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WOOD RESEARCH LABORATORY

a means for providing

Treated Wood Products



for farm and home outdoor use

PURDUE UNIVERSITY

A MEANS FOR PROVIDING TREATED WOOD * PRODUCTS FOR FARM AND HOME OUTDOOR USE

Michael O. Hunt and Robert H. Perkins
Department of Forestry and Conservation

Introduction

Because of the increasingly widespread interest and use of treated wood products, --both decorative and utilitarian-- an immediate guide is needed on home production of preservative treated raw wood products. This publication will answer some questions of an immediate nature, but many can be answered only after analysis of additional data being generated from experiments in progress at the Purdue Wood Research Laboratory. In view of this, information presented here should be considered a progress report, subject to change and broadening as research progresses.

Treating Method and Facility

Recommendations in this publication for preservative treatment of wood products pertain to a simple, non-pressure impregnation process commonly referred to as the cold-soak method.

A 5 per cent solution of penta (pentachlorophenol) in No. 2 fuel oil was utilized for the treatment of all items. Penta is the preservative chemical, and the oil is used as the carrier of this toxic material into the cells of the wood. The treating solution can be purchased ready-mixed from co-ops, farm supply stores, lumber yards, etc., or the fuel oil and penta concentrate can be obtained separately. Instruction on the concentrate can should be followed closely to insure the correct preparation of a 5 per cent solution in fuel oil.

Soaking Pit

A trench 12 feet long, 3 feet wide and 12 inches deep in the ground will make a treating tank large enough for most small-volume treating operations.

Dress the sides of the trench until they are about vertical, and be sure the bottom is level and free from sharp pointed objects such as loose stones and broken bits of root. Next construct a rectangular frame of 2" by 4" material slightly longer and wider than the top outline of the trench. Place this frame over the top of the trench and nail each corner to a 1" by 2" by 12" wood stake driven in the ground at each outside corner of the frame. Line the pit with plastic film and fasten the top edges to the wood frame with 1" by 2" batten strips.

Place two L-shaped bumpers of 2" by 4" and 4" by 4" lumber on top of the plastic inside the pit, 4 feet from each end, and fasten them to the wood frame with nails. This keeps the posts, rails, or lumber from touching the plastic bottom and sides which are easily punctured by slivers of wood and knots on posts. It is advisable to round the bottom corners of the 4"

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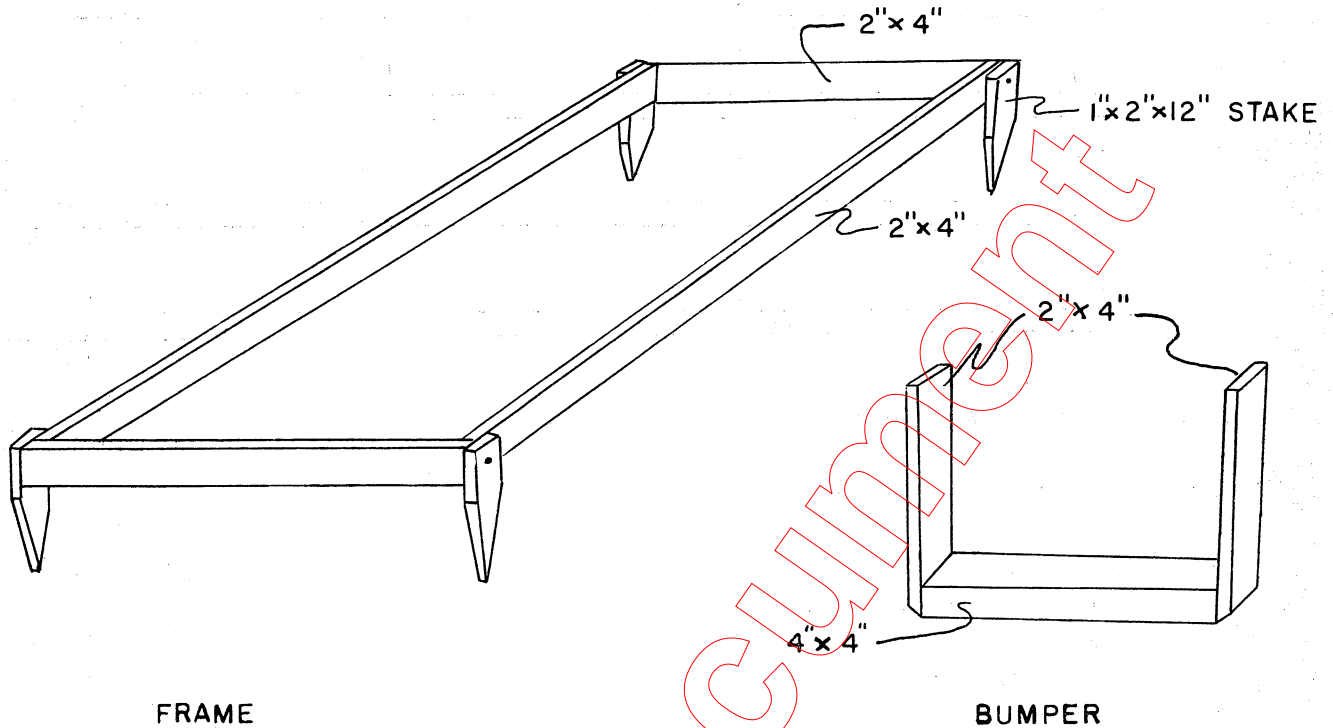


