Post-Frame Construction Features

Today, post-frame construction is built upon thoroughly developed engineering principles, which means that the entire building is designed for optimum load-carrying performance. Post-frame structures begin with posts and end with wood or steel siding covering the structural framework. Each element of the structure is present for a specific purpose, providing the required strength to meet all applicable code requirements.

Sound design and quality manufacturing will create a building that meets or exceeds accepted standards for safety and performance. A review of post-frame structural elements follows:

Columns

Columns, or posts, are one of the most important elements in post-frame construction. The posts can be buried directly in the ground, buried in concrete, or anchored to a concrete foundation. See Figures 2 and 3.

Supporting columns are spaced further apart in post-frame buildings than in typical construction – 4 feet, 8 feet, or more, rather than the 16 or 24 inches on center typically used for conventional light-frame wood structures. See Figures 4 and 5.

There are five major categories of columns in use today: solid sawn; glued-laminated; structural composite lumber; unspliced, mechanically laminated; and spliced, mechanically laminated. Each column type has specific advantages, some of which follow:

Solid columns (e.g., square or round solid-sawn, glued-laminated, or structural composite lumber):

- The column is solid throughout providing continuity of strength.
- They have a history of excellent structural foundation performance.
- The columns are easily treated with preservatives for lasting performance. As an example, consider the durability of telephone poles.

Mechanically laminated columns (unspliced or spliced):

- Smaller pieces of lumber that can be put together to create large columns. (This also applies to glued-laminated columns.)
- Higher lumber grades can be used, creating stronger columns. (This also applies to glued-laminated columns.)
- Individual 2x laminations are easier to treat thoroughly.
- In spliced columns, only the portion of the column in ground contact needs to be treated, saving treatment costs.
- Corrosion-resistant fasteners are only needed in the treated wood portion of the column, resulting in cost savings.
- These columns can provide efficient truss/rafter connection details because the length of the different laminations can be varied, creating a slot for the truss/rafter to slide into.

Columns are the primary structural elements for framing side and end walls. Column design should be performed by professional engineers experienced in post-frame construction because they are such a critical structural element. These elements should be designed to meet the accepted analysis and design procedures in ASAE Engineering Practice (EP), No. 484.1. Column embedment should follow ASAE EP 486 for both lateral and vertical loading design.

Columns may be subjected to both compressive and bending forces. Evaluation of the combined conditions is addressed in both the *Allowable Stress Design (ASD) and Load* and *Resistance Factor Design (LRFD) Manuals for Engineered Wood Construction*, published by the American Forest and Paper Association (AF&PA). You can contact AF&PA at 202/463-2700 or visit www.awc.org.

Allowable uniform loads for glued-laminated posts/columns are provided in Table 4.

FIGURE 2

POST ANCHORAGE (post embedded)

Typical for Solid-Sawn Columns

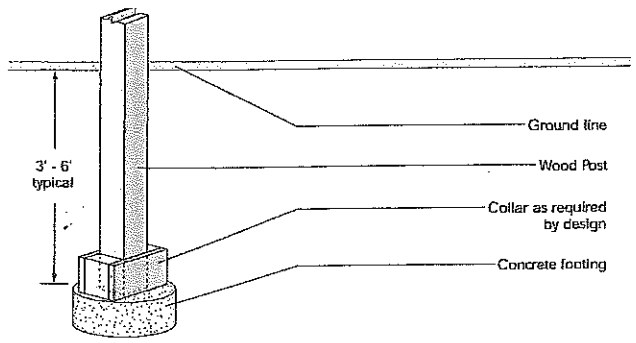

FIGURE 3

POST ANCHORAGE (post pinned)

Typical for Glued-Laminated Columns