

## **12.2 Ramping and Blocking of Material**

- (a) Handling of all heavy materials requires considerable care. Never use “short cuts.”
- (b) Pay particular attention to the position of fingers and feet when using rollers, pinchbars, jacks and blocking to move heavy materials and equipment.
- (c) Before trying to lift a load with a pinchbar, be sure to take an ample “bite.”
- (d) Jacks shall always be placed on a solid footing and so located that a good “bite” is provided on the object being moved.
- (e) Timber used for blocking and cribbing shall be of adequate size to carry and distribute loads being supported.
- (f) When placing blocking and cribbing, be sure to have ample bearing surface. Never stack the timber in such a manner that maneuvering the load could cause it to tip.
- (g) Whenever more than two tiers of timber are used, be sure to cross-rib.
- (h) Secure skid-boards to eliminate the possibility of their shifting, and block or crib them to prevent excessive or uneven deflection.
- (i) Passageways for the movement of materials and equipment shall be cleared of debris and obstacles to afford needed working space and ease of movement.
- (j) Before moving extremely heavy loads (machines, escalator trusses, etc.) check with your Superintendent/Manager that the floor will support the load.

## **12.3 Hoisting and Rigging**

- (a) The cardinal rules of hoisting are: stay clear of the load at all times, never stand under the load, know the weight of the load, capacity of your equipment, the structure to which you are rigging and the overall condition

of these items. Stand uphill or to the side of a load that's on a ramp.

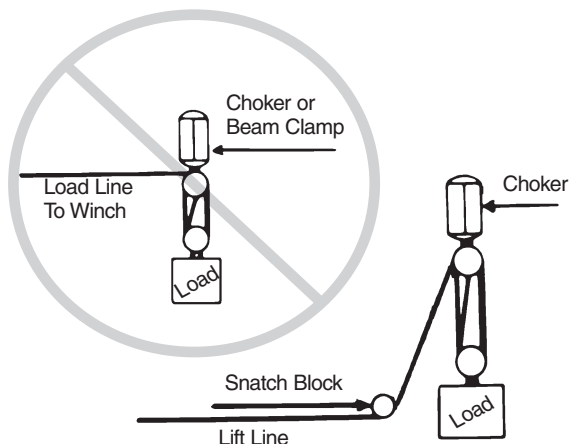
- (b) Do not allow non-Company personnel to use Elevator Company hoisting and rigging.
- (c) Elevator personnel must be aware of all hoisting being done in or around their work area. Always take necessary safety precautions.
- (d) When elevator personnel are conducting hoisting operations, access to hoisting areas, especially hoistways and wellways, shall be restricted to elevator personnel involved in the lift. Warning signs shall be posted.
- (e) Elevator personnel shall avoid areas where other trades are hoisting.
- (f) Before making the first hoist, and at the start of each day thereafter, when the hoist is to be used, the rigging, overhead supports, blocking, etc., shall be inspected by the mechanic/MIC. The hoist shall be inspected visually prior to each use. It shall be tested by raising the load several inches and holding it there prior to making an actual lift.
- (g) Power operated rigging equipment shall be tested to ensure the machine stalls prior to rigging breaking or coming loose (i.e., tie to major support structure – activate motor to ensure integrity of rigging system).
- (h) The safe working load of a hoist, or any part of the rigging system, as determined by the manufacturer, shall be clearly marked on the hoist or other equipment, and this safe working load shall not be exceeded. If the hoist or other equipment is not marked with the safe working load – do not use.
- (i) Only company approved hoisting and rigging equipment shall be used.

