Government of **Western Australia**
Department of **Mines, Industry Regulation and Safety**

Building Commission

Documentation for timber framed roof construction

This industry bulletin provides information on the documentation required for timber framed roof construction for domestic single and double storey dwellings, particularly for sites subject to design wind speeds of N1 to N3 (non-cyclonic). Documentation for timber framed roof construction for all design wind speeds are expected to demonstrate a similar level of detail.

Background

A general inspection report (GIR 1) was issued by the Building Commission in April 2016. The report raised concerns into how well sheet metal clad timber roof frames were being constructed in Western Australia. The report is available to view at www.commerce.wa.gov.au/publications/general-inspection-report-one-general-inspection-metal-roof-construction.

This bulletin was prepared in response to Recommendation 2 of GIR 1—*Prescribe minimum standards of documentation for framed roof construction*. This follows consultation with an industry response group which included key industry representative stakeholders. It is presented as a non-prescriptive option to addressing the recommendation, and is intended to provide guidance to building professionals including:

- **Builders:** to ensure clear details are provided to know the correct materials and details required for construction on the site.
- **Building designers:** to ensure the relevant details are on plans and specifications in conjunction with the structural engineer where relevant.
- **Building surveyors:** to ensure there is sufficient information on plans and specifications to demonstrate compliance with applicable building standards.
- **Structural engineers:** to provide sufficient details as appropriate.

Applicable building standards

The *Building Act 2011* includes the requirement for buildings and incidental structures to comply with applicable building standards.

The applicable building standards for timber framed roof construction are those contained in the Building Code of Australia (BCA). The BCA is Volume One and Volume Two of the National Construction Code (NCC). The BCA is a performance-based standard which includes the option of:

- following prescriptive requirements known as deemed-to-satisfy solutions; or
- developing performance solutions to comply with the performance requirements.

The NCC Volume Two contains acceptable construction practices and manuals for housing to provide deemed-to-satisfy solutions. The BCA acknowledges that the acceptable construction practices documented may have very specific limitations and accordingly will not be suitable for all situations.

The performance requirement for timber framing and masonry accessories within the NCC Volume Two is P2.1.1 *Structural stability and resistance to actions*. Timber framed roof construction in accordance with acceptable construction manuals AS 1684.2 (non-cyclonic) or AS 1684.4 (simplified non-cyclonic), AS/NZS 1170.1 and AS 1720.1 or a combination of these satisfies this performance requirement. Masonry accessories complying with AS 3700 or AS 4773 (Parts 1 and 2) satisfy this performance requirement in relation to masonry.

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There is no obligation to adopt any particular option contained in the NCC Volume Two, Section 3 – Acceptable Construction, if an appropriate alternative approach is preferred or better suited to the application.

By reviewing design documentation then completing a certificate of design compliance (BA3), a registered building surveyor is providing confirmation that the building—if completed in accordance with the plans, specifications and documents referenced in the certificate—will comply with each applicable building standard, namely the BCA.

By completing a notice of completion (BA7) and submitting it to the permit authority as required, a registered builder is providing confirmation that the completed works comply with the plans and specifications referenced in the applicable certificate of design compliance and the building standards.

Documentation requirements

To demonstrate compliance with the applicable building standards at the design stage of a dwelling, the items identified in the table below should be provided in documentation.

TABLE 1: Additional details to be included in plans and specifications

Item	Required documentation
Wind classification	• Wind classification to be nominated (site specific).
Tie-down corrosion rating	• Corrosion rating noted (site specific). • Details/notes showing tie down materials requirement relative to the corrosion rating.
Tie-down installation	• Drawing details/notes identifying required embedment and connection details.
Timber roof battens within 1200 mm of roof edges and in general areas	• Timber batten to rafter connection detailed/noted. • Details/notes also provided where using battens thicker than 38 mm.
Metal battens	• Metal batten to rafter connection detailed/noted. • Fixing to be aligned with manufacturer's instructions or as specified by an appropriately qualified structural engineer.
Rafter connections	• Drawing details/notes demonstrating rafter connections to tie down end, underpurlin and ridge.
Strut connections	• Drawing details/notes demonstrating strut connections to underpurlin and wall plate.
Collar ties	• Drawing details/notes showing location and spacing of collar ties.
Timber roof beams	• Type and grade of timber. • Size and location nominated on layout plan (structural/architectural). • Beam tie-down details. • Details/notes provided for fixing of roof strutting beam to support. • Beam to beam connection details/notes.
Steel roof beams	• Size and location nominated on layout plan (structural). • Beam tie-down details. • Beam to beam connection details/notes. • Connection to timber plate detailed/noted.

