



# Trusses Installation Guide

INFORMATION FOR SITE USE

TRUSSES INSTALLATION GUIDE

HOMEBUILDING SOLUTIONS



## Introduction

(General Information relating to Health and Safety issues in Trussed Rafter Construction).

When the Construction (Design and Management) Regulations were published in 1994, a fundamental change in approach was initiated with regard to the attitude toward and significance of issues relating to Health and Safety in the Construction Industry. Since that time, a raft of further supporting legislation has been drafted and published which together now document in great detail the duties, obligations and responsibilities of those engaged in the process of Construction, from members of the original design team to trainee operatives working on site.

In order to fully understand and implement the requirements of these Regulations it is necessary to appreciate and recognise these new philosophies by making the necessary changes in working practices to elevate the profile of Health and Safety issues across the full spectrum of Construction Activities. This can be achieved by undertaking Risk Assessments, designing out hazards where evident, providing sufficient resources at all times, proper training and good levels of communication channels within the design team and on site.

The advice that is set out within the Sections of this handbook which provide assistance relating to issues of Health and Safety is therefore illustrative only and does not form prescriptive advice on any of the matters discussed. It is vital that each project should be approached by the parties involved as a fresh challenge from the point of view of Health and Safety to allow creative and innovative solutions to be developed. Readers of this handbook are therefore encouraged to fully acquaint themselves with the various Regulations, and particular:-

Health and Safety at Work Act 1974  
Construction (Design and Management) Regulations 1994  
Management of Health and Safety at work Regulations 1992  
Provision and Use of Work Equipment Regulations 1992

Construction (Health, Safety and Welfare) Regulations 1996 - (CHSW Regulations 1996)  
Manual Handling Operations 1992  
Workplace (Health, Safety and Welfare) Regulations 1992

## Unloading Trussed Rafters

(Information for the safe unloading of trussed rafters).

When the delivery of trussed rafters arrives on site the contractor(s) involved should be prepared and already allocated sufficient and suitable resources to ensure that trussed rafters are unloaded safely and in a manner so as not to overstress or damage the trusses. This operation will have been subject to a Contractors General Risk Assessment and then detailed in a safe working method statement that has been approved by the principal contractor or the person responsible for Health and Safety on site. Normally trussed rafters will be delivered in tight bundles using steel or plastic bindings. This will often require mechanical handling equipment, such as a forklift or crane, to enable the safe manoeuvring of these large units. The safe working method statement should accommodate any special handling instructions or hazards specified by the designer in his risk assessment for the truss design.

## Site Storage of Trussed Rafters

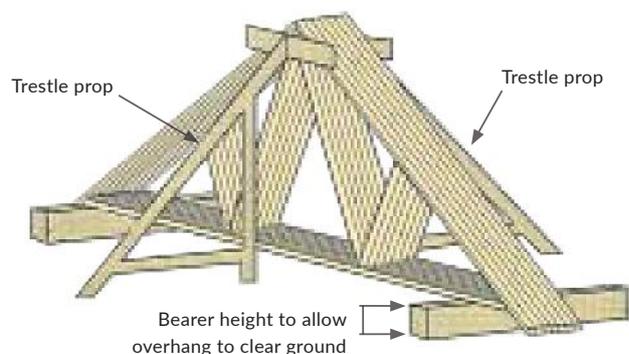
(Methods for the proper and safe storage of trussed rafters on site).

Trussed Rafters can be safely stored vertically or horizontally at ground level or on any other properly designed temporary storage platform above ground level. Whichever method and location is chosen the temporary support should be set out to ensure that the units do not make direct contact with the ground or any vegetation and be so arranged as to prevent any distortion. The delivery of trussed rafters should wherever possible be organised to minimise site storage time, however where longer periods of storage are anticipated then the trusses should be protected with covers fixed in such a way as to allow proper ventilation around the trusses.

When stored vertically, bearers should be positioned at the locations where support has been assumed to be provided in the design with stacking carried out against a firm and safe support or by using suitable props.

## Figure 90

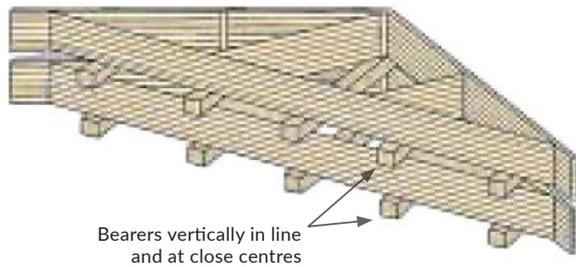
### SAFE VERTICAL STORAGE



When trusses are stored horizontally, level bearers should be positioned beneath each truss node (minimum) to prevent any deformation and distortion. (See figure 91 below).

**Figure 91**

## SAFE HORIZONTAL STORAGE

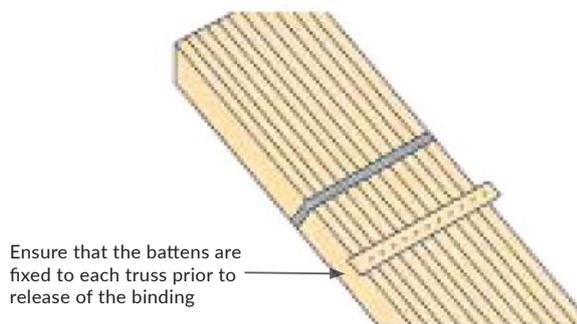


No other method of storing trussed rafters is considered to be suitable, except where specific provision has been made in the design for an alternative temporary support load case.

