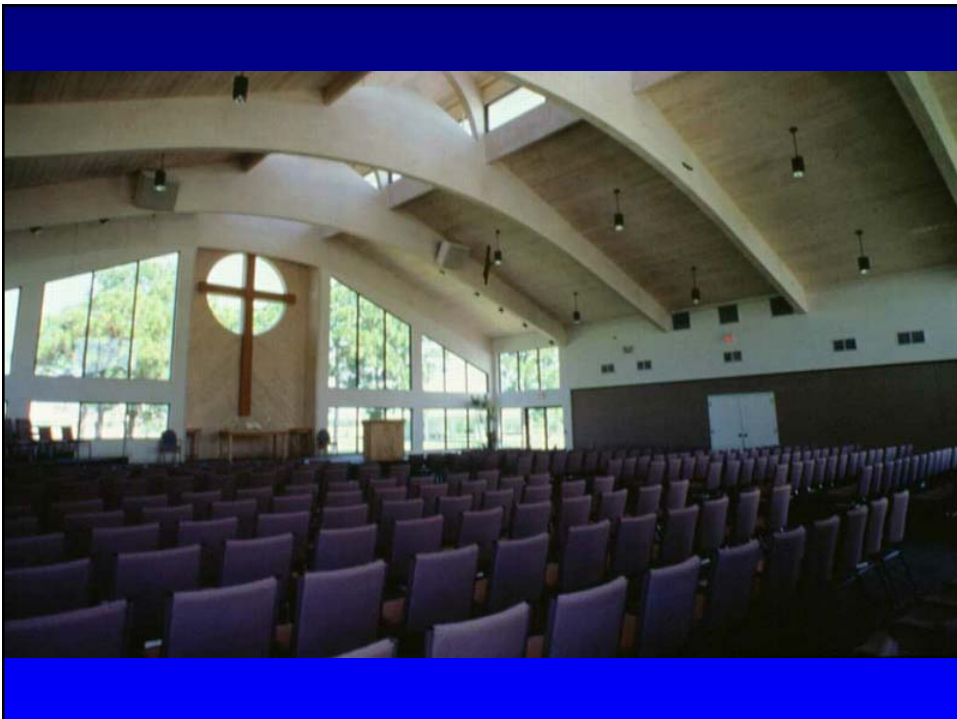


Glued-Laminated Timber

- Structural glued-laminated timber (glulam) is a highly engineered, stress-rated product
- Made from selected lumber laminations bonded together on wide faces with structural adhesive
- End joints are used to splice lumber together longitudinally to form laminations
- Can be fabricated in typical rectangular shapes or in pitched, tapered, or curved shapes



Glued-Laminated Timber

- Most common species groups:
 - southern pine
 - Western species (Douglas fir, Hem fir)
- Two types of products:
 - stock beams
 - used as a commodity product
 - custom beams
 - laminators provide engineering services
- Two industry agencies:
 - American Institute of Timber Construction (AITC)
 - American Plywood Association (APA-EWS)

Stock beams













Glued-Laminated Timber

- Lamination process removes or disperses strength-reducing characteristics found in sawn lumber

Sawn Lumber

↗ A

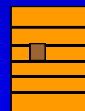
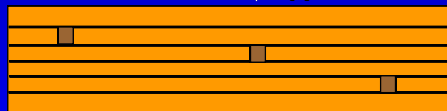


A-A

Glulam

↘ A

↗ A



A-A





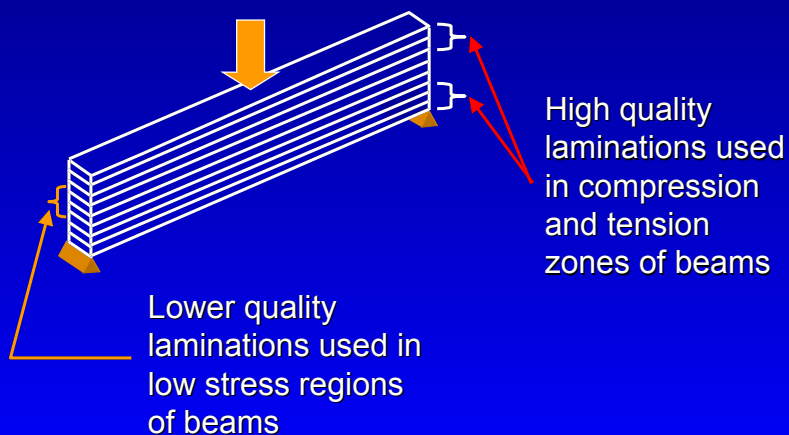
Glued-Laminated Timber

- Glulam specified by
 - Combination symbol
 - Stress Class
- Bending combinations
 - intended for use as a beam
 - examples:
 - 24F-V3 (2400 psi allowable bending value, fabricated from visually graded lumber)
 - 24F-E3 (2400 psi allowable bending value, fabricated from mechanically graded lumber)

Glued-Laminated Timber

- Stress Class
 - Simplifies selection of beams
 - Allows the engineer to select a general stress level without selecting particular combination
 - examples:
 - 24F-1.8E
 - 2400 psi allowable bending value,
 - 1.8 million psi MOE,
 - fabricated from visually graded or E-Rated lumber
 - Contains several actual combinations

Glulam Bending Combinations



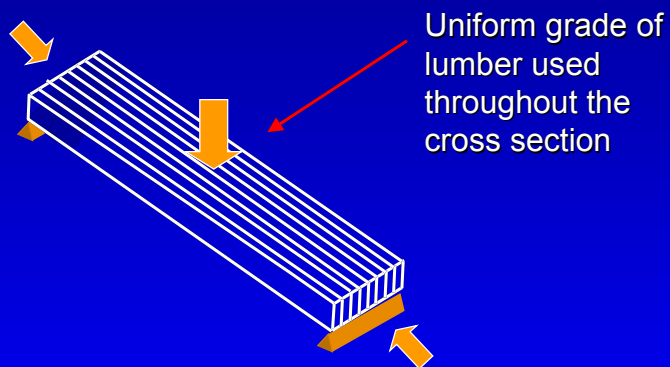
Custom
beams



Glued-Laminated Timber

- Axial combinations
 - intended for use as columns, tension members, truss chords, bridge deck panels
 - examples:
 - Combination 48

Glulam Axial Combinations







Sample Glulam Quality Mark

Intended structural use
 (B = simple span beam,
 C = compression member,
 T = tension member,
 CB = cantilever or continuous)

Appearance Grade
 (IND = industrial,
 FRAMING = framing,
 ARCH = architectural,
 PREM = premium)

Indicates designated plant met all qualification and QC requirements of AITC



Plant number

Species Group

Combination Symbol
 (24F-V4)

Conformance to
 AITC/ANSI A190

Specifying Glued-Laminated Timber

- **Glulam combination symbol**
- **Lamination species group**
- **Manufacturing standard (ANSI/AITC A190)**
- **Size of member**
- **Adhesives (wet use for exterior)**
- **Moisture Content**
- **Appearance grade (Premium, Architectural, Industrial)**
- **Quality marks and certificates**