Figure 1. Configuration of wood frame and bumpers used in fabrication of plastic lined treating pit.

by 4" members and place a pad made of small pieces of plastic between them and the plastic lining. Sketches of the rectangular frame and U shaped bumper are shown in Figure 1. The plastic lining at the end of the pit is best protected by pieces of low grade plywood also fastened to the frame around the top.

Before placing treating solution in the finished tank, fill with water to test for leaks. If the level remains constant for a short period (overnight), empty the water and refill with treating solution. A rectangular wooden frame made of 2" by 2" members about 4 inches shorter than the inside pit dimensions and with two top members spaced about 12-14 inches apart should be placed on top of the posts or lumber in the preservative solution. Such a hold-down frame is shown in Figure 2. A number of heavy objects sufficient to sink the posts or lumber beneath the top of the liquid are then laid on the frame. Solid 4" x 8" x 16" concrete blocks with a wire looped around the middle to provide a handle are convenient weights. Six to eight of these blocks will be enough to sink the usual maximum volume of wood treated in the above sized pit at any one time.

Rubber gloves should be worn to protect your skin while you work with any preservative oil. Areas of skin that have come in contact with the solution should be washed immediately. Also, provide covering to prevent rain, dirt, leaves, livestock, pets, and children from falling into the pit. An inexpensive cover can be made from plastic film fastened to a light wood frame. However, a much sturdier cover is needed if the treating facility is readily accessible to pets and small children. Since the type of cover necessary will depend on the specific environment surrounding each cold-soak pit, the materials for cover construction have not been included in the following list.