At such time when it is necessary to remove the pretensioned bindings from a bundle of trusses, extreme care should be exercised. As a precaution against destabilisation of the whole bundle of trusses, it is recommended that prior to the removal of the bands, timber battens are fixed across the bundle at several locations with a part driven nail into every truss. Such a simple precaution will allow the safe removal of single trusses once the steel bands are removed. A suggested arrangement of batten locations for a standard Fink truss is shown in figure 92 below.

**Figure 92**

## DIAGRAM ILLUSTRATING SAFE METHOD OF BREAKING A BUNDLE OF TRUSSES



Alternative details relating to this procedure and which involve the unbundling of the trusses whilst on the back of the lorry should be communicated by the contractor to the truss manufacturer prior to their delivery to site.

## Manual Handling of Trussed Rafters

(Information relating to manoeuvring trussed rafters around the site using manual handling techniques).

With careful consideration manual handling methods can be safely employed to move trussed rafters around a construction site, although the choice of method will depend to a large extent on the particular circumstances of the lifting operation. Such operation will generally be identified in a contractor's safe working method statement that takes account of all the assessed risks and which utilises and refers only to the resources which are available to the site. The preparation of this method statement should be undertaken sufficiently in advance to ensure the adequate planning and coordination of the task and sourcing of any special equipment that may be required. For example, a situation where the manual handling of trussed rafters may be appropriate might be the lifting of single trusses on to residential units not exceeding two storeys in height.

Whatever technique is adopted to manually manoeuvre trussed rafters it is vital that the technique takes full account of any special instructions issued by the designer to ensure that the structural integrity of the units is maintained and that there is no risk of damage to the trusses.

## Mechanical Handling of Trussed Rafters

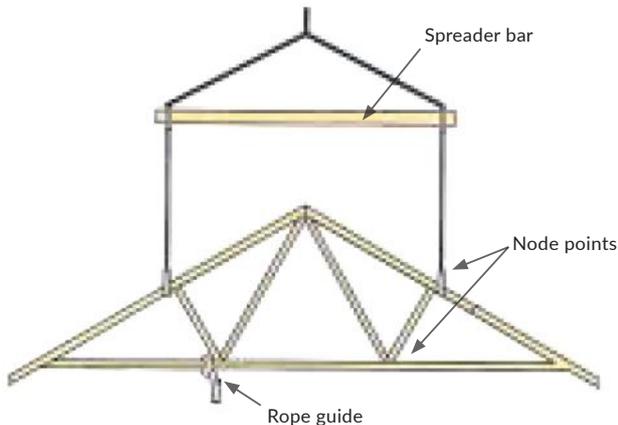
(Information relating to manoeuvring trussed rafters around the site using mechanical handling techniques).

Where it is not possible for reasons of safety or other practical considerations to implement manual handling techniques to manoeuvre trussed rafters, other means that involve the use of mechanical handling or lifting equipment will be necessary. Using such equipment gives the option of being able to move larger and heavier loads and consequently, the ability to raise completely or partially assembled sections of roof that have been pre-assembled at another location (for example, on the ground level superstructure of an adjacent plot). Similar considerations to those identified in the section relating to manual handling remain relevant, although as the size of the loads increase, issues of instability and potential distress/damage to the trussed rafters becomes more critical. For this reason, it is vital that trusses or sections of roof are only lifted at locations approved by the truss designer, such locations being preferably marked on the units at the time of their manufacture. Where appropriate, the use of spreader bars and strongbacks may be required to ensure an even distribution of lifting points.

An example of the use of a spreader bar is shown in figure 93 below.

**Figure 93**

## MECHANICAL HANDLING



Where bundles of trusses are raised to roof level, caution should be exercised in the removal of the restraining bands (see section 3.11 figure 92). Should these bundles of trusses be stored either on a temporary working platform or at eaves level, the contractor should take the necessary steps to ensure that the supporting structure has sufficient strength and that a storage system as illustrated in either figure 90 or 91 is constructed.

Designated slewing areas should be cordoned off and the movement of operatives either restricted or prohibited within this area during all lifting operations.

At all times, strict adherence with the Contractors method statement should be observed.

Where circumstances and design considerations dictate that pre-assembled sections of roof, such as hips etc., (or indeed, complete roofs) are raised in one single lifting operation, particular attention should be given to the method of lifting the assembled sections.

Such large and unwieldy loads require that checks should at least be made regarding the following:

- Prevailing weather conditions, with particular reference to wind speed.
- A survey of obstacles in the slewing area, including scaffolds, towers and overhead services.
- A survey of the accuracy of construction and setting out of the pre-assembled roof structure.
- Underground services locations to avoid damage by the use of large cranes etc.

These sorts of techniques have the potential to save significant amounts of time and money on site whilst additionally offering significant Health and Safety benefits to all employees and personnel, although they generally require early design input and planning to ensure sufficient strength is inherent during the lifting procedure. Typical benefits which may be associated with improvements in matters relating to Health and Safety include:-

The immediate provision of stable sections of roof, away from which infill sections of roof can be constructed, rather than relying on temporary bracing.

- All assembly operations are carried out at ground level and therefore the risk of operatives falling is totally eliminated.
- The risk of operatives being struck by falling objects during an alternative roof level assembly is significantly reduced.

Clearly, there are many other benefits relating to speed, efficiency and the overall costs associated with the construction process.

Mechanical handling and lifting operations are essential where the scope of the works falls outside of simple residential scale projects.

