

# GETTING THE DETAILS RIGHT

## Design Notes – Glulam Timber Structures

Owen Griffiths<sup>1</sup>

**These notes have suggestions for:**

- Manufacturing functional products
- Achieve Cost effective and practical timber solutions

**To assist:**

- Concept Designer
- Architect
- Engineer
- Manufacturer
- Constructor

### Manufacturing Specifications and Standards

**Use Appropriate Specification**

- NZS 3606 is Dead !!
- No More No 1 Framing, Engineering etc
- Glulam – ASNZS 1328

### Design Values

Some specifiers are still using NZS3606 as the current code for manufacture of Glulam. This has been replaced for some time by the joint Australian and New Zealand Code ASNZS1328.

In specifying the grades from which Glulam beams are manufactured some designers are still using non current grades such as Engineering and No 1 framing. These have been replaced by the GL grades detailed in ASNZS 1328.

**TABLE 1.2**  
**CHARACTERISTIC STRENGTHS AND ELASTIC MODULI FOR GLULAM GRADES**

Glulam Grade	Characteristic strengths (MPa)				Elastic moduli (MPa)	
	Bending $f'_b$	Tension parallel to grain $f'_t$	Shear in beam $f'_s$	Compression parallel to grain $f'_c$	Short modulus of elasticity parallel to the grain $E$	Short duration modulus of rigidity for beams $G$
GL18	50	25	5.0	50	18500	1230
GL17	42	21	3.7	35	16700	1110
GL13	33	16	3.7	33	13300	900
GL12	25	12.5	3.7	29	11500	770
GL10	22	11	3.7	26	10000	670
GL8	19	10	3.7	24	8000	530

**1.4.2.3 Manufacturer's grades** Manufacturers may opt to declare non-standard properties in excess or in deficit of GL values.

**1.4.2.4 Custom specification** As an alternative to the GL grades described in 1.4.2.1 and tables 1.1 and 1.2, glulam meeting the requirements of AS/NZS 1328:Part 1 may be manufactured to a custom specification.

<sup>1</sup> Owen Griffiths, Marketing Director, McIntosh Timber Laminates Ltd

**Other codes relevant to developing Glulam designs are:**

**Finger Jointing – ASNZS 1491**

This controls manufacture of end joints in lamination.

**Preservative Treating – ASNZS – 1604**

Careful note should be taken as to the limitations of H3 penetration achievable using LOSP treatment. While this is satisfactory for H3.1 it does not provide the greater protection required for external use. Where LOSP is used for beams exposed to weather ASNZS 3602 calls for LOSP treated beams to be protected with a paint coat in order to comply with durability requirements in exterior situations.

In this case CCA treated material provides the required protection. CCA treatment is carried out on laminates before gluing.

**Use only licensed manufacturers**

Of utmost importance in using Glulam members is the need to specify product supplied by Licensed manufacturers. This is of particular importance bearing in mind liability issues if non licensed product is used in structural applications.



AS/NZS 1491  
LIC. No. 2354  
AS/NZS 1328  
LIC. No. 2061

**Cost Effective Solutions**

Some basic considerations in achieving the most cost effective options in Glulam detailing.

Choosing deeper narrowing members can save up to 50% volume in comparison to wider shallower selection.

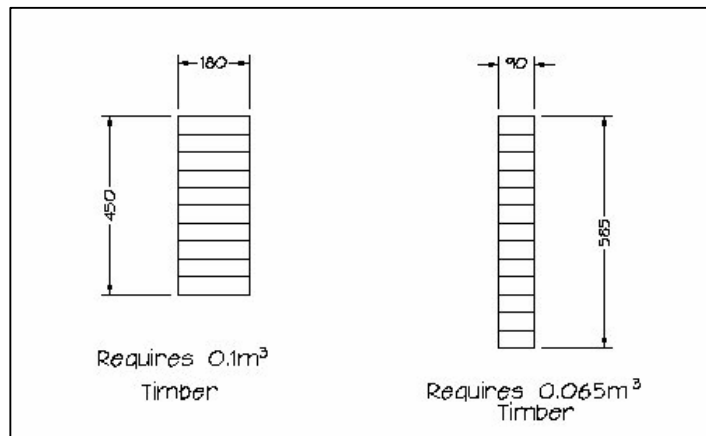


Figure 1

The instability that might result from deep slender members can be controlled by careful detailing of stability struts or dropped purlins.

