



RESCUE SYSTEMS 1

Basic Rescue Skills



Topic 3-1: Introduction to Lifting and Moving Heavy Objects

The contact point to height ratios are as follows:

| | |
|------------------|--------------------------|
| 4 contact points | 3 x length of cribbing |
| 2 contact points | 1.5 x length of cribbing |
| 1 contact point | 1 x length of cribbing |

The height ratios are approximate and need to be reduced due to slopes and nature of incident, i.e., earthquake aftershocks, settling, etc.

Precut cribbing in 18" to 24" lengths can be stockpiled ahead of time. Prior arrangements and agreements with local lumberyards to supply rescue teams with bulk lumber in order to cut cribbing into desired lengths is a good idea. This prevents the need to stockpile large amounts of materials ahead of time. During a large-scale disaster, rescuers may be required to reconnoiter the area and use materials as located, i.e., construction sites, collapsed structures, fences, etc.

Wedges: 2x4x12" and 4x4x18" wedges are used to support, stabilize, and shim a load as it is lifted. The wedges need to be inserted as the load is raised. This is to prevent the load from dropping if a purchase point fails or if a rescuer cannot hold the load. Insert a full-size 4x4 piece of cribbing as soon as space allows.

A single 2x4x12" wedge should be used as a shim to fill voids between the load and crib beds. This increases stability by transferring the load to additional contact points.

Wedges can also be used to change the angle of thrust in order to get the optimum contact with uneven or sloped surfaces. Wedges can be cut in the field with chain or circular saws, but that can be difficult to do. They can be purchased precut from most lumberyards and should be prestocked in a rescue cache.

Cribbing and Crib Beds

Capacity varies from 200 psi to 1,000 psi depending on wood species. 500 psi is used for emergency shoring. Example: $500 \times 2.5 \times 3.5 \times 4 = 24,000$.

For a 2-Member x 2-Member Box Crib

4 x 4 box crib capacity = 24,000 lbs (12 tons)

6 x 6 box crib capacity = 60,000 lbs (30 tons)

For a 3-Member x 3-Member Cross-tie Crib

4 x 4 cross-tie capacity = 54,000 lbs (27 tons)

6 x 6 cross-tie capacity = 135,000 lbs (67½ tons)

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Do not stack cribbing more than two high in the same direction



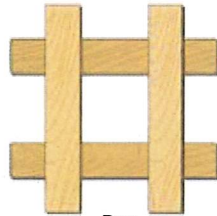
18" Minimum
Cribbing



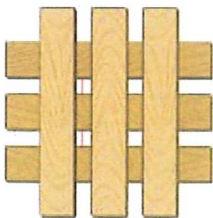
Wedge



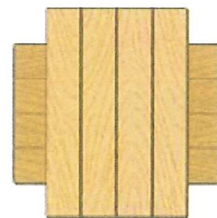
Wedge



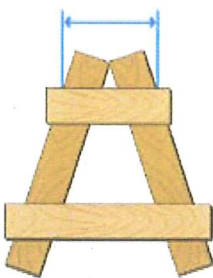
Box



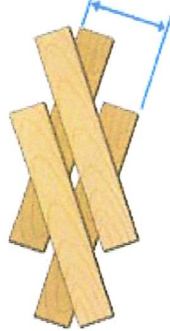
Crosstie



Solid Platform



Triangle



Parallelogram

Both are not very stable. Keep height to width within 1:1

Figure 3:7 Cribbing and Crib Beds

