

## How to reinforce, strengthen and support your bough-type shelter



### REINFORCING THE POST / BEAM / RAFTER JOINTS

Fencing wire can be readily found in most communities and outstations. You can use fencing wire with a minimum number of tools to substantially reinforce a shelter.



Fabricated flat bar brackets can be replaced by old leaf springs (photo B).



These can be found at the tips (or town dumps) of most communities. Leaf springs can be easily cut with an angle grinder but are extremely difficult to drill (and drill bits out bush are like gold). If used, consider wiring in place rather than using screws. If the bar is cut from the middle part of each leaf then there is already a bolt hole in the centre which can be used for fixing down into the post (photo C).



A strap cut from any scrap sheet metal or roofing sheet, fixed with 30mm clouts, can be used on top to tie the members together instead of screws through the bar (photo D).

### BACKGROUND / OVERVIEW

On many remote Indigenous communities, outstations and town camps you can find shade shelters, usually of the type described as a Bough Shelter.

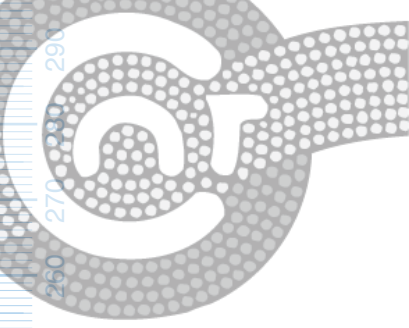
Bough shelters (or bower shelters) are an important structure on communities as they provide an area away from a family's house where the community members can meet and socialize. They come in many forms from simple shelters made from locally found trees and branches and covered with grass (photo A) to more complex steel hexagonal or octagonal structures clad with colour bonded corrugated iron sheets.

In this BUSH TECH we offer some suggestions on how to reinforce and strengthen your Bough shelter. For this purpose we will focus on an octagonal, pitched structure made of round Perma-pine poles, the type found on many communities and outstations; however the same principles can be used on any shape of shade shelter.

### CHECKING THE POSTS

If the posts are set into the ground to a sufficient depth (min. 800mm), they rarely need to be concreted into place as the earth around the posts has been compacted by years of rains. However, in soft or sandy soils, two-three bags of pre-mixed concrete per hole is recommended.

If there are indications of white ant damage to the posts they will need to be replaced. Vehicle damage to posts is not uncommon and would be another reason for post replacement. If the posts are solid, the connection between the posts, beams and /or rafters is the most important thing in making the structure solid.

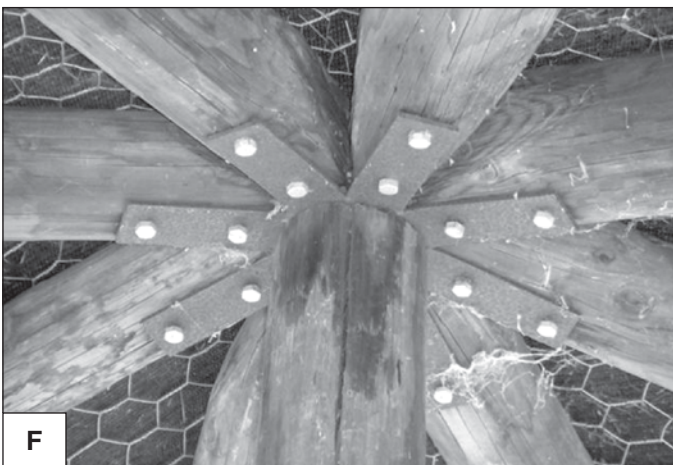


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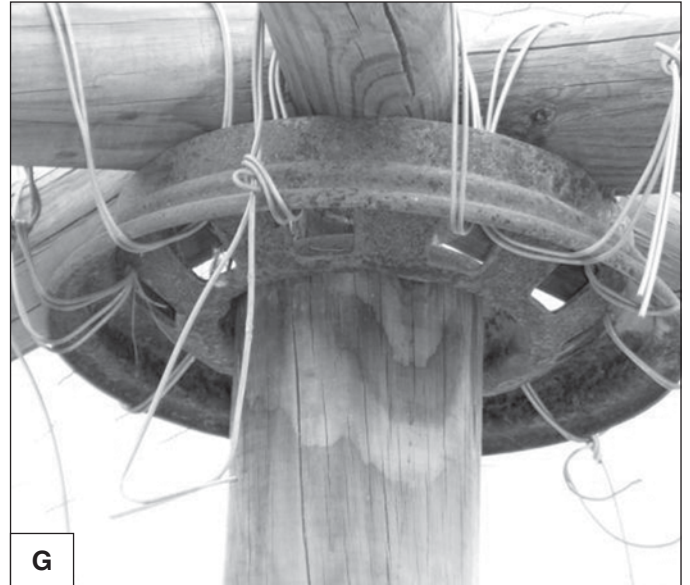


The poles can then be wired together using a Cobb & Co. hitch (photo E).

### “REINFORCING THE APEX JOINT



The connection at the top of the bough shelter, where the rafters meet the centre post is the apex joint. This can be reinforced by a complex fabricated steel apex bracket, which requires high level welding and set-out skills as well as coach screws (photo F).



This connection can also be reinforced using items sourced at the tip, such as the wheel rim shown in photo G.

The wheel rim does not require fixing to the centre pole as the weight of the eight poles plus the roofing material will hold it down. If however, wiring is required, two holes drilled through the post approx. 200mm below the rim can be used for threading the wire through and then up to the slots in the rim, in a similar way as shown in photo E. Each rafter can then be attached to the rim using a Cobb & Co hitch.

### BRACING

Octagon-shaped (eight-side) and Hexagon-shaped (six-side) shelters are self bracing due to their triangular configuration. However, square and rectangular shade structures should be checked for adequate roof bracing. To make these types of roofs stronger, try diagonal bracing in a crisscross pattern with either hoop iron or fencing wire. This will vastly improve the stability of the structure.

Further information can be accessed by contacting the Centre for Appropriate Technology on 08 89596100.

BUSH TECH REFERENCES:  
BUSH TECH NO. 31  
BUSH TECH NO. 43  
BUSH TECHS can be downloaded from [www.icat.org.au](http://www.icat.org.au)

OUR PLACE MAGAZINE REFERENCES:  
Our Place number 34