

Observation Tower Construction

Step 1 – Appoint a Safety Officer, Signal Caller, and Project

Leader

- Appoint a project leader.
- Appoint safety officer – the safety officer had absolutely no other duties
- Appoint a signal caller for raising the tower.

Step 2 – Ladder and Non-Ladder End Material

Acquire the following:

- 4 – 14' spars
- 15 – 3' spars
- 30 sections of 15' long, ¼" pioneering rope

Step 3 – Ladder End Construction

Layout a pair of 14' spars on the ground. Ensure that the spars are parallel (2-½ feet apart) and the butt ends (larger diameter) are on the same side. Make sure that the butt ends are even. The butt ends will eventually rest on the ground. It is best to have the 14' spars off the ground (i.e. on a concrete block or something similar) so you can work on the top and bottom while tying lashings.

- Mark 10' from the butt end of the 14' spars. This is where the **Top Spreader** (See Figure 1) will be placed. Lash a 3' spar to this location using square lashings. Ensure that you maintain the 2-½' separation between the 14' spars..
- Lash the **Bottom Spreader** to the spars. The **Bottom Spreader** should be about 4" from the butt end. Use square lashings. Ensure that you maintain the 2-½' separation between the 14' spars.
- Lash a 3' spar to the top (non-butt end) of the 14' spars. This spar should be 13'6" from the butt end of the spar. Use square lashings
- Place the remaining 3' spars (8 of them) between the **Top Spreader** and the **Bottom Spreader** at 1' intervals. Use square lashings.
- Recheck all lashings to ensure that they are tight and tied correctly. There should be no loose ends of rope. If you have additional rope, wrap it around the spar before completing the lashing with a clove hitch.

Step 4 – Non-Ladder End Construction

Layout a pair of 14' spars on the ground. Ensure that the spars are parallel (2-½ feet apart) and the butt ends (larger diameter) are on the same side. Make sure that the butt ends are even. The butt ends will eventually rest on the ground. It is best to have the 14' spars off the ground (i.e. on a concrete block or something similar) so you can work on the top and bottom while tying lashings.

- Mark 10' from the butt end of the 14' spars. This is where the **Top Spreader** (See Figure 1) will be placed. Lash a 3' spar to the 14' spars at this location using square lashings. Ensure that you maintain the 2-½' separation between the 14' spars. Use square lashings.
- Lash the **Bottom Spreader** to the spars. The **Bottom Spreader** should be about 4" from the butt end. Use square lashings. Ensure that you maintain the 2-½' separation between the 14' spars.
- Lash a 3' spar to the top (non-butt end) of the 14' spars. This spar should be 13'6" from the butt end of the spar. Use square lashings.

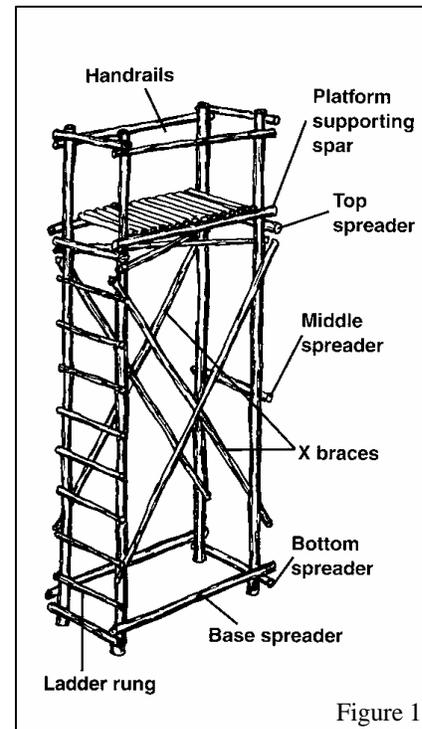


Figure 1

- Place a **Middle Spreader** half way between the **Top Spreader** and the **Bottom Spreader**. Use square lashings.
- Recheck all lashings to ensure that they are tight and tied correctly. There should be no loose ends of rope. If you have additional rope, wrap it around the spar before completing the lashing with a clove hitch.

