



Home Builders Health and Safety Forum

Guidance Note Maintaining temporary stability of Simple Roof Trusses during erection

Guidance Notes on Bracing of Roof Trusses

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Guidance Notes on Bracing of Roof Trusses

1.0 Introduction

This guide has been prepared by the by the Home Builders Federation’s Health & Safety Forum in to assist in the methodology for the erection of simple prefabricated roof trusses.

Its purpose is to set out example methodologies of how to maintain temporary stability of prefabricated truss rafters once first lifted onto the wall plate, during the roof truss erection process and prior to installing felt and battens.

This guidance is not intended to be prescriptive but to demonstrate a safe and efficient method which home builders and their contractors could adopt or develop in their safe systems of work for this activity.

Working at Height Control Measures

The illustrations detailed within this guidance document include the use of decking systems below the truss bottom chord as part of the fall prevention system, meeting the requirements for the hierarchy of fall prevention. Organisations are required to undertake risk assessment for all work at heights, and organisations that utilise alternative fall protection/ mitigation measures will need to appraise their impact on the arrangements shown herein

2.0 Scope & Design limitations

Across the Home Building Industry there is a large variety of different house types, and therefore a large range of prefabricated trussed rafters (PTRs) in use. It is therefore acknowledged that this guide does not cover all PTRs in use, but, it aims to set out an erection sequence for ‘Simple Domestic Roofs’.

This will generally be limited to house types where the width of the truss is <9.5m and the height of the truss does not exceed 3.5m.

Fixings & Bracing – correct bracings / materials must be used to ensure design calculations applied in this methodology to ensure stability is maintained.

- Nails used must be 100mm x 4.5mm round steel nails (all fixing points except horizontal brace to truss which are to be screwed). Must be driven so as to achieve a minimum of 50mm penetration into securing timber (i.e. wall plate or trussed rafter)
- Screws (fixing horizontal brace to truss) to be 5mm diameter length to be thickness of truss timbers + 30mm.
- Fixings for truss shoes/clips must be as per manufacturer’s instructions (type, size and number)
- All timber to be minimum C16 structural grade.
- Horizontal bracing timbers on table lift and truss to be 100mm x 50mm
- All other bracing timbers to be 100mm x 25mm

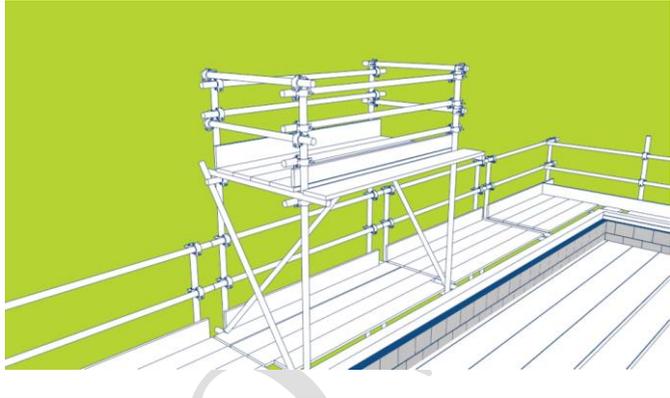
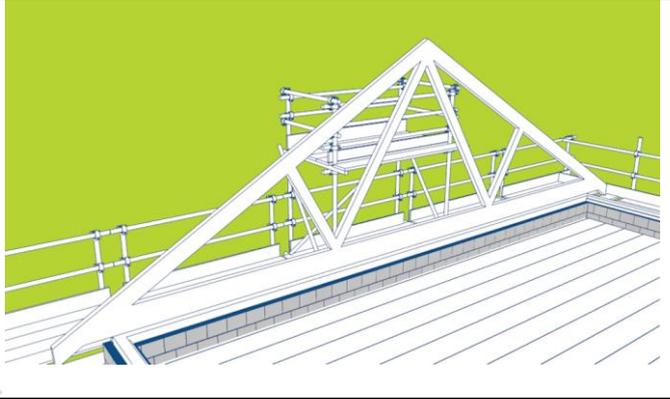
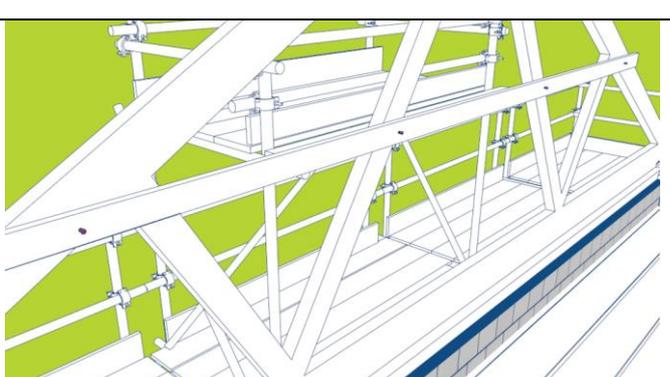
The calculations are also based on a maximum wind speed. Therefore, it is essential that before erecting PTRs that the weather forecast and wind speed are checked (by use of an anemometer or the Beaufort scale – see below). **If gusts of wind in excess of 11m/s (25mph) are likely then trusses should not be erected.**