The GIR1 identified that details regarding the items listed in Table 1 above were lacking from the design documentation for roof construction. Since the GIR1 there has been an improvement in industry on documenting timber framed roof details.

The drawing *SAMPLE-BC01* is provided as an example of the details listed in Table 1 that should be provided in addition to general roof framing documentation in order to demonstrate timber frame roof design compliance with the building standards (see Appendix).

The items listed in Table 1 should be provided in drawing detail, drawing notes or specification. The information may be contained within architectural or structural documents as appropriate.

It is the obligation of the registered building surveyor to exercise due diligence in analysing the documentation they will reference in part three of the certificate of design compliance in order to confirm demonstrated compliance with the applicable building standards.

Limitations

This industry bulletin relates to domestic single and double storey dwellings with construction methods incorporating a combination of cavity brickwork and timber roof framing. The information contained in this publication is not intended for sites considered to be subject to design wind speeds greater than N3 (non-cyclonic) or C1 (cyclonic).

The typical details provided are general in nature and are intended to assist industry professionals. It does not endorse any particular manner in which the required documentation is presented, nor does it intend to endorse one particular method of compliance with the applicable building standards over another.

An appropriately qualified person such as a structural engineer with suitable knowledge and experience in roof design should be consulted for specific queries.

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Building Commission | Department of Mines, Industry Regulation and Safety
Level 1, 303 Sevenoaks Street, Cannington WA 6107
P: Locked Bag 14, Cloisters Square WA 6850
T: 1300 489 099 | F: 08 6251 1501
E: BCinfo@dmirs.wa.gov.au
W: www.dmirs.wa.gov.au/building-commission

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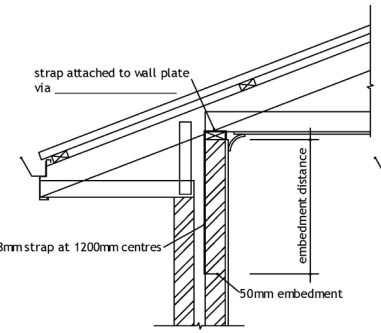
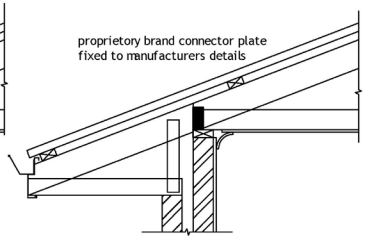
FOR REFERENCE ONLY
This drawing is representative of IB #..

This drawing is an example of a demonstration of the minimum documentation requirements for timber framed conventional roofing

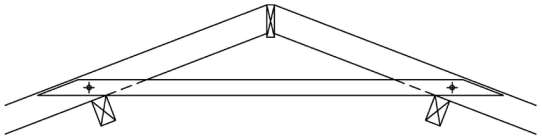
SAMPLE ONLY



Tie-down Installation Detail
scale 1:20

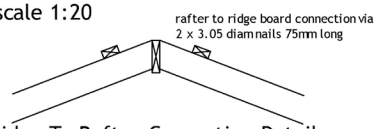


Rafter to Wall Plate Connection Detail
scale 1:20
all nails used for framing anchor and straps to be corrosion protected flathead connecdtor nails

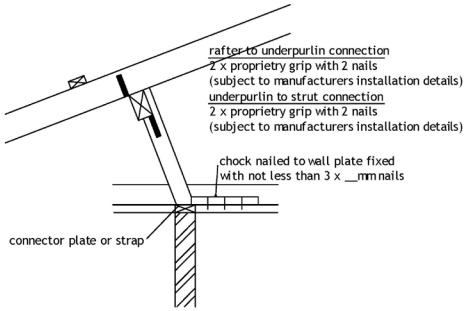


Collar ties to be fitted to every second pair of rafters or at 1200mm cts (whichever is lesser). Collar ties shall be fixed to rafters with one M10 bolt for ties greater than 4.2m long or min 2/75mm hand driven nails or 3/75 x 3.05mm diameter machine-driven nails for ties up to 4.2m long