Step 5 – Acquire Materials for Lashing the Ladder and Non-Ladder Ends

Acquire the following materials.

- 6 – 6’ Spars
- 4 – 10’ Spars
- 2 – 8’ Spars
- 24 sections of 15’ long, ¼” diameter pioneering rope

Step 6 – Lash One Side of the Ladder and Non-Ladder Ends

- Turn the ladders up on their sides so they are parallel to each other and 5½ feet apart. Ensure that the ladder rungs are turned to the outside.
- Ensure that the butt ends of both structures are even.
- Lash on a **Base Spreader** (See Figure 1) to join the bottoms of the ladder and non-ladder sections. Use a 6’ spar. Use square lashings. The **Base Spreader** is placed just above the **Bottom Spreader**.
- Lash on a **Platform Supporting Spar** to join the ladder and non-ladder ends. Use a 6’ spar. Use square lashings. Ensure that you maintain the same separation from bottom to top (5½ feet). Ensure that the bottoms (butt ends) are even. The **Platform Supporting Spar** is placed just above the **Top Spreader**.
- Lash on a **Handrail** between the ladder and non-ladder sections. Use a 6’ spar. Use square lashings. The **Handrail** goes under the ladder and non-ladder end top spars.
- Lash the **X-Braces** between the ladder and non-ladder sections using 10’ spars. Note that 3 of the 4 braces are on top of the ladder and non-ladder sections. One end of the **X-Braces** is lashed underneath. Use square lashings where the **X-Braces** intersect the ladder and non-ladder sections.
- Use a diagonal lashing where the **X-Braces** intersect.
- Recheck all lashings to ensure that they are tight and tied correctly. There should be no loose ends of rope. If you have additional rope, wrap it around the spar before completing the lashing with a clove hitch.

Step 7 – Lash the Other Side of the Ladder and Non-Ladder Ends

- Have the crew turn roll the tower 180°. Roll on the long side.
- Lash on a **Base Spreader** (See Figure 1) to join the bottoms of the ladder and non-ladder sections. Use a 6’ spar. Use square lashings. The **Base Spreader** is placed just above the **Bottom Spreader**.
- Lash on a **Platform Supporting Spar** to join the ladder and non-ladder ends. Use a 6’ spar. Use square lashings. Ensure that you maintain the same separation from bottom to top (5½ feet). Ensure that the bottoms (butt ends) are even. The **Platform Supporting Spar** is placed just above the **Top Spreader**.
- Lash on a **Handrail** between the ladder and non-ladder sections. Use a 6’ spar. Use square lashings. The **Handrail** goes under the ladder and non-ladder end top spars.
- Lash the **X-Braces** between the ladder and non-ladder sections using 10’ spars. Note that 3 of the 4 braces are on top of the ladder and non-ladder sections. One end of the **X-Braces** is lashed underneath. Use square lashings where the **X-Braces** intersect the ladder and non-ladder sections.
- Use a diagonal lashing where the **X-Braces** intersect.
- Recheck all lashings to ensure that they are tight and tied correctly. There should be no loose ends of rope. If you have additional rope, wrap it around the spar before completing the lashing with a clove hitch.

- Lash the **Platform X-Braces** under the platform using 8' spars (See Figure 2). Use square lashings where the **Platform X-Braces** intersect the ladder and non-ladder sections. Use a diagonal lashing where the **Platform X-Braces** intersect.
- Recheck all lashings to ensure that they are tight and tied correctly. There should be no loose ends of rope. If you have additional rope, wrap it around the spar before completing the lashing with a clove hitch.

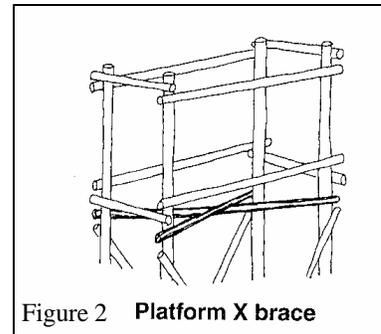


Figure 2 Platform X brace

Step 8 – Acquire Materials for Lashing the Platform

Acquire the following materials.

