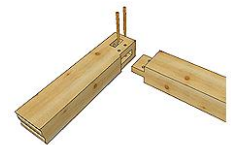
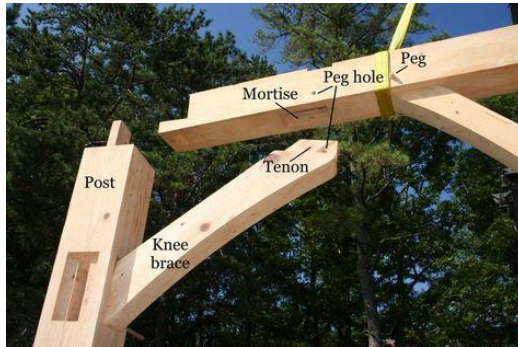


A Very Quick View of Post and beam construction

A building method that relies on heavy timbers rather than dimensional lumber. ... The use of large timbers in **post and beam construction** means fewer support **beams** are needed, thus creating dramatically open interior spaces.


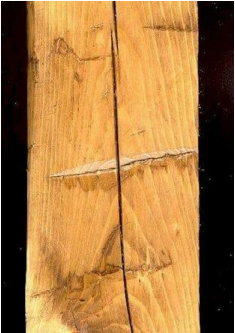
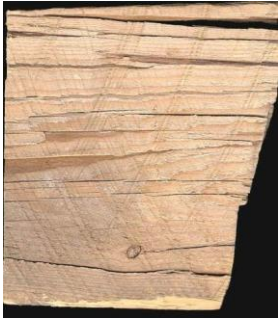
Mortise (or mortice) and tenon joint connects two pieces of wood or of other material. Woodworkers around the world have used it for thousands of years to join pieces of wood, mainly when the adjoining pieces connect at right angles. In its most basic form, a **mortise and tenon** joint is both simple and strong.

While post and beam construction can be used for just about any **foundation** type, it really does lend itself to a system that relies on piers rather than a continuous footing. This makes sense, as the weight of the house is a series of point loads where the posts are.



- Timber construction is differentiated from its much younger cousin, light-frame wood construction (commonly referred to as stick framing), by the size of the members. While light-frame wood construction is made up of dimensional lumber or manufactured I-joists, timber structures are fashioned from sawn or hewn timbers 5"x 5" and larger.

TYPES OF SHAKE & CHECKING

		
<p>Extreme Shake</p> <p>Shake is the separation of the rings in a piece of wood that occurs as it dries. The wood can also 'peel' off around the rings, similar to the layers of an onion.</p>	<p>A Natural Check</p> <p>This image shows natural checking that is to be expected in timber. A "Check" is a long crack that appears as the sap wood of a timber shrinks around the heart wood over time. Checking is not a structural problem, and usually occurs only on one or two sides of a beam. Oak, however, can have surface checks everywhere, which many people feel add to the beautiful rustic appearance of a timber frame.</p>	<p>Extreme Shake & Checking in Oak</p> <p>Checking is the appearance of cracks or splits in wood as the wood dries out over time. The image above shows extreme shake and checking in oak.</p>

Evaluating Splits or Cracks in Wooden Posts


As long as they can be characterized as typical wood-post or wood-beam checking, those splits found in vertical posts are not a structural concern.



Placed vertically the post is in compression. Checking cracks in a post such as the 6x6" pressure treated deck post shown here are not going to be flagged as a concern by your building inspector, deck builder, nor other experienced field investigators.

Watch out: While checking-cracks in a vertical post are harmless, as we illustrate just below, overloading, rot, insect damage, or side-loading can indeed cause failure of a wooden post and risks catastrophic building collapse.

In this photo we have a set of old locust wood posts that are bending and breaking as the whole building is collapsing. The root problem in this wood structure collapse-in-process is the inwards collapse of the concrete foundation wall.

 **Fungal Decay:** Fungal decay – often simply called decay or rot - is by far the most common type of timber deterioration





-  **Insect Infestation:** There are several species of insects that bore into or feed on wood tissue. In North America, the most common are termites, powder-post beetles, carpenter ants, and carpenter bees.
-  **Mechanical Damage:** Insects are not the only species that have been known to do mechanical damage to timbers. Rodents frequently gnaw on timbers to gain access to buildings or nesting sites. In agricultural barns, confined livestock will occasionally chew on structural timbers and sills.
-  **Overloading:** Identifying the structural impairment associated with overloading can be challenging. Often the loading history of a structure is not known. Splits along the grain caused by notching of members subjected to high shear stress can be a cause for concern. Unlike a seasoning check, a split extends through the full thickness of a timber.
-  **Fire Damage** Unlike light-frame wood structures, timber construction tends to perform well in a fire. A char layer forms on the outside of a timber during a fire, protecting the core of the timber. It is not uncommon to find some fire damaged timbers still in service in older structures.



Figure 3 Discoloration can be a sign of rot



Figure 4 Brown rot



Figure 5 Termite damaged timber



Figure 9: Termite infestation in bottom chord of a powder post beam



Figure 10 Split in a notched timber

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