Carpentry Level One

Building Materials, Fasteners, and Adhesives 27102-13

Objectives

- Identify various types of building materials and describe their uses.
- k. State the uses of various types of engineered lumber.
- l. Identify applications for wood I-beams.
- m. List advantages of glulam lumber over conventional solid lumber.

Performance Task

1. Given a selection of building materials, identify a particular material and state its use.

Kickoff Activity

- Can you identify what types of building materials might have been used for these historic buildings?

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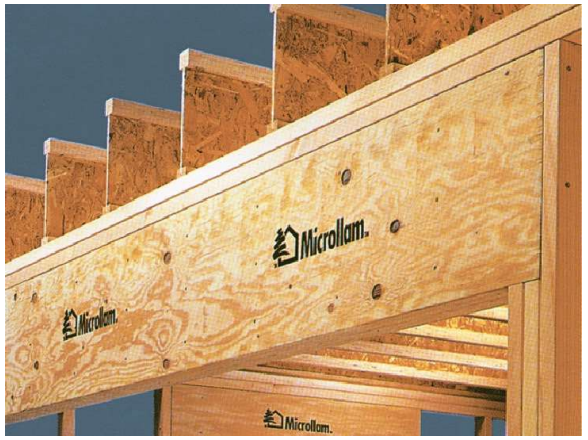
Section 1.11.0

- Engineered lumber
  - Makes efficient use of natural resources (trees) and provides exceptional structural qualities
  - Includes:
    - Laminated veneer lumber (LVL)
    - Parallel strand lumber (PSL)
    - Laminated strand lumber (LSL)

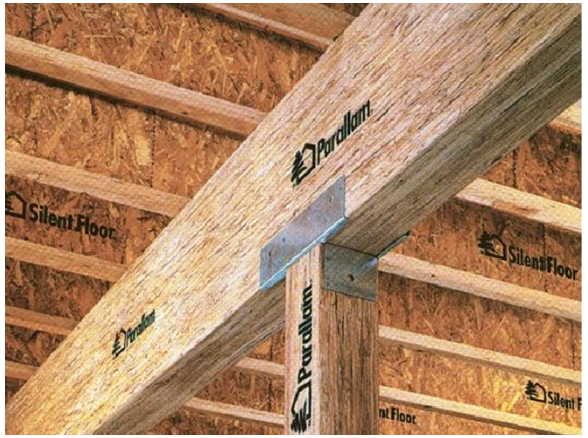
Section 1.11.1

- Laminated veneer lumber (LVL)
  - Peeled from the tree in widths of 27" or 54"
  - The veneers are laid-up in a staggered pattern and overlapped.
  - The grain of each layer runs in the same direction as the other layers.
  - The veneers are bonded with an exterior-grade adhesive and pressed together and heated.



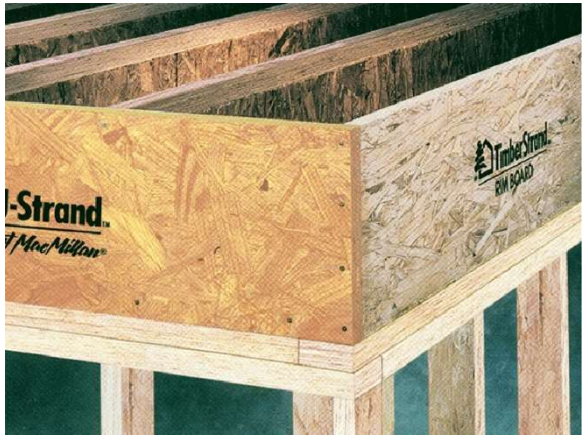
Section 1.11.2

- Parallel strand lumber (PSL)
  - Strands are about 1/8" or 1/10" thick.
  - Bonded together with waterproof adhesive in a special heating process



Section 1.11.3

- Laminated strand lumber (LSL)
  - Logs are cut into short strands, which are bonded together and pressed into long blocks (billets) up to 5 1/2" thick, 8' wide, and 40' long.

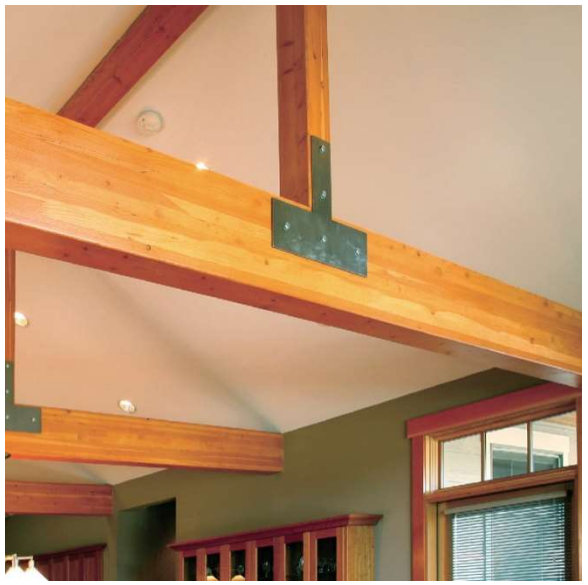


Section 1.12.0

- Wood I-beams
  - A web with flanges bonded to the top and bottom
    - This arrangement, which mimics a steel I-beam, provides exceptional strength.
    - The webs are made of OSB or plywood, and the flanges are grooved to fit over the web.
  - Can be used in greater spans than a comparable length of dimension lumber

Section 1.13.0

- Glued laminated lumber (glulam)
  - Manufactured from lengths of solid, kiln-dried lumber that are glued together
  - Because of its exceptional strength and flexibility, glulam can be used in areas subject to high winds or earthquakes.



Section 1.13.0

- Three appearance grades of glulam:
  1. *Industrial grade*—used in open buildings where appearance is not a priority or where *beams are not exposed*
  2. *Architectural grade*—used where beams are exposed and appearance is important
  3. *Premium grade*—the highest grade; used where the highest-quality appearance is needed

Section 1.13.0

- Fire-retardant building materials
  - Lumber and panel materials are sometimes treated with fire-retardant chemicals.
  - The chemicals react to extreme heat, releasing vapors that form a protective coating around the outside of the wood.
  - This coating delays ignition and inhibits the release of smoke and toxic fumes.

Wrap Up

Looking at the samples of engineered lumber in the room, write one thing you learned about each type of lumber. When asked, post one of your notes by the classroom sample. Try not to repeat notes.

Next Lesson: Concrete, Concrete Masonry Construction, and Steel Framing Materials Review Sections 1.14.0–1.16.0