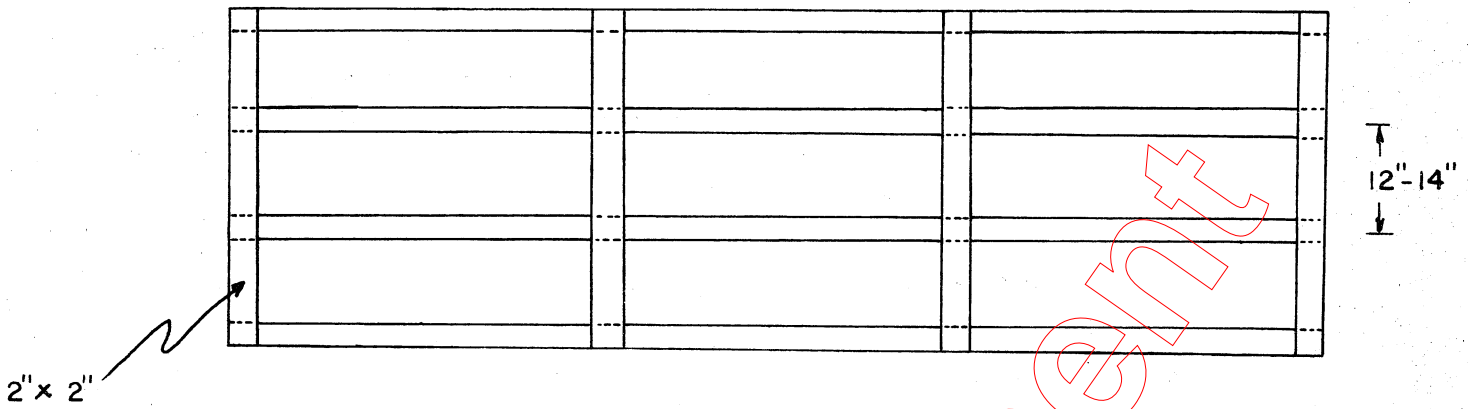


Figure 2. Hold-down Frame.

Bill of Materials for Treating Pit

- 3 pcs. - 2" x 4" x 12'
- 2 pcs. - 16" x 35" x 1/4" plywood
- 1 pc. - 4" x 4" x 6'
- 3 pcs. - 1" x 2" x 12'
- 5 pcs. - 2" x 2" x 12'
- 1 sheet polyethylene plastic film at least 8' x 16' and preferably 10 mil. and certainly no less than 6 mil. thick.

Products and Recommendations

Outlined below are recommendations for the preparation and treatment of the wood products:

PATIO BLOCKS

MATERIALS: Logs of any species.

PREPARATION: Cut 4" thick cross sections. These circular sections can be of any diameter (dependent only on the tree from which they are cut.) At least one surface of the block should be free of rot. Do not remove the bark from the blocks.

SEASONING: Arrange blocks so that they are off the ground and that cut surfaces of the block are exposed to optimum drying. These blocks should dry for 2-1/2 to 3 months from the first of May through August. If they are cut in the Fall, allow them to dry through the following Spring before treating.

NOTE: Research to date has not definitely proven or disproven the practicality of seasoning patio block material prior to treating. Although the soaking of green blocks will greatly extend their service life, seasoning of these blocks would result in a more complete treatment.

TREATMENT: Any wooden or metal container is suitable for soaking the blocks as long as the treating solution is accessible to both surfaces. One suggestion is the use of a 55-gallon metal drum set upright with the top end cut



Figure 3. Patio blocks in place.

