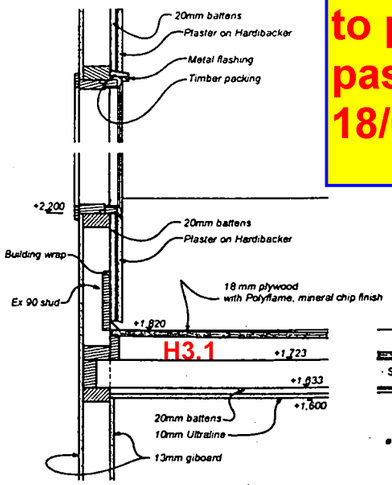
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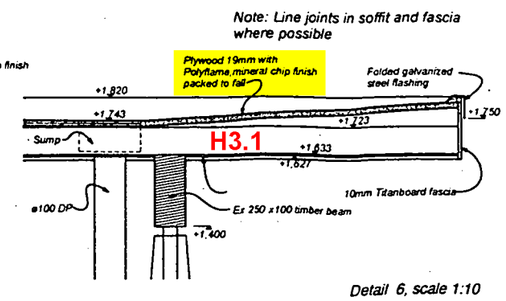
Refer to the engineering plans for foundation details



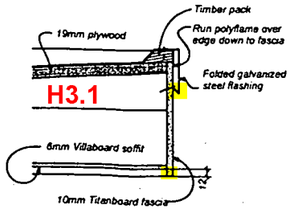
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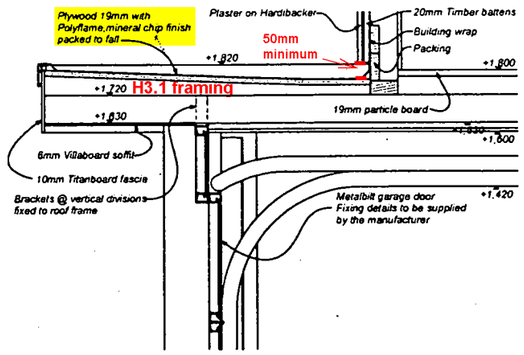


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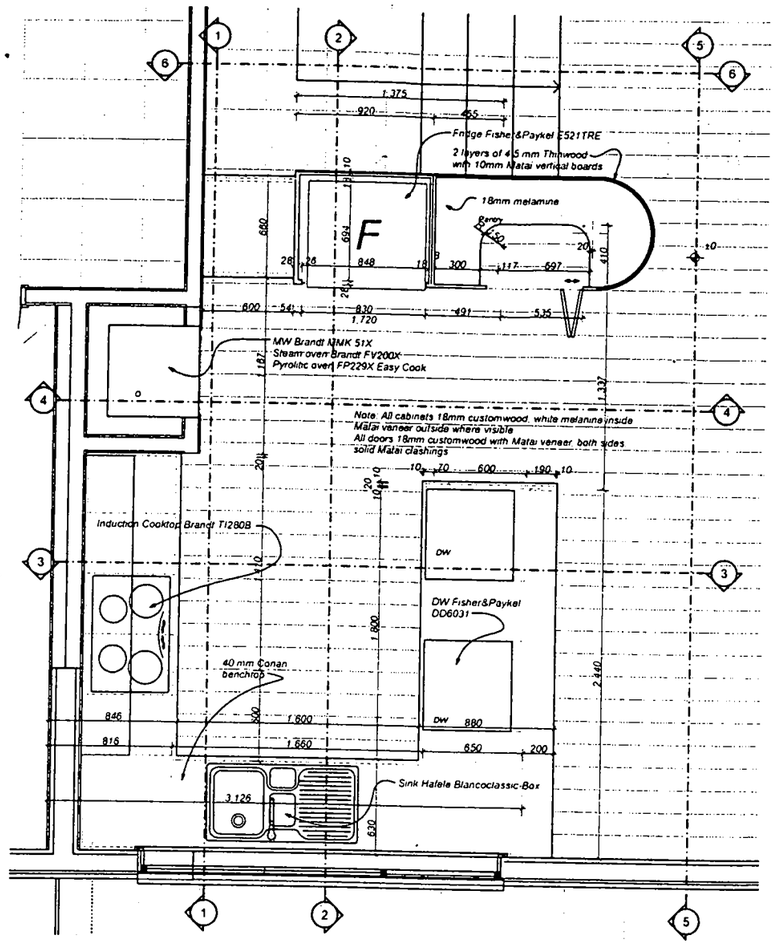
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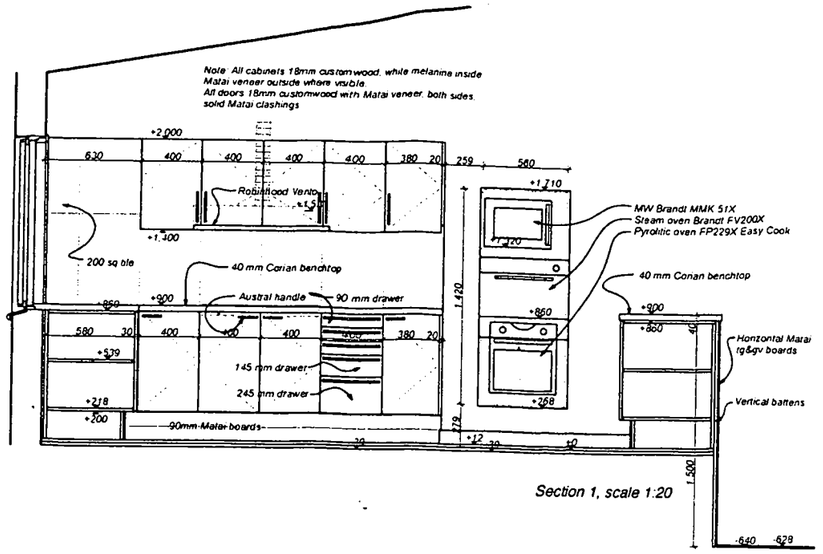


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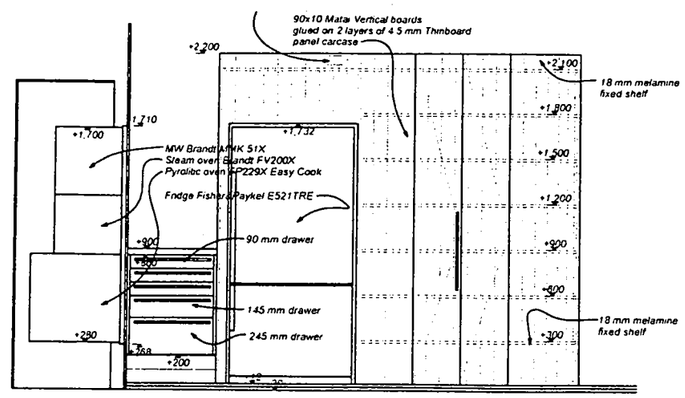
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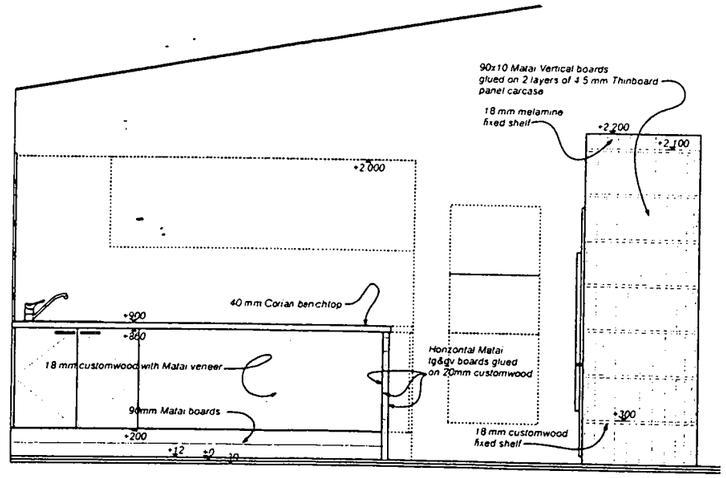
Kitchen joinery plan, scale 1:20



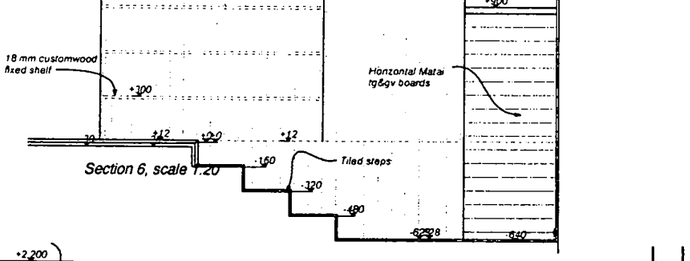
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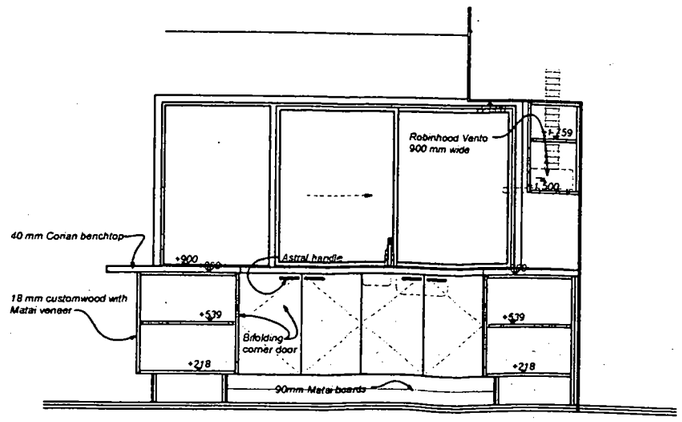
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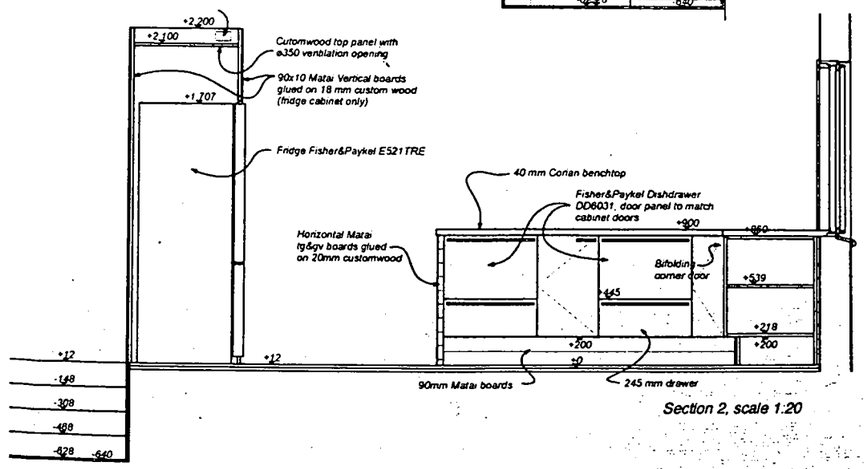
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Section 6, scale 1:20



Section 3, scale 1:20



Section 2, scale 1:20

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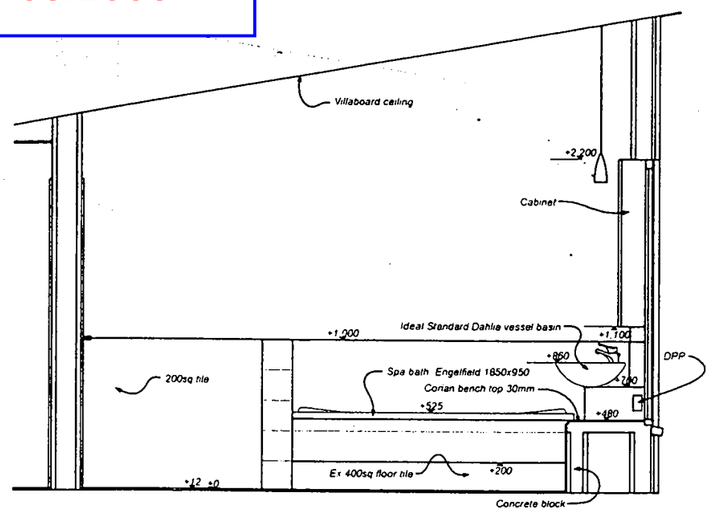
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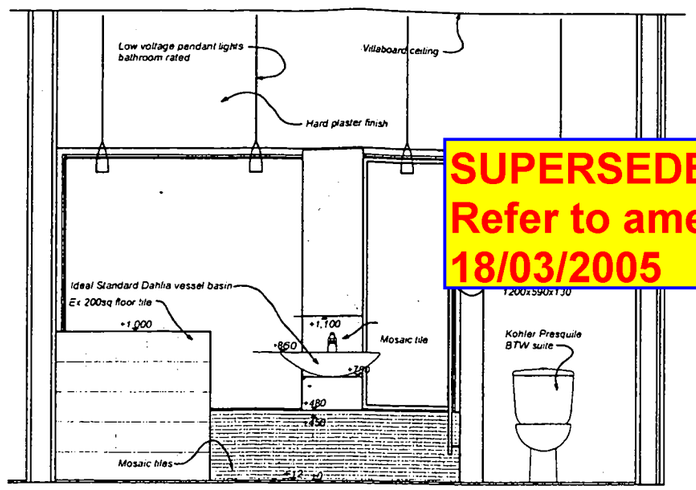
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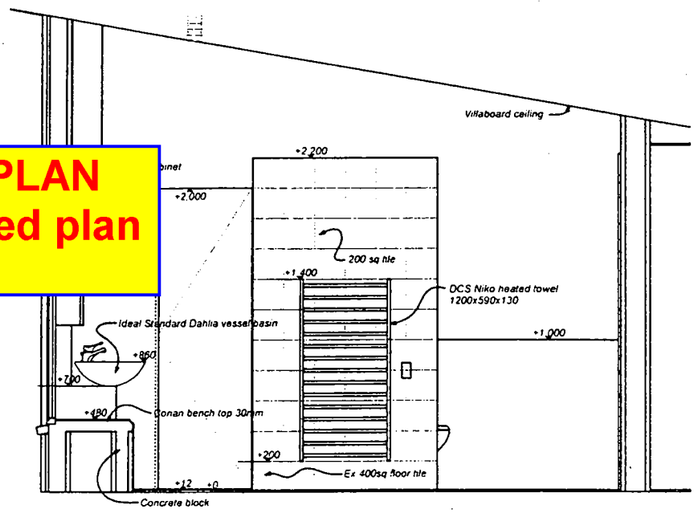


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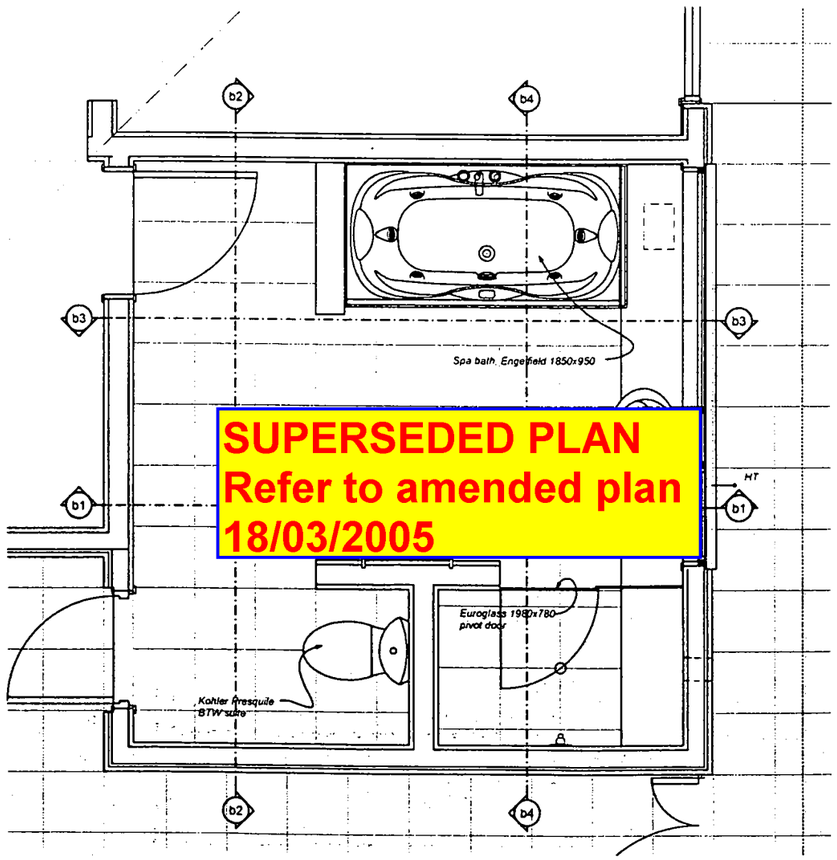


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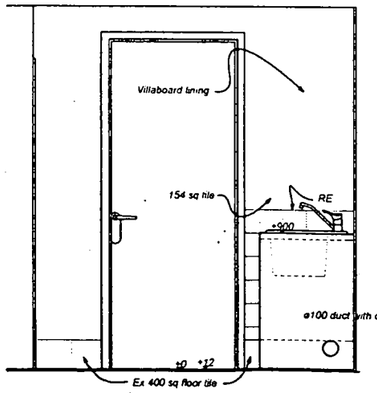


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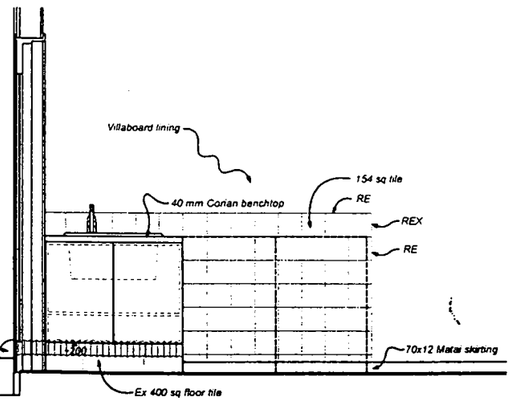


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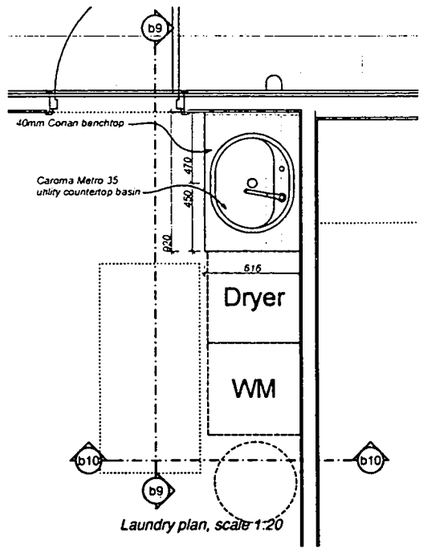
Bathroom 1 plan, scale 1:20



Section b10, scale 1:20



Section b9, scale 1:20



Laundry plan, scale 1:20

Note: Datum +0 for this drawing is actually at -800

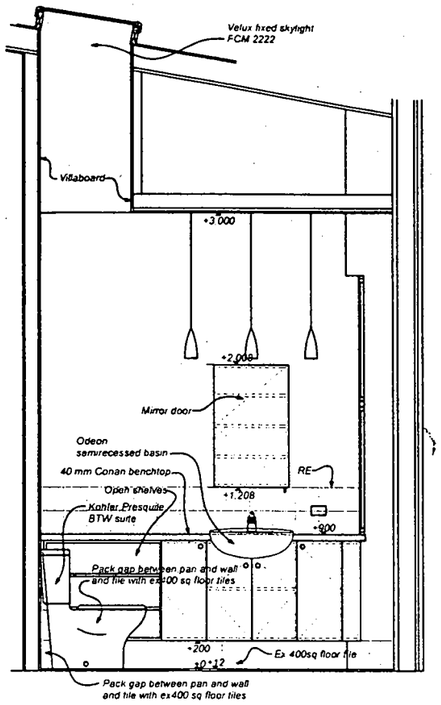
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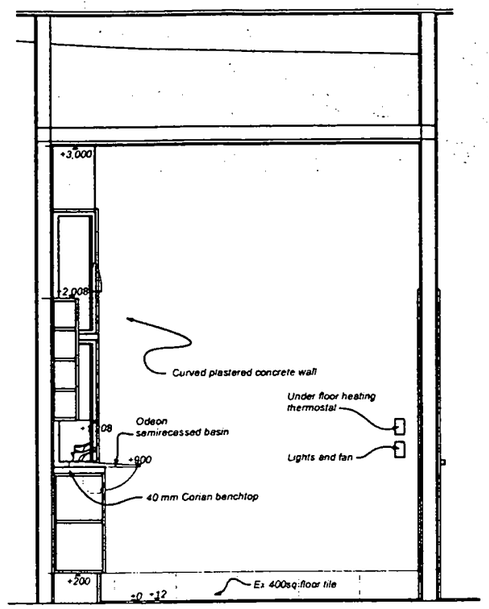
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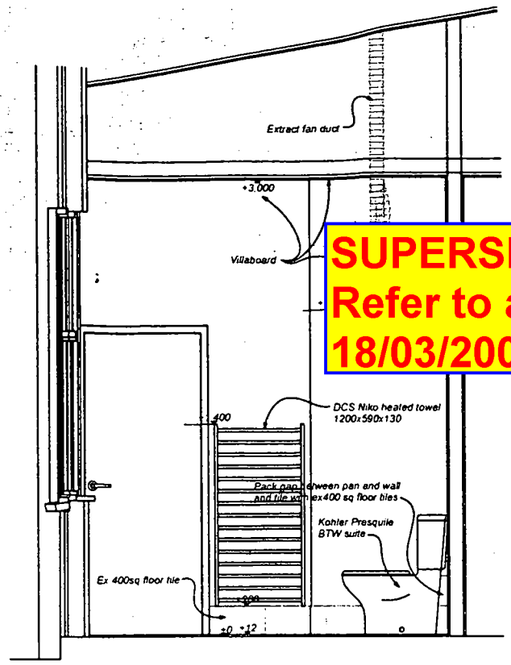
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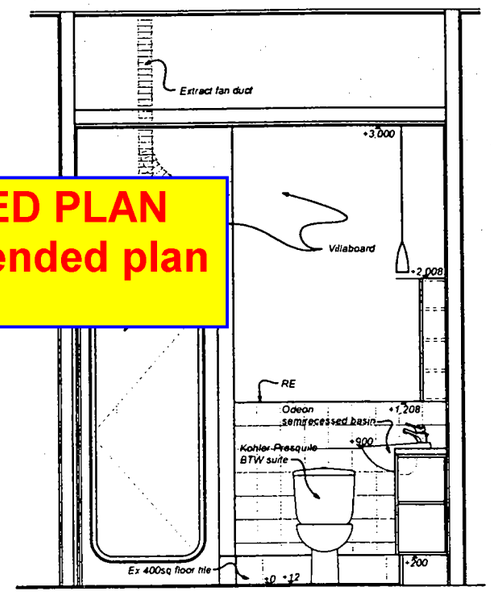
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Section b6, scale 1:20

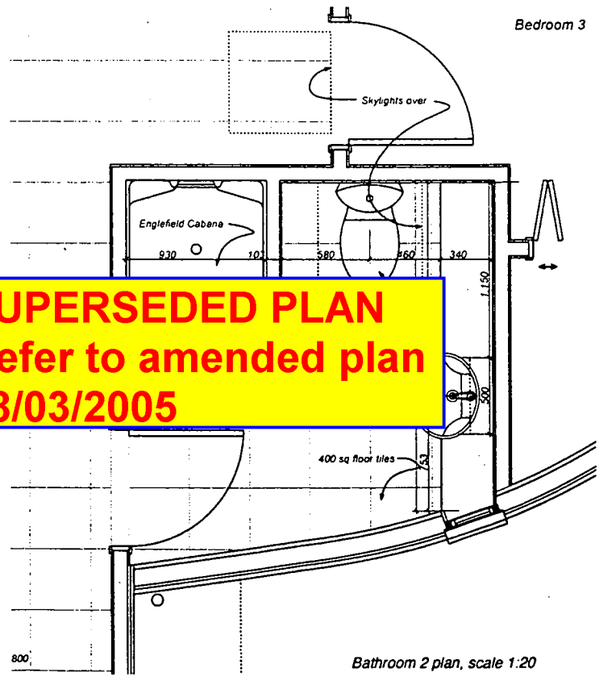


Section b7, scale 1:20



Section b8, scale 1:20

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Bathroom 2 plan, scale 1:20

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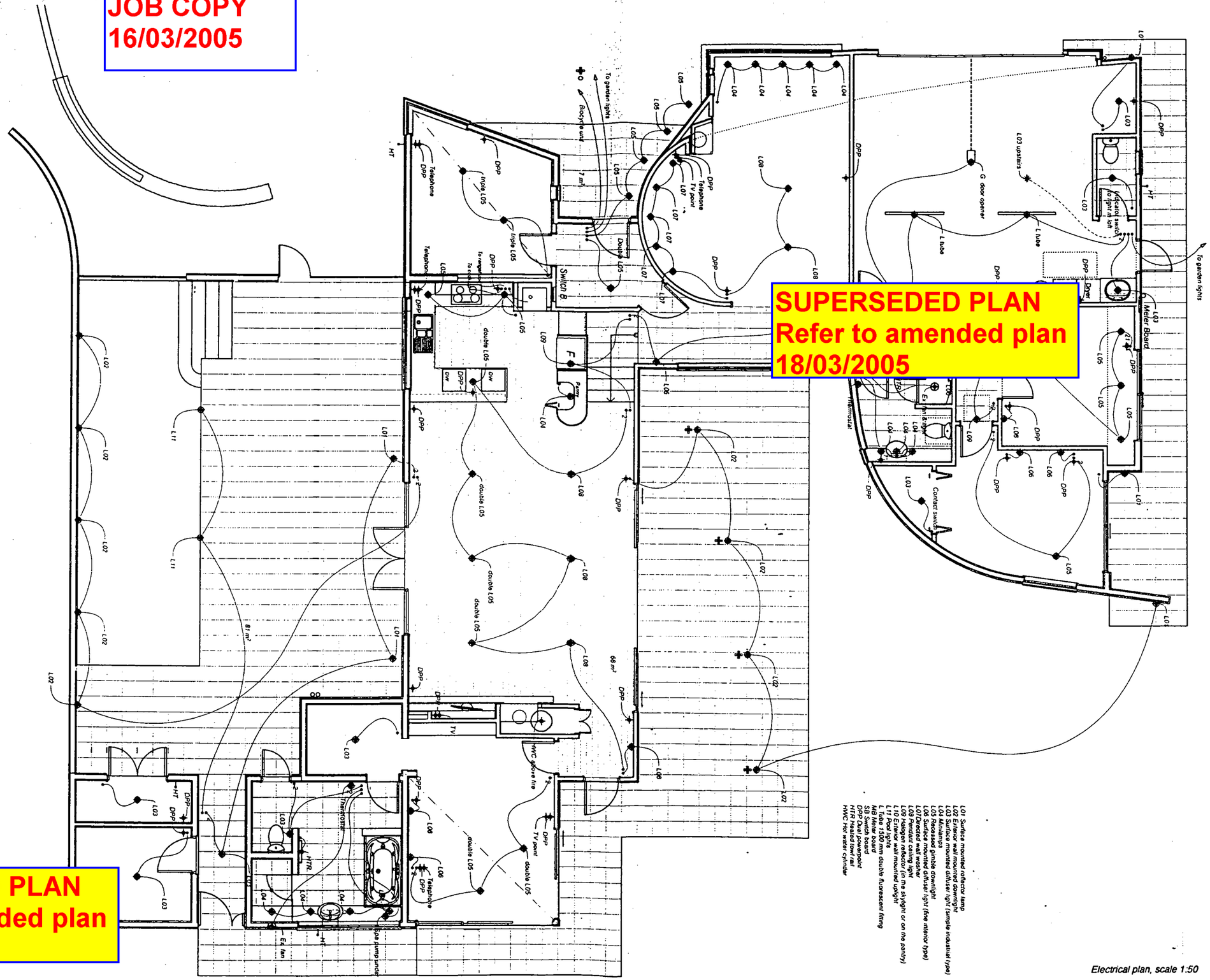
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Electrical plan, scale 1:50

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WANZ WIS™ (Window Installation System)

Stage 1 : Pre Cladding Trim Preparation

Contact: **Stewart Knowles**
Window Association of NZ (Inc)
P.O. Box 11-464
Manners Street
Wellington 6034

Disclaimer

Neither the Window Association of NZ (Inc), nor any of its members accept direct or consequential liability of any kind, howsoever arising, associated with the use, application or modification of the WANZ Window Installation System (WANZ WIS) described herein or any losses, costs or expenses associated therewith

The information and suggestions contained in this report and the accompanying independent BRANZ Opinion are offered in good faith, but independent product appraisals (such as BRANZ Appraisal Certificates) have not yet been published. The performance of the system will always be dependant upon the necessary care and trade skill of the on-site workers involved.

WANZ strongly endorses the BRANZ recommendation of the use of traditional sill trays in addition to the WANZ WIS.

WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

Date
18 Oct 02

Introduction

Why this report is prepared:

This is a report on the work undertaken by the WANZ Technical Committee to fundamentally improve the installation of windows. The project began in early 2001 and fortuitously coincided with a call from the Building Industry Authority (BIA), for all sectors of the New Zealand Building Industry to assist with addressing the current "leaking buildings" issue.

History

The New Zealand homeowners desire for new styles of construction, using new materials, in more demanding locations, at rock bottom prices makes huge demands on the entire NZ building industry.

Increasingly there are reports of buildings leaking and rotting. Although roofs, balconies, and cladding junctions are known to be the prime areas of concern, the Building Industry Authority has strongly urged all sectors of the NZ building industry to assist with addressing the issues. Attention to detail is vital for ensuring good weathertightness for buildings in New Zealand.

An overview of what WANZ has done:

There are two major aspects to weathertightness of windows:

1. The weathertightness of the window unit itself.

2. The weathertightness of the installation of the window into the building structure.

1. The weathertightness of the window itself is addressed by laboratory certification of window designs manufactured to NZS 4211, Performance Standards for Windows. WANZ rules require its members to label each window unit with a NZS 4211 compliance label that certifies that the window is designed and manufactured for the stated wind zone. These IANZ registered laboratory tests meet all the requirements of the NZ Building Code.

2. The weathertightness of the installation is reliant on the skill of the builder installing the window into the building. The building industry has relied on longstanding traditional methods of installation using flashings. BRANZ (Building Research Association of New Zealand) has published many flashing details over the years and these have always been widely available to the construction trades.

The problem is identified:

The WANZ Technical Committee noted that issues related to leaks around window installations were caused mainly by inadequate installation.

A major reason for builders not installing flashings, is the expense involved getting special flashings made, and the extra time it takes to install them in accordance with the best available trade practice. Often sealants are used as a substitute solution, but sealants have proven to be inadequate.

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The WANZ Project Brief:

The WANZ Technical Committee set about finding a quick and easy pre cladding window trim opening preparation method that would be applicable for all residential window and door installations regardless of wind zone.

Principles of water leakage

The wind and rain that is part of New Zealand's temperate climate mean that water can be blown on to almost any external surfaces of a building. In windy areas, water is often driven upwards.

Water leakage will occur when:

- There is water on the surface, and
- Water leakage paths are present, and
- Air pressure differences (airflow), gravity, capillary action or surface tension moves the water along the leakage path.

In this demanding environment, sound detailing is a necessary part of weathertightness. Sealant alone cannot guarantee the integrity of the building envelope.

Background work for this report included extensive simulated weather testing of joinery units in accredited industry test laboratories.

WANZ WIS Window Installation System: Stage 1 - Pre Cladding

New Direction for Weathertight Openings

One of the key recommendations arising from the industry tests is the incorporation of 'pressure equalization' principles in the installation of joinery units, especially in relation to the "trim" cavity that separates window units from the building structure. This interface has previously relied upon traditional methodology and detailing without further research. The tests associated with this report demonstrate the importance of this interface.

If a good air seal can be obtained between internal wall linings and the reveals of installed joinery units then a pressure equalized, ventilated trim cavity can be achieved around window and door frames. A pressure equalized ventilated trim cavity can resist water entry through the outer cladding/window interface and also allow for free drainage.

The practices outlined in this report chart a new direction in weathertightness. It moves away from the use of critical external face seals to an emphasis on an effective internal air seal creating a pressure equalized trim cavity, and a simpler system of providing trim cavity moisture barriers.

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Summary of New Direction

The system is designed as a back up or secondary line of defence to the primary weathering detail recommended or specified by the cladding manufacturer or building designer.

Testing has been carried out to in excess of the very high wind zone requirements, of the code, with no primary external weather seals. Test reports are available on request from your local window fabricator/proprietary window systems supplier.

The attached BRANZ opinion reports on their testing of this WANZ WIS, Stage 1, Pre-cladding trim preparation. The BRANZ opinion determines a number of issues related to the WNZ WIS and the performance characteristics of the WANZ WIS components.

This system will be suitable for buildings designed and constructed in accordance to NZS 3604.

Key Components of the System

- Building wrap.
- Flexible sill flashing.
- Head flashing.
- Pressure equalization of trim cavity between window and framing.
- External gap between aluminium frame sill and cladding.
- Internal air seal.

Explanation of the Components

Building Wrap
- Revised method of cutting preparing and fixing building wrap around window and door openings.
- Wrapped around into framed opening providing moisture barrier to framing

Flexible Sill Flashing
- Continuous Flexible sill flashing used in lieu of rigid (traditional) flashings.
- Provides moisture barrier to trim cavity framing trimmer.
- No stop ends or joints required.
- Allows for considerable expansion and contraction.
- Quick installation, less labour to apply.

Head Flashing
- Revised method of installation of head flashings.
- Head flashing applied to face of wrap and over flashed with approved tape.
- Problems encountered with existing traditional method of fitting head flashings under wrap.

Pressure Equalization
- Equalising the trim cavity pressure to external pressure prevents water crossing the cladding/window interface. Water will not easily travel across equal pressure zones.
- Less reliance on primary external seal.

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External Air gap

- 5mm gap required between back of joinery facing and cladding (window stands off cladding 5mm).
- Air gap mandatory at sill, at jambs must be sealed.
- Provides air feed to pressure equalise trim cavity.

Internal Air Seal

- Air seal required to trim gap between joinery reveal and framing, back at the internal edge of framing line.
- Air seal is important to hold pressure in trim cavity and enable pressure equalization to be achieved.
- Air seal must be complete and without gaps ensuring that any imperfections in the fitting of the building wrap over the trimmers (i.e. wrinkles, folds etc.) are sealed. This ensure folds do not act as conduits for water penetration.
- The trim gap must be a minimum of 5mm.

Proposed Installation Steps

This report contains installation instructions for the WANZ Window Installation System, Stage 1. Pre Cladding, Refer steps 1 to 8 in the installation guide. Please refer to the BRANZ opinion for definitions of "suitable" components.

A brief explanation.

1. Building Wrap Preparation
   A suitable building wrap is applied, as standard, to all walls. At window and door openings it is cut and folded back around the framing on all four sides and stapled in place.

2. Flexible Sill Flashing
   A strip of suitable sill flashing tape is then applied to the sill trimmer over the top of the building wrap and is folded up each jamb to a minimum height of 200mm.

3. Upper Corners
   Apply short strips of a suitable flexible flashing tape to exposed timber at upper corners.

4. Proprietary Flashings
   Fit any proprietary cladding systems flashing components that require fitting before window installation. BRANZ state that this flashing, if on top of the sill trimmer, will need to be sloped.

5. Window Installation
   Fit window to opening on 5mm spacers on top of flexible flashing at sill, to maintain a reasonable sealable gap for the air seal. Maintain a 5mm gap between back of frame facing and cladding outer surface. (Window stands 5mm off the cladding face). This gap must be sealed or filled at jambs, but a **5mm GAP MUST REMAIN OPEN AT SILL.**

6. Air Seal
   A suitable expandable foam air seal is applied on the inside between the joinery units reveal and wrapped timber framing around the full perimeter of the unit. The trim gap for the air seal must be a minimum of 5mm.

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7. Head Flashing
   Face fit the head flashing above the window to the building wrap. The top edge of the flashing is fixed and sealed by taping to the wrap with a suitable tape. **DO NOT** cut the wrap.
   NB. The flashing is fitted **over** the building wrap rather than cut in and under it.
   Add an additional piece of building wrap over the top of the flashing to complete the weathering of this detail.

8. Cladding
   The cladding and its associated flashings if required are then applied around the joinery unit to cladding manufacturers recommendations

Where to from here

This report is for the purpose of preparing a bare trim opening to receive a window or door unit and providing a means of achieving near pressure equalisation of the trim opening to resist water ingress.
Flashings, proprietary or otherwise, may need to be applied to the WANZ WIS prepared opening. This shall be in accordance to the cladding manufacturers recommendations.

This part 1. Pre cladding report will be followed by;
Part 2. Cladding Details.
Part 3. Installation and training program.

BRANZ are developing an appraisal system for the components of WANZ WIS for product suppliers to achieve compliance.

The outcome of the BRANZ work will enable component suppliers of wrap, sill tape, air seals etc to obtain a BRANZ appraisal on the products they supply and thus may be accepted by Territorial Authorities as an Alternative Solution.

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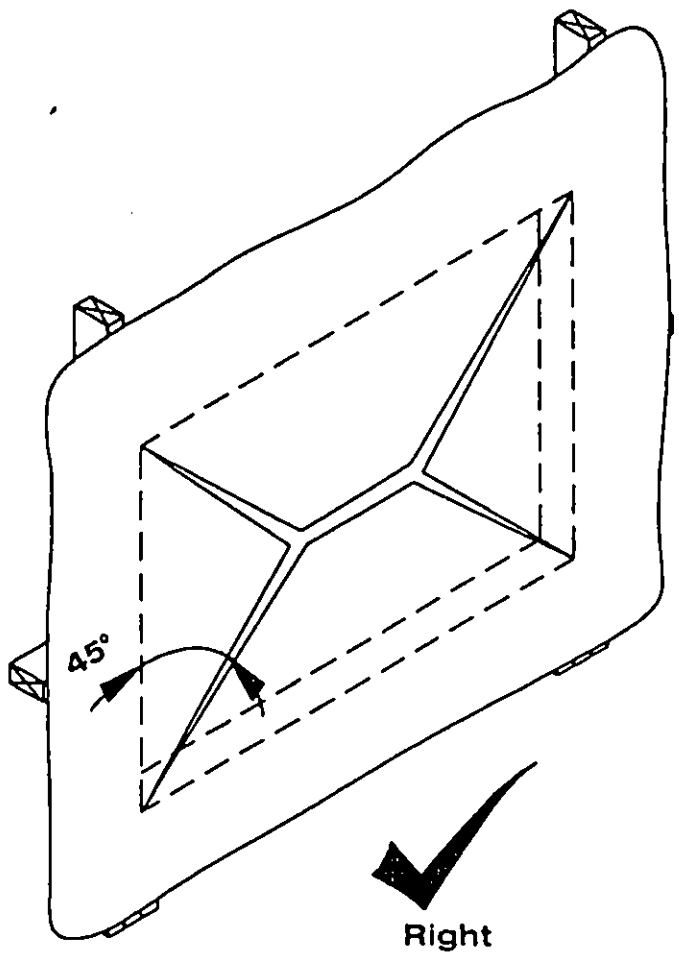
WANZ WIS (WINDOW INSTALLATION SYSTEM)

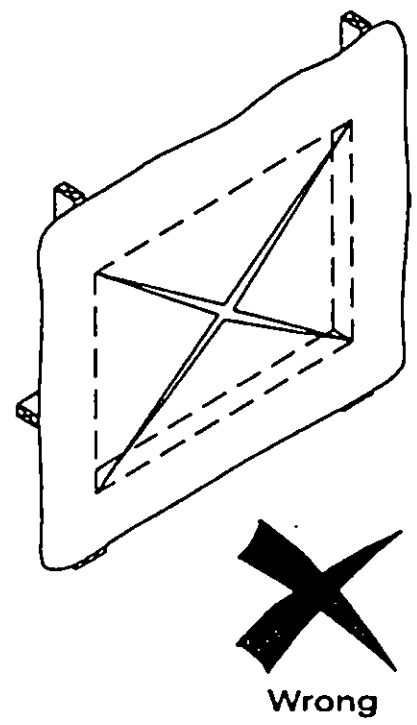
Stage 1 - Pre Cladding Trim Preparation

Installation Step No. 1 - Building Wrap Preparation

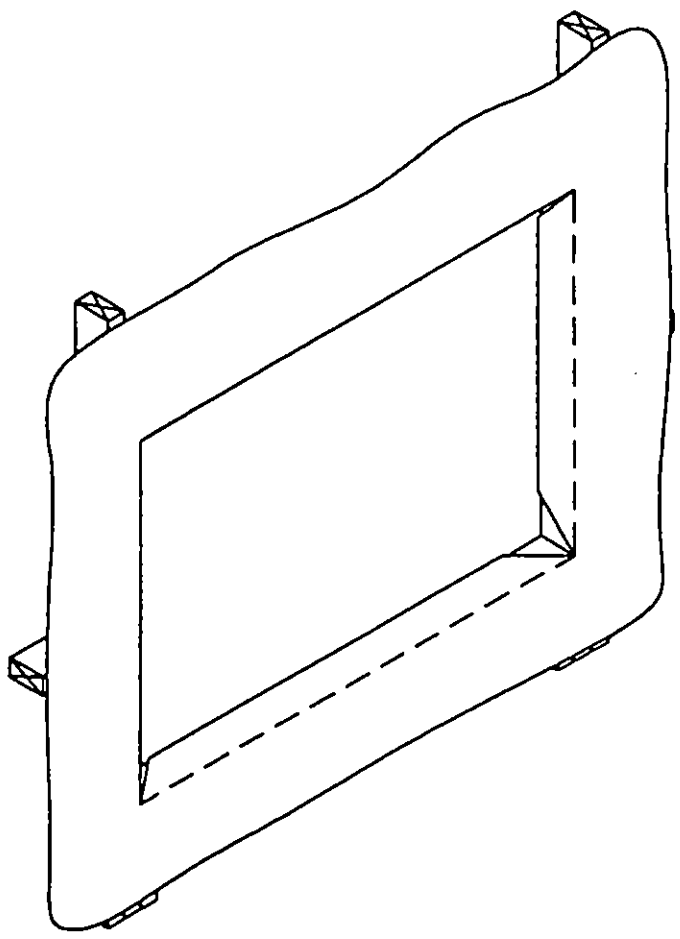
Date
18 Oct 02

Scale
NTS



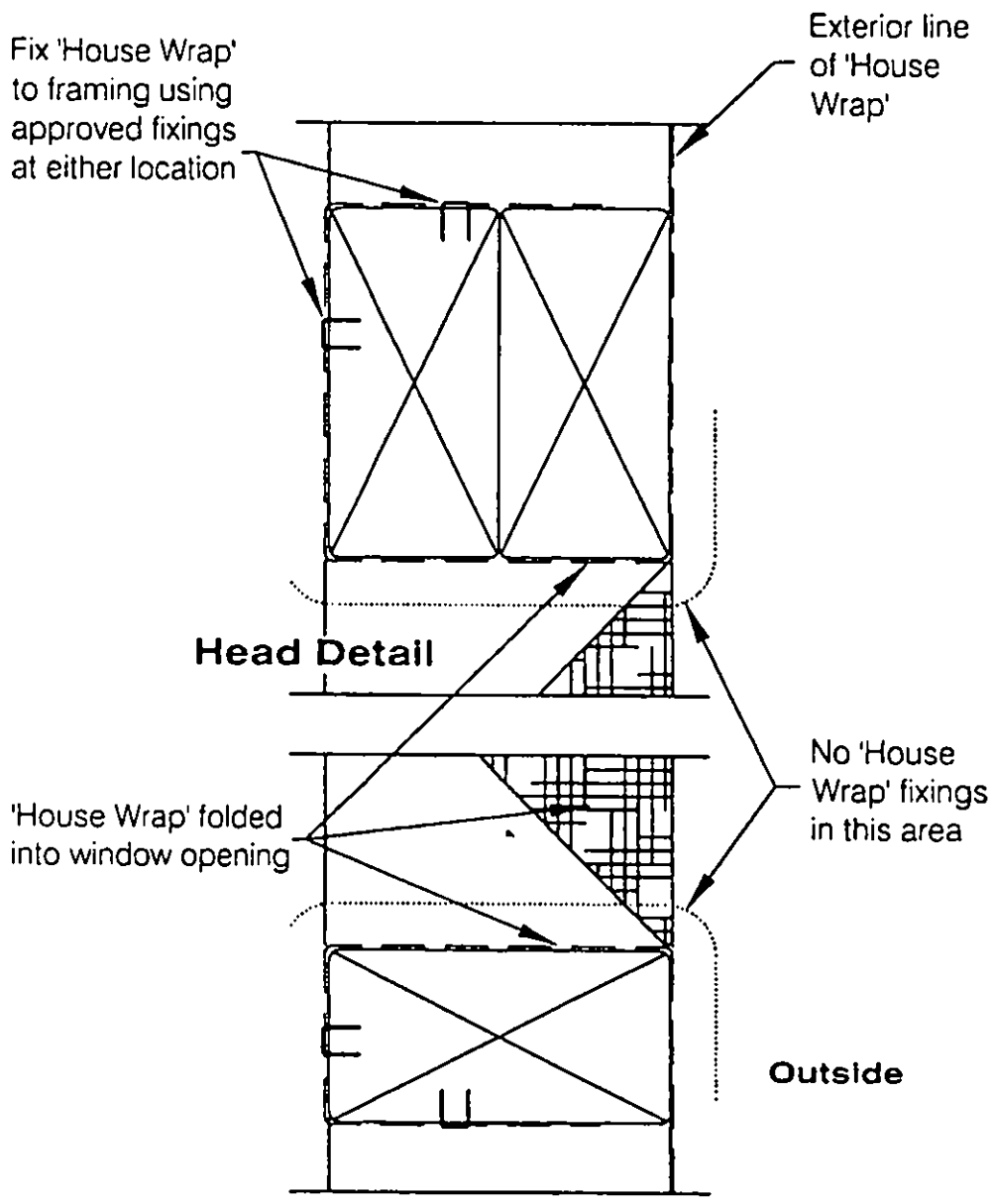


6.1 Cut 'House Wrap' at 45° away from each corner



6.2 Fold flaps into opening and secure on all sides

6.3 Trim off excess after fixing



Sill Detail - Jamb Similar

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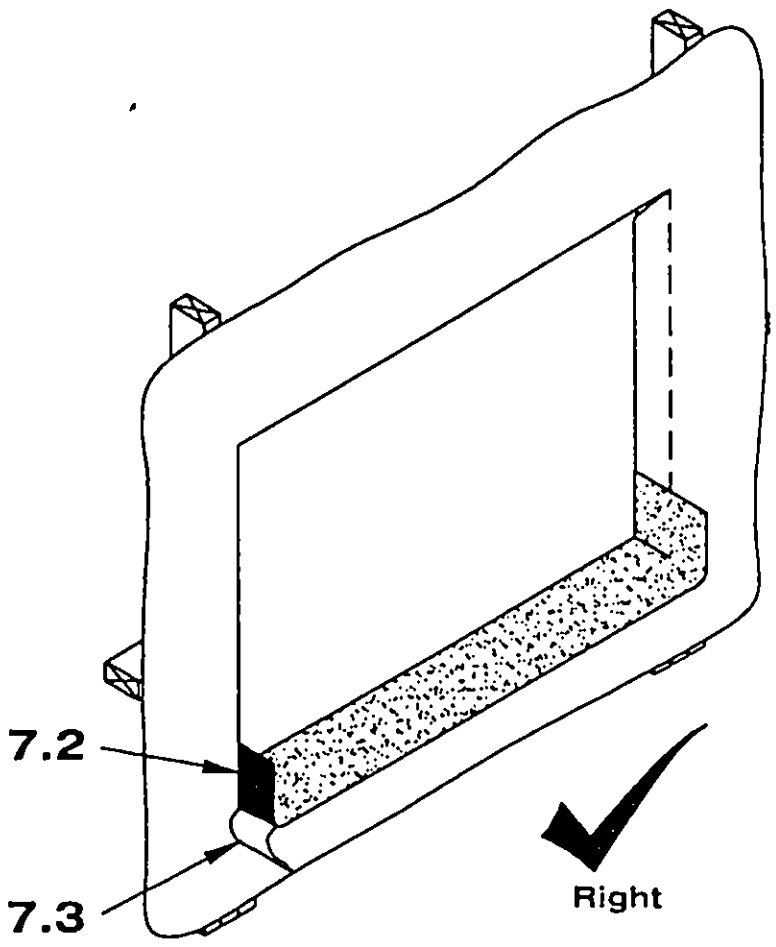
WANZ WIS (WINDOW INSTALLATION SYSTEM)

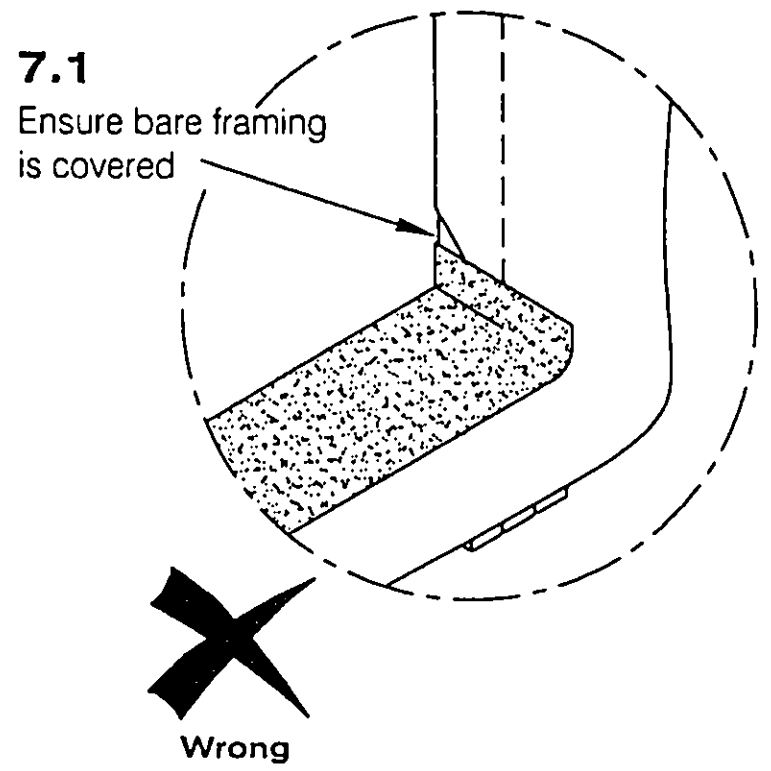
Stage 1 - Pre Cladding Trim Preparation

Installation Step No. 2 - Flexible Sill Flashing

Date
18 Oct 02

Scale
NTS

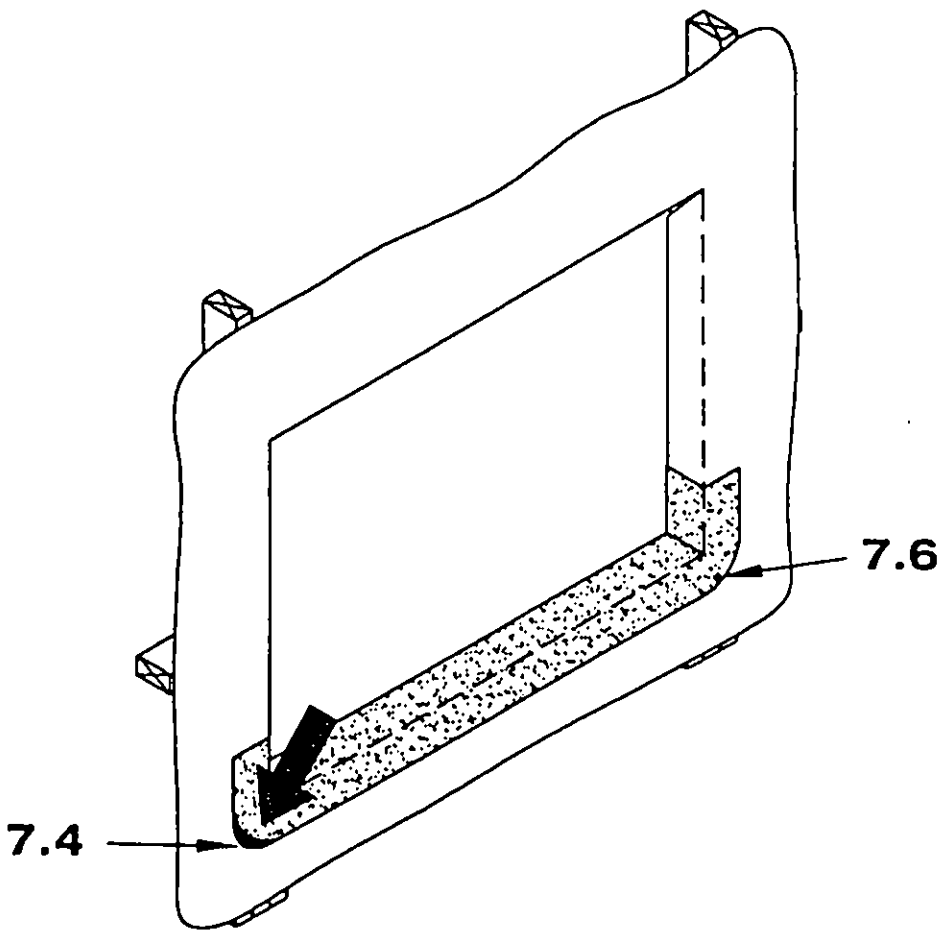




7.1 Cut sill flashing tape at least 400mm longer than the opening width, to ensure bare framing is covered.

7.2 Remove first piece of release paper, align edge of sill flashing tape with inside edge of sill, and adhere into opening across sill and up each jamb (min. 200mm).
Note - Sill flashing should not wrap onto the interior surface of the framing.

