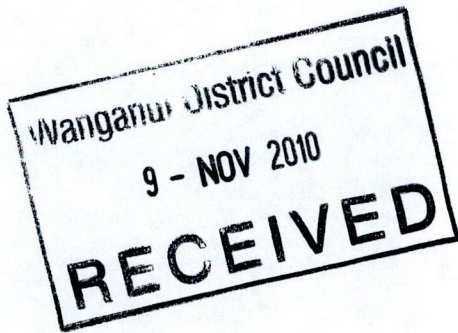




Job Ref: LOT-28

Scale 1:100
(on: A3)

Page 1 of 1

NOTES:

GENERAL

1. All work to be in accordance with New Zealand Building Code. All codes refer to the current edition plus all amendments.
2. These drawings are to read in conjunction with the drawings and specification of other consultants e.g. Architect, Building Services, Electrical etc. The principal Consultant must be notified of any discrepancy between structural and other drawings.
3. Check all dimensions on site before construction.
4. During construction, the structure shall be maintained in a stable by means of temporary propping, bracing and guying and no part shall be overstressed.
5. Under no circumstances should any concentrated stormwater runoff be allowed to discharge directly onto the ground or into soakpits.
6. It is the contractor's responsibility to **contact Building Officer to observe** the excavation for the foundation.
7. All surplus excavated material shall be removed from this site.
8. Cut off all topsoil and weak soil layers down to firm natural ground.
9. Ensure cuts are nearly horizontal & slope so as to provide drainage. Terrace cuts if necessary. Base course to be suitable graded hardfill and compacted in layers not greater than 100 mm and in wet condition. The layers are to be completely compacted by a vibrating roller with a minimum compaction force that is equivalent to 4 tonnes. Use PVC D.P.C. between basecourse and concrete.

CONCRETE

1. Material and workmanship to be accordance with NZS 3109.
2. Minimum cover to principal reinforcement shall be:

Member	Against natural ground	Against boxing or screed concrete	Exposed to weather	Not exposed to weather
Foundations, Beams, Columns (principal reinforcing)	75mm	50mm	50mm	35mm

3. Minimum slump shall be:

Member	Concrete slump(max.)
Floor slab on ground	80mm

4. Concrete grades:

Foundations:	-20Mpa at 28 days
Floor slab:	-20Mpa at 28 days
Masonry infill:	- 17.5 Mpa at 28 days

5. The saw cut should be cut to a depth of 20 and should be cut no later than 24 hours in summer, or 48 hours in winter, after the concrete is placed. Supplementary reinforcing bars to be placed at each corner, 2D10, 1.2m long. Sawcut grids 5000x5000 maximum unless otherwise noted. Slab to be 100mm thick with 665 mesh as shown on detail.

REINFORCEMENT

1. Reinforcement is shown diagrammatically and is not necessarily shown in true projection.
2. Reinforcing has been designated:
 - (a) High yield deformed ($f_y = 500\text{Mpa}$) e.g. HD16
 - (b) Mild steel deformed ($f_y = 300\text{Mpa}$) e.g. D16
 - (c) Mild steel plain ($f_y = 300\text{Mpa}$) e.g. R6
3. Laps in reinforcement to be made only in the positions shown and shall be (unless shown otherwise):

	D10	D12	D16	D20	D24	D28	D32	D40
Grade 300	400	480	640	800	1100	1250	1450	not permitted
Grade 500	480	580	770	1100	1500	1750	2000	permitted

4. Where laps not shown on the drawings, reinforcement in slabs and walls may, if approved, be lapped at random in a staggered pattern. Bars longer than 3m where length is critical for accurate placing should incorporate one lap according to the table above. No welding or heating of high yield bars is permitted.
5. Reinforcement in slabs is to be supported on stools or other approved methods - starters to be tied in place before pouring.
6. All reinforcement to be New Zealand manufactured steel bars to NZS 3402 or equivalent.

BLOCKWORK

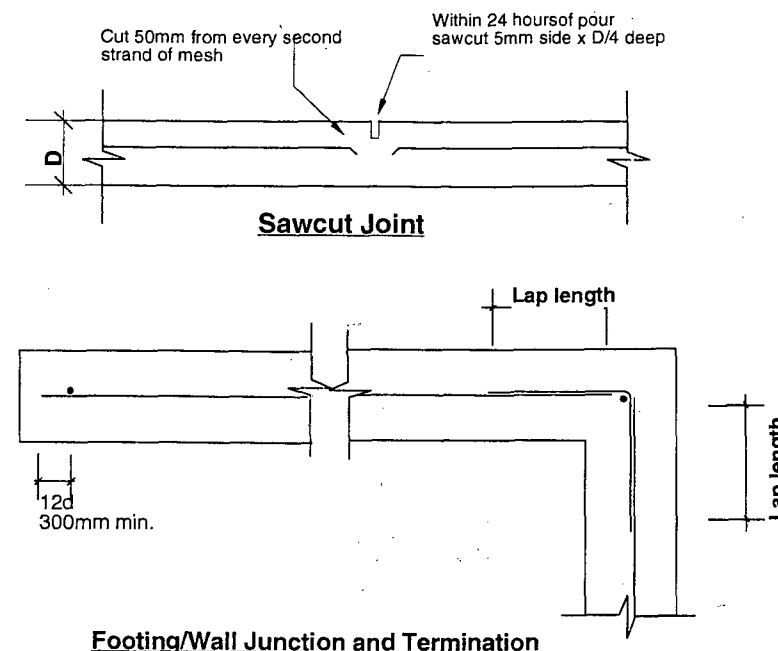
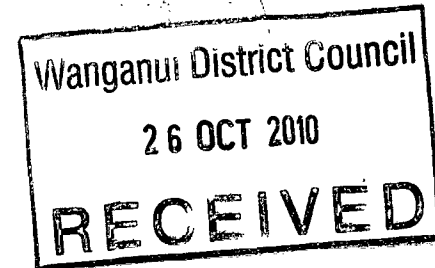
1. All blockwork shall be under the direct supervision of a registered mason who shall provide continuous inspection. All work shall comply with NZS4210 Masonry Material and Workmanship.
2. Masonry is to be constructed by the "high lift" method with clean out ports at every vertical bar and at the bottom of every lift. Bottom course to be open ended bond beam blocks placed upside down.
3. Fix vertical bars before laying blocks and place vertical/horizontal bars as laying proceeds.
4. Blockwork to be 8MPa grade and all cells to filled unless otherwise noted.
5. Concrete for filling blockwork to have a compressive strength as shown in Concrete note 4 above.

STEEL WORK

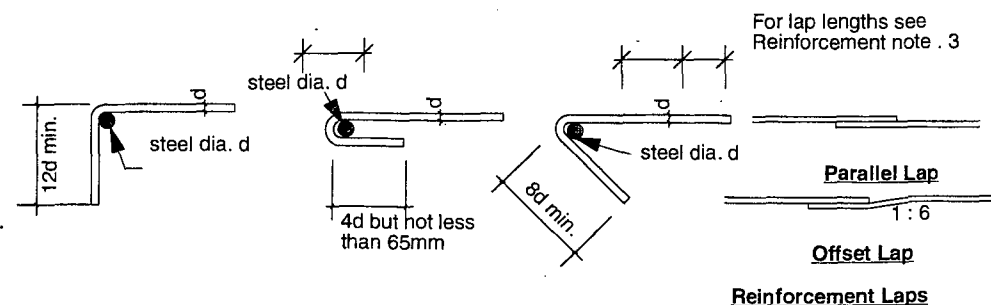
1. All structural steelwork to be grade 300 unless noted otherwise complying with the appropriate standards listed in NZS 3404.
2. Bolted connection to be made with grade 4.6 bolts to AS 1111 with 2mm clearance to holes, unless shown otherwise, where high strength (grade 8.8) bolts to be used in accordance with AS 1252.
3. Bolts threads to be excluded from shear plane.
4. All welding to arc welding in accordance with NZS 4203 GP. All welds to be 6mm fillet weld continuous unless noted otherwise.
5. Do not paint steel work that is to be encased in concrete.
6. This set of structural steelwork drawings show the design intent. Shop drawings remain the responsibility of the contractor.
7. All holding down bolts and other fixing devices are to be set by a template and checked for level and position before concreting.
8. Check and verify all dimensions and levels on site before commencing fabrication of any structural steelwork.
9. Unless shown otherwise, all base plates shall bear directly on 25 + / 5mm of dry pack mortar.
10. Washers tapered where necessary, are to be used under all nuts and bolts heads.

INSPECTION

Adequate notice is required by the engineer for inspection of the works. The contractor must be satisfied that the works have been completed in accordance with the drawings and specifications before requesting an inspection by the engineer.



APPROVED
10/0868
Consent No.



Main reinforcement

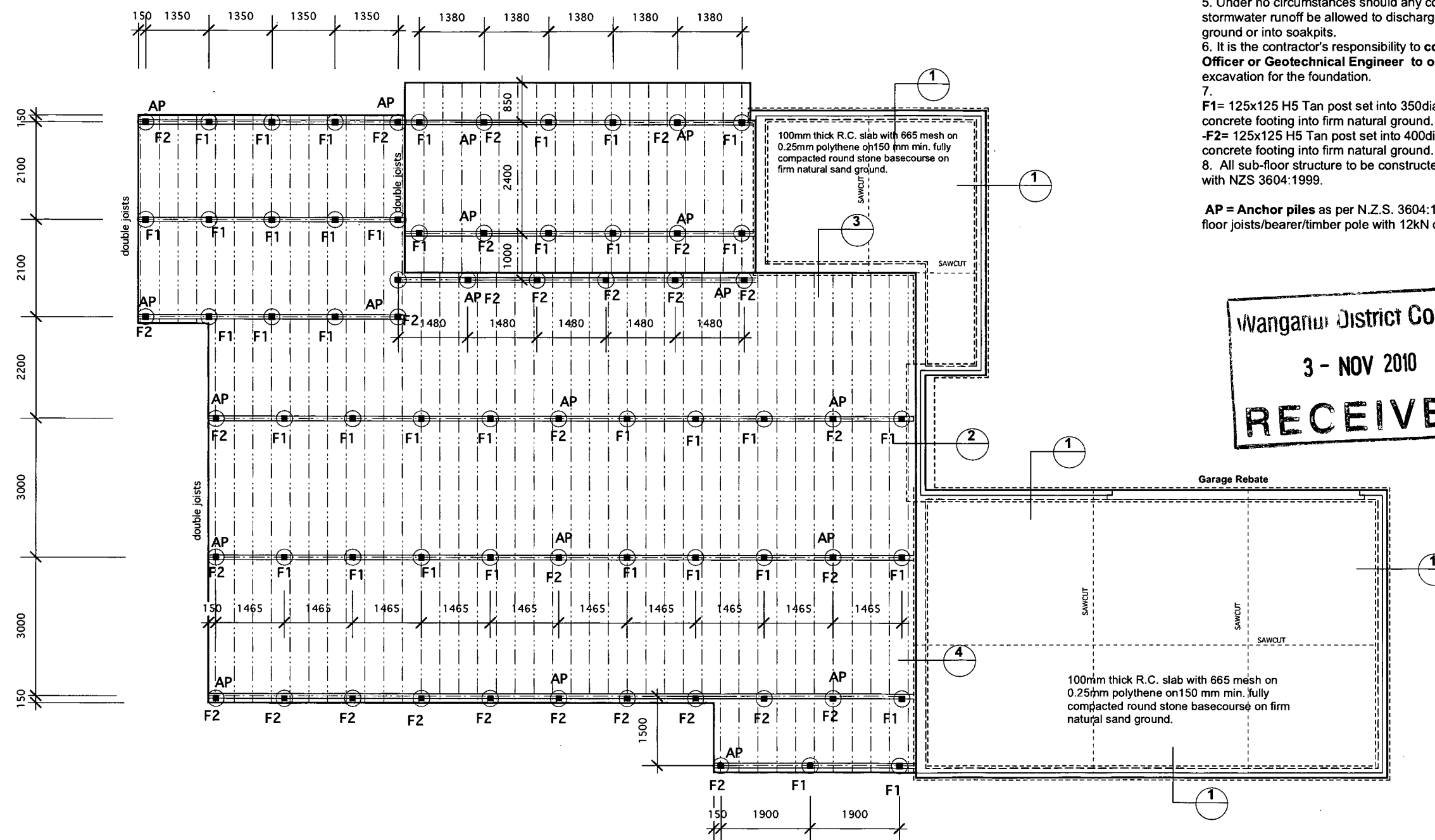
Steel grade	Bar size	min. dia. of bend
300MPa or 500MPa	6 - 20	5d
	24 - 40	6d

Ties and stirrups

Steel grade	Bar size	bar type	
		plain dia.	deformed dia.
300MPa or 500MPa	6 - 20	2d	4d
	24 - 40	3d	6d

Reinforcing Bends

REVISIONS	DATE	COMMENTS
A	18 Oct 10	
Issued for building consent		
ENGINEER:		
MEC ENGINEERING CONSULTANTS LTD. STRUCTURAL & CIVIL ENGINEERS		
76 MEDALLION DR ALBANY P O BOX 301 131 ALBANY AUCKLAND, NEW ZEALAND TEL: 09 476 8184 FAX: 09 476 8186		
PROJECT:		
NEW HOUSE AT LOT 28, LITHGOW DRIVE WANGANUI		
TITLE:		
GENERAL SPECIFICATIONS		
DESIGN:	MM	
DRAWN:	MM	
CHECKED:	MM	
DATE:	MARCH 2008	
SCALE:	NTS	
JOB No:	REY 082	
SHEET NO:	S 01	
COPYRIGHT: THIS DRAWING REMAINS THE PROPERTY OF MEC ENGINEERING CONSULTANTS LIMITED AND IS PROVIDED FOR USE AS DESCRIBED AND MAY NOT BE USED OR REPRODUCED IN WHOLE OR PART WITHOUT WRITTEN PERMISSION.		



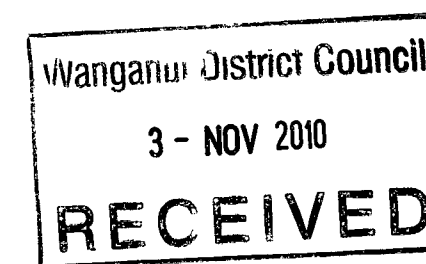
Foundation Plan

- Deck bearer: 2/150x50 H3.2 MSG8
- Deck joists: 150x50 H3.2 MSG8 at 400 crs.
- House bearer: 2/150x50 H3.2 MSG8
- House joists: 200x50 H1.2 MSG8 at 400 crs.
- F1= 125x125 H5 Tan post set into 350dia. 600 deep concrete footing into firm natural ground.
- F2= 125x125 H5 Tan post set into 400dia. 900 deep concrete footing into firm natural ground.
- AP= Anchor pile

NOTES:

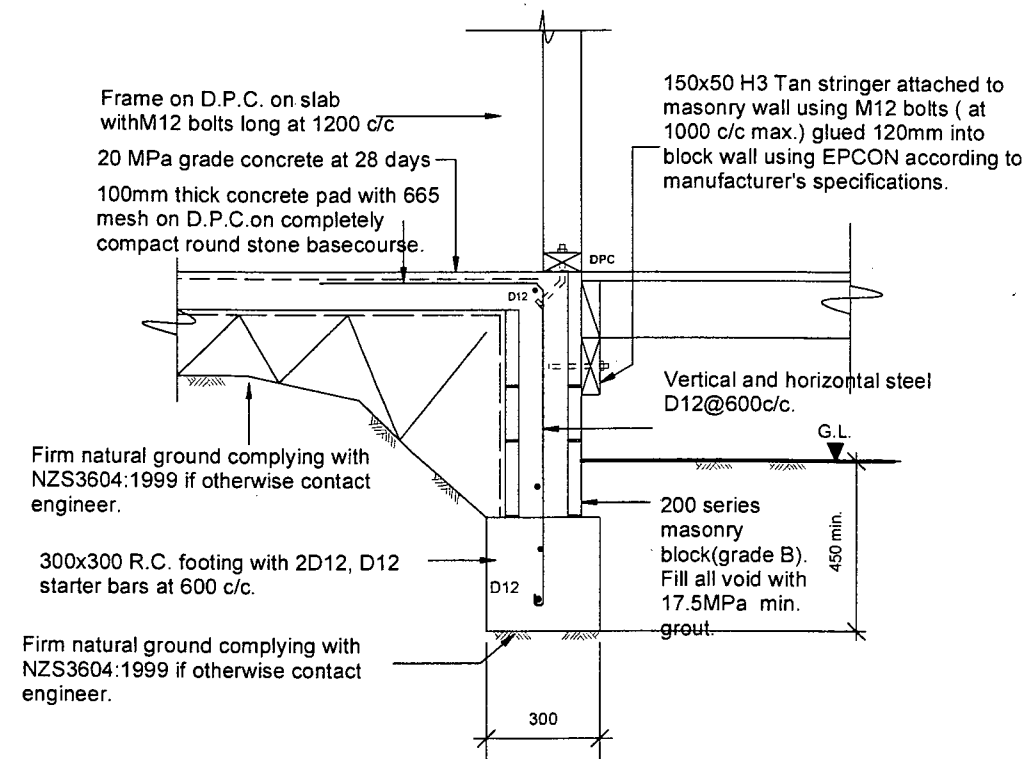
1. Check all dimensions on site before construction.
2. This drawing to be read in conjunction with architectural drawings.
3. The saw cut should be cut to a depth of 20 and should be cut no later than 24 hours in summer, or 48 hours in winter, after the concrete is placed.
4. Concrete grade to 20 MPa min. at 28 days.
5. Under no circumstances should any concentrated stormwater runoff be allowed to discharge directly onto the ground or into soakpits.
6. It is the contractor's responsibility to **contact Building Officer or Geotechnical Engineer** to observe the excavation for the foundation.
7. F1= 125x125 H5 Tan post set into 350dia. 600 deep concrete footing into firm natural ground.
- F2= 125x125 H5 Tan post set into 400dia. 900 deep concrete footing into firm natural ground.
8. All sub-floor structure to be constructed in accordance with NZS 3604:1999.

AP = Anchor piles as per N.Z.S. 3604:1999. Connect floor joists/bearer/timber pole with 12kN connector.

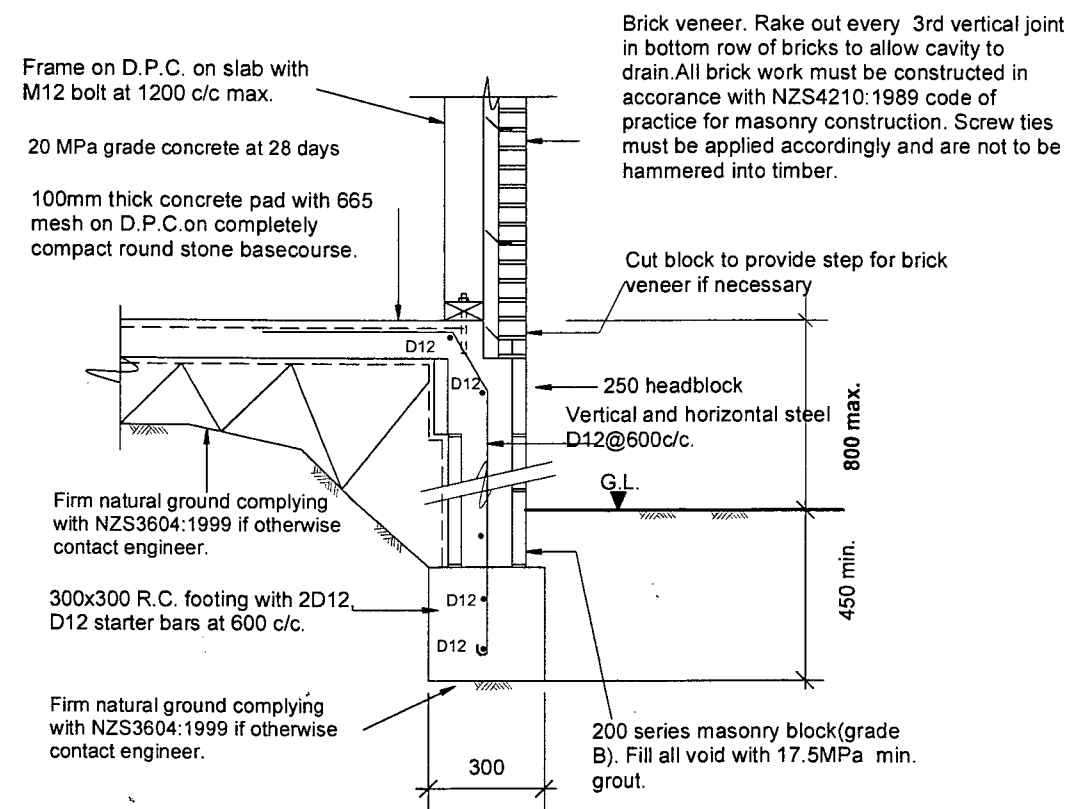


APPROVED
10/0868
Consent No.

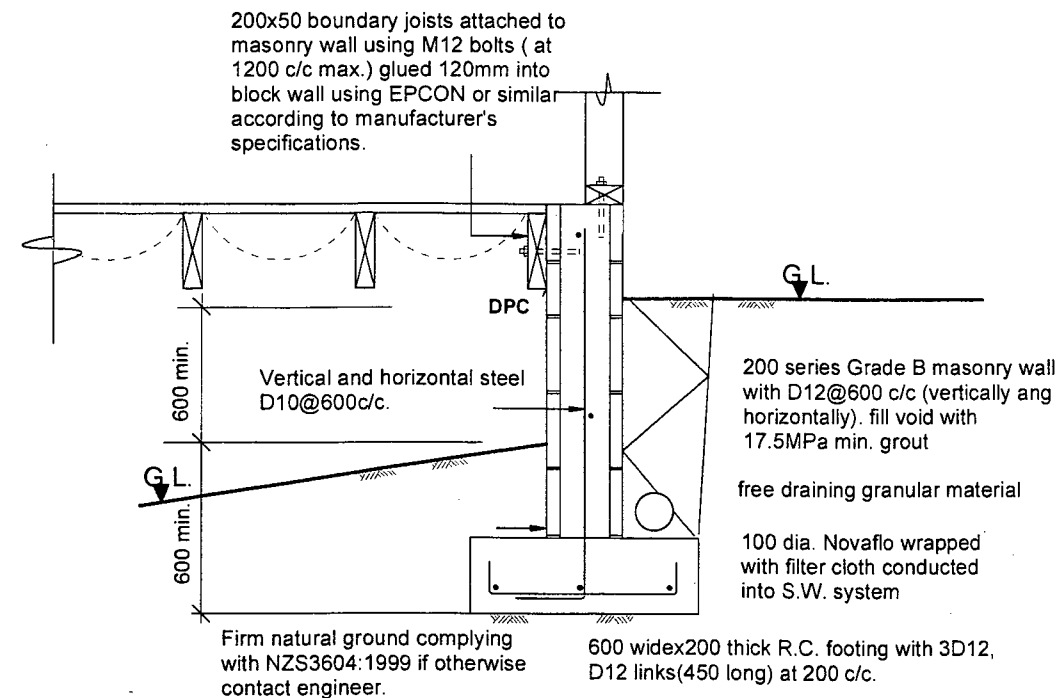
REVISIONS	DATE	COMMENTS
A	18 Oct 10	
Issued for building consent		
ENGINEER:		
MEC ENGINEERING CONSULTANTS LTD. STRUCTURAL & CIVIL ENGINEERS		
76 MEDALLION DR ALBANY P O BOX 301 131 ALBANY AUCKLAND, NEW ZEALAND TEL: 09 476 8184 FAX: 09-476 8186		
PROJECT:		
NEW HOUSE AT LOT 28, LITHGOW DRIVE WANGANUI		
TITLE:		
FOUNDATION PLAN		
DESIGN:	MM	
DRAWN:	MM	
CHECKED:	MM	
DATE:	MARCH 2008	
SCALE:	1:100 (A3)	
JOB No:	REY 082	
SHEET NO:	S 02	
COPYRIGHT: THIS DRAWING REMAINS THE PROPERTY OF MEC ENGINEERING CONSULTANTS LIMITED AND IS PROVIDED FOR USE AS DESCRIBED AND MAY NOT BE USED OR REPRODUCED IN WHOLE OR PART WITHOUT WRITTEN PERMISSION.		



FOOTING DETAIL 3
FOOTING DETAIL 4 Similar



FOOTING DETAIL 1

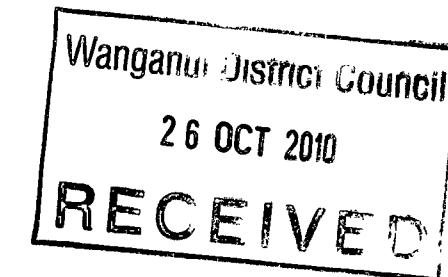


FOOTING DETAIL 2

APPROVED
10/0868
Consent No.

