

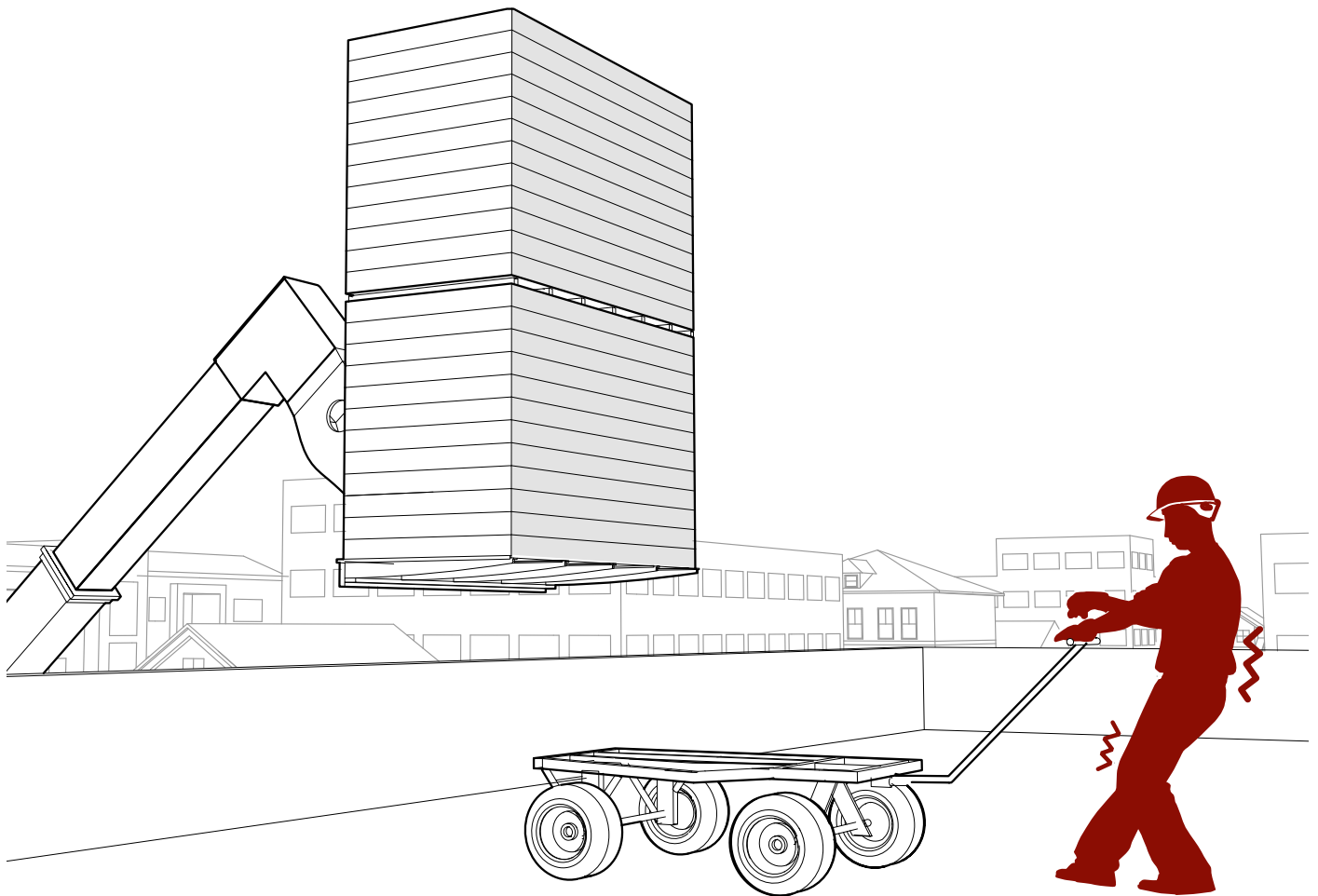
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7 TIPS

For Using Four-Wheel Carts In The Roofing Trade



Four-wheel carts are used daily in the roofing trade to transport materials. However, cart handling can be strenuous and may result in overexertion injuries. This handout provides cart handling tips which are intended to prevent injuries and enhance field performance.

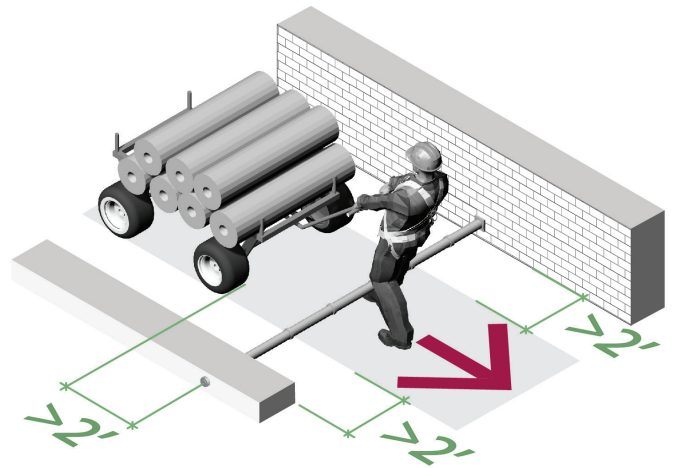
TIP 1: INSPECT AND MAINTAIN CARTS

Material carts should be properly maintained. Old carts with warped axles, loose turntable, worn tires, and broken/deformed bearings should be replaced immediately. Operating an old cart could increase the risk of injury by as much as 30% and decrease the productivity by 35%.