7.3 Remove second release paper.



7.4 Fan sill flashing tape at bottom corners onto face of house wrap.

7.5 Firmly press sill flashing tape onto all surfaces to ensure full adhesion.

7.6 Secure edges of bottom corners with a clout through the flashing tape into the stud.

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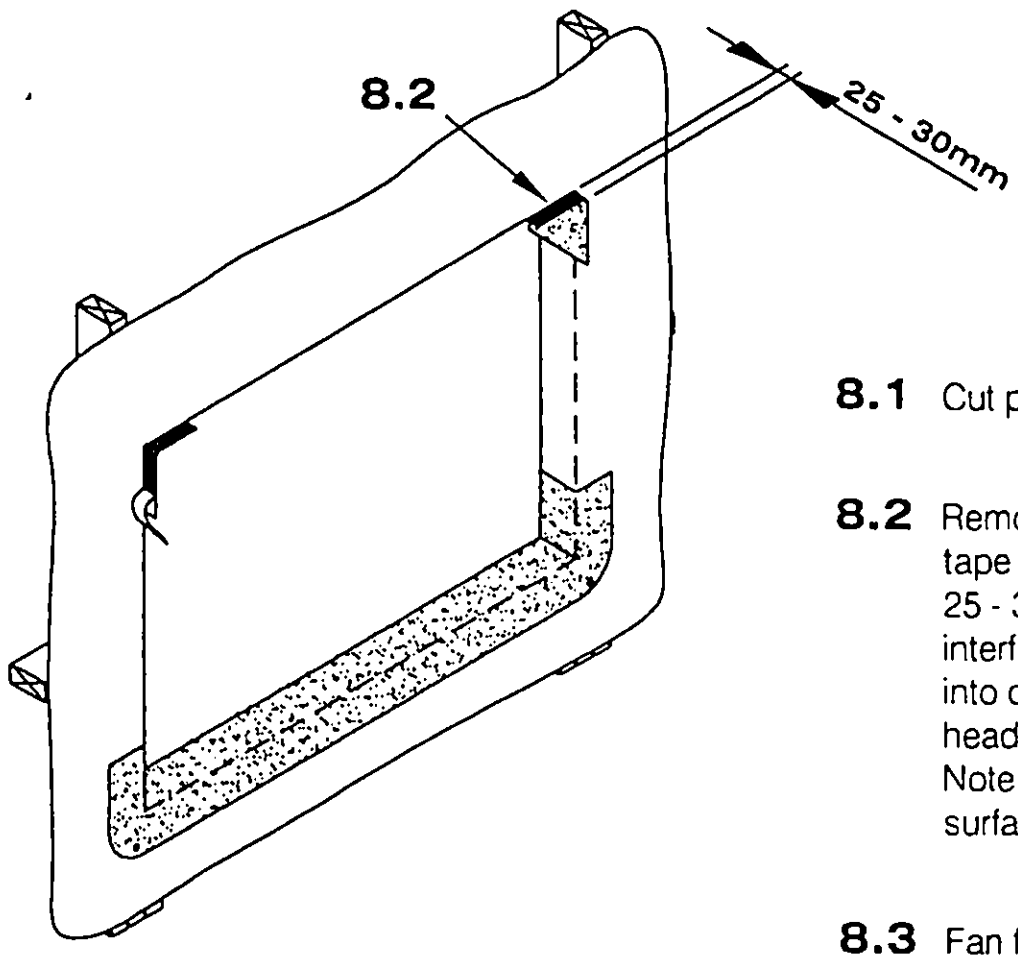
WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

Installation Step No. 3 - Upper Corners

Date
18 Oct 02

Scale
NTS



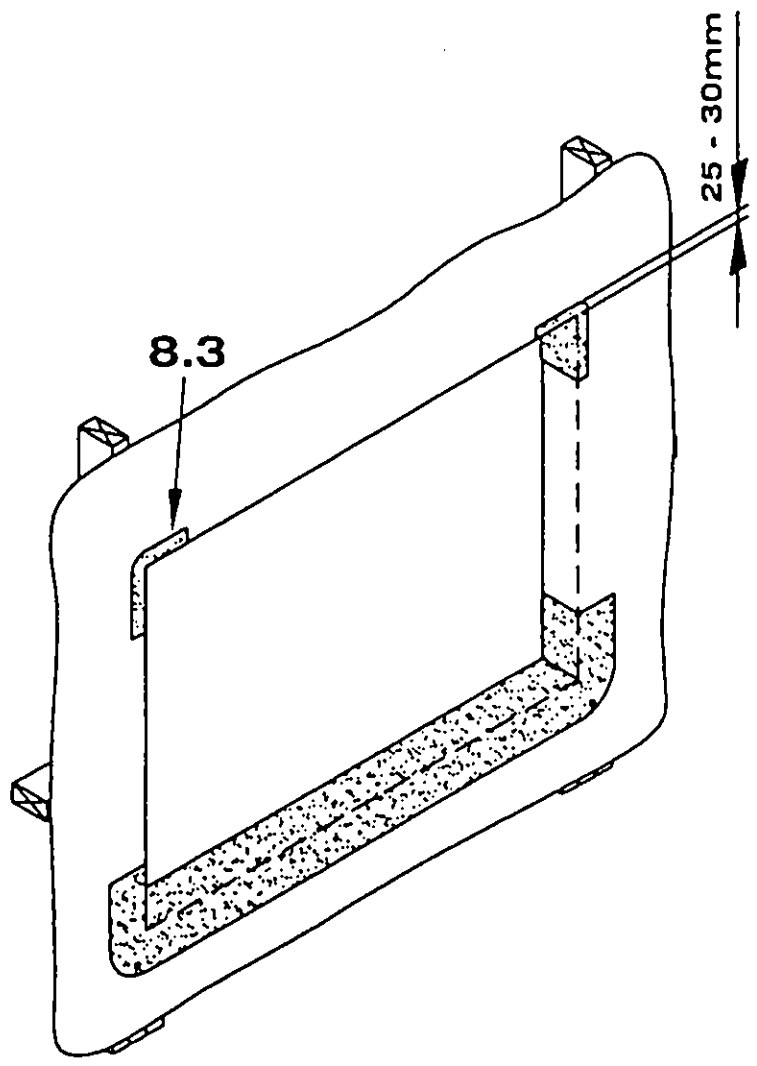
8.1 Cut pieces of flashing tape at least 400mm long.

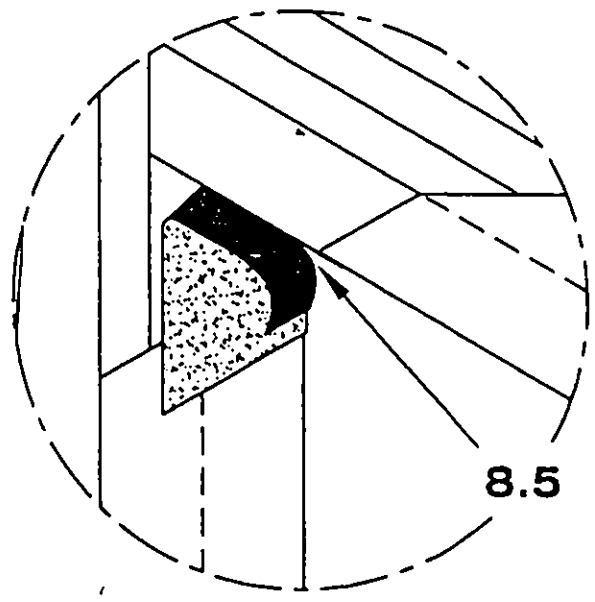
8.2 Remove release paper, and set flashing tape with the edge projecting approximately 25 - 30mm outside the cavity, to prevent interference with the head flashing. Adhere into opening up each jamb and across the head a minimum of 200mm in each direction. Note - Do not wrap flashing tape onto the interior surface of the framing.

8.3 Fan flashing tape at top corners onto face of house wrap.

8.4 Firmly press flashing tape onto all surfaces to ensure full adhesion.

8.5 Trim excess tape from inside, flush with face of framing. Care must be taken not to cut house wrap.





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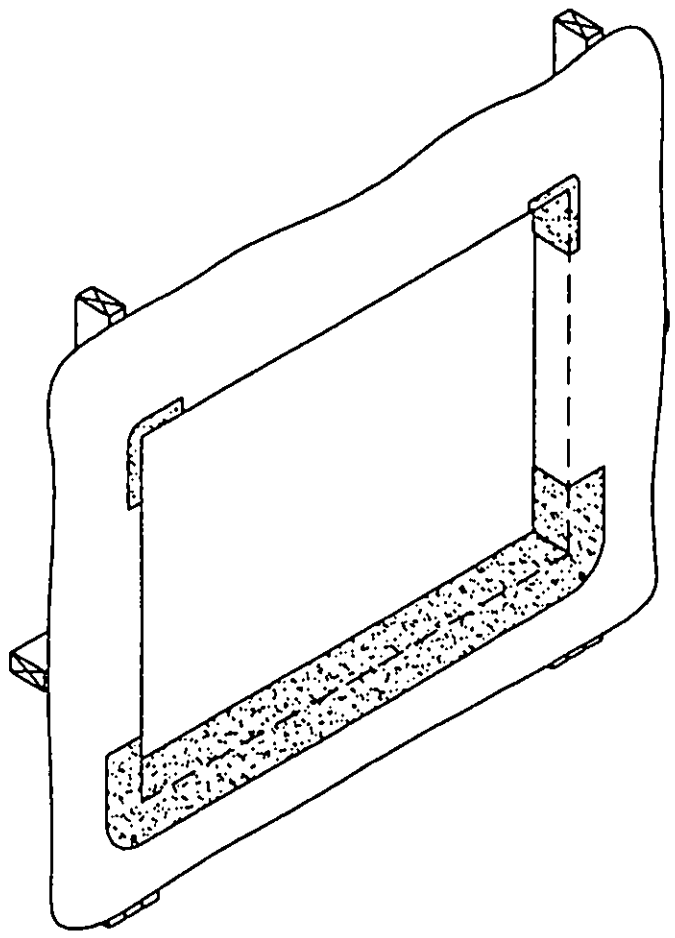
WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

Installation Step No. 4 - Proprietary Flashings

Date
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9.1 With cladding systems that require the fitting of proprietary flashing components, prior to the installation of the window, these should be fitted at this stage.

9.2 A sill tray, sloped sill or other means of removing water to the outside of the cladding may be required on some claddings.

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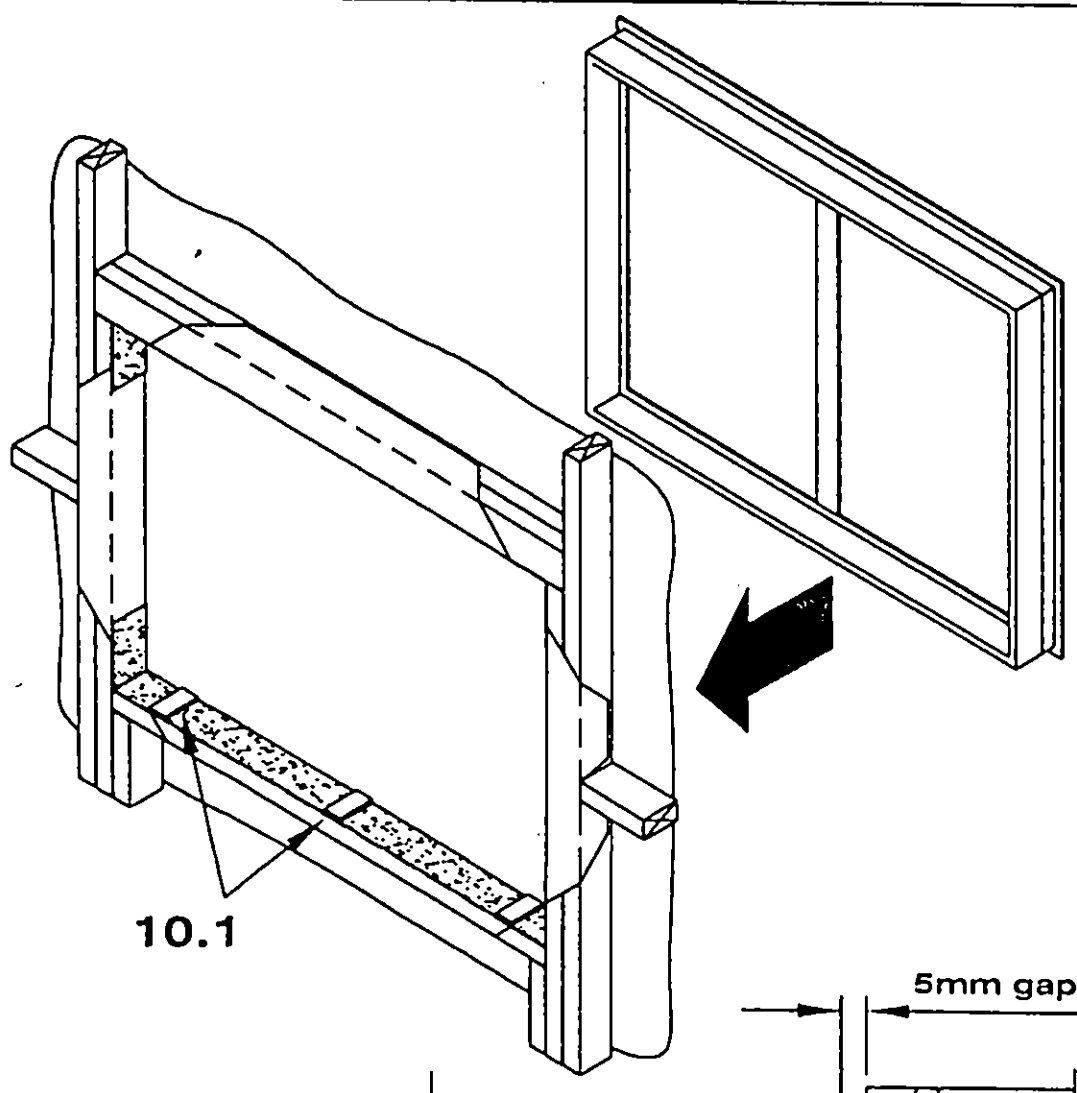
WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

Installation Step No. 5 - Window Installation

Date
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10.1

10.1 Position 5mm thick spacers on the sill flashing tape at fixing centres, 150mm from each jamb and 450mm centres between.

10.2 Position window into opening and secure with nails or other approved fixing method.

10.3 Ensure window is positioned so that;

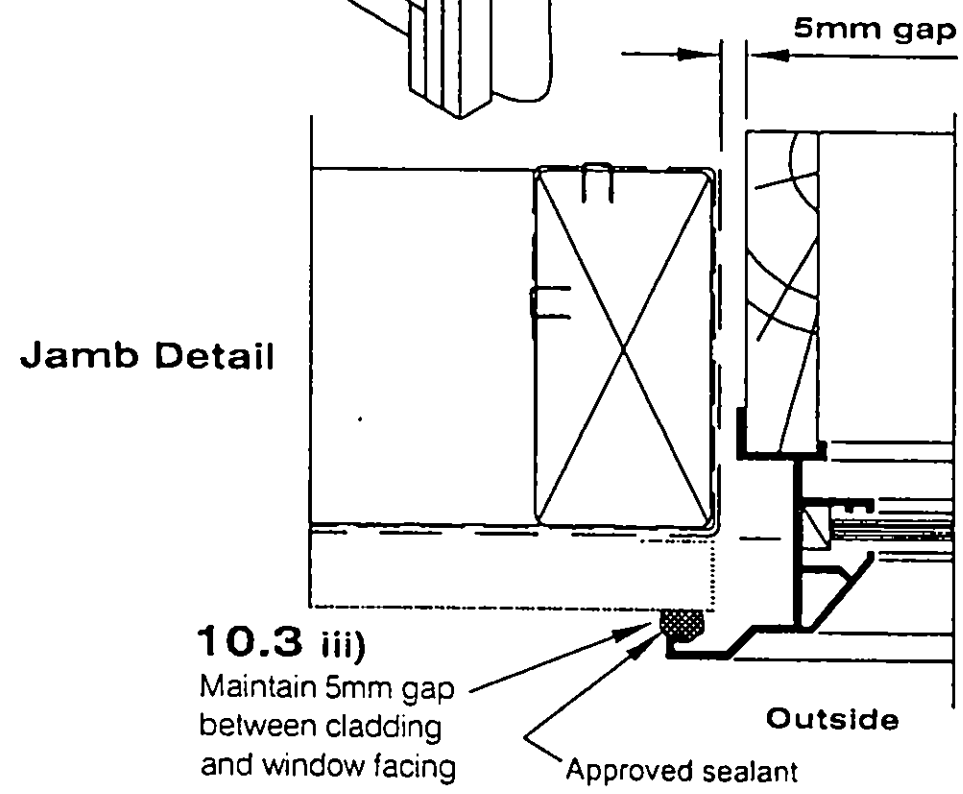
i) interior linings finish in the correct plane.

ii) a 5mm gap must be maintained between window reveal and wrapped trim cavity. This 5mm gap is essential to allow the trim cavity to pressurize. Too narrow a gap will induce leakage.

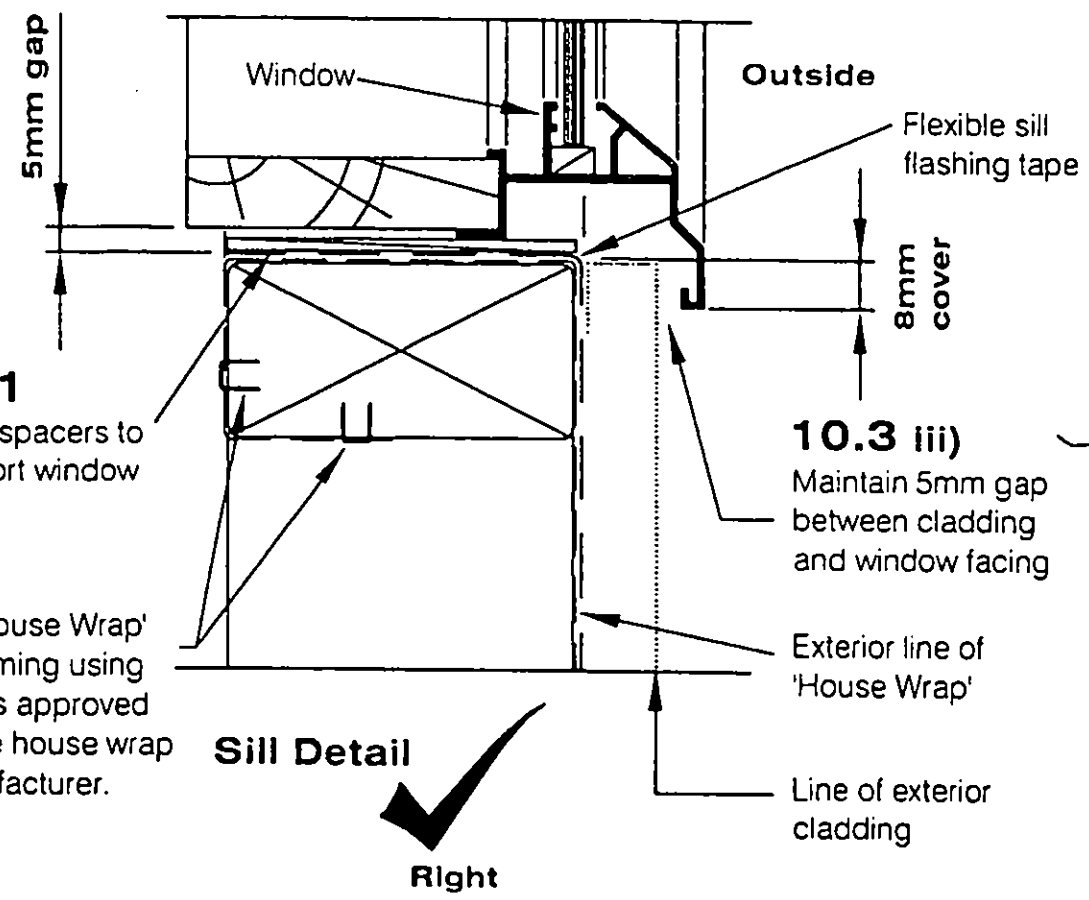
iii) a 5mm gap must be maintained between cladding and window facing. This 5mm gap is essential to admit outside air pressure to the cavity and provide a pathway for drainage to the exterior. This gap provides essential drying / ventilation.

iv) 8mm of frame cover is maintained over the cladding at the sill.

v) The cladding below the sill trimmer shall not extend above the sill trimmer across the window opening.

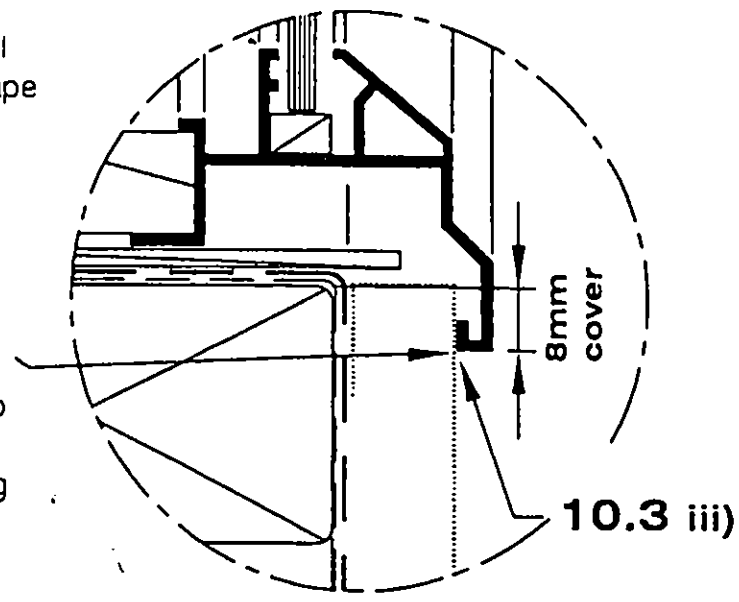


Jamb Detail



Sill Detail

Right



Wrong

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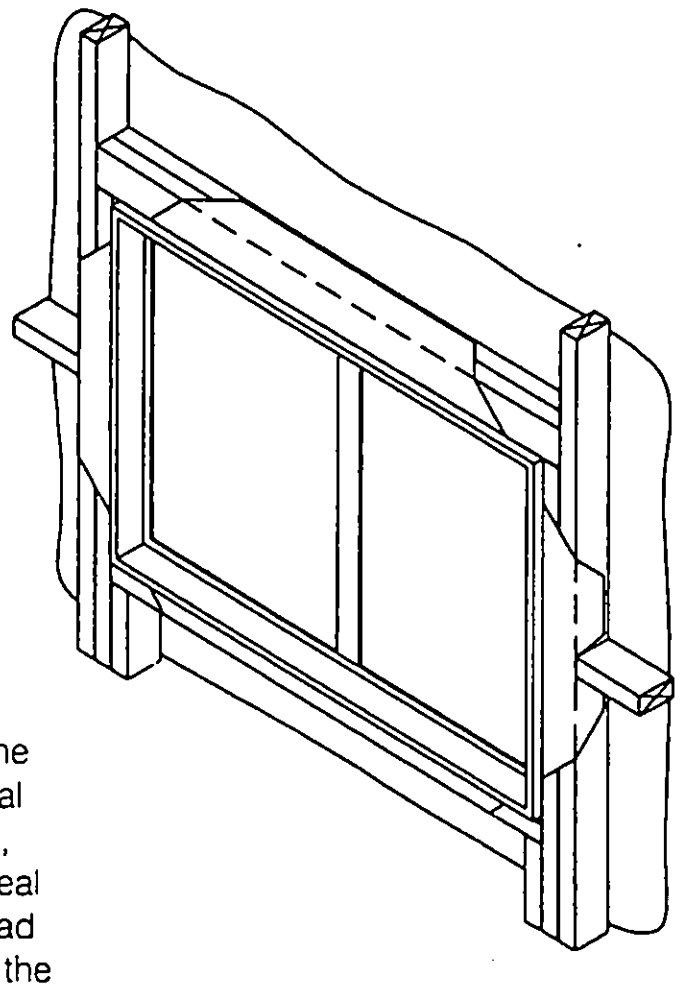
WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

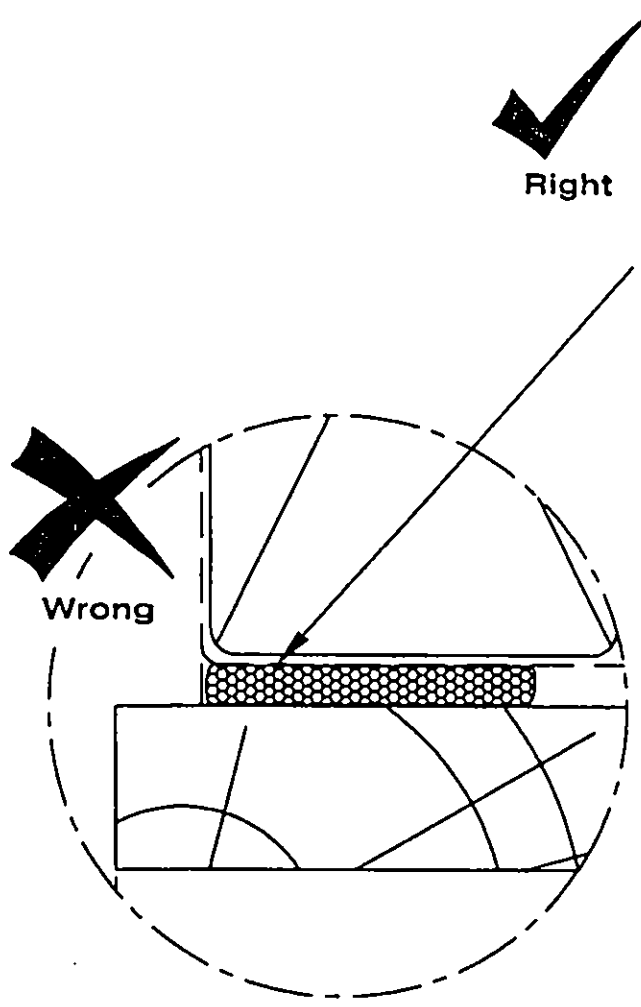
Installation Step No. 6 - Air Seal

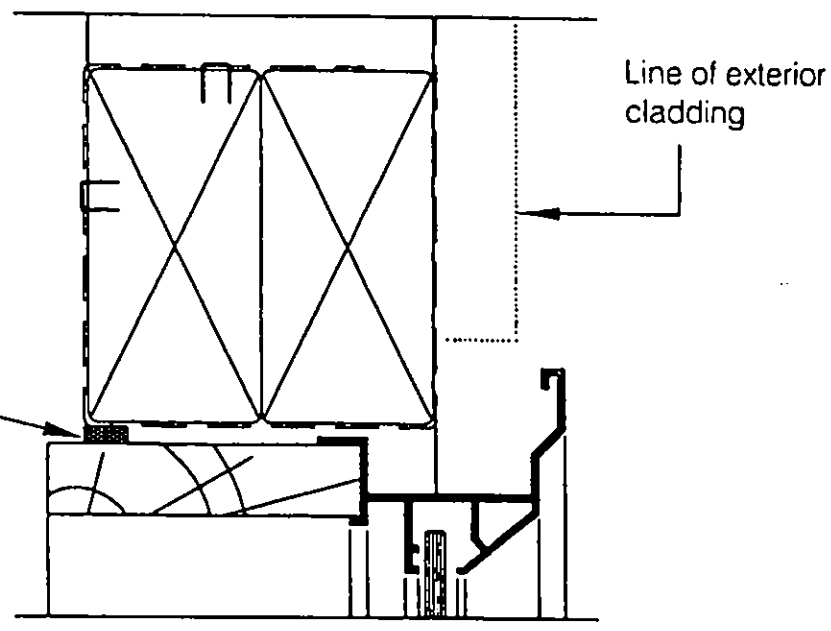
Date
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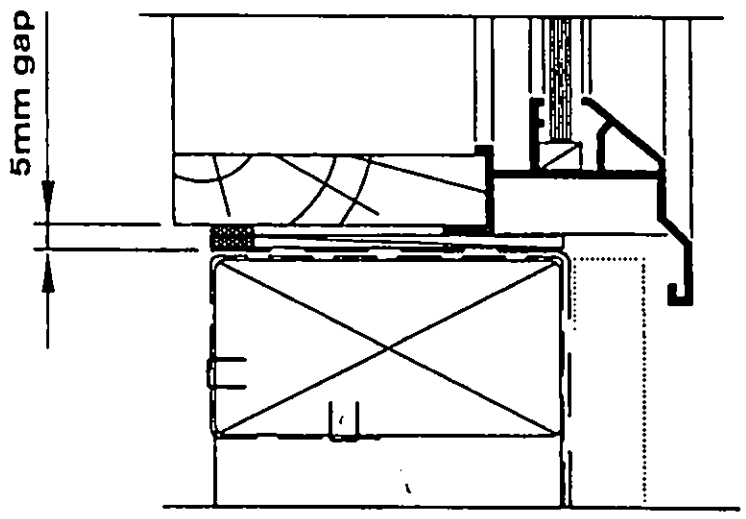


11.1 Apply a continuous bead of a suitable approved, water resistant 'Air Seal' to the perimeter of the trim cavity. Run the seal along the inside edge of the trim cavity, ensuring contact with both window reveal and house wrap so that the air seal bead extends approximately 10 - 12mm into the cavity space.
Note - Do Not fill the cavity with the air seal product as doing so effects the cavity created in step 10.3 ii - (please refer back for the reasons).





Head Detail



Sill Detail - Jamb Similar

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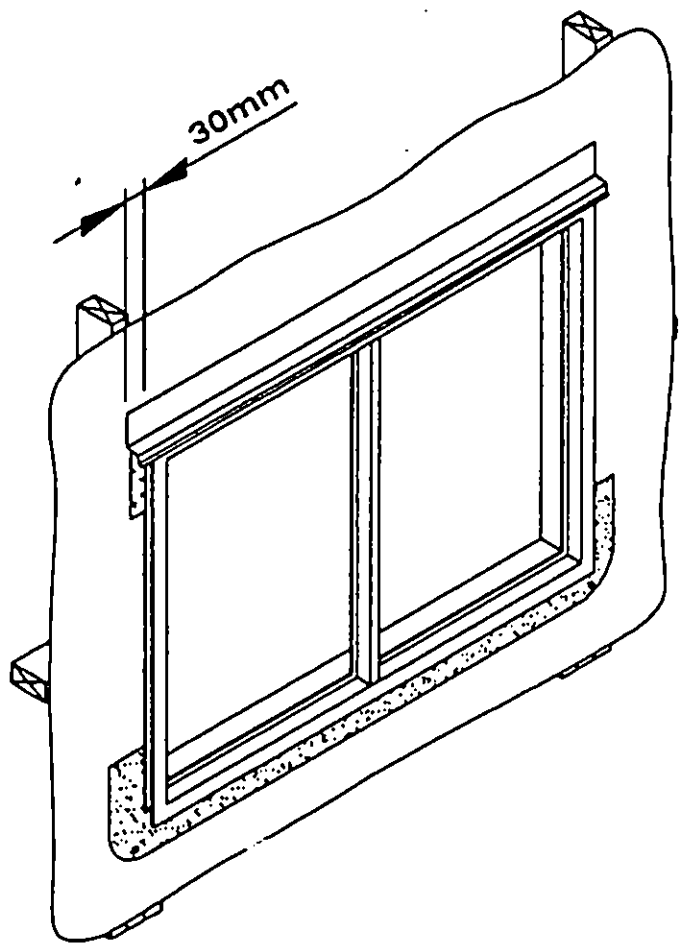
WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

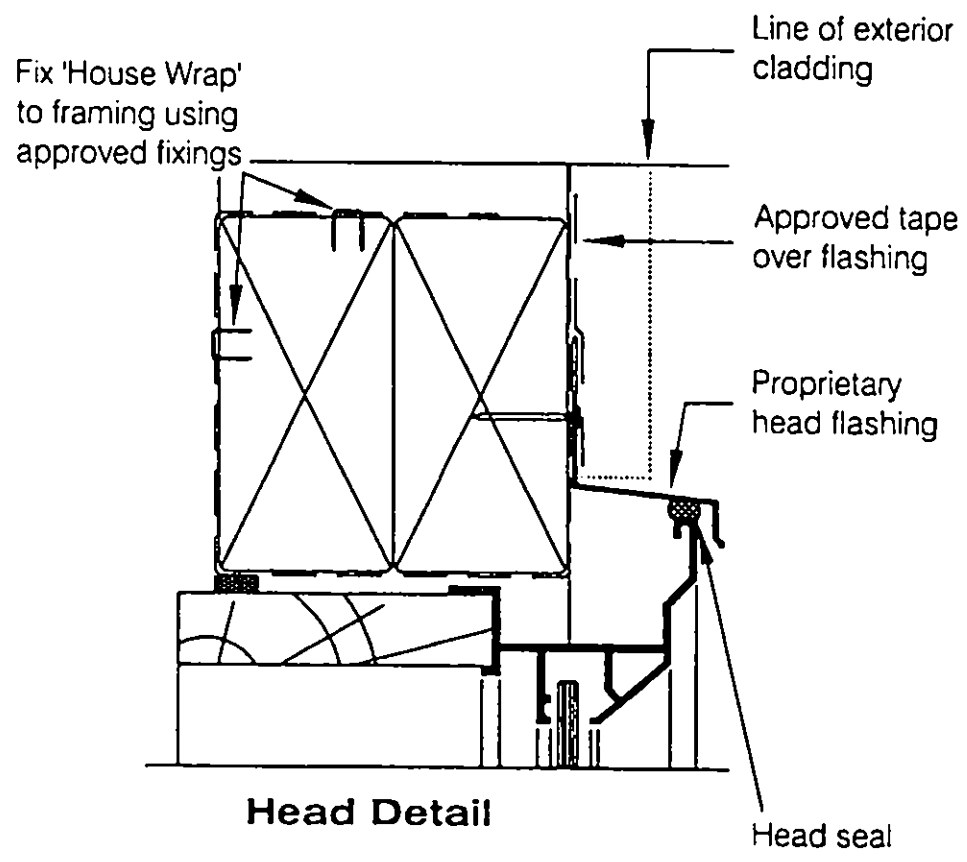
Installation Step No. 7 - Head Flashing

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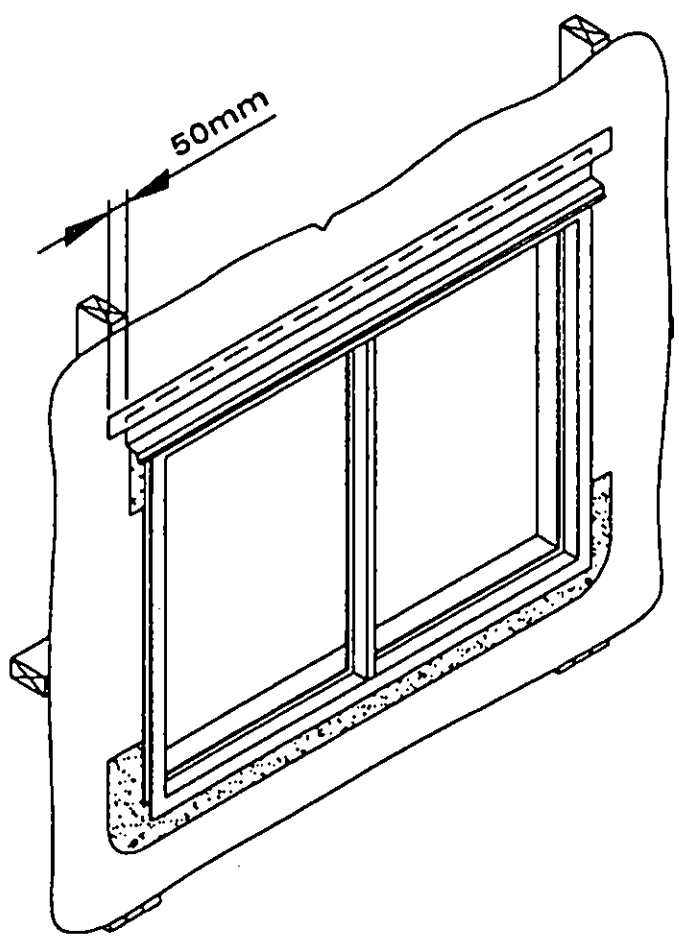
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12.1 Cut head flashing at least 60mm wider than the window and fix *over* 'House Wrap'. Position centrally to sit on top of window facing.



Head Detail



12.2 Install approved adhesive tape over upper edge of head flashing to assist with water diversion. Run past each end by at least 50mm.

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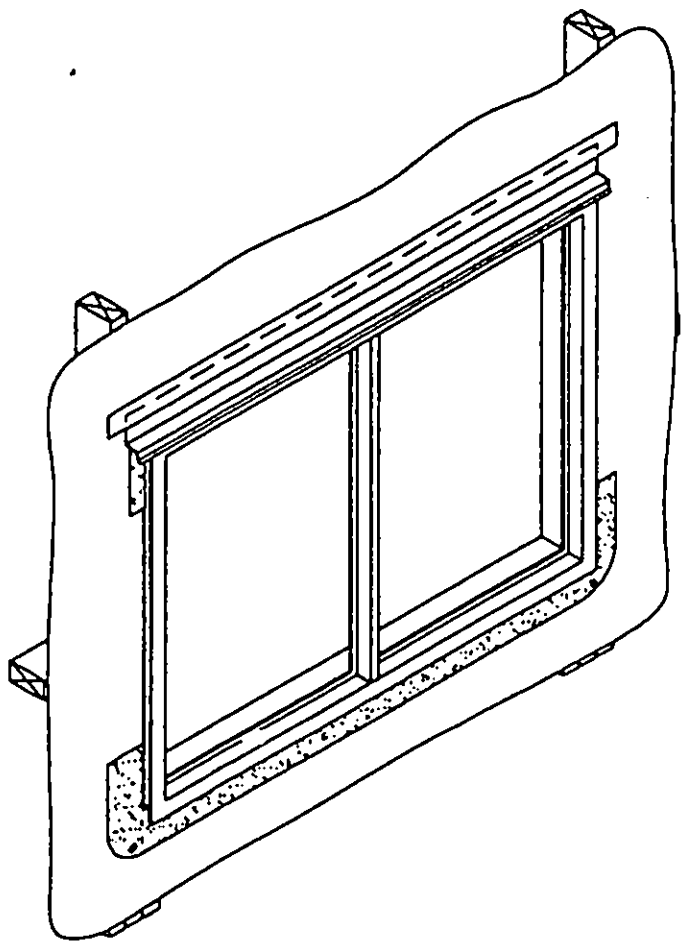
WANZ WIS (WINDOW INSTALLATION SYSTEM)

Stage 1 - Pre Cladding Trim Preparation

Installation Step No. 8 - Cladding

Date
18 Oct 02

Scale
NTS

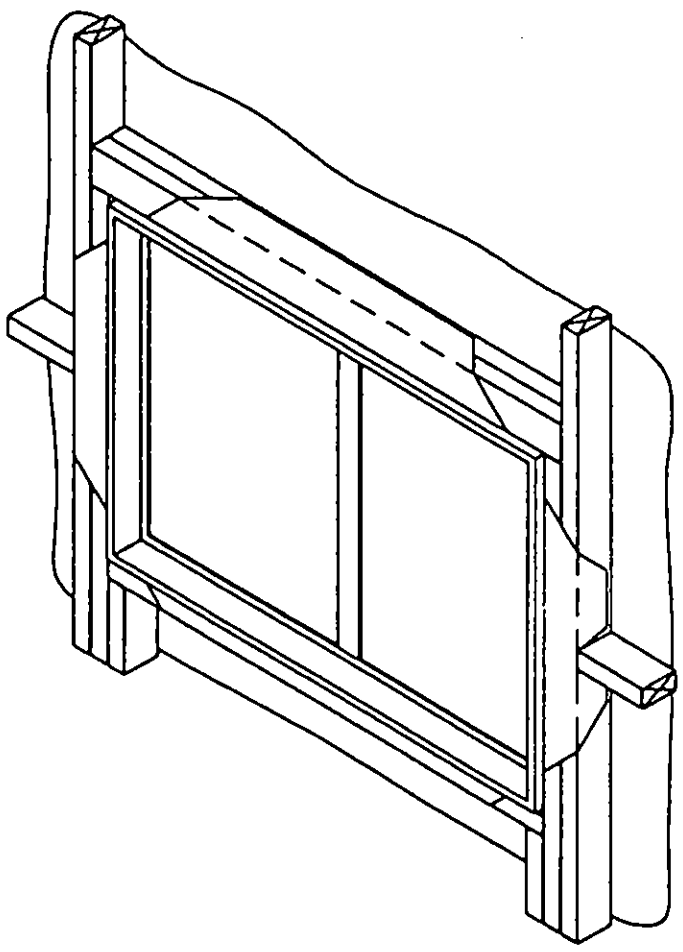


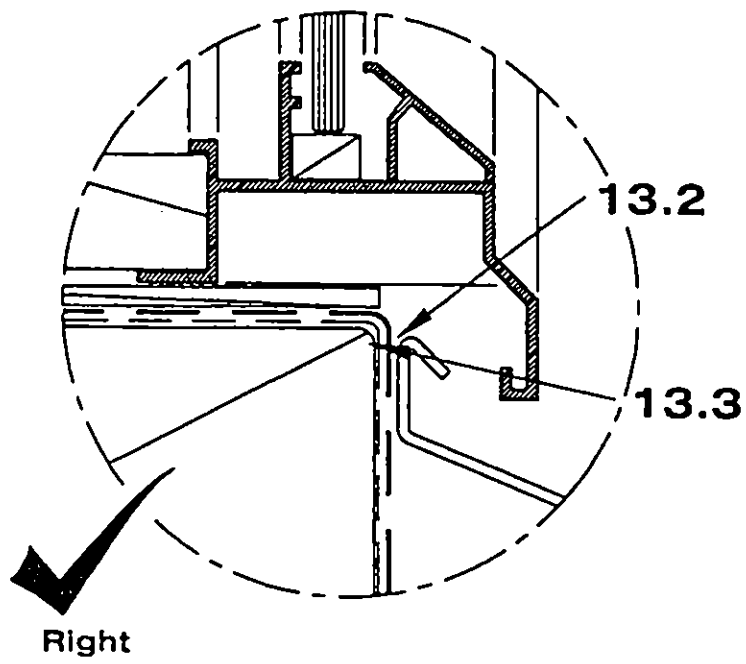
13.1 Install exterior cladding in accordance with the 'Manufacturers Recommendations'.

'DO NOT SEAL EXTERIOR SILL GAP'
The sill must be left open to allow the trim cavity to pressure equalize and drain.

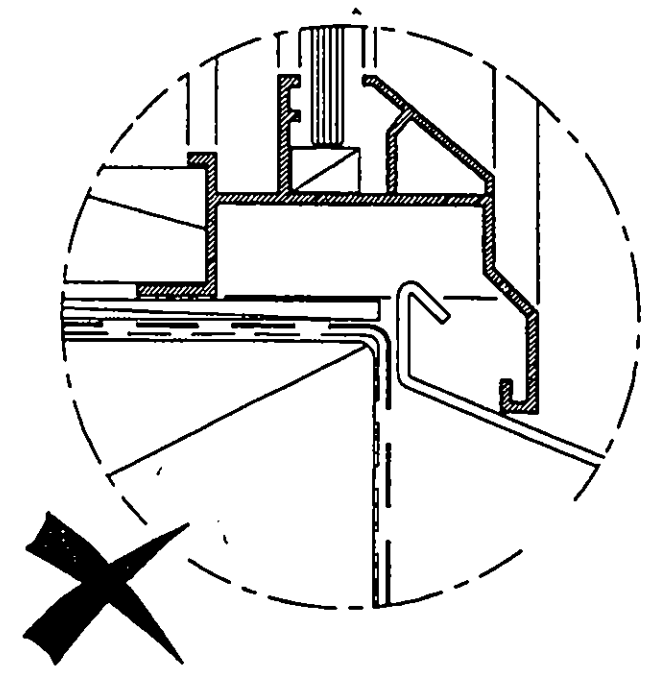
13.2 Some proprietary flashings will require 'laminating', i.e. using a wet seal or similar, to the sill flashing tape to guard against water seepage between house wrap and cladding.
Please ensure the compatibility of the seal with the sill tape by using only a suitable approved material.

13.3 Ensure any proprietary sill flashings are fitted level with or below the line of the sill framing, to avoid water damming on sill.





Right



Wrong

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Appendix

BRANZ Report : EC0610

Weathertightness testing of Direct Fixed Cladding with the WANZ WIS.

BRANZ
BUILDING ON KNOWLEDGE

EC0610

Weathertightness testing of Direct Fixed Cladding with the WANZ WIS.

Author: John Burgess
Scientist

Reviewer: Mark Bassett
Principal Scientist

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Moonshine Road
Judgeford
Private Bag 50908
Porirua City
New Zealand
Tel: +64 4 237 1170
Fax: +64 4 237 1171
www.branz.co.nz

Quality System
Quality Endorsed Company
ISO 9001 Lic 2437
Standards Australia

5. RESULTS

The Window Association of New Zealand's Window Installation system (the WANZ WIS) is a window installation system that provides a means for installing aluminium-based windows into low-rise domestic cladding systems in the New Zealand environment.
The WANZ WIS includes the following:

- building wrap (or housewrap) installed over timber framing, which is cut over window openings and wrapped around the trimmers.
- A flexible, waterproof adhesive tape installed across the sill, and at the jamb/lintel joints to cover any bare timber that is not covered by the building wrap, to complete the airtightness of the trim cavity.
- A head flashing taped over the building wrap, and windows installed standing proud off the cladding by 5mm.
- An internal airseal applied to the trim gap between the joinery reveal and the framing.

The WANZ WIS provided a weathertight joint between the cladding and the window when subjected to typical air pressures within the New Zealand low-rise domestic environment if the following points were adhered to:

- Jambs were sealed
- The internal airseal remained intact
- Window offset was at least 5mm.
- Window trim cavity was at least 5mm.
- Cover of the aluminium window flange extended at least 8mm over the cladding.

6. CONCLUSION

The WANZ WIS is a fundamental advance in the weathertight performance of the junction between cladding systems and windows in the low-rise domestic New Zealand market. The WANZ WIS offers the first verifiable means of ensuring the weathertightness of the junction between the cladding and the window.

The WANZ WIS does not include proprietary cladding system flashings, but may be improved by their installation, or by the use of sill trays or wrapped, sloped sill trimmers. These are likely to add significantly to the ability of the WANZ WIS system to cope with water leaks attributed to workmanship and building tolerance issues.

SCANNED TO TRIM

RECEIVED
- 3 AUG 2005
H.D.C.

CONCEPT
MASTER BUILDERS

2nd August 2005

Hastings District Council
Private Bag 9002
HASTINGS
Att: J Simons

Dear John

Re: Barnes House 2535 State Highway 50 Hastings ABA 20042396

This is to advise you that the attached door closer will be fitted to the family room sliding doors, which lead out onto the pool area. French doors were originally proposed for this area, but due to the exposed nature of the site the door type has been changed.

Should you have any queries, I can be contacted on the above phone number.

Kind Regards
Concept Master Builders

Barry Koenders
Project Manager

Concept Building Limited Concept House 369 State Highway 2 RD2 Hastings
Tel 06 878 4690 Fax 06 876 2732 Email info@conceptmb.co.nz www.conceptmb.co.nz

att Barry

Swish Door Closers and Safety Latches

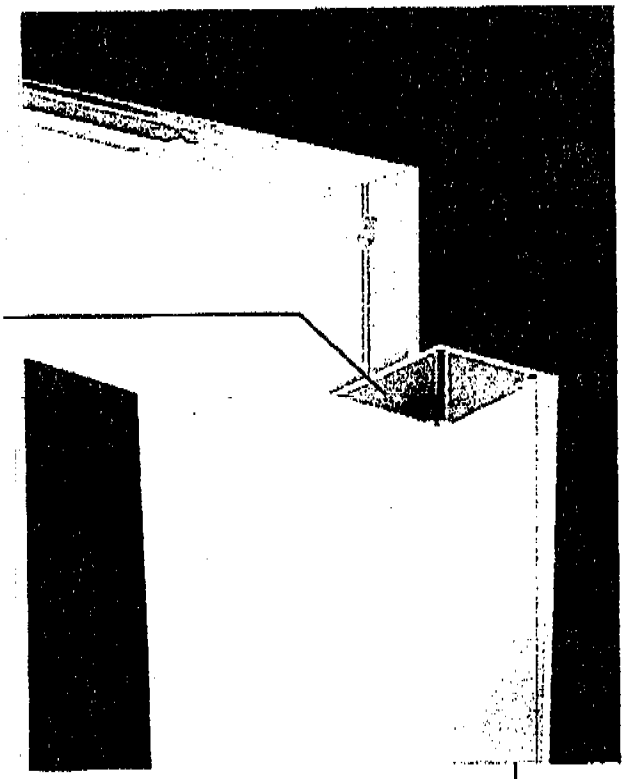
© 2005 Swish Automation
info@swishautomation.com

swish

Sliding Door Closer and Latch

July 2005

Swish Sliding Door Closers can be mounted horizontally in the top door rail as standard.



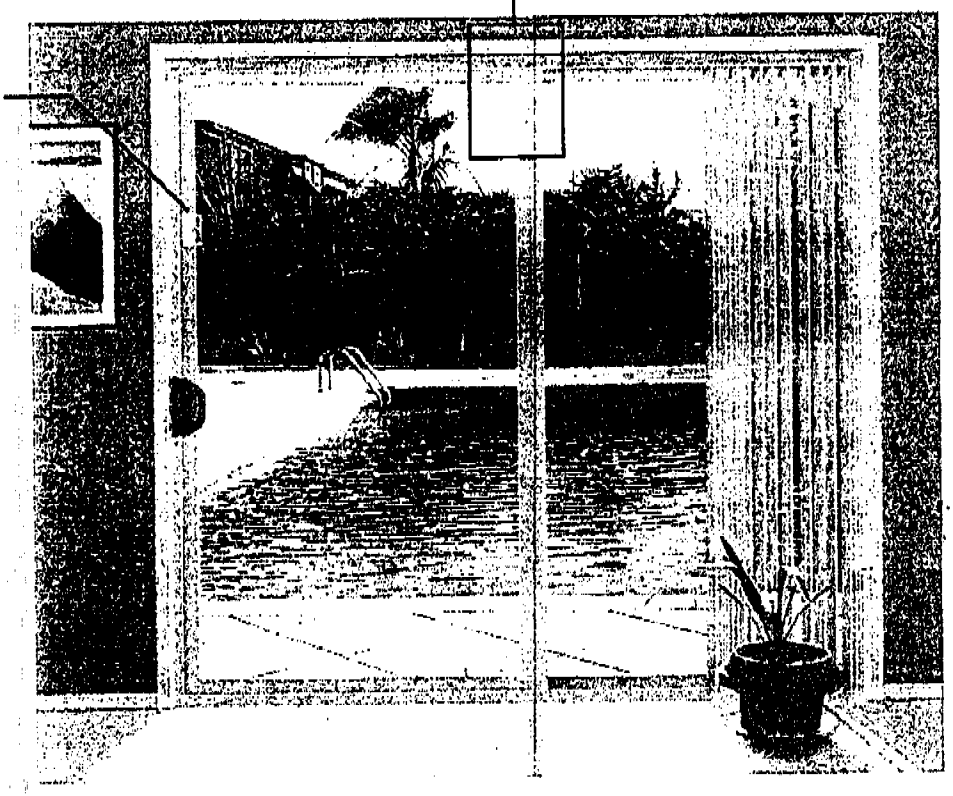
Alternatively, where surface-mounting of the door-closer mechanism is necessary, it is concealed in a vertical duct, which is accessible for adjustment and servicing.

