SMALL SAWMILL IMPROVEMENT
PRACTICAL POINTERS TO FIELD AGENCIES

METHODS OF HANDLING LUMBER AT THE REAR OF THE MILL

Increasing labor and other operational costs make it advisable for the small sawmill operator to consider every practical way to mechanize his operation, including lumber handling at the rear of the mill. Previous reports of this series (R899-16 and R899-23) and USDA Agricultural Handbook No. 27 describe several simplified methods of handling lumber at the rear of the mill by truck. However, the lift truck, which has come into more common use at the small mill, can often be used to better advantage without too great an investment in equipment or in revamping the mill setup. The methods outlined in this report are presented with this in mind. They are not intended as recommended installations for any specific mill setup, but it is believed they can serve as guides to help the mill operator solve some of his lumber-handling problems.

Lift truck with lumber dollies.--This method is suited for mills that have a low-level green chain. Many such mills have been using a similar layout with lumber scoots or buggies hauled by horse or tractor or with straddle trucks. Figure 1 is a detailed sketch of the overall layout, and for the most part it is self explanatory. The dolly system and the inclined track make it easy to move full loads away from the green chain so the operators can start a new load. At the same time, the load moves into the clear where the lift truck has easy access to it. This permits more efficient use of the lift truck, because the operator can move the load at his convenience.

The incline should have just enough pitch so that the pile-out man can move a full load easily but not enough to permit the load to run away. Rails can be 1 by 4's or 2 by 4's faced with flat iron but often only 1 by 4's or 2 by 4's are used.

The lumber dollies can be made of kiln trucks or similar flanged wheels with 4- by 4-timbers laid across them for bolsters. After the lift truck picks up the pile, the dolly is available for another load.

Lift truck and roller conveyor.--This method will possibly have wider application at small mills than the previous method because more of the small mills use roller conveyors.

As shown in figure 2A, this layout is also designed to provide a ready means of moving full loads away from the rolls so that new stacks can be set up. The layout also provides "banking" room to hold piles until the lift truck can conveniently move them to the lumber yard.
The roll sections are installed on the pile-out deck so that they slope gently toward the edge of the deck. The length of the rolls depends on the space available and the number of piles it is planned to "bank." Some mills sticker their lumber at this point and use sticker guides similar to those shown in figure 2B instead of the short board stops.

Lift truck and transfer platform.--The overall details of this method are illustrated in figure 3. The slight incline of the roller assemblies on the pile-out deck will permit easier movement of the lumber stacks to the transfer platform. The rollers at the edge of the deck and the center rollers on the transfer platform are fitted with a crank and latch to hold the rollers immovable when lumber is being stacked and when the transfer platform is being moved. The latch can be released with a minimum of difficulty, and, because of the slight incline, the load will start of its own weight or with but a slight assist. The roller sockets should be kept well greased. Should the load bind, the roller can be cranked to move the load onto the platform where it is secured with the latch. The platform likewise is constructed with a slight incline (away from the deck), which adds to the ease of moving the load onto the platform. The platform, which is constructed of 2- by 4- and 4- by 4-timbers, can be readily approached from either side with a lift truck. Flanged wheel assemblies are attached to the bottom under each leg or upright.

The cable feed employs somewhat the same principle as the drum and cable system commonly used on a sawmill carriage. The 1/2-inch or 3/8-inch cable is kept reasonably tight and each end is anchored to a side of the platform, passing under the platform as does the sawmill cable under the carriage. The drum should have flanged edges to restrict the sideways movement of the cable, and it should not have grooves. The drum can be manually operated, but it should be power operated for best efficiency.

Skid-loading method.--Basically this method was designed for truck loading, but it can be modified for lift-truck operation.

Figure 4 shows layout details. The use of this system at mills that produce 12 thousand board feet or more per day will enable 2 men to sort the lumber into 4 to 6 grades and sizes.

As shown in figure 4, the lumber is conveyed to the rear of the mill by means of standard lumber-conveyor rolls. The pile-out men on either side of the conveyor near the stacking rails let one end of the board go by, then they take the other end and place it on the loading rail. The far end of the board is swung away from the rolls, using the rail as a fulcrum. The near end is then slid on the rail until the board is lined up with one of the piles and pushed onto the stack. The stacks nearest the

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1This method was observed and reported by M. A. Taras, Southeastern Forest Experiment Station, and Graham Chamblee, North Carolina Department of Conservation and Development.

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front of the mill should be used for piling the sizes or sorts most commonly produced, and rear stacks should be used for the least common sizes. For efficient handling, the stacks should not be more than 5 feet high.

In loading, a truck is backed into the pit and the cable (with a round hook attached) is passed around the stack (a long stick with a looped rope or rawhide on the end is used to pull the cable through the underside of the load) and hooked back on itself as shown in figure 4. The winch is started, and the stack is pulled onto the truck. The skids are greased periodically to facilitate sliding the load.

The stack next to the rolls is usually only partially completed, but it can be moved with the cable to the position vacated by the first stack. Loading into the second pit is accomplished in the same way except that the skidding cable is passed across the pile-out deck, under the lumber stacks, and through the snatchblock pulley, where it can pull the load onto the truck bed by the cross-haul method.

Note: To avoid the need of passing the cable across the deck, a second, shorter cable -- fitted with a round hook on one end and a ring on the other -- can be left in place across the floor of the deck under the stacks. The ring end should be at the edge of the first loading pit where it can be readily attached to the main cable hook.

Following are some details essential to the construction of this layout.

The lumber conveyor is made of the conventional type of steel rollers commonly used at sawmills. The skids consist of either two 6-by-6-timbers 16 feet long for each pair of lumber stacks or 8-to-12-inch diameter poles approximately 30 feet long laid across the pile-out deck from one loading pit to the other. The logs are probably best where the pile-out deck is a dirt floor.

The loading pits are 8 to 9 feet wide (depending on truck and load size) with a maximum depth of 3 feet 4 inches. The length of the pits depends upon the contour of the ground. If the mill setup is on a level area, a long pit will be required to avoid excessive slope of the roadway. To prevent cave-ins, the sides and back of the pits are reinforced with 2-by-8-inch boards nailed to posts driven in the corners and along the sides. A plank or timber runway is necessary in the pit bottom to insure maintaining the truck bed on the same level with the deck skids. Drainage of the pit is highly desirable.

The skidder can be a gasoline or an electric winch with a 1/2-inch or 3/8-inch hauling cable. A hand winch can be used, and it is also possible to couple the hauling cable to the power take-off winch, which is mounted behind the cab of some trucks. In this case, a snatchblock pulley should be mounted in the position shown for the winch in figure 1, together with an anchor post.
For lift-truck operation, the loading pit is unnecessary. Lumber roll sections installed in much the same manner as illustrated in figure 2 are substituted for the skids. If the roll sections are slightly inclined the cables, winch, and pulleys can be eliminated.

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Figure 1.—Layout for use of a lift truck with lumber dollies.

Figure 2.—A. Layout for lift truck and conveyor rolls; B, Sticker guide.
Figure 3. -Layout for lift truck and transfer platform.

Figure 4. -Skid-loading method.