

## Pickets:

### 1) Traditional Vertical Pickets:

- a) More forces at top.
- b) Shear cone layers.
- c) Snow fails in compression near the top surface.
- d) Things to do:
  - i) Use the firmest snow possible.
  - ii) Use the longest and widest picket.
  - iii) Completely bury the picket for both strength and protection from the suns solar energy.
  - iv) Place picket just above the strongest layer of snow.
  - v) Use multiple pickets when feasible.
  - vi) On mild slopes , place the picket/s at a 15 degree angle up hill from the slope
  - vii) On steep slopes, place the picket/s at a 45 degree angle up hill from the slope.

### 2) Horizontal Pickets:

- a) Stronger than traditional pickets.
- b) Watch for icy layers in the snow.
- c) Discuss shear cones.
- d) When using multiple pickets place them a minimum of 3 times the depth apart **but avoid putting the pickets in front of each other. If the pickets are placed in front of each other make sure the front picket will not be lifted out.**
- e) Things to do:
  - i) Bury as deep as possible.
  - ii) Use the firmest snow possible.
  - iii) In firm snow use the 24" picket instead of the 36" picket.
  - iv) Attach to the center hole so the picket does not rotate.
  - v) Make sure the trench is wide enough to backfill properly.

### 3) Sierra Pickets:

- a) More than 20% stronger than horizontal placement.
- b) Less sensitive to weak layer within the snow than in the horizontal configuration.
- c) When using multiple pickets place them a minimum of 3 times the depth apart **but avoid putting the pickets in front of each other. If the pickets are placed in front of each other make sure the front picket will not be lifted out.**
- d) Things to do:
  - i) Use the firmest snow possible.
  - ii) Bury as deep as possible.
  - iii) Place Sierra picket/s perpendicular to the slope.
  - iv) In firm snow use the 24" picket instead of the 36" picket.
  - v) Make sure the trench is wide enough to backfill properly.

When using multiple tools make sure you equalize the anchors **but do NOT use self-equalizing rigging!**

## Ice Axe/s in place of Pickets:

### 1) **Horizontal:**

- a) Same thing applies as for the horizontal pickets.
- b) Girth-hitch a runner to the mid-point of the ice axe handle.
- c) Use a carabiner in the spiked end of the ice axe to prevent the runner from slipping off.

### 2) **Vertical:**

- a) Same thing applies has for the vertical pickets.
- b) The approximate pull out strength with the head of the ice axe buried approximately 12” below the snows surface; 900-1500 lbs.
- c) Strongest if girth-hitched to the mid-point of the ice axe handle.

### 3) **Horizontal + Vertical:**

- a) Stronger than the vertical and horizontal placements.
- b) Strongest if the horizontal axe is placed in front of the vertical axe and is located at the mid-point of the vertical axe.
- c) The approximate pull out strength with the head of the vertical ice axe buried approximately 12” below the snows surface; 1900 lbs.

**For the most part pickets make a stronger anchor than ice axes!**

## Deadman:

- 1) Attach a length of webbing to the center of a pack, snow shovel, snowshoe, etc; with the most frontal area facing perpendicular to the slope.
  - a) Things to do:
    - i) Use the firmest snow possible.
    - ii) Use multiple anchors when possible, when using multiple anchors place them a minimum of 3 times the depth apart.
    - iii) Make sure your attachment point to the anchor will **NOT** cause the anchor to rotate.
    - iv) Bury as deep as possible.
    - v) Make sure the trench is wide enough to backfill properly.

## Snow Bollards:

- 1) Make horseshoe-shape where the uphill side is the deepest and the downhill side is undisturbed snow.
- 2) Depending on the snow type the bollard should be 3-10 feet wide and a foot to 1-1/2 feet deep.
- 3) Pack the snow in and around the upper perimeter of the bollard and pad it with packs, clothing, ice axes, pickets, padding, or whatever you may have on hand to keep the rope from cutting into the sides of the bollard.
- 4) Use webbing when possible, it is less likely “when placed properly” to cut through the bollard than rope.
- 5) When constructing a snow bollard watch for ice layers, the rope can slip right through those layers with very little force.