Swish Sliding Door Closer mechanisms are totally concealed for safety and tidy appearance.

The Fencing of Swimming Pools Act 1987 requires that doors and gates offering access to a pool area must be fitted with a self-closing and self-latching function.

Swish Sliding Door Closers and Swish Safety Latches can be installed on most commercial and residential door profiles. Consult Swish Automation for recommendations on closing and latching configurations to suit your individual requirements.

The Swish Sliding Door Latch is mounted on the leading door-stile profile, at or above 1500mm from floor level to comply with the provisions of the fencing of Swimming Pools Act 1987. The latch is operable from both sides of the door.



Stainless steel componentry is used throughout the door closer mechanism for corrosion resistance, strength, durability, smooth operation and good appearance.

A specialised treatment is applied to moving parts to dampen noise and vibration.

Replacement Card

FIELD INSPECTION RECORD

ABA No. 2004/2396

OWNER / ID:	PHONE	PROJECT ADDRESS / PROPERTY ID:
Barnes		2538 SH 50 / Ngaleravue.

BUILDER	PHONE	DRAIN LAYER	PHONE	PLUMBER	PHONE
Concept Blds.		R Snell		R Snell.	

Description of Work: Dwelling

TYPE	CODE	NO	TYPE	CODE	NO
FOUNDATIONS/SITING	201		CLADDING / STUCCO	207	
BLOCKWORK/BOND BEAM	202		SHEET BRACING/FIRE LININGS	208	
UNDER-FLOOR PIPE-OUT	203		SEWER	209	
FLOOR	204		STORMWATER	210	
FRAMING PRE-LINE	205		OTHER	211	
FRAMING PIPE-OUT	206		COMPLETION	212	

INSPECTION RECORDS:

CODE	DATE	COMMENTS	KMS	TIME	SIGN
X 209	1/8/06	Completion of sewer to R/W 9000 Ant sewer treatment tank, effluent system not yet run out, Sewer falls Bedding & drain test holding. Stormwater to R/W tank with drain below tank level adjacent to courtyard stormwater drain & spreader. Overflow from R/W tank not yet connected.	40	75	✓
J 212	12/2/07	Final started, refer to report 2443 also check sheet Dwelling occupied. Off paths, terrace and landscaping complete. Recheck required.	36	120	BD ✓
212	23/5/07	FINAL recheck passed all items on report 2443 complete. * check is S/W as laid required. if not give Barry Cordero a ring on 0274424375. ✓ S/W as laid with sewer drain as laid plan.	25	45	BD ✓

ABA No. 2004/2396

CODE COMPLIANCE CERTIFICATE CAN BE ISSUED? YES NO

DOES JOB REQUIRE COMPLIANCE SCHEDULE? YES NO

Replacement Card

FIELD INSPECTION RECORD

ABA No. 20042396

OWNER	PHONE	PROJECT ADDRESS
Barnes		2535 S.H. 50
ID:		**PROPERTY ID:** 96665

BUILDER	PHONE	DRAIN LAYER	PHONE	PLUMBER	PHONE
				Randall Sree	

Description of Work:.....

TYPE	CODE	NO	TYPE	CODE	NO
FOUNDATIONS/SITING	201		CLADDING / STUCCO	207	
BLOCKWORK/BOND BEAM	202		SHEET BRACING/FIRE LININGS	208	
UNDER-FLOOR PIPE-OUT	203		SEWER	209	
FLOOR	204		STORMWATER	210	
FRAMING PRE-LINE	205		OTHER	211	
FRAMING PIPE-OUT	206		COMPLETION	212	

INSPECTION RECORDS:

CODE	DATE	COMMENTS	KMS	TIME	SIGN
203	01/07/05	G/S Sewer pipes @40 65 & 100 laid to falls all penetrations sealed through DPM of upper & lower level D12 starters bent into floor & tied to D12 perimeter rod to perimeter of upper & lower level. 665 mesh lapped & tied on 50 mm layer chairs on -250 DPM on 20 sand blinding on compacted fill to upper & lower levels all thickenings as per plan OK to pour	21	90	AG
202	15/7/05	Part only sighting of block work cavity clear wash outs in place construction joints all in place all steel HD outside wall HD16 with HD12 interior wall all exterior wall has polystyrene glued to inside of block OK to pour	37	30	
	27/7/05	Gemco have advised 8° roof to have 2 coats of Metal X	36		TJN
202	29/07/05	6 block high to curved wall - seismic joint ready with Denso tape to one side only verts. steel & in centre of each cell. Doors placed @ 4000, All other main walls OK with brickwork clear of debris verts tied & all doors placed OK to pour	36	45	AG
202	02/08/05	Another 6 block high to curved wall all verts tied vertically & horizontally OK to pour	36	60	AG

CODE COMPLIANCE CERTIFICATE CAN BE ISSUED? YES NO

DOES JOB REQUIRE COMPLIANCE SCHEDULE? YES NO

ABA No. 20042396

20042396

INSPECTION RECORDS continued:

CODE	DATE	COMMENTS	KMS	TIME	SIGN
201	9-8-05	Sighting of Pool foundation and floor slab			
204		all steel tied correctly to engineers specifications			
		D16 vertical and D12 horizontal with 665 mes			
		on 75mm bar chairs in floor slab			
		OK to pour pool floor.			
202		Sighting of remainder of curved wall			
		blocks some shaping to be done to top of			
		wall but 99% complete ok to pour once			
		last few blocks cut to slope			
			36	45	
202	23/08/05	Blockwork to pool area, HD 16 verts.			
		@ 400 c/c HD12 @ 400 c/c heights vary			
		from 600 mm to 2090 mm. Knockouts			
		clean & clear of debris			
		OK to pour			
	*	Advised builder to check Gib bracing			
		as to BP/stud - stud/TP fixing			
		requirements for a high wind zone	36	60	
207	20/3/06	Sighting of cavitie batton not quite			
		ready. Head flashings need at turn up			
		at ends and also discussed how the meter			
		box is to be flashed. Builder to reboole			
		once ready.	36	45	
207	23/3/06	Cavitie battons now completed and			
201		head flashings have a turn up at each			
		end vent strip in place. Control joints			
		at 3.6m centers. Racking soffite flashings			
		all in place. Horizontal control joint on			
		high wall all done correctly horizontal cavitie			
		rings 100mm long with slope all installed			
		correctly.			
		Sighting of post hole pads and reinforcing			
		all over sized and D12 reinforcing tied			
		correctly with starters to go into patio			
		slab.			
		Sighting of swimming pool control joint			
		tie foundations all done as per plan.			
		OK to continue.	36	60	
207	13/4/06	Sighting of head, jamb and sill flashings for			
		rockote and hardibacker all flashings in place			
		and correctly done nice tidy job.			
		OK to continue.	36	60	

ABA No. 20042396

CODE COMPLIANCE CERTIFICATE CAN BE ISSUED?	YES	NO
DOES JOB REQUIRE COMPLIANCE SCHEDULE?	YES	NO

Drive way on right 800m's South of Ngatarawa Rd.

FIELD INSPECTION RECORD

ABA No. 2004 2396.

OWNER Barnes.	PHONE	PROJECT ADDRESS 2536 State Highway 50
ID:		PROPERTY ID: 96665.

BUILDER Concept	PHONE	DRAIN LAYER	PHONE	PLUMBER	PHONE

Wayne
Description of Work: Dwelling

TYPE	CODE	NO	TYPE	CODE	NO
FOUNDATIONS/SITING Y 2	201	2	~~CLADDING~~ / STUCCO	207	3
BLOCKWORK/BOND BEAM	202	4	SHEET BRACING/FIRE LININGS	208	1
UNDER-FLOOR PIPE-OUT	203	1	SEWER	209	1
FLOOR	204		STORMWATER	210	
FRAMING PRE-LINE	205	1	OTHER	211	
FRAMING PIPE-OUT	206		COMPLETION	212	1

INSPECTION RECORDS:

CODE	DATE	COMMENTS	KMS 36.	TIME	SIGN
		Water analysis is required prior to CCC being approved.			
		Ref to Consent Notice.			
201	7/6/05	All footings with blocks to go on HD16's & HD12 all correct sizes, standard footings where timber frame all D12 Horizontals & D10 verticals ground hard All steel on 75mm bar chairs all steel well tied and all footing have polythene under. OK to pour	36	60	[illegible]
202	14-6-05	Block inspect. to floor height. Split levels one section with bond bar. All steel H12 with builder installing starters to take slab and extra vert. lengths. Cavities clean, OK to fill. Block layer - Graham Sinclair.	36	60	[signature]
	16-6-05	Inspection not req. - forgot to cancel booking	36	30	[signature]
204	10/04/06	Phil Saunders - Design Works 8787669 to. Peer Review of PS4 & Reports to council & Astrology phoned to confirm this is o.k. Changes from consented drawings - D20 block started @ 400ctrs with D12 mesh formed on 400 mm grids with hooks to slab edge D12 on chairs on poly. control joints formed at anchor points	36	45	CEM

CODE COMPLIANCE CERTIFICATE CAN BE ISSUED? YES NO

DOES JOB REQUIRE COMPLIANCE SCHEDULE? YES NO

ABA No. 2004 2396.

04/2396

INSPECTION RECORDS continued:

CODE	DATE	COMMENTS (36)	KMS	TIME	SIGN	
✓ 205 206	31/05/06	K2 Pipework used for H&C water supply – pressure @ 300 psi & holding NC&A – 10% all BR5 brace elements with M12 bolts & 50 mm sq washers & straps to brace elements – Initial pressings complete – purlin / truss connections complete OK to line	36	90	AG	✓
✓ 207	03/06/06	2nd coat plaster to timber & blockwork wall – good evenness & straight OK to continue	36	75	AG	✓
✓ 202	12/05/06	Siting of reo in 20 series blockwork around upper shelf of pool – D12 @ 400 & with D12 horiz @ 400 c – seismic joint of R16 with Sensa tape one end OK to pour	36	75	AG	✓
X 209 210	31/5/06	Sewer layed in DN100 with very good falls to driveway out in front of house with all bar one terminal vent in framing. Inspection points on all 90° changes of direction and at any intersections in the line, nice tidy job ~~Not under water test and will need redone~~ OK to backfill Storm water DN100 also layed with good fall to same point as sewer with rodding eyes at the top end of the drains OK to backfill.	36	75	[illegible]	✓
✓ 208	9/6/06	SHEET BRACES ALL FIXED AS PER PLANS OK TO CONTINUE	36	~~77~~	60	✓
209	16/6/06	Sewer line on test & holding head good flows when released OK to continue	36	60	AG	✓

ABA No.

CODE COMPLIANCE CERTIFICATE CAN BE ISSUED?	YES	NO
DOES JOB REQUIRE COMPLIANCE SCHEDULE?	YES	NO

Geotech Engineer for effluent Disposal siting
Stormwater to dissipate at Base of gully Lot 2 + Lot 3
see Consent Notice

Drain plan
Electrical
gas
AOC

CODE COMPLIANCE CERTIFICATE AUDIT CHECKLIST

HASTINGS DISTRICT COUNCIL

Consent No:	2004/2396	**Date:**	31/5/07
Address:	2538 SH 50		
Audit Officer:	**George Astridge**		

Dwellings	YES	NO	N/A
All Inspections have been carried out and PASSED	☑	☐	☐
Final Inspection Checklist Completed	☑	☐	☐
As Built Drainage Plan Received	☑	☐	☐
Electrical Certificate Received	☑	☐	☐
Gas Certificate Received	☑	☐	☐
Cladding Checklist Completed & Producer Statement Received	☑	☐	☐
Engineering Producer Statements Received (Structural, Precast etc.)	☐	☐	☐
Other Producer Statements (Glazing etc.) Roof. ✓	☐	☐	☐
Comments Relating to Checklist	☑	☐	☐
Application for Code Compliance Certificate (Form 6) [AOC]	☑	☐	☐
RESULT (circle result)	**PASS**	FAIL	N/A
Code Compliance Certificate can be Issued	☑	☐	☐
Notice to Fix	☐	☐	☐

Multi-Unit Residential, Commercial, Industrial		YES	NO	N/A
All Inspections have been carried out and PASSED		☐	☐	☐
Final Inspection Checklist Completed		☐	☐	☐
As Built Drainage Plan Received		☐	☐	☐
Electrical Certificate Received		☐	☐	☐
Gas Certificate Received		☐	☐	☐
Cladding Checklist Completed & Producer Statement Received		☐	☐	☐
Engineering Producer Statements Received (Structural, Precast etc.)		☐	☐	☐
Other Producer Statements:	Fire Alarm / Sprinkler System	☐	☐	☐
	Air Conditioning System (HVAC)	☐	☐	☐
	Lifts	☐	☐	☐
	Backflow Prevention Devices	☐	☐	☐
	Others (Glazing etc.)	☐	☐	☐
Commissioning Statements for above Received		☐	☐	☐
Comments Relating to Checklist		☐	☐	☐
Application for Code Compliance Certificate (Form 6) [AOC]		☐	☐	☐
RESULT (circle result) Code Compliance Schedule y / n		**PASS**	FAIL	N/A
Code Compliance Certificate can be Issued		☐	☐	☐
Notice to Fix		☐	☐	☐

PRODUCER STATEMENT
For
TEXTURE COATING/SOLID PLASTERING

ISSUED BY: **Wynands Masonry**

29 Leyland Street, Onekawa, Napier.

Box 5135 Greenmeadows, Napier

TO: *Concept Builders Ltd*

TO BE SUPPLIED TO: *Hastings City Council*

IN RESPECT OF: *Exterior Cladding, Rockcote Plaster System, Texture finish.*

ABA No. *2004/2396*

FOR : *D & C Barnes*

AT: 2538 SH50, Hastings

Wynands Masonry (PLASTERER/APPLICATOR) has been engaged by Concept Builders Ltd (BUILDER)

To provide the **exterior plastering services** in respect of the requirements of Clause B1 Structure of the NZ Building Code for

☑ All ☐ Part only

the exterior cladding system of the building work. The application of the plaster/texture coating has been carried out in accordance with the relevant NZ Standard, **NZS4251: Part 1:1998** and/or the relevant manufacturers specifications for the texture coating systems applied to the exterior sheathing.

☑ The mix ratios of the solid plaster and application of the plaster is in strict accordance with NZS4251: Part 1:1998, Table 3.

☑ The texture application has been carried out in strict accordance with the manufacturers requirements and literature supplied with the . Building Consent application

TEXTURE SYSTEM USED: All work carried out using Rockcote 100% acrylic plaster. 3 coat system applied. Base coat (with netting), Levelling coat (sealed) and finished in pre-coloured, 1mm Classico Texture with 1 coat of tinted Armour paint. Painter RD Stewart and Son.

Name: **Gerry Wynands**
Company: **Wynands Masonry**
Address: **29 Leyland St, Onekawa**

Signed: GWynands Dated: 13 April 07

Note: This issuing of this Producer Statement does not exclude the requirement for an inspection. This is a declaration of your knowledge of the required standards to perform this job

JAYDEX®
INTERNATIONAL · LIMITED

PRODUCER STATEMENT

JAYDEX POLIBIT MINERAL SINGLE SHEET MEMBRANE SYSTEM FOR PLYWOOD ROOFS

DEC 2005 **110p**

Polibit Mineral produced in Italy by **Novaglass** and marketed here by **Jaydex International Ltd** has been tested and approved by the British Board of Agrement (Cert. No 91/2657/C). Yarsley Technical Laboratories UK, Deutsche Bundesbahn Germany and many other European research and test institutions.

When the **Polibit Mineral** system is applied in accordance with standard specification **NOVA110c**, by **Jaydex** Licensed Contractors, the finished system is warranted for 20 years.

Such warranties are issued jointly between **Jaydex International** and its Licensed Contractor for the protection of the client and main contractor.

R. A. Wilson
Managing Director

Postal Address - P.O. BOX 100000, NSMC, AUCKLAND 9, NEW ZEALAND
Office & Warehouse - UNIT 3C-3 MARKEN PLACE, GLENFIELD, AUCKLAND 10
TELEPHONE: (09) 444-1751
FAX: (09) 444-0132

Producer Statement

ISSUED BY: Gunac HB Ltd
(contractor)

TO: D & C BARNES
(Principal)

IN RESPECT OF: MEMBRANE ROOFING
(Description of Building Work)

AT: 2538 STATE HIGHWAY 50 FERNHILL
(Address)

Gunac HB Ltd (Contractor) has contracted to D & C BARNES (Principal)

to carry out and complete certain building works in accordance with a Contract, titled NEW RESIDENCE ("the Contract")
(project)

I: BRUCE MEEHAN (Duly Authorised Agent) a duly authorised representative of Gunac HB Ltd (Contractor)

believe on reasonable grounds that Gunac HB Ltd (Contractor) has carried out and completed

☑ All ☐ Part only as specified in the attached particulars of the building works in accordance with the Contract

B Meehan
(Signature of Duly Authorised Agent)

Date: 24/04/07

on behalf of: Gunac HB Ltd
(Contractor)

P.O. Box 1128 HASTINGS
(Address)

HASTINGS DISTRICT COUNCIL

96665

Swimming and Spa Pool Site Inspection Report 4200

Owner/~~Occupier/Agent~~: D.A. & C.J. BARNES Date of Issue: 12/4/07
(delete non-applicable)
Address/Location of Pool: 2538 STATE HIGHWAY 50 Consent No. ABA 20042396
Postal Address: 445 NGATARAWA ROAD HASTINGS FSP No. 3448
(if different to above)
Contact Phone Number(s): 879 5270

Pool Location

	Y	N
Is the pool enclosed in a building not specifically used for the pool's purpose? *(if yes, the pool is exempt under the Fencing of Swimming Pools Act 1987)*	○	✓

Above-ground Pools

• Sides to be 1.2m minimum from ground level	○	○
• Smooth vertical sides (no climbing assistance)	○	○
• Climb points or external fixtures within 1.2m of pool	○	○
• Ladder to be removable	○	○

N/A

Immediate pool area

Is the immediate pool area only fenced? The fenced area should only contain items used for pool activities (i.e. patio furniture, decking, pool equipment, pump house etc) it must not contain: clotheslines, children's play areas or vegetable gardens)	✓	○

Hinged doors giving access to pool area

• Close and latch automatically when stationary and released 150mm from the closed position	✓	○
• Latch or handle is a minimum of 1.5m above floor	✓	○
• ~~Open away from the pool~~	○	○
• Hold-open devices fitted	○	✓

Sliding doors/bi-folds giving access to pool area

• Latch or locking bolt at a minimum height of 1.5m	✓	○

Windows below 1.2m giving access to pool area

SLIDING WINDOW OVER KITCHEN BENCH.

• Limiter fitted to prevent opening more than 100mm	✓	○

Fence

• Minimum of 1.2m high from outside ground level	✓	○
• Fixtures and fittings within 1.2m of the fence	○	✓
• 900mm minimum between horizontal rails	✓	○
• Gaps under fence 100mm maximum	✓	○
• Gaps between vertical cladding 100mm maximum	✓	○
• ~~Mesh size no more than 10mm-1.2m fence height~~	○	○
• ~~Mesh size no more than 50mm-1.8m fence height~~	○	○
• ~~Mesh firmly attached top, bottom and sides~~	○	○

Gates X 2

• Minimum of 1.2m high from outside ground level	✓	○
• Open away from the pool	✓	○
• Close and latch automatically when stationary and released 150mm from the closed position	✓	○
• Latch on outside of gate-1.5m above ground level	✓	○
• Latch on inside of gate-access point is 1.2m high	✓	○
• Remain latched when both lifted up or pulled down	✓	○

Non-Compliant Pool

	Y	N
	○	✓

If any of the shaded circles - ○ - have been ticked the pool is non-complying under the Fencing of Swimming Pools Act 1987 and it **MUST BE DRAINED IMMEDIATELY.**

General Comments: HINGED DOOR FROM ENSUITE HAS SELF-CLOSER AND LATCH AT 1500mm+. DOUBLE RANCHSLIDER OFF LIVING AREA HAS AUTO-CLOSER FITTED AND LATCH AT 1500mm+. GLASS GATE: HAS INTERNAL LATCH SET DOWN BELOW THE TOP OF GATE. BACK GATE HAS INTERNAL LATCH ONLY — THIS GATE CAN ONLY BE OPENED FROM THE OUTSIDE WITH A KEY (@ 1500mm+)

A follow-up inspection is necessary and has been scheduled for: / / at am/pm
(delete if not applicable)
Note: the annual ~~targeted~~ rate charged to ~~pool~~ owners will cover the Hastings District Council's costs in carrying out two ~~inspections~~ over the 3-year inspection cycle. Any further inspections will incur an additional charge of $112.50 (incl. GST) each.

Signed by Council Officer [signature] Contact Phone Number: 8780500 X 8683

Received by Property Owner/Occupant/Agent TSymons COPY FOR BUDG PKT. Date: 12/4/07
(delete non-applicable)

Hastings District Council, Civic Administration Building, Private Bag 9002, Lyndon Rd East, Hastings, Telephone 06 878 0500. Fax 06 878 0515

Customer Copy

2443

Onsite Inspection Report

HASTINGS DISTRICT COUNCIL

Owner / Builder / Plumber / Drainlayer *(circle one)*: Concept

Address: 2538 SH 50

ABA Number: 2004 2396

Inspection Type: FINAL

Inspector: [illegible] **Date**: 12/4/07

Weather: **Time**:

Comments:

✓ (1) As laid drainage plans approved for sewer, septic tank / effluent field and down water.

✓ (2) Producer statement is required for the Roof coat cladding system.

✓ (3) Producer statement is required for the membrain roofing.

✓ (4) Sealant is required where the toilet base contacts the floor tiles.

✓ (5) Sealant required where laundry tub butts to the wall.

✓ (6) Install brackets to downpipes.

✓ (7) Sealant required to the back of all window and exterior door under the head flashings.

✓ (8) Remove the concrete bed from the gully where the PVC relief pipe is discharging.

23 5 07 Completed DD

STANTON PRINT

FINAL INSPECTION CHECKLIST (DWELLING)

HASTINGS DISTRICT COUNCIL

PID 96665

Consent No:	2004 2396.	**Builder:**	CONCEPT.
Address:	2538 SHW 50		
Inspector:	B.C.J	**Weather:**	

DATE / TIME	UNITS	KM's	PASS	☐
12 4 07	8		FAIL	☑

Recheck

DATE / TIME	UNITS	KM's	PASS	☐
			FAIL	☐

Floor Plan Layout Checked	✓	No	Drainage As-Built Plan Received		(No)
Electrical Certificate Received	✓	No	Roofing Complete	✓	No
Gas Certificate Received	✓	No	Claddings Complete	✓	No
Producer Statements Received		(No)	Photos Taken		(No)

Bathrooms

Safety Glazing to Windows	✓	N/A	Extractor Fan Vented to Outside	✓	N/A
Wall Surfaces Sealed	✓	N/A	Waste Traps Vented	✓	N/A
Floor Surfaces Sealed	✓	N/A	FWG Charged / Location		(N/A)
Vanity Sealed to Walls	✓	N/A	Shower Enclosure Glazing	✓	N/A
WC Fixed to Floor	✓	N/A			
WC Sealed to Floor	X	N/A			

Kitchen

Wall Surfaces Sealed	✓	N/A	Wall Surfaces Sealed	✓	N/A
Floor Surfaces Sealed	✓	N/A	Floor Surfaces Sealed	✓	N/A
Extractor Fan Vented to Outside	✓	N/A	Extractor Fan Vented to Outside		N/A
Waste Traps Vented		N/A	Waste Traps Vented		N/A
		N/A	Tub Sealed ~~& Secured~~ To WALL		~~N/A~~ F

Hot Water Cylinder

Seismic Restraints	✓	N/A	Tundish	✓	N/A
Tempering Valve	✓	N/A	Cold Water Expansion Valve	✓	N/A
Open Vented	✓	N/A	Pressure Reduction Valve	✓	N/A
Valve Vented		N/A	Non Return Valve	✓	N/A
Cylinder Drain	✓	N/A	Relief Valve	✓	N/A
Relief Pipe Discharge Visible	X	N/A			

Living Rooms and Bedrooms

Wall/Ceiling Linings Completed	✓	N/A	Ventilation Requirements	✓	N/A
Lighting Requirements	✓	N/A	SMOKE DETECTORS		✓

Roof Space

Adequate Access		(N/A)	Down Lights Clear		(N/A)
Insulation Fitted		N/A	AC Unit Secure	✓	N/A

Carport			**Garage**	
Timber Sizes, Spacing & Spans	N/A		Plate Fixings	N/A
Timber Treatment	N/A		Truss/Roof Frame Fixings	N/A
Metal Connections	N/A		Bracing – Wall / Roof	N/A
Lateral Bracing	N/A		Fire Wall / Separation	N/A

Exterior

Base Ventilation & Access		N/A	Waste Pipes Sealed into Gullies	✓	N/A
Floor Clearance to Ground Level	✓	N/A	Penetrations Sealed	✓	N/A
Cladding Clearance to Ground Level	✓	N/A	Vent Cowls	✓	N/A
Floor Clearance to Paved Area	✓	N/A	Stormwater Disposal	✓	N/A
Cladding Clearance to Paved Area	✓	N/A	Cesspits		(N/A)
Cladding Painted	✓	N/A	Secondary Flow Path		(N/A)
Window ~~Scribers/Inseal~~ SEALED	X	N/A	Balustrades		(N/A)
Flashings	✓	N/A	Steps		(N/A)
Control Joints		N/A	Swimming / Spa Pool	✓	N/A

JOHN SIMMONS CHECKED

Other

	N/A		N/A
	N/A		N/A
	N/A		N/A
	N/A		N/A
	N/A		N/A

Field Inspection Notes: (Free Text)

12/4/07 Refer to report 2443
Recheck required

Recheck Inspection Checklist

Type of Inspection FINAL **of** _____

ABA No.: 2004 2396

Property Address: 2538 SHW 50 **PID:** 96665

Applicant Name: BARNES

Date: 23 5 07 Time: 3:30

Tradespersons: CONCEPT.

Sighted Registration Yes / No

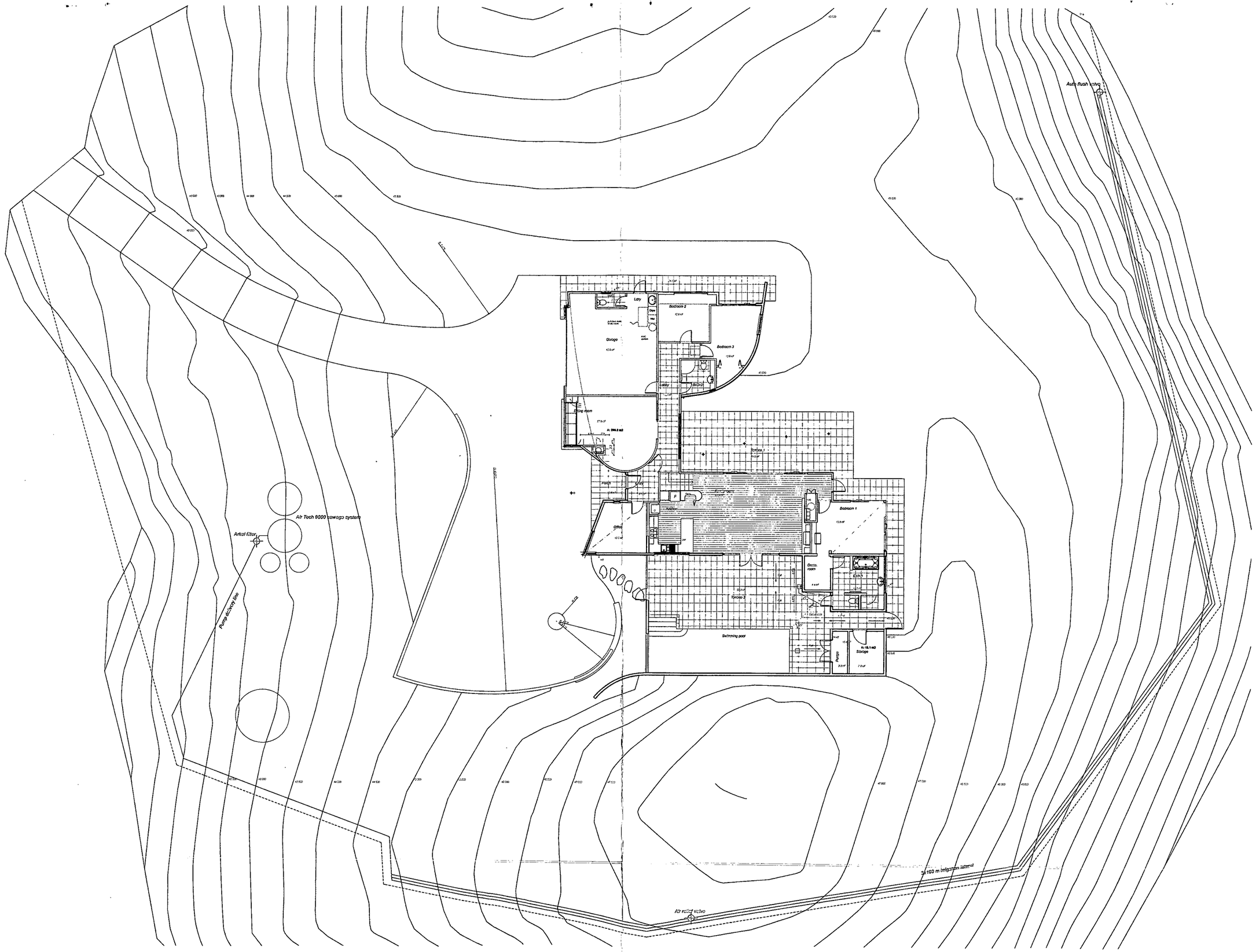
Units	KMs
3	25

Weather Conditions: wet / (fine)

Contact Details: _____

Full/Staged/Partial Inspection: _____ ___ of ___

Item to be inspected for compliance: with the Building Act 2004, NZBC & All Approved Documents and NZS 3604:1999, Manufacturers specs	Plans/Specs Checked PASS	FAIL	N/A	Details of Inspection & Comments: Comments must be made for: 1. Non-complying Items 2. Items/work deviates from approved documents 3. Detail alternative solution & how compliance achieved
Conditions of consent/site instructions read?			✓	Yes / (No)
Approved plans & specifications sighted? *Approved stamped site plan, foundation plan, cross section drawings, truss layout and fixing detail, specifications, engineer detail, floor plan*	✓			(Yes) / No
Approved plans include specific design detail?			✓	Yes / No
Previous on site report completed	✓			(Yes) / No
All Statements & certificated received	✓			(Yes) / No
As laid drainage plans received	✓			Yes / No ~~S/W ?~~
Can work proceed			✓	Yes / No
Is the inspection complete	✓			(Yes) / No
Is the Final inspection complete	✓			(Yes) / No
Can the CCC be completed				Yes / No
Photographs as required			✓	Comments
Any landscaping issues			✓	
Previous problem area resolved	✓			
Overview			✓	
Amended plans / specifications required?	**Yes / (No)**			**Officer:** BCI
Reinspection required?	**Yes / (No)**			**Signed:**
Site instruction issued? #	**Yes / (No)**			
Cavity inspection passed? NA	**Yes / No**			**Date:** 23 5 07


Auto flush valve
Air Tech 9000 sewage system
Arkal filter
Pump delivery line
Air relief valve
24-100 m irrigation lateral
Garage
Lobby
Bedroom 2
Bedroom 3
Bedroom 1
Living room
Kitchen
Office
Terrace 1
Terrace 2
Swimming pool
Pump
Storage
Ensuite
Ensuite room
Laundry
Dryer
Porch

11/6/07 8780515 5 pages

H.D.C. - George Astridge.

CONCEPT
MASTER BUILDERS

R: ABA 2004/2396.

Please find attached

- Electrical Certificate.
- Gas Certificate.
- Completion advise form.

As discussed the owner will have the Geotech Engineer assess the effluent disposal / stormwater overflow. Once I have this I will forward on.

Thanks Garry.

Concept Building Limited Concept House 369 State Highway 2 RD2 Hastings
Tel 06 878 4690 Fax 06 876 2732 Email info@conceptmb.co.nz www.conceptmb.co.nz

ADVICE OF COMPLETION OF BUILDING WORK
Section 43(1), Building Act 1991

HASTINGS DISTRICT COUNCIL

To: Hastings District Council
Private Bag 9002
HASTINGS

Under Building Consent Number: ABA20042396

From Owner – Name: Derek Arthur Barnes

Mailing Address: Concept Building Limited
369 State Highway 2
HAWKES BAY

Project Location: 2356 State Highway 50, Hastings

Work Description: Erect Dwelling

You are hereby advised that:
- ☑ All
- ☐ Part only as specified in the attached particulars

Of the building work under the above building consent is believed to have been completed to the extent required by that building consent.

You are requested to issue:
- ☑ A final
- ☐ An interim

Code Compliance Certificate accordingly (except where a code compliance certificate has been issued by a building certifier as stated below).

The attached particulars include:
- ☐ Building certificates
- ☐ Code Compliance No: [Click & type No.]
- ☐ Issued by [Click & type Name] (building certifier)
- ☐ Producer Statements

Signed by / for and on behalf of the Owner:

Name: Concept Martin Builders - Barry Koonders

Position: Project Manager.

Date: 11/6/07

File/TRIM Ref:

ELECTRICAL WORKERS REGISTRATION BOARD
Safety + Competency

EWRB 551

Electrical Certificate of Compliance

No. 2037376

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

No. of attachments

To be completed whether or not an Inspection is required.

CUSTOMER INFORMATION - PLEASE PRINT CLEARLY

Name of customer: D&C BARNES Phone: 8795270

Address of installation: ~~[illegible] Rd~~ 2538 Roys Hill Rd SH50

Postal address of customer (if not as above): Roys Hill HASTINGS

WORK DETAILS

100 No. of lighting outlets | No. of ranges | Please tick (✓) as appropriate where work includes:

28 No. of socket outlets | No. of water heaters | ✓ Mains | ✓ Main earthing system

Was any installation work carried out by the homeowner? | Yes | ✓ No | ✓ Switchboard | Electric lines

Description: NEW House Work sheet Attached

(MAIN EARTH POOLSIDE OFFICE WALL)

If necessary attach any pages with sketches of work done

It is recommended that test results be recorded here:

- Visual Examination ☐
- Earth Continuity ☐
- Bonding ☐
- Polarity ☐
- Insulation Resistance _____ Mohm
- Other _____

CERTIFICATION OF WORK

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

ELECTRICAL WORKER DETAILS

Name: PETER SLYFIELD
Registration no.: E5629
Company: TE MATA ELECTRICAL LTD
Signature: [signature]
Date: 29 August 06
Contact Ph No.: 0274 442119

CERTIFICATION OF ELECTRIC LINES

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

Name: PETER SLYFIELD
Registration no.: E5629
Company: TE MATA ELECTRICAL
Signature: [signature]
Date: 29 August 06
Contact Ph No.: 0274 442119

INSPECTION DETAILS Electrical work requiring inspection by a registered electrical inspector.

✓ New mains | ✓ Switchboard | ✓ Earthing system | Installation work in hazardous areas

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

Name: T. Beech
Signature: [signature]
Registration no.: T1255
Date: 11 - 9 - 06
Contact Ph No.:

This form is approved by the Electrical Workers Registration Board (PO Box 10-156, Wellington. Freephone 0800 66-1000) for the purposes of the Electricity Regulations 1997.

BARNES COC LIST COC# 2037376.

2538 ROYS HILL ROAD SH 50 HASTING

3x Undertile Heat Pads
1x Solar Hotwater Connection
1x Switch SPA BATH P/P.
2x Bathroom Extract FANS
2x Heated Towel Rail
1x Septic Tank Connection.

TE MATA ELECTRICAL LTD
P.O. BOX 8629
HAVELOCK NORTH
Ph (06) 874 6657
(025) 442 119

1x Dishwasher P/P
1x Induction Hobb
2x Wall oven P/P
3 Switch P/P FRIG/MWAVE/RANGE HOOD.

3 P/P in outside Pool Decks
2x ht " " " "

29 DOUBLE P/P
1x GARAGE DOOR OPENR
1x Attic P/P.

Inside lights
13x Wall lights.
4x 12v Pendants
4x 230v Pendant
6x 230v C/C.
2x GARAGE FLORO
30x 12v Halgn D/C VARIOUS.
1x PANTRY LT
1x Kitchn Cabinet "UP" light.
1x 3WAY LT SWITCH
7x 2WAY.

Outside lights
1x 500 watt Flood.
1x Wall lights on pool wall PARRIAW
3x Sensor heads
1x 2WAY. O/S
21x 12v Downlight.
4x 230v wall lt.

3Ø 30WAY MAIN ENTERNL SWB
2x RCBOS 19x MCBS
EXTERNAL METER BOX

CONSUMERS COPY

Plumbers, Gasfitters and Drainlayers Board

PLUMBERS, GASFITTERS AND DRAINLAYERS BOARD

GASFITTING CERTIFICATION CERTIFICATE
(Pursuant to the Gas Act 1992 and the Gas Regulations 1993 and amendments)
ENERGY WORK CERTIFICATE
(Pursuant to the Building Act 1991)

Certificate No 416610

9th Floor, 70 The Terrace
PO Box 10655
WELLINGTON
Tel 04 494 2970
Fax 04 494 2975
website www.pgdb.co.nz

THIS CERTIFICATE IS NOT TRANSFERABLE

Installation address: Please complete in block letters

(Box No's not acceptable) (Number) 2535 (Street name) State Highway 50

(Suburb)

Hastings (Town/City)

Consumer: (Title) Mr (Initials) D (Family/Business name) Barnes

Category	Type (Regulation 24(1))
☑ Domestic	☑ New
☐ Commercial	☐ Addition, ☐ Extension,
☐ Industrial	☐ Replacement
☐ Temporary	☐ Alteration
☐ Other	☐ Repair following accident

Gas Type ☐ NG ☑ LPG ☐ TLP ☐ Bio

Name of Gas Supplier NOVA LPG

Pipework Installed ☑ YES ☐ NO
(attach pipework diagram)

DESCRIPTION OF GASFITTING TO WHICH THIS CERTIFICATE APPLIES

	Appliance				Flue		Ventilation	
Qty	Type	Location	Make/model	Input rate	Type	Location	Type	Location
1	Water Heater	Ceiling space of garage	Rinnai Infinity REU-V2632FFU-ZK	195 MJ/h	Manufacturers Forced draught	Through Roof.	Complies	
		2 x 18kg LPG Bottles with Auto Change over valve.			Fitted outside			

Test Results

20	min	Duration
7/2.75	kPa	Test pressure
—	kPa	Loss / gain
2.75	kPa	Working pressure

Other Testing

Combustion ☐ Yes ☑ No

Ventilation ☐ Yes ☑ No

Test Date 8/12/06

I certify that :-

1. All appliances and fittings worked on by me or by persons working under my supervision are safe and that all work carried out was in accordance with all applicable requirements of the Gas Act 1992 and Gas Regulations 1993 as amended.
2. The gasfitting to which this certificate applies does not make other parts of the installation unsafe or otherwise non-compliant with the Gas Act 1992 and Gas Regulations 1993 as amended.
3. Gasfitting work to which this certificate applies ☐ **does** ☑ **does not** include work on an appliance or fitting imported or manufactured by a person for their own use.

Certifiers Name S. Fosty

Address 113 A Riverslea Rd Hastings

Registration No 11090

Signature S Fosty

Date 8/12/06

Registered Gasfitter/s Supervised by certifier

Name S. Thomsen

Registration No 18661

Name P Gosling

Registration No 14426

Certificate owner S. Fosty

Registration No 11090

On behalf of HB Gas Services

Address 113 A Riverslea Rd Hastings.

(If other than certifying gasfitter)

POOS 15:01/ST. 14:59 11 06 2007 FROM

HASTINGS DISTRICT COUNCIL

RESOURCE MANAGEMENT DIVISION

Heretaunga Haro te Kahu

Private Bag 9002 Hastings, Telephone (06) 878-0500, Fax (06) 878-0515

TO: Barry Kerenders DATE: 11/6/07

ORGANISATION: Concept Homes FAXED

DESTINATION No: 8762732

SENDER: George Ashenden

We are Transmitting 4 pages (includes this cover sheet) FILE No. 2004/2396

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Please provide me following for Barnes Dwelling for CCC.

2538 SH 50

1. Electrical Certificate
2. Gas Certificate ?
3. Advice of Completion form filled in
4. See attached Consent Notice

Provide written confirmation the effluent field portion has been approved by a Chartered Engineer. & that all Stormwater has been collected & discharged as per the consent Notice.

George Ashenden.

FAXED

DEZIGN WORKS
Consulting Engineers Civil Structural

SCANNED TO TRIM

Original copy given to Phil McKay

1 APR 2005

30th March 2005

Phillip McKay
Private Bag 9002
Hastings

Dear Mr McKay

RE: Geotechnical and Soil Report for Lots 2 and 3 DP 16914, ABA 20042396

In response to your fax dated Enclosed is two copies of the Geotechnical and Soil Report for the above properties. In this report recommendations are made about how the stormwater and sewer are to be dealt with and where the allowable locations for house sites with foundation design parameters are included.

All the structural parameters and recommendations have been followed in the design of the house under which this Building Consent has been applied for.

This Geotechnical and Soil Report was sent in as part of the documentation for the Building Consent Documentation supplied by us and a copy should be on record for this site.

If you have any other questions or queries please contact the undersigned directly.

Yours sincerely
Dezign Works HB Ltd

Phil Paterson
Structural Engineer

Enc: 2 copies of Geotechnical and Soil Report for Lot 2 and 3 of DP 16914

Cc: Raiford Gardiner, Raiford Gardiner Architect (letter only).
Barry, Concept Builders (letter only).

Dezign Works HB Ltd: 107 Market Street North • P O Box 5 • HASTINGS
Telephone: (06) 878-7669 • Facsimile: (06) 878-7699 • Email: info@dworks.co.nz

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1.0 Introduction

1.1 Client's Brief

Tonkin & Taylor were engaged by Les Cole to provide a geotechnical engineers report on the stability of the land at Roys Hill for a proposed rural-residential subdivision. The scope of this report is set out in a letter from Hastings District Council Resource Management Division dated 23 January 2001. The letter requests a preliminary geotechnical report that addresses the issue of stormwater disposal and identifies areas suitable for building sites and on site sewerage disposal as the site is steep with some signs of past instability.

The appraisal reported is based on visual inspection, engineering geological mapping and limited subsurface investigations.

1.2 Location of Site

The proposed subdivision is located on Roys Hill, Ngatarawa, adjacent to SH50. The proposed development will involve the subdivision of the land southeast of the existing access road into four lots, one of which (Lot 1) is occupied by the existing house.

1.3 Site History

It is understood that the area has been under pasture for at least the last 100 years. No significant earthworks have been carried out on the site except for the construction of an access to the existing house and out buildings.

1.4 Previous Work

Except for regional geological studies it is understood that no previous geological or geotechnical reports were carried out for the proposed subdivision area. Experience gained with the soft, weak sedimentary rocks elsewhere in Hawkes Bay has been used in the site appraisal reported here.

2.0 Topography

The site of proposed Lots 1 to 3 is located on a broad southwest to northeast trending ridge flanked by moderately steep slopes some 70 metres above the surrounding plain. The ridge is terminated at the southwestern end by a north trending gully. Access to the ridge top is by a sidling cut which climbs from the floor of the north trending valley up the southeastern side of a blind northeasterly trending gully. Lot 4 is located on a southwesterly trending spur from the main ridge that drops in sharply in elevation down to the valley floor towards the southwest.

3.0 Geology

3.1 Regional Geology

Roys Hill forms an isolated flat-topped hill on the southeastern banks of the Ngaruroro River and is surrounded by Recent gravel. Kingma (Kingma, J.T., 1970, Sheets N134 & N135 Napier and Hastings, Geological Map of New Zealand 1:63360) shows Roys Hill to be formed by Roys Hill Siltstone of Nukumaruan age and capped with limestone mapped as Lower Scinde Island Limestone. Regionally, the Heretaunga Plains that border the site represent a tectonic depression that developed within the East Coast Deformed Belt during the last 1.5 million years. This basin contains up to 1 km of Pleistocene (post 2 million years) gravel, sand and silt which overlie the limestone and sandstone that form the local bedrock (Berryman, K., McVerry, G., Villamor, P., 1997: Hawkes Bay Region Earthquake Hazard Analysis Programme, Stage 2).

Shallow crustal faults and the subduction zone between the descending Pacific Plate and Australian Plate are capable of producing a wide range of earthquake shaking intensities. Results of the Berryman et al studies show that the 142 year return period seismic hazard could produce a PGA 0.26 – 0.40 g across the Hawkes Bay area.

3.2 Site Geology

The broad ridge at the proposed subdivision site is covered by a thin veneer of loess derived topsoil overlying an approximately 1.5 m thick mantle of hard to weakly cemented silty SANDSTONE/sandy SILTSTONE. A 6 m to 8 m thick subhorizontal bed of greyish white shelly LIMESTONE underlies the sandstone/siltstone forming an erosional resistant cap to the ridge. Soft weak SILTSTONE underlies the limestone forming the main part of the ridge.

Shallow slope failures, generally less than 2 m deep; are common on the steeper slopes and are generally due to water entering highly desiccated surficial loess.

Deeper seated landslide scars are also present on the flanks of the ridge. These vacated landslides are typically up to 100 m wide with a head scarp formed at the base of the limestone bed. The failure geometry is indicative of a circular-type release surface with the debris from the event left at the toe of the slope. No groundwater seeps were noticed and water well drilling on the ridge has been unsuccessful suggesting low storativity in the siltstone rock mass and low groundwater levels.

More detailed inspection of these landslides suggests that the failed soil mass is derived from the weathered outer mantle of the siltstone on the flanks of the ridge. This, coupled with the probable low groundwater levels, is interpreted to indicate the failures are likely to be caused by severed earthquake shaking. This aspect is covered in more detail in a following section.

4.0 Field Investigations

4.1 Engineering Geological Investigation

The site was field mapped using GIS generated orthophotography showing property boundaries. Locations were determined by using a hand-held GPS with an accuracy of ±5 m and sections measured using a tape and clinometer.

Engineering geological data is shown plotted on a plan (Figure 1) and cross sections (Figure 2).

4.2 Field Testing

The proposed house sites for Lots 2 and 3 were investigated by test pits excavated by a small hydraulic excavator. An engineering geologist logged the pits. The two pits (TP1 at Lot 2 house site, TP2 at Lot 3 house site) both encountered 0.2 m topsoil underlain by 1.0 m of hard to weakly cemented SAND and SILTS transitional to soft weak SANDSTONE and SILTSTONE. Detailed field mapping showed that a 6 m to 8 m thick subhorizontal bed of hard shelly LIMESTONE underlay the SAND and SILT at approximately 2 m depth. The digger was unable to penetrate deeper than 1.0 m through the hard soils.

5.0 Seismicity

The seismicity for the Hawkes Bay region is described Berryman et al (1997) and Figure 8 of the Stage 2 report by Berryman et al ("A Numerical Assessment of the Earthquake Hazard in the Hawkes Bay Region") assesses the 142 year PGA (g) for the site as 0.33 g. This value has been used to assess the stability of the building platforms in a following section.

6.0 Influence of Subsurface Conditions on Site Development

Development of Lots 2 & 3 should be relatively straightforward for a dwelling designed in accordance with normally accepted stability requirements. The main issue considered for each of these building platforms involved determining the set back from the break in slope. Lot 1 building platform is located on the ridge crest behind the headscarp of an vacated landslide scar, Lot 2 building platform is located on the crest above a slope unaffected by previous deep seated landslippage.

Long sections were prepared for each building platform and annotated with the local stratigraphy. Back analysis of the vacated scar below Lot 2 (Section A-A') was undertaken using interpolated surface contours derived outside the landslide area to determine soil shear strength characterisation for failed soil mass for a horizontal ground acceleration of 0.33g. These analyses were undertaken using both *SLOPE W* and *SARMA method of non vertical slices*. The slope was assumed to be fully drained soil shear strength characterisation of $c' = 20$ kPa $\emptyset = 35°$ were derived for the weathered siltstone. Hoek-Brown criteria were used to estimate the strength of the unweathered rock mass. Two values of the GSI (Geological Strength Index) were taken to give upper and lower bound values for the shear strength characterisation of the rock mass at a depth of 20 m.

For a GSI of 50 (very blocky, interlocked, partially disturbed slightly weathered rock mass) the shear strength indicated was $c' = 114$ kPa, $\emptyset' = 36°$. Where the GSI was set at 70 (blocky, very well interlocked undisturbed unweathered rock mass) the shear strength was $c' = 215$ kPa, $\emptyset' = 40°$.

These shear strengths were then used to complete stability analyses of the profiles below the two building platforms for earthquake shaking. The failure geometry used was a circular-type failure up to the base of the limestone unit with a vertical tension crack through the limestone to represent a vertical defect. The potential failure surface modelled above intersected the existing slope 10 m back from the break in slope.

The stability analyses indicate the following:

House Site	Rock Mass Shear Strength		FoS at g = 0.33
Lot 2	$c' = 114$ kPa	$\emptyset' = 36°$	1.59
Lot 2	$c' = 215$ kPa	$\emptyset' = 40°$	2.40
Lot 3	$c' = 114$ kPa	$\emptyset' = 36°$	1.38
Lot 3	$c' = 215$ kPa	$\emptyset' = 40°$	2.00

A 10 m set back for buildings from the break in slope is therefore recommended.

No specific investigations were carried out for the proposed house platform on Lot 4. Based on our visual assessment the house platform located at the end of a broad ridge immediately above the valley floor is free of any stability issues but should be subject to specific foundation investigation and design. The house site is well away from the steeper section of the ridge to the northeast and the hazard associated with down-slope movement of debris onto the house site is judged to be negligible. Access to the proposed house sites on Lot's 2, 3, and 4 is straightforward and will only require minimal earthworks.

7.0 Settlement and Allowable Foundation Bearing Pressures

Conventional spread footings are the appropriate foundation type for this site given the stiff nature of the surficial deposits and absence of evidence for compressible layers at depth.

Allowable foundation bearing pressures could not be determined by consideration of the shear strength on near surface soils due to the stiff nature of the soils. (The shear vane could not be pushed into the soil.) From the soil description we recommend that a lower bound shear strength of 100 kPa should be taken for design purposes. It is also recommended that all footings be founded at a minimum depth of 450 mm below the ground level to minimise the effects of ground shrinkage or swelling.

8.0 Stormwater Disposal

It is recommended that all stormwater from house roofs not required for domestic use and that collected from paved areas be taken via sealed drains

from Lots 2 and 3 to the base of adjacent gullies on the northern (Lot 2) and western (Lot 3) side of the ridge and discharged in a controlled manner to overland flow. An energy dissipation structure may be required at the point of outfall.

Stormwater runoff from the proposed roading development to Lots 2 and 3 will require to be treated in a similar manner. Where loess is encountered in the roading development table drains may require to be sealed and pipes laid in these materials will require drainage cut-offs in the trenches to minimise internal erosion.

9.0 Household Effluent Disposal

No testing was undertaken to determine the rate of shallow soakage on site. However it is expected that the soils will be slow draining and have a moderately severe limitation to soakge. Proposed soakage fields will require to be located on the northwestern side of the ridge for Lots 2 and 3 and be of sufficient size to operate as evapo-transpiration units.

It is recommended that the siting of proposed soakage fields be subject to approval of an engineer experienced in geotechnical engineering to minimise adverse effects on local slope stability.

10.0 Conclusions and Recommendations

- The proposed development will involve the subdivision of the land into four lots. Lot 1 contains the existing house, Lots 2 and 3 are on the same ridge crest as Lot 1 with access extending on from the existing access road. Lot 4 is located on the northern side of the property.

