

# Additions & Alterations

## Engineering Drawing Index

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## Engineering Drawing Index

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En06	A	Bracing Details
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En08	A	Typical Construction Sections



**VISIONENGINEERS**

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### Revision Schedule

Rev	Date	Description
A	08/06/18	Engineering

**Client:**

**Address:**

Date Started: 09-04-2018

Drawing No: 318-6428

Sheet: En01

Scale: @ A3

**General Notes:**

- These drawings shall be read in conjunction with the architectural and other consultants drawings / specifications and with other such written instructions as may be issued during the construction. Any discrepancy shall be referred to the Engineer before commencing the work.
- All dimensions are in millimeters, Unless noted otherwise.
- These drawings shall not be scaled, refer to dimensions given only or refer to the Architectural drawings.
- All levels and setting out dimensions shown on the drawings shall be checked on site prior to the commencement of work.
- During construction the structure shall be maintained in a stable condition with no part being overstressed with temporary supports / bracing installed as required.
- The engineer shall approve any proposed substitution prior to the commencement of works.

**Earthworks:**

- The earthworks shall be carried out in accordance with the geotechnical report and engineering specifications.
- The site shall be stripped a minimum depth of 150mm under pavements and buildings to remove the top soil. Any remaining uncontrolled fill matter, organic material, refuse or roots shall be removed.
- If a vibrating type roller is used, consideration shall be given to the effects on adjacent properties.
- All filling shall be under the supervision of the project geotechnical engineer who shall provide compaction certificates to the engineer for approval.

**Foundation Maintenance:**

- All soils are affected by water. Silts are weakened by water and some sands can settle if heavily watered, but most problems arise on clay foundations. Clays swell and shrink due to changes in moisture content and the potential amount of the movement is implied in the site classification in Australian Standard AS2870, which is specified as follows:
 

A - Stable (Non-reactive)	S - Slightly Reactive
M - Moderately Reactive	H - Highly Reactive
E - Extremely Reactive	
- All sites shall be maintained at essentially stable moisture conditions and extremes of wetting and drying prevented. This will require attention to the following.
- Site drainage: The site shall be graded or drained so that water cannot pond against or near the house. The ground immediately adjacent to the house shall be graded to a uniform fall of 50mm minimum away from the house over the first meter. The subfloor space for the houses with suspended floors shall be graded or drained to prevent ponding. The site drainage requirements shall be maintained.
- Gardens: The gardens shall not interfere with the drainage requirements or the subfloor ventilation and weep holes drainage requirements. Garden beds adjacent to the house should be avoided. Over watering of gardens close to the house shall be avoided.
- Restrictions on trees / shrubs: Planting of trees shall be avoided near the footings of the house or neighboring house on reactive sites as they can cause damage due to drying the clay. To minimise the possibility of damage, tree planting should be restricted to a distance from the house of:
  - 1.50 x The mature height for Class E sites.
  - 1.00 x The mature height for Class H sites.
  - 0.75 x The mature height for Class M sites.
- Where rows or groups of trees are involved, the distance from the building should be increased. Removal of trees from the site can also cause similar problems.
- Repair of leaks: Leaks in plumbing, including stormwater and sewerage drainage should be repaired promptly.

**Timber:**

- All workmanship and materials shall be in accordance with AS1684 and AS1720.
- AS1684 shall be applied to domestic construction in sheltered locations.
- Softwood to be a minimum of F7 MGP10 and hardwood to be a minimum of F17 UNO.
- External timber shall be either hardwood durability class 1 or 2 as per AS1720 or impregnated pine grade F7 MGP10, pressure treated to AS1604 and re-dried prior to use. Supplementary treatment shall be applied to all cut surfaces.
- Two (2) copies of timber truss shop drawings shall be submitted to the engineer for approval, clearly indicating design loads and point loads applied to the structure.
- All bolts in timber construction shall be M16 4.6/S UNO. Washers under heads and nuts shall be at least 2.5 times the bolt diameter.
- All timber joints and notches shall be a minimum on 100mm away from loose knots, severe sloping grain, gum veins or other minor defects.

**Structural Steel:**

- All workmanship and materials shall be in accordance with AS4100 and AS/NZ4600.
- The structural design has been based on the following steel grades, UNO:
  - Hot rolled universal beams, columns, channels & angles: 300PLUS
  - Circular, square & rectangular hollow sections: C350/C450LOC
  - Cold formed open DuraGal profiles: 350/C450LO
  - Cold formed lipped Cee & Zed Purlins: G550/G500/G450
- The structural design has been based on MBPMA nominal size Cee & Zed lipped purlins.
- Qualifications for welding procedures and personnel shall conform to Section 4 of AS 1554.1. Non destructive testing of welds shall include 100% visual inspection and additional testing as shown on the drawings.
- All welds shall be 6mm continuous fillet type GP, UNO. All butt welds shall be complete penetration in accordance with AS1554.1, UNO.
- Bolt Designation:
  - 4.6/S - Commercial bolts to AS 1111, snug tightened.
  - 8.8/S - High strength structural bolts to AS1562, snug tightened.
  - 8.8/TB - High strength structural bolts to AS1562, full tensioned bearing joint.
  - 8.8/TF - High strength structural bolts to AS1562, fully tensioned friction joint.
- All bolts shall be M16 8.8/S, with a minimum of 2 bolts per connection UNO.
- Fin plates shall be a minimum of 10mm thick, grade 300PLUS steel, UNO.
- Concrete encased steel work shall be wrapped with SL62 mesh and shall have a minimum 50mm of cover, UNO.
- Steelwork to be encased in concrete shall have the following surface treatment, UNO:

Exposure Classification to AS3600	Steelwork Protection Required
A1 / A2	Power tool clean to AS1627 Class 1, 1 Coat Alkyd Primer (Zinc Phosphate)
B1	Abrasive blast to AS1627 Class 2.5 1 Coat Inorganic Zinc Silicate
B2	Hot Dipped Galvanised to AS1650

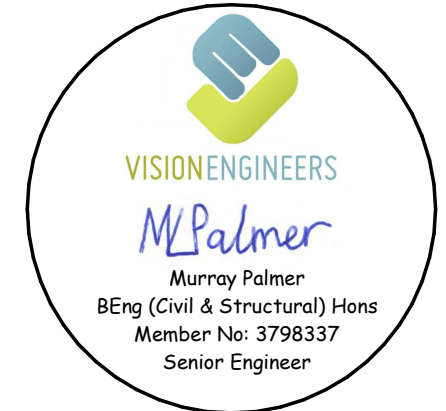
- Where sealed tube members are hot dipped galvanised, the fabricator shall provide drill holes as necessary to allow gases to escape.
- All transport and erection damage, site welds etc., shall be reinstated to an equivalent finish to adjacent steelwork.
- If steel beams and posts are designated to be galvanised, then end plates, cap plates, and base plates shall also be galvanised.
- All nuts and bolts shall be galvanised or marine grade stainless steel.