- (j) No alterations to any hoisting and rigging equipment shall be made without the manufacturer's written approval. Annual or manufacturer's recommended testing to certify the safe working load of the hoist shall be done by a qualified testing facility and the hoist shall be tagged or identified certifying test and date.
- (k) The supporting structure to which the hoist is attached shall have sufficient strength to support the load. (Refer to Allowable Concentrated Loads on American Standard Beams in Figure 22i).
- (l) The support shall be arranged so as to provide for free movement of the hoist and shall not restrict the hoist from lining itself up with the load.
- (m) The hoist shall be installed only in locations that permit the operator to stand clear of the load at all times.
- (n) The overhead structure shall be padded where any choke or assembly is passed over steel. This padding is essential to keeping the rigging in good condition.
- (o) Only properly made wire rope or nylon slings and chokers shall be used for rigging.
- (p) Do not use the hoist chain as a choker.
- (q) Do not use a jack wrench as a lifting block. These are not designed for these uses.
- (r) The use of two or more chain hoists for hoisting a single load is not permitted, unless any one of them will handle the entire load by itself.
- (s) Whenever a load cannot be lifted by one person pulling on the chain, investigate for overload or a defect in the chain fall.
- (t) To prevent hooks from being disengaged from the load or overhead support, it is recommended that only hooks with safety latches be used. Hooks which do not have safety latches shall be moused as a temporary measure.

- (u) A clevis-type shackle, with locking device or through bolt with jam nut, or nut with cotter pin, shall be used to hoist rails, brackets, etc.
- (v) Use only manufacturer recommended wire rope of the proper size for powered hoists. Always examine such wire rope for defects. Wire ropes found to be defective shall not be used.
- (w) Always wear gloves when handling wire rope.
- (x) When using a capstan hoist, do not stand in the coil of rope.
- (y) Do not rig the capstan hoist so as to overload it.

Figure 12e

### VERTICAL PULL ONLY



*Do not pull so that bending stress is put on beam clamp.*

- (aa) Do not drill additional holes in the capstan hoist's mounting brackets, as this could weaken the hoist.
- (ab) Rated load divided by the number of parts of the rope shall not exceed 20% of the nominal breaking strength of the rope (i.e., safety factor of 5).
- (ac) Wire rope used for supporting the top block hoist rig shall have, as a minimum, one more turn than the number of sheaves used in the traveling hoist rope, and shall be well padded where it goes around the support beam. Remember: Wire rope strength deteriorates 25% when it is wrapped around supports and is secured with fist grip type clips.
- (ad) Hoist machines shall be substantially secured so that they will not shift under a load.
- (ae) When starting a lift, gradually take slack out of slings and make sure that no one's hands are in a position to be caught between the load and sling hook.
- (af) Never attempt to make a lift or move equipment when anyone is in a position to be injured should the load shift or fall.
- (ag) Do not drag sling, chains, etc., along the floor or across equipment.
- (ah) When hoisting rails into a hoistway, and the guardrail system must be removed to allow access, if there is more than a 6 ft (1.8 m) fall exposure, the employee feeding the rails into the hoistway shall be protected from falling into the hoistway by a personal fall arrest system attached to a lifeline. Remember to keep the guardrail system up on the unused portions of the hoistway and keep others out of your hoisting area.
- (ai) Clear communications are required. All verbal commands shall be repeated by the receiving party and reconfirmed by the directing party.

Figure 12f

### **Allowable Number of Broken Strands for Wire Ropes used in Hoisting Equipment**

1. Six randomly distributed broken wires in one lay.
2. Three broken wires in one strand on one lay.
3. If one-third of the outside wires show wear or disintegrate at any place on the rope.

### **Causes Of Wire Rope Failure**

1. Using wire rope of insufficient strength for the job.
2. Improper rigging.
3. Kinking.
4. Improper lubrication, storage and care, allowing rusting, corrosion or internal abrasion.
5. Exposure to extreme heat.
6. Crushing on winch drum.
7. Using drums or sheaves of insufficient diameter of incorrect tread.
8. Permitting ropes to abrade over sharp corners or other fixed objects.
9. Contact with electrical current.

### **Signs Of Wire Rope Deterioration**

1. Reduction of rope diameter below nominal diameter due to loss of core support, internal/ external corrosion, or wear of outside wire.
2. Broken outside wires and degree of distribution or concentration of broken wires.
3. Worn outside wires.
4. Corroded, rusty or broken wires at end connections.
5. Severe kinking, crushing, cutting and/or unstranding.