- The local geology consists of a thin limestone bed forming a cap to a broad ridge which is formed by soft weak siltstone. Bedding of these Nukumaruan marine sediments is subhorizontal.

- Nearby shallow crustal faults and the subduction zone are capable of producing a wide range of earthquake shaking intensities.

- The 142 year return period seismic hazard would produce a 0.33 g PGA at the site.

- Both shallow (less than 2 m) and deeper seated landslide scars are present on the flanks of the ridge below Lots 2 and 3. The shallow landslides appear to be due to saturation of the surficial soils.

- The deeper landslides are interpreted as resulting from severe earthquake shaking based on failure geometry and expected low groundwater levels within the soil profile.

- Field investigations show the soils at the house platforms for Lots 2 and 3 to be very stiff to hard in the silts and dense to weakly cemented in the sands. While similar soil conditions are expected for the house platform on Lot4 specific foundation investigation and design are recommended.

- Stability analyses carried out with estimated rock mass shear strength parameters indicate that the house platforms be set back 10 m from the break in slope for Lots 2 and 3.

- Conventional spread footings are considered appropriate with a lower bound shear strength of 100 kPa taken for design purposes.

- Particular care needs to be applied to stormwater runoff especially for the access roads.

- Evapo-transpiration fields will be required for sewerage effluent disposal. It is recommended that the field locations be approved by an engineer experienced in geotechnical engineering to minimise adverse effects on local slope stability.

11.0 Applicability

This report has been prepared for the benefit of you with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

TONKIN & TAYLOR LTD
Environmental and Engineering Consultants

Report prepared by:

Bernard Hegan
Senior Geologist

Authorised for Tonkin & Taylor by:

Peter Millar
Geotechnical Group Manager

rmt
11 May, 2001
J:\1882\9\BDH260401.REP.DOC

APPENDIX A

TEST PIT LOGS
PRELIMINARY GEOTECHNICAL PLAN & SECTIONS

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP 1
Location:
SHEET 1 OF 1

PROJECT: L. Coles SH50 | LOCATION: House Site 1 | JOB No: 18829

CO-ORDINATES mN / mE | EXPOSURE TYPE: PIT | HOLE STARTED: 15-3-01

R.L. m | EQUIPMENT: DIGGER | HOLE FINISHED: 15-3-01

DATUM | OPERATOR: | LOGGED BY: BAH

DIMENSIONS: | CHECKED BY:

EXCAVATION TESTS						ENGINEERING DESCRIPTION						GEOLOGICAL	
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
		DRY			0.5			dark brown sandy SILT				topsoil	
					1.0			khaki sandy SILT, hard dry grades to silty SAND very dense to weakly cemented				Tertiary SANDSTONE	
								EOP 1.0m					

SKETCH

TONKIN & TAYLOR LTD

EXCAVATION LOG

EXCAVATION No: TP2
Location:
SHEET 1 OF 1

PROJECT: L. Colas SH50 LOCATION: House Site 2 JOB No: 18829

CO-ORDINATES mN / mE
R.L. m
DATUM

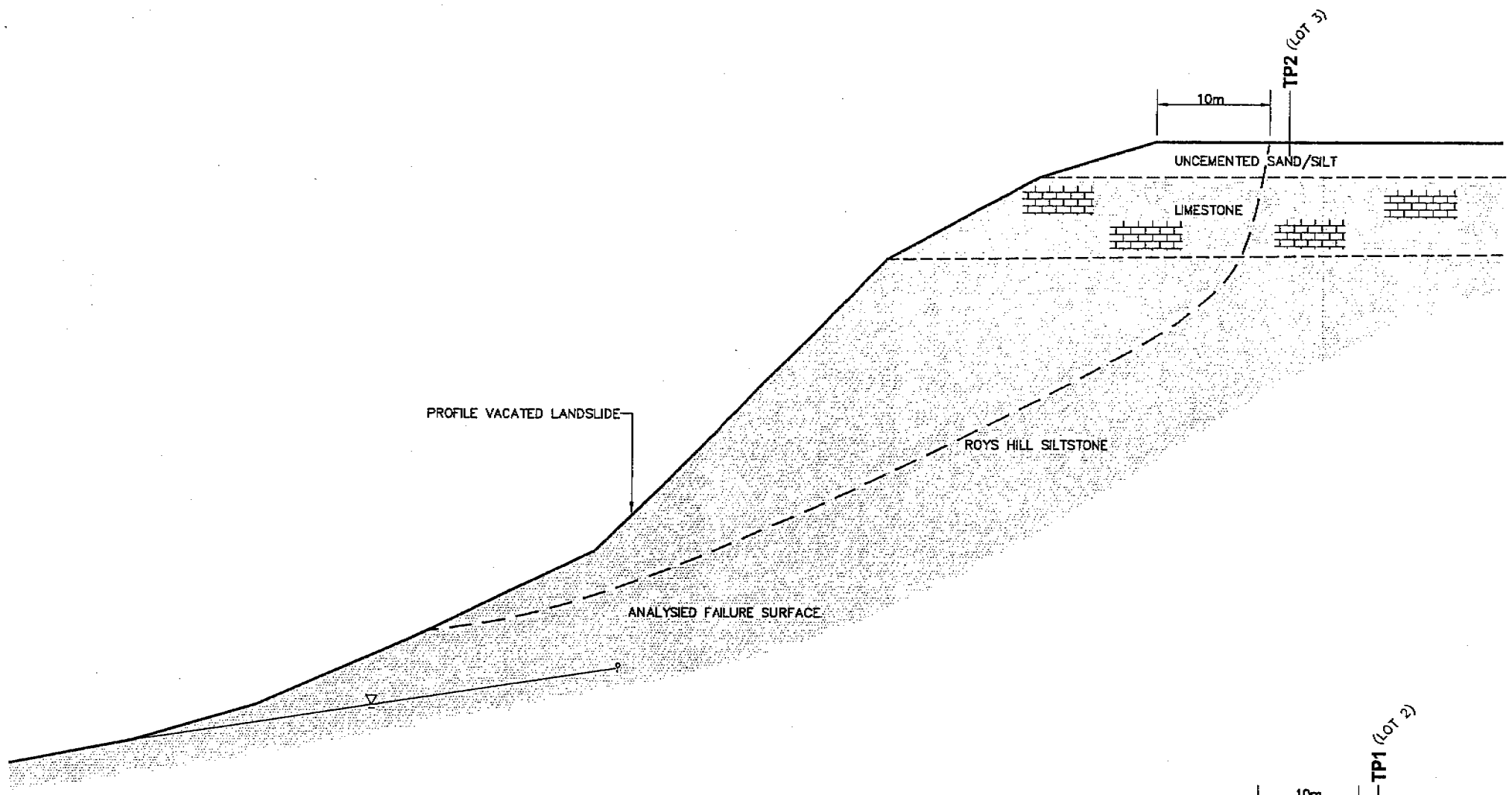
EXPOSURE TYPE:
EQUIPMENT:
OPERATOR:
DIMENSIONS:

HOLE STARTED:
HOLE FINISHED:
LOGGED BY:
CHECKED BY:

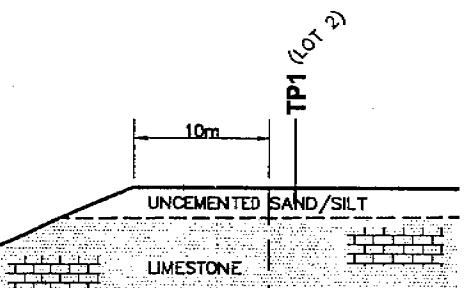
EXCAVATION TESTS | ENGINEERING DESCRIPTION | GEOLOGICAL

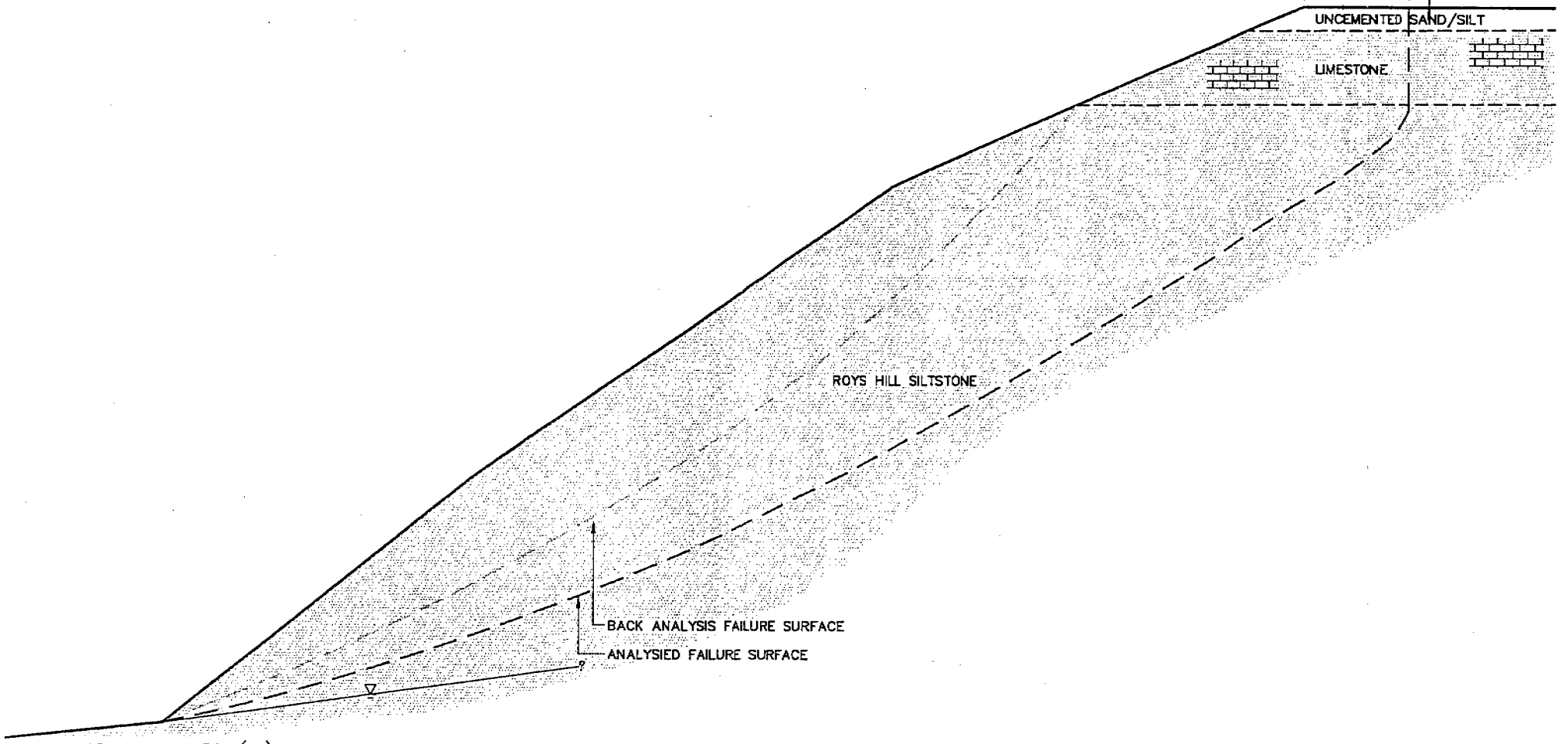
PENETRATION	SUPPORT	WATER	SAMPLES, TESTS	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL NAME, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, SECONDARY AND MINOR COMPONENTS	MOISTURE CONDITION / WEATHERING	STRENGTH / DENSITY CLASSIFICATION	ESTIMATED SHEAR STRENGTH	ORIGIN TYPE, MINERAL COMPOSITION, DEFECTS, STRUCTURE	UNIT
		DRY			0.5			dark brown sandy SILT				Topsoil	
								weakly cemented khaki sandy SILTSTONE				Tertiary SILTSTONE	
					1.0			EOP 1.0m					

SKETCH



CROSS SECTION AA





CROSS SECTION BB

GEOLOGICAL LEGEND

- WATER LEVEL
- SPRINGS
- INFERRED GROUNDWATER TABLE
- BACK ANALYSIS FAILURE SURFACE
- ANALYSIED FAILURE SURFACE
- UNCEMENTED SAND/SILT
- LIMESTONE
- ROYS HILL SILTSTONE

SCALE 1:500

0 10 20 30 40 50 (m)

NOTES

1. All dimensions are in metre units unless noted otherwise.

0	First Issue	
REVISION DESCRIPTION	BY	DATE
DESIGNED :		
DRAWN :	AMM	MAY 01
DESIGN CHECKED :		
DRAFTING CHECKED :		

REFERENCE :

CADFILE : L:\18829\18829-02

APPROVED :

NOT FOR CONSTRUCTION

This drawing is not to be used for construction purposes unless signed as approved

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TONKIN & TAYLOR
ENVIRONMENTAL & ENGINEERING CONSULTANTS
AUCKLAND 19 MORGAN ST. NEWMARKET
TEL. (09) 355 6000 FAX. (09) 307 0265
EMAIL : auck@tonkin.co.nz
WELLINGTON CHRISTCHURCH
HAMILTON NELSON WHANGAREI

LES COLES

PROPOSED SUBDIVISION
GEOTECHNICAL
INVESTIGATION
SH50
HASTINGS/HAWKES BAY

GEOLOGICAL
CROSS SECTIONS

SCALES (AT A3 SIZE)
1:500

DWG. No.

REV.



Hastings District Council

G.I.S. Section

L Cole Subdivision: Preliminary Geotechnical Plan

Grid: New Zealand Map Grid
Height Datum: Mean Sea Level
Coordinates in Metres
Geodetic Datum 1949

Scale 1 : 3001

30.01 0 30.01 60.02 90.03 120.04

Metres

Date : Thu 15 Mar 2001

N

DATA SOURCE
Cadastral information derived from the Land Information New Zealand's Digital Cadastral Database (DCDB).
CROWN COPYRIGHT RESERVED

COPYRIGHT
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DISCLAIMER
The Hastings District Council cannot guarantee that the data shown on this map is 100% accurate.

HASTINGS DISTRICT COUNCIL

96665

Swimming and Spa Pool Site Inspection Report 4200

Owner/Occupier/Agent: D.A. & C.J. BARNER Date of Issue: 12/4/07
(delete non-applicable)
Address/Location of Pool: 253B STATE HIGHWAY 50 Consent No. ARA 20042396
Postal Address: 445 NGATARANA ROAD HASTINGS FSP No. 3448
(if different to above)
Contact Phone Number(s): 879 5270

Pool Location

	Y	N
Is the pool enclosed in a building not specifically used for the pool's purpose? *(if yes, the pool is exempt under the Fencing of Swimming Pools Act 1987)*	○	✓

Above-ground Pools

• Sides to be 1.2m minimum from ground level	○	○
• Smooth vertical sides (no climbing assistance)	○	○
• Climb points or external fixtures within 1.2m of pool	○	○
• Ladder to be removable	○	○

Immediate pool area

Is the immediate pool area only fenced? The fenced area should only contain items used for pool activities (i.e. patio furniture, decking, pool equipment, pump house etc) it must not contain: clotheslines, children's play areas or vegetable gardens)	✓	○

Hinged doors giving access to pool area

• Close and latch automatically when stationary and released 150mm from the closed position	✓	○
• Latch or handle is a minimum of 1.5m above floor	✓	○
• Open away from the pool	○	○
• Hold-open devices fitted	○	✓

Sliding doors/bi-folds giving access to pool area

• Latch or locking bolt at a minimum height of 1.5m	✓	○

Windows below 1.2m giving access to pool area

SLIDING WINDOW OVER KITCHEN BENCH

• Limiter fitted to prevent opening more than 100mm	✓	○

Fence

• Minimum of 1.2m high from outside ground level	✓	○
• Fixtures and fittings within 1.2m of the fence	○	✓
• 900mm minimum between horizontal rails	✓	○
• Gaps under fence 100mm maximum	✓	○
• Gaps between vertical cladding 100mm maximum	✓	○
• Mesh size no more than 10mm-1.2m fence height	○	○
• Mesh size no more than 50mm-1.8m fence height	○	○
• Mesh firmly attached top, bottom and sides	○	○

Gates x 2

• Minimum of 1.2m high from outside ground level	✓	○
• Open away from the pool	✓	○
• Close and latch automatically when stationary and released 150mm from the closed position	✓	○
• Latch on outside of gate-1.5m above ground level	✓	○
• Latch on inside of gate-access point is 1.2m high	✓	○
• Remain latched when both lifted up or pulled down	✓	○

Non-Compliant Pool

	Y	N
	○	✓

If any of the shaded circles - ○ - have been ticked the pool is non-complying under the Fencing of Swimming Pools Act 1987 and it **MUST BE DRAINED IMMEDIATELY.**

General Comments: HINGED DOOR FROM GARAGE HAS SELF-CLOSER AND LATCH AT 1500mm. DOUBLE PANEL SLIDER OFF LIVING AREA HAS ANTI-CLOSER FITTED AND LATCH AT 1500mm. GLASS GATE HAS INTEGRAL LATCH SET DOWN BELOW THE TOP OF GATE. BARN GATE HAS INTEGRAL LATCH ONLY - THIS GATE CAN ONLY BE OPENED FROM THE OUTSIDE WITH A KEY (1500mm)

A follow-up inspection is necessary and has been scheduled for: / / at am/pm
(delete if not applicable)
Note: the annual targeted rate charged to pool owners will cover the Hastings District Council's costs in carrying out two inspections over the 3-year inspection cycle. Any further inspections will incur an additional charge of $112.50 (incl. GST) each.

Signed by Council Officer ..... Contact Phone Number: 8780500 K Bolt

Received by Property Owner/Occupant/Agent T SIMONS COPY FOR BUILDER PACK Date: 12/4/07
(delete non-applicable)

Office Copy Data Entered ✓

If calling ask for Helen Gelletly

TRIM Ref: 96665#024

7 June 2005

Derek Barnes
445 Ngatarawa Road
HASTINGS

Dear Derek

Rural Property Numbering

You will find enclosed the rural property number that has been issued to you by the Hastings District Council.

The number that has been identified for your property is: 2532

A twenty dollar rapid number fee has been added to your building consent ABA20042396.

This is now your official street address and can be used every time you need to identify your property. In most cases this number is the distance in kilometres a property is from the start of the road, or in some cases its intersection with another major road. Dividing it by 100 would give the distance to the start of the road, eg number 165 is 1.65km along the left and 2672 is 26.72 along the road on the right.

If for any reason you feel the number that has been allocated is incorrect please let me know as soon as possible.

Council encourages you to use this number wherever possible as we believe it is in everyone's interest that properties be easily found. An example of how your number should be used is;

Mr J Simpson
165 Smith Road
R D 2
HASTINGS

You should note that NZ Post recognise the Rapid numbering system as a component of an address so you are encouraged to use your number on your address but the RD number must **always** be supplied as well.

The number you have been provided should be installed at the entrance to your property.

This number should not be moved from this position because it signifies the actual measurement to that location.

Yours sincerely

Helen Gelletly
Property Data Officer
heleng@hdc.govt.nz

RESOURCE MANAGEMENT

207 Lyndon Road East
Private Bag 9002, HASTINGS
DX MA75020
Phone (06) 878-0500 Fax (06) 878-0515
www.hastingsdc.govt.nz

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BARNES HOUSE.
State Highway 50
Hawkes Bay.

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O INTRODUCTION

O.1.1 EMPLOYER:

Concept Master Builders Ltd
369 State Highway 2, RD2, HASTINGS
Tel 06-8784690
Fax 06-8762732

O.1.2 PRINCIPAL CONSULTANT:

Raiford Gardiner Architects Ltd
212 Queen St East, Hastings, Box 1491 HASTINGS.
Tel 06-876-7601
Fax 06-876-2790,
Cell 025-491-227
E-Mail raiford@airnet.net.nz

O.1.3 SECONDARY CONSULTANTS:

Holmes Consulting Ltd, Structural and Civil Engineers
212 Queen St East, Hastings,
Tel 06-876-0818
Fax 06-876-2790

O.1.4 LOCAL AUTHORITIES:

Hastings District Council
Tel 8780500

O.2 SITE

O.2.1 Lot 1,DP 308836 Access: From ROW
Working Area: The owner will define the available areas of the site.

O.3 CONTRACT DOCUMENTS are as follows:

O.3.1 NZIA Conditions of Contract and Addenda

O.3.2 Contract Drawings: Architectural Drawings Sheets 1-9 plus Engineers Documents and Bracing Plan.

0.3.3 This specification; which is divided into trade sections generally according to the same or similar codes used in NZS 4202 [Standard Method of Measurement of Building Works]

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1 **PRELIMINARIES**

1.2. FORM OF CONTRACT.

1.2. FORM OF CONTRACT.

The form of contract shall be the current edition of the NZIA Conditions of Contract, together with any Addenda, Special Conditions of Contract and any amendments or supplementary conditions.

1.3 THE CONTRACTOR SHALL ALLOW FOR THE FOLLOWING:

1.3.1 The General Conditions and Special Conditions of Contract.

1.3.2 Compliance with, and the giving of, notices required by any Act of Parliament, by Regulations made thereunder, or by the order or direction of any lawful authority including those noted under 0.1.4, and the paying and indemnifying of the employer against any fees or charges demandable by law. Regardless of any requirement defined by the drawings or this specification the requirements of any Act of Parliament or Regulation, or Local Authority Bylaw shall take precedence.

1.3.2.1 Giving reasonable notice to the Architect, the owner, or other consultants as necessary before closing in or covering any work required to be measured on site.

1.3.3 The obtaining of necessary consents from any local authority, electrical supply company or the like, and the payment of fees to such bodies in relation to the building works.

1.3.4 INSURANCE OF THE WORKS

INSURANCE OF THE WORKS [see General Conditions of Contract, clauses] shall cover the structure as well as materials on the site for the full insurable values of the respective interests of the contractor and the employer. Exclude from the amount to be insured any significant elements such as demolitions or bulk earthworks which are not subject to the hazards insured. The cover is required to be increased progressively as the structure proceeds.

1.3.5 Bond [Deleted]

1.3.6 [Deleted]

1.3.7 Providing and maintaining up to date a linked bar chart construction programme.

1.3.8 Setting out the works, and the provision of all instruments and labour required for the checking of the works when required or requested.

1.3.14 Sheds, mess rooms, toilets, water, power, telephone etc, and attendance on the same.
Water, power and telephone are available on site.

1.3.17 The care and security of the works.

1.3.18 The daily management, supervision, and administration of the works.

1.3.19 General attendance upon the Works. Attending site meetings when called, monthly or when specially called by the Architect. Provide copies of the current programme for the architect and the owner at each site meeting.

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1.3.21 Testing of materials and submission of samples and results.

1.3.22 Plant and tools required for the execution of the works.

1.3.24 Scaffolding for exterior and/or interior as required.

1.3.28 The protection of the Works from weather or damage from any other cause. Leaving the works secure on completion with all access ways locked. Handing over the keys to the owner on completion of the contract.

1.3.30 The maintenance and protection of other property, and the property of water, electricity or gas suppliers and similar undertakings, and the making good and paying for any damage thereto.

1.3.31 Providing a skip or bin or other enclosed or semi enclosed container for all trades to dump debris, off cuts etc, and emptying the container when full so that no rubbish is left around the site at any time. Each trade shall dump their rubbish in the provided container or take it away from the site daily. Hazardous waste (if any) shall be separately dumped by the relevant trade according to safety regulations covering the particular waste product. Ref 1.5.4 below.

1.3.32 Cleaning all surfaces ready for occupation.

1.3.35 The correction of defects in the Works together with any special requirements, including any repairs or reinstatement works required on account of damage to or failure of any material, component, system or element.

1.4 MATERIALS AND WORKMANSHIP.

1.4.1 Use only new materials and fittings unless otherwise required.

1.4.2 Integrate materials deliveries with programme requirements.

1.4.3 Handle, store, use and/or fix materials, fittings, etc in accordance with the manufacturers recommendations, instructions or the like.

1.4.4 Provide the Architect with samples when requested. Retain samples on site until completion of works. Remove when no longer required.

1.4.5 Dissimilar materials. Where dissimilar materials may come into contact in such a way as to cause corrosion, allow for separation by non-corrosive coating, tapes, strips or similar, to completely avoid such corrosion.

1.4.6 DOCUMENTS: All dimensions shall be taken as between structural members or framing unless clearly shown to centrelines or otherwise. Tolerances shall be noted and/or allowed for each trade or item.

1.4.7 **SAFETY NOTE: THE SITE IS LOCATED NEAR THE EDGE OF A STEEP BLUFF. THE OWNER SHALL FENCE THIS OFF AND THE CONTRACTOR SHALL FIX ORANGE WARNING TAPES TO THE FENCE AND SHALL MAINTAIN THESE THROUGHOUT CONSTRUCTION OF THE HOUSE. THE CONTRACTOR SHALL BRING THIS POTENTIAL HAZARD TO THE ATTENTION OF ALL SUBCONTRACTORS, ETC ON THE SITE.**

1.5 STANDARDS

1.5.1 Reference to NZS [Code no] means the relevant current version [as at time of close of tenders] of a standard published by The Standards Association of New Zealand.
NZBC means the New Zealand Building Code, Handbook and/or Approved Documents.

1.5.2 The Contractor, Subcontractors and Suppliers shall comply with any standard or standards and the NZ Building Code relevant to this project.

1.5.3 A copy of each standard relevant to any sub trades on site work shall be kept on site by the sub tradesman any time that such works are under way on the site.

1.5.4 The Contractor, Subcontractors and Suppliers shall comply with all local bodies requirements, OSH requirements, and all manufacturers and/or suppliers specifications or instructions, whether noted on the drawings or in this specification, or not.

1.5.5 Manufacturers Documents for supply, installation or operation shall be referred to whether noted in this specification or not. Documents are available by contacting the manufacturer or supplier. The contractor shall ensure that all supplied elements are installed in compliance with the relevant manufacturers instructions and shall obtain these if they are not supplied with the elements on delivery to the project.

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3 EXCAVATION AND BACKFILL

3.1. Preliminary & General

The subcontractor shall take notice of and abide by any parts of the preliminary and general clauses that relate to this trade.

3.2. Scope This section includes but is not necessarily limited to: excavation and backfill for construction works or service lines.

3.3. Standards: Except as modified by this section, all materials and workmanship shall comply with the appropriate NZ Standard , NRB specification or New Zealand Building Code.

3.4. Setting Out: The Contractor shall be responsible for setting out the work.
Refer Site, Dimension and Slab Plans. Check all the levels on site.

3.5. Materials

3.5.1 Hardfill

Hardfill shall consist of approved excavated rock or suitably graded imported rock or gravel material of 50mm maximum size. Material shall be clean and free from clay, organic or other foreign matter.

3.5.2 AP40 Basecourse: The AP40 basecourse aggregate shall comply with the requirements of Transit New Zealand M/5 specification.

3.5.3 Sand:Sand shall be natural river sand or crushed aggregate sand with an approximate grading of 10-30% passing a 300 micron sieve and not greater than 5% passing a 150 micron sieve.

3.6. Stripping of the Site: Allow to strip the building area of all vegetation, topsoil, rubbish etc. Remove all unsuitable material off the site. Store topsoil where directed by the owner.

3.7. Excavation: Excavate the site to the levels shown on the site layout drawings. Drainage trenches: excavate to suit pipe falls, in straight lines or even curves, allowing space for joints. Excavate for the Biocycle tank where indicated.

The Contractor shall be responsible for any temporary support necessary. All overbreak shall be removed and the resulting spaces backfilled with free draining material to the Engineers satisfaction.
Extra depths may be required to attain solid bearing, as directed by the Engineer. Maintain and drain the surface at all times.
Foundations shall be founded on firm ground with a minimum safe bearing capacity of 100 kPa.

3.8. Ground Water

Ensure that ground water level on site does not affect the excavations.

3.9. Excavated Material

All surplus material from excavations, not suitable for backfilling shall be disposed of off the site. Material suitable for use as hardfill may be stockpiled on site and used instead of imported material.

3.10. Foundations: After excavation is complete, notify the Building Inspectors to inspect the foundation material before any concrete is placed.

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3.11. Backfilling

3.11.1 General

All spaces excavated and not occupied by concrete shall be backfilled with approved material and compacted up to the level of the nominal surface from which the Contractor is required to excavate.

3.11.2 Fill under Slabs and Permanent Works

Fill to near the underside of DPM with hardfill laid at its optimum moisture content and compacted in layers not exceeding 150mm thickness. Fill shall be brought up evenly on both sides of foundations until the final level is reached. Care must be taken so as not to damage services, pipes subsoil drains etc. during filling.

Provide a thin sand blinding (25 mm maximum) over hardfill under floor slabs. The blinding shall cover the entire surface and leave no stones showing through. Note the lower levels required for the polystyrene underfloor insulation.

3.11.3 Backfill Around Foundations Outside Building

Backfill to level of adjoining ground with hardfill placed in layers not exceeding 150mm in thickness. Backfilling shall be brought up evenly on both sides of foundations until the final level is reached. Care must be taken so as not to damage footing walls, services, pipes, subsoil drains etc. during backfilling. Adjacent to foundation beams and footings hand compaction methods may be necessary.

3.11.4 Fill to Services Trenches

Backfill services trenches only after testing and inspection of the services. Take care not to damage pipes, cables.

3.12. Damp-proof Membrane

Over the sand blinding to slabs where shown on the drawings, place one layer of Ultrathane 2000 or equal to form a continuous membrane. Lap to Manufacturer's recommendations and thoroughly seal with adhesive tape. The membrane shall be turned up the slab edges all round the floor area, and in particular shall be sealed to the tanking on the block retaining walls. See drawings. Lay ***under*** 40 mm polystyrene.

3.13. Compaction

Each layer of fill shall be compacted to a uniformly dense, stable condition in which it does not weave or creep under rolling.

3.14 CLEANUP. Pick up any debris, off cuts or other rubbish generated by this trades work on site.
Remove debris from the site
Do not leave rubbish (or anything else) at any time where it could cause a hazard.

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6 CONCRETE WORK

6.1. Preliminary & General

The subcontractor shall take notice of and abide by any parts of the preliminary and general clauses that relate to this trade. Refer to standard details and follow as appropriate.

6.2. Scope: This section includes but is not necessarily limited to: the supply, placing and finishing of cast insitu concrete. This includes the footings, floors, stairs, terraces and paving and blockfill.

6.3. Refer to the following:

The following standards shall apply:-

New Zealand Building Code NZS 3101, Design of Concrete Structures

NZS 3109, Concrete Construction

NZS 3313, Chemical Admixtures for Concrete

NZS 3114, Concrete Surface Finishes

NZS 3121, Water and Aggregate for Concrete

NZS 3122, Portland Cement

NZS 3123, Portland Pozzolon Cement

NZS 4210, Code of Practice for Masonry Buildings

6.4. Materials All materials shall comply with the relevant New Zealand Standard.

6.4.1 Air Entrainment

The manufacturer may add an air entraining agent to the concrete to provide up to 6% of the entrained air in the mix. Do not use air entrainment for any concrete scheduled to be finished with exposed aggregate or by grinding to expose the stones. see finishes schedule.

The application of the air entraining agent shall fully comply with the requirements of NZS 3109. Do not use air entrainment for exterior paving concrete.

6.5. Concrete Production

Ready mixed concrete shall be used, complying with NZS 3104:1983, special grade.

6.6. Schedule of Concrete Mixes: Concrete mixes shall be as follows:

28 DAYS	STRENGTH MPa	LOCATION
	10	Site Concrete
	20	Foundation and Floors
	20	Masonry Grout
	35	Precast Slabs

6.7. Handling and Placing

- The handling and placing of concrete shall be in accordance with NZS 3109.
- The Building Inspector shall be advised of those areas to receive concrete at least 24 working hours before concreting for inspection purposes.

6.8. Vibration: All concrete shall be vibrated with immersion type vibrators. Ensure that no concrete blockwork is spattered by the vibrators or any other means.

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6.9. Curing All slabs shall be protected and water cured for 7 days (minimum)

6.10. Tests During Construction

The Contractor shall allow for the cost of concrete testing. Tests shall be carried out during construction to check the compliance of the concrete with the specification. The tests required shall be carried out in accordance with NZS 3112 Parts 1 and 2, 1986 and NZS 3109:1980. The Contractor shall provide and keep on site all equipment necessary for the making of all site tests required by the specification.

6.11. Falsework & Formwork

•Shall be used whenever necessary to support, confine and shape the concrete to required lines and dimensions. After constructing the formwork, check the actual dimensions of the formwork against the drawn dimensions and report results to the architect. Check the location and size of the floor rebates for doors, plumbing outlets etc to ensure that no adjustment is required later.

•Shall be accurately and securely set up with adequate bracing and close joints.

•Fillets or chamfers as appropriate shall be provided at internal and external corners to ensure stripping of forms does not damage finish.

•On completion of the formwork it shall be measured and checked against the dimensions shown on plan and the results immediately reported in writing to the architect and later to the next site meeting.

•Formwork shall not be stripped until the minimum periods set out in Table 5 of NZS 3109, (with due allowance for cold weather), or such extended time as the Engineer considers necessary. Care shall be taken when stripping formwork to avoid marking the surface.

6.12 Surface Finish

Surface finishes shall be as set out in the Schedules of Surface Finishes below. All surface finishes shall comply with the requirements of NZS 3114:1987. Where applicable, the concrete surfaces shall be suitable for application of the specified finishing material, and of such evenness that the finishing material does not reflect blemishes.

Formed Surfaces

Foundations not exposed to view	F1
All other concrete	F3

Unformed Surfaces

Floor Slab	U3

6.13 Protection

At all times make adequate provision for protection from rain. When rain is possible, the pour shall not commence unless adequate temporary cover, suitable for rapid positioning, is available.

Make good any weather damage to concrete.

Protect all new concrete work and ensure that no heavy loads are placed on or moved over the finished concrete until twenty eight days old.

6.14 Crack Control Joints. For preference do not saw the crack control joints but use proprietary metal construction joint makers.

[If sawn construction joints are used they shall be cut to a depth of 20 mm using a 6 mm blade, **as soon as possible after finishing the pour**. Care shall be taken to avoid any damage to the edges of the saw cuts. Fill these joints with a firm/slightly flexible grout after two weeks.]

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6.15 Construction Joints

The shape and location of construction joints shall be as sho s drawings. Proprietary metal construction joint makers shall be used in lieu of saw cutting wherever possible.

6.16 Holding-Down Bolts

Provide suitable templates for locating holding-down plates and bolts. Ensure that they are positioned to a tolerance of +/- 1.0mm relative to each other and +/- 5.0mm to group position and level. Holding down bolts for steelwork shall be positioned to a tolerance of +/- 1.0mm.

6.17 Floor Recesses Form all door recesses as required for the doors, showers etc on the drawings.

6.18 No plaster or concrete droppings shall mar the finished appearance of any blockwork exposed to view. See section 12.

6.18 CLEANUP. Pick up any debris, off cuts or other rubbish generated by this trades work on site.

Remove extra concrete dumped or debris from the site or dump it in the main contractors skip at the end of the day. Do not leave rubbish (or anything else) at any time where it could cause a hazard.

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9 REINFORCING STEEL

9.1. Preliminary & General

The subcontractor shall take notice of and abide by any parts of the preliminary and general clauses that relate to this trade.

9.2. Scope

This section includes but is not necessarily limited to:, cutting, bending, placing and fixing in position of all reinforcing bars shown on the drawings. The Contractor shall allow for all supports, spacers & ties.

9.3. Standards

The following standards shall apply:-
New Zealand Building Code
NZS 3109: 1980 Specification for Concrete Construction
NZS 3402P:1973 Hot rolled steel bars for concrete reinforcement
NZS 3421: 1975 Hard drawn mild steel wire for concrete reinforcement
NZS 3422: 1975 Welded fabric of drawn steel wire for concrete reinforcement
NZS 4702: 1982 Metal-Arc welding of Grade 275 Reinforcing Bar

9.4. Material

9.4.1 Reinforcing Steel: Grade 300 round mild steel rods complying with NZS 3402P shall be used for all stirrups, column ties and other reinforcement requiring tight hooks or tight bends.
Grade 300 and 430 deformed steel complying with NZS 3402P shall be used for all other reinforcement.
At the times concrete is placed, reinforcement shall be free from all loose mill scale, rust dirt, oil, paint, retardant or other coating which may destroy or reduce the bond.

9.4.2 Mesh

Mesh shall be HRC welded reinforcing fabric complying with NZS 3422, BS 1221 and ASTM A 18564T.

9.4.3 Tying Wire

Tying wire shall be 1.2mm soft black iron wire.

9.5.1 Workmanship

9.5.1 Detailing

Where laps are not shown, they shall be staggered so that not more than one quarter of the rods are lapped within any 1000mm length.
The Contractor shall check the dimensions of all reinforcement before proceeding.

9.5.2 Fabrication

Reinforcement shall be cut and bent strictly in accordance with the drawings, and as required by this specification. All bends shall be made cold.
Deformed bars shall not be bent around fixed pins. Rollers shall have the least possible resistance to movement to avoid undue stretching at the bends

9.5.3 Placing Reinforcement

Reinforcement shall be accurately placed and securely fastened in accordance with the drawings. Adequately support reinforcement with chairs, spacers or hangers etc, securing against lateral displacement during placing and vibration of concrete.
Ensure that reinforcing for blockwork if required has the starter bars accurately placed to suit the core locations.

Support slab reinforcement at not more than 1 metre centres.

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Suitable plastic spacers shall be used on all fairface work.

All specified concrete cover shown on the drawings must be adhered to. Where not shown the cover must comply with the requirements of NZS 3109

Starter bars cast into concrete shall not be bent in any way.

All reinforcing to be lapped 40 diameters and mesh 300mm unless otherwise shown on the drawings.

No reinforcing or tie wire shall intrude into the concrete 'cover'.

9.5.4 Welding
Welding of reinforcement is not permitted except where shown on the Engineering drawings.

9.5.5 Tolerances
Reinforcement shall be bent and placed in accordance with NZS 310

9.9.5.6 CLEANUP. Pick up any debris, off cuts or other rubbish generated by this trades work on site.
Remove debris from the site or dump it in the main contractors skip at the end of the day.
Do not leave rubbish (or anything else) at any time where it could cause a hazard.

12 CONCRETE MASONRY

12.1 SCOPE: This section includes but is not necessarily limited to: reinforced block walls and footing walls plus the retaining walls to the carpark and driveway areas.

12.2 REFER: Preliminaries, Drawings, Finishes Schedule, NZBC, NZS 3102P, 3103P, 4210, 3604.

12.3 The function of the concrete blockwork is to provide strong permanent formwork for the concrete contained therein, and to prevent the passage of moisture, wind, dust and light whilst providing where required a suitable base for further finishes.

12.4 FINISH: Blocks shall have an even texture and finish. No finish requirements where the blockwork is below ground, is plastered or behind strapping and lining. Where exposed the blockwork shall be neat and straight, with clean raked and pressed joints alternating in line. Reject chipped, cracked , warped blocks or otherwise defective blocks in any visible location. Most blockwork will be plastered externally and internally.

12.5 TOLERANCE: Joints=10mm ± 1mm height. 2mm in 3m horizontally or vertically (perpends)
Walls lateral tolerance, 2mm variation in 3m height or width..
Max size of any sudden step between adjacent block faces separated by a block joint= 1mm

12.6 INSTALLATION Refer to Framing Plan, cross sections and details

12.7 Blockwork: shall be 200 Series (190 wide) fully grouted, generally except where noted or detailed.
Note the general use of hotblocks for the exterior house walls.
Mortar: constituents are to batched and mixed consistently to produce the same colour joints for exposed blockwork only. ~~(This is especially important as the cleanout ports are to be whole block faces that need to be replaced after the rest of the mortar is set)~~

12.8 All blockwork to carried out by expert block layers in accordance with NZS 4210. Do not smear mortar on the face of the blocks when tooling, pressing or polishing joints or at any other time.
Joints under tiled areas may be simply cut off. Press tight and tool to a firm dense finish.
Cutting: Cut blocks as required away from finished walls or walls under construction.
Clean dust or residue completely off the blocks before laying.

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12.9 Lay blocks in stretcher bond generally.

12.10 Provide shrinkage control joints at 5m centres or as shown.

12.11 Check and ensure that the starter bars are accurately located in relation to the block cores. This is important!

12.12 Provide cleanout ports on the interior face of the wall by cutting the entire face off the block and replacing it after cleaning is complete. Allow to clean out mortar droppings before they set.

12.13 CLEANUP. Pick up any debris, off cuts or other rubbish generated by this trades work on site.
Remove debris from the site or dump it in the main contractors skip at the end of the day.
Do not leave rubbish (or anything else) at any time where it could cause a hazard.

13 STONEWORK

13.1 SCOPE: This section includes but is not necessarily limited to the Garden Walls, under the Sitting room windows and the curved wall by the front door.

13.2 REFER: Preliminaries, Drawings, Finishes Schedule, NZBC, NZS 3102P, 3103P, 4210, 3604.

13.3 The function of the stone veneer is to provide a strong durable finish and to prevent the passage of moisture, wind, dust and light.

13.4 FINISH: Stones shall be limestone of about 250mm to 400mm long, no more than 150mm high. The total veneer thickness should be approx 125mm.

12.5 TOLERANCE: Joints=12mm ± 10mm

13.6 INSTALLATION Refer to cross sections and details

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14 METALWORK

14.1 SCOPE: This section includes but is not necessarily limited to the steel base supports to the timber columns, and the stainless steel handrails for the swimming pool.

14.2 REFER: Preliminaries, Elevations and details, finishes schedule, NZBC, NZS 3604.

14.3 The function of the handrail is to provide a strong railing providing a secure grip.

14.4 FINISH: See Fin Schedule.

14.5 TOLERANCE: Fit level and straight to within ± 2mm in 3m.

14.6 INSTALLATION Refer to cross sections and details. Use standard 40 mmØ SS tbe with welded brackets to form a handrail all round the pool and angling up the pool wall by the steps. See Engineers drawing for the post brackets.

16 METAL WINDOWS AND DOORS

16.1 SCOPE: This section includes but is not necessarily limited to: the manufacturer, supply, installation and glazing of aluminium windows and doors, including all hardware and associated works. Fletcher Aluminium sections for doors and windows.

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16.2 REFER: Preliminary and General, the drawings, NZBC. NZS 3604.
NZS 3504 Aluminium windows.
NZS 4203 General structural design and design loadings for buildings.
NZS 4211 Performance of windows.
NZS 4223 Glazing
BS 4842 Stoved organic finishes on aluminium extrusions and preformed sections for external architectural applications.
AS 1734 Wrought aluminium and aluminium alloy flat sheet, coiled sheet and plate for general engineering purposes.
AS G31 Stainless and heat resisting steel plate, rolled bar, sheet strip and foil.

16.3 FUNCTION: To provide complete door and window systems completely resistant to the penetration of wind, dust, rain, the DWP and other applied loads, and free from rattles or wind noise. Opening doors or sashes and all hardware shall operate smoothly and easily.

16.4 FINISH:

16.4.1 The Contractor shall maintain the specified finishes free of dents, scratches, corrosion, stains, marks or any other defect whatsoever until handing over.

16.4.2 Finishes to aluminium shall be factory powdercoat painted high gloss for doors and windows, all capable of insitu recoating. Colour;see fin schedule. Jamb liners shall be Matai, sanded and presealed before installation.

16.5 GUARANTEE. Guarantee the function and finish (as above) of the metal joinery, for a period of 10 Years.
Provide the Employer with the standard product guarantees relevant to this section or trade.

16.6 INSTALLATION Air Leakage Grade and Design Wind Pressure: CHECK for requirements for very high wind zone.

16.6.1 The contractor is responsible for the proper installation, operation, function and durability of the system and any operating mechanisms attached thereto.

16.6.2 Install aluminium sections to all windows in accordance with the manufacturers specifications. Install Rylock or similar Window and Doorsets generally.

16.6.3 Note: Timber front door to be Cedar RGA pattern. Install in Matai frame to later detail c/w Raven concealed lift up door seal at bottom of door and vinyl seals around the rebates for the door. Make up Tan P TG&V doors for the Pump house C/W Tan P frame. Storeroom door similar but use standard solid core FP door.

16.6.4 Fixings and fastenings hardware to be supplied by manufacturer of component being fixed. Check with architect.

16.6.5 Fixings and fastenings exposed to the weather to be of aluminium or suitable stainless steel.

16.6.6 Fixings and fastenings not exposed to the weather may be hot dip galvanised steel with a coating weight of 469g/m2 to BS 729.

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16.6.7 Bedding Compound: Neutral curing silicon rubber [black]

16.6.8 Pointing Sealant: Neutral curing silicon rubber [black]

16.6.9 Proprietary components: Fix in accordance with manufacturers recommendations.

16.6.10

Corrosion Protection: Before fixing, apply suitable barriers of bituminous coatings or polythene underlays between dissimilar metals or other materials in contact.

16.6.11

Sealants: Prepare joints for sealants in accordance with sealant manufacturer's recommendations, using recommended solvents and primers where necessary. All joints, especially mitre joints must be prepared and sealed in accordance with the sealant manufacturers requirements. Additionally the back of the joint shall have a run of sealant at least 3mm thick extending 7-10 mm each side of the joint for the whole length of each joint, properly adhered to the aluminium or powder coating.

16.7 GLASS AND GLAZING:

16.7.1 Glass and Glazing techniques shall comply with NZS 4223 & 4218. Vinyl gaskets shall be selected to suit the glass thickness, to prevent leakage of water or air and shall not shrink, come loose or bulge. Most windows and doors to be glazed with normal float glass except some locations may require laminated glass such as at low door panels, tinted glass to west windows where or if so noted, etc. Ref NZS 4223. Glass thickness to suit opening sizes and as required to fit in frames.

16.7.2 Aluminium Joinery may be glazed on or off site. **This site is very windy and very exposed.**

17 CARPENTRY

17.1 CARPENTRY FRAMING

17.1.1 SCOPE: This section includes but is not necessarily limited to: timber stud framework, posts, beams, bracing etc usually supporting sheet or board finishes.

17.1.2 REFER: Preliminaries, NZBC, The Drawings, Finishes Schedule.
NZS 3601 Metric Dimensions of Timber
NZS 3602 Specifying timber and wood based products in building NZS 3604 Light timber frame buildings not requiring specific design
NZS 3631 Classification and grading of NZ timbers
Timber Preservation Council - Woodmark Specifications

17.1.3 FINISH: Suitable to receive the scheduled linings/claddings/coatings.

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17.1.4 TOLERANCES: Tolerances for all framework to be:
Straightness in each 8m [not cumulative] +/-6 mm.
Straightness in Story Height +/-3mm.
Plumb in storey height +/-3mm
Width or height of openings +/-3mm.

17.1.5 INSTALLATION: All timber specified in this section is to comply with the requirements and recommendations of NZS 3601, 3602, 3604 where appropriate, unless otherwise specified.
Timber specified, grade, quality and preservative treatment may be any of those as listed in NZS 3602 for each situation, unless otherwise specified.

17.1.6 Test moisture content of timbers specified to be 'dry' using an electrical moisture meter. Test 5% but not less than 10 lengths of each cross section in the centre of the length. 90% of the values obtained must be within the range specified by NZS 3602.

17.1.7 All framing timber greater than 25 mm in thickness is to be gauged to both width and thickness unless otherwise specified.

17.1.8 Workmanship: Generally to be in accordance with the best trade practice, and this shall be deemed to include those methods, practices and processes contained in current syllabuses for the New Zealand Trade Certificates in carpentry and timber machining and as contained in NZS 3604.

17.1.9 Additional supports: Position and fix additional supports not shown on drawings, for stripping, fixtures, joinery, edge of sheets, and to provide lateral support to load carrying framing.

17.1.10 Timber Beams. Laminated or solid macrocarpa, free of loose knots, dressed and sanded four sides. Arriss edges to 3mm radius. Bolt to conc columns as shown. Beam Front porch/Sitting room = 240x90 macrocarpa sanded and clear finished.

17.1.11 Select all timbers exposed to view to avoid defects.

17.1.12 Install the special timber posts to the Verandah and the Front Porch as shown. Note the steel rod base and top connectors, screw fix to framing or beam as indicated. Ref also Engineers dwngs.

17.1.13 Proprietary joints and connectors are not to be used on any structural timber exposed to view unless indicated.

17.1.14 Clean off any marks on exposed timber

17.1.15 Timber Flooring: To the areas shown install 90x20 heart matai T & G flooring supplied by the owner. Seal the concrete floor under using Aquron 2000 plus a surface sealer in accordance with the Markham Distributing Ltd specifications. Fix the flooring battens to the concrete using Maxbond or similar and concrete nails. Ensure the battens are brought to an absolutely level line such that the final level of the timber floor is at +12mm above datum, ie in line with the top of the tiles.

17.2 INSULATION

17.2.1 SCOPE: This section includes but is not necessarily limited to: fibreglass and/or polystyrene thermal insulation.

17.2.2 REFER: Preliminaries, NZBC, Drawings, NZS 4222. See also Polystyrene and Fibreglass manufacturers data.

17.2.3 FUNCTION: To control the transmission of heat and sound and eliminate areas of thermal difference likely to cause condensation.

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17.2.4 TOLERANCES: Gaps are not permitted.

17.2.5 INSTALLATION: Floors: 40mm Polystyrene under concrete flooring.
Walls: Fit 100 fibreglass insulation to framed walls
Roofs: Fit 150 fibreglass insulation as shown.
Note that the Hotblocks already come with polystyrene inserts

17.2.6 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

17.3 SHEET LININGS

17.3.1 SCOPE: This section includes but is not necessarily limited to: MDF Fibreboard, 18mm plywood sarking to roof decks; Hardiflex, Villaboard, Hardies Titan Board

17.3.2 REFER: Preliminaries, NZBC, Finishes Schedule, Drawings, Manufacturers requirements or instructions and the following:
NZS 841
NZS 1900
NZS 3602
NZS 3604
NZS 3608
NZS 3611
NZS 3614 See also Plasterboard linings.

17.3.3 FUNCTION: The function of sheet linings or sheet lining systems, is to prevent the passage of moisture, wind and light, to limit noise and heat transmission and to provide a suitable base for any further finishes that may be applied (where required).

17.3.4 FINISH: The finish of the sheet linings shall be smooth, even and level [see tolerances] and shall, where further finishes are to be applied, be suitable for the application of the finishes scheduled.

17.3.5 TOLERANCES: Sheet linings shall be fixed so that the final surface varies by no more that 3 mm in 3m. Joints where exposed shall vary in width by no more than 20% from the width noted as required.

17.3.6 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

17.3.7 INSTALLATION: All sheet linings shall be fixed in accordance with the manufacturers instructions and particularly as noted below.

17.3.8 Plywood: Install 18mm CpD Plywood to the "flat" roof decks and fall to sumps where shown.

17.3.9 Villaboard. Line the walls and ceilings to bathrooms, laundry/store and garage. Stop bathrooms & laundry ready for paintingto manf requirements where not shown tiled. Square stop cornice.
Soffits; fix 6 mm Hardies soffit board with arrissed edges 1mm apart. Stop over the fixings only.

17.4 JOINERY INSTALLATION

17.4.1 SCOPE: This section includes but is not necessarily limited to: the work required to install interior doors and frames, skylights, cabinets, fittings, shelves, benches, finishing timbers and such like, including any associated hardware.

17.4.2 REFER: Preliminaries, NZBC, Drawings, Finishes Schedule, Manufacturers and Suppliers data, NZS 3602, 3604, 1156.

17.4.3 FITTING: Fit each unit or item neatly, level and square where required. Finishing timbers shall cover junctions completely and shall fit tightly against adjacent surfaces. Hardware shall work perfectly and all moving items such as locks, latches, doors, hinges, drawers, rollers etc shall be checked to ensure that they move smoothly with the minimum resistance possible without squeaks, scraping or other noises. Use glue, nails or screws as required.
Install the Velux skylights where shown in strict accordance with the manufacturers instructions. Groove the frames for gib if required and run the gib linings up the wall and into the groove where required.

17.4.4 FINISH: All timber or timber based components such as doors, drawers, shelves, finishings, etc shall be delivered to the site with properly arrissed edges, corners etc. Finishing timbers (Matai) shall also be arrissed to suit the final finish. Generally this requires that corners be arrissed to a 3mm radius except where noted, drawn or required otherwise. Protect prefinished or prepainted items from damage. Arriss PVC clashing to prefinished boards so that radius = thickness.