**FOUNDATIONS:**

- All footing to be founded in material of minimum 150 kPa safe bearing capacity or piered minimum 300mm into stiff material of minimum 250 kPa safe bearing capacity. Piers to be 400mm Dia bored @ max 2000mm cts except two storey section, piers to be 400mm Dia @ 1600mm cts.
- All loadbearing footings and slab beams to be piered to rock where rock is exposed. Piers may be reduced to 300mm if rock is exposed.

**CONCRETE:**

- All works in accordance with AS2870 & AS3600
- Concrete grades:-  
Slabs and footings - 25 MPa, maximum 20mm aggregate & 80mm slump.
- All concrete to be vibrated during placement.
- All concrete to be cured in an approved manner for a minimum of 7 days.
- Minimum reinforcement laps:-  
Tm - 500mm  
Mesh - 2 Crossrods + 25mm
- Cover to reinforcement:-  
Internal - 30mm  
External - 40mm  
Ground - 50mm
- Concrete slabs and footings have been designed to satisfy the performance criteria of section 3 of AS2870 - Residential slabs and footings.
- In areas of brittle floor coverings e.g. slate or tile, it would be recommended that one of the following measures be utilised:-  
- Increase mesh size to SL92 or double mesh layer.  
- Use a rubberised flexible adhesive bedding.  
- Delay placing tiles for a minimum of 3 months.
- The owners attention is drawn to CSIRO pamphlet "Guide to home owners on foundation maintenance & footing performance". Owner should comply with the recommendations of this pamphlet. The site around the building perimeter & service trenches are to be graded to drain away from the building perimeter.



Revision Schedule		
Rev	Date	Description
A	08/06/18	Engineering

**Client:**

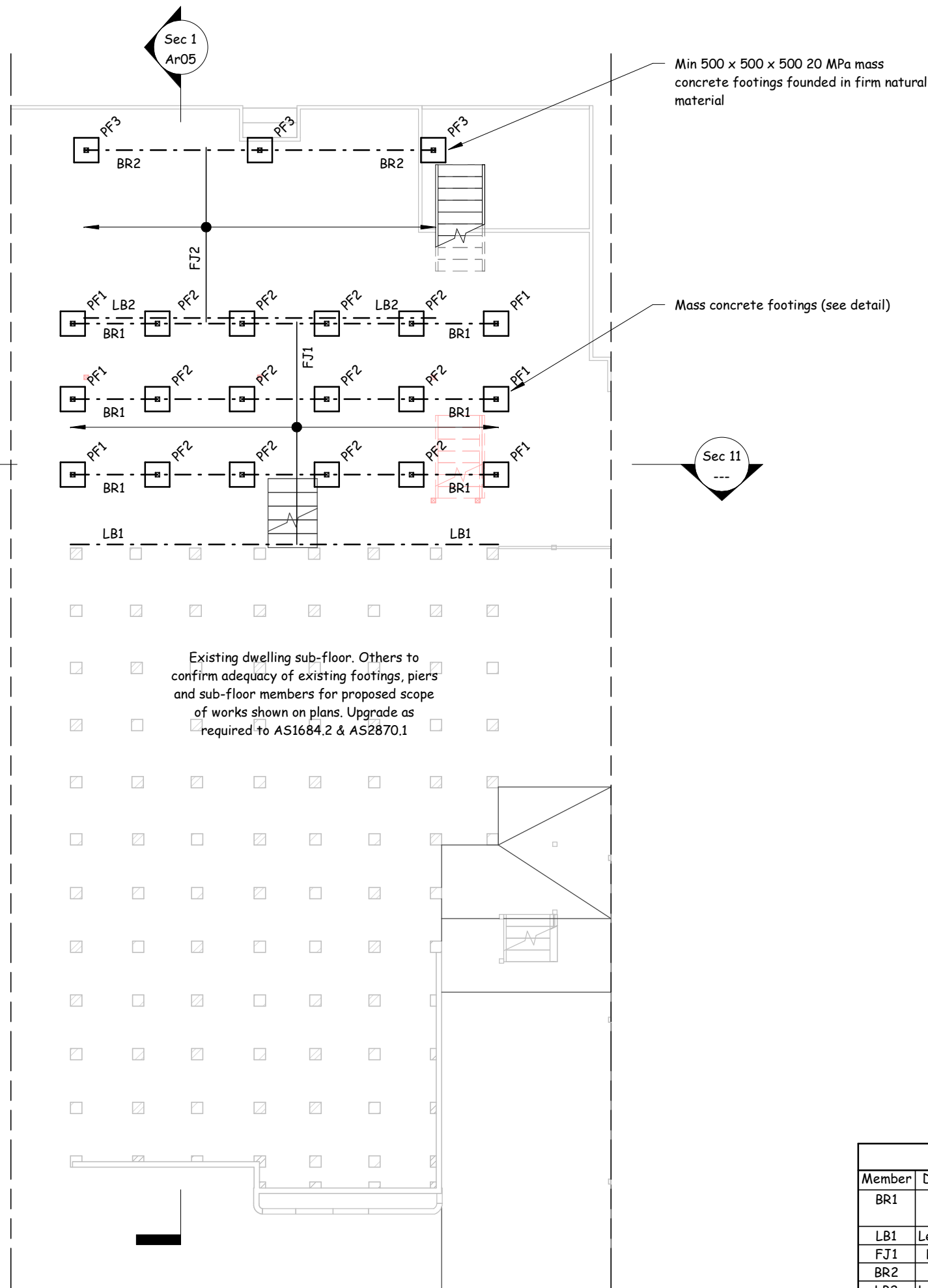
**Address:**

Date Started: 09-04-2018


Drawing No: 318-6428

Sheet: En02

Scale: As indicated @ A3



- General Notes**
1. Bracing and tie-down details to the engineers details and AS1684.2
  2. All timber and steel to be installed and treated to the manufacturers specifications, especially for any exterior applications
  3. All white ant protection to be strictly within the guidelines of AS3660 and installed by a qualified licenced pest control consultant
  4. AJ denotes masonry articulation joint, to be installed to AS 3700 section 4.8 requirements



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I hereby certify that the above mentioned works are structurally adequate for their intended purpose. This certification is limited to the structural elements detailed, and based on the works being carried out in accordance with these structural/civil plans. The structure has been designed in accordance with the following:

- AS/NZS 1170.0:2002: Structural design actions - General principles
- AS/NZS 1170.1:2002: Structural design actions - Permanent, imposed & other actions
- AS/NZS 1170.2:2011: Structural design actions - Wind actions
- AS 4055-2012: Wind Loads For Housing
- AS 4100-1998: Steel Structures
- AS 1163-1991: Structural Steel Hollow Sections
- AS/NZS 1111-1996: ISO Metric Hexagon Commercial Bolts & Screws
- AS 3600-2009: Concrete Structures.
- AS 3700-2011: Masonry Structures
- AS 2870-2011: Residential slabs and footings - Construction
- AS 1684-2010: Residential timber framed construction
- AS 1720.1-2010: Timber Structures - Design Methods
- AS 3959-2009: Construction of buildings in bushfire prone areas
- Building Code of Australia (BCA)

All works to be carried out by a licensed builder in accordance with the current edition of the Building Code of Australia (BCA) and relevant Australian Standards for construction. Based on the above parameters, I hereby certify that the structural components are adequate under the imposed loading provided that they are constructed in accordance with the relevant Australian Standards. I certify that I am a qualified and practising Structural Engineer in accordance with the requirements of the Building Code of Australia and The Institution of Engineers, Australia.

*M Palmer*  
Murray Palmer  
BEng (Civil & Structural) Hons  
Member No: 3798337  
Senior Engineer

Member Schedule (Floor Frame)		
Member	Description	Size
BR1	Bearer	100 x 75 Red Alert Smart LVL, Continuous, OR 100 x 50 x 2.0 Duragal Plus ZB135/135 C450L0
LB1	Ledger beam	100 x 75 Red Alert Smart LVL, Continuous
FJ1	Floor joist	100 x 45 Red Alert Smart LVL @Max. 450 ctrs, Continuous
BR2	Bearer	Re-Use Existing Deck Bearer
LB2	Ledger beam	140 x 45 MGP10 H3, Continuous
FJ2	Floor joist	Re-Use Existing Deck Joist

Footings Plan  
1 : 100



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Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground. Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes. Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary. Materials are under no circumstances to be ordered direct off Additions Plans. Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list. Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.

Wind Class: N2 (W33N) (Assumed)  
Site Class: 'M' Soil Class: 'M'  
Refer to Geotech report for more details

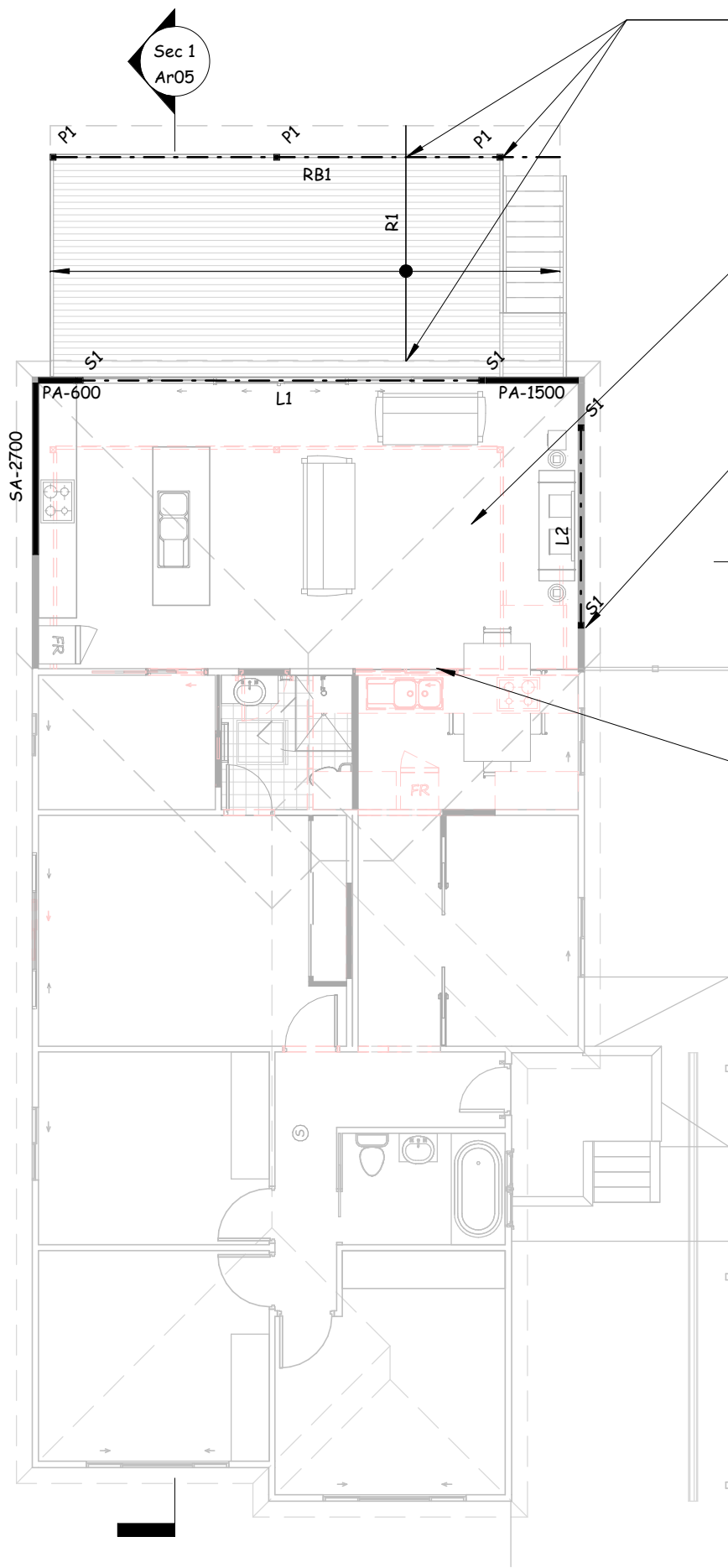
**SURVEY NOTE:**  
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Revision Schedule		
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Additions & Alterations

**Client:**  
  
**Address:**

Date Started: 09-04-2018  
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Scale: As indicated @ A3



The existing deck roof framing shall be constructed in accordance with AS1684.2. Fixings and connections shall be as per Section 9 and manufacturer's specifications

Roof trusses over. Roof trusses, roof bracing and tie downs to the manufacturers specifications and AS1684.

L1/L2 shall have tie-downs as per AS1684.2 Table 9.20(A) - 6 nails each end (typical)

Vision Engineers recommends that the existing roof at this location is supported on a specifically designed girder truss, to avoid the need for large timber beams and studs and possible floor strengthening.