REVISIONS	DATE	COMMENTS
A	18 Oct 10	

Issued for building consent



ENGINEER:
MEC ENGINEERING CONSULTANTS LTD.
STRUCTURAL & CIVIL ENGINEERS

76 MEDALLION DR ALBANY
P.O. BOX 301 131 ALBANY
AUCKLAND, NEW ZEALAND

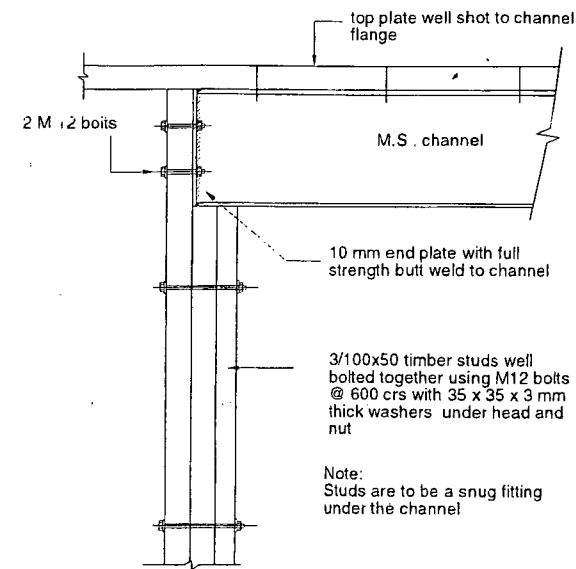
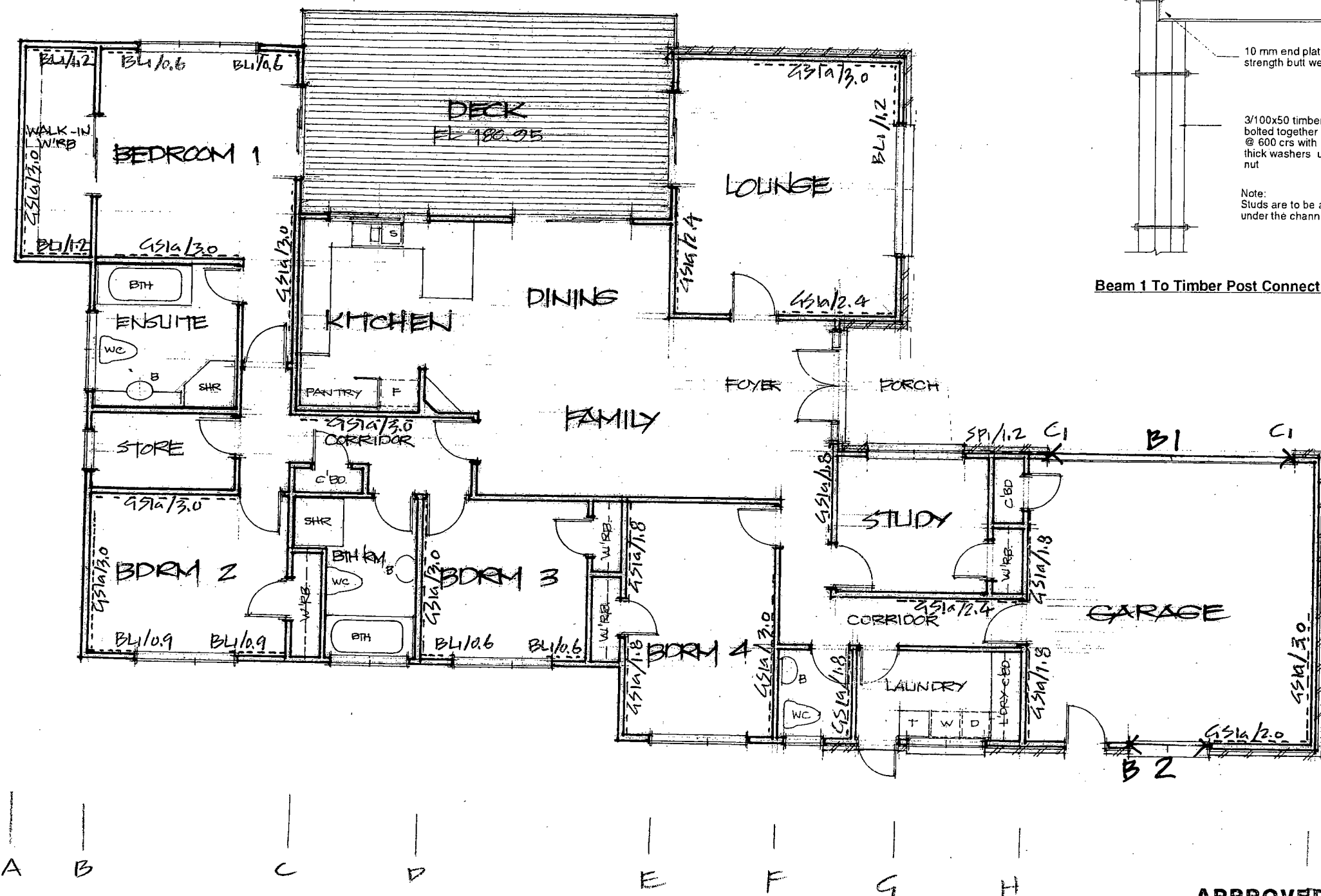
TEL: 09 476 8184 FAX: 09 476 8186

PROJECT:
NEW HOUSE AT LOT 28, LITHGOW DRIVE WANGANUI

TITLE:
FOOTING DETAILS

DESIGN:	MM
DRAWN:	MM
CHECKED:	MM
DATE:	MARCH 2008
SCALE:	NTS
JOB No:	REY 082
SHEET NO:	S 03

COPYRIGHT: THIS DRAWING REMAINS THE PROPERTY OF MEC ENGINEERING CONSULTANTS LIMITED AND IS PROVIDED FOR USE AS DESCRIBED AND MAY NOT BE USED OR REPRODUCED IN WHOLE OR PART WITHOUT WRITTEN PERMISSION.



Beam 1 To Timber Post Connection

C1= 3/100x50 studs M12 bolted together as per details

Note: Contractor ensure all beam's posts to be supported on posts or beams below. If there is any doubt, please contact engineer.
Construct ceiling or floor as diaphragm as per NZS3604:1999.

Beam and Wall Bracing Plan

APPROVED

10/0868

Consent No.

REVISIONS	DATE	COMMENTS

Issued for building consent
Beam 1 - 200PFC or FB30H BY GangNail Ltd
Beam 2 - 2/200x50 H1.2 MSG8

Wanganui District Council
27 SEP 2010
RECEIVED

Note:
- Wall bracing element nailing, end strap connection refer manufacturer's technical manual.
- In wet area, use Aqualine for lining.

Note:
1. Roof truss layout refer architectural drawings.
2. The final truss layout may affect some intel/beam's sizes. It is recommended that the final truss layout should be sent to engineer to review the associated intels and beams.
3. These engineering drawings to be read in conjunction with architectural drawings.

ENGINEER:
MEC ENGINEERING CONSULTANTS LTD.
STRUCTURAL & CIVIL ENGINEERS

76 MEDALLION DR ALBANY
P O BOX 301 131 ALBANY
AUCKLAND, NEW ZEALAND
TEL: 09 476 8184 FAX: 09 476 8186

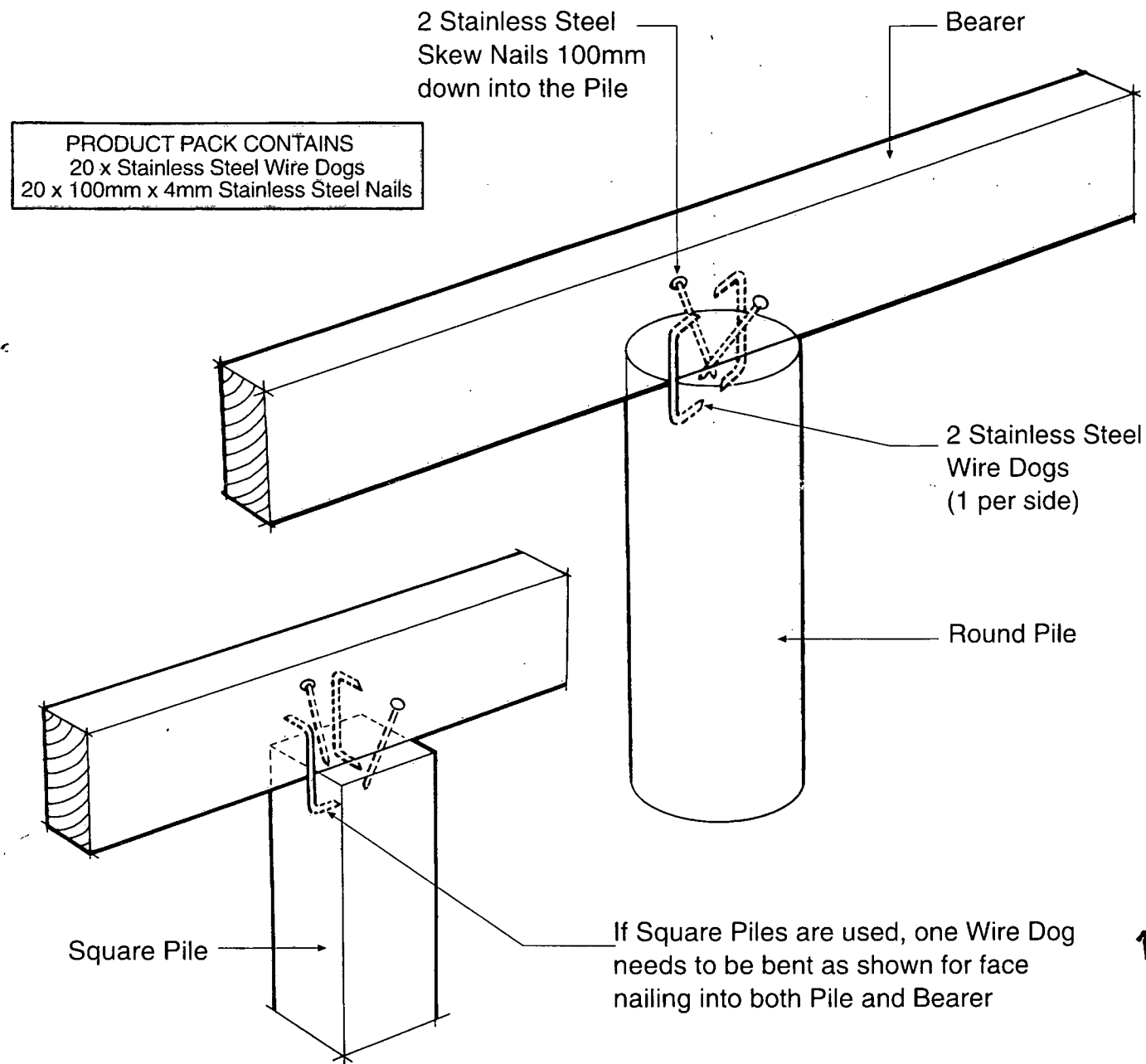
PROJECT:
NEW HOUSE AT LOT 28, LITHGOW DRIVE WANGANUI

TITLE:
BEAM/WALL BRACING PLAN

DESIGN:	MM
DRAWN:	MM
CHECKED:	MM
DATE:	MARCH 2008
SCALE:	1:100(A3)
JOB No:	REY 082
SHEET NO	S 04

COPYRIGHT: THIS DRAWING REMAINS THE PROPERTY OF MEC ENGINEERING CONSULTANTS LIMITED AND IS PROVIDED FOR USE AS DESCRIBED AND MAY NOT BE USED OR REPRODUCED IN WHOLE OR PART WITHOUT WRITTEN PERMISSION.

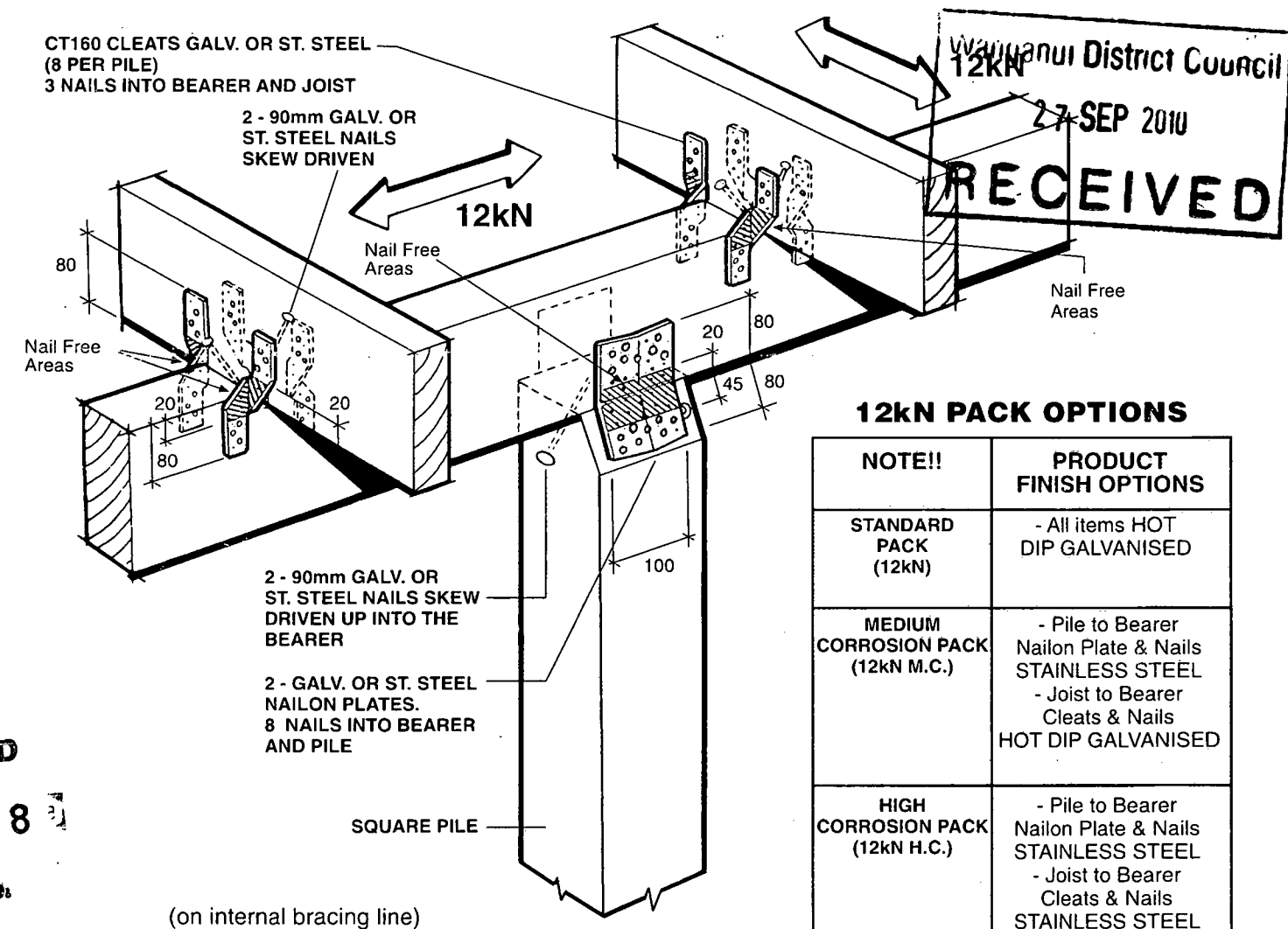
Complies with NZS3604: 1999
All Fixings Stainless Steel
For all Ordinary Piles (Refer Fig 6.3 NZS3604: 1999)



**Available from leading Builders Supply Merchants
 throughout New Zealand**

For Braced Piles or Anchor Piles

- The 12kN Pile Fixing must be installed in accordance with this brochure
- Auckland University Tested. Test Ref. 4613
- All subfloor construction must be in accordance with NZS3604: 1999
- NZS3604 requires lines of lateral support to floor joists within 300mm of bearer or bracing lines, refer to Reference 7.1.2
- Suitable for bearers and joists up to 150mm deep. Maximum joist depth to width ratio 3:1 and maximum bearer depth to width ratio 1.5:1



12kN PACK OPTIONS

NOTE!!	PRODUCT FINISH OPTIONS
STANDARD PACK (12kN)	- All items HOT DIP GALVANISED
MEDIUM CORROSION PACK (12kN M.C.)	- Pile to Bearer Nylon Plate & Nails STAINLESS STEEL - Joist to Bearer Cleats & Nails HOT DIP GALVANISED
HIGH CORROSION PACK (12kN H.C.)	- Pile to Bearer Nylon Plate & Nails STAINLESS STEEL - Joist to Bearer Cleats & Nails STAINLESS STEEL

See Over For Corrosion Table.

**Available from leading Builders Supply Merchants
 throughout New Zealand**



HOME OF GANG-NAIL® BUILDING SYSTEMS

MiTek New Zealand Ltd.

AUCKLAND
 PO Box 58-014, Greenmount
 Phone: (09) 274 7109
 Fax: (09) 274 7100

www.mitek.nz.co.nz

CHRISTCHURCH
 PO Box 8387, Riccarton
 Phone: (03) 348 8691
 Fax: (03) 348 0314



HOME OF GANG-NAIL® BUILDING SYSTEMS

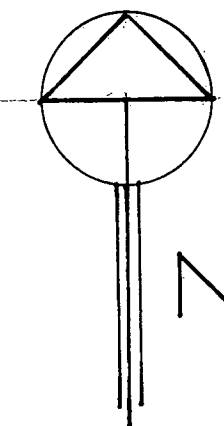
MiTek New Zealand Ltd.

AUCKLAND
 PO Box 58-014, Greenmount
 Phone: (09) 274 7109
 Fax: (09) 274 7100

www.mitek.nz.co.nz

CHRISTCHURCH
 PO Box 8387, Riccarton
 Phone: (03) 348 8691
 Fax: (03) 348 0314

Wanganui District Council
27 SEP 2010
RECEIVED



LOT NO. 28
DP 378698
AREA 870 m²

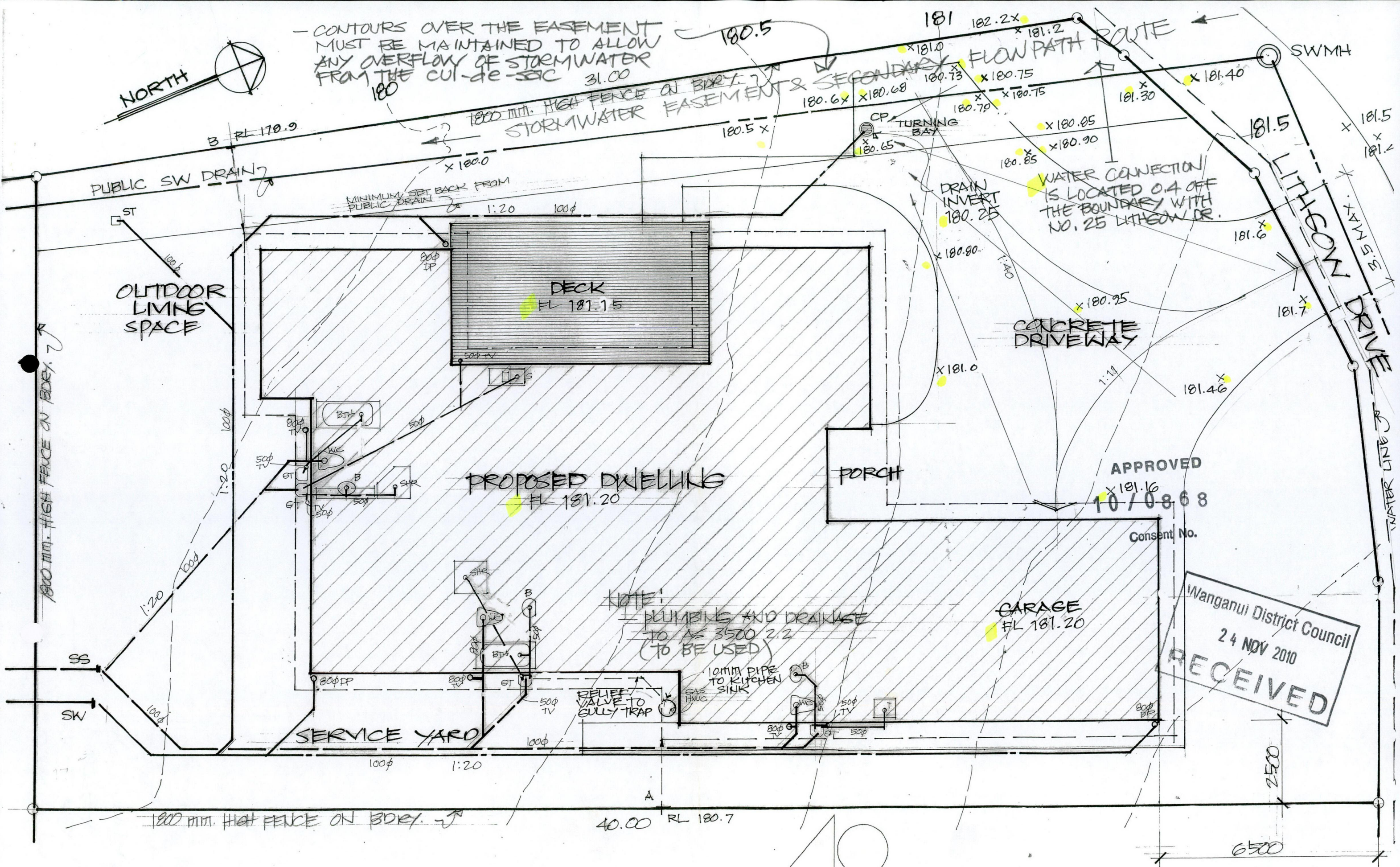
BLOS. COVERAGE	251.7 m ²	28.93 %
PERMEABLE	514.3 m ²	59.12 %
IMPERMEABLE	104.0 m ²	11.95 %
EARTHWORKS	71 m ²	40 m ³

REFER TO
SIT. NO. ND-02

APPROVED
10/0868
Consent No.

JOB TITLE A NEW SINGLE STOREY DWELLING AT LOT 28 LITHGOW DRIVE, WANGANUI	DRAWING TITLE LOCATION PLAN
---	--------------------------------

DRAWN JMR	DATE 21 SEPT. 2010	SHEET NO ND-01
SCALE 1:500	JOB NO 2195	



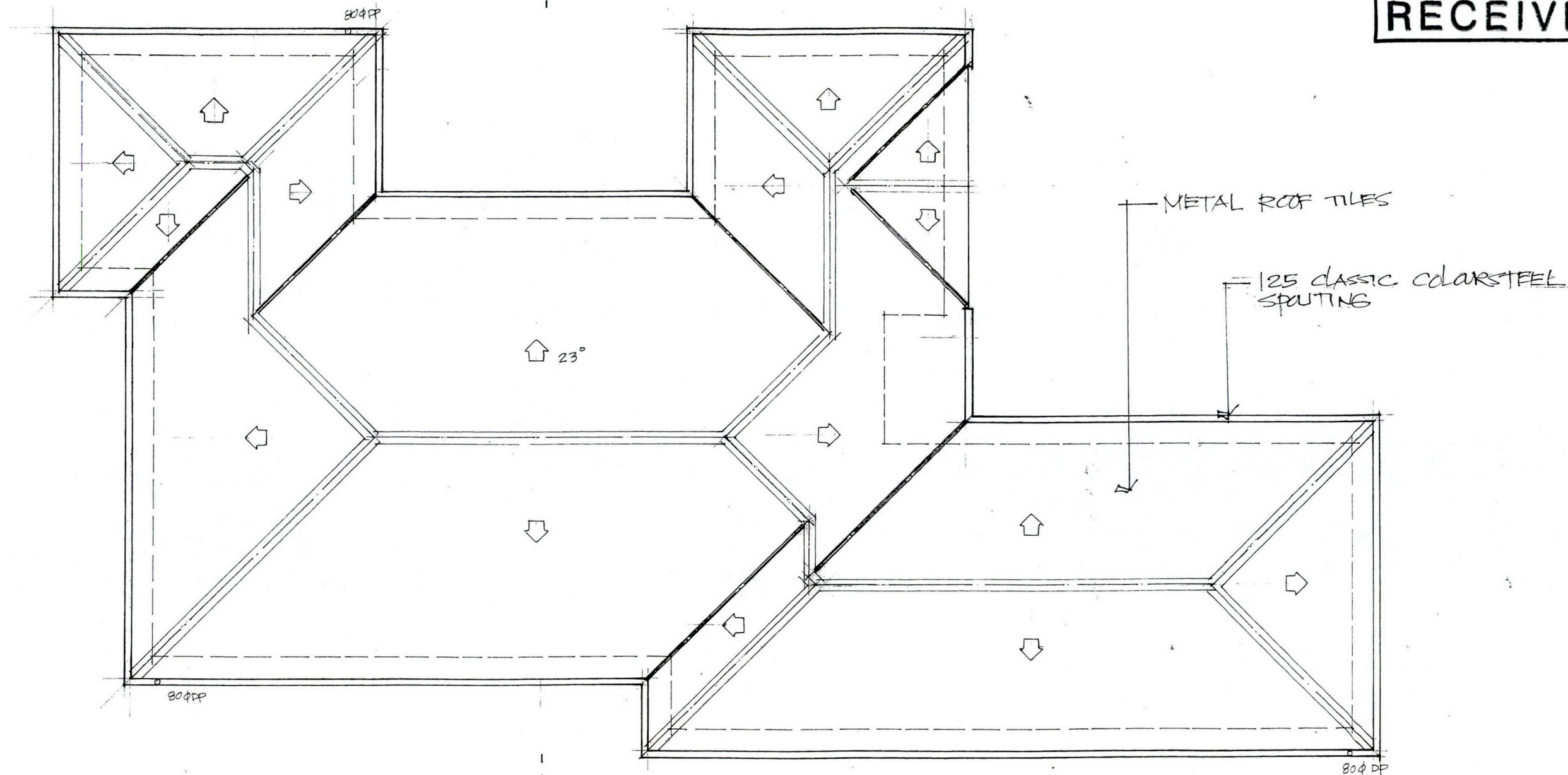
JOB TITLE A NEW SINGLE STOREY DWELLING AT LOT 28 (23) LITHGOW DRIVE, WANGANUI	DRAWING TITLE SITE & DRAINAGE PLAN
---	--

DRAWN TMR	DATE 22 NOV. 2010	SHEET NO ND-02
SCALE 1:100	JOB NO 2195	

Wanganui District Council

27 SEP 2010

RECEIVED

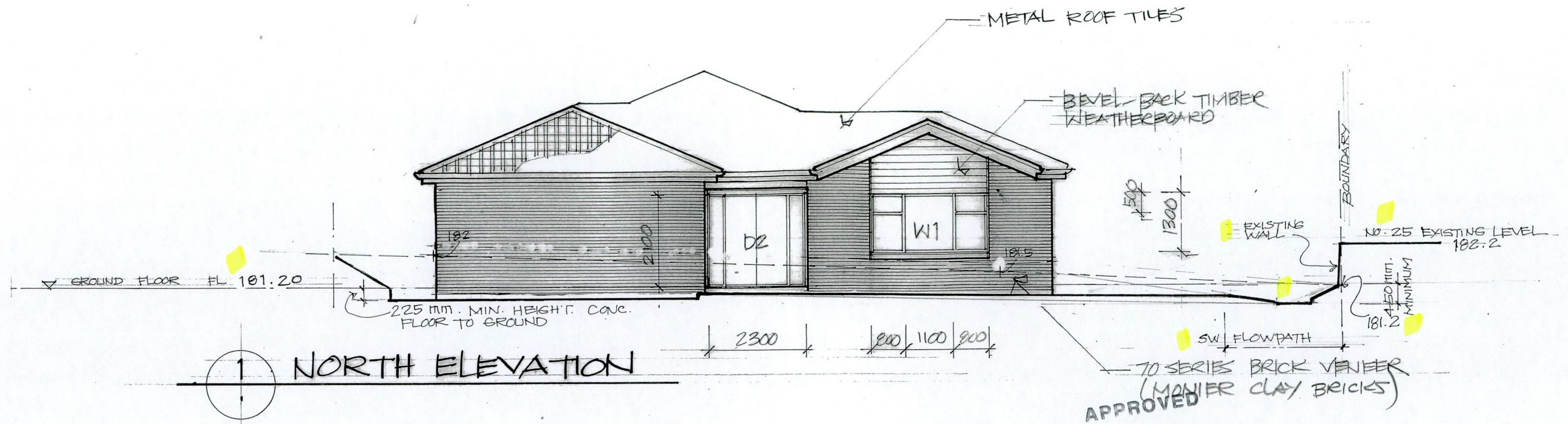


APPROVED
10/0868
Consent No.

