LUMBER STORAGE AND HANDLING
FOR LUMBER MILLS,
DEALERS AND CONTRACTORS

LUMBER STORAGE

Why Proper Storage

Why should a mill manager or lumber dealer store his lumber properly? For one, proper storage retains structural lumber's dimensional stability which helps prevent twist, cup, warp, and other characteristics that can result in degrade or material loss.

Such stability is also necessary for non-structural applications including siding, paneling, moulding and trim. Here, additional costs may be incurred if the product has to be redried, repaired or replaced.

In addition, good storage practices protect sales appeal by keeping lumber clean and bright. Product appearance is especially important to the customers who make up the remodeling and do-it-yourself market.

Most important, proper storage protects the buyer's investment made in inventory by helping to reduce the costs of degrade or material loss.

Lumber and Moisture Content

Proper storage is primarily a means of protecting the lumber's appearance and of controlling moisture changes in the wood. Rapid or uneven moisture change can result in degrade and material loss. Understanding how moisture changes occur is the key to proper storage.

Wood either absorbs or loses moisture depending on the difference between its moisture content and the moisture content of the surrounding air. Air temperature also plays a role. When the air is cold, moisture changes occur slowly. On the other hand, warm humid surroundings will cause dry wood to quickly gain moisture.

When lumber dries, moisture moves from the interior of the piece to the surface. The reverse is true for absorption as moisture travels from the wet exterior to the drier interior. During this process of moisture loss or absorption, lumber shrinks or swells accordingly.

Problems begin when shrinkage or swelling occur unevenly or too quickly. This action breaks down the wood fibers, often causing grade loss in the form of twist, cup, warp, splits or checks.

In addition to its dimensional properties, lumber is subject to fungal decay and stain. Fungal growth may occur when moisture content reaches 20 percent or greater and air temperature is between 40 and 100 degrees F. Even high humidity can cause mold and stain to develop.

Common Sense for Storing Unseasoned and Seasoned Products

Improperly stored or unprotected lumber is prone to rapid or uneven moisture changes and other hazards. To prevent these, certain measures apply depending on whether the material is green or dry and the type of storage facilities available.

■ Green Lumber

Green or unseasoned lumber can be stored outdoors without protection in cool weather, provided the storage period is not extensive. For longer periods the lumber should be stickered.

Stickering allows air circulation, which helps prevent mold and stain from developing. Some wetting is not hazardous as the moisture content of green lumber is little affected by rainfall.

During warmer months, however, risk of fungal stain and decay increases in green lumber and precautions should be taken. For instance, inventory should be moved quickly using the first-in, first-out rule.

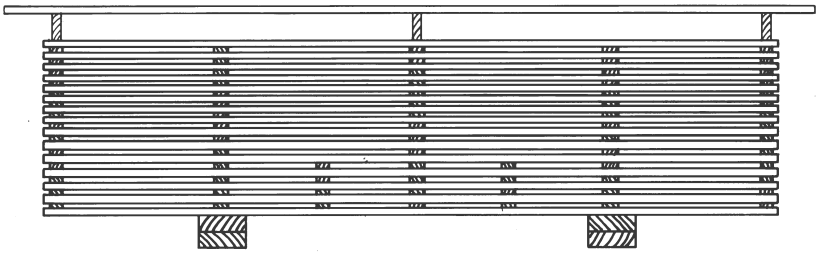
Also, pile roofs or cover boards should be placed on the upper courses to protect them from the sun, which can cause seasoning checks to develop. Pile roofs can be made of old lumber ends and should be long enough to overhang the end of the lumber pile. The roofs can be placed on the top package before it is lifted into place.

"Pile burn" is another hazard of warm weather outdoor storage. Here, the center of a solid stack absorbs a great deal of heat which "cooks" the wood fibers, causing them to rapidly decompose. To reduce the chance of pile burn, sticker the lumber, thus encouraging better air circulation.

Posts, beams and timbers are typically manufactured as green products as it is impractical to air or kiln dry such items. In storage, seasoning checks will usually occur, but these will have no effect on the performance of the piece in structural applications.

However, it is desirable to prevent sizable or excessive checking. To keep them from drying too

A typical unit package air drying roof.



Pile roofs protect the upper courses from direct sunlight. They can be made from old lumber ends and should extend beyond the end of the lumber pile.

quickly, timbers should be solid stacked. In especially hot weather they should be kept under a roof. And when possible, wetted burlap or sprinklers can be used to slow the checking process.