**General Notes**

1. Bracing and tie-down details to the engineers details and AS1684.2
2. All timber and steel to be installed and treated to the manufacturers specifications, especially for any exterior applications
3. All white ant protection to be strictly within the guidelines of AS3660 and installed by a qualified licenced pest control consultant
4. AJ denotes masonry articulation joint, to be installed to AS 3700 section 4.8 requirements

Timber grade	Minimum size for non-loadbearing lintels				
	Span				
	Up to 1200	Up to 1800	Up to 2400	Up to 3000	Up to 3600
MGP10/F7	90 x 45	90 x 45	120 x 45	190 x 45	190 x 45
Hyspan	95 x 36	95 x 45	130 x 36	130 x 45	170 x 45
Smart LVL 15	90 x 42	120 x 35	120 x 35	130 x 58	170 x 58

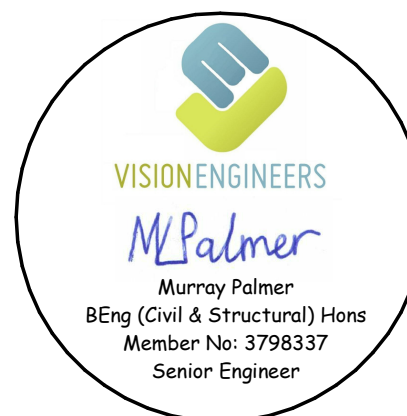
Timber grade	Minimum size for lintels supporting sheet roof up to 3m RLW (N1/N2)				
	Span				
	Up to 1200	Up to 1800	Up to 2400	Up to 3000	Up to 3600
MGP10/F7	2/90 x 45	140 x 35	190 x 35	240 x 35	2/240 x 35
Hyspan	95 x 45	130 x 45	150 x 45	200 x 45	240 x 45
Smart LVL 15	120 x 35	120 x 35	150 x 42	170 x 42	240 x 42

Timber grade	Minimum size for lintels supporting sheet roof up to 4.5m RLW (N1/N2)				
	Span				
	Up to 1200	Up to 1800	Up to 2400	Up to 3000	Up to 3600
MGP10/F7	120 x 45	190 x 35	190 x 45	240 x 45	2/240 x 45
Hyspan	90 x 45	130 x 45	150 x 63	200 x 63	240 x 63
Smart LVL 15	120 x 35	130 x 42	150 x 42	200 x 58	240 x 58

For all lintels in non-loadbearing walls, the fixings shall be nominal as per AS1684.2 Table 9.4

RLW	Tie-downs for lintels supporting sheet roof (AS1684.2 Table 9.20)				
	Up to 1200	Up to 1800	Up to 2400	Up to 3000	Up to 3600
3000	9.20(A) - 4 Nails	9.20(A) - 4 Nails	9.20(A) - 6 Nails	9.20(A) - 6 Nails	9.20(A) - 4 Nails
4500	9.20(A) - 4 Nails	9.20(A) - 6 Nails	9.20(A) - 4 Nails	9.20(A) - 6 Nails	9.20(A) - 6 Nails

Member Schedule (First Floor Joist)		
Member	Description	Size
S1	Studs	3/90 x 45 F7/MGP10, Nail laminated
P1	Post	Re-Use Existing Deck Post
RB1	Roof Beam	Re-Use Existing Deck Beam
R1	Rafter	Re-Use Existing Deck Roof
L1	Lintel	360 x 85 SmartLAM GL17C (Max. 4500 RLW)
L2	Lintel	240 x 63 Hyspan LVL



Roof Plan

1 : 100



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Wind Class: N2 (W33N) (Assumed)  
Site Class: 'M' Soil Class: 'M'  
Refer to Geotech report for more details

**SURVEY NOTE :**

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**Revision Schedule**

Rev	Date	Description
A	08/06/18	Engineering

**Additions & Alterations**

**Client:**

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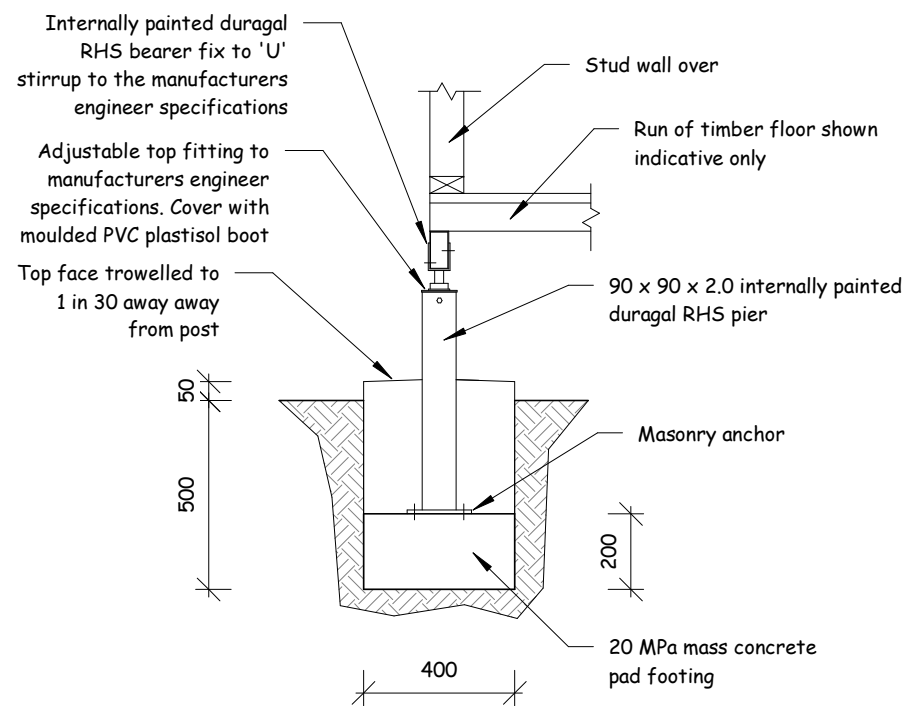
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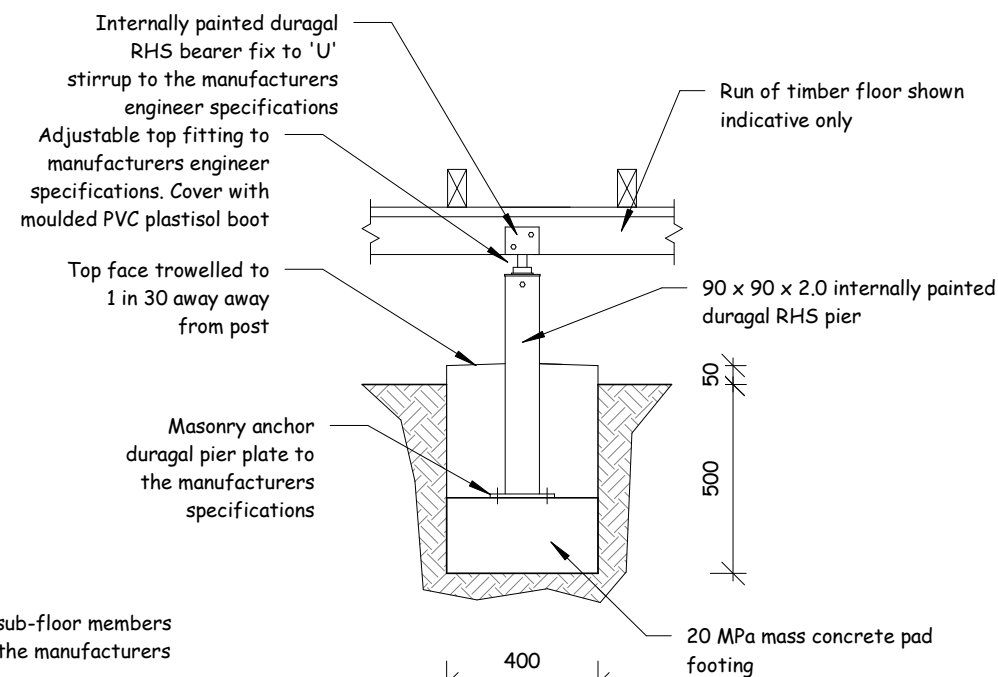
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**PF1 Detail**