JOB TITLE
A NEW SINGLE STOREY
DWELLING AT LOT 28
LITHGOW DRIVE, WANGANUI

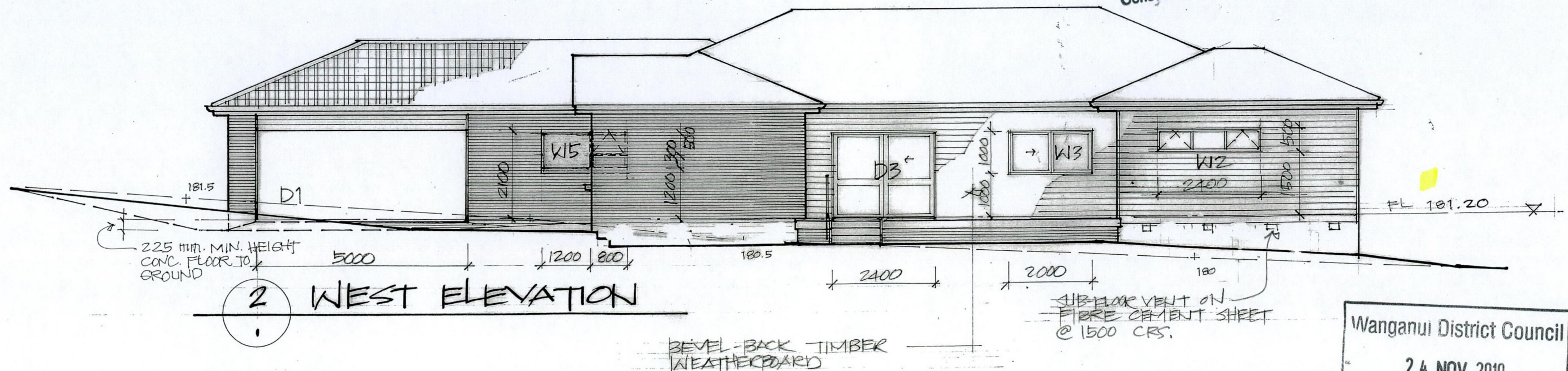
DRAWING TITLE
ROOF PLAN

DRAWN TMR	DATE 21 SEPT. 2010	SHEET NO ND-04
SCALE 1:100	JOB NO 2195	



APPROVED
10/0868

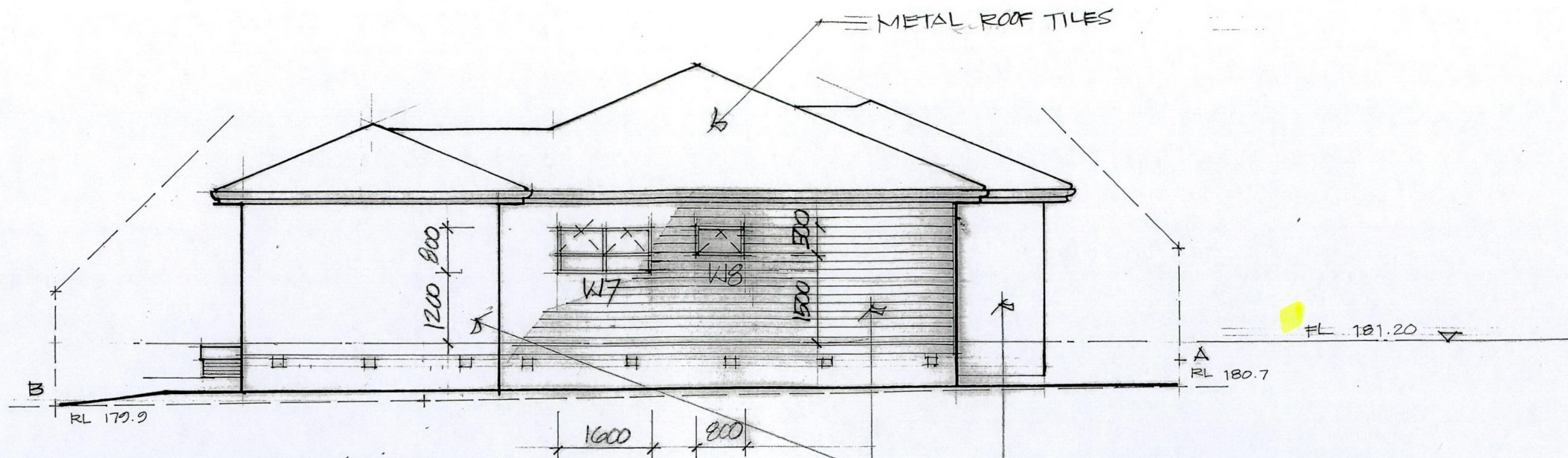
Consent No.



Wanganui District Council
24 NOV 2010
RECEIVED

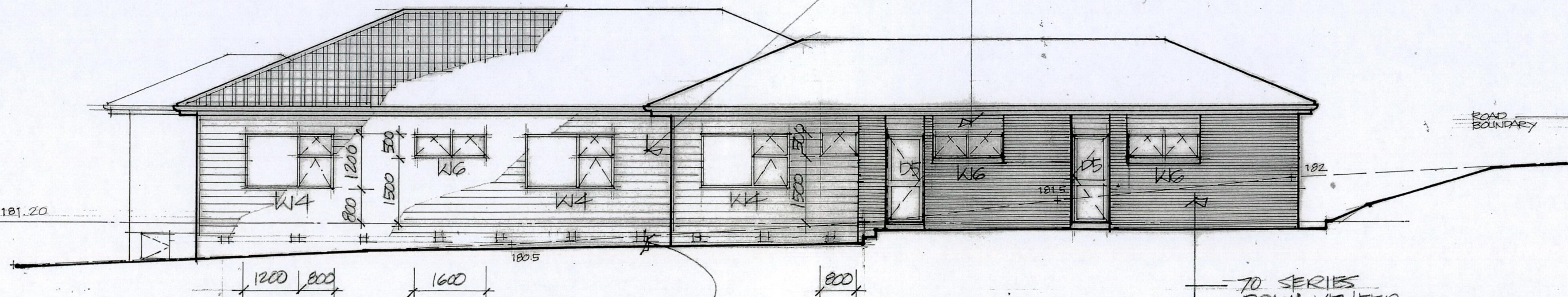
JOB TITLE	DRAWING TITLE
A NEW SINGLE STOREY DWELLING AT LOT 28 (23) LITLOCK DRIVE, WANGANUI	NORTH & WEST ELEVATIONS

DRAWN	DATE	SHEET NO
THR	22 NOV. 2010	ND-05
SCALE	JOB NO	
1:100	2195	



1 SOUTH ELEVATION

BEVEL BACK TIMBER
WEATHERBOARD



2 EAST ELEVATION

APPROVED

70 SERIES
BRICK VENEER
(MONIER CLAY BRICKS)

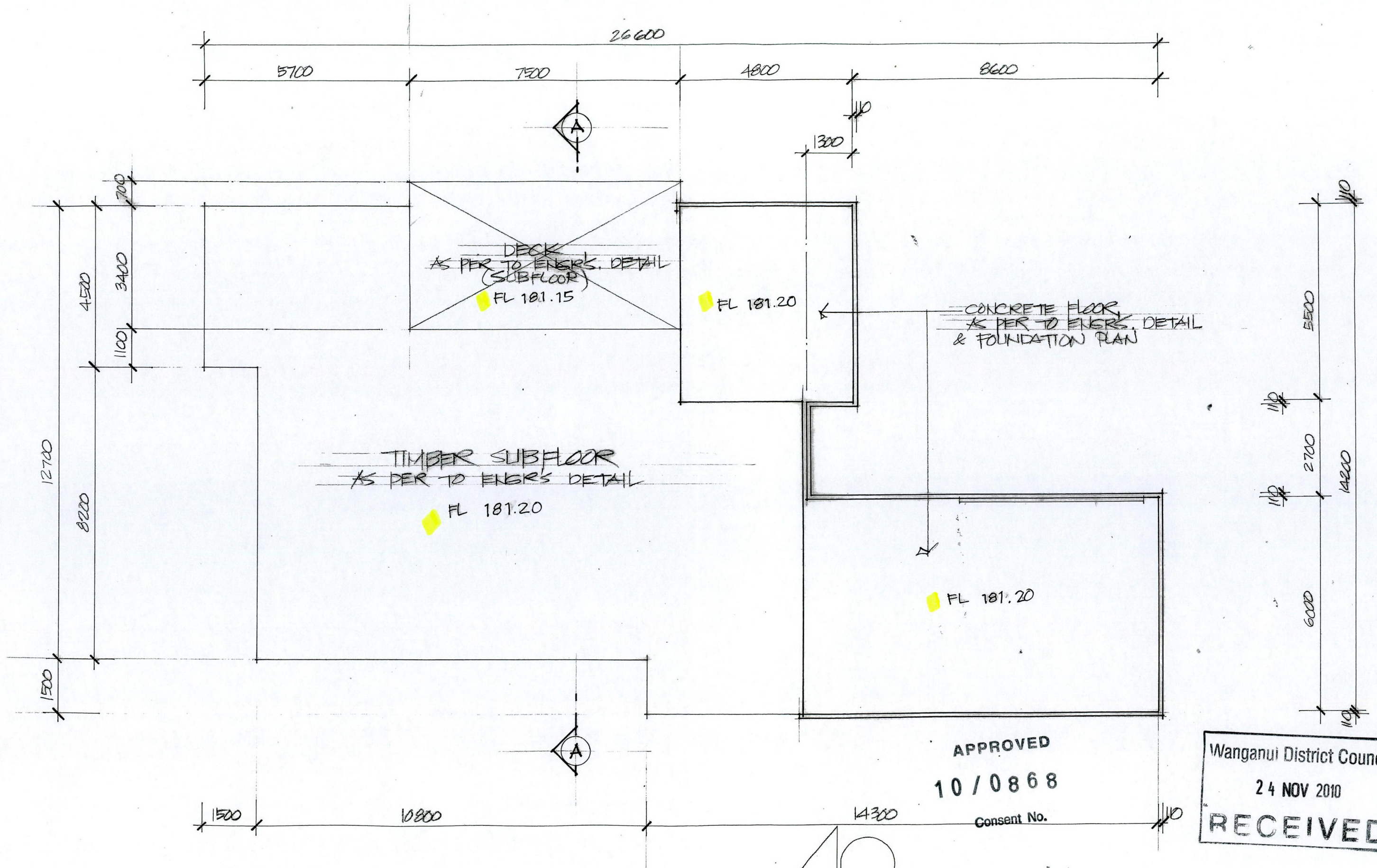
SUB FLOOR VENT
FIBRE CEMENT SHEET
@ MAX. 1500 CRS.

Consent No.

Wanganui District Council
24 NOV 2010
RECEIVED

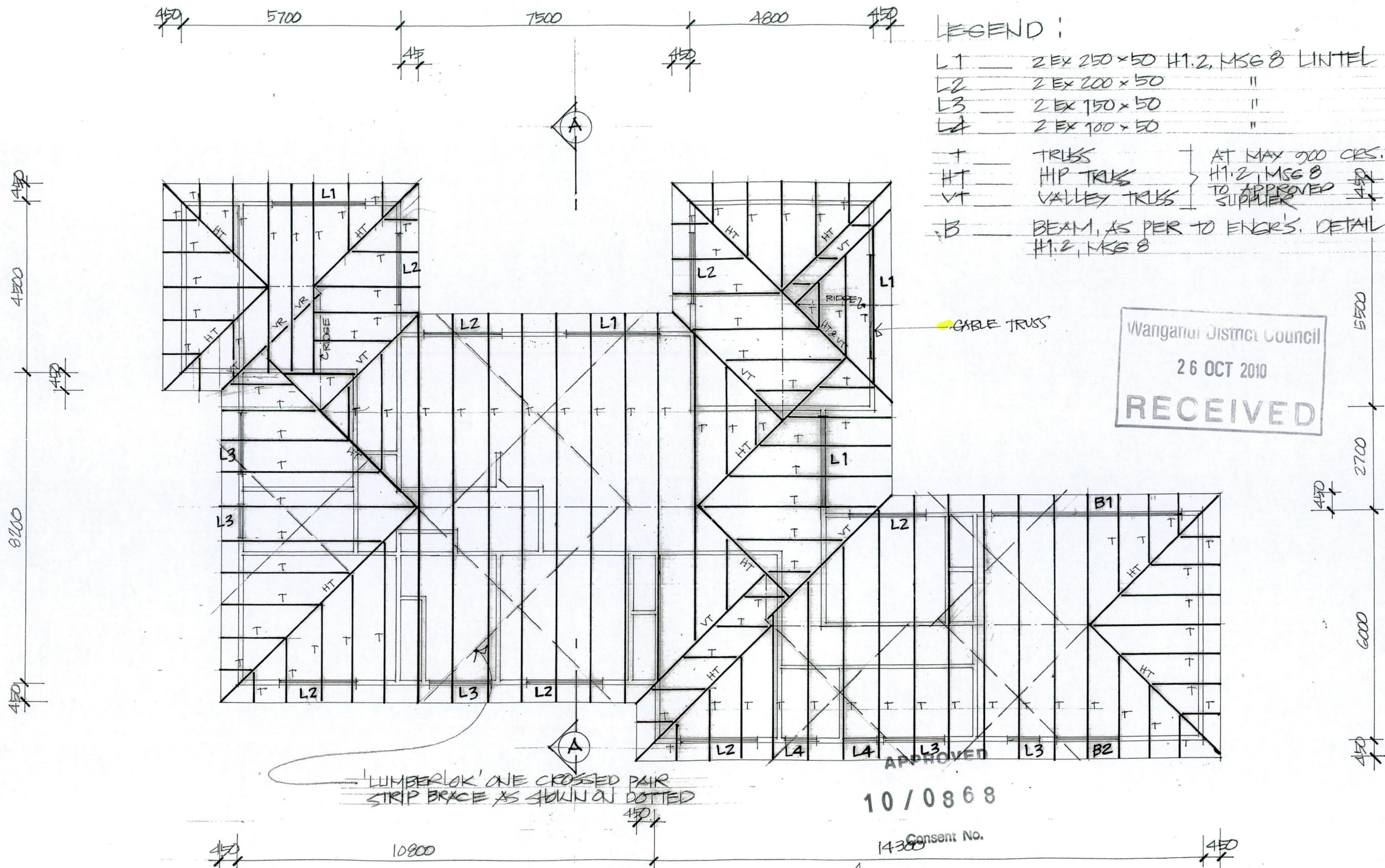
JOB TITLE	DRAWING TITLE
A NEW SINGLE STOREY DWELLING AT LOT 28 LITHGOW DRIVE, WANGANUI	SOUTH & EAST ELEVATIONS

DRAWN	DATE	SHEET NO
THIR	22 NOV. 2010	ND-06
SCALE	JOB NO	
1:100	2125	



JOB TITLE	DRAWING TITLE
A NEW SINGLE STOREY DWELLING AT LOT 28 LITHGOW DRIVE, WANGANUI	FOUNDATION PLAN

DRAWN	DATE	SHEET NO
THR	22 NOV. 2010	ND-07
SCALE	JOB NO	
1:100	2195	



JOB TITLE

A NEW SINGLE STOREY
DWELLING AT LOT 28
LITHGOW DRIVE, WANGANUI

DRAWING TITLE

ROOF FRAMING PLAN

DRAWN

TMR

DATE

21 SEPT. 2010

SHEET NO

ND-08

SCALE

1:100

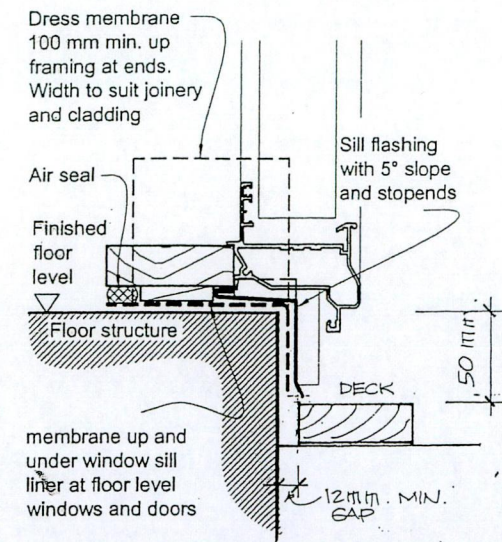
JOB NO

2195

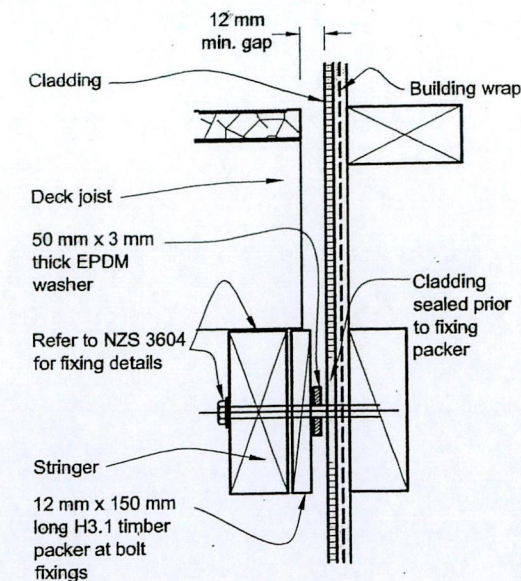
METAL TILES ON EX 50x40 H1.2
BATTENS ON ROOF UNDERLAY OVER TRUSSES
@ MAX. 900 CRS. TO APPROVED SUPPLIER

10 mm GIB'BD. CEILING LINING ON
70 x 35 BATTEN @ 450 MAX. CRS.
WITH R3.2 INSULATION

125 CLASSIC COLOURSTEEL
SPOLTING ON H3.1
FASCIA BOARD



DIRECT FIX THRESHOLD AT OPENING



DECK TO WALL JUNCTION
DETAIL

BEVEL-BACK TIMBER
WEATHERBOARD ON
BUILDING WRAP

DECKING TO OWNER'S SELECTION
OVER JOISTS SEE ENGRS.
SUB-FLOOR FRAMING PLAN

10 mm GIB'BD. ON 90x45
H1.2, MSG 8 TIMBER FRAME WALL
VERT. @ 600 CRS.
HOR. @ 800 CRS.

20 mm HD PARTELE BOARD ON
PERFORATED FOIL INSULATION DRAPED
100 mm OVER JOISTS SEE ENGRS.
SUB-FLOOR FRAMING PLAN

EXTERIOR WALLS
R2.2 INSULATION

BEDROOM 3

FAMILY

DINING

DECK FL 181.15

NOTE:

- ALL WINDOWS TO BE
DOUBLE GLAZED

ROOF FIXINGS:

PURLINS _ 2-90X3.15 (POWER DRIVEN) NAILS
ROOF TRUSSES AT SUPPORT _ 2-100X3.75 SKEWED NAILS + 2 WIRE DOGS
LINTEL TO TRIMMING STUD _ 3-90X3.15 (POWER DRIVEN) NAILS
STUD TO PLATE _ 3-90X3.15 (POWER DRIVEN) NAILS
TOP PLATE TO LINTEL _ 3-90X3.15 (POWER DRIVEN) NAILS
CEILING BATTEN TO BOTTOM TRUSS _ 2-90X3.15 (POWER DRIVEN) NAILS

APPROVED

10/0868

Consent No.

ALL FIXINGS WITHIN
600 mm OF FINISHED
GROUND LEVEL
SHALL BE STAINLESS STEEL

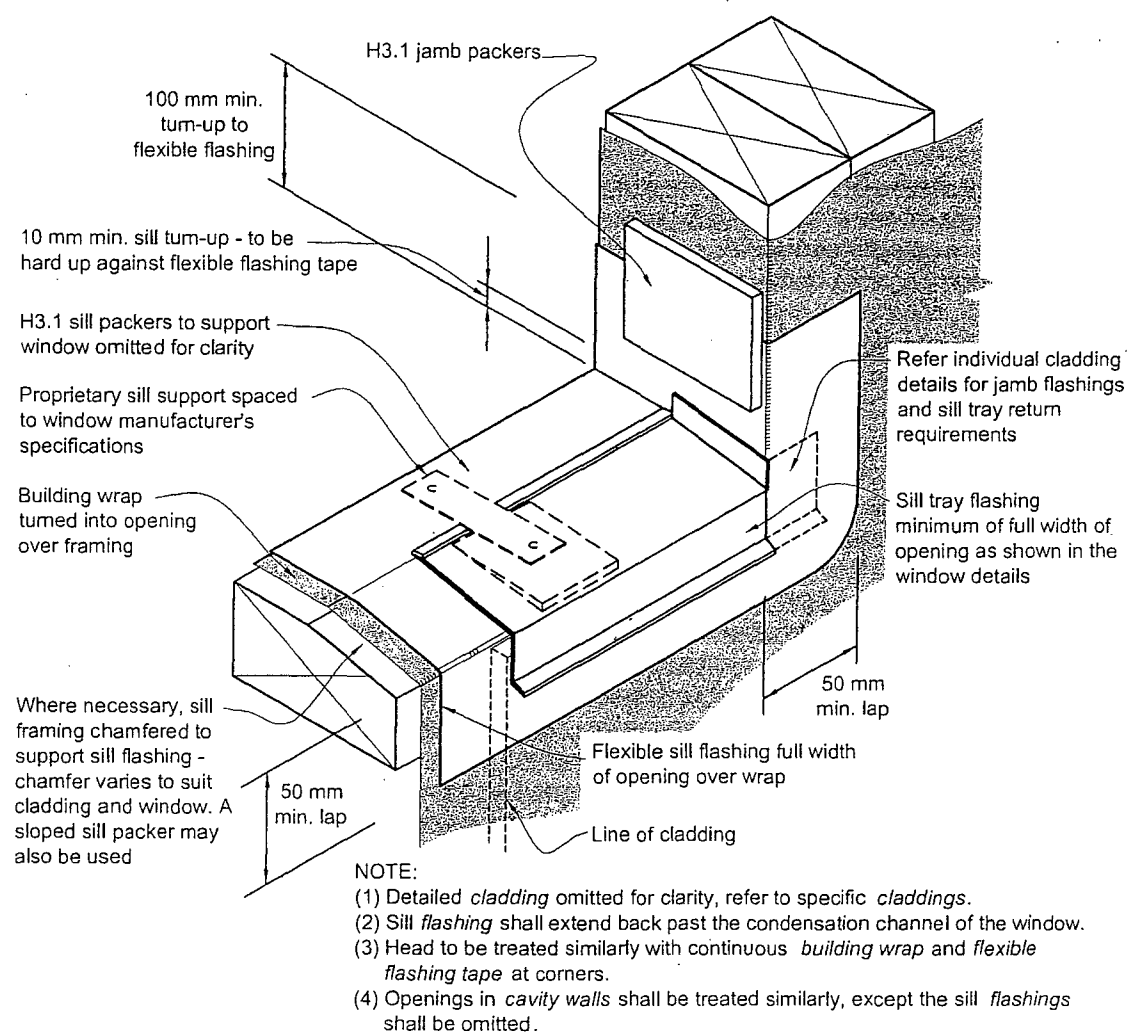
SEE ENGRS' DETAIL

Wanganui District Council
24 NOV 2010
RECEIVED

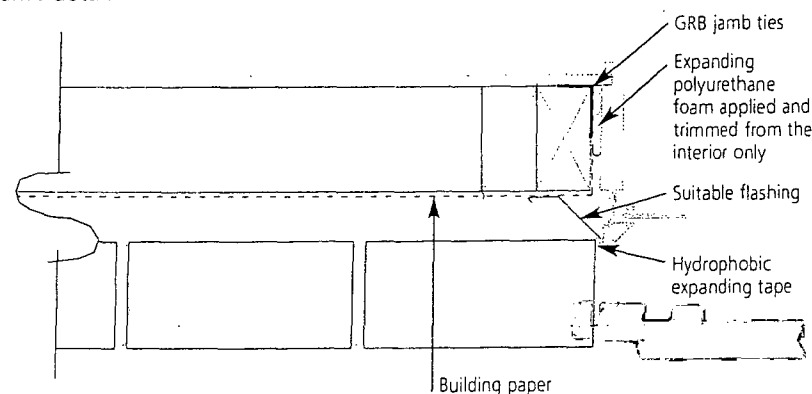
JOB TITLE	DRAWING TITLE
A NEW SINGLE STOREY DWELLING AT LOT 28 LITHGOW DRIVE, WANGANUI	CROSS SECTION A-A DETAIL

DRAWN	DATE	SHEET NO
TMR	22 NOV. 2010	ND-09
SCALE	JOB NO	
1:50	2195	

Figure 72: General window opening
Paragraphs 9.1.6 and 9.1.10.2, Figures 76, 81, 86, 90, 91, 95, 99, 116, 118, 127 and 128



Jamb detail



APPROVED
10/0868
Consent No.