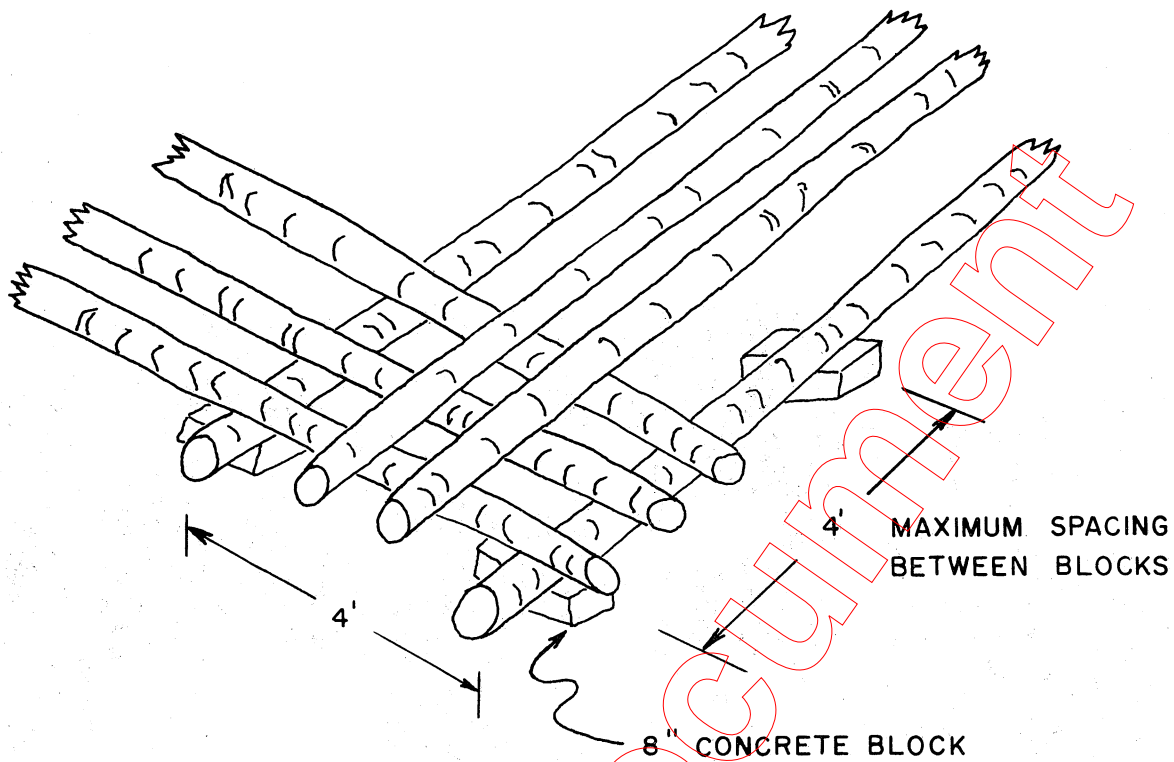


Figure 4. Posts properly stacked for seasoning.

out. Cut several circular sections of field fencing to a diameter slightly less than the inside diameter of the drum for use as spacers. First, insert a section of wire in the bottom of the drum, then partially fill the drum with treating solution, and alternate layers of patio blocks and wire sections. Sufficient weight must be placed on top of the last wire spacer to keep the top layer of blocks submerged. To unload the drum, remove the weight, and since the treated blocks will still be buoyant, one layer of blocks can be removed at a time from the surface of the solution. A few loads in this drum should provide enough blocks to surface an average patio. Figure 3 shows one suggested spacing for patio blocks with different diameters.

POST AND RAIL FENCE

MATERIAL: Any of the pines grown in the Central States whether in plantations or natural stands.

SEASONING: Peel the bark from the timber as soon as possible after it is cut.

The peeled posts and rails should be stacked as shown in Figure 4 in an area that is protected from direct exposure to the sun, for example under a shade or tree. Allow the posts to season until a sample post loses less than 1 pound each week during the summer months. If this technique is followed, the wood will be at the correct moisture content for optimum preservative treatment. Allow no wetting by rain for at least a week prior to treating.

PREPARATION: The dimensions given in the sketches of Figure 5 are for seasoned posts and rails. All machining should be completed prior to treatment.