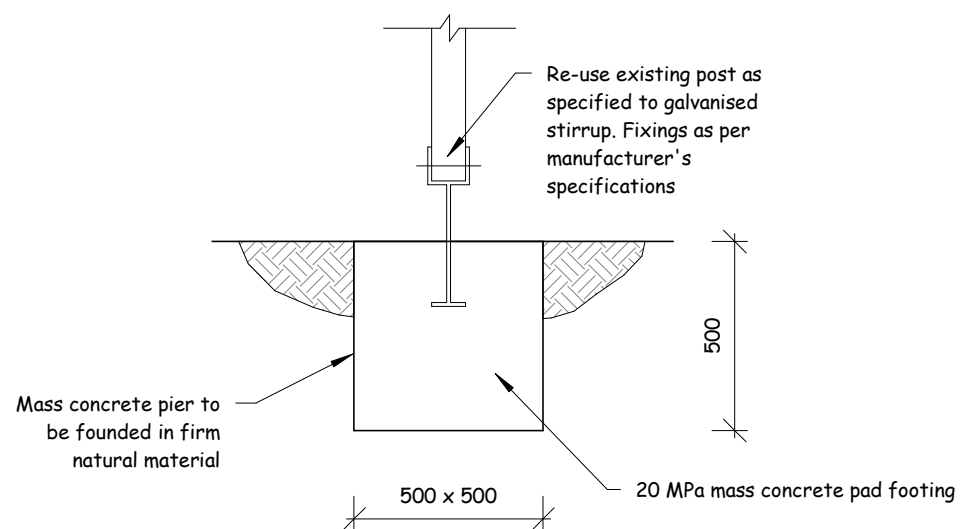
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**PF2 Detail**

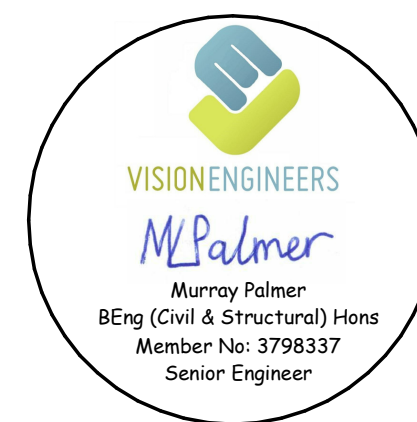
Scale 1:20

Note:  
Duragal adjustable piers, sub-floor members and connection details to the manufacturers specifications



**PF3 Detail**

Scale 1:20



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Site Class: 'M' Soil Class: 'M'

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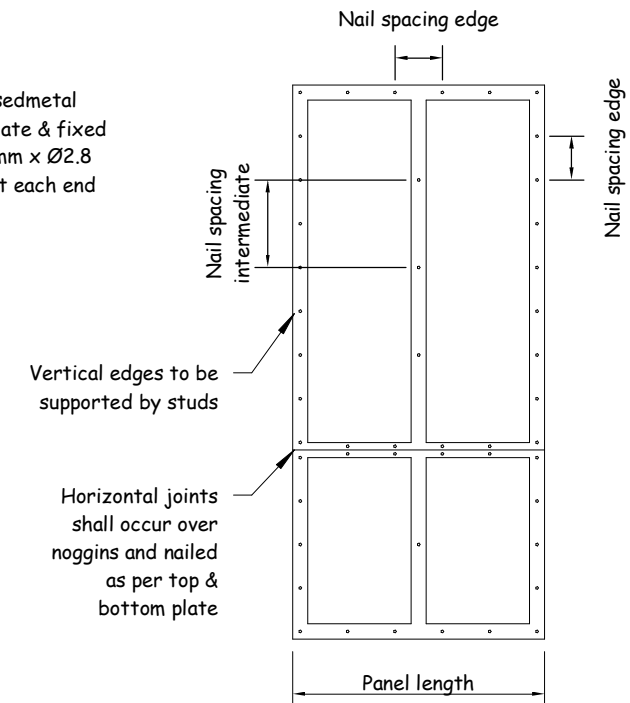
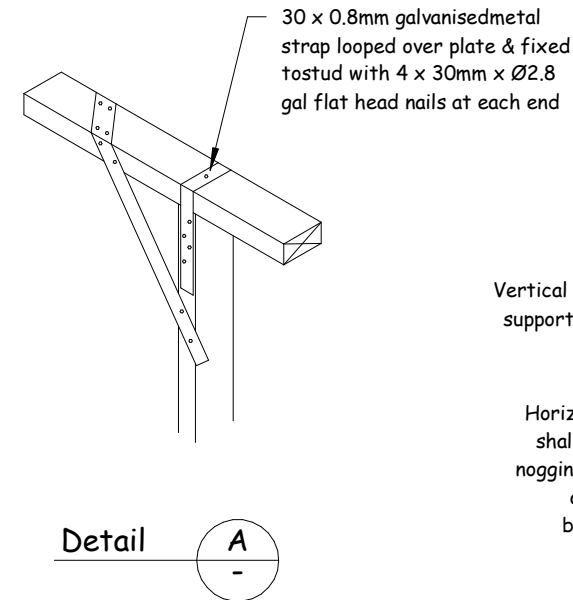
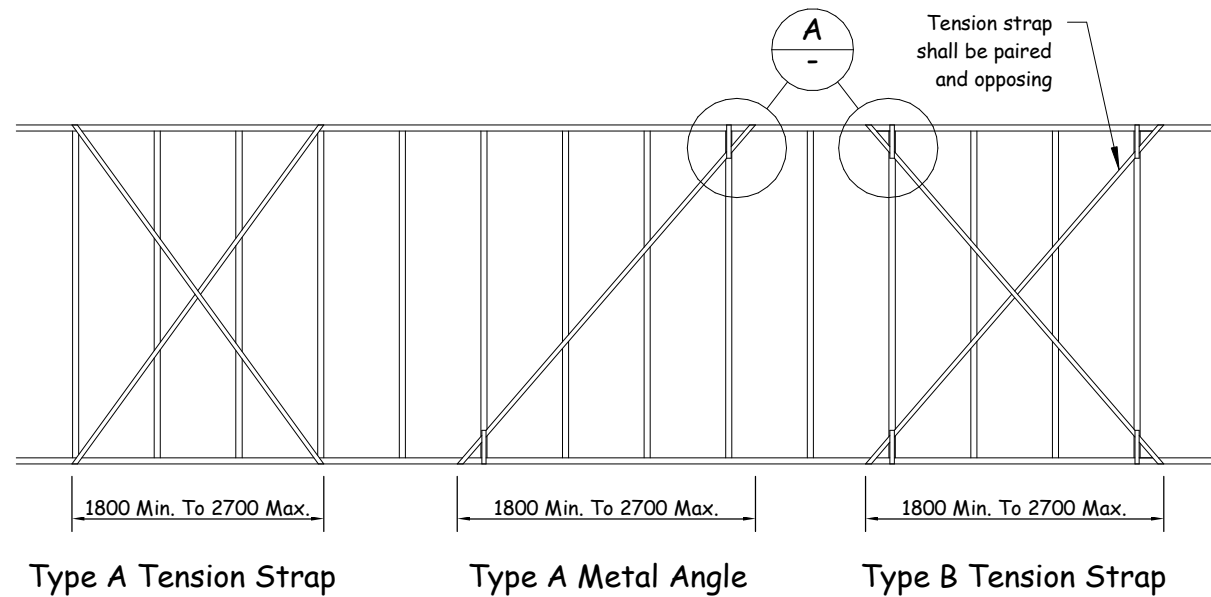
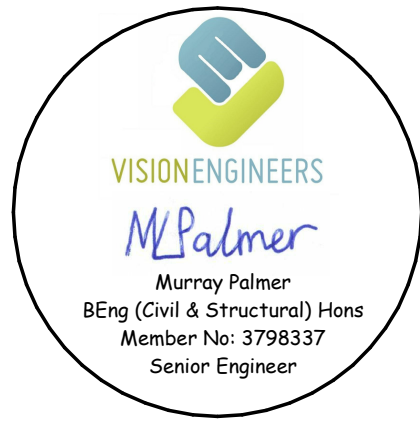
**Address:**