GENERAL: (a) Refer Figure 72 for wrapping of framed opening prior to window installation
(b) Sliding and bi-fold windows will require specific design.
(c) A minimum of 8 mm effective cover at sills shall be permitted where necessary to allow for tolerances.

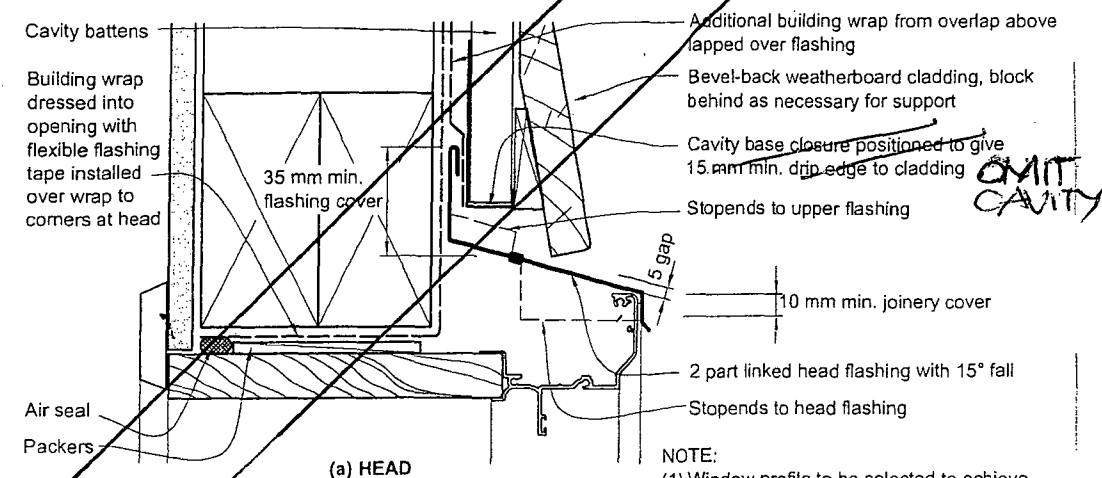
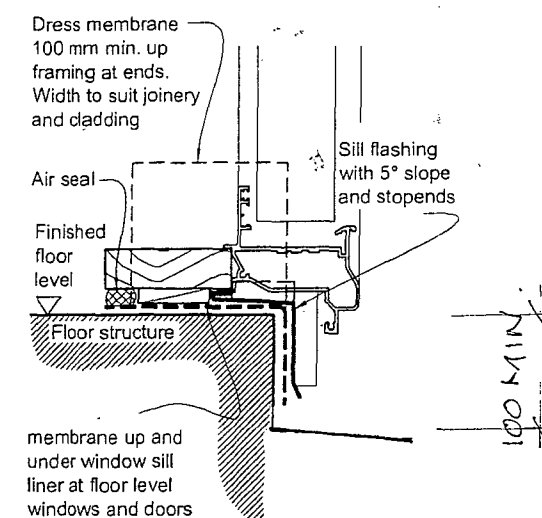
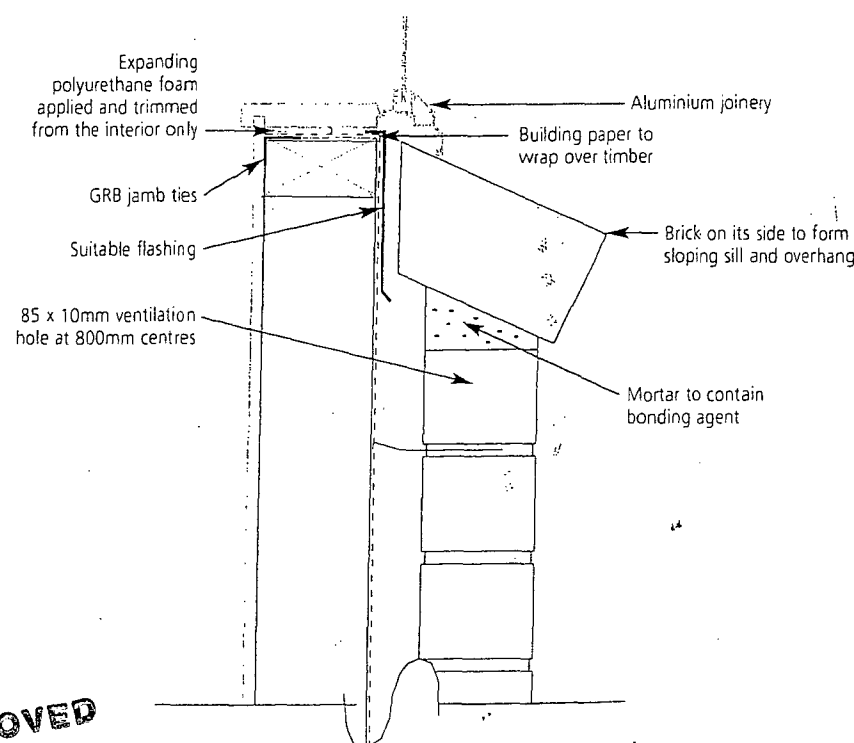


Diagram 26 - Sill

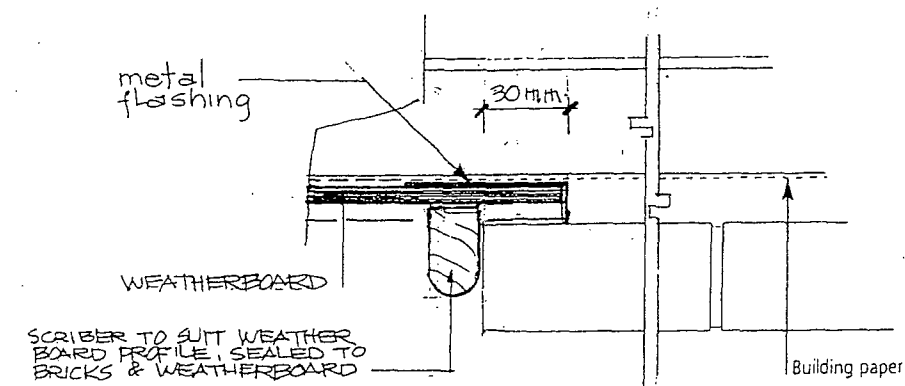
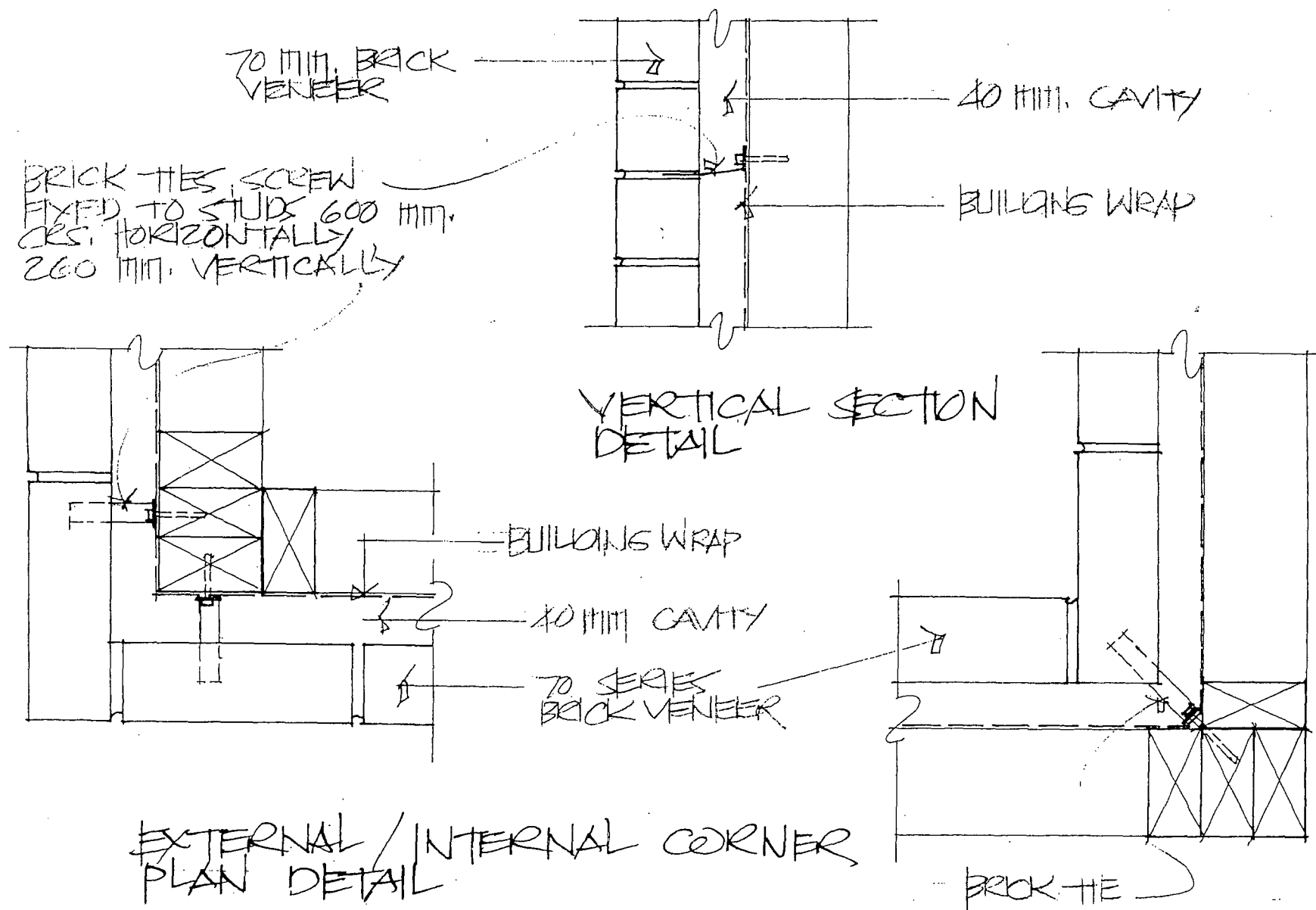


DIRECT FIX THRESHOLD AT OPENING

Wanganui District Council
27 SEP 2010
RECEIVED

JOB TITLE	DRAWING TITLE
A NEW SINGLE STOREY DWELLING AT LOT 28 LITHGOW DRIVE, WANGANUI	DETAIL AT OPENING

DRAWN	DATE	SHEET NO
THK	21 SEPT. 2010	ND-10
SCALE	JOB NO	
1:5	2105	



CLADDING JUNCTIONS BETWEEN BRICK VENEER AND WEATHERBOARD

APPROVED

10/0868

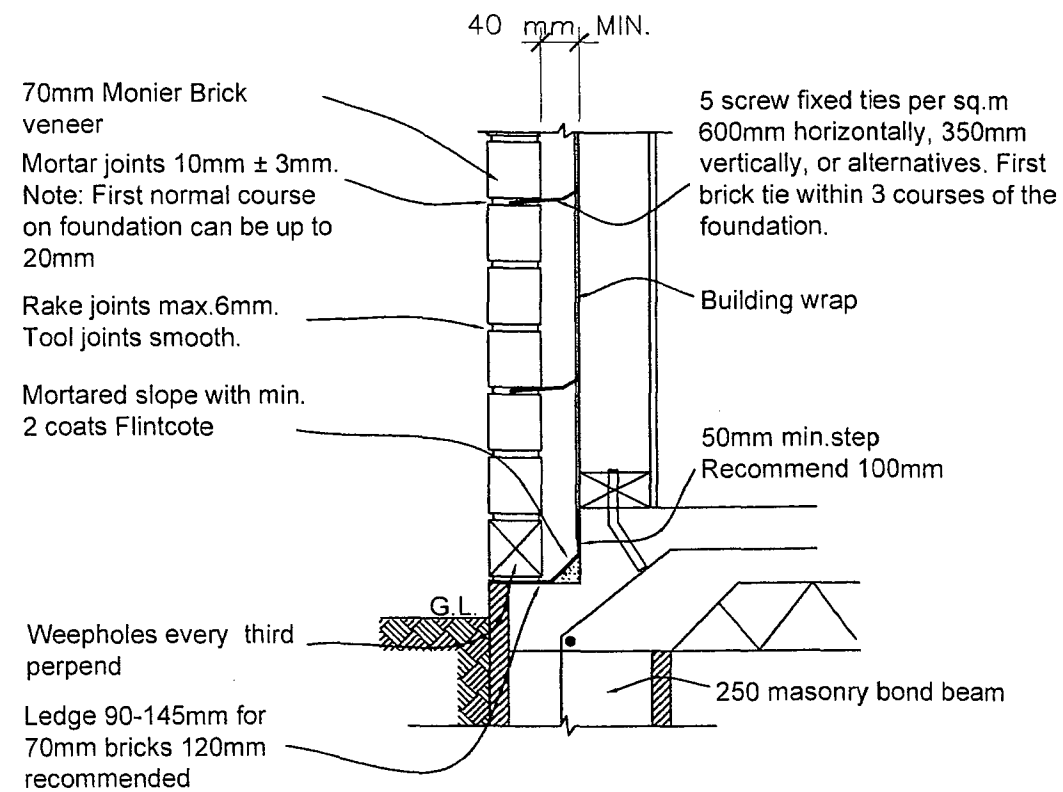
Consent No.

10

JOB TITLE	DRAWING TITLE
A NEW SINGLE STOREY DWELLING AT LOT 28 LITHGOW DRIVE, WANGANUI	BRICK VENEER AND BRICK TO WEATHERBOARD JUNCTION WEATHERTIGHTNESS DETAIL

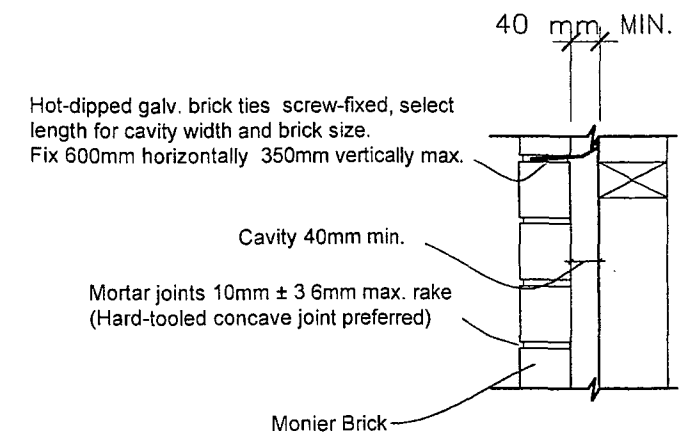
DRAWN	DATE	SHEET NO
TMR	21 SEPT. 2010	ND-11
SCALE	JOB NO	
1:5	2195	

Wanganui District Council
27 SEP 2010
RECEIVED



Standard brick veneer

Scale 1:10



Wall Section - Typical

Scale 1:10

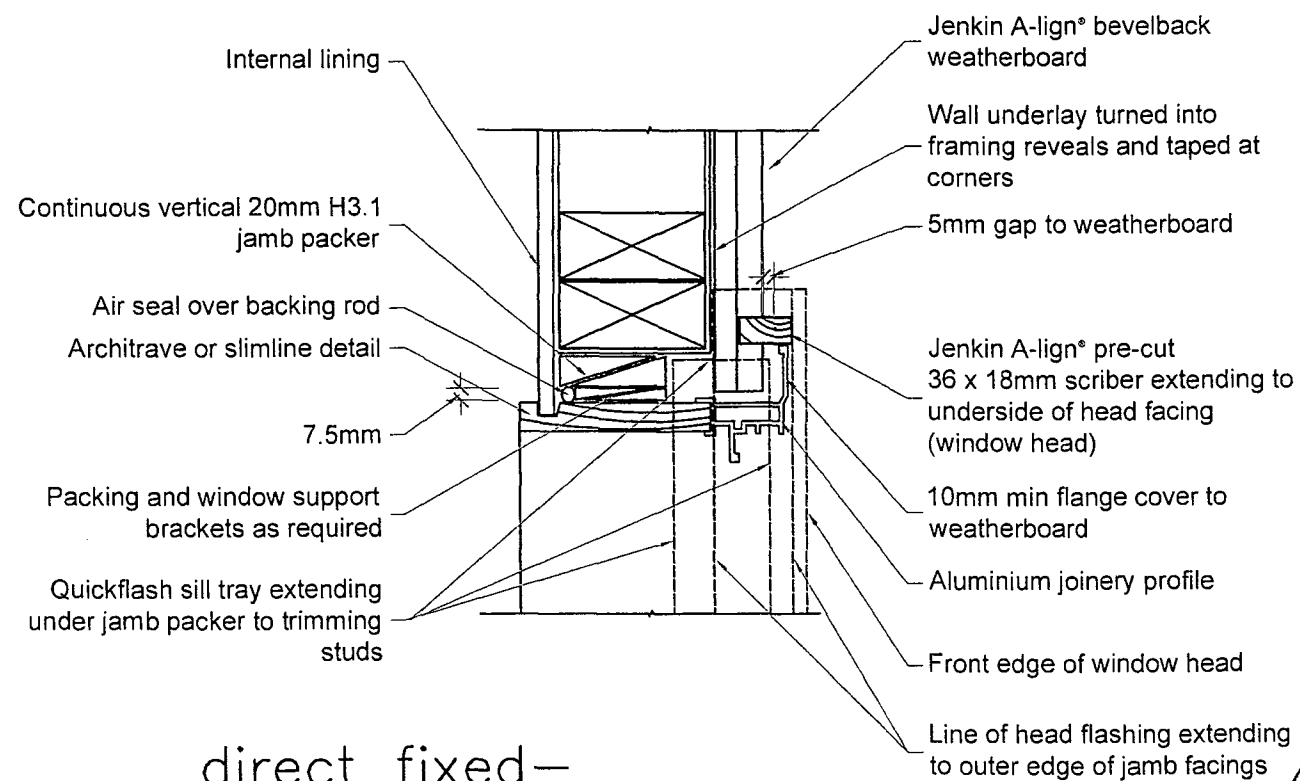
APPROVED

10/0868

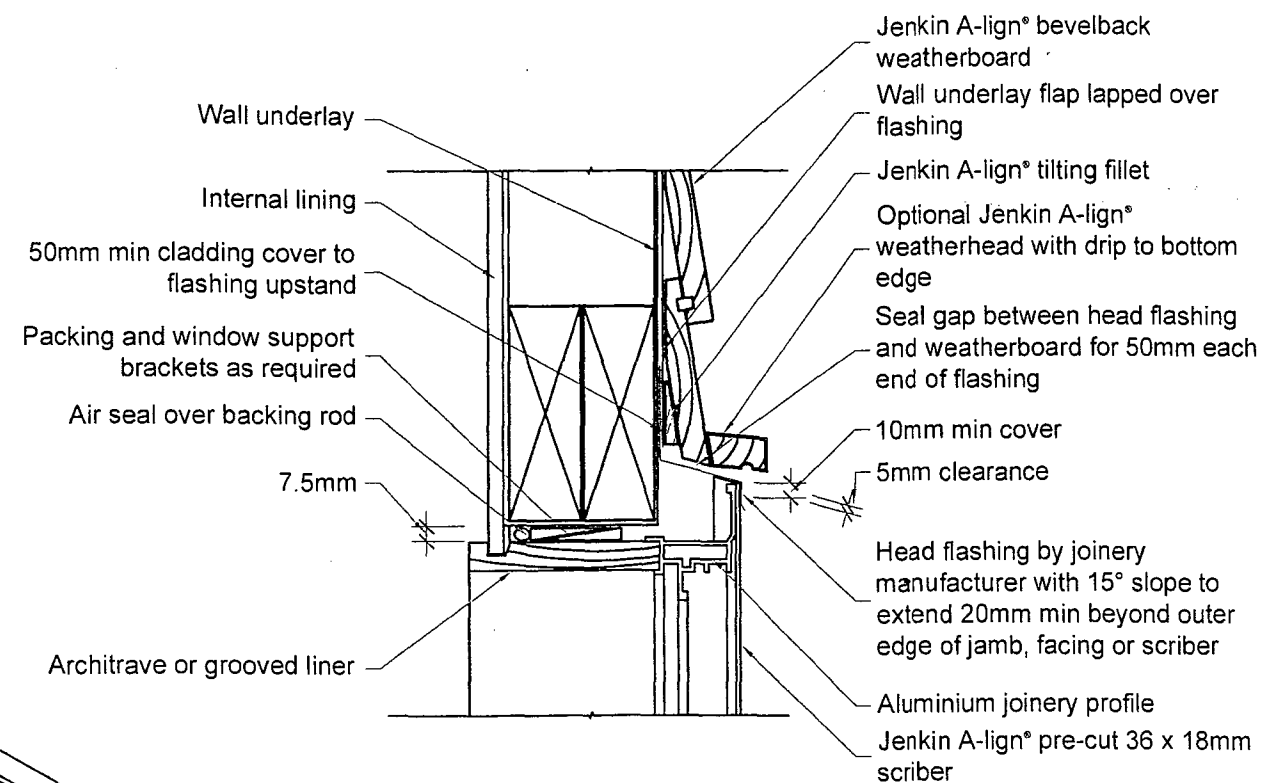
Consent No.