- 18 – 3' Spars
- 2 sections of 50' long, 1/4" diameter pioneering rope

Step 9 – Lash the Platform

- Use a weaving pattern on the **Platform Supporting Spar** to attach the platform to the structure. The weaving pattern goes over a platform spar, under the **Platform Supporting Spar**, and then over the next platform spar. Continue this pattern until the end and retrace the pattern back. Begin and end the rope with clove hitches. Perform the same tie down on the other **Platform Supporting Spar**.

Step 10 – Acquire Materials for Raising the Tower

Acquire the following materials.

- 8 – 3' Hardwood Anchors
- 7 – 50' long, 3/8" diameter pioneering rope

Step 11 – Raise the Tower.

- Move the tower to the place where it will be hoisted. Hopefully, it was constructed where it will be placed.
- Determine the location of the anchors for the four corners of the tower.
- Place four 1-1 anchors at these locations. See Figure 3 and Figure 4.
- Attach four 50' guy lines to the 14' spars just above the **Platform Supporting Spar**. Attach with a roundturn with two half hitches (See Figure 4). Secure the running end of the rope.
- Attach three remaining 50' pioneering ropes to the 14' spars just above the guy rope location. These ropes will be used to lift the structure. Use two on the side that is pulled up and one on the back for safety. Attach with a roundturn with two half hitches.
- Ensure that entire crew (at least 7 people) is available for hoisting. Appoint a safety officer who observes all safety considerations and sign of trouble during hoisting. Appoint a signal caller who tells the crew members when and how fast to pull on the hoisting ropes. One or two Scouts should be on the back rope to prevent overpulling. All remaining Scouts should be on the hoisting ropes.
- Signal caller directs the Scouts on the hoisting ropes to hoist the tower.
- After the raising the tower, temporarily tie-off the guy lines on the anchors with a round turn and two half hitches.

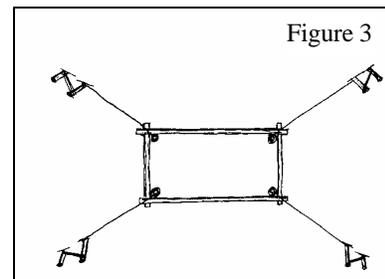


Figure 3

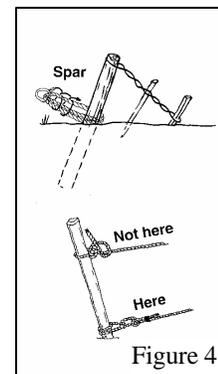


Figure 4

Step 12 – Heel in the Legs.

- With the tower upright, heel in the butt ends of the tower legs in holes about 4”-6” deep.

Step 13 – Tighten the Guys.

- Acquire four 10’ - 1/4” pioneering rope. One of these ropes will be used on each guy.
- Tighten one guy and only one guy at a time. Acquire four 10’ - 1/4” pioneering ropes. One of these ropes will be used on each guy.
- Perform the following procedure for each guy.
 - Remove the tower guy from the anchor.
 - Using the 10’ rope, tie a roundturn and two half hitches around the anchor. See Figure 8. Tie a bowline on the other side of the 10’ rope.
 - Make a rope tackle on the tower guy line. The Butterfly knot is shown in Figure 5. Figure 6 shows the rope tackle. The load in the diagram will be the loop in the bowline from the previous step.
 - Put the guy under tension.
 - Tie off the rope tackle as shown in Figure 7 with a half hitch.
- After completing all four guys, re-check them. Add tension to any guys that are not under tension.

Step 14 – Test the Structure.

- Before the tower can be put in general use, make a test climb while the safety officer and the whole crew observe all lashings and anchors to ensure that they are all secure.
- Remove hoisting ropes. Coil ropes. Return them to the proper bin of the pioneering kit.
- Ensure that a safety officer is always nearby when anyone is climbing on the tower.