Fit the hardware and leave the same unmarked by scratches, chips, paint spots or any other mark upon delivery of the works to the owner at the end of the contract.

Putty. **DO NOT USE PUTTY.** Use non shrink proprietary wood filler only if required. **Use DAP** or similar permanent tinted filler to match timber colour with clear finishes. Ensure that all filler material is removed from the timber surfaces to avoid patchiness after finishing.

17.5 GARAGE DOOR

The garage door is to be a Renlita low headroom type glazed sectional door. Install in accordance with the details and the manufactures instructions. Note the fixed glass panels over the top of the door proper.

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17.5 HARDWARE

17.5.1 SCOPE: This section includes but is not necessarily limited to: the supply & installation of locks, latches, door pulls, plates, closers, door stops, towel rails, brackets etc, not covered under Metal Windows.

17.5.2 REFER: Preliminaries, NZBC, drawings, Finishes Schedule, Manufacturers instructions.

17.5.3 FITTING: The Contractor shall allow to fit all items of Hardware in strict accordance with the manufacturers instructions or the drawings.

17.5.4 FINISH: Ensure that all hardware is maintained free of marks, scratches, paint etc until the building is handed over at the end of the contract. Remove the hardware to allow for painting or clear finishing.

17.5.5 HARDWARE Allow a net sum of $3500.00 for the supply only of this hardware.

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19 TIMBER JOINERY

19.1.1 SCOPE: This section includes but is not necessarily limited to: the supply to the site of: the Front Door and frame, Pump room Doors and frame, the storeroom door and frame, interior doors, and frames, finishing beads, Velux or other skylights, including normal operating hardware such as hinges etc, together with the various cabinets, stair handrails etc as detailed or required.

19.1.2 REFER: Preliminary and General, The Drawings, The Finishes Schedule, NZBC, NZS 3604, NZS 1156 Doors. NZS 3602 Specifying timber and wood based products for use in building.

19.1.3 FUNCTION: The function of timber or timber based windows/doors and/or frames is to provide a stable support for the applied finishes, and to open [or close] to allow free passage through when open. Moving parts must move smoothly, and close to prevent the passage of air, noise, dust or other airborne elements. Cabinets shall provide safe and secure storage for household items and shall provide a stable base for finishes applied over.

19.1.4 FINISH: The timber or timber based joinery finish shall be as required for the coatings to be applied over, clear finishes require colour matched timbers where adjacent. All timbers shall be generously arrissed [3mm min radius], smoothly scraped or sanded. See Finishes schedule for finishes including prefinished boarding.

19.1.5 TOLERANCES: Straightness: to NZS specifications. Door or sash clearance = 3mm +/-20% max AFTER allowing for paint or varnish film thickness.

19.1.6 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

19.1.7 MANUFACTURE:
All materials and workmanship are to comply with the requirements and recommendations NZS 1158, NZS 3602 where appropriate. 3mm radius arrissed edges to each door.

1 Interior doors: hollow core Matai veneer. To timber framed walls fit in 19 mm selected Matai frames, 45x15 architraves as detailed and 45x12 Matai planted stops. All parts to have 3mm arrissed edges all round, sanded smooth and ready for clear finishing.
7 @ 810 mm + 1@860 mm solid core + 1@760 in frames + 1@710 in frameas above
plus 4@410, double bifold in frame + 2@610, in frame, 1x910 pq fp door in frame to store
1 @ 1420 mm cavity slider, Check Drawings to ensure that all doors etc are allowed for.

2 Skirtings: 90x12 Matai

3 Cabinets generally
Champagne Sagawood Supermatt melamine carcases and drawers, Blue Shimmer Hautelink shelves, match clash
18 clear lacquered Matai veneer doors with matching edge clashings.
Bathroom & E/S over cabinets to have vinyl backed mirror with pol bevelled edges glue fixed to the doors. mirror laminate exposed edges of doors and cabinets.

4 Kitchen cupboards, benchtops etc as drawn, noted and detailed.

5 Laundry cabinet and shelves as drawn

6 Supply shelving in the cupboards to suit the owners requirements. 18 Champagne Sagawood Supermatt melamine with matching clashings.

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22 ROOFING

22.1.1 SCOPE This section includes but is not necessarily limited to: the supply and installation of Corrugated Colorsteel to the sloping roof areas, complete with all required spoutings, flashings & barges as detailed.

22.1.2 REFER Preliminaries, Finishes Schedule, NZBC, Drawings, Manufacturers Specifications and/or other data, manufacturers Specifiers and Installers guides, NZS 3604 and NZS 3441.

22.1.3 FUNCTION: The function of the metal roof/wall cladding is to prevent the ingress of water or damp, wind, dust or other airborne elements into the building and to provide the final decorative finish for the roofing.

22.1.4 FINISH: Roofing, flashings, spoutings, etc shall be installed clean and free of oil, grease or other contaminants. Leave completely unmarked or dented.
READ THE MANUFACTURERS INSTRUCTIONS!!!

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22.1.5 TOLERANCES: Metal claddings shall be fitted straight to within +/- 3mm per 3m run.

22.1.6 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

22.1.7 INSTALLATION

22.1.8 Metal: 0.55bmt Zincalum/Colorsteel or Colorcote (See finishes schedule).

22.1.9 Profiles: Standard corrugated or equal for roofing, as noted or shown for flashings, spoutings, downpipes etc.

22.1.10Fixings: Proprietary nails and blind aluminium pop rivets to manufacturers specification. Do not use rivets that can rust.

22.1.11 Sealants: Use only neutral curing paintable silicon rubber sealant of a type approved by the roofing manufacturer. Do not use clear sealants.

22.1.12 Flash the skylights and other protrusions through the roof and ensure a completely waterproof result.

22.1.13 Cutting: Use Electric nibblers or tin snips for cutting the roof, not saws.
Remove all offcuts from the roof and spoutings.

22.1.14 Fixing: Fix roofing in accordance with manufacturers specifications.

22.1.15 Flashings: Instal flashings roof penetrations, etc in accordance with manufacturers specifications. Ensure that any excess sealant is completely removed on completion of the job.

22.1.16 Ensure that all roof penetrations, flashings etc are compatible with the roofing material or finishes.

22.2 RAINWATER/SHEET METALWORK

22.2.1 SCOPE: This section includes but is not necessarily limited to: the supply and installation of galv flashings, galv rainwater heads to the garage and bedroom walls, downpipes, dp brackets, and their associated accessories and means of fixing and jointing, plus flashings, cappings or other galv sheet metalwork noted, or required to complete the job.

22.2.2 REFER: Preliminaries, NZBC, Drawings. READ THE Colorsteel/Colorcote INSTRUCTIONS!!!

22.2.3 FUNCTION: The function of the rainwater system is to run the rainwater to the stormwater drains via the Index roof gutters or metal spouting and downpipes in such a manner as to avoid overflow into or against the building or ponding or other defects.

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22.2.4 FINISH: Colorsteel or Pacific Coilcoaters ZR8. See Finishes Schedule.

22.2.5 INSTALLATION: Solder together and fit the galv rainwater heads in the end of the Index gutters and connect the downpipes where shown.

22.2.6 Instal Galv or Colorcote flashings as drawn, noted or required.

22.2.7 GUARANTEE. Provide the Employer with the standard guarantees relevant to this section or trade.

22.2.8 CLEANUP. Pick up any debris, offcuts or other rubbish generated by this trades work on site.
Remove debris from the site or dump it in the main contractors skip at the end of the day.
Do not leave rubbish (or anything else) at any time where it could cause a hazard.

22.3 SYNTHETIC ROOFING

22.3.1 SCOPE: This section includes but is not necessarily limited to: Polyflame waterproofing membrane to the "flat" roof areas. Use Gripset 38 to form flashings to the top of plastered block walls where exposed.

22.3.2 REFER: Preliminaries, NZBC, Drawings, Finishes schedule. Refer also to the wall cladding manufacturers requirements for upstand flashings etc

22.3.3 FUNCTION: The function of the Gripset 38 is to prevent the ingress of water or damp, wind dust or other airborne elements into the building by redirecting any precipitation into spoutings, downpipes etc, and to provide a stable waterproof base for the tiling over.

22.3.4 FINISH: To match adjacent finishes.

23.3.5 CLEANUP. Pick up any debris, offcuts or other rubbish generated by this trades work on site.
Remove debris from the site or dump it in the main contractors skip at the end of the day.
Do not leave rubbish (or anything else) at any time where it could cause a hazard.

22.3.5 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

22.3.6 INSTALLATION: In strict accordance with the Gripset & Polyflame manufacturers instructions.

23 PLUMBING

23.1.1 SCOPE: This section includes but is not necessarily limited to: the installation of, the hot and cold water supply, reticulation and disposal including taps, fittings and their accessories, traps, wastes, valves etc, plus the connection to the water supply on site (this last arranged by owner)

23.1.2 REFER: Preliminaries and Drawings, NZBC,NZS 7602, CSA B137.8, Plumbers, Gas fitters and Drain layers Act 1976 Manufacturers specifications, Local Authorities requirements.

23.1.3 FUNCTION: The function of the water supply systems is to supply hot and/or cold water to the various fittings ***free from any leakage, creaking, water hammer or other noises, or other defects.***

23.1.3.1 The function of the various sanitary appliances and their associated wastes is to contain water (supplied as above) and to allow free drainage of such water when required ***without leaks, creaking gurgling or other noises, or other defects.***

23.1.4 FINISH: The finish of all fittings, taps, sanitary appliances etc shall be unmarked and as supplied by the factory. No exposed threads are permitted.

23.1.5 INSTALLATION: Install in each of the units the following taps.

23.1.5.1 Allow a net sum of $3000.00 for the supply only of taps and fittings as below:

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TAP	#	BRAND & TYPE	FINISH	COLOUR
Hose taps	4	HMC 35	Pol	Brass
HW Cyl tap	2	20mm Wheel valve	unpol	brass
Bathroom 1				
Bathmixer	1	Net Sum	Pol	Chrome
Bathspout	1		Pol	Chrome
Basinmixer	1	Net Sum	Pol	Chrome
Handwash dispenser	1	Net Sum	Pol	Chrome
Showermixer	1	Net Sum	Pol	Chrome
		+ Slide shower	Pol	Chrome
WC tap	1	Net Sum	Pol	Chrome
Heated Towel rail	1	Net sum	Pol	Chrome
Toilet roll holder	1	Net sum	Pol	Chrome
Grab rail over bath	1	Net sum	Pol	Chrome
Bathroom 2				
Basinmixer	1	Net Sum	Pol	Chrome
Handwash dispenser	1	Net Sum	Pol	Chrome
Showertap	1	Net Sum	Pol	Chrome
+ Slide shower			Pol	Chrome
WC tap	1	Net Sum	Pol	Chrome
Heated Towel rail	1	Net sum	Pol	Chrome
Toilet roll holder	1	Net sum	Pol	Chrome

Laundry

Wash machine taps	2	Bal-O-Fix	Pol	Chrome
Conceal pipework incl washing machine standpipe in wall recess behind machine				
Tub mixer	1	Net Sum	Pol	Chrome
Handwash dispenser	1	Net Sum	Pol	Chrome

Kitchen

Sink mixer	1	Net Sum	Pol	Chrome
Dishwashers	4	Bal-O-Fix	Pol	Chrome

WC

Tap supplied with wc				
Toilet roll holder	1	Net sum	Pol	Chrome

23.1.6 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

23.1.5.2 SANITARY APPLIANCES

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Allow a net sum of $6500.00 for the following sanitary appliances.

Install the following items: Spa bath, 2x 2 hole basins, 3x BTW toilet suites, 1x Cabana shower c/w toughened glass doors, 1x toughened glass doors to tiled shower, 1x ss sink and drainer, 1x 2 hole Ceramic utility bowl (set into benchtop). Branded schedule to be provided later. Ref drawings for type, location and installation of sanitary ware.

Allow to install the sink flush with the benchtops as shown on the drawings and in accordance with the manufacturers instructions c/w pop up waste. Instal pop-up wastes to other fittings. Showers to have Englefield easy clean traps.

23.1.5.3 Check the above off the drawings and instal where indicated.

23.1.5.4 Run 13 id. polybutylene or Fusiotherm piping to fittings generally. **Use swept bends** where bends are required. No joints below concrete slabs.

23.1.5.5 Fit pvc waste pipes to sizes and falls required where concealed, CP finish on copper or brass elsewhere. **No exposed threads to show.**

23.1.5.6 All piping and wastes to run concealed in walls or under floors. **Where connecting a basin or cistern or similar where pipework protrudes through the wall, care shall be taken to ensure that the pipework is fitted as high as possible up under the fitting to hide the pipework from view.** Any pipework that must be exposed to be cp finished. **No exposed threads to show.**

23.1.5.7 Connect the Kitchen and Bathroom 1 units requiring hot water to a Coopers or similar 240 litre (stainless steel coil tube heat exchanger type) mains pressure electric hot water cylinder located in cupboard by the fireplace. Connect the Bathroom 2 and laundry units to a 135litre low pressure cylinder in the roof space over the garage.

24 DRAINAGE

24.1 SCOPE: This section includes but is not necessarily limited to: both stormwater and foul water drainage systems.

24.2 REFER: Preliminaries, Drawings, NZBC, Local Authorities requirements, manufacturers specifications and recommendations.

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24.3 FUNCTION:

The function of the foul drainage system is to efficiently deliver water borne waste to the Biocycle tank, without leakage, blocking, smells, noise, back pressure or other defects. Note that the use of the Australian Standard as a substitute may contravene this section since it is very difficult to make such a system quiet.

The function of the stormwater system is to collect the rainwater from the downpipes and sumps and run it to a spreader unit where shown without leakage, blocking, smells, noise, back pressure or other defects.

24.4 FINISH: No finish requirements generally since no pipes shall run exposed to view. Refer to drawings for the layout of both the stormwater and sewer lines.

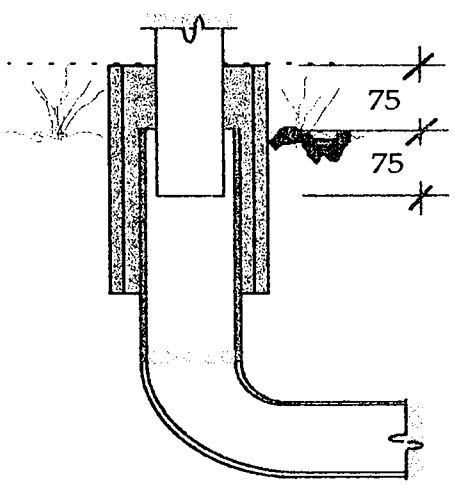
24.5 INSTALLATION: Install all the drains in strict accordance with the NZBC and the manufacturers latest specifications, recommendations or requirements. Run the pumped outlet from this tank to the effluent field in accordance with the Biocycle instructions.

Ensure that the DPC wraps around floor penetrations completely and seals tight.

See site plan and slab plan for location and setout.

24.5.1 Any brand of drainage pipe, fittings etc may be used provided it is approved for use by the Local Authority concerned.

24.5.2 Instal a 300 mm length of unglazed earthenware pipe where the downpipe meets the stormwater drain, with the top of the earthenware pipe level with adjacent paving where paved, or 75 mm above ground where in gardens, grass etc. The top of the drain shall finish 50 mm below the top of this earthenware pipe and the downpipe shall finish 50mm below the top of the drain.



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28 ELECTRICAL

28.1 SCOPE

This section includes but is not necessarily limited to: the connection of the mains to a new meter board on the bedroom 2 wall, installation of the meter board, main switchboard, the provision of electrical circuit wiring and fittings for light and power or other circuits as shown on the electrical plans.

28.2 REFER: Preliminaries, the drawings, NZBC, N.Z. Electrical wiring regulations, hand book and relevant codes of practice.

28.3 FUNCTION: The function of the electrical system is to provide a safe means by which both wired in electrically operated fittings and plug in fittings may be conveniently operated.

28.4 FINISH: The electrical fittings remaining visible on completion of the job shall be clean, neat, plumb, aligned with adjacent fittings where required, firm, and in any case to the Architects satisfaction.

28.5 TOLERANCES: The electrical plan shows only the general location of equipment and outlets. Allow to install fittings within 1 metre of any point shown if so directed.

28.6 GUARANTEE. Provide the Employer with all standard product guarantees relevant to this section or trade.

28.7 INSTALLATION: The whole of the electrical installation will be in accordance with the 1993 Electrical Regulation Hand Book, relevant codes of practice, and any subsequent amendments.

28.7.1 MAINS

Instal a new mains cable and run to a new meter board mounted flush into the bedroom 2 exterior wall and a new switchboard flush mounted in the garage on the stair wall behind the door from the entry hall.

28.7.2 EARTHING AND BONDING

Earthing and bonding of all metal and metallic pipe as per 1993 Wiring Regulations and electrical Codes of Practice.

28.7.3 MAIN SWITCHBOARD

Install a PDL DBF30 plastic switchboard. Allow to protect all circuits except light and refrigerator/freezer circuits with residual current devices. Protect these others with HRC fuses fitted in accordance with 1993 Wiring Regulations and electrical Codes of Practice. Label the circuits clearly with Dymo tape labels or similar.

28.7.7 TESTING, INSPECTING AND CERTIFYING. Testing, inspection and certifying will be carried out as per Electricity Regulations 1993; 34,35,36 and ECP 11 and Hand Book To Electricity Regulations 1993.

28.7.8 COMPLETION OF INSTALLATION

The installation will not be completed until a Certificate Of Compliance is delivered to the Employer.

28.8 ANCILLARY COMPONENTS Refer to the Architectural drawings for the location of these items.

28.8.1 LIGHT CIRCUITS. Light circuits shall be minimum 1.5 sq mm 2+E TPS, cable size to be selected to accommodate loading. Light switches to be Clipsal Eclipse series generally, selected colour metal finish, mounted vertically on the locking side of the door with the switch 1100mm to centreline above floor level.

28.8.2.1POWER POINT CIRCUITS. Power point circuits shall be minimum 2.5 sq mm 2+E TPS, cable size to be selected to accommodate loading. Power points: to be horizontally mounted Clipsal Eclipse series generally, double, switched type, with metal faceplates and mounted at 300mm above floor level generally, or as directed or shown. Install matching units for the telephone, audio, TV or other outlets outlets.

28.8.2.2TELEPHONE OUTLETS: to be Clipsal Eclipse series, mounting height as for power outlets. Allow to wire telephones back to main junction box.

28.9 LIGHT FITTINGS AND EXTRACT FANS

The contractor shall allow to supply and install all the light fittings indicated on the plan. Allow a net sum of $5000.00 for the purchase of fittings. Both bathrooms have extract fan/lights.

28.10 ALARMS

Install smoke detector alarms outside bedroom 1, in the Lobby and in the kitchen.

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29 PLASTER CLADDING

29.1 SCOPE: This section includes but is not necessarily limited to: the installation 20mm ventilated Hardibacker backed cavity plaster system to the exterior walls.

30.2 REFER: Preliminary and General, NZBC, the Drawings, the Finishes Schedule, NZS 3604, and the Manufacturers Product Data and Specifications.

30.3 FUNCTION: The function of the plaster is to provide a strong, stable, crack resistant and waterproof base for the final paint finishes over.

30.4 FINISH: Fix plaster smooth and level ready for painting, in accordance with the manufacturer's specification.

30.5 INSTALLATION: Fix and finish the plaster where shown in strict accordance with the manufacturer's recommendations. Only applicators approved by the manufacturer shall be used. Plaster the base blockwork to exactly line with and match the cladding above it.

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30 PLASTERBOARD AND OTHER LININGS

30.1 GIBRALTAR BOARD

30.1.1 SCOPE: This section includes but is not necessarily limited to: the installation of Gibraltar Board (Gibboard) fixing, jointing and finishing to interior framed ceilings and walls.

30.2 REFER: Preliminary and General, NZBC, the Drawings, the Finishes Schedule, NZS 3604, BS1230, Winstones Gibraltar Board Product Data and Specifications.

30.3 FUNCTION: The function of the plaster board linings is to provide a strong, stable base for stopping to an approved Fire Rating if required.

30.4 FINISH: Fix Gibboard smooth and level ready for stopping, in accordance with the manufacturer's specification. Joint and stop as below to produce a surface suitable for the final finish over (see Finishes Schedule).

30.5 INSTALLATION: Fix the Gibraltar Board Sheets where specified in strict accordance with the manufacturer's recommendations.

30.5.1 Fix 12.5 Gibraltar Board sheets joint and stop in strict accordance with Winstones "Gib Jointing and Finishing Instructions" suitable for the final finish [see finishes schedule]. Fix Bead-X or equal metal reinforcing on all exposed edges or corners.

30.5.2 Ceilings. Use 10mm GIB Ultraline generally.

30.5.3 Wet Areas. Install 6 mm Villaboard to walls and ceilings of the garage, bathrooms and kitchen and stop to the same surface finish as for the Gib board. Fix Bead-X or equal metal reinforcing on all exposed edges or corners.

30.5.4 HotBlock or Block walls . 13mm Gib. Seal the blocks then direct glue fix.

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32 CERAMIC TILING

32.1.1 SCOPE: This section includes but is not necessarily limited to:
Exterior tiling: Ceramic tiling the Front Porch, the Deck and Paths plus sill and other tiles where indicated .
Interior tiling: Ceramic floor tiling and skirtings to the Entry, Hallway, Bathrooms, Laundry and the WC shall be tiled over heating cables.
Allow to install the tiling and stonework to the fireplaces.

32.1.2 REFER: Preliminaries, NZBC, Drawings, Finishes Schedule, Manufacturers Specifications or Recommendations or Instructions.

32.1.3 FUNCTION: Tiling is required to preclude the entry of water, to provide a firm hard durable finish free from fading and highly resistant to wear, sunlight, rain or other elements.

32.1.4 FINISH: As manufactured. Grout generally to match tile colour, unless stipulated otherwise.

32.1.5 TOLERANCES: Tile joint lines shall not vary from the nominal straight line by more than 2 mm over a 3 m length of accumulated variation nor shall they step by more than 0.5 mm between any two lines.

32.1.6.1 Allow a net sum of $60.00/sq m average for the supply only of all tiles.

32.1.6.2 Fix and grout the all tiling in strict accordance with the manufacturers instructions. Press the grout well into the gaps and level off as close the the level of the top of the tiles as possible. Use ABA Multifix for floor tiling; ABA Flexigrout for grouting tiles. Install in strict accordance with the ABA specification.

32.1.6 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

34 FLOOR COVERINGS

34.1 CARPET

34.1.1 SCOPE: This section deals with carpet and associated works to the Sitting Room, Bedrooms including wardrobes, Dressing Room, Landing and Stairs.

34.1.2 REFER: Preliminaries, Drawings, NZBC, Manufacturer's data, Finishes Schedule. NZ Federation of Master Floor Contractors Manual of Practice - Carpet. Note that for the purposes of this contract there is no "agent" for the client.

34.1.3 FUNCTION: The function of carpeting (and underlay) is: to provide a soft medium for the colour and texture of the flooring, to decrease the effect of impact noises and to absorb other noise, to cover the floor and underlay and to produce a smooth even appearance.

34.1.4 FINISH: Carpet to be selected later.

34.1.5 UNDERLAY: 6 mm commercial rubber underlay.

34.1.6 CARPET: Install the carpet in strict accordance with the manufacturer's specifications and the NZMFC Manual of Practice.

35 PAINTING

35.1 SCOPE: This section includes but is not necessarily limited to: the preparation of surfaces and the application of thin film coatings and sealing. See also the Finishes Schedule

35.2 REFER: Preliminaries; Drawings; NZBC, Finishes Schedule. NZS 3604; NZS 7703 Painting of Buildings; Manufacturers Recommendations.

35.3 FUNCTION: To protect the relevant substrates from the effects of sun, wind, rain, wear and tear etc and to completely waterproof the relevant surfaces where required .

To provide medium for the final colour and texture.

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35.4 FINISH: Refer Finishes Schedule and manufacturers data sheets

35.5 INSTALLATION: All Brands of Paint and Other Coating Materials must conform with the surface spread of flame index and smoke developed index for each part of the building as required by NZ Building Code.

35.5.1 Coating Materials: are to be delivered in sealed containers, clearly labelled with the following information:
Type of Material.
Brand name.
Intended use.
Manufacturer's batch numbers.

35.5.2 Paint Systems: Priming coats, undercoats and finishing coats for any one surface must be obtained from the same manufacturer.

35.5.3 The finishes schedule normally only notes the finish and colour of the top or final coat. The contractor shall prepare the substrate and apply the primers and/or the undercoats required for use with that substrate and final coat in strict accordance with the manufacturers instructions to achieve the the finish and function stated. Where a substrate has been installed that differs from that shown on the schedule contact the architect immediately before proceeding.

35.5.4 Cleanliness: Keep all surfaces clean and free from dust during coating and drying. Provide a suitable receptacle for liquids, slop washing etc. Do not use any sanitary fitting for disposal of waste or for cleaning equipment. Do not dump liquids outside. Use the contractors skip for solid waste

35.5.5 Generally: Prepare coating materials and substrates as recommended by the manufacturers and in accordance with NZS 7703.

35.6 Glazing: Protect etched, sand blasted, laminated or ground glass from attack by oily constituents of coating materials by treating edges before coating: clean surfaces after coating.

35.7 Removable fitting, fixtures and hardware: Have the carpenter remove from surfaces to be coated and replace on completion of painting. Do not paint hinges and butts.

35.8 Priming generally: Is to be done only by painting tradesmen. Apply priming coats by brush unless other methods are specifically noted or permitted. Work primer into surface, joints, angles and end grain. Ensure that priming coats are of adequate thickness and suit the surface porosity. Ensure that any primed surfaces which have deteriorated on site or in transit are touched-up or re-primed if more than one month has elapsed since priming.

35.9 Do not paint surfaces that may move, shrink or crack due to moisture, curing etc until they have stabilised or been corrected.

35.10 Doors shall be spray finished on all sides including the top and bottom edges.

35.11 Painting: Apply all paints by spray or roller, or by brush only if necessary, and as recommended by NZS 7703. Lay off all areas evenly, ensure that finished surfaces are free from brush or other marks and are smooth, level and even.

35.12 Spray painting: Mask all adjoining surfaces and comply with NZS 7703. Refer finishes schedule for sprayed areas.

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36 GLAZING

36.1 SCOPE: This section deals with the supply and installation of, Mirrors in the Bathrooms & WC. All glass, mirrors, beads, gaskets, adhesives, sealants, etc but excludes Aluminium Windows, Patent Glazing, or pre glazed windows, skylights or doors in other materials.

36.2 REFER: Preliminaries, NZBC, Drawings, Finishes Schedule, NZS2258, NZS 5802, NZS 4211, NZS 3604, NZS 1900 Chapters 4, 10, 6.1 & 8.

36.3 FUNCTION: the function of the glazing is generally to allow light to pass while limiting the passage of sound, temperature change, and eliminating any air movement.

36.4 FINISH: Glass finishes shall comply with the standards above.

36.5 TOLERANCES: To comply with NZS 2258

36.6 INSTALLATION:
Installed glass shall not rattle, creak or make any other noise during the normal use of the building
Glass thickness shall comply with current NZ standards for the size, shape and location of the glass panes.

Glazing Compounds: Putty shall NOT be used. Ensure that compounds, sealants, paints etc used together or abutting are compatible. Glaze the Cedar Front Door with black silicon sealant in the rebate behind the glass, then seal the beads tightly against the glass. Fix the beads with ss panel pins.

Pol the exposed edges of the vinyl backed mirrors approx 2mm bevel. Glue fix vinyl backed mirrors to substrates with clear silicon rubber. For return edges to mirror faced doors and return sides to adjacent cabinets, mirror finish laminate may be used.

37 SITEWORKS

37.1 Preliminary & General-The subcontractor shall take notice of and abide by any parts of the preliminary and general clauses that relate to this trade.

37.2 Scope-This section includes but is not necessarily limited to: Kerbing, site drainage and asphaltic paving of the Driveway Areas. See also Concrete Masonry for the block retaining walls.

37.3 Standards-Except as modified by this section, all materials and workmanship shall comply with the appropriate Transit New Zealand specifications.
TNZ M/1 Asphaltic Bitumen 1989
TNZ M/6 Sealing Chip 1992 and any relevant amendments.
TNZ M/10 First Coat Sealing 1988
TNZ P/9 Construction of Asphalt Concrete Paving 1975

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37.4 The Contractor shall allow to set out the work.

37.5 Subgrade. Trim the subgrade to the correct falls and compact with not less than three passes of a tractor drawn or equivalent vibrating roller. If the existing material is to be re-used as the sub-base allow to undercut compact the exposed subgrade and respread the material.

37.5.2 Topsoil shall be stockpiled within the site where directed by the owner.

37.5.3 Sub-base shall be uniformly graded shingle with sufficient non-plastic fines to enable it to compact. The maximum stone size shall not exceed 75 mm and the material CBR shall be not less than 40. Compaction shall be carried out until a 90 percentile Clegg Impact Hammer reading of 25 is obtained.

37.6 Basecourse. Basecourse shall comply with the requirements of transit New Zealand Specification M5. Compaction shall comply with the requirements of Transit New Zealand Specification B2. Prior to sealing the prepared surface is to be tested with a Clegg Impact Hammer. Areas with readings under 40 are to be recompacted to achieve a 40 result.

37.7 Sealing. All sealing shall consist 25 mm of Asphaltic Concrete Paving over an emulsion tack coat.

37.8 The construction of the asphaltic concrete paving shall be carried out strictly in accordance with TNZ P/9 and as follows
25 mm thick; tolerances= -5mm, +20mm. Surfaces to be straight to within ± 5mm in 3m̂.

All asphaltic concrete used shall be weighed on a certified weigh bridge and dockets for each load supplied to the Engineer.
The temperature of each load shall be a minimum of 150°c when fed into the paving machine.
Finish the asphaltic concrete paving level with or not more than 5mm proud of nominal lines or the concrete paving or kerbing as appropriate.

37.9 Prevention of Damage-All buildings, concrete work, etc which could suffer damage or marking due to spraying or pouring operations shall be covered before work starts. The Contractor shall be entirely responsible for any remedial work necessary to clean surfaces which become splashed or marked.

37.10 Kerbing & Channelling

37.10.1

General- a) All kerbing and channelling shall be constructed true to line, level, grade and cross section within a tolerance of plus or minus 7 mm. Special care shall be taken at junctions with existing work to ensure that there are no abrupt irregularities. The exposed faces of all kerbing and channelling shall be dense, smooth surfaces, free from scale, honeycombing or other irregularities. No air entraining agents may be used.

b) Tolerance: The height of kerbing between tangent points shall not deviate from a straight line (measured at the top of the kerb and the face nearest to the carriageway) by more than +/-5 mm in any length of 2.5 m. The same tolerance applies to the gradient line.

37.10.2

Extruded Kerb and Channelling-The use of an extrusion machine for constructing kerbing and channelling will be required. The concrete shall be extruded from the machine at a uniform rate, and the concrete shall be stiff enough after extrusion to maintain its cross section without support. Construction joints shall be made at a maximum spacing of 4 metres and may be made by sawing or pre-forming. The depth of a cut or sawn construction joint shall not be less than 50 mm.

Expansion joints shall be formed at 30 metre intervals by a break in the channel of 5 mm, and shall be filled with a grey polysulphide sealant. Where the construction or expansion joint is made prior to the concrete hardening, the concrete adjacent to the joint shall be fitted with a close fitting shield, and care taken to prevent any damage to the joint in the way of cracking and spalling at the edges of the joint. All runs must start and end at such a joint.

37.11 Maintenance-The Contractor shall maintain, to the satisfaction of the Engineer the new paved surface from the date of completion of the paving until the end of the maintenance period.

37.12 Sump - Construct stormwater sump under the cast iron tree surround/grating and fall the asphaltic concrete paving towards this as shown on the drawings. Fall the remainder of the paving to the existing drain channel on the north side of the driveway.

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38 NET SUMS

Allow for the owner to expend the following sums within this contract, net of profit, margins, GST etc for the supply only of the following. Allow to install and supply all associated items.

38.1	Contingency Fund	$6000.00	
38.2	Fireplaces + Flues	$7500.00	
38.3	Light Fittings	$5000	
38.4	Tile Supply only	$60/sq m	
38.5	Hardware	$3500.00	
38.6	Plumbing Taps	$3000.00	
38.7	Landscaping Plants and installation		$8,000.00
38.8	Swimming pool lining, pump, filter, skimmer, chlorinator etc		$20,000.00

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APPENDIX 1 : EXTERIOR FINISHES SCHEDULE

ITEM	SUBSTRATE	FINISH	COLOUR
Roof	Colorsteel Trimdeck/Trimline	PCC ZR8	Greyfriars
Roof flashings	Colorsteel	PCC ZR8	Greyfriars
Spoutings	Galv Steel	HG Enamel	16E56
"Flat" roofs	18 Plywood	Polyflame Mineral Chip	Green-grey
Internal Gutters	Gripset 38	Hi Glo	13HK92
Flashing cappings top of block walls	Concrete or block	Gripset 38+wall finish	=Wall colour
Downpipes/Rainwaterheads	Galv Steel	Resene Metallic	10MA40
Brackets for above(concealed)	Galv steel	Resene Metallics	SL
Fascias	Titan B'd	Hi Glo	13HK92
Soffits	Villaboard	HG Acrylic Sprayed	White
Chimneys	SS+SS Mesh		SS
Timber framed walls generally	Polymer Plaster	Low sheen Acrylic	White
Plastered Block walls generally	Polymer Plaster	Low sheen Acrylic	White
Family Room walls round to bed 1	Polymer Plaster	SG Acrylic	20C37
Timber frame walls to bedroom 1 and to Hall wall	Polymer Plaster	SG Acrylic	16C37
Panel between Garage/Sitting room	Polymer Plaster	Hi Glo	13HK92
Curved block wall to bath 2/bed 3	Polymer Plaster	Low sheen Acrylic	3V81
Stone clad walls	Frame+Hardibacker	Limestone	Natural
Exterior Joinery incl Garage Door	Alum	Dulux Metropolis	Porpoise
Window head flashings	Alum	Dulux Metropolis	Porpoise
Window Flaps	Cedar	Resene Metallics	11MB30
Front door	Cedar	HG Enamel	16E56
Front Door frame	Matai	Resene Metallic	10MA40
Pump room, Store doors, Pool Gates	Tan P	HG Enamel	16E56
Frames to above	Tan P	Resene Metallics	10MA40
Meterboard	Galv Steel	Prefin	Pure White
Balustrade, Window & Gate to Pool west wall		Toughened Glass	Clear
Timber posts and beams	Tan P	Sikkens	Walnut
Steel rod brackets to above	Galv	HG Enamel	16E56

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APPENDIX 2 : INTERIOR FINISHES SCHEDULE

ITEM	SUBSTRATE	FINISH	COLOUR
General			
Int Door frames	Matai	HG	Clear
Int Doors	Matai veneer	SG	Clear
Ext doors & windows Jamb Liners	Matai	HG	Clear
Sill clashings	Matai	HG	Clear
Sills	Villaboard	Tile	SL
Skirtings	Matai or tiled if adjacent to tiled floors	HG	Clear
Family Room, Kitchen and Entry Hall			
Floor	Concrete	Matai T&G	SL
Walls	Gib 13	Matt Acrylic	SL
Ceilings	Gib Ultraline	Matt Acrylic	SL
Bedroom 1 and Dressing Room			
Floor	Particle board	Carpet	SL
Walls	Gib	Matt Acrylic	SL
Ceilings	Gib Ultraline	Matt Acrylic	SL
Bathroom 1			
Floor	Concrete	Tile	SL
Walls or	Villaboard L5	Matt Acrylic	SL
Walls	Villaboard or block	Tile	SL
Ceiling	Villaboard L5	Matt Acrylic	SL
Cabinet doors	MDF	Melamine/Mirror	
Shower walls	Block	Tile	SL
Bedrooms 2 & 3			
Floor	Concrete	Carpet	SL
Walls	Gib	Matt Acrylic	SL
Ceiling	Gib Ultraline	Matt Acrylic	SL

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ITEM	SUBSTRATE	FINISH	COLOUR
Sitting Room			
Floor	Concrete	Carpet	SL
Walls	Gib	Matt Acrylic	SL
Ceiling	Gib Ultraline	Matt Acrylic	SL
Hall			
Floor	Concrete	Tile	SL
Walls	Gib	Matt Acrylic	SL
Ceiling	Gib Ultraline	Matt Acrylic	SL
Kitchen			
Floor & Toeboards	Concrete	Matai T & G	SL
Ceiling	Ultraline	Matt Acrylic	SL
Cabinet interiors & Drawer ints	MDF	Melamine	Champagne Sagawood Supermatt
Drawer bottoms and shelves	MDF	Melamine Blue Shimmer Hautelink	
Drawer slides	Alum	Alum	Alum
Cab Doors & Drawers	MDF, Matai veneer	80% gloss Lacquer	SL
Frig/Pantry cabinet ext	MDF, matai boarding	80% gloss Lacquer	SL
Pantry interior	MDF	Champagne Sagawood Supermatt	
Shelves	MDF	Melamine Blue Shimmer Hautelink	
Benchtops	Stone or Corian	Matt	SL
Upstand behind benches	Gib	Tile	SL
Garage			
Floor	Concrete	Resene sidewalk	Pebble grey
Ceiling	Gib	Matt Acrylic	SL
Walls	Villaboard L4	SG Acrylic	SL

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APPENDIX III

CONTRACTOR SAFETY PREQUALIFICATION FORM

CONTRACT Barnes House, Roy's Hill.

CONTRACTOR Concept master Builders Ltd

ADDRESS State Highway 50, Hawkes bay

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OCCUPATION/ACTIVITY

The contractor is required to supply the following information to the employer in order for both the employer and the contractor to meet their mutual obligations under the Health and Safety In Employment Act, 1992.

1	A copy of the contractors Health and Safety Policy.	
2	Health and Safety Programme: Does your programme include the following?	
2.1	Safe work practices and safety rules?	yes/no
2.2	Safety supervision?	yes/no
2.3	Emergency procedures?	yes/no
2.4	First aid procedures?	yes/no
2.5	Accident/incident reporting?	yes/no
2.6	Accident/incident investigation?	yes/no
2.7	New employees induction procedures?	yes/no
2.8	Hazard investigation?	yes/no
2.9	Training standards?	yes/no

Please provide relevant documentation to substantiate your replies to the above.

APPENDIX IV.

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PAYMENT CLAIM FORM

Barnes House, State Highway 50, Roy's Hill, Hawkes Bay.

The contractor shall provide the following data with each claim for payment:

.Claim $....., GST #.....

.Claim incl GST.....

1 CLAIM DATE ...../...../.....

2 Total value of work completed to date
or total amount being claimed to date $.....

3 Total of extras, variations and increased costs$.....

4 Total reductions to date $.....

5 Total of all previous payments $.....

6 Provide a dated, cumulative summary showing details of
extras, variations, increased or reduced costs with each claim.

All the above amounts shall EXCLUDE GST.

CLAIMS NOT INCLUDING THIS FORM COMPLETED IN FULL MAY INCUR DELAYS IN PROCESSING. USE THIS FORM.

ITEM	SUBSTRATE	FINISH	COLOUR
Sitting Room			
Floor	Concrete	Carpet	SL
Walls	Gib	Matt Acrylic	SL
Ceiling	Gib Ultraline	Matt Acrylic	SL
Hall			
Floor	Concrete	Tile	SL
Walls	Gib	Matt Acrylic	SL
Ceiling	Gib Ultraline	Matt Acrylic	SL
Kitchen			
Floor & Toeboards	Concrete	Matai T & G	SL
Ceiling	Ultraline	Matt Acrylic	SL
Cabinet interiors & Drawer ints	MDF	Melamine	Champagne Sagawood Supermatt
Drawer bottoms and shelves	MDF	Melamine Blue Shimmer Hautelink	
Drawer slides	Alum	Alum	Alum
Cab Doors & Drawers	MDF, Matai veneer	80% gloss Lacquer	SL
Frig/Pantry cabinet ext	MDF, matai boarding	80% gloss Lacquer	SL
Pantry interior	MDF	Champagne Sagawood Supermatt	
Shelves	MDF	Melamine Blue Shimmer Hautelink	
Benchtops	Stone or Corian	Matt	SL
Upstand behind benches	Gib	Tile	SL
Garage			
Floor	Concrete	Resene sidewalk	Pebble grey
Ceiling	Gib	Matt Acrylic	SL
Walls	Villaboard L4	SG Acrylic	SL

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RX PLASTICS LTD

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HAMILTON BRANCH
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PHONE (0064) (07) 829 9350
FAX (0064) (07) 829 9066

PRODUCER STATEMENT

AMENDED PLAN
Refer previous plans also
for past endorsements

In respect of:	**Air Tech ™ 9000 A.W.T.S. Household Sewage Treatment System**
Att:	**Hastings District Council**
For:	**DA & CJ Barnes: 2538 S.H.50**

APPROVED /BUILDING
PLUMBING DRAINAGE
Hastings District
Council 3/04/2006

We believe that we have designed the above wastewater treatment system having regard to the basic performance criteria incorporated in the following standards and guidelines:

AS/NZ 1546:1.1998: On-site Wastewater Treatment Units Part 1 - Septic Tanks
NZS 4610 : 1982 Household Septic Tank Systems
ARC Environment: TP 58 November 1994 - On-site Wastewater Disposal from Household and Institutions

and the requirements of:

NZ Building Code: Section B2 Durability
Section G13 Foul Water
Section G14 Industrial Wastes

PERFORMANCE:

The system is designed to achieve the following quality of effluent treatment:

BOD	:	15 to 20mg/1
Total Suspended Solids	:	20 to 30mg/1
Faecal Coliforms	:	0 to 200/100ml (after disinfection / soil treatment)

EFFLUENT DISPOSAL:

The design of the effluent disposal system is based on the discharge of 1200 litres per day of treated effluent at a hydraulic loading of 3 mm per square metre. The required disposal area is 400 square metres.

The effluent is to be dispersed through a subsurface Naan dripline irrigation system. 400m of Naan pipe will be laid. The proposed siting and layout of the disposal area is shown on the attached plan. Landscaping of the irrigation area is the owner's responsibility.

The on-site contractor is ultimately responsible for ensuring the system is installed in accordance with the Company's installation specifications.

An approved installation Agent will be responsible for the commissioning of the system.

AMENDED PLAN
Refer previous plans also
for past endorsements

Signed: .....

Neville Moon
Manager RX Environmental Division

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SEWAGE TREATMENT AND EFFLUENT DISPOSAL DESIGN

Treatment Process	:	Aerated Wastewater Treatment System (A.W.T.S)
System Design	:	Air Tech™9000
Design Capacity	:	2000ltrs per day (maximum)

DESIGN LOADINGS

Number of persons	:	6
Water Supply	:	Tank
Wastewater Flow	:	200ltrs per person per day
Total Wastewater Flow:		6 x 200 = 1200 lts per day
Soil Category Type	:	3 mm D.I.R per day
1200 litres / 3mm	=	400²m of irrigation disposal area required

EFFLUENT DISPOSAL

Effluent dispersement will be **NAAN DAN** purple compensating emitter irrigation lateral.
Emitters will be at .600mm spacings with a 2.1ltr per/hr flow rate.
The irrigation system will incorporate a vacuum break and line flushing valve.
An Arkal inline ring disc filter will protect the dripper lateral.

SOIL TYPE

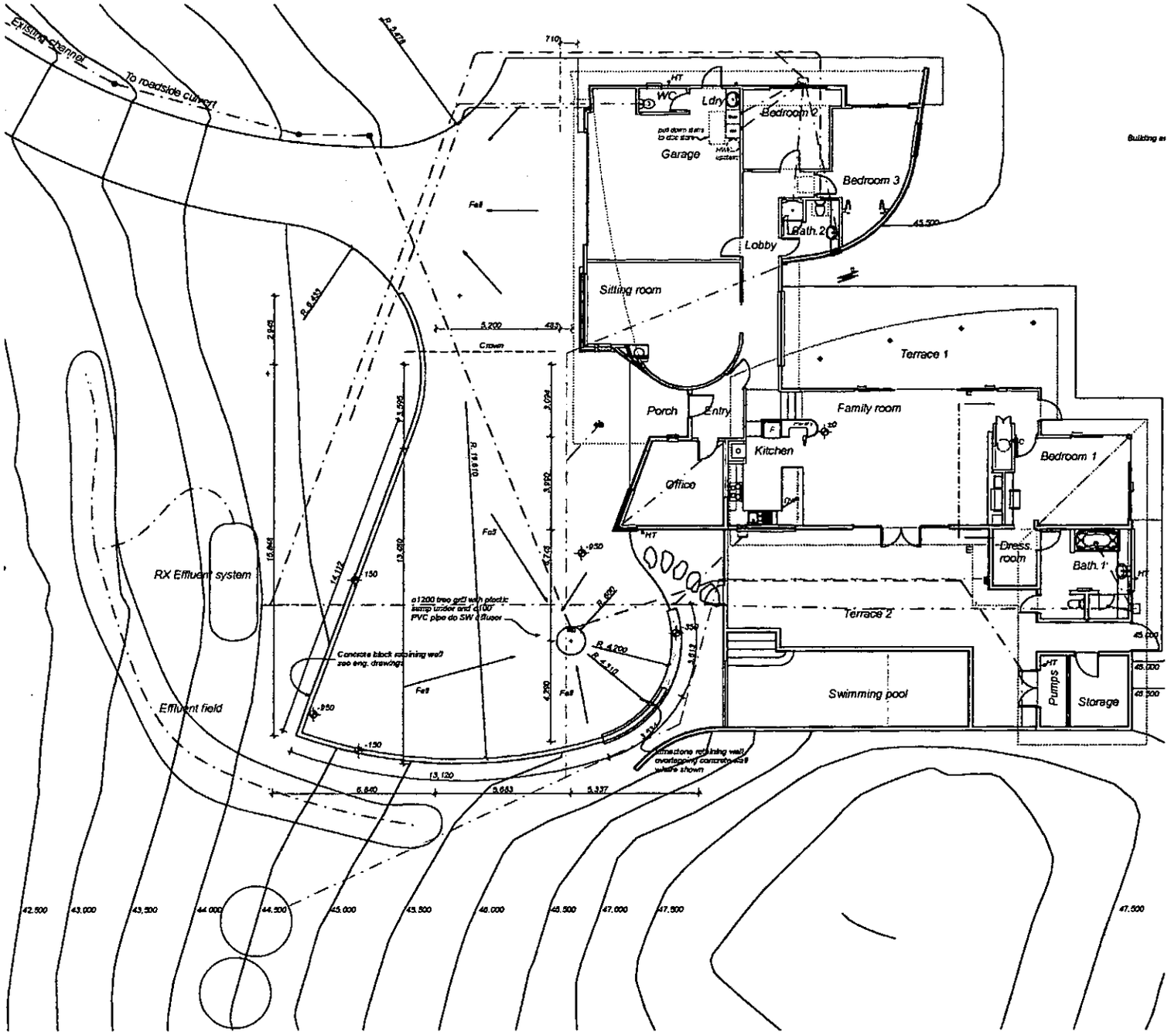
The site is flat with a west aspect and receives good sun exposure. The area designated for the effluent disposal via drip irrigation lateral will have bush and tree plantings that will have very good nutrient uptake. Evapotranspiration will be greatly assisted given the sunny north west aspect of the site.

Given the nature of the site, soil type has been assessed as a category four - 3 mm D.I.R. per day.

RESERVE DISPOSAL AREA

There is available land and landscape area for additional disposal if required.

Neville Moon
RX Environmental
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1 : 250; 10/12/05 5:24 PM; Effluent system/ stormwater/ tank location

AMENDED PLAN
Refer previous plans also for past endorsements

TECHNICAL SPECIFICATION

AIR TECH ™ 9000 SEWAGE TREATMENT SYSTEM

The specifications of the Air Tech ™ 9000 Aerated Wastewater Treatment System are as follows:-

Tank Chambers — Polethylene modular interlocking tank chambers - complying with construction standard AWS/NZS 1546.1:1998
Capacities - primary chamber 3300 litres - Aerobic chamber 1500 litres
Clarification chamber 1200 litres - pump chamber (maximum) 1000 litres

Primary Chamber Filter — Biotube 100mm Effluent Filter. Flow Modulation Outlet.

Air Blower — Side Channel 120 Rotary Vane. Double Inlet Filter.

Diffuser — Pro Flex 250 Disc Diaphragm. Automatic Check Valve.

Air System — Supplies air to the diffuser and venturi sludge return system (aerobic and anaerobic). The air system is controlled by valves enabling the air supply to be regulated and fined tuned to achieve the most effective and efficient use of air in the treatment system.

Media — Bio-Tube Module - purpose made polytheylene biological treatment and filtration media.

Disinfection — 1. Chlorinator (optional) - Chlorine tablet water contact dispenser /single adjustable tube.
2. Electronic Treatment - Water Sterilisation system

Effluent Pump — D42A submersible pump 26m maximum head

Effluent Filter — Arkal 1" Super Filter - Red Grooved Rings 120 mesh = 130 micron = .13mm

Controller Alarm & Management System — The Air Tech ™ 9000 Aerated Wastewater Treatment System is managed by an electronically monitored controller. This state of the art microprocessor based unit is monitored 24 hours a day and in the unlikely event of a system fault will alert the home owner with an audio-visual alarm.

The controller will then communicate through the Public Switched Telecom Network (FSTN) transmitting a status report to a central database. These reports are logged with date and time, processed, and if necessary, transmitted to the Area Service Technician who can respond to the alarm call.

Design Certification

The design of the Air Tech ™ 9000 Sewage Treatment System has been developed in accordance with sound and widely accepted engineering principles and technology. The system has been assessed, for a typical domestic household wastewater loading, as capable of meeting the following quality of effluent treatment:

BOD_5	-	14 to 20 mg/L
TSS	-	20 to 30 mg/L
Faecal Coliforms (soil treatment)	-	less than 1000/FC (CRC GA Standard)
Faecal Coliforms (with disnfection)	-	0 to 200/100ml

Andrew Dakers ME, BE, Registered Engineer, Natural Resources Engineering

The Technical specifications are for the Air Tech ™ 9000 domestic wastewater treatment system. Because of the company's on-going research and development, RX Plastics Ltd reserves the right to alter specifications without notice

Such alterations will maintain or improve the above effluent quality standard. C:\WPWIN60\WPDOCS\SEPTIC\TECH.WPD

SERVICING SCHEDULE

AIR TECH ™ 9000 SEWAGE TREATMENT SYSTEM

RX Plastics Ltd specify that the system shall be serviced in accordance with the following regime:

Full service by the manufacturers approved service technician : annually
Regular servicing by the service technician or "owner" * : as specified by the manufacturer

* "owner" must be the property owner who has been specifically trained by the company to service the system.

The system is designed so that it can be simply serviced. The company has developed a recording system for the monitoring of each installation. The owner will be required to submit certification that the servicing has been carried out in accordance with the service schedule, specified below.

The servicing requirements for componentry, as recommended by manufacturers, are as follows:-

1	Primary Chamber	check **annually/desluge every five years or as required**
2	Bio tube Effluent Filter	remove filter and wash **annually**
3	Air Blower	clean the air filter **three times per year**
4	Air System	check diffuser/sludge return/air flow **annually**
5	Chlorinator (if fitted)	top up chlorine tablets **three times per year**
6	Effluent Pump	general check of pump and flow pressure **annually**
7	Arkal Disc Filter	check and wash **three times per year**
8	Alarm System	check system **twice a year**
9	Effluent Disposal System	check disposal area **twice a year**

Servicing Chart

	Function	4 Monthly	6 Monthly	Annually
1	Primary Chamber/Check			Service Technician
2	Bio tube/Clean Filter			Service Technician
3	Air Blower/Clean Filter		Owner	Service Technician
4	Air System/Check			Service Technician
5	Chlorinator/Tablets	Owner		Service Technician
6	Effluent Pump/Check			Service Technician
7	Effluent Filter/Clean	Owner		Service Technician
8	Alarm System/Check		Owner	Service Technician
9	Effluent Disposal System		Owner	Service Technician

Note: The desludging of the anaerobic chamber is the responsibility of the owner and should be carried out at least every five years or sooner if required.