Date Started: 09-04-2018

Drawing No: 318-6428

Sheet: En05

Scale: 1 : 20 @ A3



Sheet Bracing Details

Type A - Sheet Bracing (PA) Specifics

Product	Australian Standard	Type / Grade	Minimum Thickness For Stud Spacing (mm)		Panel Length (mm)	Nail Size (mm)	Nail Spacing (mm)		Special Requirements
			450	600			Edge	Intermediate	
Plywood	AS2269	F8	7	9	900	30mm x Ø2.8 Galv.	150	300	No nogging req'd except at sheet Ends. Nails shall be 7mm from all Edges
		F11	4.5	7					
		F14	4	6					
		F27	3	4.5					
Hardboard (Masonite)	AS2458	G.P.	6.4	6.4	900	30mm x Ø2.8 Galv.	100	300	Nails to be 10mm from vertical Edges & 20mm from Horizontal edges. No nogging req'd Except at sheet Ends.

Type A - Sheet Bracing Notes

- Panel lengths greater than those listed above can be considered as a number of bracing units directly proportioned to their installed length I.E. A 1200mm panel of plywood equals 1200 / 900 = 1.33 bracing units.
- Nails should be driven just below the surface of the sheet using the hammer face only. Nails must not be punched
- Plywood panel lengths of 600mm are equivalent to 1/3 of a type a bracing unit.
- For stud spacing of 600mm c/c where noggins are installed and the plywood bracing panels are nailed to the noggins at 1500mm c/c, the plywood thickness may be as for stud spacing at 450mm c/c.
- PA\* indicates full length available.
- Refer to table 1 on the following sheet for top & bottom plate fixing details.

Type A - Strap Bracing (SA) Specifics

Type Of Diagonal Brace	Material & Size	Nailing Requirements		Special Requirements
		To Each Stud	To Each Plate	
Metal Angle	Galvanised angle, nom. Section 20x18x1.2mm min. Net section 42mm <sup>2</sup>	1x30xØ2.8mm Galv. Flat head nail	2x30xØ2.8mm Galv. Flat head nail	Drill holes if necessary to prevent nail splitting
Tension Strap	Galvanised flat metal tension strapping of min. Thickness 0.8mm & min. Net section of 15.2mm <sup>2</sup>	1x30xØ2.8mm Galv. Flat head nail	3x30xØ2.8mm Galv. Flat head nail	Straps must be properly tensioned

Type B - Sheet Bracing (PB) Specifics

Product	Australian Standard	Type / Grade	Minimum Thickness For Stud Spacing (mm)		Panel Length (mm)	Nail Size (mm)	Nail Spacing (mm)		Special Requirements
			450	600			Edge	Intermediate	
Plywood	AS2269	F8	7	9	900 / 1200	30mm x Ø2.8 Galv.	50 to plates & 150 to edge studs	300	No nogging req'd except at sheet ends. Nails shall be 7mm from all edges
		F11	6	7					
		F14	4	6					
		F27	4	4.5					
Hardboard (Masonite)	AS2458	G.P.	6.4	6.4	900 / 1200	30mm x Ø2.8 Galv.	50 to plates & 150 to edge studs	300	Nails to be 10mm from vertical edges & 20mm from horizontal edges. No nogging req'd except at sheet ends.

Type B - Sheet Bracing Notes

- Panel lengths greater than those listed above can be considered as a number of bracing units directly proportioned to their installed length I.E. A 1200mm panel of plywood equals 1200 / 900 = 1.33 bracing units.
- Nails should be driven just below the surface of the sheet using the hammer face only. Nails must not be punched
- PB\* indicates full length available.
- Refer to table 1 on the following sheet for top & bottom plate fixing details.

Type B - Strap Bracing (SB) Specifics

Type Of Diagonal Brace	Material & Size	Nailing Requirements		Special Requirements
		To Each Stud	To Each Plate	
Tension Strap	Galvanised flat metal tension strap nom. Size 30x0.8mm & min. Section of 24mm <sup>2</sup>	2/30xØ3.15mm galv. Flat head nail	4/30xØ2.8mm galv. Flat head nail	Straps must be properly tensioned & strap must return over top plate & under the bottom plate. The stud nearest to each end of each diagonal strap shall be fixed to the plates with straps or framing anchors 4x30xØ2.8mm nails at each end.