Collar Tie Connection Detail
scale 1:20



Ridge To Rafter Connection Detail
scale 1:20



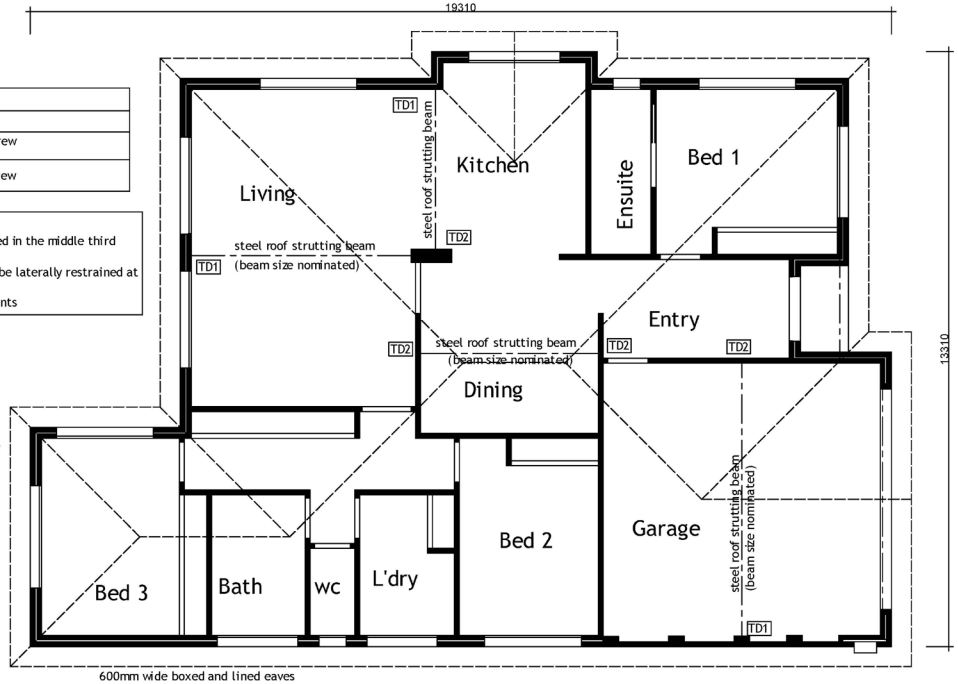
STRUT TO WALL PLATE NOTE
Connection requirements vary depending on the roof area supported (eg the number of underpurlins and frequency of struts or tie-downs) and each roof may need to be assessed to determine adequate connection capacities.

Rafter - Underpurlin - Strut - Wall Plate Connection Detail scale 1:20

TIMBER BATTEN FIXING TABLE	
LOCATION	FIXING
general area	75mm bugle head screw
roof edge	75mm bugle head screw

STEEL ROOF STRUTTING BEAMS NOTES:
* where a point load is applied it should be located in the middle third of the width of the strutting beam
* top and bottom flanges of strutting beams must be laterally restrained at the loading point
* strutting beam must be tied down at support points

LEGEND
TD1 : R10 HOLDING DOWN ROD CAST INTO FOOTING WITH 300 COG
TD2: TIE-DOWN STRAP FITTED THROUGH TIE-DOWN BRICK & EMBEDDED INTO BED JOINT IN 1st COURSE



ROOF LAYOUT AND STRUTTING BEAM PLAN scale 1:100

SAMPLE ONLY

TIEDOWN CORROSION DETAILS

DURABILITY CLASS	EXPOSURE ENVIRONMENT	Material Requirement
(AS4773-2015) Table 4.1	(AS4773-2015) Table 4.1	(AS2699.2-2000) Table 1
R3	Marine	Strap galvanised after manufacture from bare steel sheet and complying with AS/NZS 4680 except that the coating mass shall be at least 300 g/m2 (Z600) on each side

PROJECT / SITE DETAILS

ROOF COVER	METAL SHEET CORRUGATED PROFILE
ROOF PITCH	21 DEGREES
WIND RATING	N2
RAFTER SPACING	900mm

Typical details listed in Table 1 to be incorporated in timber roof design