PROJECT A NEW SINGLE STOREY DWELLING AT LOT 28 LITHGOW DRIVE, WANGANUI	DRAWING BRICK VENEER CLADDING DETAIL	10 REYES DESIGN 12 COLWILL ROAD, MASSEY, AUCKLAND PH (09) 832 06 08 FAX (09) 8320688 Email: reyestheo@hotmail.com	AMENDMENT	DESIGNED THEO REYES DRAWN THEO REYES CHECKED THEO REYES	DATE 23 SEPT. 2010 SCALE 1:10 JOB NO. 2195	SHEET NO. ND 11a
---	---	--	-----------	---	--	--

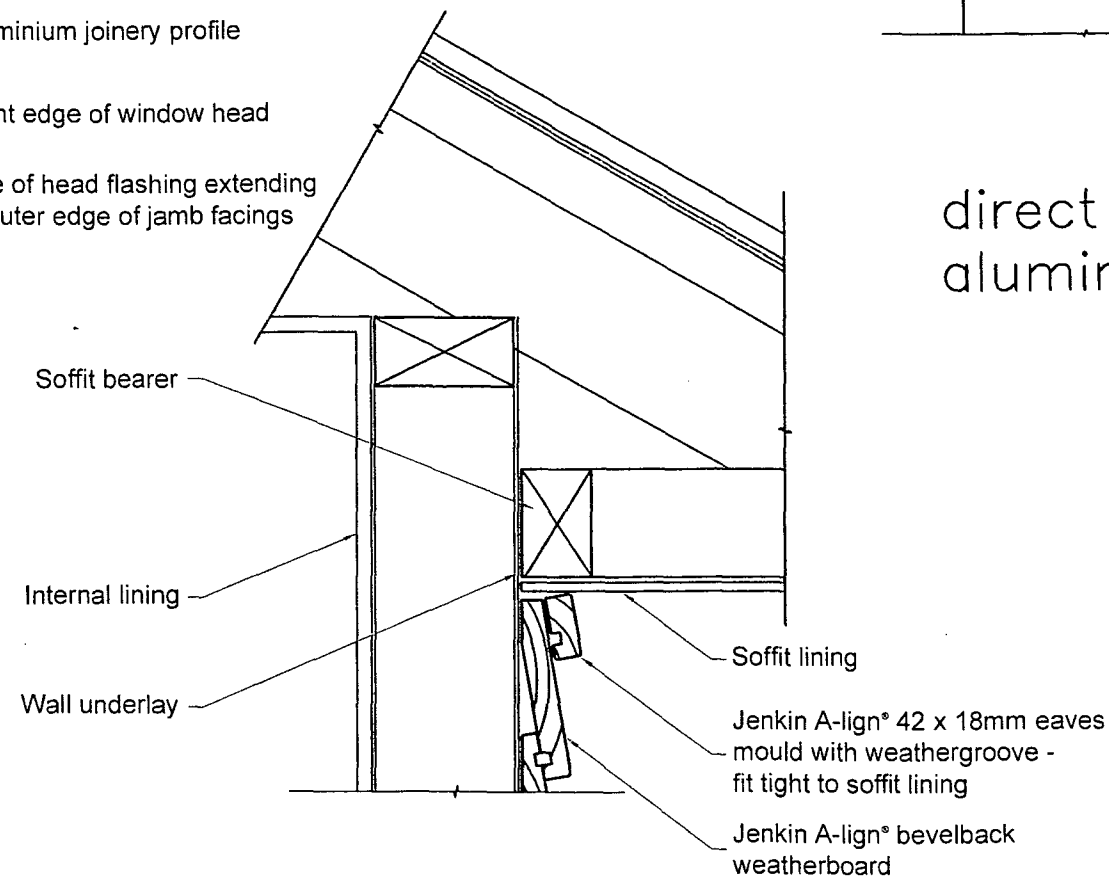
COPYRIGHT
THE COPYRIGHT OF THESE DRAWINGS AND ALL PART THEREOF
REMAIN THE PROPERTY OF REYES DESIGN ARCHITECTURAL
SERVICES



direct fixed—
aluminum window jamb



direct fixed—
aluminum window head



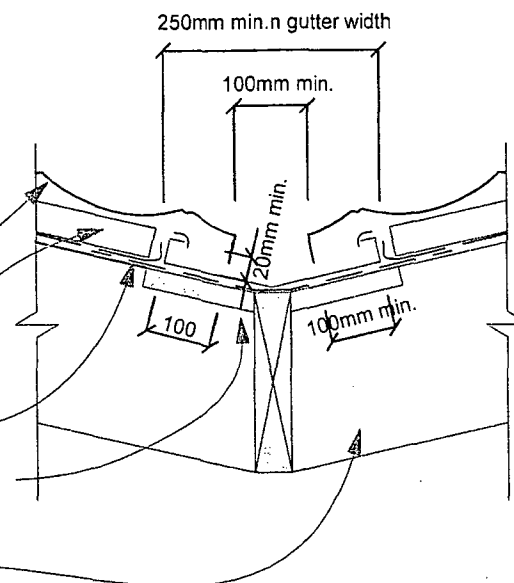
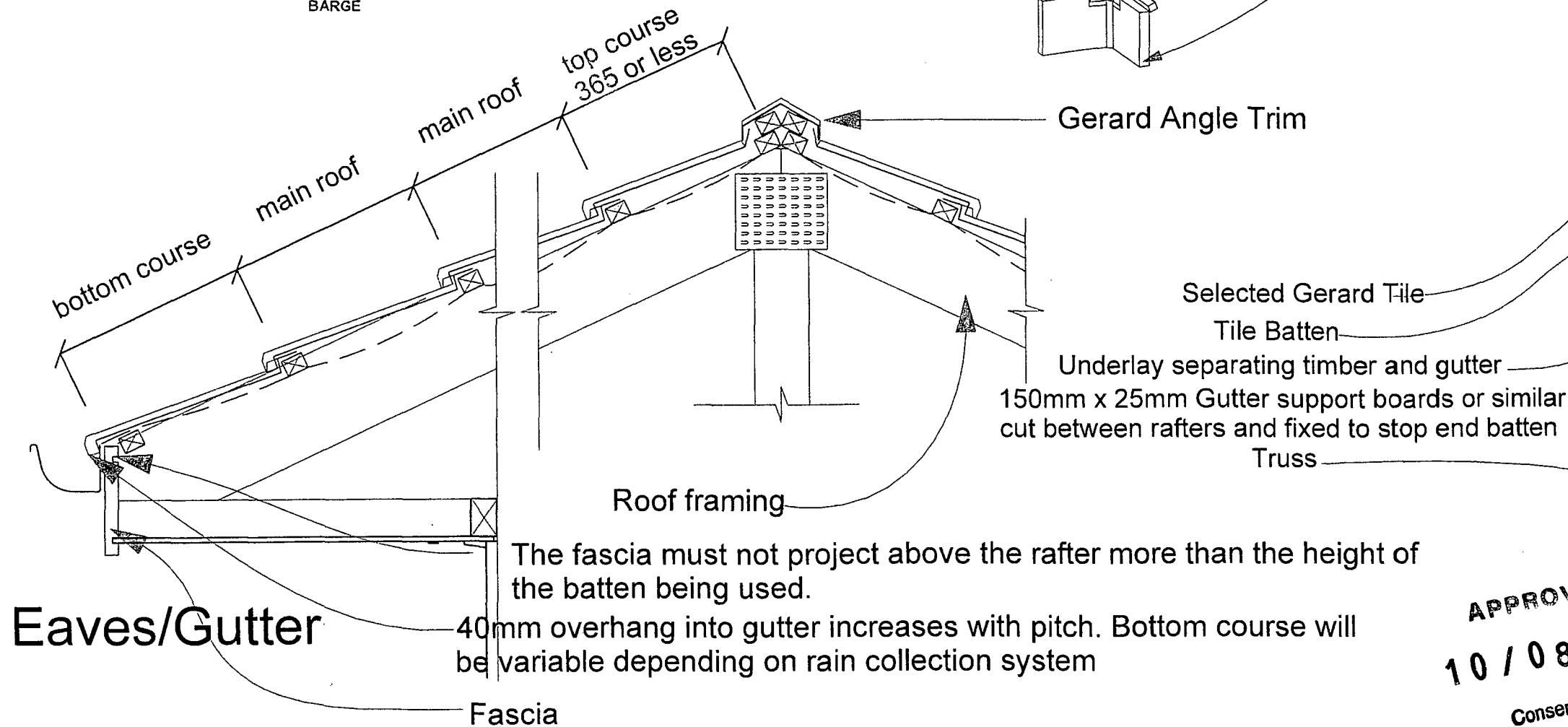
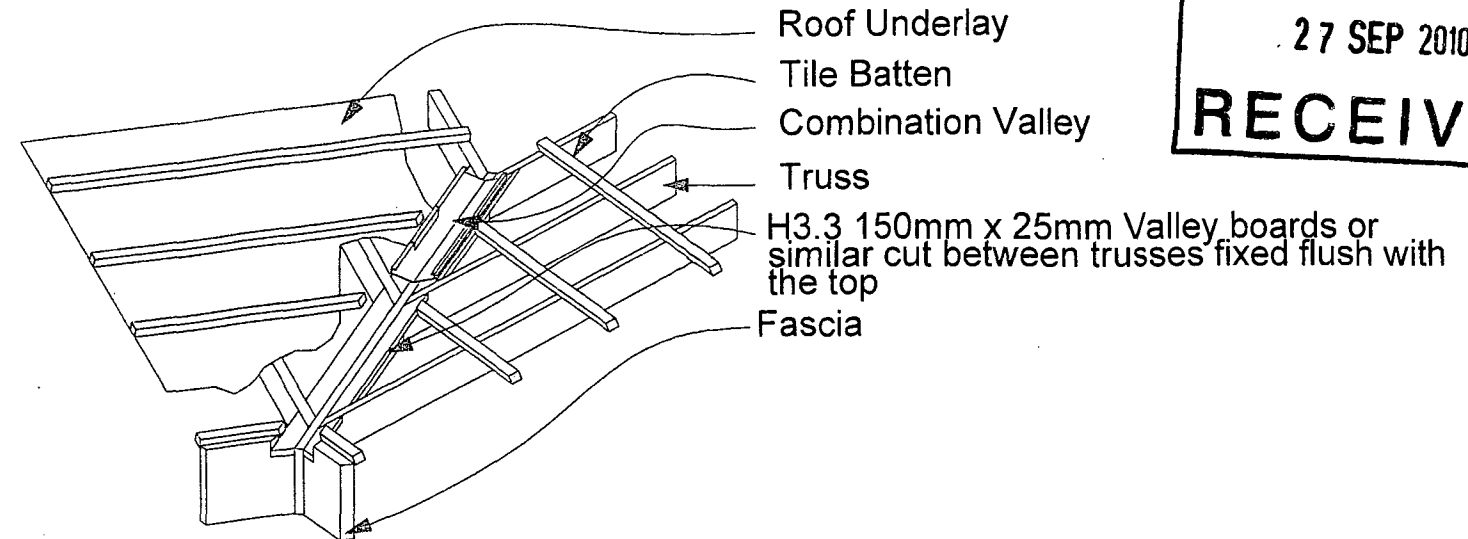
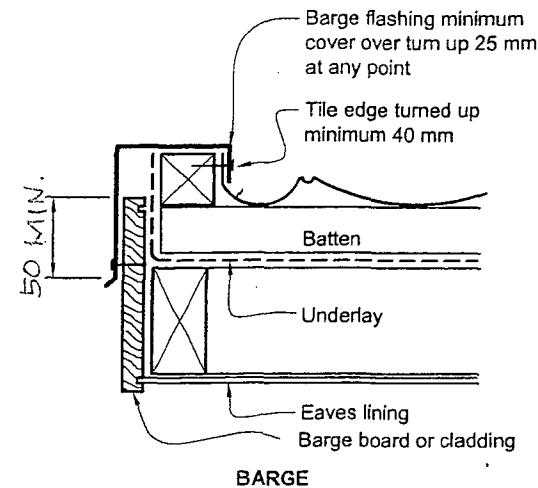
direct fixed—
eaves with flat soffit

Wanganui District Council
27 SEP 2010
RECEIVED

APPROVED
10/0868
Consent No.

PROJECT A NEW SINGLE STOREY DWELLING AT LOT 28 LITHGOW DRIVE, WANGANUI	DRAWING WEATHERBOARD CLADDING WEATHER TIGHTNESS DETAIL	REYES DESIGN 12 COLWILL ROAD, MASSEY, AUCKLAND PH (09) 832 06 08 FAX (09) 832 06 88 Email: reyestheo@hotmail.com	AMENDMENT 	DESIGNED THEO REYES DRAWN THEO REYES CHECKED THEO REYES	DATE 23 SEPT. 2010 SCALE 1:5 JOB NO. 2195	SHEET NO. ND 12
---	---	---	---------------	---	---	---------------------------

COPYRIGHT
THE COPYRIGHT OF THESE DRAWINGS AND ALL PART THEREOF
REMAIN THE PROPERTY OF REYES DESIGN ARCHITECTURAL
SERVICES



Valleys

APPROVED
10/0868
Consent No.

**Batten spacing - Ridge or Hip with conventional rafter
Colortile profile. Angle Trim**

PROJECT	DRAWING	AMENDMENT	DESIGNED	THEO REYES	DATE	23 SEPT. 2010	SHEET NO.
A NEW SINGLE STOREY DWELLING AT LOT 28 LITHGOW DRIVE, WANGANUI	METAL ROOF TILE DETAILS		DRAWN	THEO REYES	SCALE	1:10	
			CHECKED	THEO REYES	JOB NO.	2195	
			COPYRIGHT THE COPYRIGHT OF THESE DRAWINGS AND ALL PART THEREOF REMAIN THE PROPERTY OF REYES DESIGN ARCHITECTURAL SERVICES				
							ND 13

10 REYES DESIGN
12 COLWILL ROAD, MASSEY, AUCKLAND
PH (09) 832 06 08 FAX (09) 8320688
Email: reyestheo@hotmail.com

Typical Wet Area Details - Timber Frame

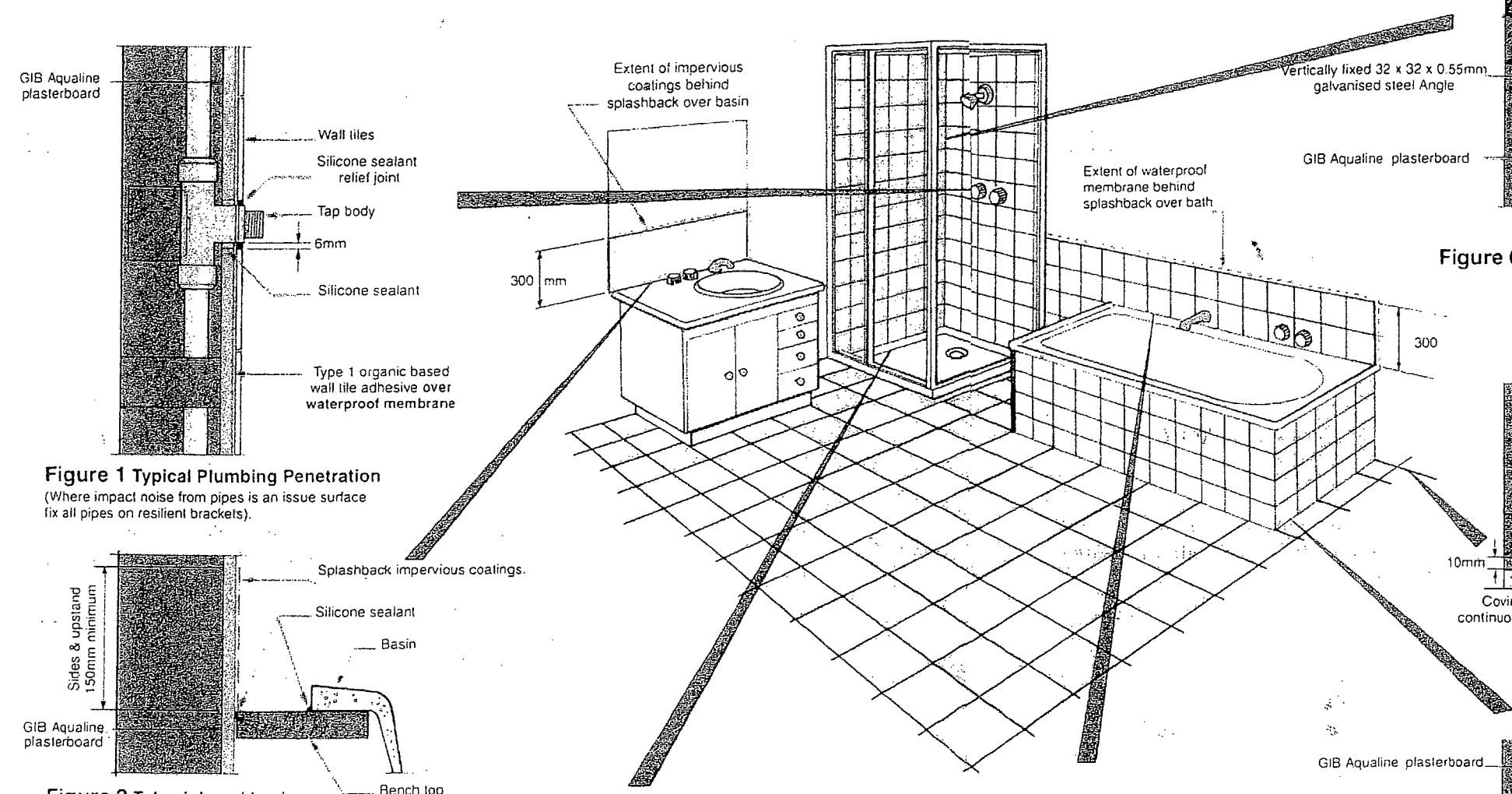


Figure 1 Typical Plumbing Penetration
(Where impact noise from pipes is an issue surface fix all pipes on resilient brackets).

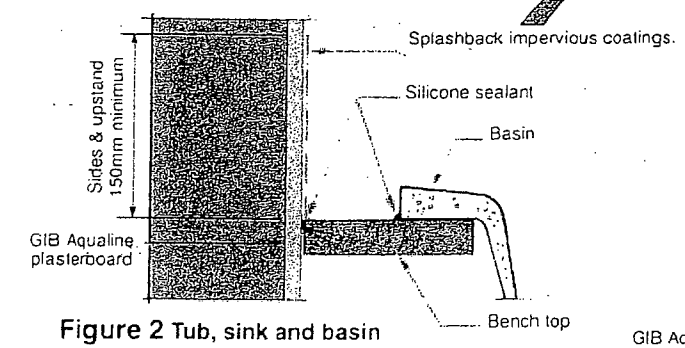


Figure 2 Tub, sink and basin

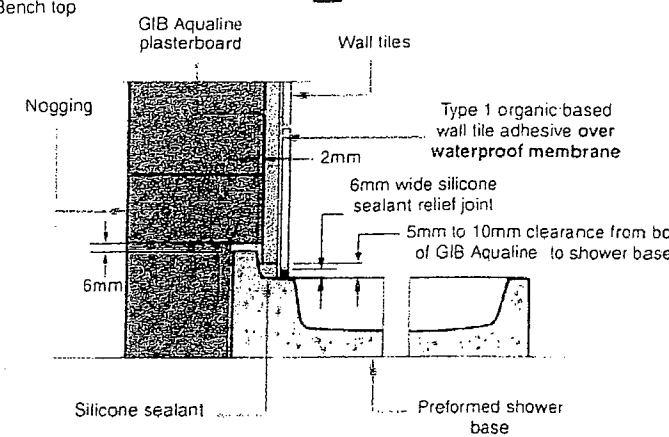


Figure 3 Preformed Shower Base Wall Junction
(Suitable where fire and sound ratings are not critical)

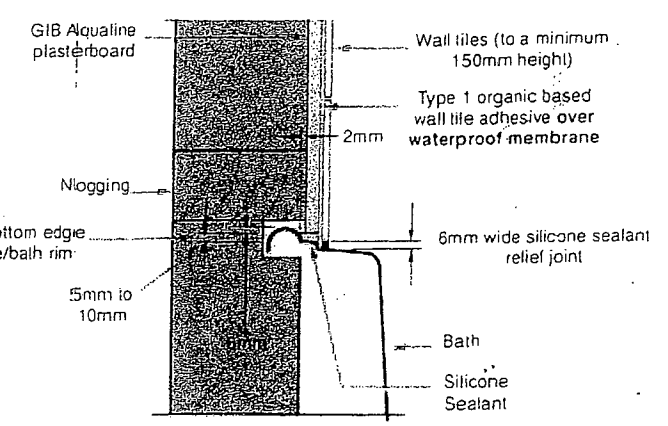


Figure 4 Bath Wall Junction Detail
(This detail is not permitted in Fire Rated or Noise Controlled areas)

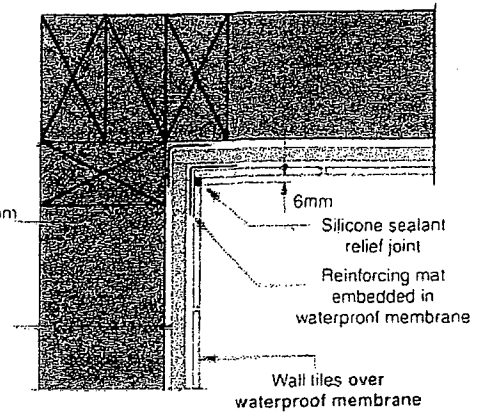
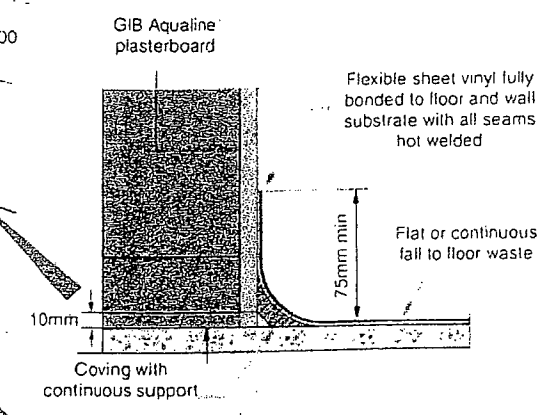
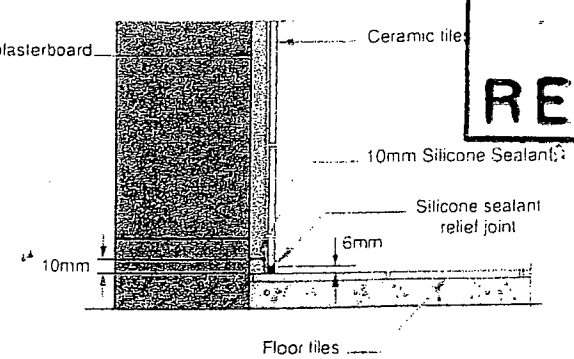


Figure 6 Tiled Shower - Internal Corner Detail



(a) Vinyl floor covering



(b) Ceramic tile covering

Figure 5 Wall to Floor Junctions
Bathrooms, Kitchens and Laundries

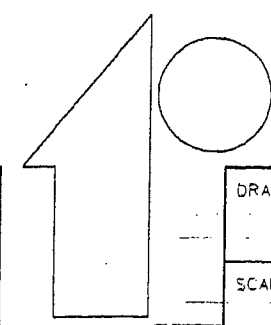
- Notes:**
- Silicone sealants shall be of the mould inhibited type.
 - For details on Fire Rated and/or Noise Control systems, refer pages 16, 17.

Wanganui District Council
27 SEP 2010
RECEIVED

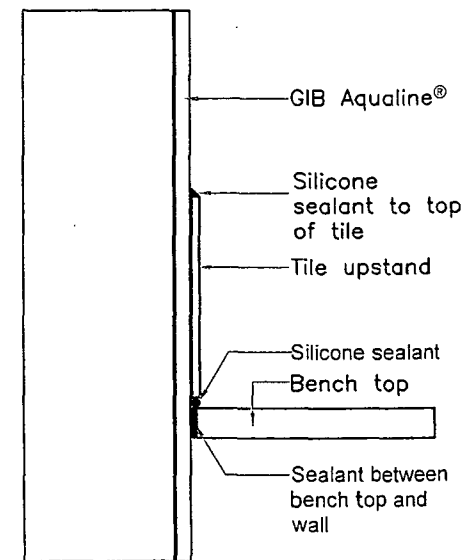
APPROVED
10/0868

Consent No.

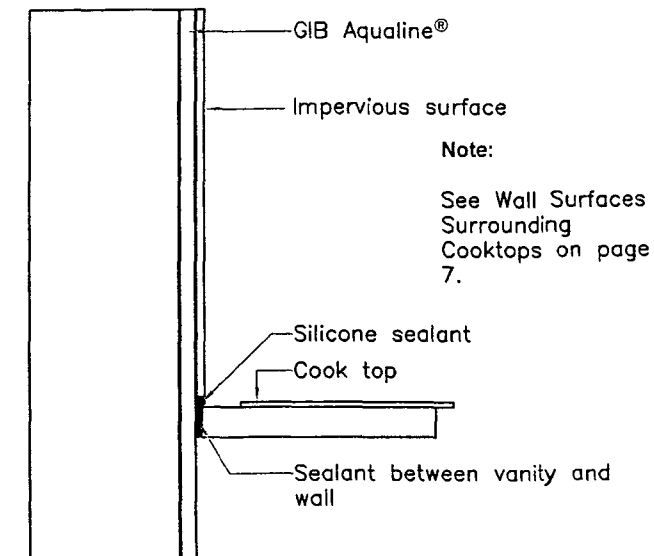
JOB TITLE A NEW SINGLE STOREY DWELLING AT LOT 28 LITHCOW DRIVE, WANGANUI	DRAWING TITLE TYPICAL WET AREA DETAILS
---	---



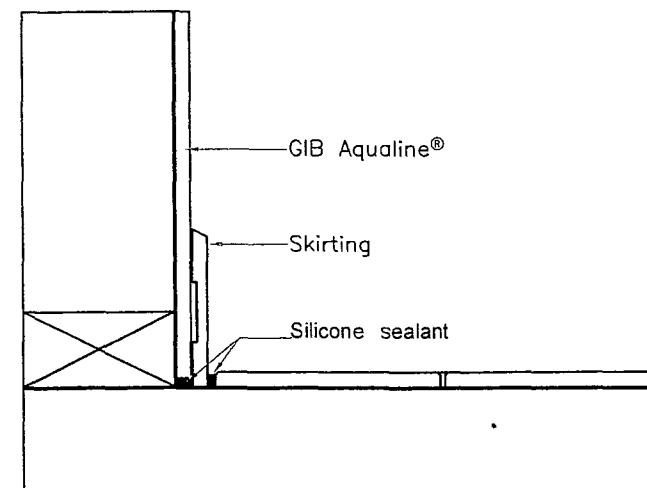
DRAWN TMR	DATE 21 SEPT. 2010	SHEET NO ND-14
SCALE 1:5	JOB NO 2105	



1 Bench Top/Wall Detail
Kitchen and Laundry



2 Cook Top/Wall Detail
Kitchen and Laundry



3 Wall/Floor Detail
Kitchen and Laundry

Wanganui District Council
27 SEP 2010
RECEIVED

APPROVED
10 / 0868
Consent No.

PROJECT

A NEW SINGLE STOREY
DWELLING AT LOT 28
LITHGOW DRIVE, WANGANUI

DRAWING

KITCHEN & LAUNDRY
WET AREA DETAIL



REYES DESIGN

12 COLWILL ROAD, MASSEY, AUCKLAND
PH (09) 832 06 08 FAX (09) 832 06 88
Email: reyestheo@hotmail.com

AMENDMENT

DESIGNED THEO REYES

DATE 23 SEPT. 2010

SHEET NO.