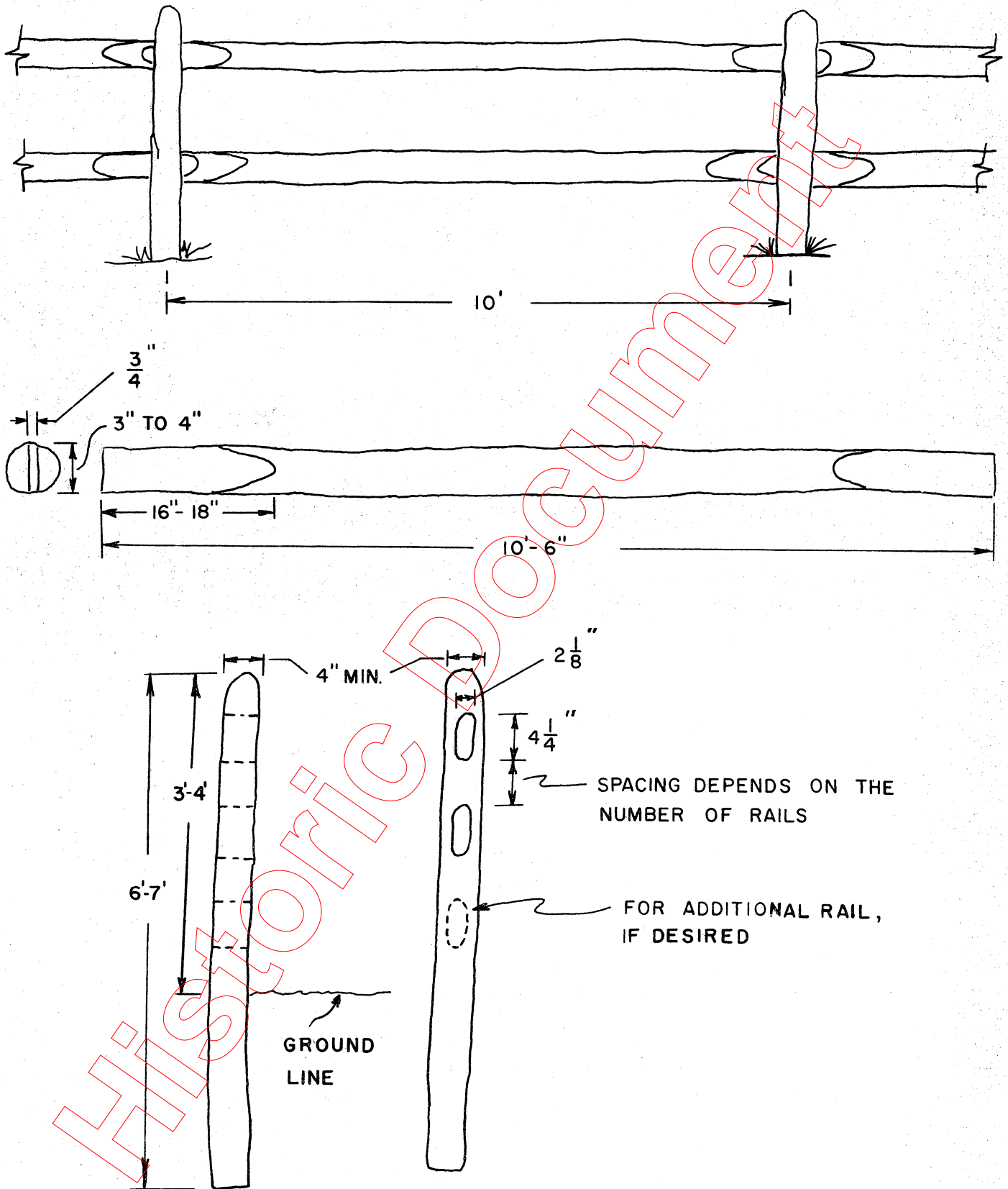


Figure 5. Dimensions and machining details for post and rail fence.



Figure 6. A strong durable gate made of basswood lumber cold-soaked in penta solution.

TREATMENT: After seasoning and machining, immerse posts and rails in the treating pit for 48 hours during periods of normal summer temperatures.

POSTS (Ordinary farm fencing)

Materials, seasoning, preparation, and treatment are the same as prescribed for post and rail fencing.

LUMBER

MATERIAL: To date the Purdue Wood Research Laboratory has investigated the treatability of red oak and basswood (linn) by the cold-soaking method. Red oak shows limited possibilities. It can be used where incidence of rot is high but not in direct contact with the ground. Basswood, popular for wood gates of the type shown in Figure 6 because of its good warp resistance and high strength-low weight combination, appears to take a treatment that will also allow its use under the most extreme exposure conditions including ground contact.

White oak, because of its cellular composition, can not be satisfactorily treated by the cold-soak method.

NOTE: This is a continuing program and the treatability of other native hardwood lumber species by the cold-soaking method will be investigated in the future.