Beaufort Scale				
Beaufort number	Wind Speed (mph)	Seaman's term		Effects on Land
0	Under 1	Calm		Calm; smoke rises vertically.
1	1-3	Light Air		Smoke drift indicates wind direction; vanes do not move.
2	4-7	Light Breeze		Wind felt on face; leaves rustle; vanes begin to move.
3	8-12	Gentle Breeze		Leaves, small twigs in constant motion; light flags extended.
4	13-18	Moderate Breeze		Dust, leaves and loose paper raised up; small branches move.
5	19-24	Fresh Breeze		Small trees begin to sway.
6	25-31	Strong Breeze		Large branches of trees in motion; whistling heard in wires.
7	32-38	Moderate Gale		Whole trees in motion; resistance felt in walking against the wind.
8	39-46	Fresh Gale		Twigs and small branches broken off trees.
9	47-54	Strong Gale		Slight structural damage occurs; slate blown from roofs.
10	55-63	Whole Gale		Seldom experienced on land; trees broken; structural damage occurs.
11	64-72	Storm		Very rarely experienced on land; usually with widespread damage.
12	73 or higher	Hurricane Force		Violence and destruction.

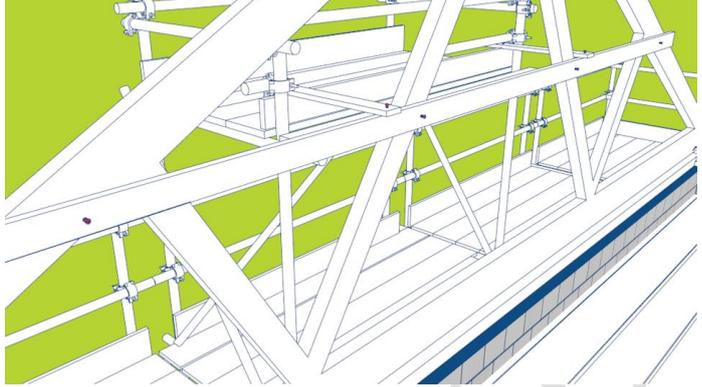
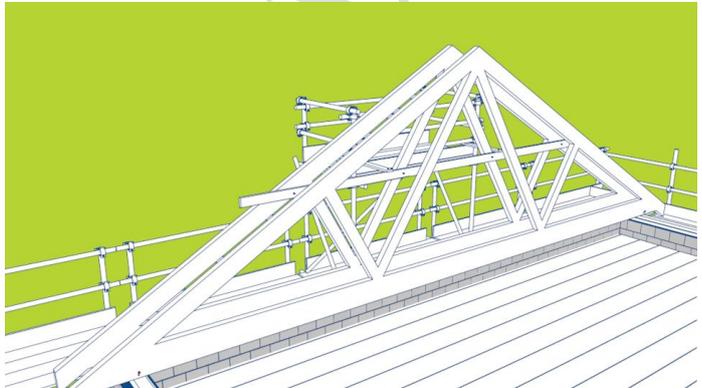
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3.0 Method 1 – Securing Trusses back to Scaffold Framework