DRAWN THEO REYES

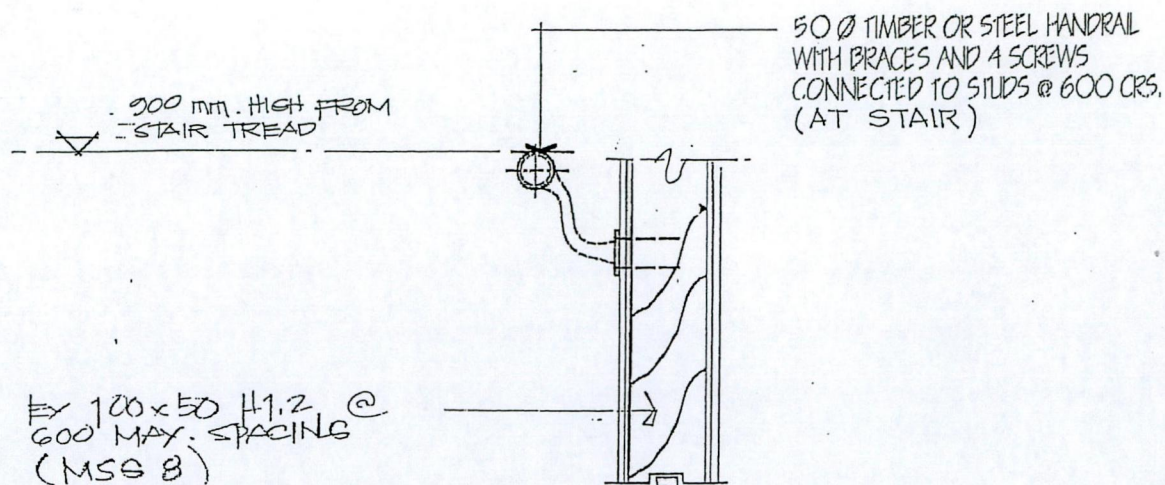
SCALE 1:5

CHECKED THEO REYES

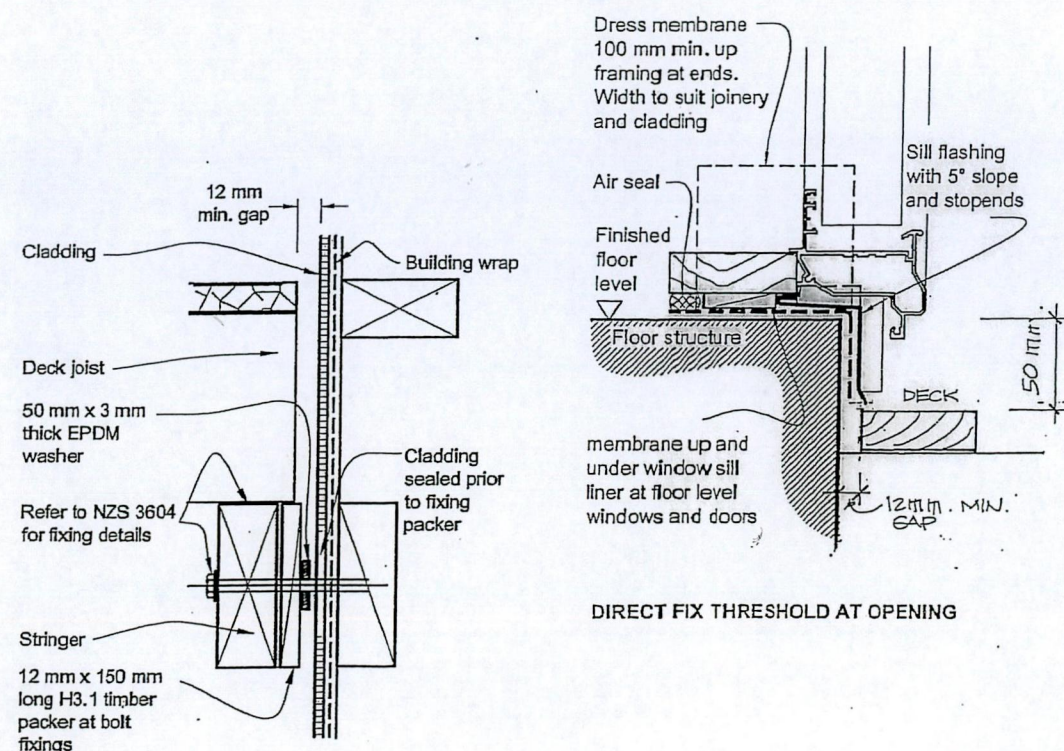
JOB NO. 2195

COPYRIGHT
THE COPYRIGHT OF THESE DRAWINGS AND ALL PART THEREOF
REMAIN THE PROPERTY OF REYES DESIGN ARCHITECTURAL
SERVICES

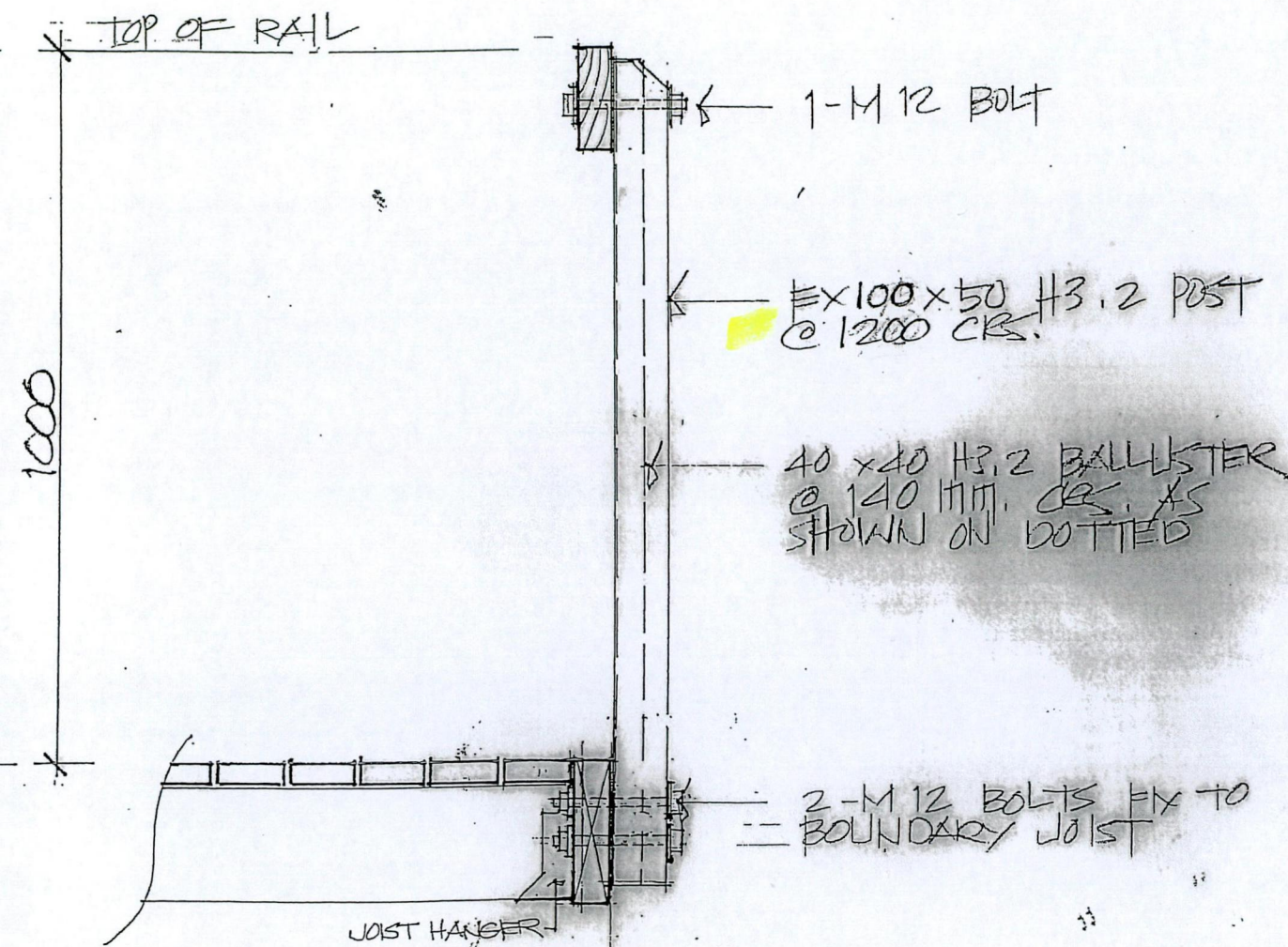
ND
15



HANDRAIL FIXING DETAIL



DIRECT FIX THRESHOLD AT OPENING

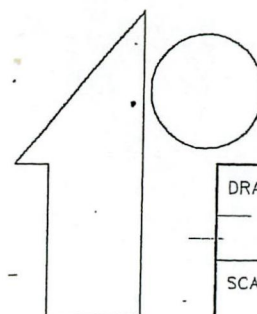


BARRIER FIXING DETAIL SCALE 1:10

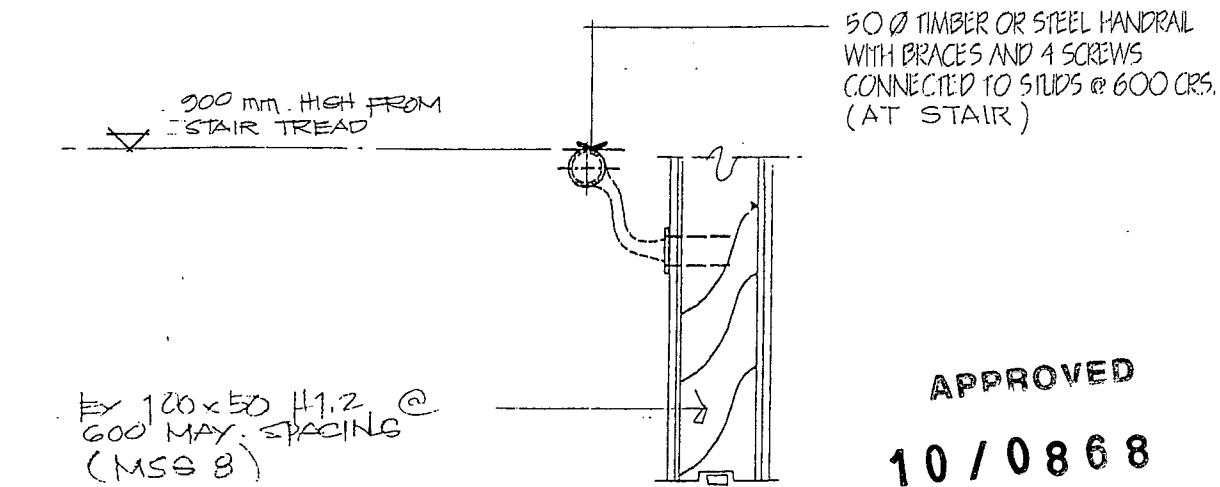
APPROVED
10/0868
Consent No.

DECK TO WALL JUNCTION DETAIL

JOB TITLE	DRAWING TITLE
A NEW SINGLE STOREY DWELLING AT LOT LITHOW DRIVE, WANGANUI	CONSTRUCTION DETAILS



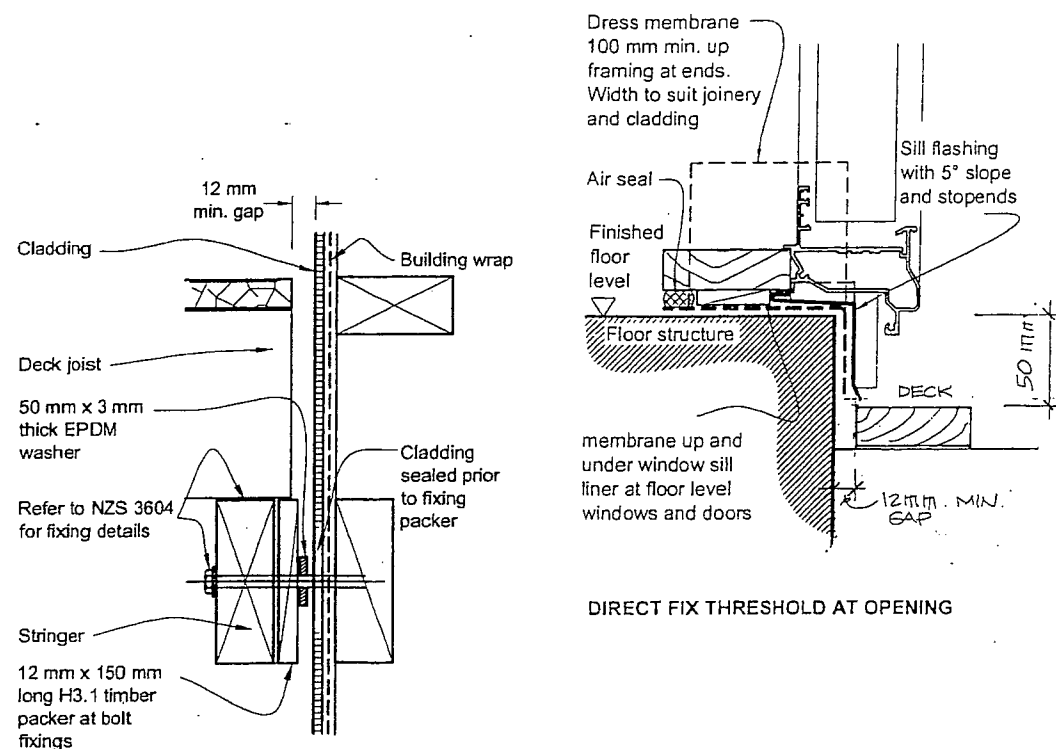
DRAWN	DATE	SHEET NO
TMR	17 OCT. 2010	ND-16
SCALE	JOB NO	
1:10	2125	



APPROVED
10/0868

Consent No.

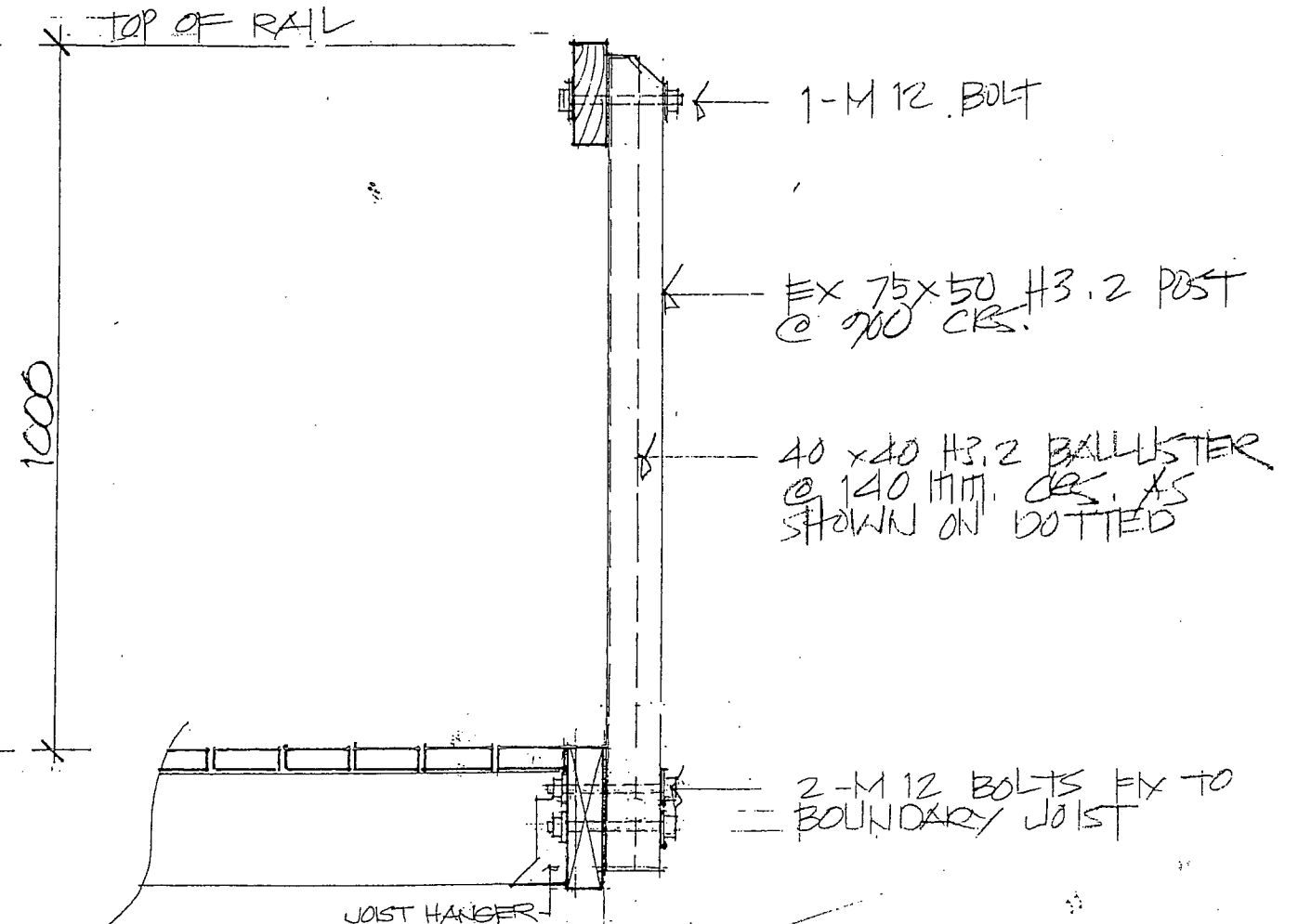
HANDRAIL FIXING DETAIL



DIRECT FIX THRESHOLD AT OPENING

FLOOR

BARRIER FIXING
DETAIL SCALE 1:10



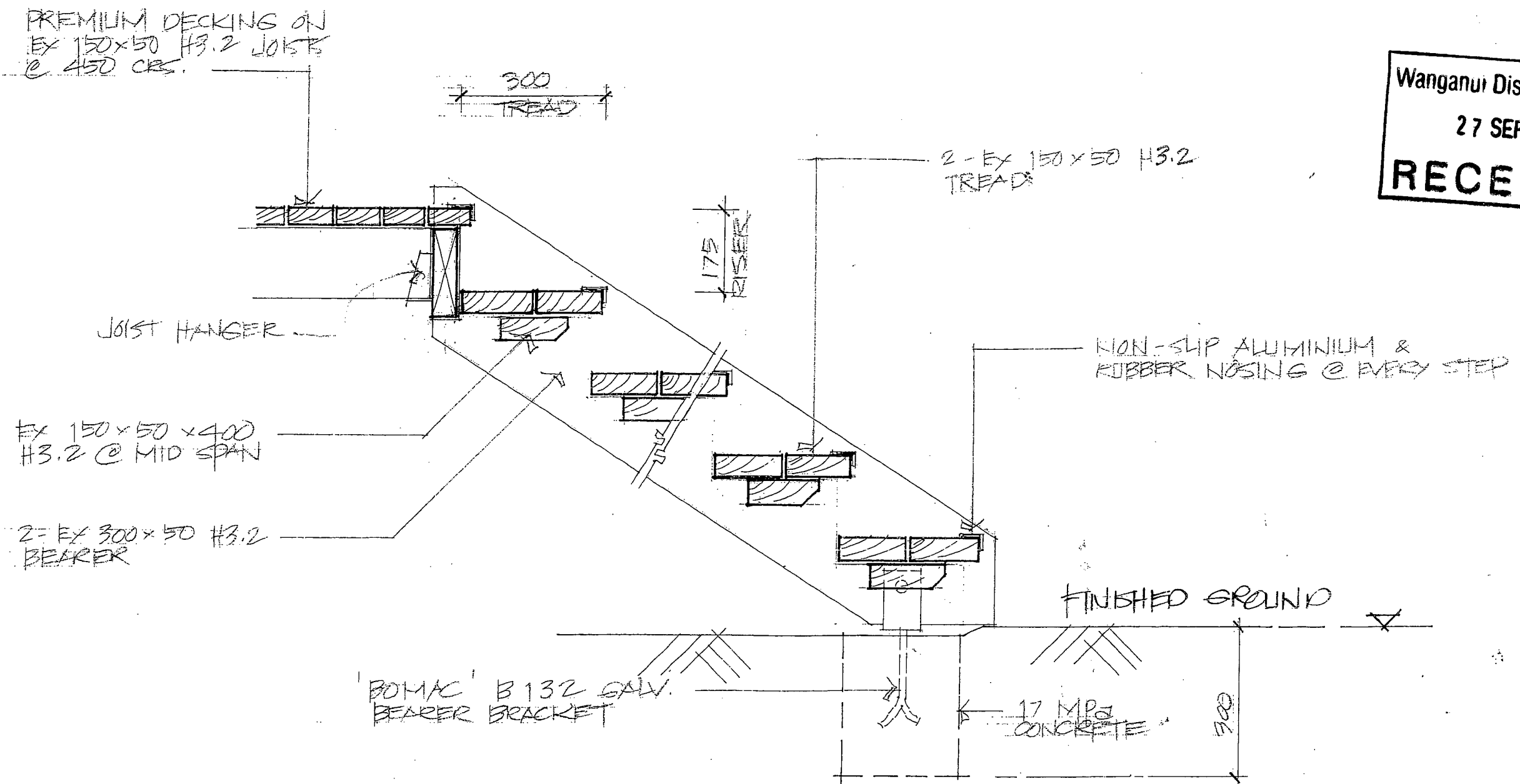
DECK TO WALL JUNCTION
DETAIL

OBSCUTB

JOB TITLE	DRAWING TITLE
A NEW SINGLE STOREY DWELLINGS AT LOT 28 LITHOW DRIVE, WANGANUI	CONSTRUCTION DETAILS

DRAWN	DATE	SHEET NO
TMR	21 SEPT. 2010	ND-17
SCALE	JOB NO	
1:10	2125	

Wanganui District Council
27 SEP 2010
RECEIVED



1 ENTRY STAIR DETAIL

APPROVED

10/0868

Consent No.

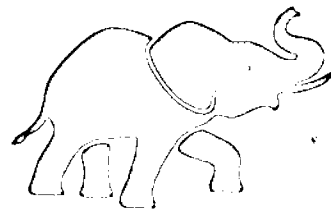
JOB TITLE A NEW SINGLE STOREY DWELLING AT LOT 28 LITHGOW DRIVE, WANGANUI	DRAWING TITLE ENTRY STAIR CONSTRUCTION DETAIL
---	---

DRAWN JMR	DATE 21 SEPT. 2010	SHEET NO ND-18
SCALE 1:10	JOB NO 2195	

23 Lithgow Drive

Date: 28 February 2011

Team Leader Building Inspections



Elephant

Plasterboard

Elephant Plasterboard (NZ) Ltd

Dear Sir / Madam

Building Consent No: * BLD

Address: Lot 28 Lithgow Drive Wanganui.....

Owner: *

SUBSTITUTION DOCUMENT

This Document is to advise that the interior wall and ceiling linings on the works under the above building consent have been changed from the "GIB" brand of plasterboard to the "Elephant" brand of plasterboard. Accordingly the wall bracing systems and ceiling diaphragm bracing systems (if applicable) have been changed to the "Elephant" plasterboard bracing systems.

Ceiling lining 10 mm Elephant 5/1 Replaces 10 mm Gib 5/1

The replacement bracing systems total performances either equal or exceed the total performance of the systems originally specified or they equal or exceed the total bracing Demand for both Wind and Earthquake. Therefore the re-calculated wall bracing element's total bracing units achieved would equal or exceed that of the bracing units achieved from that originally specified or they have equalled or exceeded the bracing Demand for both Wind and Earthquake as is required under NZS 3604:1999.

Accordingly the "Bracing Elements" have been changed as per the attached bracing recalculation sheets.

N.B. The attached sheets serve two purposes;

1. They demonstrate that the total bracing units achieved by the new bracing systems exceed the bracing Demand for both Wind and Earthquake as is required under NZS 3604:1999
2. They indicate that the placement and length of the new bracing elements are identical to the placement and length of the original bracing elements.

PRODUCER STATEMENT

We the Producer hereby confirm and declare that the above system changes will result in a total bracing system performance that will either equal or exceed the performance originally specified or would result in a total bracing system performance that will either equal or exceed the bracing Demand for both Wind and Earthquake as is required under NZS 3604:1999.

Elephant Plasterboard NZ Ltd

Kevin van Hest
Managing Director

OWNERS AUTHORISATION TO CHANGE

I/We the Property Owner or Duly Authorised Agent hereby confirm that I/We accept the above changes to the original building consent documentation.

Signed

Property Owner or Duly Authorised Agent

Name (Please Print)

STRENGTH WITH STYLE

P.O. Box 21 436 Henderson Phone 09 818 7706 Fax 09 818 7702 Freephone 0800 ELEPHANT

14 Bancroft Crescent, Glendene, Auckland

www.elephantplasterboard.co.nz

MEC Engineering Consultants Ltd. Consulting Structural & Civil Engineers P O Box 301 131 Albany Tel: 09 476 8184 Fax: 09 476 8186	Job No.	Rey 082	Page:	
	Site	Lot 28, Lithgow Drive Wanganui		
		Ground Floor	Date	03-Mar-08

Part 1 Wall Bracing calculation Sheet A

Name _____			
Street and Number Lot 28, Lithgow Drive			
Lot and DP Number _____			
City/Town/District Surburbs			
Location of Story: Ground Floor			
Building height to apex	4.5 m average	Roof weight	Light
Roof height above eaves	1.5 m average	first floor clading weight	N/A
Stud height	2.7 m	ground floor clading weight	Heavy
Average roof pitch	22.5 degree	Room in roof space	No
Ground Floor			
Building length BL=	10.2 m	Gross Building	Ground Floor
Building width BW=	6.4 m	Plan Area, GPA=	65 m ²
Note: When the average roof pitch is over 25 degrees, use the eaves length and width to determine BL and BW. Note: For heavy roof use roof plan at eaves level to determined GPA.			