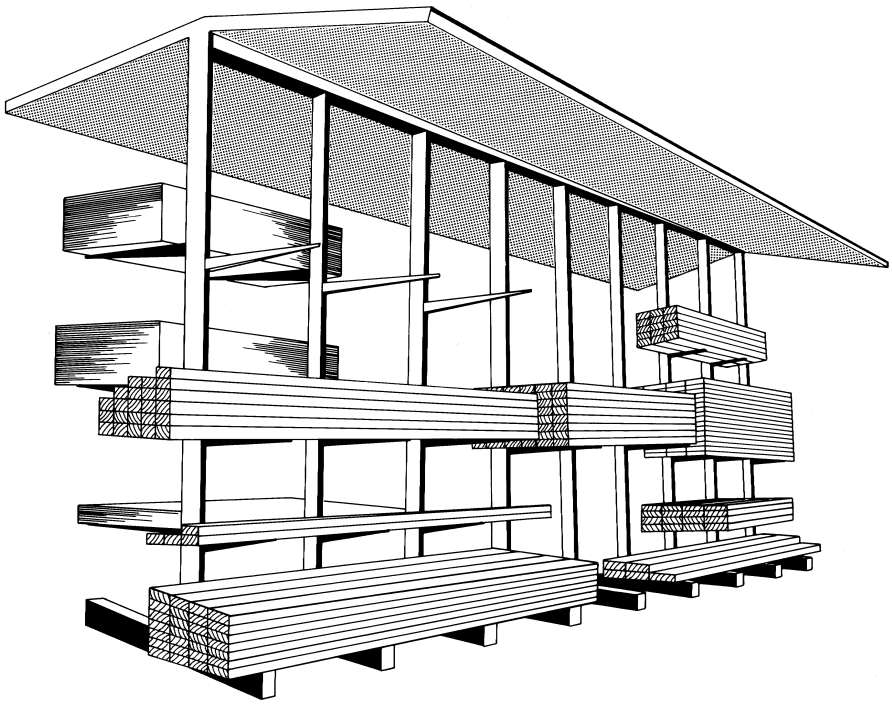
Covered metal T-stands provide excellent storage for such items. The product is protected from direct sunlight and yet is readily accessible to forklift handling.

■ Dry Lumber

Unlike green lumber, kiln or air dried lumber must not get wet, otherwise, the product may lose the value that was added by careful seasoning. (Redrying the product is not a good solution because degrade often occurs during redrying.)

Rain wetting of any dried lumber can also impair its dimensional stability. If stored outdoors, dry lumber must be protected by tarpaulins, canvas, plastic wrap or paper wrapping. Paper wrapping, however, offers only short-term protection. And torn wrappers caused by mishandling should be repaired promptly. Open or closed storage sheds are preferable to outdoor storage.

High-grade items such as shop, moulding and millwork should be solid piled in a closed heated shed that has a clean paved floor. Upper common grades and mouldings are usually stored in vertical bins for ease of handling.



Covered T-stands provide excellent storage and ready access for such items as timbers or other green products.

Outside Yard Storage

Whether at the mill, distribution center or retail outlet, air flow is the most important factor in the lumberyard layout. A large volume of air must circulate through the yard freely in order to evaporate moisture from the lumber. Make certain the yard is open, with no trees or buildings blocking the air flow.

Good water drainage is equally important; standing water adds to the yard's humidity, which increases the possibility of mold and stain.

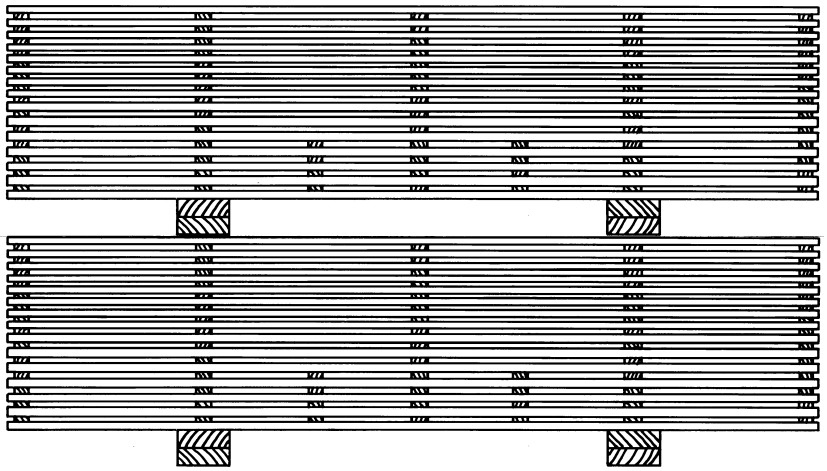
In addition, pile foundations must be 12 to 18 inches off the ground allowing cool moist air to move downward and away from the piles. The foundations, made from either timbers or ties, should be sturdy and level. In most areas, lumber piles should be stacked farther apart in winter (36" to 48" of space) than in summer (6" to 19").

In desert-like regions such as the Southwest, where drying may occur too quickly, lumber piles should be oriented so prevailing winds travel at right angles to the rows to prevent end checking.