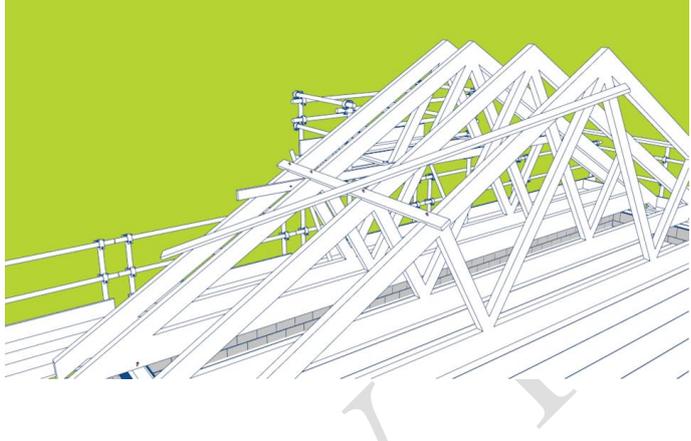
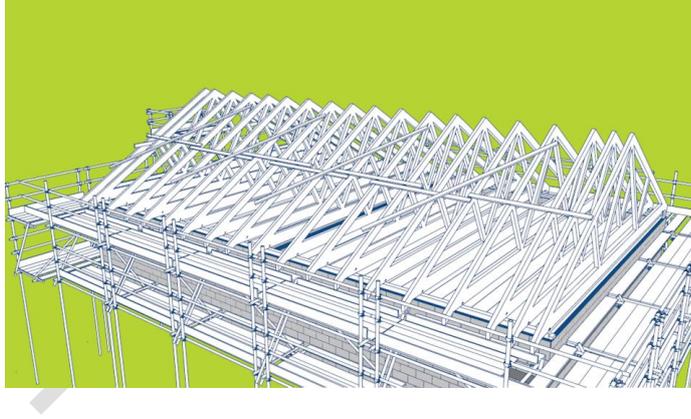
Method requires that trusses are lifted and secured individually completing each truss sequential before lifting the adjacent truss into place.

<u>Temporary Bracing for Roof Truss using an erected scaffold framework</u>		
1.	<p><i>Pre – erection</i> – a scaffold table lift to be erected in accordance with TG2014 or equivalent design. Alternate bays ledger braced and frame to be fitted with a third guardrail as per illustration.</p>	
2.	<p>1st Truss placed up onto wall plate adjacent to Table Lift and held in place to commence securing into position</p>	
3.	<p>1st Truss nailed to wall plate at each end of end of truss with 100mm 4.5mm nails</p>	
4.	<p>Fixing Horizontal Brace 100 x 50 ? Horizontal brace screwed to the truss ensuring minimum 30mm penetration. What height is the brace? – to be level with top edge of table lift toe board ?</p>	

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<p>5.</p> <p>Bracing the truss to the table lift Truss is plumbed and 100x50 bracing timbers are added from the table lift to the horizontal brace. Both end of bracing timber secured by single 5mm screw projecting a minimum of 30mm beyond the brace timber.</p> <p>Is one end of brace screwed to toe board? If so how is toe board secured to scaffold?</p>		
<p>6.</p> <p>Second Truss is then located into position on the wall plate, plumbed up and secured to the previous truss by the bracing on both sides as shown above.</p> <p>Can't see in the image what bracing is used?</p>		
<p>7.</p> <p>Lateral temporary Bracing (100mmx25mm) C16 structural timbers, are added to each side, keeping the brace as close as possible to the horizontal brace on the first truss – these should then be nailed with a single nail to each side of the roof at every truss position.</p> <p>Position of this temporary brace presumably doesn't accord with its permanent position?</p>		
<p>8.</p> <p>Previous steps (6&7) repeated for subsequent trusses until the roof is complete ensuring temporary bracing is continued throughout and the permanent bracing is installed in line with manufacturer's instructions at the earliest opportunity.</p> <p>Operatives can release truss once both horizontal bracing timbers are fixed</p>		

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9	<p>Diagonal Bracing added progressively to ensure trusses braced in line with manufacturer's design</p>	
10	<p>Steps 6 – 9 can then be repeated until the whole of the roof is erected.</p> <p>Image shows external bracing laid over temporary longitudinal tie- is that right?</p>	
NOTE	<p>Access to any high level / ridge bracing should be carried out using a proprietary access system where necessary. EG Safe Truss Access System, DTE Safe Step – please see further information in section 4.</p> <p>Think we need to provide some guidance rather than just manufactures blurb. Might only need a paragraph or two;</p>	

