Correct Use of Scaffold Trusses

Introduction

Trusses are commonly used in the NZ scaffold industry to form bridges on independent scaffolds and to create temporary roof structures. Trusses must be used in accordance with the manufacturers information or in accordance with a design by a Chartered Professional Engineer(CPEng).

Trusses are frequently used incorrectly, which can lead to overloading and failure. Common issues are:

- Trusses not being fixed to supporting scaffold with load bearing couplers (e.g. Right angle couplers.)
- Trusses are being used without lateral restraint or bracing.
- Trusses are not used in accordance with manufacturers information or CPEng design
- Single couplers are used for attaching lacing tubes to the truss chords.

The following information is intended as a guide for using trusses in bridging and temporary roofs, however, the manufacturers information must be used when determining spans and bracing requirements or the structure must be designed by a CPEng.

Bridging

Trusses are often used as a bridge that supports scaffolding above an opening in an independent scaffold. The most common method of bridging is to fix a pair of trusses above the ledgers and connect them to the outer standard and inner standards of the scaffold.

Trusses should be attached to tube and coupler scaffolds and most system scaffolds to the inner faces of the standards, above the ledgers and be connected using right-angle couplers, to each standard at the top and bottom chords of the truss. A pair of connections is required at the supporting standards at each side of the opening and at each standard supported by the trusses.

The length of the truss must be sufficient to span the opening and connect to the supporting standards on either side. Trusses are available in a variety of lengths and depths.

A selected truss must have enough load-bearing capacity to support the scaffolding (dead load), required working platform rating (duty live load) and environmental loads (e.g. wind) above the opening. Aluminium trusses are lighter than steel but have less load-bearing capacity.

Trusses should be used according to the manufacturer's specifications and instructions. If loads cannot be verified, a CPEng must verify the design.

Lacing tubes

The top and bottom chords of the trusses must be tied together by connecting the inner and outer trusses with tubes using right angle couplers. The lacing tubes stabilize the pair of trusses. Lacing tubes should be attached every 1.2m on the compression chords and 2.4m on tension chords or according to the manufacturer's specifications and instructions.

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Plan Bracing

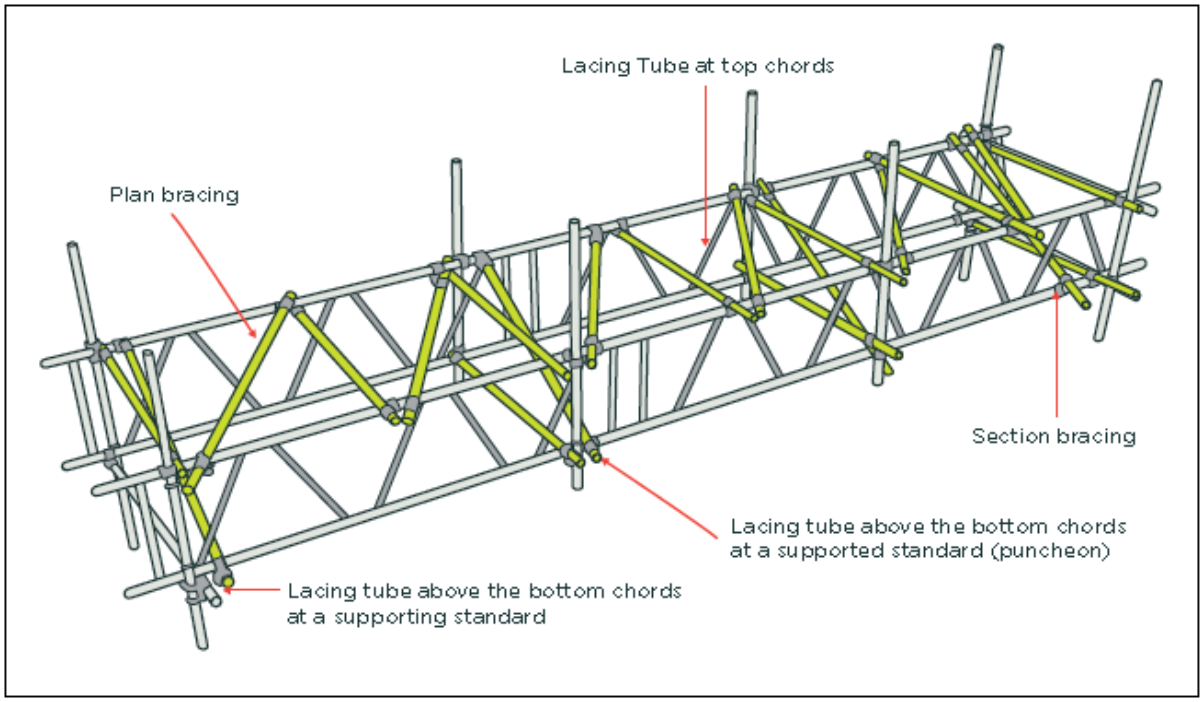
Plan bracing should be fixed between the inner and outer trusses at 1.2 m maximum spacing or according to the manufacturer's specifications and instructions using right-angle or swivel couplers. The spacing of the bracing should match the spacing of the lacing tubes at the compression chords.