Wind Zone box 2			
Region:	Terrain:	Exposure:	Topography:
R1 0	Inland 0	Sheltered 0	Gentle 0
R2 1	Coastal 1	Exposed 1	Moderate 1
			Extreme 3
Total points			
Wind Zone:	Low(0)	Very high (3)	
	Medium Medium(1)	Specific Design (4)	
	High(2)		

Earthquake Zone box 3
From Figure EQ1 select Earthquake Zone: A

BU's required Wind box 4
From table W1A/W1B
Ground Floor
W across= 37 BU's/m
W along= 44 BU's/m
Total wind load,
W ACROSS
W acrossxBL= 377 Bus
W ALONG
W alongxBW= 282 BU's

BU's required Earthquake box 5
From table EQ 1
Ground Floor
E = 5.2 BU's/m ²
Note: For a room in the roof space use E+1
Total earthquake load,
EQ ALONG and EQ ACROSS:
E x GPA BU's= 338 BU's

Elephant Plasterboard® Quickbrace Systems 2010 Solution Sheet

Print Date:

25-Feb-11

Lot 28 Part 1
Lithgow Drive

Wall Along			Single Storey		Achieved BU =			156%	441		113%	380	
			Lining Option		Required BU =				282			338	
							Floor Type Max BU's/m or SD	Wind		Earthquake			
Line	Element #	Supplier	Available Wall Length	Wall Angle °	Element Height	System Number		BU/m	% off Actual Performance	Achieved BU's	BU/m	% off Actual Performance	Achieved BU's
M	1	Elephant	2.00		2.7	Esa	120 BU's	84	10%	152	71	13%	124
	2												
	3												
	4												
	5												
	Min Req: =			M linetotal Achieved:						152			124
N	1	Elephant	2.40		2.7	ESa	120 BU's	84	10%	182	71	13%	149
	2												
	3												
	4												
	5												
	Min Req: =			N linetotal Achieved:						182			149
O	1	ECOPLY	1.20		2.7	SP1	120 BU's	89		107	89		107
	2												
	3												
	4												
	5												
	Min Req: =			O linetotal Achieved:						107			107
	1												
	2												
	3												
	4												
	5												
	Min Req: =			0 linetotal Achieved:									
	1												
	2												
	3												
	4												
	5												
	Min Req: =			0 linetotal Achieved:									
	1												
	2												
	3												
	4												
	5												
	Min Req: =			0 linetotal Achieved:									
	1												
	2												
	3												
	4												
	5												
	Min Req: =			0 linetotal Achieved:									
	1												
	2												
	3												
	4												
	5												
	Min Req: =			0 linetotal Achieved:									
	1												
	2												
	3												
	4												
	5												
	Min Req: =			0 linetotal Achieved:									
							Wind			Earthquake			
Wall Along							Achieved BU =			380			
Elephant Plasterboard® Quickbrace™ October 2010							Required BU =			338			
							156%			441			
										113%			
										282			

Elephant Plasterboard® Quickbrace™ October 2010

Achieved BU =

Required BU =

156%

441

113%

380

282

338

Elephant Plasterboard® Quickbrace Systems 2010 Solution Sheet										Print Date: 25-Feb-11					
Lot 28 Part 1					Lithgow Drive										
Wall Across		Single storey			Achieved BU =			169%		638		135%		523	
		Lining Option			Required BU =					377				388	
								Wind			Earthquake				
Line	Element #	Supplier	Available Wall Length	Wall Angle °	Element Height	System Number	Floor Type Max BU's/m or SD	BU/m	% off Actual Performance	Achieved BU's	BU/m	% off Actual Performance	Achieved BU's		
G	1	Elephant	1.80		2.7	ESA	120 BU's	84	10%	137	71	13%	112		
	2														
	3														
	4														
	5														
	Min Req: =		G linetotal Achieved:								137			112	
H	1	Elephant	1.80		2.7	Esa	120 BU's	84	10%	137	71	13%	112		
	2	Elephant	1.80		2.7	ESA	120 BU's	84	10%	137	71	13%	112		
	3														
	4														
	5														
	Min Req: =		H linetotal Achieved:								274			224	
I	1	Elephant	3.00		2.7	Esa	120 BU's	84	10%	228	71	13%	187		
	2														
	3														
	4														
	5														
	Min Req: =		I linetotal Achieved:								228			187	
	1														
	2														
	3														
	4														
	5														
	Min Req: =		0 linetotal Achieved:												
	1														
	2														
	3														
	4														
	5														
	Min Req: =		0 linetotal Achieved:												
	1														
	2														
	3														
	4														
	5														
	Min Req: =		0 linetotal Achieved:												
	1														
	2														
	3														
	4														
	5														
	Min Req: =		0 linetotal Achieved:												
	1														
	2														
	3														
	4														
	5														
	Min Req: =		0 linetotal Achieved:												
	1														
	2														
	3														
	4														
	5														
	Min Req: =		0 linetotal Achieved:												
	1														
	2														
	3														
	4														
	5														
	Min Req: =		0 linetotal Achieved:												

Wall Across					Achieved BU =		169%		638		135%		523	
Elephant Plasterboard® Quickbrace™ October 2010					Required BU =				377				388	

MEC Engineering Consultants Ltd. Consulting Structural & Civil Engineers P O Box 301 131 Albany Tel: 09 476 8184 Fax: 09 476 8186	Job No.	Rey 082	Page:	
	Site	Lot 28, Lithgow Drive Wanganui		
		Ground Floor	Date	03-Mar-08

Part 2 Wall Bracing calculation Sheet A

Name _____				
Street and Number Lot 28, Lithgow Drive				
Lot and DP Number _____				
City/Town/District Surburbs				
Location of Story: Ground Floor				
Building height to apex	<u>4.5</u>	m average	Roof weight	Light
Roof height above eaves	<u>1.5</u>	m average	first floor clading weight	N/A
Stud height	<u>2.7</u>	m	ground floor clading weight	Heavy
Average roof pitch	<u>22.5</u>	degree	Room in roof space	No
Ground Floor				
Building length BL=	<u>5.5</u>	m	Gross Building	Ground Floor
Building width BW=	<u>5</u>	m	Plan Area, GPA=	<u>27</u> m ²
Note: When the average roof pitch is over 25 degrees, use the eaves length and width to determine BL and BW.				
Note: For heavy roof use roof plan at eaves level to determine GPA.				

Wind Zone box 2

Region:	Terrain:	Exposure:	Topography:
R1 0 _____	Inland 0 _____	Sheltered 0 _____	Gentle 0 _____
R2 1 _____	Coastal 1 _____	Exposed 1 _____	Moderate 1 _____
			Extreme 3 _____
Total points	_____		
Wind Zone:	Low(0)	Very high (3)	
	Medium Medium(1)	Specific Design (4)	
	High(2)		

Earthquake Zone box 3

From Figure EQ1 select Earthquake Zone:	A
---	----------

BU's required Wind box 4

Ground Floor	
W across=	<u>37</u> BU's/m
W along=	<u>44</u> BU's/m
Total wind load,	
W ACROSS	
W acrossxBL=	<u>204</u> Bus
W ALONG	
W alongxBW=	<u>220</u> BU's

BU's required Earthquake box 5

Ground Floor	
E =	<u>5.2</u> BU's/m ²
Note: For a room in the roof space use E+1	
Total earthquake load,	
EQ ALONG and EQ ACROSS:	
E x GPA BU's=	<u>140</u> BU's

Elephant Plasterboard® Quickbrace Systems 2010 Solution Sheet

Print Date: 25-Feb-11

Lot 28 Part 2
Lithgow Drive

Wall Along			Single Storey			Achieved BU =			127%	278		163%	229
				Lining Option		Required BU =				220			140
								Wind			Earthquake		
Line	Element #	Supplier	Available Wall Length	Wall Angle °	Element Height	System Number	Floor Type Max BU's/m or SD	BU/m	% off Actual Performance	Achieved BU's	BU/m	% off Actual Performance	Achieved BU's
E	1	Elephant	2.40		2.7	Esa	120 BU's	84	10%	182	71	13%	149
	2												
	3												
	4												
	5												
	Min Req: =			E linetotal Achieved:						182			149
G	1	Elephant	1.20		2.7	EXS	120 BU's	89	10%	96	76	13%	79
	2												
	3												
	4												
	5												
	Min Req: =			G linetotal Achieved:						96			79
	1												
	2												
	3												
	4												
	5												
	Min Req: =			0 linetotal Achieved:									
	1												
	2												
	3												
	4												
	5												
	Min Req: =			0 linetotal Achieved:									
	1												
	2												
	3												
	4												
	5												
	Min Req: =			0 linetotal Achieved:									
	1												
	2												
	3												
	4												
	5												
	Min Req: =			0 linetotal Achieved:									
	1												
	2												
	3												
	4												
	5												
	Min Req: =			0 linetotal Achieved:									
	1												
	2												
	3												
	4												
	5												
	Min Req: =			0 linetotal Achieved:									
								Wind			Earthquake		
Wall Along						Achieved BU =		127%		278	163%		229
Elephant Plasterboard® Quickbrace™ October 2010						Required BU =				220			140

Elephant Plasterboard® Quickbrace Systems 2010 Solution Sheet										Print Date:		25-Feb-11		
Lot 28 Part 2					Lithgow Drive									
Wall Across		Single storey			Achieved BU =		179%		365		213%		299	
		Lining Option			Required BU =				204				140	
							Floor Type		Wind			Earthquake		
Line	Element #	Supplier	Available Wall Length	Wall Angle °	Element Height	System Number	Floor Type Max BU's/m or SD	BU/m	% off Actual Performance	Achieved BU's	BU/m	% off Actual Performance	Achieved BU's	
P	1	Elephant	2.40		2.7	ESA	120 BU's	84	10%	182	71	13%	149	
	2													
	3													
	4													
	5													
	Min Req: =				P linetotal Achieved:					182			149	
R	1	Elephant	2.40		2.7	Esa	120 BU's	84	10%	182	71	13%	149	
	2													
	3													
	4													
	5													
	Min Req: =				R linetotal Achieved:					182			149	
	1													
	2													
	3													
	4													
	5													
	Min Req: =				0 linetotal Achieved:									
	1													
	2													
	3													
	4													
	5													
	Min Req: =				0 linetotal Achieved:									
	1													
	2													
	3													
	4													
	5													
	Min Req: =				0 linetotal Achieved:									
	1													
	2													
	3													
	4													
	5													
	Min Req: =				0 linetotal Achieved:									
	1													
	2													
	3													
	4													
	5													
	Min Req: =				0 linetotal Achieved:									
	1													
	2													
	3													
	4													
	5													
	Min Req: =				0 linetotal Achieved:									

Wall Across		Achieved BU =		179%		365		213%		299	
Elephant Plasterboard® Quickbrace™ October 2010		Required BU =				204				140	

MEC Engineering Consultants Ltd. Consulting Structural & Civil Engineers P O Box 301 131 Albany Tel: 09 476 8184 Fax: 09 476 8186	Job No.	Rey 082	Page:	
	Site	Lot 28, Lithgow Drive Wanganui		
		Ground Floor	Date	03-Mar-08

Part 3

Wall Bracing calculation Sheet A

Name _____			
Street and Number Lot 28, Lithgow Drive			
Lot and DP Number _____			
City/Town/District <u>Surburbs</u>			
Location of Story: <u>Ground Floor</u>			
Building height to apex	<u>5.5</u> m average	Roof weight	<u>Light</u>
Roof height above eaves	<u>2</u> m average	first floor clading weight	<u>N/A</u>
Stud height	<u>2.7</u> m	ground floor clading weight	<u>Heavy</u>
Average roof pitch	<u>22.5</u> degree	Room in roof space	<u>No</u>
Ground Floor			
Building length BL=	<u>17.2</u> m	Gross Building Plan Area,	<u>Ground Floor</u>
Building width BW=	<u>13</u> m	GPA=	<u>160</u> m ²
Note: When the average roof pitch is over 25 degrees, use the eaves length and width to determine BL and BW.			
Note: For heavy roof use roof plan at eaves level to determined GPA.			

Wind Zone

box 2

Region:	Terrain:	Exposure:	Topography:
R1 0 _____	Inland 0 _____	Sheltered 0 _____	Gentle 0 _____
R2 1 _____	Coastal 1 _____	Exposed 1 _____	Moderate 1 _____
			Extreme 3 _____
Total points	_____		
Wind Zone:	Low(0)	Very high (3)	
	<u>Medium</u> Medium(1)	Specific Design (4)	
	High(2)		

Earthquake Zone

box 3

From Figure EQ1 select Earthquake Zone:	<u>A</u>
---	----------

BUs required Wind

box 4

Ground Floor	
W across=	<u>37</u> BUs/m
W along=	<u>44</u> BUs/m
Total wind load,	
W ACROSS	
W acrossxBL=	<u>636</u> Bus
W ALONG	
W alongxBW=	<u>572</u> BUs

BUs required Earthquake

box 5

Ground Floor	
E =	<u>6.7</u> BUs/m ²
Note: For a room in the roof space use E+1	
Total earthquake load,	
EQ ALONG and EQ ACROSS:	
E x GPA BUs=	<u>1072</u> BUs

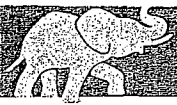
Elephant Plasterboard® Quickbrace Systems 2010 Solution Sheet

Print Date: 25-Feb-11

Lot 28 Part 3
Lithgow Drive

Wall Along				Single Storey		Achieved BU =		230%		1313		102%		1091	
				Lining Option		Required BU =				572				1072	
								Wind				Earthquake			
Line	Element #	Supplier	Available Wall Length	Wall Angle °	Element Height	System Number	Floor Type Max BU's/m or SD	BU/m	% off Actual Performance	Achieved BU's	BU/m	% off Actual Performance	Achieved BU's		
N	1	Elephant	0.90		2.7	EXSc	120 BU's	104	10%	85	89	13%	70		
	2	Elephant	0.90		2.7	EXSc	120 BU's	104	10%	85	89	13%	70		
	3	Elephant	0.60		2.7	EXSc	120 BU's	102	10%	55	89	13%	47		
	4	Elephant	0.60		2.7	EXSc	120 BU's	102	10%	55	89	13%	47		
	5														
Min Req: =			N linetotal Achieved:						280				233		
O	1	Elephant	3.00		2.7	ESA	120 BU's	84	10%	228	71	13%	187		
	2	Elephant	3.00		2.7	ESa	120 BU's	84	10%	228	71	13%	187		
	3														
	4														
	5														
Min Req: =			O linetotal Achieved:						456				373		
Q	1	Elephant	3.00		2.7	ESA	120 BU's	84	10%	228	71	13%	187		
	2	Elephant	1.20		2.7	EXSc	120 BU's	107	10%	115	89	13%	93		
	3														
	4														
	5														
Min Req: =			Q linetotal Achieved:						343				280		
R	1	Elephant	1.20		2.7	EXSc	120 BU's	107	10%	115	89	13%	93		
	2	Elephant	0.60		2.7	EXSc	120 BU's	102	10%	55	89	13%	47		
	3	Elephant	0.60		2.7	EXMc	120 BU's	107		64	107		64		
	4														
	5														
Min Req: =			R linetotal Achieved:						234				204		
	1														
	2														
	3														
	4														
	5														
Min Req: =			0 linetotal Achieved:												
	1														
	2														
	3														
	4														
	5														
Min Req: =			0 linetotal Achieved:												
	1														
	2														
	3														
	4														
	5														
Min Req: =			0 linetotal Achieved:												
	1														
	2														
	3														
	4														
	5														
Min Req: =			0 linetotal Achieved:												
	1														
	2														
	3														
	4														
	5														
Min Req: =			0 linetotal Achieved:												
Wall Along						Achieved BU =		230%		1313		102%		1091	
Elephant Plasterboard® Quickbrace™ October 2010						Required BU =				572				1072	

Elephant Plasterboard® Quickbrace Systems 2010 Solution Sheet										Print Date: 25-Feb-11					
Lot 28 Part 3					Lithgow Drive										
Wall Across		Single storey			Achieved BU =			244%		1550		118%		1269	
		Lining Option			Required BU =					636				1072	
								Wind				Earthquake			
Line	Element #	Supplier	Available Wall Length	Wall Angle °	Element Height	System Number	Floor Type Max BU's/m or SD	BU/m	% off Actual Performance	Achieved BU's	BU/m	% off Actual Performance	Achieved BU's		
A	1	Elephant	3.00		2.7	Esa	120 BU's	84	10%	228	71	13%	187		
	2														
	3														
	4														
	5														
	Min Req: =		A linetotal Achieved:							228			187		
B	1	Elephant	3.00		2.7	Esa	120 BU's	84	10%	228	71	13%	187		
	2														
	3														
	4														
	5														
	Min Req: =		B linetotal Achieved:							228			187		
C	1	Elephant	3.00		2.7	Esa	120 BU's	84	10%	228	71	13%	187		
	2														
	3														
	4														
	5														
	Min Req: =		C linetotal Achieved:							228			187		
D	1	Elephant	3.00		2.7	Esa	120 BU's	84	10%	228	71	13%	187		
	2														
	3														
	4														
	5														
	Min Req: =		D linetotal Achieved:							228			187		
E	1	Elephant	1.80		2.7	Esa	120 BU's	84	10%	137	71	13%	112		
	2	Elephant	1.80		2.7	Esa	120 BU's	84	10%	137	71	13%	112		
	3														
	4														
	5														
	Min Req: =		E linetotal Achieved:							274			224		
F	1	Elephant	3.00		2.7	Esa	120 BU's	84	10%	228	71	13%	187		
	2														
	3														
	4														
	5														
	Min Req: =		F linetotal Achieved:							228			187		
G	1	Elephant	1.80		2.7	Esa	120 BU's	84	10%	137	71	13%	112		
	2														
	3														
	4														
	5														
	Min Req: =		G linetotal Achieved:							137			112		
H	1														
	2														
	3														
	4														
	5														
	Min Req: =		H linetotal Achieved:												
I	1														
	2														
	3														
	4														
	5														
	Min Req: =		I linetotal Achieved:												
Wall Across							Achieved BU =		244%		1550	118%		1269	
Elephant Plasterboard® Quickbrace™ October 2010							Required BU =				636			1072	



Elephant QuickBrace® Systems

Elephant Plasterboard (NZ) Limited is pleased to announce the introduction of New and Innovative Bracing Systems.

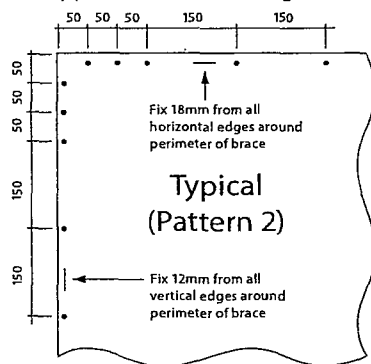
After extensive research, new systems have been developed that will allow designers, engineers, building officials and builders to utilise innovative bracing solutions that not only perform higher, they will also significantly cut building costs both in materials and installation time.

How did we do it?

We've introduced a new Set of fast and easy Corner Fixing Patterns:

- The Typical Corner Fixing Pattern
- The Condensed Corner Fixing Pattern.

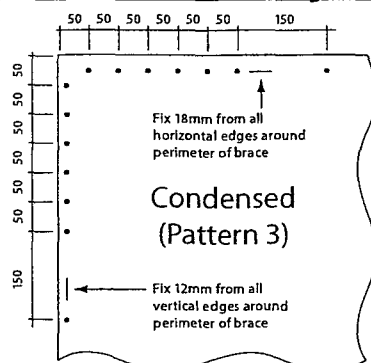
The Typical Corner Fixing Pattern



The most common corner fixing pattern has been referred to in our past literature as Pattern 2. Other plasterboard manufacturer's bracing systems also use Pattern 2. This is the "Typical" corner and perimeter pattern.

NB: The ES, ESa, ESS and ESP systems now also require this Typical Corner Pattern.

The Condensed Corner Fixing Pattern



Bracing System names containing a 'c', E.g. EXSc, EXMSc, EXMca etc. require this slightly more condensed corner pattern on at least one side, and use small head screws only.

NB: The perimeter spacing is the same as with Pattern 2, i.e. 150mm centres.

The Benefits

No more Bracing Nails or Bracing Screws

The single most beneficial result is that all Elephant Plasterboard QuickBrace® Systems no longer require "Bracing Nails or Bracing Screws" (large head fixings). All bracing systems now only require the use of small head fixings.

This has a number of benefits over Bracing Nails and Bracing Screws;

- The small head fixings are about 60% lower in cost.
- The small head fixings are usually 3 times faster to drive in.
- This results in some cases over \$3.00 per sqm saving.

Not only that, Bracing Nails and Bracing Screws often make a mess, break the paper or stick out proud. All of which make it difficult for the plasterer to get a top quality finish.

Increased Performance

The new Set of Corner Fixing Patterns have resulted in significant increases in bracing performance.

- Reducing the need for higher cost boards like Multiboard
- Reducing the overall number of Bracing Elements required

All Elements can start at 400mm wide

All bracing elements can start at 400mm wide on both internal and external walls, giving the designer or engineer full flexibility.

Current 2008 Systems

The current 2008 Elephant Plasterboard Bracing Systems remain valid.

If a current 2008 'EM' system set (Large Head Fixings, Pattern 2) has been specified, this can be changed to an 'EXMc' system set (Small Head Screws, Pattern 3), as it outperforms the 'EM' system set.

All other aspects of our bracing systems, including the fixing of the Plywood, remain the same and are as per the current manual Elephant Plasterboard Bracing Systems April 2008. A new technical manual is being produced which will detail more features of these innovative solutions.

Elephant QuickBrace® Software

We strongly recommend the use of the Elephant QuickBrace® Software. This will often provide higher bracing performance than those published in the table overleaf. The Software can be downloaded from our web site: www.elephantplasterboard.co.nz or you can request a copy by phoning: 0800 ELEPHANT (353 742)



The Elephant QuickBrace® Numbering System

The Elephant QuickBrace® Numbering System has also been revised and made more logical and easier to understand for designers, engineers, building officials, and builders.

E	= Elephant Plasterboard Systems	13	= 13mm Plasterboard
X	= Panel Hold Downs <u>and</u> Small Head fixings	c	= Condensed Pattern (3, instead of "Typical" Pattern 2)
S	= Standard Plasterboard one side	a	= Angle Brace
SS	= Standard Plasterboard both sides	d	= Double Strap or Double Bottom Plate
SP	= Standard Plasterboard one side, Plywood the other		
M	= Multiboard one side		
MS	= Multiboard one side, Standard Plasterboard the other		
MP	= Multiboard one side, Plywood the other		

NB: The Elephant QuickBrace® Numbering System and the sub components thereof are protected by copyright.

The New Range of Elephant Plasterboard Bracing Design Solutions

10mm Plasterboard Systems using Typical Corner Pattern		Status:	See Notes:
ES	= Elephant Standard Plasterboard one side.	Existing	1
ESa	= Elephant Standard Plasterboard one side plus angle brace.	Existing	1
ESS	= Elephant Standard Plasterboard both sides.	Existing	1
ESP	= Elephant Standard Plasterboard one side, Plywood the other side.	Existing	1
EXS	= Elephant Standard Plasterboard one side, with panel hold downs.	Existing	
EXSa	= Elephant Standard Plasterboard one side, with panel hold downs plus angle brace.	Existing	
EXSS	= Elephant Standard Plasterboard both sides, with panel hold downs.	Existing	
EXSP	= Elephant Standard Plasterboard one side, Plywood the other side, with panel hold downs.	Existing	
10mm Plasterboard Systems using Condensed Corner Pattern "c" (Small Head Screws only)		Status:	See Notes:
EXSc	= Elephant Standard Plasterboard one side, with panel hold downs.	New	
EXSca	= Elephant Standard Plasterboard one side, with panel hold downs plus angle brace.	New	
EXSSc	= Elephant Standard Plasterboard both sides, with panel hold downs.	New	
EXSPc	= Elephant Standard Plasterboard one side, Plywood the other side, with panel hold downs.	New	
EXMc	= Elephant Multiboard one side, with panel hold downs.	New	2
EXMca	= Elephant Multiboard one side, with panel hold downs plus angle brace.	New	2
EXMSc	= Elephant Multiboard one side, Standard Plasterboard the other side, with panel hold downs.	New	2
EXMPc	= Elephant Multiboard one side, Plywood the other side, with panel hold downs.	New	2
EXMcd	= Elephant Multiboard one side, with either panel hold downs and double bottom plate, or double strap.	New	2
13mm Plasterboard Systems:			
Same as above, but codes have a "13" <u>after</u> the board type to indicate thickness:			
E.g. ES13, ES13a ESS13, ESP13, EXS13c, EXS13ca, EXSS13c, EXSP13c.			
Further:		Status:	See Notes:
EXS13	= 13mm Elephant Standard Plasterboard one side, with panel hold downs.	Was "E13S"	3
EXS13a	= 13mm Elephant Standard Plasterboard one side, with panel hold downs plus angle brace.	Was "E13Sa"	3
EXSS13	= 13mm Elephant Standard Plasterboard both sides, with panel hold downs.	Was "E13SS"	3
EXSP13	= 13mm Elephant Standard Plasterboard one side, Plywood the other side, with panel hold downs.	Was "E13SP"	3
EXM13c	= 13mm Elephant Multiboard one side, with panel hold downs.	New	2
EXM13ca	= 13mm Elephant Multiboard one side, with panel hold downs plus angle brace.	New	2
EXM13c	= 13mm Elephant Multiboard one side, Standard Plasterboard the other side, with panel hold downs.	New	2
EXMP13c	= 13mm Elephant Multiboard one side, Plywood the other side, with panel hold downs.	New	2

Notes:

1. The 'ES' system set formerly required Corner Pattern 1, now requires 'Typical' Corner Pattern 2.
2. The new set of 'EXMc' and 'EXM13c' Multiboard systems that use Small Head screws and 'Condensed' Corner Pattern 3, replace and outperform the current 2008 set of 'EM' and 'EM13' Multiboard systems that used Large Head Fixings and 'Typical' Corner Pattern 2.
3. These 13mm Systems were previously called E13S, E13Sa, E13SS, and E13SP respectively. They now contain an "X" in the code to clarify that panel hold downs are required.



Elephant
Plasterboard
STRENGTH WITH STYLE

10mm Elephant Plasterboard QuickBrace® 2010 Systems BU/m Ratings

NB: The Elephant QuickBrace® Numbering System and the sub components thereof are protected by copyright.

Wall Type
External or Internal walls. Plasterboard one side.
... and with Angle Brace. "a"
Internal walls. Plasterboard both sides.
External walls. Plasterboard one side, Plywood the other.
Corner Fixing Pattern.