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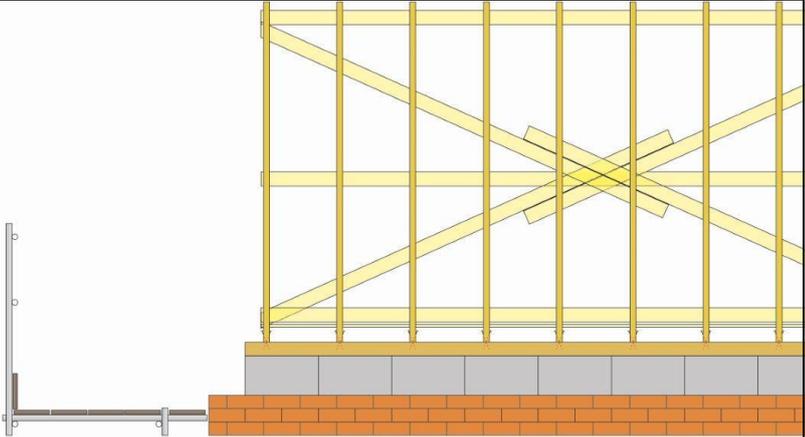
4.0 Method allows pack of trusses to be lifted on wall plate and then spread into position.

Method 2 – Securing Trusses back to Scaffold Toe Boards		
1.	<ul style="list-style-type: none"> Crane to lift required pack of trusses onto the wall plate Using 100 x 25mm timber lengths, fix temporary diagonal bracing from the trusses to the scaffold kick board (ensuring scaffold clip is securely fastened), one either side using 2 number 100 mm x 4.5 mm nails at each end 	
2.	<ul style="list-style-type: none"> Secure the trusses using a temporary brace batten (one at each side) Stagger the nails on the brace batten, this will prevent the brace batten from splitting Release the chains from the truss pack 	
3.	<ul style="list-style-type: none"> Release the 1st truss from the brace batten and position at the far end of the wall plate, this truss will be the end truss in the roof installation Temporary brace the end truss, using the same method as previously stated in section 1 Measure correct overhang for the truss, as stated on design drawing and fix the truss to the wall plate by using 2 number 100 mm x 4.5 mm nails 	

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<p>4.</p>	<ul style="list-style-type: none"> String a line between the end trusses Temporary fix a horizontal brace 100x25 ? (one each side of the trusses) from the truss pack to the newly installed end truss The horizontal bracing should be pre marked to identify the permanent location of the trusses 	
<p>6.</p>	<ul style="list-style-type: none"> Move trusses one at a time from the truss pack into position on the wall plate by releasing the brace batten Temporary fix the trusses using the horizontal bracing 	
<p>7.</p>	<ul style="list-style-type: none"> Process completed for each truss 	
<p>8.</p>	<ul style="list-style-type: none"> Process continued until all trusses in place and braced 	
<p>9.</p>	<ul style="list-style-type: none"> Fix all permanent bracing as shown on design drawing. See access note below for all high level bracing 	

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10	<ul style="list-style-type: none">• After permanent bracing is complete all temporary bracing can be removed	 A technical diagram showing a cross-section of a roof truss system. The trusses are highlighted in yellow. Vertical posts are shown supporting the trusses from below. Diagonal bracing is shown in a cross pattern between the trusses. The structure is supported by a brick wall on the right and a metal beam on the left.
NOTE	<p>Access to any high level / ridge bracing should be carried out using a proprietary access system where necessary. EG Safe Truss Access System, DTE Safe Step – please see further information in section 5.</p>	  Two photographs illustrating roof truss construction. The top photograph shows a worker in a high-visibility vest standing on a wooden truss structure, likely performing bracing or access work. The bottom photograph is a close-up of a wooden truss joint, showing a metal plate and a blue ratchet strap used for securing or bracing the structure.

5.0 High level Bracing Considerations

Following a general increase in the demand for taller roof trusses it has been noted that the ability to access high level longitudinal bracing safely has become more challenging.

With this in mind a number of proprietary systems have appeared in the marketplace to provide some solutions to this problem, information shown below outlines a few examples of such systems which are being implemented across the Industry.

These are shown for information purposes only and the HBF is not associated with and does not endorse any of the listed products.

- [S.T.A System – Safe Truss Access](#)
- [DTE Safe Step](#)

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