Assessment of Servicing Schedule C:\WPWIN60\WPDOCS\SEPTIC\TECH.WPD
This servicing schedule has been assessed and confirmed by:-

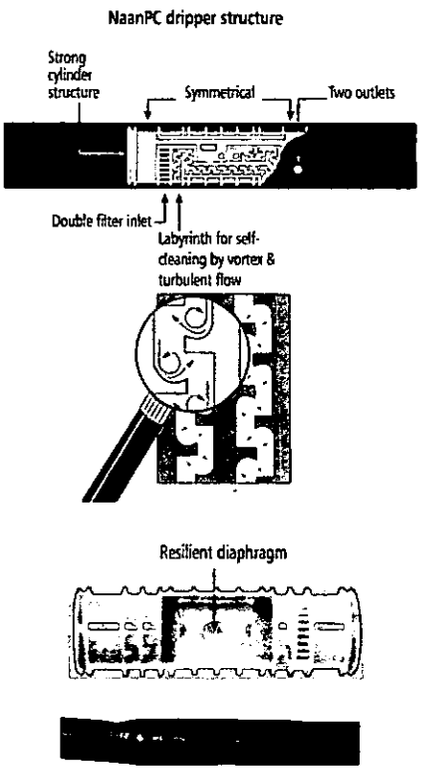
Naan PC

NAANDAN
Irrigation Systems

High-tech pressure compensating effluent dripline

The optimum solution for effluent dispersal where control over the flow rate is desired. Excellent performance with all qualities of water.

- Continuous 16mm polyethylene drip-line with integrated self-regulating emitters.
- Two water inlets and two water outlets per emitter.
- Resilient diaphragm, unaffected by effluent, chemicals or fertilizers. Provides precision and durability.
- Self-cleaning: Each emitter has an emergency filter and flushing mechanism.
- Pressure regulating range: 0.5 bar to 4.0 bar.
- Recommended working pressure: 1.0 bar to 3.0 bar.



Head Loss

Head loss (m) in relation to lateral length (m) and dripper spacing (cm).

Pressure Calculation

Dripline:	**16mm**
Emitter Flow:	2.1lph
Emitter Spacing:	60cm
Length:	120m
Topography:	2.0m

Required lateral pressure:

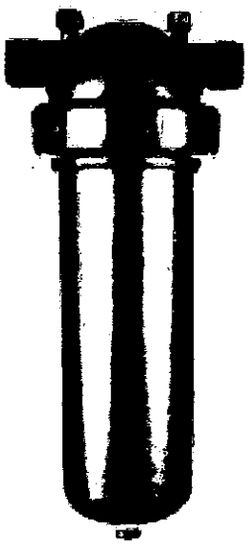
Head loss (from table)	5.4m
Topography	2.0m
Minimum operating pressure	10.0m
Total pressure	**17.4m**

NaanPC 16 dripline - 2.1(blue)

Lateral length m	Dripper spacing (cm)							
	30	40	50	60	75	100	125	150
20	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
40	1.2	0.6	0.3	0.2	0.1	0.1	0.0	0.0
60	4.0	1.9	1.1	0.7	0.4	0.2	0.1	0.1
80	9.3	4.4	2.5	1.6	0.9	0.5	0.3	0.2
100	18.2	8.5	4.8	3.1	1.8	1.0	0.6	0.4
120		14.7	8.3	5.4	3.1	1.6	1.0	0.7
140		23.3	13.1	8.4	4.9	2.6	1.5	1.1
160			19.6	12.4	7.3	3.8	2.3	1.5
180				17.8	10.2	5.3	3.2	2.1
200					14.0	7.2	4.3	2.9
220					18.6	9.5	5.7	3.8
240						12.3	7.3	4.9
260						15.5	9.3	6.3
280						19.3	11.5	7.7
300							14.1	9.4
320							17.0	11.5
340							20.3	13.6
360							24.0	16.0
380							28.1	18.9

ARKAL 1" SUPER FILTER

CATALOG NO. 1102-0



FEATURES

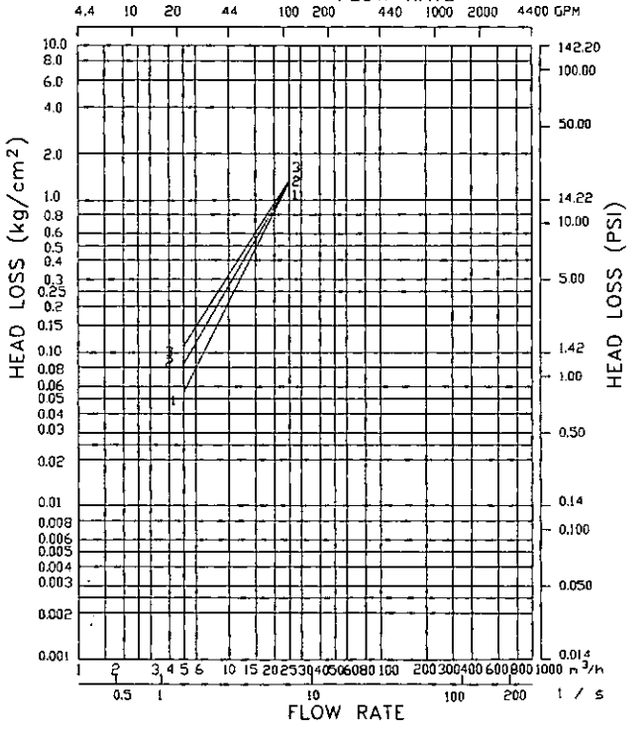
- A "T" shaped filter with two 1" male threads.
- A "T" volume filter for in-line installation on 1" pipelines.
- The filter prevents clogging due to its enlarged filtering area that collects sediments and particles.
- Manufactured entirely from fiber reinforced plastic.
- A cylindrical column of grooved rings constitutes the filter element.
- A sealing spring keeps the rings compressed.
- Screw-on filter cover.
- Filter rings are available in six optional filtering degrees.

TECHNICAL DATA

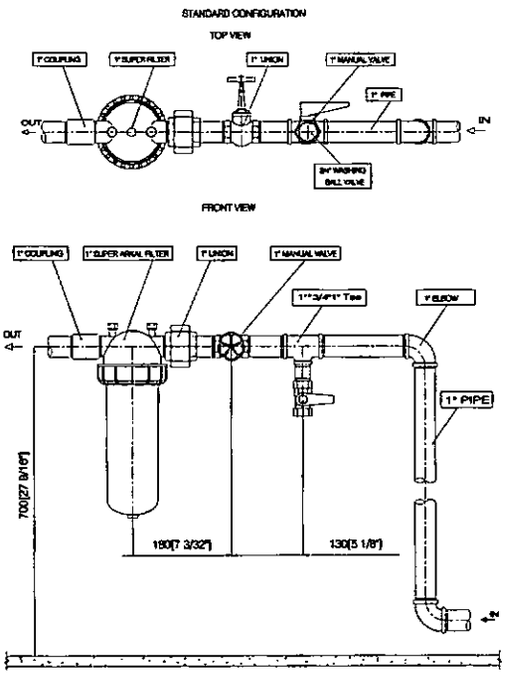
Inlet/outlet diameter	1" BSPT (male) 25.0 mm – nominal diameter 33.6 mm – pipe diameter (O. D.)	1" BSPT (male)
Recommended maximum pressure	10 atm	140 psi
Maximum flow rate	8 m^3/h (1.7 l/sec)	35 gpm
General filtering area	501.2 cm^2	77.78 in^2
Filtering volume	592 cm^3	36.1 in^3
Filter length	347 mm	13 11/16"
Filter width	130 mm	5 1/8"
Distance between end connections	158 mm	6 7/32"
Weight	1.420 kg	3.13 lbs.

HEAD LOSS

1 – BLUE	(400 MICRON / 40 MESH)
2 – YELLOW	(200 MICRON / 80 MESH)
3 – RED	(130 MICRON / 120 MESH)
3 – BLACK	(100 MICRON / 140 MESH)
4 – GREEN	(55 MICRON)



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INSTALLATION

1. Filter may be installed either vertically or horizontally.
2. Use Teflon tape on filter end connections.
3. Never use spanners for tightening the filter cover.

MAINTENANCE

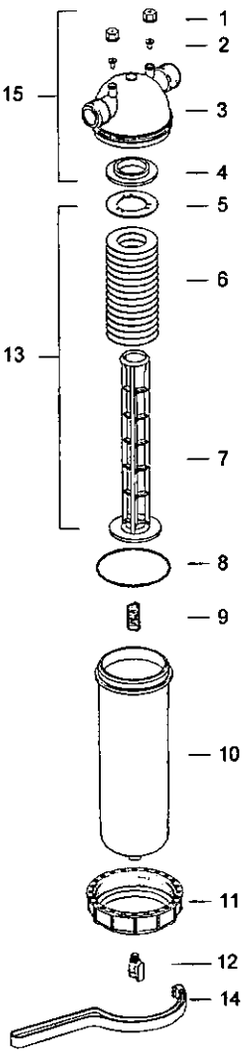
If the filter rings are covered with lime deposits then remove the element and treat with chloric acid.

DISMANTLING

1. Turn off the water.
2. Make sure that the pressure is released from the filter.
3. Unscrew the cover from the filter body.
4. Pull out the filter element.
5. Move the sealing ring to the end of the spine.
6. Flush the rings with the water jet.

ASSEMBLY

1. Verify that the tightening spring is placed at the bottom of the filter cover.
2. Assemble in reverse order.
3. Tighten the cover by turning the fixing nut clockwise and don't over tighten.

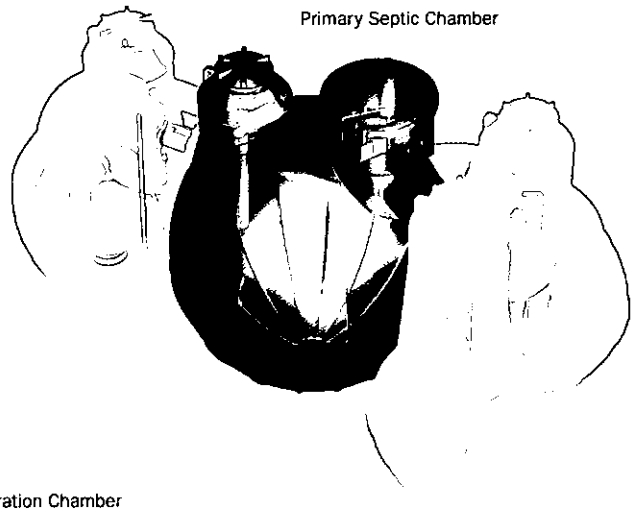


PART LIST

NO.	CAT. NO.	DESCRIPTION	MATERIALS
1	2511 0103	GAUGE PORT NUT (SINGLE UNIT)	
2	5006 0004	GAUGE PORT SEAL (SINGLE UNIT)	
3	2500 0100	FILTER BODY (BSP)	
	2500 0101	FILTER BODY (NPT)	
4	2507 0100	FILTER ADAPTOR RING	
5	2507 0102	ELEMENT RETAINING RING	
6	2012 1___	DISC SET	
7	2502 0111	SPINE	
8	5002 9004	90x4 O-RING	
9	5044 0011	COMPRESSION SPRING	
10	2501 0111	FILTER COVER	
11	2506 0100	FIXING NUT	
12	5054 0008	¼" TAP (•)	
13	2112 1___	FILTER ELEMENT	
14	2530 0115	1"-1½" FILTER WRENCH	
15	2208 0001	FILTER BODY COMPLEX BSP	
	2208 0002	FILTER BODY COMPLEX NPT	

MATERIALS:
R.P.P. – REINFORCED POLYPROPYLENE
R.P.A. – REINFORCED POLYAMIDE
S.S. – STAINLESS STEEL
P.P. – POLYPROPYLENE
N.R. – NITRILE RUBBER
P.C. – POLYCARBONAT

Unique Patented Chamber System



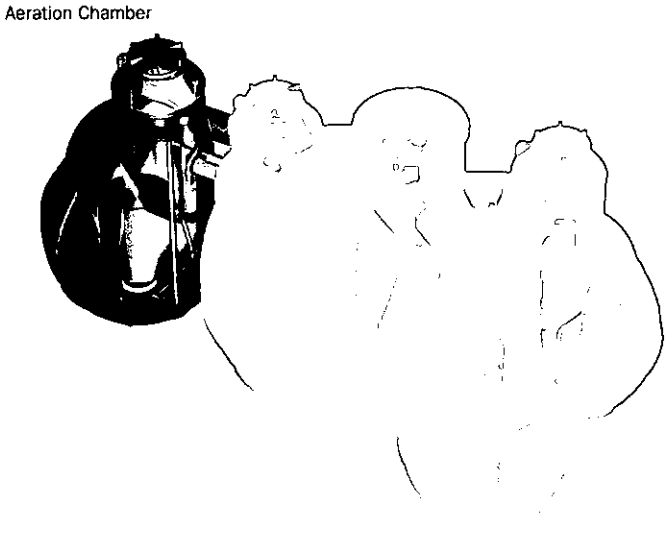
PRIMARY SEPTIC CHAMBER (3300 L)

This is the main chamber where all household sewage and wastewater is discharged and the settling out of up to 95% of solid waste occurs. There is also a reduction in the Biochemical Oxygen Demand (BOD^5) of up to 40%.

The primary chamber has a large liquid working capacity of 3300 litres ensuring maximum retention time allowing adequate anaerobic digestion of the accumulated solid waste.

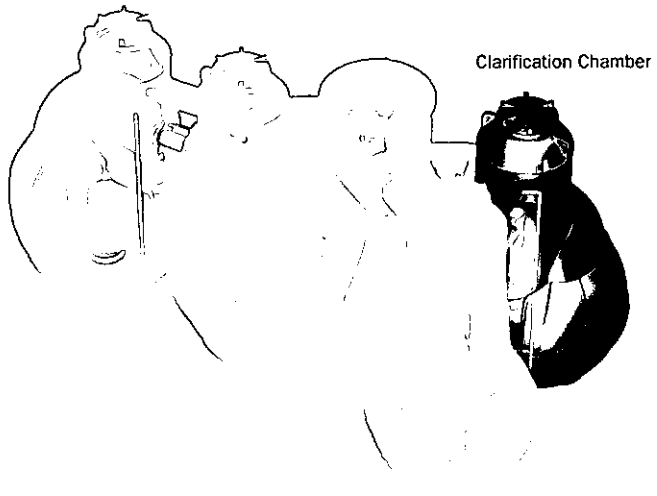
The primary chamber is a sealed chamber making sure there is no crossflow contamination between the separate treatment processes within the system.

The outlet is fitted with an industry proven 3mm biofilter minimising solid waste carry-over integrating a flow modulation baffle to manage peak flow levels limiting shock loading of the system.



AERATION CHAMBER (1500 L)

The partially treated wastewater flows into the Aeration Chamber where aggressive digesting aerobic bacteria further reduce the suspended solid sludge. Efficient oxygen transfer through fine air diffusion maintains high aerobic activity and population. Increased surface area through additional submerged media enhances and accommodates a greater growth of bacteria.

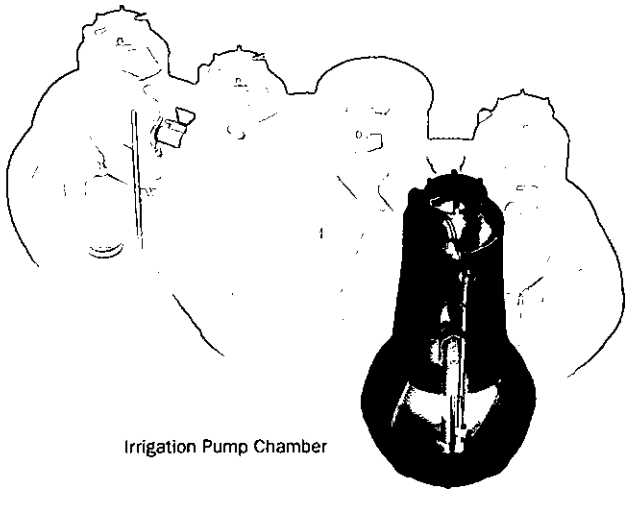


Performance by Design

CLARIFICATION CHAMBER (1200 L)

Wastewater effluent is gravity fed into the Clarification Chamber where, in quiescent conditions, any remaining sludge and suspended material settle and are returned to the Primary Chamber through a venturi airlift manifold.

This continual flow of enhanced activated sludge ensures a healthy treatment plant in periods of low or zero flow to the system.

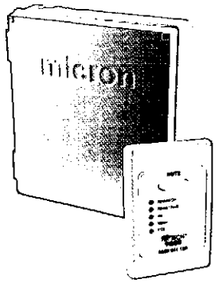


IRRIGATION PUMP CHAMBER (1000 L)

The gravity flow of clean, clear odourless effluent into the Irrigation Pump Chamber is nutrient enriched and is recycled through a designed irrigation system to enhance landscape, shelter belt or coppice tree woodlots on your property.

This chamber is protected with an alarm that will activate in the unlikely event of a pump failure, and as required by regulations, has a capacity to hold up to 1000 litres of effluent storage.

Controller Alarm Communication Management System

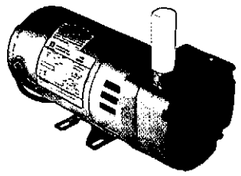


The **AirTech(TM) 9000** Aerated Wastewater Treatment System is managed by an electronically monitored controller. This state-of-the-art microprocesor based unit is monitored 24 hours a day and in the unlikely event of a system fault will alert the home owner with an audio-visual alarm.

The controller will then communicate through the Public Switched Telecom Network (PSTN) transmitting a status report to a central database. These reports are logged with date and time, processed, and if necessary, transmitted to the Area Service Technician who can respond to the alarm call.

CONTROLLER AND ALARM PLATE
- Automatic 24 hour self setting facility
- Battery back up
- 24 hour alarm monitoring
- Connected to communications data support systems
- Online maintenance management assessment facility
- Setting industry standards

Equipment and Components



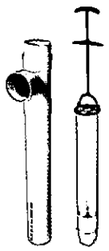
Q.R. AIR BLOWER
- Low flow, high pressure performance
- Die-cast aluminium sound chamber
- Long life bearing lubrication
- Inlet and outlet dust filters
- Exhaust muffler baffle
- Ideally suited for effluent aeration



PROFLEX DISC DIFFUSER
- Uniform bubble distribution
- Flexible rubber membrane
- Auto checkvalve preventing backflow
- Heavy duty EPDM diaphragm
- Unique precision perforated I slits
- Corrosion resistant polypropylene
- PVC retaining ring



BIOLOGICAL TREATMENT MEDIA
- Submerged aerobic application
- High specific surfac area (m^2/m^3)
- Strong construction
- Low maintenance
- Fast bio-mass accumulation
- Lightweight
- Non-clog characteristics

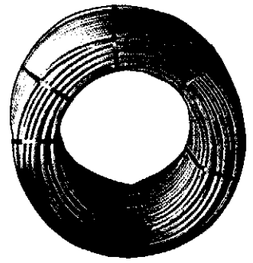


BIO FILTER
- Proven tube mesh design
- Large filtration surface area
- Improved efficiency
- 3mm filter screen
- Flow modulation outlet
- Manages peak flow levels
- Robust injection moulded flexi handle
- Suited to New Zealand conditions

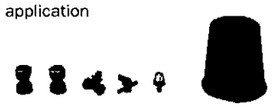


SUBMERSIBLE IRRIGATION PUMP
- Double mechanical seal
- Stainless steel shaft and motor shell
- Twin impeller design
- Corrosion resistant polycarbonate impellers
- Stainless steel fine mesh suction strainer
- Large surface area suction strainer
- 26m working head

Irrigation Effluent Disposal System



IRRIGATION LATERAL
- Internationally colour coded purple dripline identifying effluent application.
- 17mm low density linear polyethylene lateral tube.
- Integrated emitters set at specified spacings
- Pressure compensating emitters, 3 litre/hour application
- Automatic air relief valve
- Automatic MFV line flushing valve
- Proven effluent disposal system

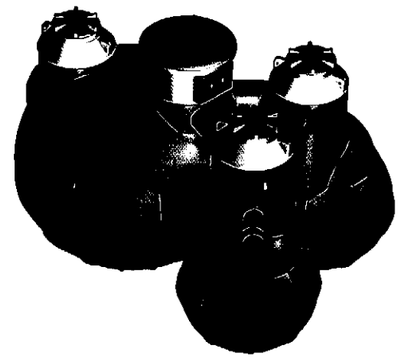




ARKAL SUPER FILTER
- Patented Disc Filtration technology
- Irrigation lateral protection
- Industry proven ring disc filter
- Cylindrical column filter element
- Corrosion resistant
- Simple disc cleaning procedure

Adding to your existing septic tank

The unique patented system is unparalleled in both rotational moulding and innovative sewage treatment technology.
The modular tank system offers many options and can be retrofitted to existing septic tanks to increase sewage treatment capacity and improve effluent quality.



Environmental Concerns

Discharge of sewage and wastewater to our environment has a serious impact on soil structures and water aquifers. With local and regional authorities requiring you, a rural resident with no sewage reticulation, to manage, treat and dispose of your own sewage and wastewater within the boundaries of your property, this issue may become a serious concern for you and the management of your property.

To meet the range of effluent quality standards that may vary between authorities you need a septic tank or sewage treatment system designed to minimise these adverse effects.

The **AirTech(TM) 9000** Aerated Wastewater Treatment System (AWTS) is New Zealand's most innovative sewage treatment system specifically designed to maximise the treatment of all household sewage and wastewater.

Before we bring any product to the market we thoroughly explore and test all aspects of the design and function to ensure that by the time it reaches you, we know it will perform to our usual exacting standards.

The **AirTech(TM) 9000** system's innovative design is the result of over 4 years commitment to developing the best sewage and wastewater treatment system available today.

Our goal was to make a simple, lightweight, polyethylene system and at the same time avoid the failings of existing plastic tank systems that have been met with varying degrees of success in the past.

Designed recognising the latest industry standards and incorporating many innovative features we believe the **AirTech(TM) 9000** is unequalled by any existing polyethylene tank system available today.

AIR TECH™ 9000

Aerated Wastewater Treatment System

The **AirTech(TM) 9000** system is an efficient, lightweight sewage treatment plant that safely and effectively processes all household sewage and wastewater and recycles it as clear, odourless nutrient enriched water to irrigate landscape, shelterbelt, coppice wood lots or existing planted areas. For the environmentally minded this means that the sewage and wastewater is treated on the property where it is produced and then recycled for reuse with little or no environmental impact on the land.



Technical

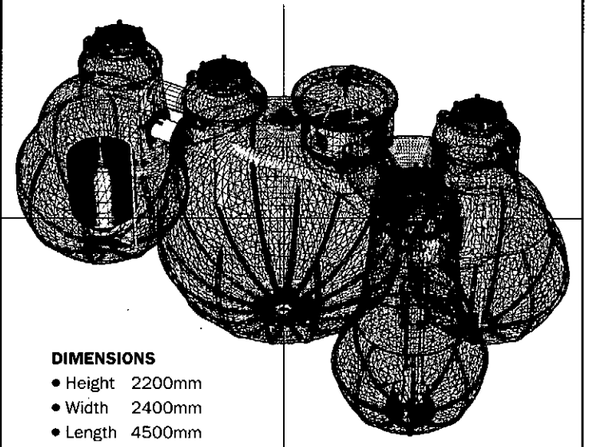
TANK CONSTRUCTION - Strongest Grade Polyethylene
TANK PRODUCTION - Rotational Moulding

FEATURES

• Primary Septic Chamber	3300 litres
• Areation Chamber	1500 litres
• Clarification Settling Chamber	1200 litres
• Pump Chamber	1000 litres
• Nominal Operating Capacity	7000 litres
• Additional Storage Capacity	2165 litres
• 3mm Bio Filter fitted	
• Integrated Flow Modulation Baffle	
• Control Alarm Panel System	
• Battery Alarm Backup	
• Mains Fail Alarm	
• System Fail Alarm	
• Data Support System	
• Online Management System	

ELECTRICAL

• Irrigation Pump	.6 kW
• Q.R. Air Blower	.25 kW



DIMENSIONS
- Height 2200mm
- Width 2400mm
- Length 4500mm
- Weight 600 kgs

All measurements nominal

Warranty

The **AirTech(TM) 9000** Aerated Wastewater Treatment System is covered by the RX Plastics extended warranty and covers the product to be free of defects in workmanship, and materials for a period of 15 years for all polyethylene rotomoulded tanks.
The manufacturers warranty apply to all other componentry used in the **AirTech(TM) 9000** system.

Customer Care

An **AirTech(TM) 9000** Aerated Wastewater Treatment System will provide you with many years of rewarding and reliable performance supported and serviced by our network of fully trained and certified installation and service technicians.
Our friendly expert technicians have extensive product and system knowledge and are able to provide you excellent support should you require.

It's all part of our commitment to your total satisfaction and peace of mind.



COMPLIANCE AND CERTIFICATION

The RX Septic Tank range meets the objectives of:
Australia New Zealand joint standard 1546 1:1998
Australia New Zealand joint standard 1547 2000
ARC Environment TP 58 Second Edition
Design and Testing verified by registered engineers and consultants
Process analysis undertaken at Lincoln University: Andrew Dakers, M.E. Natural Resources Engineering.
Member On-site Wastewater Special Interest Group (OSW-SIG)
Local Authority Approved
Meets World Health Organisation (WHO) effluent quality standards
ISO9001 Quality Management System: Telarc Registration No. 807
NZ Pat Appn No. 529820

Due to our continuous programme of product development, specifications may change at any time without notice.

Your local supplier

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RX PLASTICS LTD

Issued February 2005

DEZIGN WORKS
Consulting Engineers Civil Structural

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D & C Barnes

House Structural Design
2536 SH 50, Hastings

Specification

Dezign Works HB Ltd: 107 Market Street North • P O Box 5 • HASTINGS
Telephone: (06) 878-7669 • Facsimile: (06) 878-7699 • Email: info@dworks.co.nz

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3100 CONCRETE GENERAL

1. GENERAL

Related work

1.1 RELATED SECTIONS
Refer to 3111 FORMWORK FOR CONCRETE for formwork
Refer to 3112 REINFORCEMENT FOR CONCRETE for reinforcement
Refer to 3121 CONCRETE PLACEMENT for concrete placing
Refer to 3124 FINISHES TO WET CONCRETE for concrete finishing
Refer to 3129 CONCRETE PRODUCTION for concrete production

Documents

1.2 DOCUMENTS REFERRED TO
Documents referred to in the above sections are:

AS 1366	Rigid cellular plastics for thermal insulation Part 3 Rigid cellular polystyrene – Moulded (RC/PS – M)
AS/NZS 1554	Structural steel welding, 1554.3: Welding of reinforcing steel
AS/NZS 1860	Particleboard flooring, 1860.1: Specifications
AS/NZS 2269	Plywood – Structural
NZS 3101	Concrete Structures Standard
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction *
NZS 3112	Methods of test for concrete, Part 1: Tests relating to fresh concrete
NZS 3113	Chemical admixtures for concrete
NZS 3114	Specification for concrete surface finishes
NZS 3117	Pigments for Portland cement and Portland cement products
NZS 3121	Water and aggregate for concrete
NZS 3122	Specification for Portland and blended cements (General and special purpose)
NZS 3125	Portland - limestone filler cement
NZS 3631	New Zealand timber grading rules
AS/NZS 4357	Structural laminated veneer lumber
AS/NZS 4671	Steel reinforcing materials

Alkali aggregate reaction (Cement and Concrete Association)
*** A copy of NZS 3109 Concrete construction, must be held on site.**

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

Requirements

1.3 QUALIFICATIONS
Workers to be experienced, competent and familiar in the fabrication and erection of formwork and with the materials and the techniques specified.

1.4 INSPECTIONS
Refer to 4. SCHEDULES.

Requirements

1.5 RECORDS
Make and keep record of mix, time, date and location of each pour and make available on request together with delivery dockets. Cross reference delivery dockets in pour records.

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1.6 PRODUCER STATEMENTS

Provide Producer Statements where required by the Territorial Authority and where required by this specification. Refer to the PRELIMINARIES AND GENERAL for details of the required form.

Performance

1.7 TESTING, ON SITE

Carry out sampling and concrete acceptance tests during construction to NZS 3109, section 9, noting that concrete may be rejected for:

- Non-compliance with this specification.
- Non-compliance with NZS 3109, section 9.
- Showing by appearance when in place that it does not comply with this specification, especially in respect of surface finish, segregation, or low density and which cannot acceptably be made good.

Conduct 7 day strength tests. After a 7 day test result of less than 60% of the specified strength, concrete placement to stop until it is shown the suspect concrete complies with the specification. Make all test records available.

1.8 CONFIRM STEEL REINFORCING COMPLIANCE

Provide a Producer Statement confirming that the steel reinforcing supplied complies with the grades specified on the drawings by producing test results in accordance with AS/NZS 4671.

1.9 CONTROL TESTS

Carry out slump tests, yield tests and air content tests to NZS 3112, part 1, sections 4, 5, and 9 respectively and evaluate to NZS 3104, keeping a record of all tests at the plant and making them available on request.

1.10 STRENGTH TESTS

Carry out to NZS 3112, part 2, section 10 and evaluate to NZS 3104, keeping a record of all tests at the plant and making them available on request.

1.11 QUALITY ASSURANCE

Carry out the whole of this work to the requirements of NZS 3109 and under the regime of a quality systems model for quality assurance in production and erection to AS/NZS ISO 9002.

Quality assurance procedures to include all aspects of concrete construction including:

- Formwork quality
- Reinforcing steel placing
- Cast in items
- Concrete quality
- Concrete finishes
- Construction tolerances

Advise name of the suitably experienced and qualified representative who is responsible for quality control of the concrete work. The representative is to sign a written quality control checklist for each on site concrete pour. Provide a copy to the construction reviewer in sufficient time for a pre pour inspection.

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3111 FORMWORK FOR CONCRETE

1. GENERAL

Related work

1.1 RELATED SECTIONS
Refer to 3100 CONCRETE GENERAL for general matters
Refer to 3112 REINFORCEMENT FOR CONCRETE for reinforcement
Refer to 3121 CONCRETE PLACEMENT for concrete placing
Refer to 3124 FINISHES TO WET CONCRETE for concrete finishing
Refer to 3129 CONCRETE PRODUCTION for concrete production

Requirements

1.2 FORMWORK DRAWINGS
Provide details of formwork showing but not limited to:
- position and type of construction joints
- layout of panel joints where exposed to view
- layout of form tie holes where exposed to view
- means of sealing panel joints, tie holes and construction joints
- form surfaces for each finish specified.

2. PRODUCTS

Materials

2.1 TIMBER FALSEWORK
No. 2 framing radiata pine to NZS 3631 or as required to construct the required formwork.

2.2 TIMBER BOARDS
Dressing or merchantable grade radiata pine to NZS 3631 for shutter face, to obtain the concrete finish specified.

2.3 LAMINATED VENEER LUMBER FORMWORK BEAMS
Laminated veneer lumber to AS/NZS 4357, sizes and spacing as recommended in span tables in the manufacturer's literature.

2.4 PROPRIETARY STEEL
An approved proprietary steel formwork and shutter system.

2.5 STRUCTURAL PLYWOOD
To AS/NZS 2269 for shutter face with plywood grade as necessary to obtain the concrete finish specified.

2.6 DAMPPROOF MEMBRANE
0.25 mm minimum polyethylene to NZS 3604, section 7.5.4.

2.7 SHEET DAMPPROOFING
Rubberised bitumen membrane specifically produced for waterproofing applications, possessing high resistance to water, water vapour and gas permeability and resistant to the attack of ground bacteria and ageing effects, joined using proprietary techniques and applied by the use of special adhesives. Thickness not less than 1.5 mm.

2.8 BRUSH ON LIQUID-APPLIED MEMBRANE
Fully stable, water-based colloidal bitumen emulsion.

2.9 CELLULAR POLYSTYRENE INSULATION
Proprietary expanded polystyrene (EPS) foam board to AS 1366 part 3.

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Components

2.10 ADHESIVE TAPE
Pressure sensitive adhesive tape.

Finishes

2.11 RELEASE AGENT
A release agent which will not stain or adhere to the concrete, contaminate reinforcing steel or construction joints, or have a detrimental effect on any applied finishes.

2.12 SURFACE RETARDER
A surface retarder that will not have long term detrimental effects on the concrete, or on any applied finishes.

3. EXECUTION

Conditions

3.1 PROVIDE ALL FORMWORK
Provide all formwork necessary to support and confine the concrete and shape it to the required dimensions. Use pre sealed plywood specifically manufactured for use as formwork or seal with 2 coats of polyurethane.

3.2 ACCURACY
Unless stated otherwise on the drawings permissible deviations from established lines, grades, dimensions and cambers to remain within the tolerances laid down in NZS 3109, table 5.1 for precast components and table 5.2 for in situ construction.

3.3 TOLERANCES OF CONCRETE SURFACE FINISHES
Unless stated otherwise on the drawings, permissible abrupt, offset and gradual deviations for the specified surface finish to remain within the tolerances laid down in NZS 3114, table 3.

3.4 LOADINGS
Design and construct formwork and falsework in accordance with sound engineering principles to withstand the worst combination of:
- dead loads of formwork, reinforcement, concrete and precast elements such as floor planks
- construction loads including dynamic effects of placing, compacting and construction traffic
- wind and snow loads.

3.5 BEARINGS
Carry strutting down to a construction sufficiently strong and stable to afford the required support without permissible stress or deflections being exceeded. Prop through to other floors if the construction load on a particular floor exceeds the design load.

3.6 CAMBERS
Cambers shown on the drawings or specified, relate to the concrete immediately before formwork is struck. Unless otherwise shown on drawings, construct forms to achieve the following:
- maximum deflection of face materials between strutting: 1/240th of span, but not exceeding 6 mm, or within the tolerances specified for surface finish in 3121 CONCRETE PLACEMENT
- maximum deflection of beams: 1/900th of span
- maximum deflection of cantilevers supporting construction loads: 1/300th of cantilever length.

3.7 INSTALL CONCRETE UNDERLAY
Do not lay until granular hardfill has been formed to a suitable surface to receive the underlay using minimum 25 mm sand blinding. Lay the underlay in true alignment, lapping 150 mm. Carefully scribe fit around all penetrations. Fully seal all laps and

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penetrations with adhesive tape to the underlay manufacturer's requirements. Refer to details for treatment of sheet at perimeter of concrete.

3.8 INSTALL SHEET DAMPPROOFING
Protect horizontal surfaces to be damp proofed with a 50 mm layer of 15 MPa site concrete. Ensure surfaces for dampproofing are free from voids, spalled areas, loose particles and sharp protrusions. Masonry joints struck flush. Apply primer, then install the rubberised bitumen membrane system, strictly in accordance with the dampproofing manufacturer's requirements. All work by applicators licensed by the dampproofing manufacturer. Protect vertical surfaces with polystyrene sheets glued to the membrane and taped over joints.

3.9 CONSTRUCTION JOINTS
To NZS 3109, clause 5.6.3. Clean face of previously hardened concrete at construction joints.

Use surface retarders to provide a key at construction joints. Use in accordance with the manufacturer's stated requirements. Remove laitance, contamination and cracked or dislodged aggregate before placing the continuing shutters and forms. Keep joints clean and undamaged until placing concrete.

3.10 LOCATION OF CONSTRUCTION JOINTS
Unless otherwise shown on the drawings locate the joints at positions listed in 4. SCHEDULES.

3.11 JOINTS IN FORMS
Construct joints to prevent loss of grout between joints in form linings, as well as between forms and completed work. Column forms to have full height linings so that no horizontal joints occur on exposed faces.

3.12 COLD / HOT CONDITIONS
To NZS 3109.

Application

3.13 FABRICATION
Fabricate formwork and falsework in a manner permitting its easy removal without damage to the concrete. Provide positive means of adjustment to ensure the formwork is secured in its correct position.

Provide a 20 mm x 20 mm chamfer to all corners unless detailed or noted otherwise. Protect corners from damage during and after stripping.

3.14 SECURELY FIX
Securely fix and brace to ensure sufficient strength and rigidity to support in safety all loads arising during construction and to maintain the specified dimensional tolerances.

3.15 BEAMS
Cast monolithically with slabs.

3.16 WORK BELOW GROUND
Allow for formwork to vertical faces below ground level.

3.17 WORK BELOW GROUND WITHOUT FORMWORK
Faces may be cast against earth without formwork only if adequate measures are taken to prevent contamination of concrete.

3.18 FORM TIES
Use proprietary form ties and spreaders. Wire ties are not permitted.

3.19 CHASES, HOLES, NIBS, REBATES AND REVEALS
Form chases, fillets, holes upstands and nibs as shown on the drawings. Position accurately at time of casting concrete.

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3.20 CAST IN ITEMS, NON STRUCTURAL
Securely fix non-structural cast in items shown on drawings.

3.21 CAST IN ITEMS, STRUCTURAL STEEL
Securely fix structural steel cast in items and hold down bolts shown on drawings. Position accurately at time of casting concrete.

3.22 TRAPS AND WASHOUT PORTS
To NZS 3109.

Finishing

3.23 RELEASE AGENTS
Use the same type and brand throughout the entire area of any one finish. Apply evenly to form faces using the minimum amount necessary to obtain a clean release. Do not allow the release agent to come in contact with reinforcement, hardened concrete or other materials not part of the form face. Ensure compatibility with subsequent finishes being applied to the concrete.

Thoroughly clean any reinforcement coming in contact with release agent to remove all traces of release agent.

Completion

3.24 STRIKING FORMWORK
Ensure the safe removal of all or any part of the formwork. Remove formwork without shock or vibration or damage to the concrete and in such a manner as to take the imposed stresses gradually. Stripping times to NZS 3109, clause 5.4.

3.25 PARTIAL STRIKING
If this is required, retain supports undisturbed as follows:
- to soffit or beams where side form are struck
- to slabs where soffit forms are struck.

4. SCHEDULES

4.1 LOCATION OF CONSTRUCTION JOINTS
Where construction joints are not shown on the drawings, locate as follows:

	maximum area:	maximum length
Slabs on ground:	400 m^2	20 metres
Suspended slabs:	600 m^2	40 metres

	maximum length:	maximum lift
Beams:	25 metres	
Walls:	10 metres	4 metres
Columns:		3 metres

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3112 REINFORCEMENT FOR CONCRETE

1. GENERAL

Related work

1.1 RELATED SECTIONS
Refer to 3100 CONCRETE GENERAL for general matters
Refer to 3111 FORMWORK FOR CONCRETE for formwork
Refer to 3121 CONCRETE PLACEMENT for concrete placing
Refer to 3124 FINISHES TO WET CONCRETE for concrete finishing
Refer to 3129 CONCRETE PRODUCTION for concrete production

Requirements

1.2 SCHEDULES AND DIAGRAMS
Provide schedules and diagrams of bars and bar bending.

2. PRODUCTS

Materials

2.1 GRADE 300 STEEL
To AS/NZS 4671. Round bars are shown by symbol "R" and deformed bars by symbol "D", followed by the diameter in millimetres.

2.2 GRADE 500 STEEL
To AS/NZS 4671. Round bars shown by symbol "XR" and deformed bars by symbol "XD" followed by diameter in millimetres.

2.3 WELDED WIRE FABRIC
Hard drawn steel wire spot welded to AS/NZS 4671, smooth or deformed and to the dimensions shown on the drawings.

2.4 TYING WIRE
Mild drawn steel wire not less than 1.2 mm diameter.

Components

2.5 SPACERS AND CHAIRS
Precast concrete or purpose made moulded PVC to approval. Only use concrete spacer blocks where the concrete surface is not exposed in the finished work.

3. EXECUTION

Conditions

3.1 HANDLE AND STORE
Handle and store all reinforcing steel and accessories without damage or contamination. Store on timber fillets on hard ground in a secure area clear of any building operation. Lay steel fabric flat.

3.2 DELIVER ALL BUNDLES
Deliver all bundles of steel to the site clearly marked or tagged with numbers relating them to the bending schedule and drawings.

3.3 CLEANLINESS
Keep reinforcement clean so that at the time of placing concrete it is free of all loose mill scale, loose rust and any other contamination that may reduce bonding capacity.

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3.4 PROJECTING REINFORCEMENT
Protect projecting reinforcement from the weather where rust staining of exposed concrete surfaces may occur.

Protect and/or mark any projecting reinforcement where it provides a potential hazard to site personnel.

Assembly

3.5 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.

3.6 ADJUSTMENTS
Provide on site facilities for hand bending to deal with minor adjustments.

3.7 TOLERANCES, BENDING
To NZS 3109.

Application

3.8 SECURE REINFORCEMENT
Secure reinforcement adequately with tying wire and place accurately, supported adequately and secured against displacement when concreting. Bend tying wire back well clear of the formwork.

3.9 SPACING
Spacing as dimensioned on the drawings but if not shown then the clear distance between parallel bars in a layer, or the distance between layers, or the spacing of other steel to the minimums laid down in NZS 3109, clause 3.6.

3.10 TOLERANCES, SPACING
To NZS 3109.

3.11 LAPPED SPLICES
Length of laps where not dimensioned on the drawings in accordance with the 4. SCHEDULES. Increase laps of plain round steel by 100%. Provide laps only where indicated on the drawings. Tie all lapping bars to each other.

3.12 WELDED SPLICES
Carry out only after written approval and then to the requirements of AS/NZS1554 and NZS 3109, clause 3.7.2, in respect of developed strength, location, bars conforming to and bars not conforming to AS/NZS 4671.

3.13 MECHANICAL SPLICES
Use only shown on drawings. Use the appropriate sleeve size and length, swaged onto the bars using correct die and hydraulic press all to the manufacturer's requirements. Notify when ready for inspection and carry out tests if required.

3.14 STEEL SPACERS
Fix spacers between layers of wall reinforcement at 1.0 metre centres minimum.

3.15 MINIMUM COVER
Minimum cover to all reinforcing bars, stirrups, ties and spirals to NZS 3109, clause 3.8.

3.16 TOLERANCES, COVER
Tolerances on cover relative to the values in NZS 3109, clause 3.9.

3.17 FIX CHAIRS
Fix chairs for top reinforcement in slabs at 0.9 metre centres or to ensure adequate support.

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3.18 CONCRETE SPACER BLOCKS
Where required in exposed concrete work make from same materials and mix as surrounding concrete.

Completion

3.19 REMOVE
Remove all debris, unused materials and elements from the site.

4. SCHEDULES

4.1 REINFORCEMENT LAPS
Where reinforcement laps are not shown on the drawings, lap as follows:

Bar Diameter	Grade 300 deformed	Grade 500 deformed
10 mm	400 mm	650 mm
12 mm	500 mm	750 mm
16 mm	650 mm	1000 mm
20 mm	800 mm	1250 mm
25 mm	1000 mm	1600 mm
32 mm	1200 mm	2000 mm

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3121 CONCRETE PLACEMENT

1. GENERAL

Related work

1.1 RELATED SECTIONS
Refer to 3100 CONCRETE GENERAL for general matters
Refer to 3111 FORMWORK FOR CONCRETE for formwork
Refer to 3112 REINFORCEMENT FOR CONCRETE for reinforcement
Refer to 3124 FINISHES TO WET CONCRETE for concrete finishing
Refer to 3129 CONCRETE PRODUCTION for concrete production

2. PRODUCTS

Materials

2.1 CONCRETE MIXES
Refer to 3129 CONCRETE PRODUCTION.

3. EXECUTION

Conditions

3.1 UNFAVOURABLE CONDITIONS
Do not place concrete in high winds or other unfavourable conditions. Refer to NZS 3109, clause 7.2 for when concrete may not be placed. Remove and make good concrete damaged by frost, dry and wet conditions.

3.2 DEFECTS
Reject concrete with structural defects. Immediately after stripping formwork, identify all defects and obtain direction. Do not carry out any repair work until directed and then only in accordance with the direction. Repair defects by cutting out, making good and replacing, or otherwise as directed.

3.3 EXISTING WORK
Protect existing work from damage and make junctions to existing work as detailed.

3.4 NOTIFY
Notify for inspection minimum 24 hours before placing concrete and any necessary rectification of formwork, reinforcement and construction joint stops. Pour concrete only between properly positioned stops.

3.5 CLEANING
Ensure at the time of placing, that surfaces to receive the concrete, are clean, free of debris and with no free water present. Thoroughly clean reinforcement to remove any release agent or other surface deposit.

3.6 WETTING OF FORMWORK
To NZS 3109, clause 7.3.2.

Application

3.7 BUILD IN
Build in all necessary bolts, inserts and other fixings as the work proceeds and as required for following work.

Provide for the order of the execution of other work relative to concrete placement and details of all sleeves, chases and holes, and all items to be built into the concrete necessary for their following work. Accept responsibility for obtaining this information and building in these items.

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3.8 CONSTRUCTION JOINTS
To NZS 3109, clause 5.6.3, type B, unless directed otherwise for particular minor areas. Prepare joints to produce the required type B roughened surface.

3.9 PILE TOPS
Cut back and remove the top 50 mm minimum of piles to eliminate laitance and weak concrete.

3.10 PROTECT
Protect formwork, reinforcement, "build in" items and fresh concrete from damage, as the pour is placed, making good any damage if it occurs.

3.11 CONVEY
Convey concrete from agitator to final placement as quickly as possible using means that avoid segregation.

3.12 PLACE CONCRETE
Place concrete in layers not more than 500 mm deep, compacted and vibrated. Do not place fresh concrete against the preceding layer after more than 45 minutes, or such lesser time as required by the circumstances. All to NZS 3109, clause 7.4.

3.13 VIBRATORS
Use sufficient immersion vibrators, with one spare for emergency, to ensure that vibration is achieved throughout the entire volume of each layer of concrete, and until complete compaction is reached. All to NZS 3109.

3.14 COMPACT CONCRETE
To NZS 3109. Compact by vibration of the concrete to expel entrapped air and until settlement of the concrete is visibly evident over all areas of the surface. Maintain vibration until settlement ceases and coarse aggregate at the surface is embedded. Do not continue vibration beyond reaching this condition.

Finishing

3.15 SCREED THE SURFACE
Screed the concrete surface by straight edge or vibrating screed immediately after compaction and to tolerances in NZS 3109, table 5.2.

3.16 FINISH
Refer to 3124 FINISHES TO WET CONCRETE

3.17 CURING METHOD
Contractor to notify the engineer of the curing method to be used for this work.

3.18 CURING PERIOD
Cure all concrete of normal cement type and mixing proportions for a minimum of 7 days. Keep time between placing of concrete and the start of curing to an absolute minimum. Ensure curing is continuous.

3.19 Curing Options

3.20 PONDING
Build a temporary retaining lip around the concrete slab and pond with water, keeping the depth constant over the curing period.

3.21 SPRINKLING
Apply a fine spray of water continuously over the curing period through a system of nozzles placed to cover the whole of the concrete work being cured.

3.22 WET COVERINGS
Cover the whole of the concrete work being cured, including edges with hessian, or similar, and keep continuously moist so that a film of water remains on the concrete surface throughout the curing period.

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3.23 PLASTIC SHEETS
Cover the whole of the concrete being cured with polyethylene or other waterproof sheet material for the whole of the curing period. Fit closely, carry down over edges and tape as necessary to contain moisture.

3.24 CURING COMPOUNDS
Cover the whole of the concrete, including edges being cured, with a liquid, white pigmented membrane, which hardens to form a waterproofing coating. Apply as soon as the surface has been finished, using spray equipment at the rate and using the method required by the manufacturer. Allow to remove the compound completely before applying subsequent finishes and coatings.

3.25 KEEP FORMWORK MOIST
Keep formwork left in place continuously moist by sprinkling with water over the curing period. Continue sprinkling the exposed surface if the formwork is removed before the end of the curing period.

3.26 SECURE COVERINGS
When covering with sheet materials, ensure that edges are well secured throughout the specified curing period, to prevent draughts passing over the surfaces of the concrete.

3.27 COLD WEATHER
Do not use coverings employing water at times of freezing weather.

3.28 PROTECT PLASTIC CONCRETE
Protect plastic concrete from indentation and surface marking.

3.29 PROTECT HARDENED CONCRETE
Protect surfaces of stripped concrete from damage especially at arrises.

3.30 PROTECT EXPOSED SURFACES
Protect from rust marks and other surface disfigurements.

Completion

3.31 CLEAN AND DRESS
Clean and dress all surfaces, leaving them to the standard of finish specified for the work to follow.

3.32 CLEAN UP
Clean up surrounding areas. Dispose of surplus concrete away from the site.

3.33 REMOVE
Remove all debris, unused materials and elements from the site.

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3124 FINISHES TO WET CONCRETE

1. GENERAL

Related work

1.1 RELATED SECTIONS
Refer to 3100 CONCRETE GENERAL for general matters
Refer to 3121 CONCRETE PLACEMENT for concrete placing
Refer to 3129 CONCRETE PRODUCTION for concrete production

Requirements

1.2 PROVIDE SAMPLE PANEL
Provide a sample panel of the following specified finishes before commencing work. Panels to be of similar thickness to the proposed construction. Refer to 4. SCHEDULES.

1.3 CAST SAMPLE PANELS
Cast sample panels to the requirements of NZS 3114, clause 104.4 in respect of casting, formwork, mix, compaction, curing, striking and including rebates. Supply also the information required by that same clause.

1.4 COLOUR VARIATION
Keep inherent shade variations within the range of the grey scale in NZS 3114. Obtain written instructions regarding the colour established in the sample reference panel for matching.

1.5 TECHNIQUE DISCUSSION
Before casting the sample panel arrange a meeting to confirm the method of preparing the sample. After agreement that the sample panel is truly representative of the finish specified and can be produced on site, it then becomes the standard for that finish.

2. PRODUCTS

3. EXECUTION

Conditions

3.1 RESPONSIBILITY
Take responsibility for determining the method of producing the specified finished surface.

3.2 PROTECTION
Protect and maintain the specified finish where necessary during any handling, erection or subsequent construction operation to ensure a clean undamaged surface at completion of the contract works.

3.3 GENERAL
Except where noted otherwise on the drawings or in the specification, tolerances in regard to colour and surface to the requirements of NZS 3114 for each finish specified.

3.4 SURFACE TOLERANCES
Variation from a plane surface are defined as follows:
Abrupt: Steps or irregularities caused by displacement of form joints and measured between peak and hollow over a 200 mm straight edge.
Gradual: Undulations over the surface and measured between rise and hollow over a 1500 mm straight edge.

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Application

3.5 OFF THE FORM FINISHES

F1 finish To NZS 3114, clause 105.1, with holes filled and defective concrete repaired to NZS 3109 as required. Dimensional tolerances to those set in NZS 3109, table 4.

F2 finish To NZS 3114, clause 105.2, with abrupt and gradual surface tolerances not exceeding 6 mm.

F3 finish To NZS 3114, clause 105.3, with abrupt changes not exceeding 6 mm at construction joints nor 3 mm at joints between abutting shutters or sheets that form face material. Gradual variations not exceeding 6 mm.

F4 finish To NZS 3114, clause 105.4, with abrupt changes not exceeding 4 mm at construction joints nor 2 mm at joints between abutting shutters or sheets that form face material. Gradual variations not exceeding 6 mm.

F5 finish To NZS 3114, clause 105.5, with abrupt changes not exceeding 2 mm at construction joints nor 1 mm at joints between abutting shutters or sheets that form face material. Gradual variations not exceeding 6 mm.

F6 finish To NZS 3114, clause 105.6, with abrupt changes not exceeding 1 mm at construction joints nor 0.5 mm at joints between abutting shutters or sheets that form face material. Gradual variations not exceeding 4 mm.

3.6 FLOOR AND EXTERIOR PAVEMENT

U1 class Screeded finish to NZS 3114, part 3, with abrupt changes not exceeding 5 mm and gradual variations not exceeding 10 mm.

U2 class Floated finish to NZS 3114, part 3, with abrupt changes not exceeding 3 mm and gradual variations not exceeding 5 mm.

U3 class Trowelled finish to NZS 3114, part 3, with abrupt changes not exceeding 3 mm and gradual variations not exceeding 5 mm.

U5 class Shallow textured to NZS 3114, part 3, with abrupt changes not exceeding 3 mm and gradual variations not exceeding 5 mm.

U11 class Ground finish to NZS 3114, part 3, with no abrupt changes and gradual variations not exceeding 3 mm.

Finishing

3.7 GENERAL

Achieve the standard of the specified finish required, direct from the formwork with a minimum of attention to the stripped surface.

3.8 FILL TIE HOLES

Fill tie holes to finishes F1, F2 and F3 with mortar 1:1½ to 2, cement: sand. Colour match the parent concrete in finish F3.

3.9 MINOR SURFACE DEFECTS

Repair minor surface defects to match the shade and texture of the surrounding concrete.