When lumber is placed on stickers, the stickers must be in perfect vertical alignment with one another and with the foundation stringers. Otherwise, sagging will occur, causing the lumber to bow or have a "belly." Also, keep piles to a reasonable height. Excessive heights add weight that will crush the lumber at the bearing points and cause the lumber to kink.

Solid stacked lumber is often stored in packaged units bound with tie straps for easier forklift or carrier handling. Units should be separated by spacers, usually four-by-fours, aligned with the supporting beams to prevent sagging.

Storing lumber in sheds under a permanent roof offers better protection by keeping the material dry and bright. Material with a moisture content greater than 15 percent can be stored in an open shed; lumber with a moisture content at or below 15 percent requires closed-shed storage.



When lumber is placed on stickers, both the stickers and spacer blocks must be in perfect alignment with the pile foundation. Otherwise, sagging may occur.

Closed, unheated sheds are often used for storing kiln or air dried lumber. Here the object is to maintain the low moisture content gained by seasoning. Closed heated sheds are often reserved for the higher grades of lumber used for interior work. Such grades need particular care because of their required lower moisture content (less than 15 percent).

Lumber Handling

Careless shipping and handling practices are an additional cause of degrade and material loss. If carelessly shipped, dry lumber can regain enough moisture to require redrying. Green lumber can stain or decay if shipped for long periods without air circulation. With careful handling, however, even kiln dried lumber can be shipped worldwide without appreciable loss of quality.

Rough or finished dry lumber is usually protected by tarpaulins or by waterproof paper packaging during truck transport. Such packaging is also commonly used for flatcar shipment. Closed truck or boxcar shipment offers the best protection.

The development of unitized package wrapping has made it possible to adequately protect dry lumber on open flatcars. Such packaging uses a waterproof kraft that is glassfiber reinforced and polymer coated.

If possible, packages should be inspected periodically during transport; any ripped packaging should be quickly repaired. Otherwise, moisture may enter the unit and become trapped, which can be worse than leaving the unit unprotected.

Although not as vulnerable to moisture regain, green lumber should still be protected when shipped from sawmill or distribution center. Even for short truck hauls, a simple tarpaulin will help protect the material from direct sunlight or drying winds.

Other common-sense measures include not standing on exposed lumber (and leaving black boot marks) and leaving enough room between rows so that forklifts can operate without gouging the lumber stacks.

Jobsite Delivery and Storage

As a convenience for the builder, materials should be loaded on the delivery truck in proper sequence. Because most deliveries are either dropped or removed by fork lift, those materials that are used first should be loaded last. For example, sill plates should be on top of the load with floor joists and wall framing lumber underneath.

Lumber stored at the jobsite is seldom adequately protected, but should be. A common practice which must be avoided is placing unprotected lumber directly on the ground. Instead, use supports under the lumber units to keep them from mud and ground water. Hazards of moisture regain are a particular concern for pre-fabricated building components, such as trusses.

Lumber at the jobsite should be protected by a tarp or other type of cover to protect the lumber units. If plastic is used, leave enough room at the bottom of the pile for airflow. Otherwise, plastic that reaches to the ground will act like a greenhouse, trapping ground moisture within the stack.

Risks can be further minimized with appropriate delivery schedules as work progresses. With good scheduling, the contractor can keep the volume of exposed lumber to a minimum until the roof is completed and storage space within the building becomes available. Avoid delivery in the rain when possible.

Paneling, mouldings and millwork should always be stored on supports indoors and with good ventilation. Keep such products away from newly poured concrete or freshly drywalled surfaces as these greatly increase the humidity of the storage space.

In addition, these materials should be acclimatized before application. Acclimatization allows the wood product to reach a

moisture equilibrium in its new setting. Thus, any shrinking or swelling will take place before the material is nailed in place.

To acclimatize the product, place it on stickers and store it for 7 to 10 days in the room in which it is to be used. Again, the room should not have freshly drywalled surfaces or a new concrete floor.

For siding, store in a covered, unheated area such as an open garage or carport at the jobsite. Keep it protected from rain, snow or sun and off the ground. Siding needs to be acclimatized to the on-site atmospheric conditions, but protected from excessive moisture gain or loss; in this way it will become dimensionally stable and ready for prefinishing prior to installation.

Additional Information

Technical information on Western lumber products manufactured by WWPA mills is available through the Association's Online Technical Guide at http://www.wwpa.org/techguide. The Online Guide features sections on lumber grades, design values, specifications, properties and environmental information on Western lumber.

For a full description of technical publications available for purchase and a printable order form, go to the WWPA internet site at http://www.wwpa.org.

You also can receive an order form via fax through the WWPA Fax Delivery Service by calling 732-544-2876 and following the instructions.

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