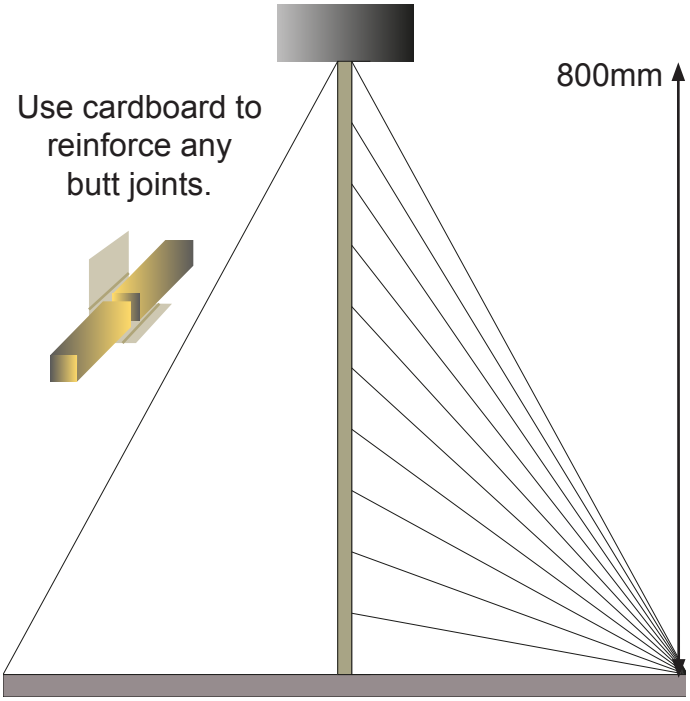
# Make and Break

www.stephenhall.org.uk/mb



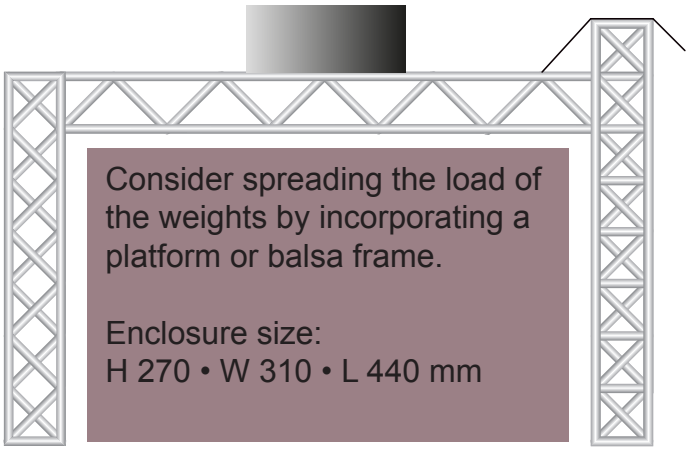

Trusses provide a good strength to weight ratio for balsa wood bridges.

If a flat bridge is loaded, the elements touching the corners of the tables will be amongst those that suffer the greatest stress.

This can be alleviated by constructing the bridge with a slight curve and providing cardboard reinforcement at the joint so that there is better weight distribution at maximum load.

Increasing the height of the truss will improve rigidity but may cause instability when loaded from above.

Inverting the truss would reduce this tendency and could then include some cotton suspension.

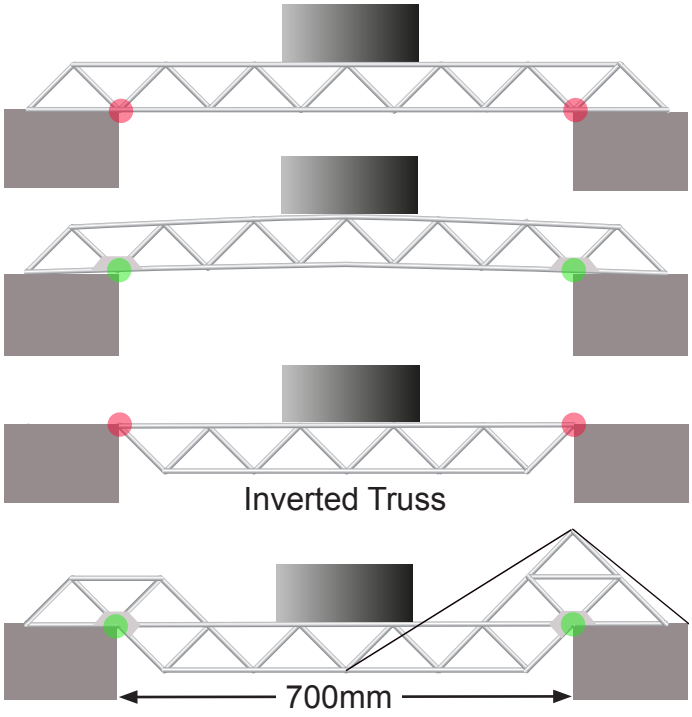



Long elements in compression fail by bending rather than crushing. The compressive force resisted by an element is inversely proportional to its unrestrained length squared (Euler).

The restraints to the right of the tower would theoretically enable the tower to resist 100 times the force compared to the single restraint on the left. Unfortunately the angled restraints also apply considerable downward forces.

These restraints would need to be repeated around the tower, in a minimum of three equally spaced locations and tensioned very carefully.

Bracing of a tower provides strength and rigidity, and should always incorporate triangular and symmetrical support for maximum effect.




An enclosure would need to incorporate the best elements of the towers and bridges to perform successfully.

Increasing the height of the supporting frame would allow cotton to be used in tension, a highly recommended construction strategy.

Although the bracing on the left is symmetrical, it may fail due to the diamonds being compressed and spreading horizontally.

Don’t exceed the maximum 200g model weight.