3.10 PAINTED SURFACES

Fill minor surface defects with approved plaster stopping compound/cellulose filler and rub down to match the texture of the surrounding concrete.

3.11 SURFACE TREATMENT

Bagging or stoning of the surface only to proceed following written instructions.

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4. SCHEDULES

4.1 ROUGH SAWN BOARD FINISH

Location:	Foundations

4.2 FLOOR AND EXTERIOR PAVEMENT

Finish	Location
U3	Floor slabs

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3129 CONCRETE PRODUCTION

1. GENERAL

Related work

1.1 RELATED SECTIONS
Refer to 3100 CONCRETE GENERAL for general matters
Refer to 3121 CONCRETE PLACEMENT for concrete placing
Refer to 3124 FINISHES TO WET CONCRETE for concrete finishing

2. PRODUCTS

Materials

2.1 CEMENT
Portland cement to NZS 3122.

2.2 CEMENT, FILLER
Portland-limestone filler cement to NZS 3125.

2.3 SAND
Sand to NZS 3121.

2.4 COARSE AGGREGATE
Coarse aggregate to NZS 3121, except as modified by NZS 3104, clauses 2.4.3. or 3.3.2. The total mass of reactive alkali in the concrete mix to not exceed the requirements of section 2 of the Cement and Concrete Alkali Aggregate Reaction publication.

2.5 AGGREGATE
All-in aggregate to NZS 3104, sections 2 and 3.

Accessories

2.6 WATER
To NZS 3121.

2.7 ADMIXTURES, PLANT
To NZS 3113 and as agreed before manufacture or placing.

2.8 ADMIXTURES, SITE
To NZS 3113 and as agreed before manufacture or placing.

2.9 PIGMENT, SITE/PLANT
To NZS 3117 and as agreed before manufacture or placing.

3. EXECUTION

Conditions

3.1 MATERIAL STANDARDS
To comply with respective standards. Store and test coarse aggregate and sand and store cement and admixtures all separately and to NZS 3104.

3.2 MEASUREMENT
Weigh aggregates and cement separately, to NZS 3104 with equipment tested to accuracy of table 2.4. Measure water by volume or weight.

3.3 MIXING
Carry out with stationary mixer and transport by truck agitator or revolving drum type with all batches recorded and all to NZS 3104.

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4. SCHEDULES

4.1 MIXES, HIGH GRADE AND SPECIAL GRADE
Concrete producer to design mix to NZS 3104.

4.2 FOUNDATIONS

28 day strength
20 MPa

4.3 FLOOR SLAB ON GRADE

28 day strength
25 MPa

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3411 STRUCTURAL STEELWORK

1. GENERAL

Documents

1.1 DOCUMENTS REFERRED TO
Documents referred to in this section are:

NZBC	F5/AS1 Construction and demolition hazards
AS/NZS 1252	High strength steel bolts with associated nuts and washers for structural engineering
AS/NZS 1554	Structural steel welding 1554.1: Welding of steel structures
AS/NZS 2312	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
NZS 3404	Steel structures Standard, Part 1: Steel structures Standard
AS/NZS 4680	Hot-dip galvanised (zinc) coatings on fabricated ferrous articles
NZS 4711	Qualification tests for metal-arc welders
NZS 4781	Code of practice for safety in welding and cutting
AS/NZS 4792	Hot-dip galvanised (zinc) coatings on ferrous hollow sections, applied by a continuous or special process
AS/NZS ISO 9002	Quality systems - Model for quality assurance in production, installation and servicing
AS 1111	ISO metric hexagon bolts and screws
AS 1112	ISO metric hexagon nuts
AS 1627	Metal finishing - Preparation and pretreatment of surfaces - Method selection guide 1627.1: Cleaning using liquid solvents and alkaline solutions 1627.2: Power tool cleaning 1627.4: Abrasive blast cleaning
AS 1897	Electroplated coatings on threaded components (metric coarse series)
AS 3828	Guidelines for the erection of building steelwork
BS EN ISO 14713	Sprayed metal coatings Part 1: Protection of iron and steel by aluminium and zinc against atmospheric corrosion
SAA/SNZ HB 62	Code of practice for safe erection of building steelwork

HERA publication: Report R4-99: HERA specification for the fabrication, erection and surface treatment of structural steelwork

OSH publication: Guidelines for the provision of facilities and general safety in the construction industry

1.2 CO-ORDINATION
Refer to architectural, electrical and services drawings to ensure details and fixings required are provided for in the structural steel work.

1.3 VERIFY DIMENSIONS
Verify dimensions against site measurements prior to fabrication. For existing structures, verify grade of steel and dimensions against site measurement.

Requirements

1.4 QUALIFICATIONS
Welding operators to be experienced, competent workers, qualified to NZS 4711, familiar with the materials and techniques specified. Comply with NZS 3404 and AS/NZS 1554.1. Welding operators to have passed the qualifications tests covering those welding positions required to complete the work as set out in NZS 4781. Provide evidence of qualifications on request.

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Riggers to be experienced and competent workers, familiar with the materials and techniques required.

1.5 SHOP DRAWINGS
Provide shop drawings.

Refer to PRELIMINARIES & GENERAL for requirements for submission and review and the provision of final shop drawings.

Performance

1.6 QUALITY ASSURANCE
Maintain quality assurance programmes to AS/NZS ISO 9002 for both fabrication and erection as necessary to assure that work is performed in accordance with this specification and the qualifying requirements of the contract documents.

1.7 INSPECTION
Inspect fabrication and construction of the structure to NZS 3404.

1.8 MATERIAL CERTIFICATES
Supply mill test certificates relating to mill sections, bolts and nuts or welding consumables. High strength steel to be marked accordingly by the supplier before delivery.

1.9 TEST WELDING
Non-destructive weld examination with method, extent and standards of acceptance to AS/NZS 1554.1, Section 7 and Table D1 of NZS 3404 part 1.

2. PRODUCTS

Materials

2.1 STRUCTURAL STEEL
Comply with Australian, British and Japanese Standards for steel as required by NZS 3404, part 1. Test and stress relieve for brittle fracture as required by NZS 3404, part 1, section 17.

Grade 300, except RHS sections Grade 350, unless noted otherwise on the drawings.

Components

2.2 BOLTS, NUTS AND WASHERS
Grade 4.6 screws and bolts to comply with AS 1111. Grade 4.6 nuts to comply with AS 1112. Grade 8.8 bolts, nuts and washers (high strength structural quality only) to comply with AS/NZS 1252. Hot dip galvanise to AS/NZS 4680, bolts, nuts and washers forming a permanent part of a structure subject to a protective coating. Alternatively electrogalvanise to AS 1897.

Accessories

2.3 ELECTRODES
To comply with and be selected for grade of steel being welded as required by AS/NZS 1554.1.

2.4 WELDING WIRE
Welding wire as required by the manufacturer for materials to be joined and the welding position.

2.5 FLUX
Welding flux to be dry and from sealed containers.

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2.6 STEEL STUDS
Material for arc stud welding to comply with AS/NZS 1554.1.

Finishes

2.7 PRIMER
Alkyd oil zinc chromate priming paint.

3. EXECUTION

Conditions

3.1 GENERALLY
Construct to NZS 3404, part 1, section 14 (fabrication) and part 1, section 15 (erection). Identify steel to NZS 3404.

3.2 DEFECTS
Discard any material or fabricated items showing defects affecting its structural integrity.

3.3 SURFACE FINISH
Grind off burrs and sharp arrises.

3.4 TOLERANCES
Comply with the tolerances laid down for holding down bolts, columns, beams and other members in HERA Report R4-99 and NZS 3404. Comply with NZS 3404 for level and alignment of beams and alignment and plumbing of struts.

Structural elements to comply for straightness, length, full contact splices and struts not prepared for full contact with NZS 3404.

3.5 CARRY OUT ERECTION
Carry out the erection of structural steel to the requirements of NZS 3404, section 15 Erection. Comply with NZBC acceptable solution F5/AS1, and the OSH publication: Guidelines for the provision of facilities and general safety in the construction industry.

3.6 START ERECTION
Start erection only when the holding down bolts and anchorages have been cast-in-place long enough to achieve sufficient strength.

3.7 SAFETY DURING ERECTION
Erection practices to comply with SAA/SNZ HB 62. During erection make structure safe against erection loading including loading due to erection equipment or its operation, and wind.

3.8 TEMPORARY BRACING
Provide temporary bracing and restraint as required to make structure safe. Leave temporary bracing and restraint in place until the erection is sufficiently advanced to allow safe removal of temporary bracing.

Assembly

3.9 CUTTING
Hand cut only where machine cutting is not possible. Cutting to comply with NZS 3404 and HERA Report R4-99, clause 4.6. Site cutting and welding are forbidden.

Application

3.10 WELD FAILURE
Comply with AS/NZS 1554.1 for detailed guidance on welding inspection and quality control.

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3.11 WELDING

Carry out welding in accordance with AS/NZS 1554 and the additional requirements of NZS 3404. Equipment to comply with AS/NZS 1554, clause 1.7.2.

3.12 WELDING SYMBOLS

Welding symbols have not been used on the drawings. Unless denoted otherwise on the drawings, shop weld touching or near-touching steelwork together all round with 6 mm continuous fillet welds.

3.13 HOLING

Comply with NZS 3404 for sizes, alignment, finishing, punching and flame cutting of holes.

3.14 BOLTING

Bolting, including high strength bolting to comply with NZS 3404, section 14.3.6. Ensure that at least one clear thread shows above the nut and at least one thread run out is clear beneath the thread after tightening

3.15 BOLTING NOTATION

Notation of bolting categories:

Bolting category	Bolt standard	Bolt grade	Tension method	Tensioned joint type
4.6/S	AS 1111	4.6	snug tight	
8.8/S	AS/NZS 1252	8.8	snug tight	
8.8/TB	AS/NZS 1252	8.8	full tension	Bearing
8.8/TF	AS/NZS 1252	8.8	full tension	Friction

In bearing type connections where the thread position relative to the shear plane is to be controlled.
N - threads included in shear plane
X - threads excluded from shear plane
F - friction type joints - prepare faying surfaces

3.16 THREADS EXCLUDED FROM SHEAR PLANE

Select length of bolts such that the threaded portion does not occur within the shear plane between joined parts.

3.17 BASE PLATES

Enlargement or site cutting of holes is not permitted. Bending or displacement of holding down bolts is not permitted.

3.18 INSTALLATION OF COLUMNS

Plumb columns using sawn steel packs and wedges not larger than necessary for the purpose. Obtain written instructions when any column base needs to be raised by more than 25 mm. Fill the space beneath the base plate with cement-sand grout, containing an approved non-shrink additive, having a minimum compressive strength of 30MPa at 28 days, or by the use of a dry pack of 1:2 cement: sand mortar hammered in tight to ensure complete filling of space.

Finishing

3.19 PREPARATION FOR CORROSION PROTECTION

Remove all slag.

For welds exposed to view:	Remove splatter and grind to a neat, clean finish.
For steelwork cast in concrete:	Remove rust and mill scale by power or manual wire brushing. Leave unprimed.
For fire protection coating:	Remove rust and mill scale by power or manual wire brushing.

Carry out sand blasting or wire brushing after completion of the fabrication and apply the required coating in accordance with the coating manufacturers' requirements. Apply coating within 4 hours of preparation. Paint off site wherever possible. Surfaces that are in contact or near contact to receive specified coating before assembly.

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3.20 CONDITIONS FOR PREPARING STEELWORK BEING PAINTED

Prepare steelwork in conditions approved for the application of coatings. Carry out off-site preparation and coating applications under cover, in a controlled environment and with adequate lighting.

3.21 BRUSHING AND POWER TOOL CLEANING

Remove oil and grease by the use of solvents. Scrape and power wire brush to a minimum class 2 finish to AS 1627.2. Clean to bright metal, but avoid producing a polished surface. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained.

3.22 ABRASIVE BLASTING

Remove oil and grease by the use of solvents. Abrasive blast clean to a class 2½ finish to AS 1627.4. Clean to bright metal, but avoid producing a polished surface. Select grit type and equipment such that the cleaned surface profile between peaks and valleys does not exceed one third of the dry film thickness. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained.

3.23 STEELWORK BEING GALVANISED

Clean sections thoroughly and apply zinc coating by the hot-dip process to the requirements of AS/NZS 4680 and AS/NZS 4792. Average zinc coating to be not less than the following:

Bolts and washers:	380 gms/m^2
Structural steelwork:	600 gms/m^2

Ensure that tolerances in screw cutting have made allowance for galvanising.

Degrease and sweep abrasive blast using a non metallic media galvanised steelwork to be painted.

3.24 UNPAINTED SURFACES

Do not paint:

- Faying face of friction type joints
- Areas to be site welded, keeping 75 mm clear all round
- Surfaces to be embedded in concrete.

Where steel is only partly encased, then extend priming 30 mm maximum into the concrete encasement area.

3.25 PRIMING GENERALLY

Coat steelwork, unless specifically noted otherwise, with the specified priming paint, including patch priming on site after erection.

3.26 SHOP PRIMING

Carefully prepare the surface and apply a coat of primer. Refer to 4. SCHEDULES for dry film build.

3.27 PATCH PRIMING

Clean areas of damaged priming and areas left clear for site jointing to a standard comparable with the shop cleaning specified. Wash off chemical deposits from welding fumes. Apply priming coats to the same standard as shop primers, ensuring thorough coating of bolts, nuts and connection areas. Reprime if the primer fails, or more than 4 weeks elapse before the final coating system is applied.

3.28 FINISHING CONCEALED INTERIOR STEELWORK

- Flame clean, chip and power wire brush to remove scale and rust to pictorial standard St3 of AS 1627.9.
- Apply one coat of red oxide zinc phosphate alkyd primer to a minimum dry film thickness of 75 microns.

3.29 FINISHING EXPOSED INTERIOR STEELWORK

- Abrasive blast clean to AS 1627.4, class $2^1/_2$, near white standard.

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- Apply one coat of epoxy mastic to a minimum dry film thickness of 125 microns.

3.30 FINISHING EXPOSED EXTERIOR STEELWORK
- Abrasive blast clean to AS 1627.4, class $2^1/_2$, near white standard.
- Apply one coat of inorganic zinc silicate primer to a minimum dry film thickness of 75 microns.
- Apply an intermediate coat of high build epoxy to a further minimum dry film thickness of 125 microns.
- Apply a top coat of a catalysed acrylic to a further dry film thickness of 75 microns.

3.31 FINISHING GALVANISED STEELWORK
- Degrease to AS 1627.1 and sweep abrasive blast the entire surface using non metallic media.
- Apply one coat of epoxy primer to a minimum dry film thickness of 50 microns.
- Apply a top coat of a catalysed acrylic to a further dry film thickness of 75 microns.

4. SCHEDULES

4.1 STEELWORK BEING GALVANISED
All exterior steel.

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3811 TRUSSES, LVL AND LAMINATED MEMBERS, SUPPLY

1. GENERAL

Related work

1.1 RELATED SECTIONS
Refer to 3813 TIMBER STRUCTURAL FRAMING for erection.

Documents

1.2 DOCUMENTS REFERRED TO
Documents referred to in this section are:

AS/NZS 1491	Finger jointed structural timber
AS 1604	Timber – Preservative treated – Sawn and round
AS 2098	Methods of test for timber and timber products
AS 2754	Adhesives for timber and timber products
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber Structures Standard
NZS 3606	The manufacture of glue laminated timber
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4357	Structural laminated veneer lumber
AS/NZS 4364	Adhesives, phenolic and aminoplastic for load-bearing timber structures: Classification and performance requirements

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

Requirements

1.3 QUALIFICATIONS
Fabricators to be experienced competent workers, familiar with the materials and the techniques specified. Fabrication firms to be accredited by the connector plate manufacturers. Laminated timber fabricators to be currently certified by Standards New Zealand to NZS 3606 and AS/NZS 1491.

1.4 TRUSS LAYOUT DRAWINGS
Provide a truss layout drawing with each standard truss identified by a proprietary design number.

1.5 TRUSS DESIGNS
Supply all the necessary drawings, calculation and other descriptive information to confirm the structural design of each type of timber truss. Submit, together with a producer statement signed by a registered engineer, before commencing truss fabrication.

1.6 LAMINATED TIMBER DESIGN
To comply with NZS 3603 in general and in particular with chapter 8: Glue laminated timber.

1.7 LAMINATED MEMBER DESIGNS
Supply all the necessary drawings, calculation and other descriptive information to confirm the structural design of each laminated timber member. Submit, together with a producer statement signed by a registered engineer, before commencing fabrication.

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Performance - laminated timber

1.8 LAMINATED MEMBERS
Make laminated members 150 mm over length to provide specimens for glue block shear tests. Mark specimens to identify member from which they are cut. Carry out normal quality control tests in addition to tests required. Provide results of normal control tests.

1.9 NON-COMPLIANCE
Where non-compliance with the tests is evident, load tests on completion will be required. Replace substandard members and retest.

1.10 LAMINATED VENEER LUMBER DESIGN
To comply with NZS 3603 in general and in particular the manufacturer's technical information.

1.11 LAMINATED VENEER LUMBER MEMBERS
Laminated veneer lumber products are to be tested and the properties monitored to the requirements of the Plywood Association of Australasia.

2. PRODUCTS

Materials - timber trusses

2.1 CHORDS AND WEBS, UTILITY GRADE
Nominally 50 mm wide, unless drawings show otherwise, with varying depths as detailed, gauged green/dry dressed. No 1 framing grade radiata pine, or standard building grade Douglas fir to NZS 3602 table 1E.

2.2 CHORDS AND WEBS, ARCHITECTURAL GRADE
Nominally 75 mm wide with varying depths as detailed, bandsawn/dry dressed.

Materials - laminated timber

2.3 LAMINATED BEAMS AND POSTS
To NZS 3602 to required lengths.

2.4 LAMINATED FLOORING
To NZS 3602 finger jointed and to required lengths.

2.5 LAMINATED VENEER LUMBER BEAMS, POSTS, FLOORING AND TRUSS CHORDS
To AS/NZS 4357, to required sizes and lengths and the manufacturer's design properties.

Components - timber trusses

2.6 STEEL CONNECTOR PLATES
1.0 mm and 1.6 mm thick galvanised steel sheet punched to form a toothed connector.

2.7 STAINLESS STEEL CONNECTOR PLATES
1.2 mm thick stainless steel sheet punched to form a toothed connector.

2.8 POWDER COATED CONNECTOR PLATES
1.0 mm and 1.6 mm thick galvanised steel sheet with a baked on epoxy powder coating, punched to form a toothed connector.

Accessories - laminated timber

2.9 ADHESIVE, INTERIOR
To NZS 3606 category A melamine-urea.

2.10 ADHESIVE, HUMID INTERIOR
To NZS 3606 category B, resorcinol or melamine-urea to minimum 40% melamine content by weight of solid resin.

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2.11 ADHESIVES, EXTERIOR AND CCA TREATED
To NZS 3606, category C.

2.12 TREATMENT, EXTERIOR
To NZS 3602, table 1B.

2.13 TREATMENT, INTERIOR
To NZS 3602, table 1E.

2.14 ADHESIVE, LAMINATED VENEER LUMBER
Veneers to be bonded with Type A marine bond (phenolic) suited to exposure category C in NZS 3606, with reference to AS 2098 and AS 2754.

2.15 ADHESIVE, LAMINATED VENEER LUMBER I-JOIST
I-Joist flange to web joint to be formed with resorcinol phenol adhesive (Type A bond to AS 2754 and Type 1 to AS/NZS 4364) permanent and durable structural bond.

2.16 TREATMENT, LAMINATED VENEER LUMBER, INTERIOR
Insecticide treatment to H1.1 LOSP as defined by NZS 3640 and AS 1604.

2.17 TREATMENT, LAMINATED VENEER LUMBER, EXTERIOR
Insecticide treatment to H3.1 LOSP as defined by NZS 3640 and AS 1604.

3. EXECUTION

Conditions - timber trusses

3.1 COMPLY
Comply with all current standards and code requirements in the design and fabrication of the trusses.

3.2 DELIVER, HANDLE AND STORE TRUSSES
Deliver, handle and store trusses so no structural damage occurs, corners and edges are not damaged, or surfaces marked or stained. Store architectural grade under cover.

Conditions - laminated timber

3.3 LAMINATIONS
Laminations to be 45 mm maximum conforming with NZS 3606, section 101.

3.4 MOISTURE CONTENT
Moisture content at time of glueing: 12-15%.

3.5 MOISTURE CONTENT VARIATION
Moisture content variation between adjacent laminates: not exceeding 2%.

3.6 MANUFACTURE
To comply with NZS 3606, part 2, except where modified by this specification.

3.7 PRE-JOINT LAMINATES
Pre-joint laminates to full length required.

3.8 END JOINT LAMINATIONS
End joint laminations by the use of finger joints that meet the requirements of AS/NZS 1491 for structural joints and show by test they have a strength at least equivalent to the strength of the grade of lamination.

3.9 ADHESIVE USE
Comply with the requirements of NZS 3606 with regard to adhesive use, and to the requirements of the adhesive manufacturer, to ensure full strength bonding.

3.10 LAMINATED VENEER LUMBER, MANUFACTURE
To AS/NZS 4357 and the manufacturer's design properties.

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Assembly - timber trusses

3.11 DIMENSIONS, UTILITY GRADE
Each member calculated length ± 3 mm. Width and thickness to gauging tolerances. Each overall joint within ± 3 mm of correct outside profile (including camber allowance). Each internal joint within ± 50 mm along the chord.

3.12 DIMENSIONS, ARCHITECTURAL GRADE
Each member calculated length ± 1 mm width and thickness to gauging tolerances. Each overall joint within ± 3 mm of correct outside profile (including camber allowance). Each internal joint within ± 10 mm along the chord. Joint thickness and width difference between members 1 mm maximum. Plate location within half of the manufacturer's tolerances plus a rotation of no more than 1 mm in 100 mm off reference line.

3.13 INSPECTION
Request inspection when timber for architectural grade trusses is ready for cutting prior to fabrication.

3.14 FABRICATION
Build camber into all elements to allow for normal deflection under load. Lay up members accurately with all joints tight fitting. Mechanically press plates to manufacturer's tolerances, fully and flat over their whole area into the members forming the joint.

Assembly - laminated timber

3.15 CAMBER
Provide upward camber as required by design. No camber required unless specifically shown.

3.16 SIZE OF FINISHED MEMBERS
Ensure size of finished members is within the tolerances set out in NZS 3606, table 6 and the uniformity in compliance with NZS 3606, clause 205.3, for the finish specified.

3.17 SURFACE FINISH
Smooth finish all exposed surfaces by sanding, to produce the standard of finish as defined in NZS 3606. Fill knot holes and defects with neutral coloured filler or by the use of inserts. Do not use putty. Ease all corners.

3.18 PLANER FINISH
Planer finish to comply with tolerances and produce a utility finish as defined in NZS 3606.

3.19 APPLY SEALER
Apply one coat of approved water repellent sealer. Use two coats of the approved sealer on end grain to ensure adequate sealing against water absorption.

3.20 CHECK COMPATIBILITY
Check compatibility of sealer with proposed finishing coating before application.

3.21 WRAP
Wrap with kraft paper (not bitumen laminated) and tape seal before delivery. Maintain wrapping in place until the members are protected from the weather.

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3813 TIMBER STRUCTURAL FRAMING

1. GENERAL

Related work

1.1 RELATED SECTIONS
Refer to 3811 PREFABRICATED TIMBER STRUCTURAL FRAMING for supply of trusses, frames, engineered wood products and laminated members.

Documents

1.2 DOCUMENTS REFERRED TO
Documents referred to in this section are:

NZS 3604	Timber framed buildings
AS 1604	Timber – Preservative treated – Sawn and round
AS 2098	Methods of test for timber and timber products
AS 2754	Adhesives for timber and timber products
NZS 3606	The manufacture of glue laminated timber
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4357	Structural laminated veneer lumber
AS/NZS 4364	Adhesives, phenolic and aminoplastic for load-bearing timber structures: Classification and performance requirements

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

2. PRODUCTS

Materials – laminated veneer lumber

2.1 LAMINATED VENEER LUMBER BEAMS, POSTS, FLOORING, TRUSS CHORDS
To AS/NZS 4357, to required sizes and lengths and the manufacturer's design properties. Manufacture to AS/NZS 4357 and the manufacturer's design properties.

2.2 ADHESIVE, LAMINATED VENEER LUMBER
Veneers to be bonded with Type A marine bond (phenolic) suited to exposure category C in NZS 3606, with reference to AS 2098 and AS 2754.

2.3 ADHESIVE, LAMINATED VENEER LUMBER I-JOIST
I-Joist flange to web joint to be formed with resorcinol phenol adhesive (Type A bond to AS 2754 and Type 1 to AS/NZS 4364) permanent and durable structural bond.

2.4 TREATMENT, LAMINATED VENEER LUMBER, INTERIOR
Insecticide treatment to H1.1 LOSP as defined by NZS 3640 and AS 1604.

2.5 TREATMENT, LAMINATED VENEER LUMBER, EXTERIOR
Insecticide treatment to H3.1 LOSP as defined by NZS 3640 and AS 1604.

3. EXECUTION

Conditions

3.1 DELIVER, HANDLE AND STORE
Deliver, handle and store members so no structural damage occurs, corners and edges are not damaged, or surfaces marked or stained. Store architectural grade under cover.

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Application - timber trusses

3.2 ERECTION

Lift, place and fix trusses without overstressing or deformation. Use temporary supports as needed without causing damage. Fix trusses to wall plates and beams to NZS 3604, section 10 and in particular section 10.2.2. Fit and fix bracing as detailed and to NZS 3604, sections 10.2.2 and 10.2.3. Ensure all trusses are correctly located, plumb and true to line and face.

3.3 TIGHTEN BOLTS

Check and tighten all fixing bolts after erection of trusses is completed.

Application - laminated timber

3.4 HANDLING

Handle all laminated members with nylon strops or similar to prevent damage.

3.5 TIMBER PREPARATION

Cut the slot in the beam end not more than 5 mm greater in width than the plate thickness. Ensure a clear gap of not less than 2 mm each side of the plate. Ensure that at the time of glueing, timber is less than 18% moisture content and the slot clear of all sawdust.

3.6 STEEL PLATE PREPARATION

Grit blast or power grind steel to glue faces to bright metal. Do not polish surface when grinding. Degrease steel surface immediately before glueing by either:

- wiping with a clean cloth soaked in clean tri-chlorethylene or methyl chloride and allow to stand for 2 minutes for complete evaporation of solvent or,
- scrub steel with commercial grade detergent in hot water, hosing off to remove all detergent, then drying thoroughly.

Caution: Solvents listed are toxic in liquid and vapour form. Use only in a well ventilated area. Do not smoke, as vapour can cause poisonous gas if inhaled through a lighted cigarette.

3.7 INSTALLATION

Insert bolts and finger tighten nuts. Provide spacer wires (2 mm diameter) between timber and plate to ensure a clear gap for glue. Tape seal the joint to prevent leakage of glue. Inject mixed epoxy glue into the joint with a fine tube or hollow needle and rod with a fine wire to remove air bubbles. After required curing time, tighten all bolts.

Application - timber trusses

3.8 ERECTION

Refer to the manufacturer's guidelines for the installation of laminated veneer lumber structural framing.

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BARNES HOUSE.
State Highway 50
Hawkes Bay.

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O INTRODUCTION

O.1.1 EMPLOYER:

Concept Master Builders Ltd
369 State Highway 2, RD2, HASTINGS
Tel 06-8784690
Fax 06-8762732

O.1.2 PRINCIPAL CONSULTANT:

Raiford Gardiner Architects Ltd
212 Queen St East, Hastings, Box 1491 HASTINGS.
Tel 06-876-7601
Fax 06-876-2790,
Cell 025-491-227
E-Mail raiford@airnet.net.nz

O.1.3 SECONDARY CONSULTANTS:

Holmes Consulting Ltd, Structural and Civil Engineers
212 Queen St East, Hastings,
Tel 06-876-0818
Fax 06-876-2790

O.1.4 LOCAL AUTHORITIES:

Hastings District Council
Tel 8780500

O.2 SITE

O.2.1 Lot 1,DP 308836 Access: From ROW
Working Area: The owner will define the available areas of the site.

O.3 CONTRACT DOCUMENTS are as follows:

O.3.1 NZIA Conditions of Contract and Addenda

O.3.2 Contract Drawings: Architectural Drawings Sheets 1-9 plus Engineers Documents and Bracing Plan.

0.3.3 This specification; which is divided into trade sections generally according to the same or similar codes used in NZS 4202 [Standard Method of Measurement of Building Works]

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1 **PRELIMINARIES**

1.2. FORM OF CONTRACT.

1.2. FORM OF CONTRACT.

The form of contract shall be the current edition of the NZIA Conditions of Contract, together with any Addenda, Special Conditions of Contract and any amendments or supplementary conditions.

1.3 THE CONTRACTOR SHALL ALLOW FOR THE FOLLOWING:

1.3.1 The General Conditions and Special Conditions of Contract.

1.3.2 Compliance with, and the giving of, notices required by any Act of Parliament, by Regulations made thereunder, or by the order or direction of any lawful authority including those noted under 0.1.4, and the paying and indemnifying of the employer against any fees or charges demandable by law. Regardless of any requirement defined by the drawings or this specification the requirements of any Act of Parliament or Regulation, or Local Authority Bylaw shall take precedence.

1.3.2.1 Giving reasonable notice to the Architect, the owner, or other consultants as necessary before closing in or covering any work required to be measured on site.

1.3.3 The obtaining of necessary consents from any local authority, electrical supply company or the like, and the payment of fees to such bodies in relation to the building works.

1.3.4 INSURANCE OF THE WORKS

INSURANCE OF THE WORKS [see General Conditions of Contract, clauses] shall cover the structure as well as materials on the site for the full insurable values of the respective interests of the contractor and the employer. Exclude from the amount to be insured any significant elements such as demolitions or bulk earthworks which are not subject to the hazards insured. The cover is required to be increased progressively as the structure proceeds.

1.3.5 Bond [Deleted]

1.3.6 [Deleted]

1.3.7 Providing and maintaining up to date a linked bar chart construction programme.

1.3.8 Setting out the works, and the provision of all instruments and labour required for the checking of the works when required or requested.

1.3.14 Sheds, mess rooms, toilets, water, power, telephone etc, and attendance on the same.
Water, power and telephone are available on site.

1.3.17 The care and security of the works.

1.3.18 The daily management, supervision, and administration of the works.

1.3.19 General attendance upon the Works. Attending site meetings when called, monthly or when specially called by the Architect. Provide copies of the current programme for the architect and the owner at each site meeting.

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1.3.21 Testing of materials and submission of samples and results.

1.3.22 Plant and tools required for the execution of the works.

1.3.24 Scaffolding for exterior and/or interior as required.

1.3.28 The protection of the Works from weather or damage from any other cause. Leaving the works secure on completion with all access ways locked. Handing over the keys to the owner on completion of the contract.

1.3.30 The maintenance and protection of other property, and the property of water, electricity or gas suppliers and similar undertakings, and the making good and paying for any damage thereto.

1.3.31 Providing a skip or bin or other enclosed or semi enclosed container for all trades to dump debris, off cuts etc, and emptying the container when full so that no rubbish is left around the site at any time. Each trade shall dump their rubbish in the provided container or take it away from the site daily. Hazardous waste (if any) shall be separately dumped by the relevant trade according to safety regulations covering the particular waste product. Ref 1.5.4 below.

1.3.32 Cleaning all surfaces ready for occupation.

1.3.35 The correction of defects in the Works together with any special requirements, including any repairs or reinstatement works required on account of damage to or failure of any material, component, system or element.

1.4 MATERIALS AND WORKMANSHIP.

1.4.1 Use only new materials and fittings unless otherwise required.

1.4.2 Integrate materials deliveries with programme requirements.

1.4.3 Handle, store, use and/or fix materials, fittings, etc in accordance with the manufacturers recommendations, instructions or the like.

1.4.4 Provide the Architect with samples when requested. Retain samples on site until completion of works. Remove when no longer required.

1.4.5 Dissimilar materials. Where dissimilar materials may come into contact in such a way as to cause corrosion, allow for separation by non-corrosive coating, tapes, strips or similar, to completely avoid such corrosion.

1.4.6 DOCUMENTS: All dimensions shall be taken as between structural members or framing unless clearly shown to centrelines or otherwise. Tolerances shall be noted and/or allowed for each trade or item.

1.4.7 **SAFETY NOTE: THE SITE IS LOCATED NEAR THE EDGE OF A STEEP BLUFF. THE OWNER SHALL FENCE THIS OFF AND THE CONTRACTOR SHALL FIX ORANGE WARNING TAPES TO THE FENCE AND SHALL MAINTAIN THESE THROUGHOUT CONSTRUCTION OF THE HOUSE. THE CONTRACTOR SHALL BRING THIS POTENTIAL HAZARD TO THE ATTENTION OF ALL SUBCONTRACTORS, ETC ON THE SITE.**

1.5 STANDARDS

1.5.1 Reference to NZS [Code no] means the relevant current version [as at time of close of tenders] of a standard published by The Standards Association of New Zealand.
NZBC means the New Zealand Building Code, Handbook and/or Approved Documents.

1.5.2 The Contractor, Subcontractors and Suppliers shall comply with any standard or standards and the NZ Building Code relevant to this project.

1.5.3 A copy of each standard relevant to any sub trades on site work shall be kept on site by the sub tradesman any time that such works are under way on the site.

1.5.4 The Contractor, Subcontractors and Suppliers shall comply with all local bodies requirements, OSH requirements, and all manufacturers and/or suppliers specifications or instructions, whether noted on the drawings or in this specification, or not.

1.5.5 Manufacturers Documents for supply, installation or operation shall be referred to whether noted in this specification or not. Documents are available by contacting the manufacturer or supplier. The contractor shall ensure that all supplied elements are installed in compliance with the relevant manufacturers instructions and shall obtain these if they are not supplied with the elements on delivery to the project.

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3 EXCAVATION AND BACKFILL

3.1. Preliminary & General

The subcontractor shall take notice of and abide by any parts of the preliminary and general clauses that relate to this trade.

3.2. Scope This section includes but is not necessarily limited to: excavation and backfill for construction works or service lines.

3.3. Standards: Except as modified by this section, all materials and workmanship shall comply with the appropriate NZ Standard , NRB specification or New Zealand Building Code.

3.4. Setting Out: The Contractor shall be responsible for setting out the work.
Refer Site, Dimension and Slab Plans. Check all the levels on site.

3.5. Materials

3.5.1 Hardfill

Hardfill shall consist of approved excavated rock or suitably graded imported rock or gravel material of 50mm maximum size. Material shall be clean and free from clay, organic or other foreign matter.

3.5.2 AP40 Basecourse: The AP40 basecourse aggregate shall comply with the requirements of Transit New Zealand M/5 specification.

3.5.3 Sand:Sand shall be natural river sand or crushed aggregate sand with an approximate grading of 10-30% passing a 300 micron sieve and not greater than 5% passing a 150 micron sieve.

3.6. Stripping of the Site: Allow to strip the building area of all vegetation, topsoil, rubbish etc. Remove all unsuitable material off the site. Store topsoil where directed by the owner.

3.7. Excavation: Excavate the site to the levels shown on the site layout drawings. Drainage trenches: excavate to suit pipe falls, in straight lines or even curves, allowing space for joints. Excavate for the Biocycle tank where indicated.

The Contractor shall be responsible for any temporary support necessary. All overbreak shall be removed and the resulting spaces backfilled with free draining material to the Engineers satisfaction.
Extra depths may be required to attain solid bearing, as directed by the Engineer. Maintain and drain the surface at all times.
Foundations shall be founded on firm ground with a minimum safe bearing capacity of 100 kPa.

3.8. Ground Water

Ensure that ground water level on site does not affect the excavations.

3.9. Excavated Material

All surplus material from excavations, not suitable for backfilling shall be disposed of off the site. Material suitable for use as hardfill may be stockpiled on site and used instead of imported material.

3.10. Foundations: After excavation is complete, notify the Building Inspectors to inspect the foundation material before any concrete is placed.

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3.11. Backfilling

3.11.1 General

All spaces excavated and not occupied by concrete shall be backfilled with approved material and compacted up to the level of the nominal surface from which the Contractor is required to excavate.

3.11.2 Fill under Slabs and Permanent Works

Fill to near the underside of DPM with hardfill laid at its optimum moisture content and compacted in layers not exceeding 150mm thickness. Fill shall be brought up evenly on both sides of foundations until the final level is reached. Care must be taken so as not to damage services, pipes subsoil drains etc. during filling.

Provide a thin sand blinding (25 mm maximum) over hardfill under floor slabs. The blinding shall cover the entire surface and leave no stones showing through. Note the lower levels required for the polystyrene underfloor insulation.

3.11.3 Backfill Around Foundations Outside Building

Backfill to level of adjoining ground with hardfill placed in layers not exceeding 150mm in thickness. Backfilling shall be brought up evenly on both sides of foundations until the final level is reached. Care must be taken so as not to damage footing walls, services, pipes, subsoil drains etc. during backfilling. Adjacent to foundation beams and footings hand compaction methods may be necessary.

3.11.4 Fill to Services Trenches

Backfill services trenches only after testing and inspection of the services. Take care not to damage pipes, cables.

3.12. Damp-proof Membrane

Over the sand blinding to slabs where shown on the drawings, place one layer of Ultrathane 2000 or equal to form a continuous membrane. Lap to Manufacturer's recommendations and thoroughly seal with adhesive tape. The membrane shall be turned up the slab edges all round the floor area, and in particular shall be sealed to the tanking on the block retaining walls. See drawings. Lay ***under*** 40 mm polystyrene.

3.13. Compaction

Each layer of fill shall be compacted to a uniformly dense, stable condition in which it does not weave or creep under rolling.

3.14 CLEANUP. Pick up any debris, off cuts or other rubbish generated by this trades work on site.
Remove debris from the site
Do not leave rubbish (or anything else) at any time where it could cause a hazard.

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6 CONCRETE WORK

6.1. Preliminary & General

The subcontractor shall take notice of and abide by any parts of the preliminary and general clauses that relate to this trade. Refer to standard details and follow as appropriate.

6.2. Scope: This section includes but is not necessarily limited to: the supply, placing and finishing of cast insitu concrete. This includes the footings, floors, stairs, terraces and paving and blockfill.

6.3. Refer to the following:

The following standards shall apply:-

New Zealand Building Code NZS 3101, Design of Concrete Structures

NZS 3109, Concrete Construction

NZS 3313, Chemical Admixtures for Concrete

NZS 3114, Concrete Surface Finishes

NZS 3121, Water and Aggregate for Concrete

NZS 3122, Portland Cement

NZS 3123, Portland Pozzolon Cement

NZS 4210, Code of Practice for Masonry Buildings

6.4. Materials All materials shall comply with the relevant New Zealand Standard.

6.4.1 Air Entrainment

The manufacturer may add an air entraining agent to the concrete to provide up to 6% of the entrained air in the mix. Do not use air entrainment for any concrete scheduled to be finished with exposed aggregate or by grinding to expose the stones. see finishes schedule.

The application of the air entraining agent shall fully comply with the requirements of NZS 3109. Do not use air entrainment for exterior paving concrete.

6.5. Concrete Production

Ready mixed concrete shall be used, complying with NZS 3104:1983, special grade.

6.6. Schedule of Concrete Mixes: Concrete mixes shall be as follows:

28 DAYS	STRENGTH MPa	LOCATION
	10	Site Concrete
	20	Foundation and Floors
	20	Masonry Grout
	35	Precast Slabs

6.7. Handling and Placing

- The handling and placing of concrete shall be in accordance with NZS 3109.
- The Building Inspector shall be advised of those areas to receive concrete at least 24 working hours before concreting for inspection purposes.

6.8. Vibration: All concrete shall be vibrated with immersion type vibrators. Ensure that no concrete blockwork is spattered by the vibrators or any other means.

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6.9. Curing All slabs shall be protected and water cured for 7 days (minimum)

6.10. Tests During Construction

The Contractor shall allow for the cost of concrete testing. Tests shall be carried out during construction to check the compliance of the concrete with the specification. The tests required shall be carried out in accordance with NZS 3112 Parts 1 and 2, 1986 and NZS 3109:1980. The Contractor shall provide and keep on site all equipment necessary for the making of all site tests required by the specification.

6.11. Falsework & Formwork

•Shall be used whenever necessary to support, confine and shape the concrete to required lines and dimensions. After constructing the formwork, check the actual dimensions of the formwork against the drawn dimensions and report results to the architect. Check the location and size of the floor rebates for doors, plumbing outlets etc to ensure that no adjustment is required later.

•Shall be accurately and securely set up with adequate bracing and close joints.

•Fillets or chamfers as appropriate shall be provided at internal and external corners to ensure stripping of forms does not damage finish.

•On completion of the formwork it shall be measured and checked against the dimensions shown on plan and the results immediately reported in writing to the architect and later to the next site meeting.

•Formwork shall not be stripped until the minimum periods set out in Table 5 of NZS 3109, (with due allowance for cold weather), or such extended time as the Engineer considers necessary. Care shall be taken when stripping formwork to avoid marking the surface.

6.12 Surface Finish

Surface finishes shall be as set out in the Schedules of Surface Finishes below. All surface finishes shall comply with the requirements of NZS 3114:1987. Where applicable, the concrete surfaces shall be suitable for application of the specified finishing material, and of such evenness that the finishing material does not reflect blemishes.

Formed Surfaces

Foundations not exposed to view	F1
All other concrete	F3

Unformed Surfaces

Floor Slab	U3

6.13 Protection

At all times make adequate provision for protection from rain. When rain is possible, the pour shall not commence unless adequate temporary cover, suitable for rapid positioning, is available.

Make good any weather damage to concrete.

Protect all new concrete work and ensure that no heavy loads are placed on or moved over the finished concrete until twenty eight days old.

6.14 Crack Control Joints. For preference do not saw the crack control joints but use proprietary metal construction joint makers.

[If sawn construction joints are used they shall be cut to a depth of 20 mm using a 6 mm blade, **as soon as possible after finishing the pour**. Care shall be taken to avoid any damage to the edges of the saw cuts. Fill these joints with a firm/slightly flexible grout after two weeks.]

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6.15 Construction Joints

The shape and location of construction joints shall be as sho s drawings. Proprietary metal construction joint makers shall be used in lieu of saw cutting wherever possible.

6.16 Holding-Down Bolts

Provide suitable templates for locating holding-down plates and bolts. Ensure that they are positioned to a tolerance of +/- 1.0mm relative to each other and +/- 5.0mm to group position and level. Holding down bolts for steelwork shall be positioned to a tolerance of +/- 1.0mm.

6.17 Floor Recesses Form all door recesses as required for the doors, showers etc on the drawings.

6.18 No plaster or concrete droppings shall mar the finished appearance of any blockwork exposed to view. See section 12.

6.18 CLEANUP. Pick up any debris, off cuts or other rubbish generated by this trades work on site.

Remove extra concrete dumped or debris from the site or dump it in the main contractors skip at the end of the day. Do not leave rubbish (or anything else) at any time where it could cause a hazard.

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9 REINFORCING STEEL

9.1. Preliminary & General

The subcontractor shall take notice of and abide by any parts of the preliminary and general clauses that relate to this trade.

9.2. Scope

This section includes but is not necessarily limited to:, cutting, bending, placing and fixing in position of all reinforcing bars shown on the drawings. The Contractor shall allow for all supports, spacers & ties.

9.3. Standards

The following standards shall apply:-
New Zealand Building Code
NZS 3109: 1980 Specification for Concrete Construction
NZS 3402P:1973 Hot rolled steel bars for concrete reinforcement
NZS 3421: 1975 Hard drawn mild steel wire for concrete reinforcement
NZS 3422: 1975 Welded fabric of drawn steel wire for concrete reinforcement
NZS 4702: 1982 Metal-Arc welding of Grade 275 Reinforcing Bar

9.4. Material

9.4.1 Reinforcing Steel: Grade 300 round mild steel rods complying with NZS 3402P shall be used for all stirrups, column ties and other reinforcement requiring tight hooks or tight bends.
Grade 300 and 430 deformed steel complying with NZS 3402P shall be used for all other reinforcement.
At the times concrete is placed, reinforcement shall be free from all loose mill scale, rust dirt, oil, paint, retardant or other coating which may destroy or reduce the bond.

9.4.2 Mesh

Mesh shall be HRC welded reinforcing fabric complying with NZS 3422, BS 1221 and ASTM A 18564T.

9.4.3 Tying Wire

Tying wire shall be 1.2mm soft black iron wire.

9.5.1 Workmanship

9.5.1 Detailing

Where laps are not shown, they shall be staggered so that not more than one quarter of the rods are lapped within any 1000mm length.
The Contractor shall check the dimensions of all reinforcement before proceeding.

9.5.2 Fabrication

Reinforcement shall be cut and bent strictly in accordance with the drawings, and as required by this specification. All bends shall be made cold.
Deformed bars shall not be bent around fixed pins. Rollers shall have the least possible resistance to movement to avoid undue stretching at the bends

9.5.3 Placing Reinforcement

Reinforcement shall be accurately placed and securely fastened in accordance with the drawings. Adequately support reinforcement with chairs, spacers or hangers etc, securing against lateral displacement during placing and vibration of concrete.
Ensure that reinforcing for blockwork if required has the starter bars accurately placed to suit the core locations.

Support slab reinforcement at not more than 1 metre centres.

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Suitable plastic spacers shall be used on all fairface work.

All specified concrete cover shown on the drawings must be adhered to. Where not shown the cover must comply with the requirements of NZS 3109

Starter bars cast into concrete shall not be bent in any way.

All reinforcing to be lapped 40 diameters and mesh 300mm unless otherwise shown on the drawings.

No reinforcing or tie wire shall intrude into the concrete 'cover'.

9.5.4 Welding
Welding of reinforcement is not permitted except where shown on the Engineering drawings.

9.5.5 Tolerances
Reinforcement shall be bent and placed in accordance with NZS 310

9.9.5.6 CLEANUP. Pick up any debris, off cuts or other rubbish generated by this trades work on site.
Remove debris from the site or dump it in the main contractors skip at the end of the day.
Do not leave rubbish (or anything else) at any time where it could cause a hazard.

12 CONCRETE MASONRY

12.1 SCOPE: This section includes but is not necessarily limited to: reinforced block walls and footing walls plus the retaining walls to the carpark and driveway areas.

12.2 REFER: Preliminaries, Drawings, Finishes Schedule, NZBC, NZS 3102P, 3103P, 4210, 3604.

12.3 The function of the concrete blockwork is to provide strong permanent formwork for the concrete contained therein, and to prevent the passage of moisture, wind, dust and light whilst providing where required a suitable base for further finishes.

12.4 FINISH: Blocks shall have an even texture and finish. No finish requirements where the blockwork is below ground, is plastered or behind strapping and lining. Where exposed the blockwork shall be neat and straight, with clean raked and pressed joints alternating in line. Reject chipped, cracked , warped blocks or otherwise defective blocks in any visible location. Most blockwork will be plastered externally and internally.

12.5 TOLERANCE: Joints=10mm ± 1mm height. 2mm in 3m horizontally or vertically (perpends)
Walls lateral tolerance, 2mm variation in 3m height or width..
Max size of any sudden step between adjacent block faces separated by a block joint= 1mm

12.6 INSTALLATION Refer to Framing Plan, cross sections and details

12.7 Blockwork: shall be 200 Series (190 wide) fully grouted, generally except where noted or detailed.
Note the general use of hotblocks for the exterior house walls.
Mortar: constituents are to batched and mixed consistently to produce the same colour joints for exposed blockwork only. ~~(This is especially important as the cleanout ports are to be whole block faces that need to be replaced after the rest of the mortar is set)~~

12.8 All blockwork to carried out by expert block layers in accordance with NZS 4210. Do not smear mortar on the face of the blocks when tooling, pressing or polishing joints or at any other time.
Joints under tiled areas may be simply cut off. Press tight and tool to a firm dense finish.
Cutting: Cut blocks as required away from finished walls or walls under construction.
Clean dust or residue completely off the blocks before laying.

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12.9 Lay blocks in stretcher bond generally.

12.10 Provide shrinkage control joints at 5m centres or as shown.

12.11 Check and ensure that the starter bars are accurately located in relation to the block cores. This is important!

12.12 Provide cleanout ports on the interior face of the wall by cutting the entire face off the block and replacing it after cleaning is complete. Allow to clean out mortar droppings before they set.

12.13 CLEANUP. Pick up any debris, off cuts or other rubbish generated by this trades work on site.
Remove debris from the site or dump it in the main contractors skip at the end of the day.
Do not leave rubbish (or anything else) at any time where it could cause a hazard.

13 STONEWORK

13.1 SCOPE: This section includes but is not necessarily limited to the Garden Walls, under the Sitting room windows and the curved wall by the front door.

13.2 REFER: Preliminaries, Drawings, Finishes Schedule, NZBC, NZS 3102P, 3103P, 4210, 3604.

13.3 The function of the stone veneer is to provide a strong durable finish and to prevent the passage of moisture, wind, dust and light.

13.4 FINISH: Stones shall be limestone of about 250mm to 400mm long, no more than 150mm high. The total veneer thickness should be approx 125mm.

12.5 TOLERANCE: Joints=12mm ± 10mm

13.6 INSTALLATION Refer to cross sections and details

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14 METALWORK

14.1 SCOPE: This section includes but is not necessarily limited to the steel base supports to the timber columns, and the stainless steel handrails for the swimming pool.

14.2 REFER: Preliminaries, Elevations and details, finishes schedule, NZBC, NZS 3604.

14.3 The function of the handrail is to provide a strong railing providing a secure grip.

14.4 FINISH: See Fin Schedule.

14.5 TOLERANCE: Fit level and straight to within ± 2mm in 3m.

14.6 INSTALLATION Refer to cross sections and details. Use standard 40 mmØ SS tbe with welded brackets to form a handrail all round the pool and angling up the pool wall by the steps. See Engineers drawing for the post brackets.

16 METAL WINDOWS AND DOORS

16.1 SCOPE: This section includes but is not necessarily limited to: the manufacturer, supply, installation and glazing of aluminium windows and doors, including all hardware and associated works. Fletcher Aluminium sections for doors and windows.

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16.2 REFER: Preliminary and General, the drawings, NZBC. NZS 3604.
NZS 3504 Aluminium windows.
NZS 4203 General structural design and design loadings for buildings.
NZS 4211 Performance of windows.
NZS 4223 Glazing
BS 4842 Stoved organic finishes on aluminium extrusions and preformed sections for external architectural applications.
AS 1734 Wrought aluminium and aluminium alloy flat sheet, coiled sheet and plate for general engineering purposes.
AS G31 Stainless and heat resisting steel plate, rolled bar, sheet strip and foil.

16.3 FUNCTION: To provide complete door and window systems completely resistant to the penetration of wind, dust, rain, the DWP and other applied loads, and free from rattles or wind noise. Opening doors or sashes and all hardware shall operate smoothly and easily.

16.4 FINISH:

16.4.1 The Contractor shall maintain the specified finishes free of dents, scratches, corrosion, stains, marks or any other defect whatsoever until handing over.

16.4.2 Finishes to aluminium shall be factory powdercoat painted high gloss for doors and windows, all capable of insitu recoating. Colour;see fin schedule. Jamb liners shall be Matai, sanded and presealed before installation.

16.5 GUARANTEE. Guarantee the function and finish (as above) of the metal joinery, for a period of 10 Years.
Provide the Employer with the standard product guarantees relevant to this section or trade.

16.6 INSTALLATION Air Leakage Grade and Design Wind Pressure: CHECK for requirements for very high wind zone.

16.6.1 The contractor is responsible for the proper installation, operation, function and durability of the system and any operating mechanisms attached thereto.

16.6.2 Install aluminium sections to all windows in accordance with the manufacturers specifications. Install Rylock or similar Window and Doorsets generally.

16.6.3 Note: Timber front door to be Cedar RGA pattern. Install in Matai frame to later detail c/w Raven concealed lift up door seal at bottom of door and vinyl seals around the rebates for the door. Make up Tan P TG&V doors for the Pump house C/W Tan P frame. Storeroom door similar but use standard solid core FP door.

16.6.4 Fixings and fastenings hardware to be supplied by manufacturer of component being fixed. Check with architect.

16.6.5 Fixings and fastenings exposed to the weather to be of aluminium or suitable stainless steel.

16.6.6 Fixings and fastenings not exposed to the weather may be hot dip galvanised steel with a coating weight of 469g/m2 to BS 729.