TIP 2: ALLOW SUFFICIENT CLEARANCE

Keep an open and clear space for cart operation. A 2 feet clearance is needed for each side of a hallway/passage. When a ramp or obstacle is present, a worker should allow at least 2 feet to build momentum. The farther back you start, the less likelihood of overexertion.



TIP 3: BUILD GENTLE RAMPS

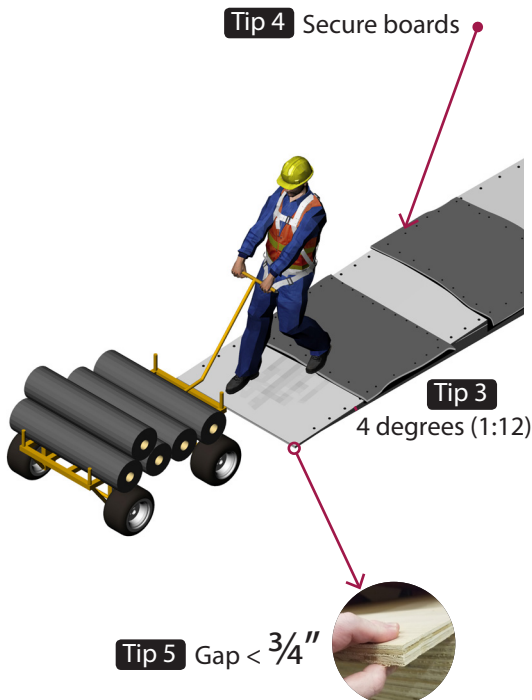
The recommended slope for ramp is 4 degrees. Moving a cart over a 4-degree (approximately 1:12) ramp presents little additional risk than over a flat surface. But a ramp soon becomes a hazard when it reaches 8 degrees or more.

TIP 4: SET UP PROPER RAMPS

Ramps should be stable with a smooth running slope and landings. Poorly set-up ramps can have harmful gaps, obstacles, and ridges. Plan ahead before building a ramp. Secure boards with screws or nails to stabilize the ramp. Use heavy sheets of membrane to bridge gaps and make a smooth ramp. Small changes will bring big results.

TIP 5: REDUCE OBSTACLE

Make sure that the path of cart movement is free of obstacles. Reduce any obstacle higher than 3/4 inches (the thickness of one piece of plywood shown in the left image).

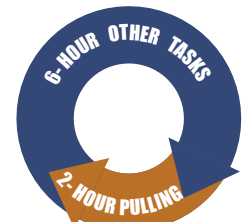


TIP 6: TEAMWORK

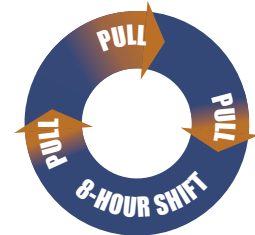
Apply team pulling/pushing to share cart loads and minimize the risk of overexertion, especially when factors relating to the physical work environment are present. The team size will depend on the cart loads and the presence of factors like space constraints, obstacles, and ramps.

TIP 7: JOB ROTATION

Job rotation can prevent workers from being exposed to particular ergonomic stressors for an extended period of time. Workers should be assigned to handle carts no more than 2 hours within an 8-hour work shift (Plan A). Alternatively, cart handling should be conducted at a lower frequency (Plan B): no more than one pull every 30 minutes, without other physically demanding activities in between.



Job rotation Plan A



Job rotation Plan B

RECOMMENDED TEAM SIZE*

SOLO JOB



TWO-PERSON JOB



THREE-PERSON JOB































FOUR-PERSON JOB



UNSAFE JOB



LOAD TYPE		flat floor	8° ramp, constrained space, or obstacle.	12° ramp
 700 lb - 2 bundles of insulation				
 820 lb - 10 rolls of base sheet				
 960 lb - 10 rolls of cap/sanded sheet				
 1,600 lb - 1 bundle of 1/4" Densdeck 4' x 8'				
 2,000 lb - 1 bundle of 1/2" Densdeck 4' x 8'				
 2,500 lb - 1 bundle of base sheet				
 3,000 lb - 1 bundle of cap/sanded sheet				

* The recommendations are targeted for acceptance of 6 in 10 of the male population as a minimal threshold.

Safety is a marathon, not a sprint!

Only those who are slow and steady can win the race!

Contact:

The SHARE Lab at SHARELab@uw.edu
or
Dr. Ken-Yu Lin
Room 130L, Architecture Hall, Box 351610
Department of Construction Management
College of Built Environments
Seattle, Washington 98195-1610
Kenyulin@uw.edu / 206-616-1915

Check out the full booklet for more information:
<https://share.be.uw.edu/researches/ergonomic-manual-cart-handling/>