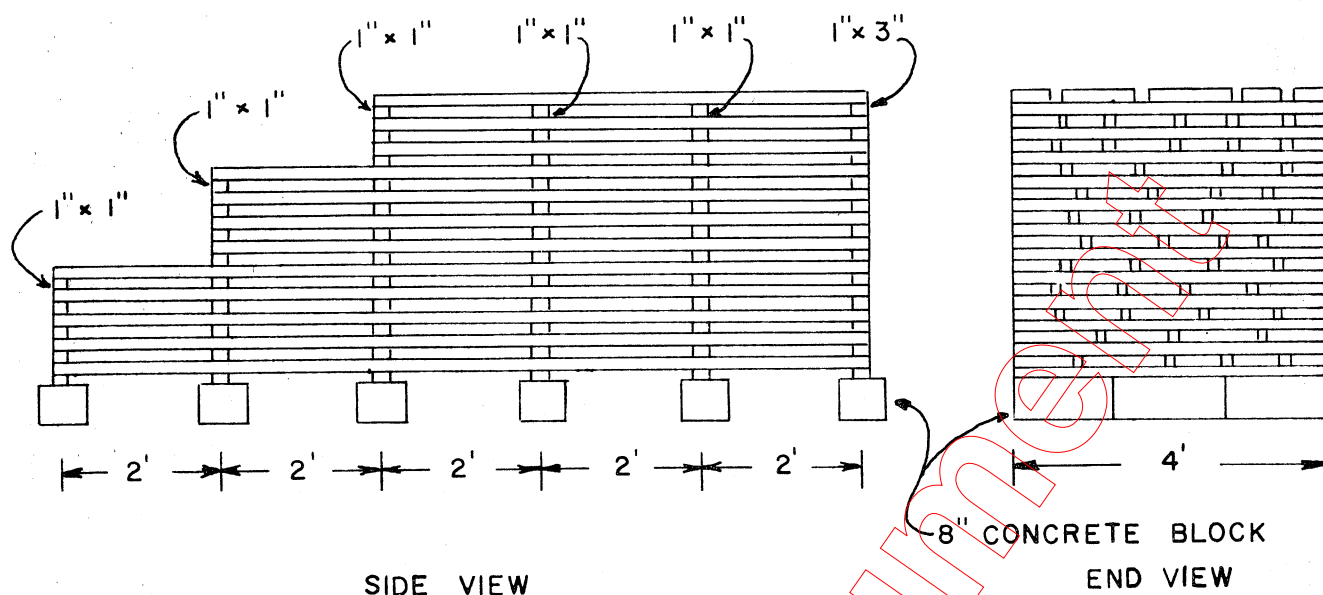


Figure 7. Lumber hand-stacked on temporary foundation. Stickers should be in good vertical alignment placed directly over the foundation blocks and spaced 2 feet apart on the boards. Leave a space about 2 inches wide between boards in each layer. A double layer of lower quality boards placed edge to edge will serve as a roof for the stack.

SEASONING: Before treatment, the moisture content of the lumber should be no greater than 15%. Most native species will attain this moisture condition in Indiana if allowed to air season for at least a year after sawing. For a more accurate check, you might borrow a moisture meter from your local lumber yard to determine moisture content. For proper seasoning, it is important that the lumber be correctly piled. A suggested temporary stack is shown in Figure 7. Purdue University Mimeo F-37, available from the Department of Agricultural Information, describes how to build a lumber stack that is more permanent and incorporates more of the features for proper seasoning into its design. The U.S. Forest Products Laboratory's Report No. 1657 (Madison, Wisconsin) also gives plans for installing more elaborate and permanent lumber piles.

TREATMENT: Be sure that there is at least 1/4 inch space between individual boards and layers of lumber in the pit. This will insure the solution's accessibility to both surfaces and edges of each board.

Red oak - after adequate seasoning submerge the lumber in the treating pit for two (2) weeks during periods of normal summer temperatures.

Basswood - after adequate seasoning submerge the lumber in the treating pit for four (4) days during periods of normal summer temperatures.