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16.6.7 Bedding Compound: Neutral curing silicon rubber [black]

16.6.8 Pointing Sealant: Neutral curing silicon rubber [black]

16.6.9 Proprietary components: Fix in accordance with manufacturers recommendations.

16.6.10

Corrosion Protection: Before fixing, apply suitable barriers of bituminous coatings or polythene underlays between dissimilar metals or other materials in contact.

16.6.11

Sealants: Prepare joints for sealants in accordance with sealant manufacturer's recommendations, using recommended solvents and primers where necessary. All joints, especially mitre joints must be prepared and sealed in accordance with the sealant manufacturers requirements. Additionally the back of the joint shall have a run of sealant at least 3mm thick extending 7-10 mm each side of the joint for the whole length of each joint, properly adhered to the aluminium or powder coating.

16.7 GLASS AND GLAZING:

16.7.1 Glass and Glazing techniques shall comply with NZS 4223 & 4218. Vinyl gaskets shall be selected to suit the glass thickness, to prevent leakage of water or air and shall not shrink, come loose or bulge. Most windows and doors to be glazed with normal float glass except some locations may require laminated glass such as at low door panels, tinted glass to west windows where or if so noted, etc. Ref NZS 4223. Glass thickness to suit opening sizes and as required to fit in frames.

16.7.2 Aluminium Joinery may be glazed on or off site. **This site is very windy and very exposed.**

17 CARPENTRY

17.1 CARPENTRY FRAMING

17.1.1 SCOPE: This section includes but is not necessarily limited to: timber stud framework, posts, beams, bracing etc usually supporting sheet or board finishes.

17.1.2 REFER: Preliminaries, NZBC, The Drawings, Finishes Schedule.
NZS 3601 Metric Dimensions of Timber
NZS 3602 Specifying timber and wood based products in building NZS 3604 Light timber frame buildings not requiring specific design
NZS 3631 Classification and grading of NZ timbers
Timber Preservation Council - Woodmark Specifications

17.1.3 FINISH: Suitable to receive the scheduled linings/claddings/coatings.

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17.1.4 TOLERANCES: Tolerances for all framework to be:
Straightness in each 8m [not cumulative] +/-6 mm.
Straightness in Story Height +/-3mm.
Plumb in storey height +/-3mm
Width or height of openings +/-3mm.

17.1.5 INSTALLATION: All timber specified in this section is to comply with the requirements and recommendations of NZS 3601, 3602, 3604 where appropriate, unless otherwise specified.
Timber specified, grade, quality and preservative treatment may be any of those as listed in NZS 3602 for each situation, unless otherwise specified.

17.1.6 Test moisture content of timbers specified to be 'dry' using an electrical moisture meter. Test 5% but not less than 10 lengths of each cross section in the centre of the length. 90% of the values obtained must be within the range specified by NZS 3602.

17.1.7 All framing timber greater than 25 mm in thickness is to be gauged to both width and thickness unless otherwise specified.

17.1.8 Workmanship: Generally to be in accordance with the best trade practice, and this shall be deemed to include those methods, practices and processes contained in current syllabuses for the New Zealand Trade Certificates in carpentry and timber machining and as contained in NZS 3604.

17.1.9 Additional supports: Position and fix additional supports not shown on drawings, for stripping, fixtures, joinery, edge of sheets, and to provide lateral support to load carrying framing.

17.1.10 Timber Beams. Laminated or solid macrocarpa, free of loose knots, dressed and sanded four sides. Arriss edges to 3mm radius. Bolt to conc columns as shown. Beam Front porch/Sitting room = 240x90 macrocarpa sanded and clear finished.

17.1.11 Select all timbers exposed to view to avoid defects.

17.1.12 Install the special timber posts to the Verandah and the Front Porch as shown. Note the steel rod base and top connectors, screw fix to framing or beam as indicated. Ref also Engineers dwngs.

17.1.13 Proprietary joints and connectors are not to be used on any structural timber exposed to view unless indicated.

17.1.14 Clean off any marks on exposed timber

17.1.15 Timber Flooring: To the areas shown install 90x20 heart matai T & G flooring supplied by the owner. Seal the concrete floor under using Aquron 2000 plus a surface sealer in accordance with the Markham Distributing Ltd specifications. Fix the flooring battens to the concrete using Maxbond or similar and concrete nails. Ensure the battens are brought to an absolutely level line such that the final level of the timber floor is at +12mm above datum, ie in line with the top of the tiles.

17.2 INSULATION

17.2.1 SCOPE: This section includes but is not necessarily limited to: fibreglass and/or polystyrene thermal insulation.

17.2.2 REFER: Preliminaries, NZBC, Drawings, NZS 4222. See also Polystyrene and Fibreglass manufacturers data.

17.2.3 FUNCTION: To control the transmission of heat and sound and eliminate areas of thermal difference likely to cause condensation.

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17.2.4 TOLERANCES: Gaps are not permitted.

17.2.5 INSTALLATION: Floors: 40mm Polystyrene under concrete flooring.
Walls: Fit 100 fibreglass insulation to framed walls
Roofs: Fit 150 fibreglass insulation as shown.
Note that the Hotblocks already come with polystyrene inserts

17.2.6 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

17.3 SHEET LININGS

17.3.1 SCOPE: This section includes but is not necessarily limited to: MDF Fibreboard, 18mm plywood sarking to roof decks; Hardiflex, Villaboard, Hardies Titan Board

17.3.2 REFER: Preliminaries, NZBC, Finishes Schedule, Drawings, Manufacturers requirements or instructions and the following:
NZS 841
NZS 1900
NZS 3602
NZS 3604
NZS 3608
NZS 3611
NZS 3614 See also Plasterboard linings.

17.3.3 FUNCTION: The function of sheet linings or sheet lining systems, is to prevent the passage of moisture, wind and light, to limit noise and heat transmission and to provide a suitable base for any further finishes that may be applied (where required).

17.3.4 FINISH: The finish of the sheet linings shall be smooth, even and level [see tolerances] and shall, where further finishes are to be applied, be suitable for the application of the finishes scheduled.

17.3.5 TOLERANCES: Sheet linings shall be fixed so that the final surface varies by no more that 3 mm in 3m. Joints where exposed shall vary in width by no more than 20% from the width noted as required.

17.3.6 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

17.3.7 INSTALLATION: All sheet linings shall be fixed in accordance with the manufacturers instructions and particularly as noted below.

17.3.8 Plywood: Install 18mm CpD Plywood to the "flat" roof decks and fall to sumps where shown.

17.3.9 Villaboard. Line the walls and ceilings to bathrooms, laundry/store and garage. Stop bathrooms & laundry ready for paintingto manf requirements where not shown tiled. Square stop cornice.
Soffits; fix 6 mm Hardies soffit board with arrissed edges 1mm apart. Stop over the fixings only.

17.4 JOINERY INSTALLATION

17.4.1 SCOPE: This section includes but is not necessarily limited to: the work required to install interior doors and frames, skylights, cabinets, fittings, shelves, benches, finishing timbers and such like, including any associated hardware.

17.4.2 REFER: Preliminaries, NZBC, Drawings, Finishes Schedule, Manufacturers and Suppliers data, NZS 3602, 3604, 1156.

17.4.3 FITTING: Fit each unit or item neatly, level and square where required. Finishing timbers shall cover junctions completely and shall fit tightly against adjacent surfaces. Hardware shall work perfectly and all moving items such as locks, latches, doors, hinges, drawers, rollers etc shall be checked to ensure that they move smoothly with the minimum resistance possible without squeaks, scraping or other noises. Use glue, nails or screws as required.
Install the Velux skylights where shown in strict accordance with the manufacturers instructions. Groove the frames for gib if required and run the gib linings up the wall and into the groove where required.

17.4.4 FINISH: All timber or timber based components such as doors, drawers, shelves, finishings, etc shall be delivered to the site with properly arrissed edges, corners etc. Finishing timbers (Matai) shall also be arrissed to suit the final finish. Generally this requires that corners be arrissed to a 3mm radius except where noted, drawn or required otherwise. Protect prefinished or prepainted items from damage. Arriss PVC clashing to prefinished boards so that radius = thickness.

Fit the hardware and leave the same unmarked by scratches, chips, paint spots or any other mark upon delivery of the works to the owner at the end of the contract.

Putty. **DO NOT USE PUTTY.** Use non shrink proprietary wood filler only if required. **Use DAP** or similar permanent tinted filler to match timber colour with clear finishes. Ensure that all filler material is removed from the timber surfaces to avoid patchiness after finishing.

17.5 GARAGE DOOR

The garage door is to be a Renlita low headroom type glazed sectional door. Install in accordance with the details and the manufactures instructions. Note the fixed glass panels over the top of the door proper.

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17.5 HARDWARE

17.5.1 SCOPE: This section includes but is not necessarily limited to: the supply & installation of locks, latches, door pulls, plates, closers, door stops, towel rails, brackets etc, not covered under Metal Windows.

17.5.2 REFER: Preliminaries, NZBC, drawings, Finishes Schedule, Manufacturers instructions.

17.5.3 FITTING: The Contractor shall allow to fit all items of Hardware in strict accordance with the manufacturers instructions or the drawings.

17.5.4 FINISH: Ensure that all hardware is maintained free of marks, scratches, paint etc until the building is handed over at the end of the contract. Remove the hardware to allow for painting or clear finishing.

17.5.5 HARDWARE Allow a net sum of $3500.00 for the supply only of this hardware.

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19 TIMBER JOINERY

19.1.1 SCOPE: This section includes but is not necessarily limited to: the supply to the site of: the Front Door and frame, Pump room Doors and frame, the storeroom door and frame, interior doors, and frames, finishing beads, Velux or other skylights, including normal operating hardware such as hinges etc, together with the various cabinets, stair handrails etc as detailed or required.

19.1.2 REFER: Preliminary and General, The Drawings, The Finishes Schedule, NZBC, NZS 3604, NZS 1156 Doors. NZS 3602 Specifying timber and wood based products for use in building.

19.1.3 FUNCTION: The function of timber or timber based windows/doors and/or frames is to provide a stable support for the applied finishes, and to open [or close] to allow free passage through when open. Moving parts must move smoothly, and close to prevent the passage of air, noise, dust or other airborne elements. Cabinets shall provide safe and secure storage for household items and shall provide a stable base for finishes applied over.

19.1.4 FINISH: The timber or timber based joinery finish shall be as required for the coatings to be applied over, clear finishes require colour matched timbers where adjacent. All timbers shall be generously arrissed [3mm min radius], smoothly scraped or sanded. See Finishes schedule for finishes including prefinished boarding.

19.1.5 TOLERANCES: Straightness: to NZS specifications. Door or sash clearance = 3mm +/-20% max AFTER allowing for paint or varnish film thickness.

19.1.6 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

19.1.7 MANUFACTURE:
All materials and workmanship are to comply with the requirements and recommendations NZS 1158, NZS 3602 where appropriate. 3mm radius arrissed edges to each door.

1 Interior doors: hollow core Matai veneer. To timber framed walls fit in 19 mm selected Matai frames, 45x15 architraves as detailed and 45x12 Matai planted stops. All parts to have 3mm arrissed edges all round, sanded smooth and ready for clear finishing.
7 @ 810 mm + 1@860 mm solid core + 1@760 in frames + 1@710 in frameas above
plus 4@410, double bifold in frame + 2@610, in frame, 1x910 pq fp door in frame to store
1 @ 1420 mm cavity slider, Check Drawings to ensure that all doors etc are allowed for.

2 Skirtings: 90x12 Matai

3 Cabinets generally
Champagne Sagawood Supermatt melamine carcases and drawers, Blue Shimmer Hautelink shelves, match clash
18 clear lacquered Matai veneer doors with matching edge clashings.
Bathroom & E/S over cabinets to have vinyl backed mirror with pol bevelled edges glue fixed to the doors. mirror laminate exposed edges of doors and cabinets.

4 Kitchen cupboards, benchtops etc as drawn, noted and detailed.

5 Laundry cabinet and shelves as drawn

6 Supply shelving in the cupboards to suit the owners requirements. 18 Champagne Sagawood Supermatt melamine with matching clashings.

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22 ROOFING

22.1.1 SCOPE This section includes but is not necessarily limited to: the supply and installation of Corrugated Colorsteel to the sloping roof areas, complete with all required spoutings, flashings & barges as detailed.

22.1.2 REFER Preliminaries, Finishes Schedule, NZBC, Drawings, Manufacturers Specifications and/or other data, manufacturers Specifiers and Installers guides, NZS 3604 and NZS 3441.

22.1.3 FUNCTION: The function of the metal roof/wall cladding is to prevent the ingress of water or damp, wind, dust or other airborne elements into the building and to provide the final decorative finish for the roofing.

22.1.4 FINISH: Roofing, flashings, spoutings, etc shall be installed clean and free of oil, grease or other contaminants. Leave completely unmarked or dented.
READ THE MANUFACTURERS INSTRUCTIONS!!!

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22.1.5 TOLERANCES: Metal claddings shall be fitted straight to within +/- 3mm per 3m run.

22.1.6 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

22.1.7 INSTALLATION

22.1.8 Metal: 0.55bmt Zincalum/Colorsteel or Colorcote (See finishes schedule).

22.1.9 Profiles: Standard corrugated or equal for roofing, as noted or shown for flashings, spoutings, downpipes etc.

22.1.10Fixings: Proprietary nails and blind aluminium pop rivets to manufacturers specification. Do not use rivets that can rust.

22.1.11 Sealants: Use only neutral curing paintable silicon rubber sealant of a type approved by the roofing manufacturer. Do not use clear sealants.

22.1.12 Flash the skylights and other protrusions through the roof and ensure a completely waterproof result.

22.1.13 Cutting: Use Electric nibblers or tin snips for cutting the roof, not saws.
Remove all offcuts from the roof and spoutings.

22.1.14 Fixing: Fix roofing in accordance with manufacturers specifications.

22.1.15 Flashings: Instal flashings roof penetrations, etc in accordance with manufacturers specifications. Ensure that any excess sealant is completely removed on completion of the job.

22.1.16 Ensure that all roof penetrations, flashings etc are compatible with the roofing material or finishes.

22.2 RAINWATER/SHEET METALWORK

22.2.1 SCOPE: This section includes but is not necessarily limited to: the supply and installation of galv flashings, galv rainwater heads to the garage and bedroom walls, downpipes, dp brackets, and their associated accessories and means of fixing and jointing, plus flashings, cappings or other galv sheet metalwork noted, or required to complete the job.

22.2.2 REFER: Preliminaries, NZBC, Drawings. READ THE Colorsteel/Colorcote INSTRUCTIONS!!!

22.2.3 FUNCTION: The function of the rainwater system is to run the rainwater to the stormwater drains via the Index roof gutters or metal spouting and downpipes in such a manner as to avoid overflow into or against the building or ponding or other defects.

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22.2.4 FINISH: Colorsteel or Pacific Coilcoaters ZR8. See Finishes Schedule.

22.2.5 INSTALLATION: Solder together and fit the galv rainwater heads in the end of the Index gutters and connect the downpipes where shown.

22.2.6 Instal Galv or Colorcote flashings as drawn, noted or required.

22.2.7 GUARANTEE. Provide the Employer with the standard guarantees relevant to this section or trade.

22.2.8 CLEANUP. Pick up any debris, offcuts or other rubbish generated by this trades work on site.
Remove debris from the site or dump it in the main contractors skip at the end of the day.
Do not leave rubbish (or anything else) at any time where it could cause a hazard.

22.3 SYNTHETIC ROOFING

22.3.1 SCOPE: This section includes but is not necessarily limited to: Polyflame waterproofing membrane to the "flat" roof areas. Use Gripset 38 to form flashings to the top of plastered block walls where exposed.

22.3.2 REFER: Preliminaries, NZBC, Drawings, Finishes schedule. Refer also to the wall cladding manufacturers requirements for upstand flashings etc

22.3.3 FUNCTION: The function of the Gripset 38 is to prevent the ingress of water or damp, wind dust or other airborne elements into the building by redirecting any precipitation into spoutings, downpipes etc, and to provide a stable waterproof base for the tiling over.

22.3.4 FINISH: To match adjacent finishes.

23.3.5 CLEANUP. Pick up any debris, offcuts or other rubbish generated by this trades work on site.
Remove debris from the site or dump it in the main contractors skip at the end of the day.
Do not leave rubbish (or anything else) at any time where it could cause a hazard.

22.3.5 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

22.3.6 INSTALLATION: In strict accordance with the Gripset & Polyflame manufacturers instructions.

23 PLUMBING

23.1.1 SCOPE: This section includes but is not necessarily limited to: the installation of, the hot and cold water supply, reticulation and disposal including taps, fittings and their accessories, traps, wastes, valves etc, plus the connection to the water supply on site (this last arranged by owner)

23.1.2 REFER: Preliminaries and Drawings, NZBC,NZS 7602, CSA B137.8, Plumbers, Gas fitters and Drain layers Act 1976 Manufacturers specifications, Local Authorities requirements.

23.1.3 FUNCTION: The function of the water supply systems is to supply hot and/or cold water to the various fittings ***free from any leakage, creaking, water hammer or other noises, or other defects.***

23.1.3.1 The function of the various sanitary appliances and their associated wastes is to contain water (supplied as above) and to allow free drainage of such water when required ***without leaks, creaking gurgling or other noises, or other defects.***

23.1.4 FINISH: The finish of all fittings, taps, sanitary appliances etc shall be unmarked and as supplied by the factory. No exposed threads are permitted.

23.1.5 INSTALLATION: Install in each of the units the following taps.

23.1.5.1 Allow a net sum of $3000.00 for the supply only of taps and fittings as below:

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TAP	#	BRAND & TYPE	FINISH	COLOUR
Hose taps	4	HMC 35	Pol	Brass
HW Cyl tap	2	20mm Wheel valve	unpol	brass
Bathroom 1				
Bathmixer	1	Net Sum	Pol	Chrome
Bathspout	1		Pol	Chrome
Basinmixer	1	Net Sum	Pol	Chrome
Handwash dispenser	1	Net Sum	Pol	Chrome
Showermixer	1	Net Sum	Pol	Chrome
		+ Slide shower	Pol	Chrome
WC tap	1	Net Sum	Pol	Chrome
Heated Towel rail	1	Net sum	Pol	Chrome
Toilet roll holder	1	Net sum	Pol	Chrome
Grab rail over bath	1	Net sum	Pol	Chrome
Bathroom 2				
Basinmixer	1	Net Sum	Pol	Chrome
Handwash dispenser	1	Net Sum	Pol	Chrome
Showertap	1	Net Sum	Pol	Chrome
+ Slide shower			Pol	Chrome
WC tap	1	Net Sum	Pol	Chrome
Heated Towel rail	1	Net sum	Pol	Chrome
Toilet roll holder	1	Net sum	Pol	Chrome

Laundry

Wash machine taps	2	Bal-O-Fix	Pol	Chrome
Conceal pipework incl washing machine standpipe in wall recess behind machine				
Tub mixer	1	Net Sum	Pol	Chrome
Handwash dispenser	1	Net Sum	Pol	Chrome

Kitchen

Sink mixer	1	Net Sum	Pol	Chrome
Dishwashers	4	Bal-O-Fix	Pol	Chrome

WC

Tap supplied with wc				
Toilet roll holder	1	Net sum	Pol	Chrome

23.1.6 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

23.1.5.2 SANITARY APPLIANCES

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Allow a net sum of $6500.00 for the following sanitary appliances.

Install the following items: Spa bath, 2x 2 hole basins, 3x BTW toilet suites, 1x Cabana shower c/w toughened glass doors, 1x toughened glass doors to tiled shower, 1x ss sink and drainer, 1x 2 hole Ceramic utility bowl (set into benchtop). Branded schedule to be provided later. Ref drawings for type, location and installation of sanitary ware.

Allow to install the sink flush with the benchtops as shown on the drawings and in accordance with the manufacturers instructions c/w pop up waste. Instal pop-up wastes to other fittings. Showers to have Englefield easy clean traps.

23.1.5.3 Check the above off the drawings and instal where indicated.

23.1.5.4 Run 13 id. polybutylene or Fusiotherm piping to fittings generally. **Use swept bends** where bends are required. No joints below concrete slabs.

23.1.5.5 Fit pvc waste pipes to sizes and falls required where concealed, CP finish on copper or brass elsewhere. **No exposed threads to show.**

23.1.5.6 All piping and wastes to run concealed in walls or under floors. **Where connecting a basin or cistern or similar where pipework protrudes through the wall, care shall be taken to ensure that the pipework is fitted as high as possible up under the fitting to hide the pipework from view.** Any pipework that must be exposed to be cp finished. **No exposed threads to show.**

23.1.5.7 Connect the Kitchen and Bathroom 1 units requiring hot water to a Coopers or similar 240 litre (stainless steel coil tube heat exchanger type) mains pressure electric hot water cylinder located in cupboard by the fireplace. Connect the Bathroom 2 and laundry units to a 135litre low pressure cylinder in the roof space over the garage.

24 DRAINAGE

24.1 SCOPE: This section includes but is not necessarily limited to: both stormwater and foul water drainage systems.

24.2 REFER: Preliminaries, Drawings, NZBC, Local Authorities requirements, manufacturers specifications and recommendations.

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24.3 FUNCTION:

The function of the foul drainage system is to efficiently deliver water borne waste to the Biocycle tank, without leakage, blocking, smells, noise, back pressure or other defects. Note that the use of the Australian Standard as a substitute may contravene this section since it is very difficult to make such a system quiet.

The function of the stormwater system is to collect the rainwater from the downpipes and sumps and run it to a spreader unit where shown without leakage, blocking, smells, noise, back pressure or other defects.

24.4 FINISH: No finish requirements generally since no pipes shall run exposed to view. Refer to drawings for the layout of both the stormwater and sewer lines.

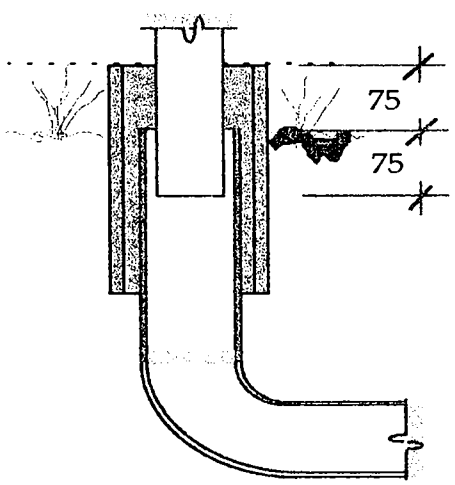
24.5 INSTALLATION: Install all the drains in strict accordance with the NZBC and the manufacturers latest specifications, recommendations or requirements. Run the pumped outlet from this tank to the effluent field in accordance with the Biocycle instructions.

Ensure that the DPC wraps around floor penetrations completely and seals tight.

See site plan and slab plan for location and setout.

24.5.1 Any brand of drainage pipe, fittings etc may be used provided it is approved for use by the Local Authority concerned.

24.5.2 Instal a 300 mm length of unglazed earthenware pipe where the downpipe meets the stormwater drain, with the top of the earthenware pipe level with adjacent paving where paved, or 75 mm above ground where in gardens, grass etc. The top of the drain shall finish 50 mm below the top of this earthenware pipe and the downpipe shall finish 50mm below the top of the drain.



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28 ELECTRICAL

28.1 SCOPE

This section includes but is not necessarily limited to: the connection of the mains to a new meter board on the bedroom 2 wall, installation of the meter board, main switchboard, the provision of electrical circuit wiring and fittings for light and power or other circuits as shown on the electrical plans.

28.2 REFER: Preliminaries, the drawings, NZBC, N.Z. Electrical wiring regulations, hand book and relevant codes of practice.

28.3 FUNCTION: The function of the electrical system is to provide a safe means by which both wired in electrically operated fittings and plug in fittings may be conveniently operated.

28.4 FINISH: The electrical fittings remaining visible on completion of the job shall be clean, neat, plumb, aligned with adjacent fittings where required, firm, and in any case to the Architects satisfaction.

28.5 TOLERANCES: The electrical plan shows only the general location of equipment and outlets. Allow to install fittings within 1 metre of any point shown if so directed.

28.6 GUARANTEE. Provide the Employer with all standard product guarantees relevant to this section or trade.

28.7 INSTALLATION: The whole of the electrical installation will be in accordance with the 1993 Electrical Regulation Hand Book, relevant codes of practice, and any subsequent amendments.

28.7.1 MAINS

Instal a new mains cable and run to a new meter board mounted flush into the bedroom 2 exterior wall and a new switchboard flush mounted in the garage on the stair wall behind the door from the entry hall.

28.7.2 EARTHING AND BONDING

Earthing and bonding of all metal and metallic pipe as per 1993 Wiring Regulations and electrical Codes of Practice.

28.7.3 MAIN SWITCHBOARD

Install a PDL DBF30 plastic switchboard. Allow to protect all circuits except light and refrigerator/freezer circuits with residual current devices. Protect these others with HRC fuses fitted in accordance with 1993 Wiring Regulations and electrical Codes of Practice. Label the circuits clearly with Dymo tape labels or similar.

28.7.7 TESTING, INSPECTING AND CERTIFYING. Testing, inspection and certifying will be carried out as per Electricity Regulations 1993; 34,35,36 and ECP 11 and Hand Book To Electricity Regulations 1993.

28.7.8 COMPLETION OF INSTALLATION

The installation will not be completed until a Certificate Of Compliance is delivered to the Employer.

28.8 ANCILLARY COMPONENTS Refer to the Architectural drawings for the location of these items.

28.8.1 LIGHT CIRCUITS. Light circuits shall be minimum 1.5 sq mm 2+E TPS, cable size to be selected to accommodate loading. Light switches to be Clipsal Eclipse series generally, selected colour metal finish, mounted vertically on the locking side of the door with the switch 1100mm to centreline above floor level.

28.8.2.1POWER POINT CIRCUITS. Power point circuits shall be minimum 2.5 sq mm 2+E TPS, cable size to be selected to accommodate loading. Power points: to be horizontally mounted Clipsal Eclipse series generally, double, switched type, with metal faceplates and mounted at 300mm above floor level generally, or as directed or shown. Install matching units for the telephone, audio, TV or other outlets outlets.

28.8.2.2TELEPHONE OUTLETS: to be Clipsal Eclipse series, mounting height as for power outlets. Allow to wire telephones back to main junction box.

28.9 LIGHT FITTINGS AND EXTRACT FANS

The contractor shall allow to supply and install all the light fittings indicated on the plan. Allow a net sum of $5000.00 for the purchase of fittings. Both bathrooms have extract fan/lights.

28.10 ALARMS

Install smoke detector alarms outside bedroom 1, in the Lobby and in the kitchen.

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29 PLASTER CLADDING

29.1 SCOPE: This section includes but is not necessarily limited to: the installation 20mm ventilated Hardibacker backed cavity plaster system to the exterior walls.

30.2 REFER: Preliminary and General, NZBC, the Drawings, the Finishes Schedule, NZS 3604, and the Manufacturers Product Data and Specifications.

30.3 FUNCTION: The function of the plaster is to provide a strong, stable, crack resistant and waterproof base for the final paint finishes over.

30.4 FINISH: Fix plaster smooth and level ready for painting, in accordance with the manufacturer's specification.

30.5 INSTALLATION: Fix and finish the plaster where shown in strict accordance with the manufacturer's recommendations. Only applicators approved by the manufacturer shall be used. Plaster the base blockwork to exactly line with and match the cladding above it.

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30 PLASTERBOARD AND OTHER LININGS

30.1 GIBRALTAR BOARD

30.1.1 SCOPE: This section includes but is not necessarily limited to: the installation of Gibraltar Board (Gibboard) fixing, jointing and finishing to interior framed ceilings and walls.

30.2 REFER: Preliminary and General, NZBC, the Drawings, the Finishes Schedule, NZS 3604, BS1230, Winstones Gibraltar Board Product Data and Specifications.

30.3 FUNCTION: The function of the plaster board linings is to provide a strong, stable base for stopping to an approved Fire Rating if required.

30.4 FINISH: Fix Gibboard smooth and level ready for stopping, in accordance with the manufacturer's specification. Joint and stop as below to produce a surface suitable for the final finish over (see Finishes Schedule).

30.5 INSTALLATION: Fix the Gibraltar Board Sheets where specified in strict accordance with the manufacturer's recommendations.

30.5.1 Fix 12.5 Gibraltar Board sheets joint and stop in strict accordance with Winstones "Gib Jointing and Finishing Instructions" suitable for the final finish [see finishes schedule]. Fix Bead-X or equal metal reinforcing on all exposed edges or corners.

30.5.2 Ceilings. Use 10mm GIB Ultraline generally.

30.5.3 Wet Areas. Install 6 mm Villaboard to walls and ceilings of the garage, bathrooms and kitchen and stop to the same surface finish as for the Gib board. Fix Bead-X or equal metal reinforcing on all exposed edges or corners.

30.5.4 HotBlock or Block walls . 13mm Gib. Seal the blocks then direct glue fix.

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32 CERAMIC TILING

32.1.1 SCOPE: This section includes but is not necessarily limited to:
Exterior tiling: Ceramic tiling the Front Porch, the Deck and Paths plus sill and other tiles where indicated .
Interior tiling: Ceramic floor tiling and skirtings to the Entry, Hallway, Bathrooms, Laundry and the WC shall be tiled over heating cables.
Allow to install the tiling and stonework to the fireplaces.

32.1.2 REFER: Preliminaries, NZBC, Drawings, Finishes Schedule, Manufacturers Specifications or Recommendations or Instructions.

32.1.3 FUNCTION: Tiling is required to preclude the entry of water, to provide a firm hard durable finish free from fading and highly resistant to wear, sunlight, rain or other elements.

32.1.4 FINISH: As manufactured. Grout generally to match tile colour, unless stipulated otherwise.

32.1.5 TOLERANCES: Tile joint lines shall not vary from the nominal straight line by more than 2 mm over a 3 m length of accumulated variation nor shall they step by more than 0.5 mm between any two lines.

32.1.6.1 Allow a net sum of $60.00/sq m average for the supply only of all tiles.

32.1.6.2 Fix and grout the all tiling in strict accordance with the manufacturers instructions. Press the grout well into the gaps and level off as close the the level of the top of the tiles as possible. Use ABA Multifix for floor tiling; ABA Flexigrout for grouting tiles. Install in strict accordance with the ABA specification.

32.1.6 GUARANTEE. Provide the Employer with the standard product guarantees relevant to this section or trade.

34 FLOOR COVERINGS

34.1 CARPET

34.1.1 SCOPE: This section deals with carpet and associated works to the Sitting Room, Bedrooms including wardrobes, Dressing Room, Landing and Stairs.

34.1.2 REFER: Preliminaries, Drawings, NZBC, Manufacturer's data, Finishes Schedule. NZ Federation of Master Floor Contractors Manual of Practice - Carpet. Note that for the purposes of this contract there is no "agent" for the client.

34.1.3 FUNCTION: The function of carpeting (and underlay) is: to provide a soft medium for the colour and texture of the flooring, to decrease the effect of impact noises and to absorb other noise, to cover the floor and underlay and to produce a smooth even appearance.

34.1.4 FINISH: Carpet to be selected later.

34.1.5 UNDERLAY: 6 mm commercial rubber underlay.

34.1.6 CARPET: Install the carpet in strict accordance with the manufacturer's specifications and the NZMFC Manual of Practice.

35 PAINTING

35.1 SCOPE: This section includes but is not necessarily limited to: the preparation of surfaces and the application of thin film coatings and sealing. See also the Finishes Schedule

35.2 REFER: Preliminaries; Drawings; NZBC, Finishes Schedule. NZS 3604; NZS 7703 Painting of Buildings; Manufacturers Recommendations.

35.3 FUNCTION: To protect the relevant substrates from the effects of sun, wind, rain, wear and tear etc and to completely waterproof the relevant surfaces where required .

To provide medium for the final colour and texture.

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35.4 FINISH: Refer Finishes Schedule and manufacturers data sheets

35.5 INSTALLATION: All Brands of Paint and Other Coating Materials must conform with the surface spread of flame index and smoke developed index for each part of the building as required by NZ Building Code.

35.5.1 Coating Materials: are to be delivered in sealed containers, clearly labelled with the following information:
Type of Material.
Brand name.
Intended use.
Manufacturer's batch numbers.

35.5.2 Paint Systems: Priming coats, undercoats and finishing coats for any one surface must be obtained from the same manufacturer.

35.5.3 The finishes schedule normally only notes the finish and colour of the top or final coat. The contractor shall prepare the substrate and apply the primers and/or the undercoats required for use with that substrate and final coat in strict accordance with the manufacturers instructions to achieve the the finish and function stated. Where a substrate has been installed that differs from that shown on the schedule contact the architect immediately before proceeding.

35.5.4 Cleanliness: Keep all surfaces clean and free from dust during coating and drying. Provide a suitable receptacle for liquids, slop washing etc. Do not use any sanitary fitting for disposal of waste or for cleaning equipment. Do not dump liquids outside. Use the contractors skip for solid waste

35.5.5 Generally: Prepare coating materials and substrates as recommended by the manufacturers and in accordance with NZS 7703.

35.6 Glazing: Protect etched, sand blasted, laminated or ground glass from attack by oily constituents of coating materials by treating edges before coating: clean surfaces after coating.

35.7 Removable fitting, fixtures and hardware: Have the carpenter remove from surfaces to be coated and replace on completion of painting. Do not paint hinges and butts.

35.8 Priming generally: Is to be done only by painting tradesmen. Apply priming coats by brush unless other methods are specifically noted or permitted. Work primer into surface, joints, angles and end grain. Ensure that priming coats are of adequate thickness and suit the surface porosity. Ensure that any primed surfaces which have deteriorated on site or in transit are touched-up or re-primed if more than one month has elapsed since priming.

35.9 Do not paint surfaces that may move, shrink or crack due to moisture, curing etc until they have stabilised or been corrected.

35.10 Doors shall be spray finished on all sides including the top and bottom edges.

35.11 Painting: Apply all paints by spray or roller, or by brush only if necessary, and as recommended by NZS 7703. Lay off all areas evenly, ensure that finished surfaces are free from brush or other marks and are smooth, level and even.

35.12 Spray painting: Mask all adjoining surfaces and comply with NZS 7703. Refer finishes schedule for sprayed areas.

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36 GLAZING

36.1 SCOPE: This section deals with the supply and installation of, Mirrors in the Bathrooms & WC. All glass, mirrors, beads, gaskets, adhesives, sealants, etc but excludes Aluminium Windows, Patent Glazing, or pre glazed windows, skylights or doors in other materials.

36.2 REFER: Preliminaries, NZBC, Drawings, Finishes Schedule, NZS2258, NZS 5802, NZS 4211, NZS 3604, NZS 1900 Chapters 4, 10, 6.1 & 8.

36.3 FUNCTION: the function of the glazing is generally to allow light to pass while limiting the passage of sound, temperature change, and eliminating any air movement.

36.4 FINISH: Glass finishes shall comply with the standards above.

36.5 TOLERANCES: To comply with NZS 2258

36.6 INSTALLATION:
Installed glass shall not rattle, creak or make any other noise during the normal use of the building
Glass thickness shall comply with current NZ standards for the size, shape and location of the glass panes.

Glazing Compounds: Putty shall NOT be used. Ensure that compounds, sealants, paints etc used together or abutting are compatible. Glaze the Cedar Front Door with black silicon sealant in the rebate behind the glass, then seal the beads tightly against the glass. Fix the beads with ss panel pins.

Pol the exposed edges of the vinyl backed mirrors approx 2mm bevel. Glue fix vinyl backed mirrors to substrates with clear silicon rubber. For return edges to mirror faced doors and return sides to adjacent cabinets, mirror finish laminate may be used.

37 SITEWORKS

37.1 Preliminary & General-The subcontractor shall take notice of and abide by any parts of the preliminary and general clauses that relate to this trade.

37.2 Scope-This section includes but is not necessarily limited to: Kerbing, site drainage and asphaltic paving of the Driveway Areas. See also Concrete Masonry for the block retaining walls.

37.3 Standards-Except as modified by this section, all materials and workmanship shall comply with the appropriate Transit New Zealand specifications.
TNZ M/1 Asphaltic Bitumen 1989
TNZ M/6 Sealing Chip 1992 and any relevant amendments.
TNZ M/10 First Coat Sealing 1988
TNZ P/9 Construction of Asphalt Concrete Paving 1975

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37.4 The Contractor shall allow to set out the work.

37.5 Subgrade. Trim the subgrade to the correct falls and compact with not less than three passes of a tractor drawn or equivalent vibrating roller. If the existing material is to be re-used as the sub-base allow to undercut compact the exposed subgrade and respread the material.

37.5.2 Topsoil shall be stockpiled within the site where directed by the owner.

37.5.3 Sub-base shall be uniformly graded shingle with sufficient non-plastic fines to enable it to compact. The maximum stone size shall not exceed 75 mm and the material CBR shall be not less than 40. Compaction shall be carried out until a 90 percentile Clegg Impact Hammer reading of 25 is obtained.

37.6 Basecourse. Basecourse shall comply with the requirements of transit New Zealand Specification M5. Compaction shall comply with the requirements of Transit New Zealand Specification B2. Prior to sealing the prepared surface is to be tested with a Clegg Impact Hammer. Areas with readings under 40 are to be recompacted to achieve a 40 result.

37.7 Sealing. All sealing shall consist 25 mm of Asphaltic Concrete Paving over an emulsion tack coat.

37.8 The construction of the asphaltic concrete paving shall be carried out strictly in accordance with TNZ P/9 and as follows
25 mm thick; tolerances= -5mm, +20mm. Surfaces to be straight to within ± 5mm in 3m̂.

All asphaltic concrete used shall be weighed on a certified weigh bridge and dockets for each load supplied to the Engineer.
The temperature of each load shall be a minimum of 150°c when fed into the paving machine.
Finish the asphaltic concrete paving level with or not more than 5mm proud of nominal lines or the concrete paving or kerbing as appropriate.

37.9 Prevention of Damage-All buildings, concrete work, etc which could suffer damage or marking due to spraying or pouring operations shall be covered before work starts. The Contractor shall be entirely responsible for any remedial work necessary to clean surfaces which become splashed or marked.

37.10 Kerbing & Channelling

37.10.1

General- a) All kerbing and channelling shall be constructed true to line, level, grade and cross section within a tolerance of plus or minus 7 mm. Special care shall be taken at junctions with existing work to ensure that there are no abrupt irregularities. The exposed faces of all kerbing and channelling shall be dense, smooth surfaces, free from scale, honeycombing or other irregularities. No air entraining agents may be used.

b) Tolerance: The height of kerbing between tangent points shall not deviate from a straight line (measured at the top of the kerb and the face nearest to the carriageway) by more than +/-5 mm in any length of 2.5 m. The same tolerance applies to the gradient line.

37.10.2

Extruded Kerb and Channelling-The use of an extrusion machine for constructing kerbing and channelling will be required. The concrete shall be extruded from the machine at a uniform rate, and the concrete shall be stiff enough after extrusion to maintain its cross section without support. Construction joints shall be made at a maximum spacing of 4 metres and may be made by sawing or pre-forming. The depth of a cut or sawn construction joint shall not be less than 50 mm.

Expansion joints shall be formed at 30 metre intervals by a break in the channel of 5 mm, and shall be filled with a grey polysulphide sealant. Where the construction or expansion joint is made prior to the concrete hardening, the concrete adjacent to the joint shall be fitted with a close fitting shield, and care taken to prevent any damage to the joint in the way of cracking and spalling at the edges of the joint. All runs must start and end at such a joint.

37.11 Maintenance-The Contractor shall maintain, to the satisfaction of the Engineer the new paved surface from the date of completion of the paving until the end of the maintenance period.

37.12 Sump - Construct stormwater sump under the cast iron tree surround/grating and fall the asphaltic concrete paving towards this as shown on the drawings. Fall the remainder of the paving to the existing drain channel on the north side of the driveway.

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38 NET SUMS

Allow for the owner to expend the following sums within this contract, net of profit, margins, GST etc for the supply only of the following. Allow to install and supply all associated items.

38.1	Contingency Fund	$6000.00	
38.2	Fireplaces + Flues	$7500.00	
38.3	Light Fittings	$5000	
38.4	Tile Supply only	$60/sq m	
38.5	Hardware	$3500.00	
38.6	Plumbing Taps	$3000.00	
38.7	Landscaping Plants and installation		$8,000.00
38.8	Swimming pool lining, pump, filter, skimmer, chlorinator etc		$20,000.00

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APPENDIX 1 : EXTERIOR FINISHES SCHEDULE

ITEM	SUBSTRATE	FINISH	COLOUR
Roof	Colorsteel Trimdeck/Trimline	PCC ZR8	Greyfriars
Roof flashings	Colorsteel	PCC ZR8	Greyfriars
Spoutings	Galv Steel	HG Enamel	16E56
"Flat" roofs	18 Plywood	Polyflame Mineral Chip	Green-grey
Internal Gutters	Gripset 38	Hi Glo	13HK92
Flashing cappings top of block walls	Concrete or block	Gripset 38+wall finish	=Wall colour
Downpipes/Rainwaterheads	Galv Steel	Resene Metallic	10MA40
Brackets for above(concealed)	Galv steel	Resene Metallics	SL
Fascias	Titan B'd	Hi Glo	13HK92
Soffits	Villaboard	HG Acrylic Sprayed	White
Chimneys	SS+SS Mesh		SS
Timber framed walls generally	Polymer Plaster	Low sheen Acrylic	White
Plastered Block walls generally	Polymer Plaster	Low sheen Acrylic	White
Family Room walls round to bed 1	Polymer Plaster	SG Acrylic	20C37
Timber frame walls to bedroom 1 and to Hall wall	Polymer Plaster	SG Acrylic	16C37
Panel between Garage/Sitting room	Polymer Plaster	Hi Glo	13HK92
Curved block wall to bath 2/bed 3	Polymer Plaster	Low sheen Acrylic	3V81
Stone clad walls	Frame+Hardibacker	Limestone	Natural
Exterior Joinery incl Garage Door	Alum	Dulux Metropolis	Porpoise
Window head flashings	Alum	Dulux Metropolis	Porpoise
Window Flaps	Cedar	Resene Metallics	11MB30
Front door	Cedar	HG Enamel	16E56
Front Door frame	Matai	Resene Metallic	10MA40
Pump room, Store doors, Pool Gates	Tan P	HG Enamel	16E56
Frames to above	Tan P	Resene Metallics	10MA40
Meterboard	Galv Steel	Prefin	Pure White
Balustrade, Window & Gate to Pool west wall		Toughened Glass	Clear
Timber posts and beams	Tan P	Sikkens	Walnut
Steel rod brackets to above	Galv	HG Enamel	16E56

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APPENDIX 2 : INTERIOR FINISHES SCHEDULE

ITEM	SUBSTRATE	FINISH	COLOUR
General			
Int Door frames	Matai	HG	Clear
Int Doors	Matai veneer	SG	Clear
Ext doors & windows Jamb Liners	Matai	HG	Clear
Sill clashings	Matai	HG	Clear
Sills	Villaboard	Tile	SL
Skirtings	Matai or tiled if adjacent to tiled floors	HG	Clear
Family Room, Kitchen and Entry Hall			
Floor	Concrete	Matai T&G	SL
Walls	Gib 13	Matt Acrylic	SL
Ceilings	Gib Ultraline	Matt Acrylic	SL
Bedroom 1 and Dressing Room			
Floor	Particle board	Carpet	SL
Walls	Gib	Matt Acrylic	SL
Ceilings	Gib Ultraline	Matt Acrylic	SL
Bathroom 1			
Floor	Concrete	Tile	SL
Walls or	Villaboard L5	Matt Acrylic	SL
Walls	Villaboard or block	Tile	SL
Ceiling	Villaboard L5	Matt Acrylic	SL
Cabinet doors	MDF	Melamine/Mirror	
Shower walls	Block	Tile	SL
Bedrooms 2 & 3			
Floor	Concrete	Carpet	SL
Walls	Gib	Matt Acrylic	SL
Ceiling	Gib Ultraline	Matt Acrylic	SL

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ITEM	SUBSTRATE	FINISH	COLOUR
Sitting Room			
Floor	Concrete	Carpet	SL
Walls	Gib	Matt Acrylic	SL
Ceiling	Gib Ultraline	Matt Acrylic	SL
Hall			
Floor	Concrete	Tile	SL
Walls	Gib	Matt Acrylic	SL
Ceiling	Gib Ultraline	Matt Acrylic	SL
Kitchen			
Floor & Toeboards	Concrete	Matai T & G	SL
Ceiling	Ultraline	Matt Acrylic	SL
Cabinet interiors & Drawer ints	MDF	Melamine	Champagne Sagawood Supermatt
Drawer bottoms and shelves	MDF	Melamine Blue Shimmer Hautelink	
Drawer slides	Alum	Alum	Alum
Cab Doors & Drawers	MDF, Matai veneer	80% gloss Lacquer	SL
Frig/Pantry cabinet ext	MDF, matai boarding	80% gloss Lacquer	SL
Pantry interior	MDF	Champagne Sagawood Supermatt	
Shelves	MDF	Melamine Blue Shimmer Hautelink	
Benchtops	Stone or Corian	Matt	SL
Upstand behind benches	Gib	Tile	SL
Garage			
Floor	Concrete	Resene sidewalk	Pebble grey
Ceiling	Gib	Matt Acrylic	SL
Walls	Villaboard L4	SG Acrylic	SL

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APPENDIX III

CONTRACTOR SAFETY PREQUALIFICATION FORM

CONTRACT Barnes House, Roy's Hill.

CONTRACTOR Concept master Builders Ltd

ADDRESS State Highway 50, Hawkes bay

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OCCUPATION/ACTIVITY

The contractor is required to supply the following information to the employer in order for both the employer and the contractor to meet their mutual obligations under the Health and Safety In Employment Act, 1992.

1	A copy of the contractors Health and Safety Policy.	
2	Health and Safety Programme: Does your programme include the following?	
2.1	Safe work practices and safety rules?	yes/no
2.2	Safety supervision?	yes/no
2.3	Emergency procedures?	yes/no
2.4	First aid procedures?	yes/no
2.5	Accident/incident reporting?	yes/no
2.6	Accident/incident investigation?	yes/no
2.7	New employees induction procedures?	yes/no
2.8	Hazard investigation?	yes/no
2.9	Training standards?	yes/no

Please provide relevant documentation to substantiate your replies to the above.

APPENDIX IV.

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PAYMENT CLAIM FORM

Barnes House, State Highway 50, Roy's Hill, Hawkes Bay.

The contractor shall provide the following data with each claim for payment:

.Claim $....., GST #.....

.Claim incl GST.....

1 CLAIM DATE ...../...../.....

2 Total value of work completed to date
or total amount being claimed to date $.....

3 Total of extras, variations and increased costs$.....

4 Total reductions to date $.....

5 Total of all previous payments $.....

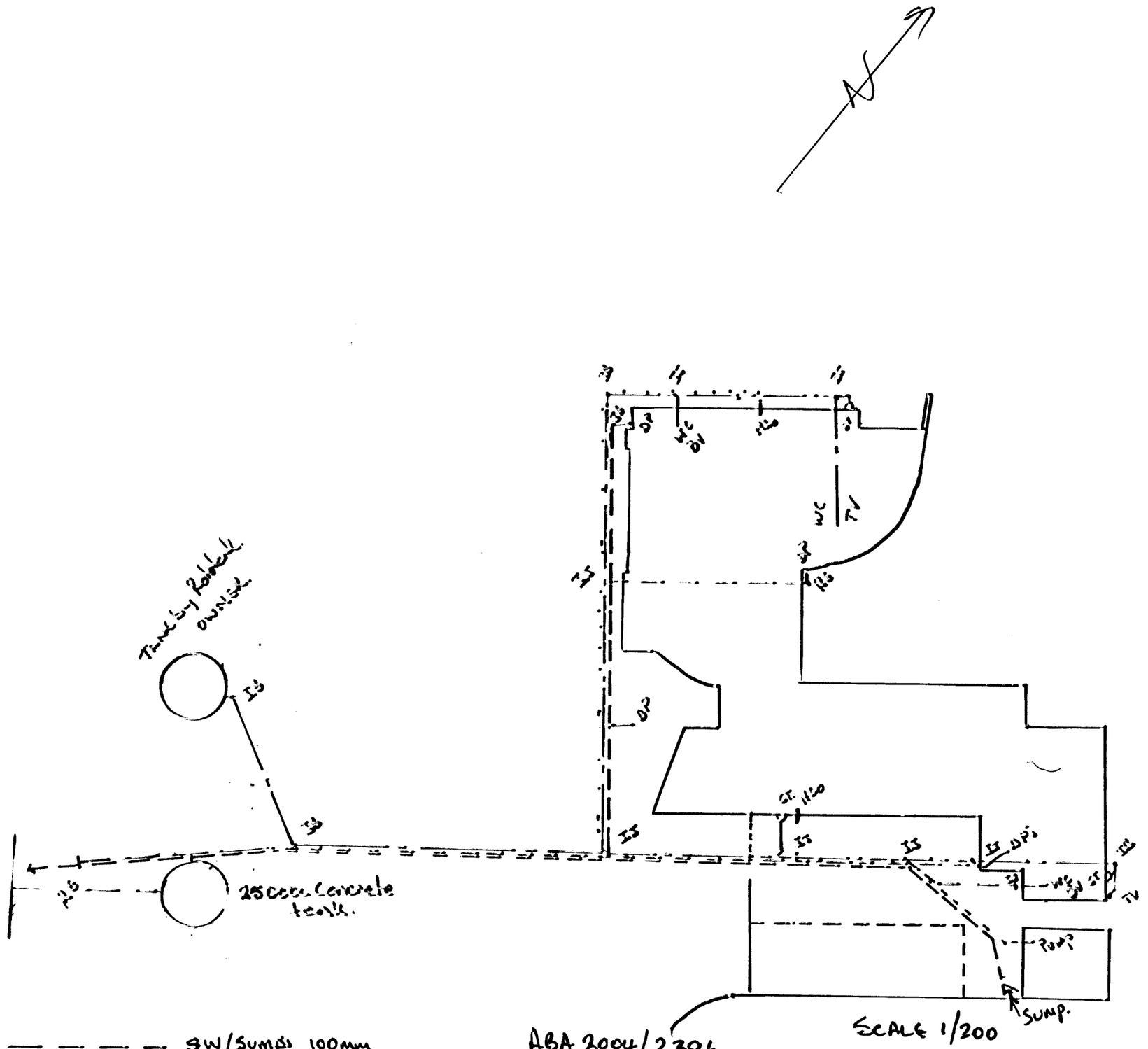
6 Provide a dated, cumulative summary showing details of
extras, variations, increased or reduced costs with each claim.

All the above amounts shall EXCLUDE GST.

CLAIMS NOT INCLUDING THIS FORM COMPLETED IN FULL MAY INCUR DELAYS IN PROCESSING. USE THIS FORM.

ITEM	SUBSTRATE	FINISH	COLOUR
Sitting Room			
Floor	Concrete	Carpet	SL
Walls	Gib	Matt Acrylic	SL
Ceiling	Gib Ultraline	Matt Acrylic	SL
Hall			
Floor	Concrete	Tile	SL
Walls	Gib	Matt Acrylic	SL
Ceiling	Gib Ultraline	Matt Acrylic	SL
Kitchen			
Floor & Toeboards	Concrete	Matai T & G	SL
Ceiling	Ultraline	Matt Acrylic	SL
Cabinet interiors & Drawer ints	MDF	Melamine	Champagne Sagawood Supermatt
Drawer bottoms and shelves	MDF	Melamine Blue Shimmer Hautelink	
Drawer slides	Alum	Alum	Alum
Cab Doors & Drawers	MDF, Matai veneer	80% gloss Lacquer	SL
Frig/Pantry cabinet ext	MDF, matai boarding	80% gloss Lacquer	SL
Pantry interior	MDF	Champagne Sagawood Supermatt	
Shelves	MDF	Melamine Blue Shimmer Hautelink	
Benchtops	Stone or Corian	Matt	SL
Upstand behind benches	Gib	Tile	SL
Garage			
Floor	Concrete	Resene sidewalk	Pebble grey
Ceiling	Gib	Matt Acrylic	SL
Walls	Villaboard L4	SG Acrylic	SL

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Timothy Robbell
owner
25 Conc. Concrete
track.
SW/Sump 100mm
Poly Pipe 5" Nom 100mm
Sewer 100mm
ABA 2004/2396
Mr D Barnes
STATE HWY 50
Hastings
SCALE 1/200
SUMP.