10mm Standard Plasterboard "S"

NO Hold Downs. Small Head Fixings

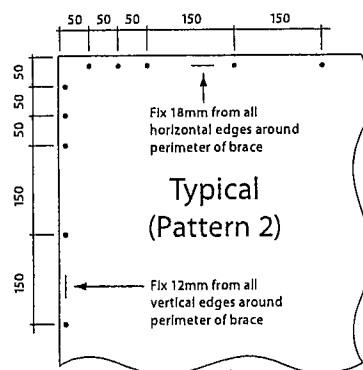
System Name	Min. Length (m)	Wind BU's/m	EQ BU's/m
ES	0.4	80	75
	1.8	85	75
ESa	1.8	95	75
ESS	0.4	85	75
	1.2	90	80
	1.8	95	80
	2.4	100	80
ESP	0.4	85	75
	0.5	90	80
	0.6	100	90

10mm Standard Plasterboard "S"

Hold Downs and Small Head Fixings "X"

System Name	Min. Length (m)	Wind BU's/m	EQ BU's/m
EXS	0.4	95	85
EXSa	1.8	120	100
EXSS	0.4	115	120
	0.5	130	125
	0.6	145	135
	0.9	150	140
EXSP	0.4	125	130
	0.5	130	135
	0.6	140	140
	0.9	150	150

Typical Corner Pattern

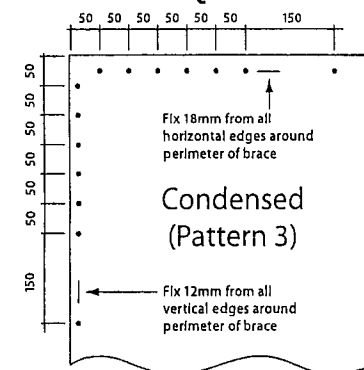


10mm Standard Plasterboard "S"

Hold Downs and Small Head Screws "X"

System Name	Min. Length (m)	Wind BU's/m	EQ BU's/m
EXSc	0.4	100	90
	0.5	105	95
	0.6	115	100
EXSca	1.8	135	115
EXSSc*	0.4	125	130
	0.5	135	135
	0.6	150	140
	0.9	150	150
EXSPc	0.4	125	130
	0.5	135	140
	0.6	150	150

Condensed Corner Pattern "c"



* For Systems requiring plasterboard both sides, the Condensed Corner Pattern is only required on **any** one side, with Typical Corner Pattern the other.

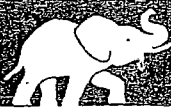
10mm Multiboard "M"

Hold Downs and Small Head Screws "X"

System Name	Min. Length (m)	Wind BU's/m	EQ BU's/m
EXMc	0.4	115	120
	0.5	130	125
	0.6	140	130
	1.2	150	130
EXMcd	0.4 to <0.45	125	125
EXMca	1.8	150	140
EXMSc*	0.4	125	130
	0.5	145	140
	0.6	150	150
EXMPc	0.4	135	140
	0.5	145	145
	0.6	150	150

For a copy of the table of the 13mm Elephant QuickBrace® 2010 Systems and BU/m Ratings, contact Elephant Plasterboard on 0800 ELEPHANT (353 742)

	= Highest Wind performance at that wall length
	= Highest E/Q performance at that wall length



Fixing Methods

General

- Elephant Plasterboard must be fixed leaving a gap of approximately 10mm at the floor level to allow for movement of framing members.
- All nails and screws should be driven in to the plasterboard at right angles and to a depth so that heads are seated in a slight recess.
- A lightweight hammer (16oz or less) or a drywall hammer must be used to avoid breaking the paper face surface of plasterboard by overdriving the fixings.
- Daubs of wallboard adhesive should be about 30mm in diameter.
- Never place the mechanical fixings through wallboard adhesive.
- Always keep the mechanical fixings 12mm from the sheet edge.
- For bracing elements fixing refer pages 24–30.

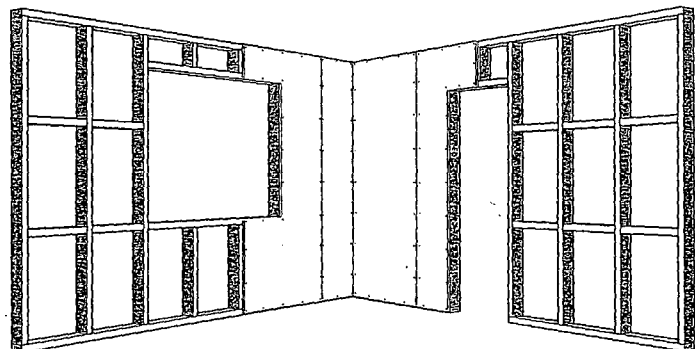
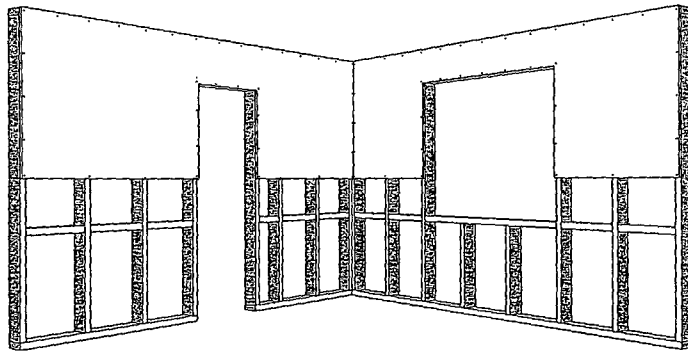
Walls

There are two approved methods for fixing plasterboard to framing members –

- **Horizontal Fixing** – Board fixed at right angles to the studs.
- **Vertical Fixing** – Board fixed parallel to the studs.

By fixing sheets using the horizontal method the number of joints is considerably reduced giving a generally higher quality wall finish. Plasterboard also has greater strength along its length so will offer more support between spans when fixed this way. Where the face of the framing member is reduced, horizontal fixing is also preferred as it is more difficult to fix two sheets on the smaller surface.

- When fixing over doors and windows it is recommended that joints do not occur on load bearing door and window studs. Sheets should be fixed horizontally and waste plasterboard cut out after it has been fixed.
- Joints should not occur within 200mm of door or window frame corners or on jamb studs as this is a point of stress.





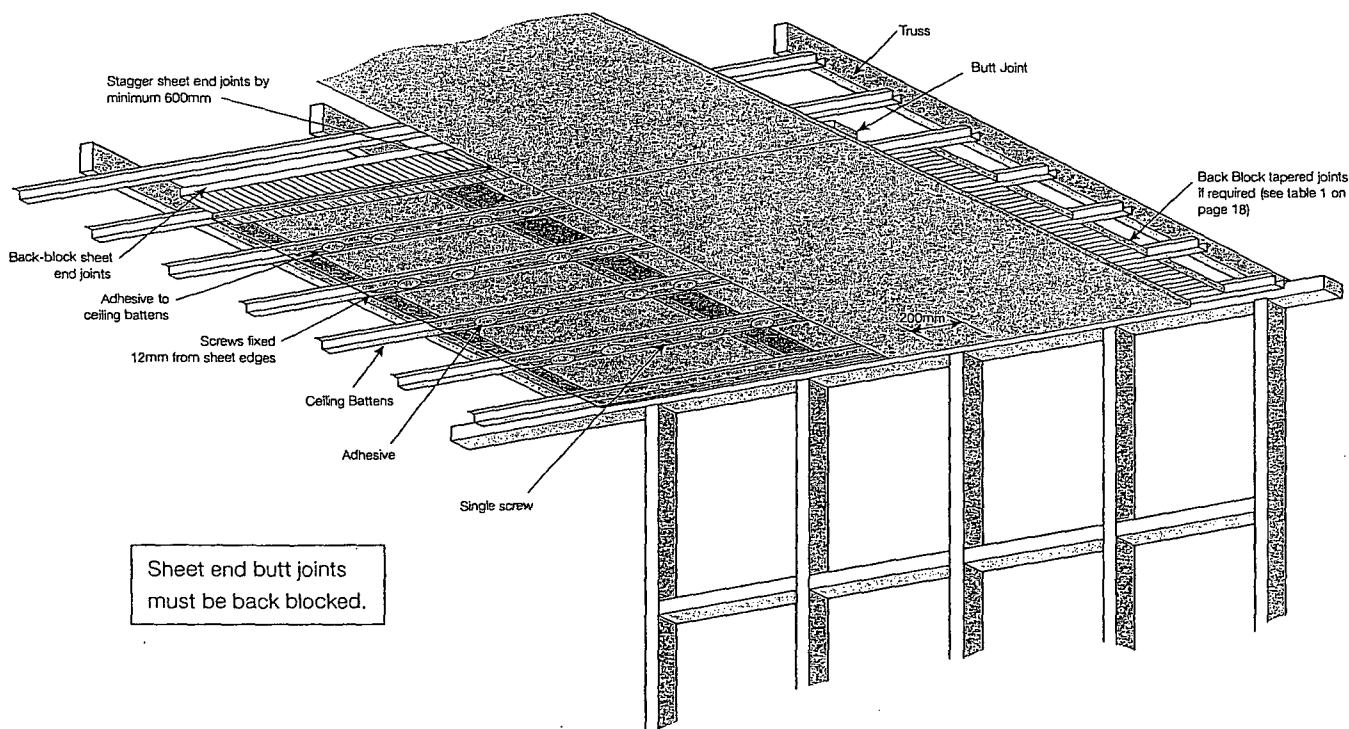
Fixing to Ceilings

Adhesive/Screw

- Fix ceiling sheets across battens or joists.
- Steel battens are recommended
- Refer to table on page 3 for suitable board thickness and framing centres.
- Apply adhesive to battens or joists at 200mm centres between centre and edge of sheet.
- Start fixing from the centre of each sheet outwards.
- Position the sheet hard up to the framing, single screw at the centre line and the edges across each batten.
- Nailing is not recommended.
- Single screws to be minimum 12mm from sheet edge.
- Press the plasterboard where adhesive has been applied to ensure full contact.

- Sheet end joints must not be made on framing and must be back blocked.
- Back blocking of sheet ends and recessed joints is essential for a high quality finish. (See table on page 18.) Fix the edges of the sheet at the wall junction at 200mm centres.
- Adhesive must not be applied to the sheet edges or under screws. This may contribute to screw popping.
- All joints between sheets should be touch fitted.
- Use long length sheets to minimise sheet end butt joints.
- The use of a drywall lifter will greatly assist the builder in achieving optimum results.

Fasteners	
Steel Battens	25mm x 6 gauge self tapping drywall screws
Timber	32mm x 6 gauge coarse thread drywall screws





Fixing to Walls – Timber Frame

Vertical Method

Wall Framing

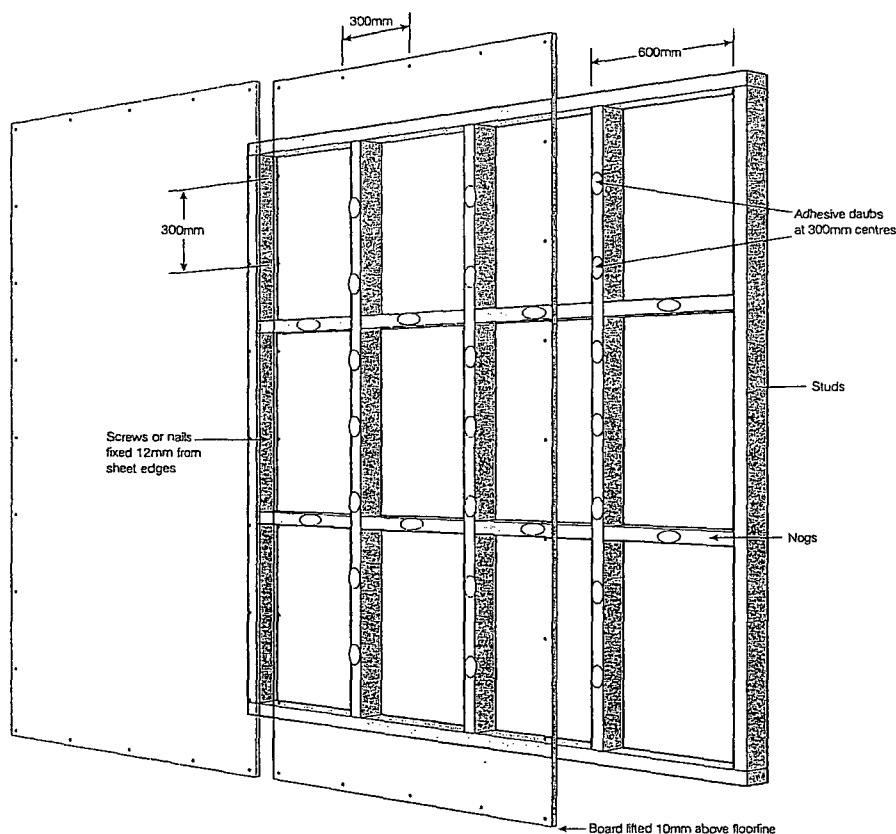
Dimensions for framing must comply with NZS3604:1999 requirements.

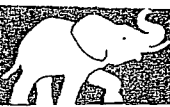
- Timber Framing moisture content should be between 12-18% when lining is installed.
- Studs must be spaced at 600mm centres maximum when using either 10mm or 13mm Elephant Plasterboard.
- For wall heights at 2400mm high, nogs need to be set at 800mm centres.
- For wall heights at 2700mm high, nogs need to be set at 900mm centres.

Fasteners	10mm	13mm
Coarse Thread Drywall Screws	25mm x 6 gauge	32mm x 6 gauge
Drywall Clouts	30mm x 2.8mm	30mm x 2.8mm

Fastening the Linings

- Leave a 6–10mm gap at the floor level to allow for movement in timber framing.
- Apply adhesive at maximum 300mm centres to intermediate studs and to the centre of each nog.
- Firmly press the plasterboard where adhesive has been applied to ensure full contact.
- Fasteners should be at 300mm centres around the sheet perimeter.
- Screws or clouts should be fixed no less than 12mm from the sheet edge.
- Adhesive must not be applied to the sheet edges or under nails or screws. This may lead to nail or screw popping.
- All joints between sheets should be touch fitted.





Backblocking

General

Backblocking is a reinforcing system designed to minimise the deformation and cracking of joints which can occur from a combination of weather conditions and/or building stresses resulting from expansion, contraction or building movement.

Backblocking is generally used where butt or end jointing of sheets occur between framing members and to recessed joints where a high standard of finish is required.

- Do not use panel adhesives for backblocking as they have high flexibility characteristics.

Ceiling recessed edge joints

- Cut back blocks at least 200mm wide and long enough to fit loosely between the framing members.
- Apply plaster based setting type adhesive/ cement to back blocks over the full face of the back block. A notched spreader to give 6mm x 6mm beads at approximately 20mm centres at right angle to the joint would be satisfactory.
- Fix Elephant Plasterboard at right angles to framing members. Place back blocks centrally along the full length of the board end or edge.
- Immediately after the blocks are in place erect the next board.
- Ceilings back blocks may be cemented into position from above the ceiling after the boards have been fixed and before they are flush jointed.

Backblocking for Ceilings and Walls

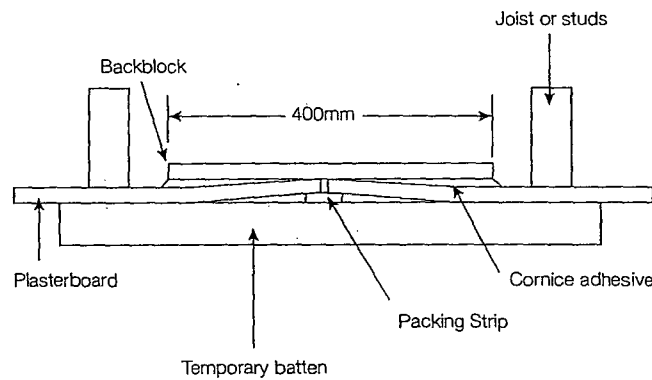
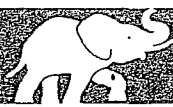


Table 1 Requirements for Backblocking

Level of Finish	Ceilings		Walls	
	Butt	Recessed	Butt	Recessed
5	Yes	Yes	Yes	No
4	Yes	Yes*	No	No
3	No	No	No	No

*Recessed joints on ceiling must be backblocked in any area containing 3 or more recessed joints.

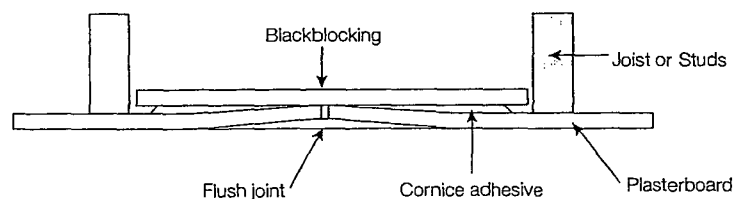


Backblocking

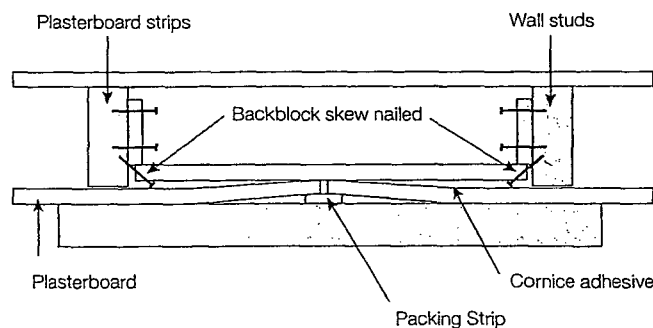
Ceiling Butt Joints

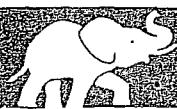
- Fix ceiling sheets with ends butted neatly together. The butt joint shall fall within 50mm of the mid-span point between framing members.
- Use battens and packers to support and deflect the sheet ends upwards about 2mm.
- Reinforce the butt joint by back-blocking with Elephant Plasterboard cut to fit loosely between the framing across the full width of the sheet and overlapping the edges of adjoining sheets by 50mm.
- Adhere back blocks with plaster-based setting type adhesive/cement applied over the full face of the backblock. A notched spreader to give 6 x 6mm beads at approximately 20mm centres at right angle to the joint would be satisfactory.
- Allow adhesive/cement to set for a minimum of 24 hours before removing temporary battens. When temporary battens are removed, a hollow formation suitable for jointing remains.
- Backblocking of sheet ends and recessed joints is essential for a high quality finish. Joints made on framing should be staggered 600mm by fixing to different battens or joists.

Butt joint after flush jointing



Backblocking walls where access is difficult





Elephant Bracing Systems

Refer to publication Elephant Bracing Systems for complete design and construction details

Design Solutions

TABLE B1X – Special Enhanced Systems

10mm Elephant Standard Plasterboard or any other Elephant Plasterboard: **Using Extra Components¹**

System Number	Plasterboard Requirement Vertical or Horizontal	Minimum Element Length (m)	Bracing Units/M Performance on Timber and Concrete Floors		Angle Brace	Panel Hold Downs	Fixing Type	Fixing Pattern Type
			Wind	Earthquake				
EXS	10mm Elephant Standard Plasterboard one side	0.4	95	85	No	Yes	32mm x 6g Drywall screws	Pattern 2
EXSa	10mm Elephant Standard Plasterboard one side	1.8	120	100	Yes			
EXSP ²	10mm Elephant Standard Plasterboard one side, 7mm D-D Plywood on the other	0.6	130	135	No			
EXSS	10mm Elephant Standard Plasterboard both sides	0.6 1.2	145 150	135 140				

1 EXS, EXSa, EXSP and EXSS Achieving these bracing unit ratings use **Pattern 2** Corner Pattern and Panel End Hold Downs on page 30.

2 EXSP For Plywood fixing, see notes on page 26.

TABLE B1 – 10mm Elephant Standard Plasterboard or any other Elephant Plasterboard

System Number	Plasterboard Requirement Vertical or Horizontal	Minimum Element Length (m)	Bracing Units/M Performance on Timber and Concrete Floors		Angle Brace	Fixing Type	Fixing Pattern Type
			Wind	Earthquake			
ES	10mm Elephant Standard Plasterboard one side	1.2	70	65	No	32mm x 6g Drywall screws	Pattern 1
		1.8	85	70			
ESa	10mm Elephant Standard Plasterboard one side	1.8	95	75	Yes		
ESP	10mm Elephant Standard Plasterboard one side 7mm D-D Plywood on the other	0.6	100	90	No		
ESS	10mm Elephant Standard Plasterboard both sides	1.2	85	75			
		1.8	95	80			
		2.4	100	80			

TABLE B2 – 10mm Elephant Multiboard (or 10mm Elephant Aquaboard, see note 1)

System Number	Plasterboard Requirement Vertical or Horizontal	Minimum Element Length (m)	Bracing Units/M Performance on Timber and Concrete Floors		Angle Brace	Panel Hold Downs	Fixing Type	Fixing Pattern Type
			Wind	Earthquake				
EM	10mm Elephant Multiboard one side	0.4	100	95	No	Yes	35mm Elephant Bracing Screw or 38mm Elephant Bracing Nail	Pattern 2
		0.6	130	115				
EMa	10mm Elephant Multiboard one side	1.8	130	115	Yes			
EMP ²	10mm Elephant Multiboard one side, 7mm D-D plywood on the other	0.6	150	150	No			
EMS ³	10mm Elephant Multiboard one side, 10mm Elephant Standard on the other	0.6	150	150				
EMd	10mm Elephant Multiboard one side	0.4	125	125		Yes ⁴	38mm EB Nails only	

1 10mm Elephant Aquaboard can be used in place of 10mm Elephant Multiboard, provided the perimeter of the element is fixed with fasteners spaced at 120mm centres, and using the relevant corner fixing pattern and fixing type.

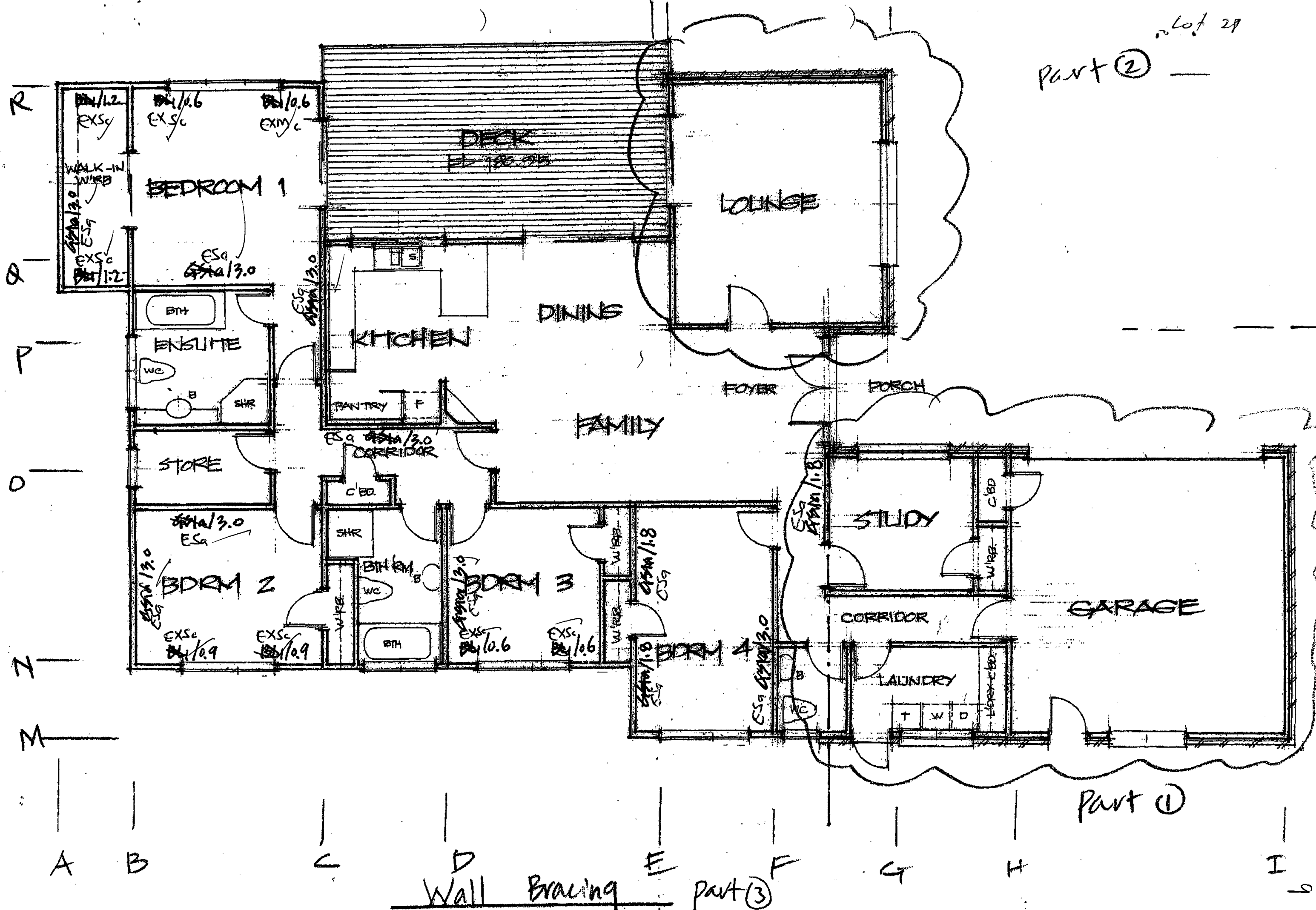
Minimum element length is 600mm.

2 EMP: For Plywood fixing, see notes on page 26.

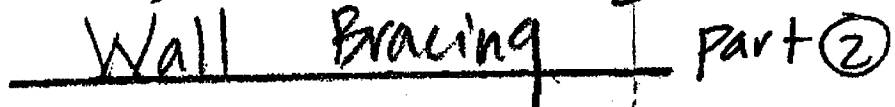
3 EMS: The 10mm Elephant Standard Plasterboard on the other face is fixed as per System ES.

4 EMd: Achieving these bracing unit ratings for element lengths under 600mm use 35mm or 38mm bracing nails only and double bottom plate if applicable. Refer Elephant Bracing Systems.

part ②



part ② — R



part ②