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Site Class: 'M' Soil Class: 'M'  
Refer to Geotech report for more details

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Client:

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**VISIONENGINEERS**

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Wind Class: N2 (W33N) (Assumed)

Site Class: 'M' Soil Class: 'M'  
Refer to Geotech report for more details

**SURVEY NOTE :**

Boundary dimensions are assumed only and taken from site information, others or owners information.  
Confirm boundaries before commencement of construction.  
Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes.  
See schedule of specifications for details.

**Revision Schedule**

Rev	Date	Description
A	08/06/18	Engineering

**Additions & Alterations**

**Client:**

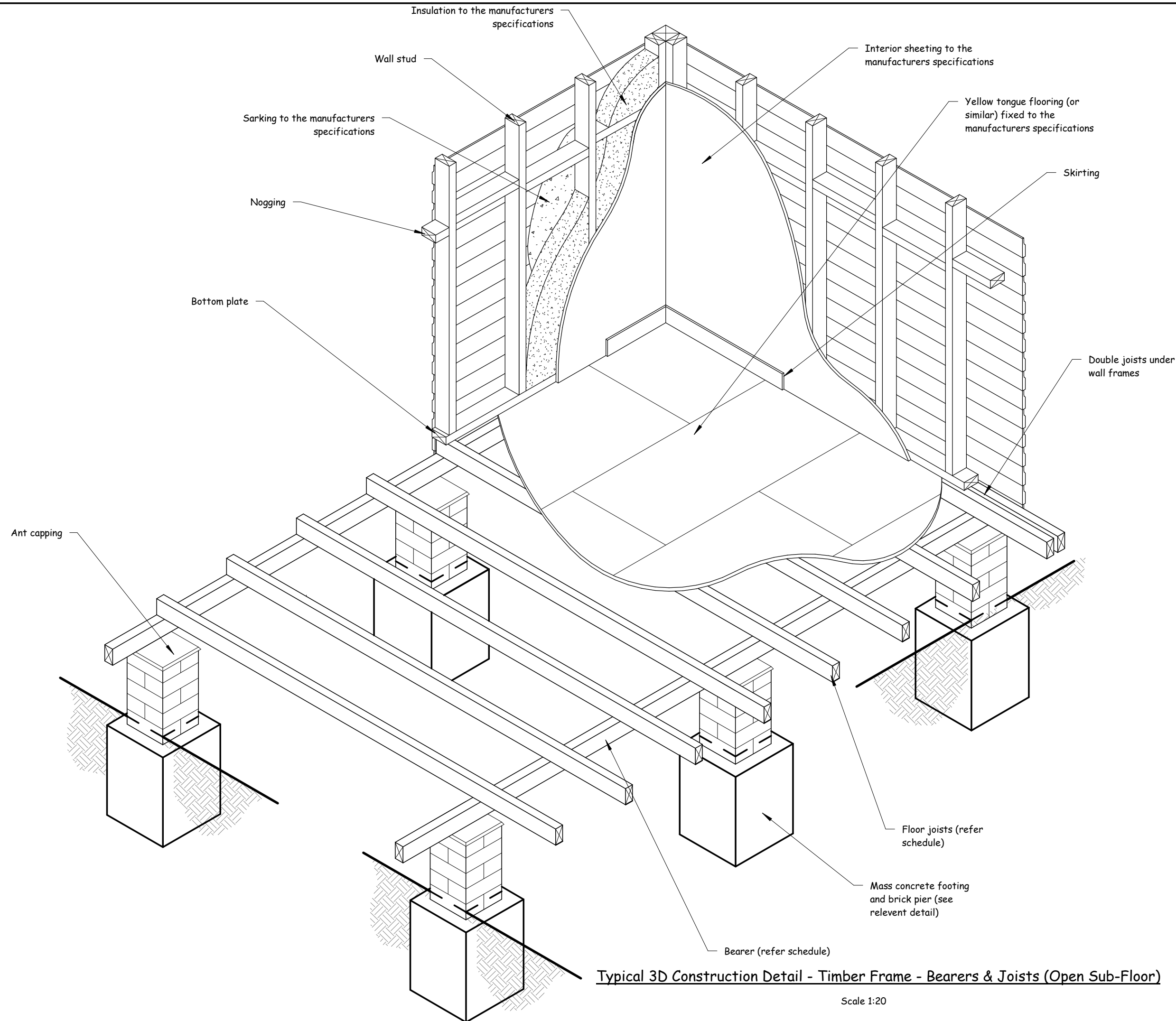
**Address:**

Date Started: 09-04-2018

Drawing No: 318-6428

Sheet: En07

Scale: 1 : 20 @ A3



**Typical 3D Construction Detail - Timber Frame - Bearers & Joists (Open Sub-Floor)**

Scale 1:20



**VISION ENGINEERS**

27 Eighth Street, Adamstown  
W/ (02) 49542422 M/ 0414 011 483

**BUILDERS NOTE :**  
Use Dimensions in preference to scale.  
Site verify all dimensions before ordering Materials.  
Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground.  
Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes.  
Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary  
Materials are under no circumstances to be ordered direct off Additions Plans.  
Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list.  
Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.

Wind Class: N2 (W33N) (Assumed)  
Site Class: 'M' Soil Class: 'M'  
Refer to Geotech report for more details