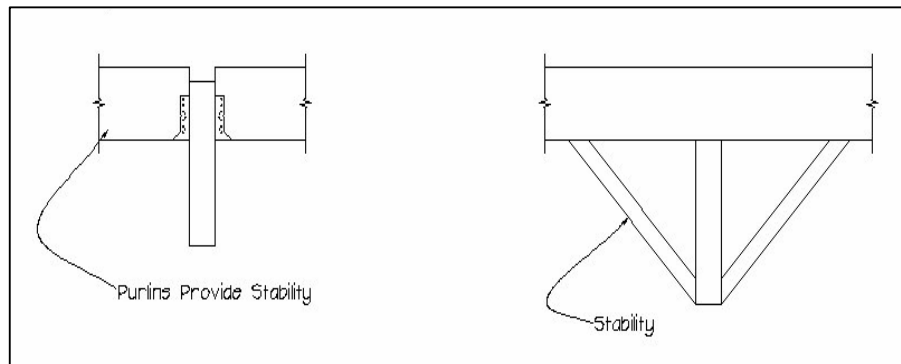


Figure 2

## Functionality Cost Savings

The design depicted in the lower diagram proves a 40% cost saving.

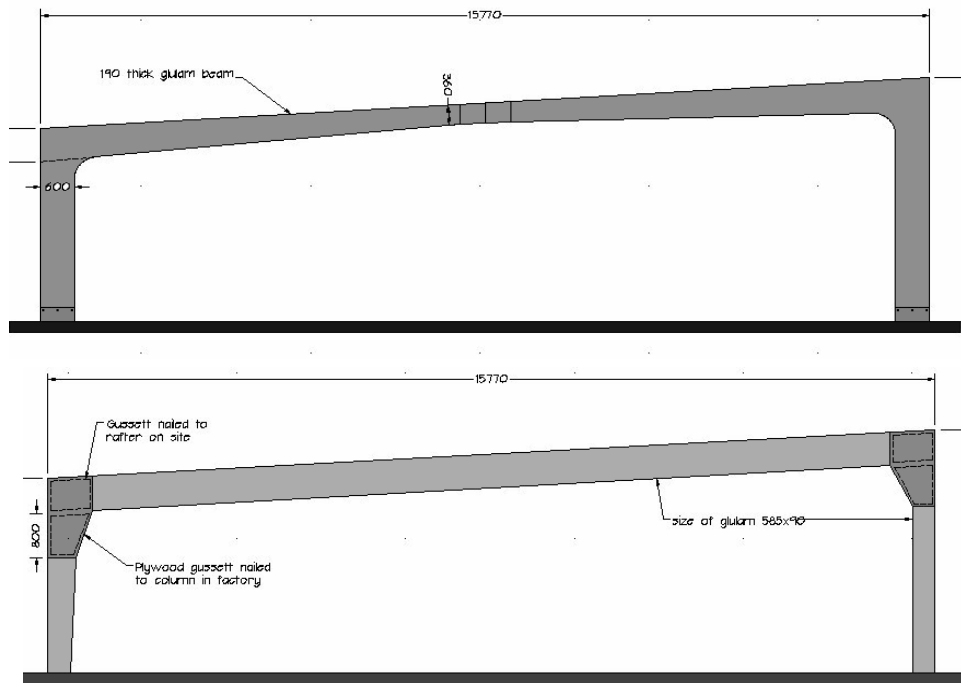


Figure 3

## Economies in Curves

Economies in curves is also affected by a number of choices. For example the difference between a solid knee curved portal with a radius of 3.0m and 1.2m would be approx 3% favoring the larger radius. However the saving by going to an open knee portal would be approx 30%