The compression chord is at the top of the truss when it spans an opening supported at both ends. In this case, the plan bracing should be within the top third of the two trusses.

The compression chord is at the bottom of the truss when it is cantilevered (i.e. it is supported at one end and in the middle). In this case, the plan bracing should be within the bottom third of the two trusses.

Section bracing

Section bracing connects the inner and outer trusses by connecting the top chord of one truss to the bottom chord of the other using right-angle or swivel couplers. It should be according to the manufacturer's specifications and instructions or at 2.4 m maximum spacing so is typically provided at each standard position.



A pair of trusses acting as a bridge between two pairs of supporting standards

Temporary Roofs

Roof structures must be designed to support all dead loads and environmental loads including loads imposed during erection and dismantle. The structure should be designed by a CPEng unless the loads are known or can be calculated by the scaffold designer. AS/NZS1170 sets out the calculations for determining environmental loads.

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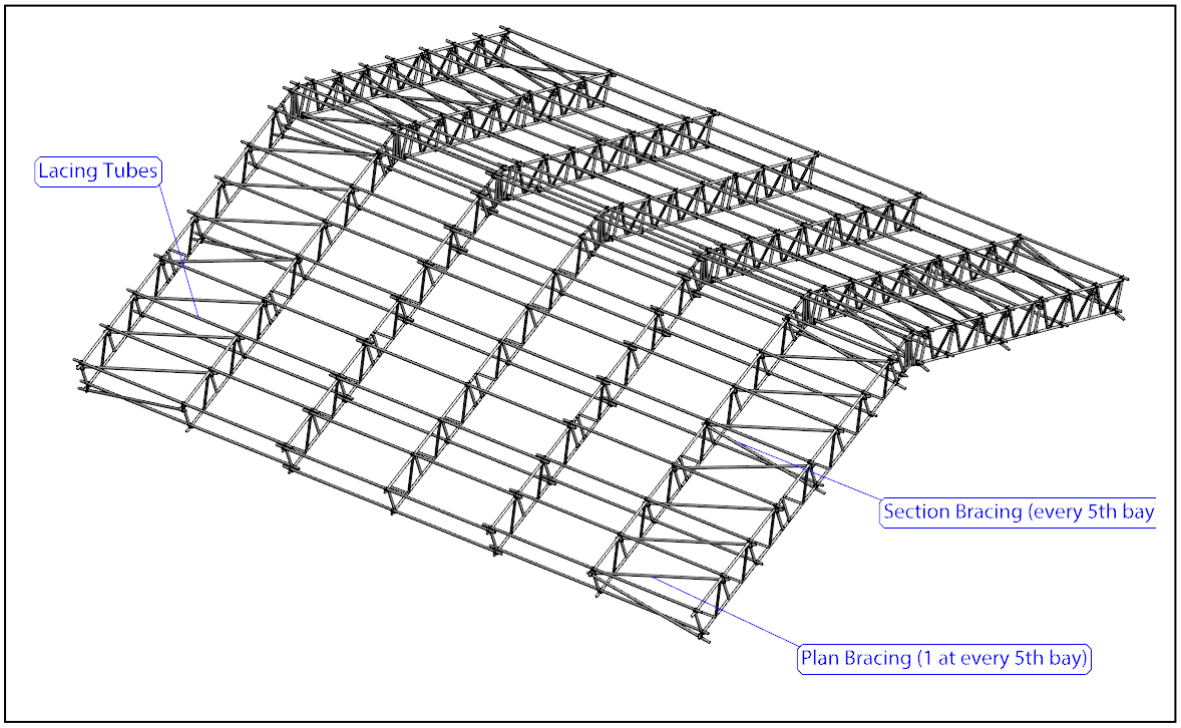
A single truss should not be used to support the ridge of a roof. The ridge should be constructed with two trusses forming a bridge as per manufacturers information and must support dead loads and environmental loads.

Trusses used as rafters in a roof structure must be laced and braced as per manufacturers information to support dead loads and environmental loads.

Trusses used as rafters require section bracing to provide lateral restraint. The brace runs from bottom chord to top chord of adjacent trusses. The spacing of the section bracing will be determined by the roof loads and the manufacturers installation instructions and loading tables. Generally, section braces are fitted every fifth bay.

Lacing tubes are connected to top and bottom chords of the trusses with right angle couplers and run continuously for the length of the roof at the same spacing as the section braces.

Plan bracing will be required to the compression chords. The compression chord of a rafter truss may be the top or bottom chord depending on wind strength and direction. A CPEng. may be required to verify these loads and the design of the roof.



Double pitched roof utilising trusses as rafters.