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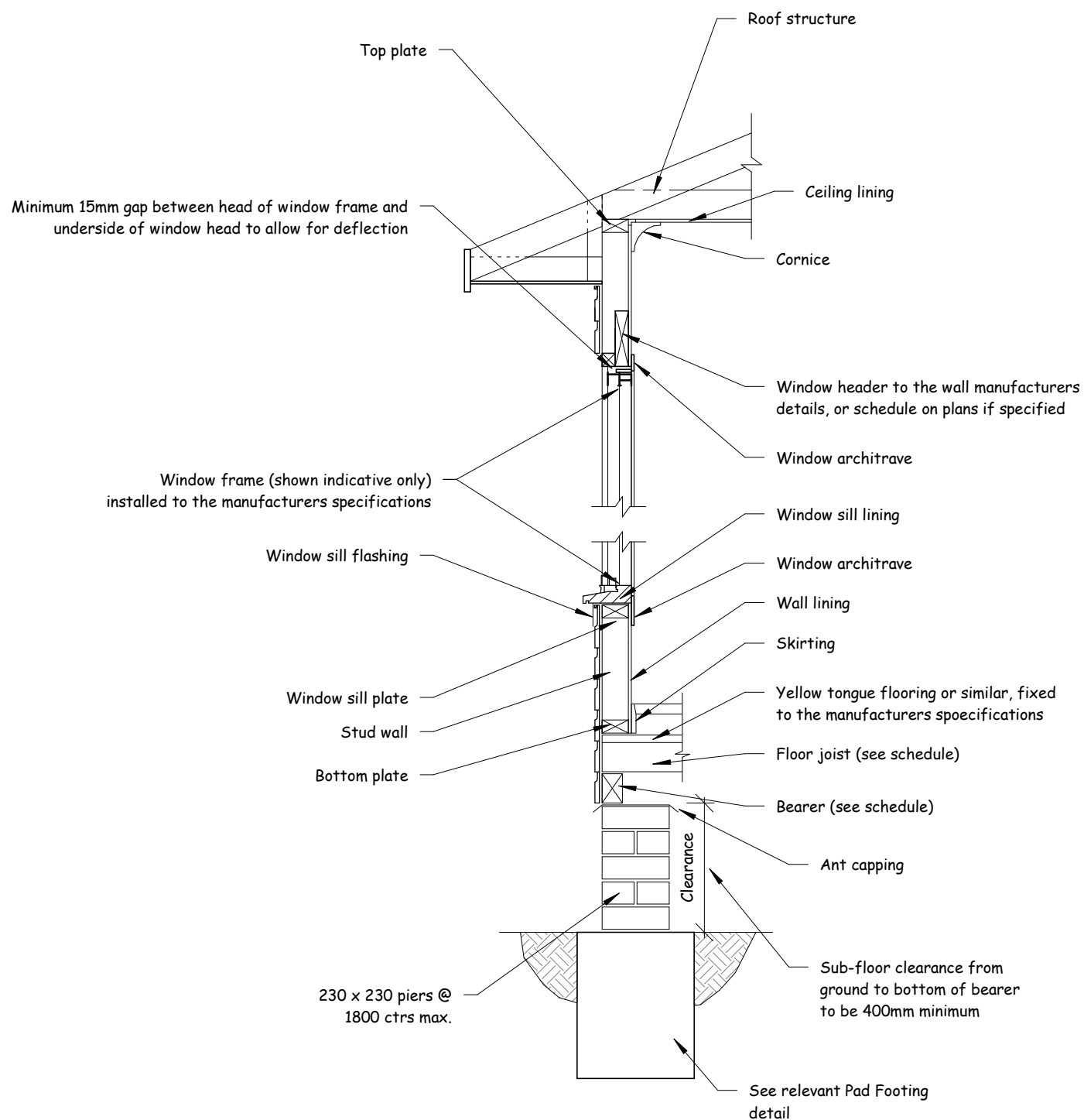
**Address:**

Date Started: 09-04-2018

Drawing No: 318-6428

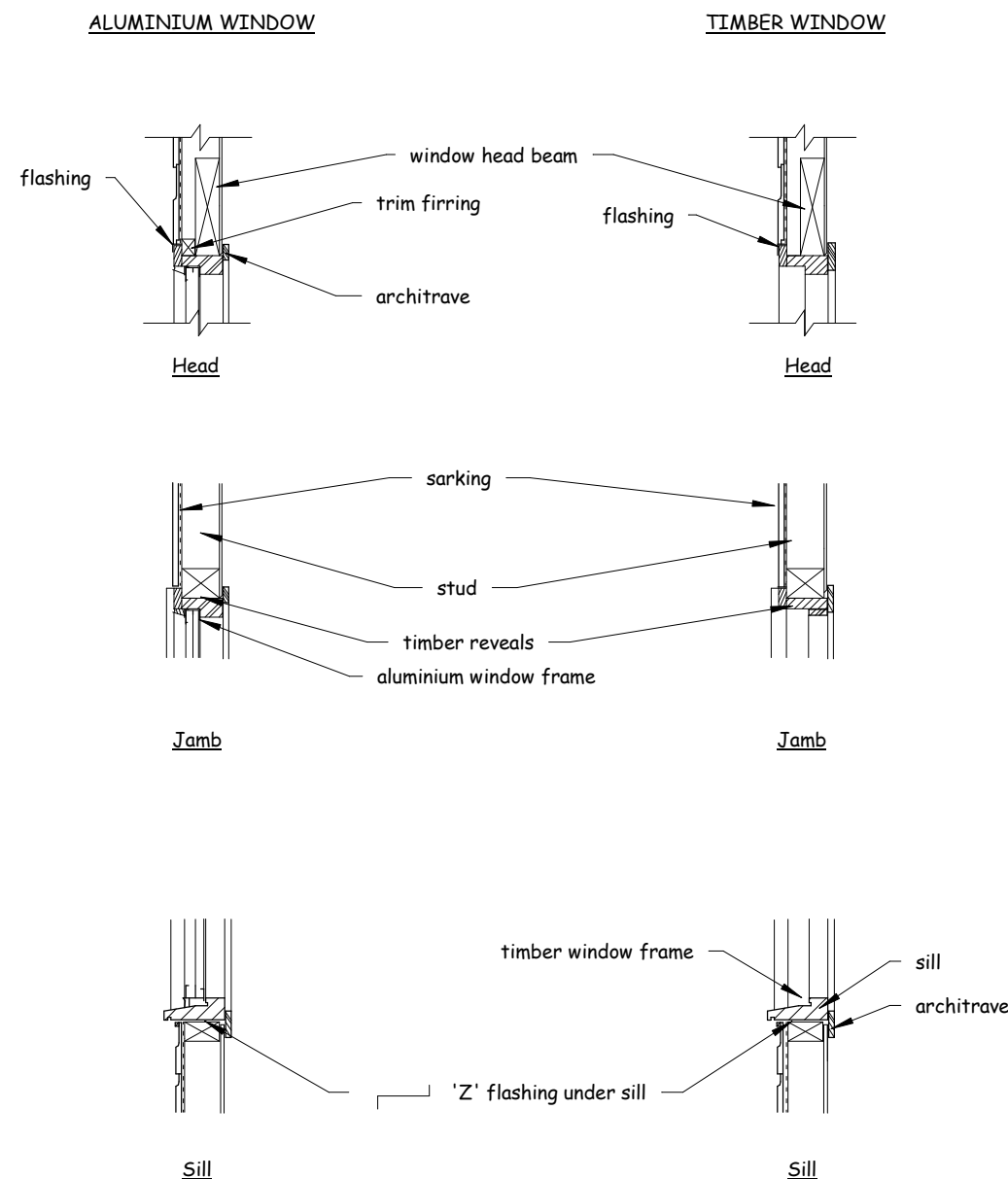
Sheet: En08

Scale: 1 : 20 @ A3



**Typical Wall Section - Timber Frame - Bearers & Joists**

Scale 1:20



**Typical Wall/Window Relationship Details - Weatherboard**

Scale 1:20