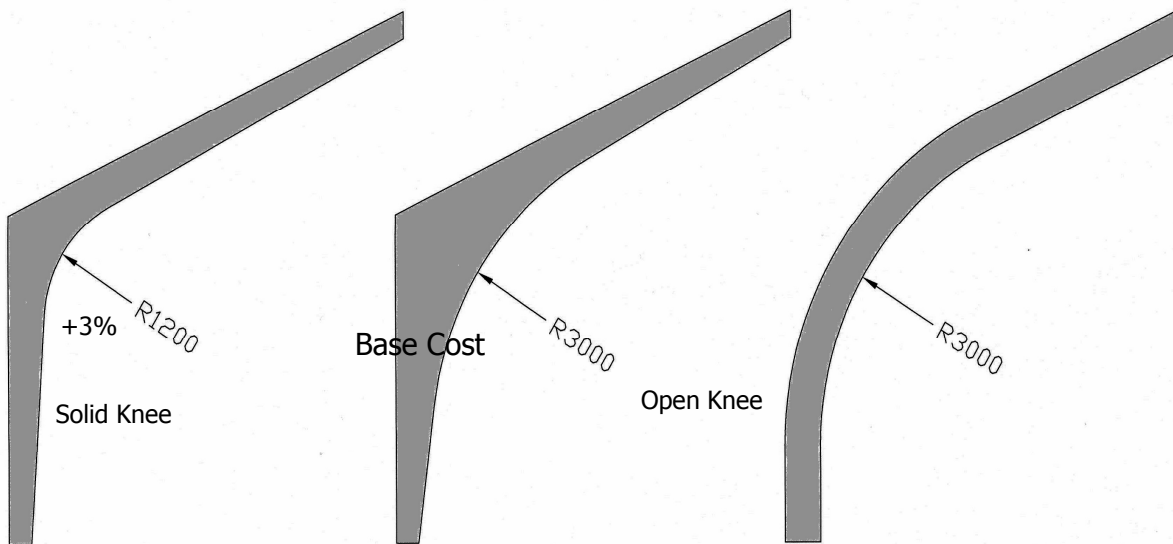


Figure 4

## Tapering Saves

Tapering members instead of detailing rectangular sections allows cost savings in reducing section size in areas where loads are reduced

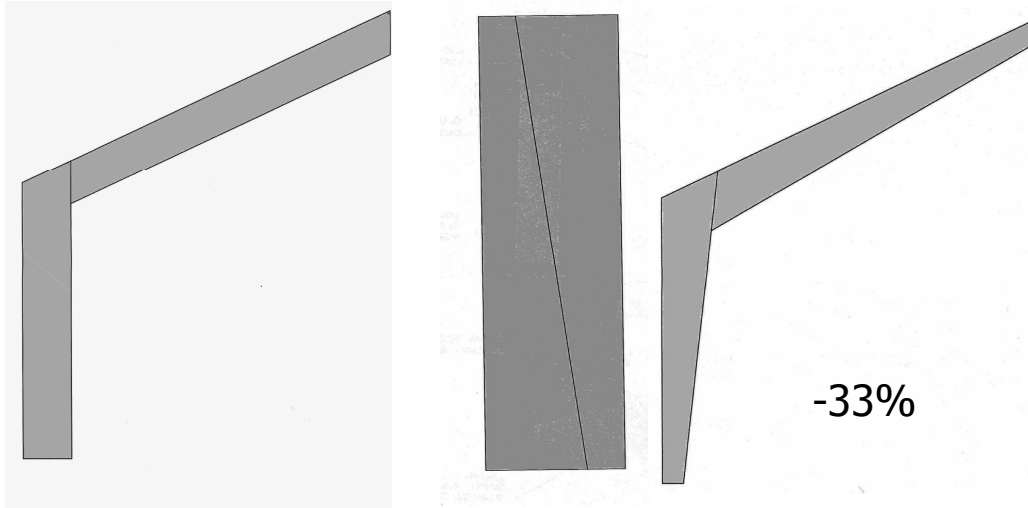


Figure 5