OLD GROWTH: OUR TIMBER ENGINEERING HERITAGE

Hank Bier, Technical Editor

This issue's Old Growth comes from Trada Bulletin Vol 3 No. 8 of November 1970 and since the photo shows the completed structure, it would have been designed around the time that Trus-Joist Corporation in USA was born, with the development of tubular metal webbed trusses. It is nice to see the New Zealand was also at the edge of these developments.

COMPOSITE STEEL AND TIMBER SPACE TRUSS*

A wedding of steel and timber occurs every now and then, though surprisingly many people have the idea that the two are mutually antagonistic. It just isn't so - but timber can do a few things that steel can't, and vice versa. Let's leave it at that.

Here is something new — a composite timber and tubular steel truss designed in the office of the chief structural engineer of the Ministry of Works (Mr O.A. Glogau) for the gymnasium of the Paremoremo Maximum Security Prison.

"A truss of this type is of more pleasing appearance than a timber truss with lapping members at the joints such as are normally required for a truss of 80' span, only 5' high and spaced at 1,3' 4" centres. In any case a timber space truss cannot be formed by conventional means. Subject to the availability of suitable timbers a composite truss uses less imported material than a full steel truss," writes Mr Glogau.

"Top and bottom chords for the truss described were two 8" x 4" dressed timbers supporting an ex 6" x 2" dressed diagonally sarked roof. Web members were 2" x 2" x 0.192 R.H.S. The longest available lengths of timber should be used for the chords to avoid the very much larger plates required in positions where they must be spliced. The triangular shape results in only half the number of bottom chords being needed for a given spacing of top chords.

"The thickness and available length of timbers for diagonal sarking influences the maximum spacing of the top chords. In diaphragms staggered lapse of sarking are required but this continuity of sarking also reduces its deflection and thus allows wider spacing of supporting members. The sidewards leaning web members stabilise the bottom chords against compression buckling under reversing loads such as can be caused by wind suction on relatively light roofs.

"No particular difficulty was experienced during the construction but the specification should make it clear which sub-contractor (timber or steel) will make his shop floor available for assembly of the composite trusses.

"The trusses were precambered 8½". The design of the joints must involve careful examination of the load path through the various splice plates and connections to avoid or allow for bending stresses, particularly in the horizontal portion of the splice plates. Similarly the balance of forces in the joints of the top chord, including those during the erection stage prior to placing of the sarking, is an important consideration with this type of truss."

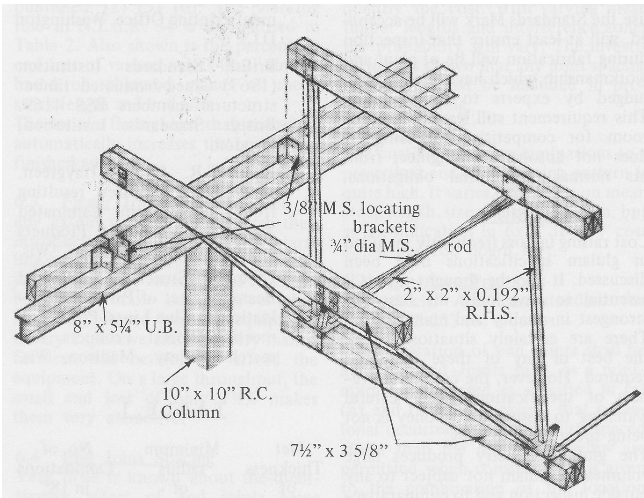

Figure 1. An isometric of the end of a truss.

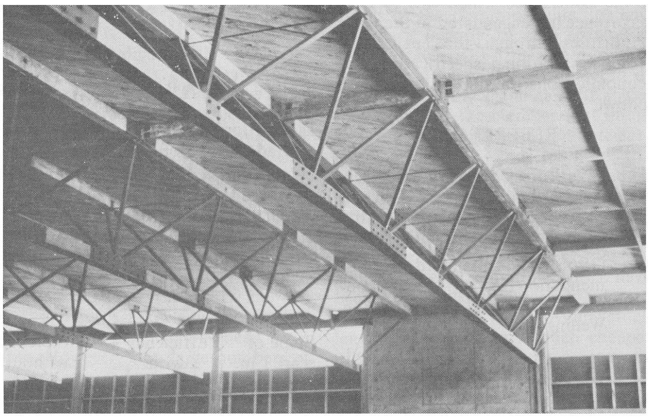

Figure 2. The completed structure.

* *Published in Timber Development Association Bulletin Vol. 3, No. 8, 1970.*