

STABILITY OF TIMBER – NATURAL MOVEMENT

Softwoods are made up of a cell structure called TRACHEIDS.

SAP is conducted up the stem to the leaves through the SAPWOOD.

HEARTWOOD cells are dead and no longer contain SAP.

When a tree is growing the sapwood is usually full of sap and the heartwood is likely to contain extractives plus some water. Both the sapwood and the heartwood cell walls contain 28% of their weight in water.

The cell water is known as BOUND WATER, the water in the cell lumens is called FREE WATER. Once kiln drying is commenced the timber will first lose the free water from the sapwood, this is replaced by water from the heartwood, drying continues until FIBRE SATURATION POINT (FSP) is reached, which is when there is no water from the heartwood to replace the free water.

When all the free water has evaporated, BOUND WATER will begin to be lost from the cell wall. When bound water is lost from the cell wall the timber will begin to shrink and move. This process naturally occurs when non kiln dried timber is exposed to hot / humid conditions.

If timber is dried unevenly one side may shrink, twist, bow or split. The method of packing the timber and the stacking method inside the kiln may increase the chances of timber movement at an earlier time than if wet timber is left exposed to the elements. Whether timber is air dried or kiln dried timber needs to be kept at a constant moisture content to retain its stability.

If the air is humid the wood cells will absorb moisture from the air and swell, if the air is dry the cell walls will lose water to the air and shrink. Given sufficient time the wood moisture content will come back into balance with the humidity and stabilize. This is known as

EQUILIBRIUM MOISTURE CONTENT (EMC).

As the humidity in the air fluctuates from day to day, area to area and particularly from season to season so the equilibrium moisture content of the timber will fluctuate.

When installed preserved wood will be exposed to extremes of conditions, wetting, drying from one day to the next Timber will be exposed on one side of the structure to driving rain, strong winds or strong sunlight than another.

The end result is that timber will respond to the external conditions it is exposed to and will constantly adapt to the prevailing conditions whether whilst installed or whilst being stored.