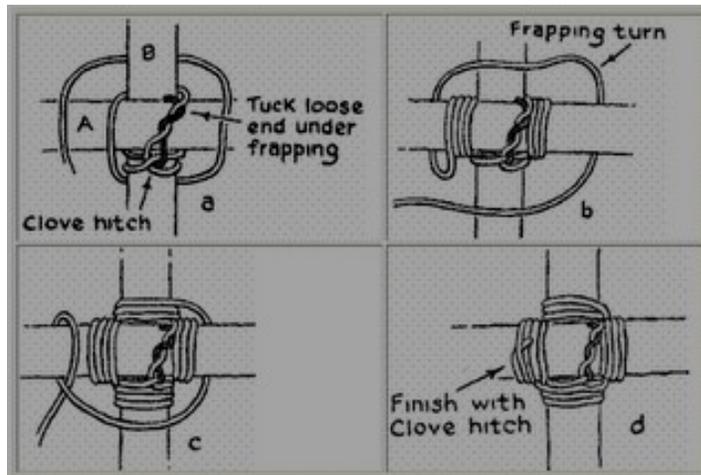


A Long-Term Survival Guide – Improvised Towers:

How To Tie The Rope Lashings Used To Make Improvised Towers:

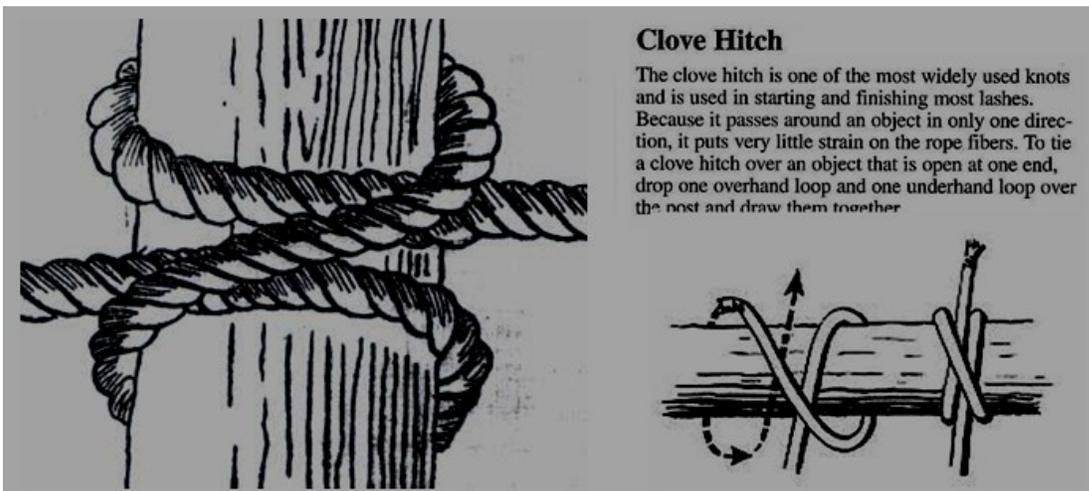
These are the ten lashings used to make most pioneering-style improvised towers:

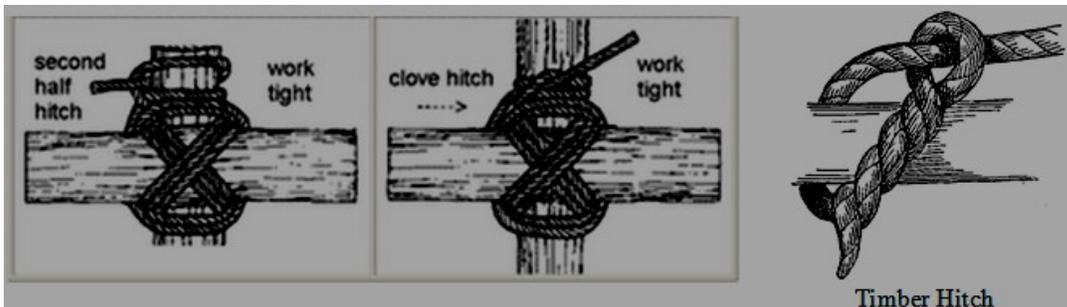
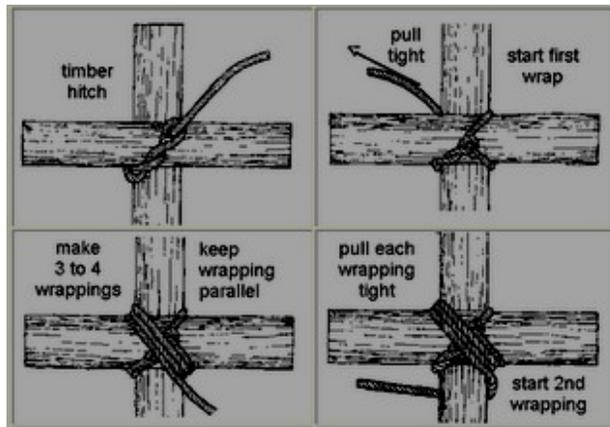
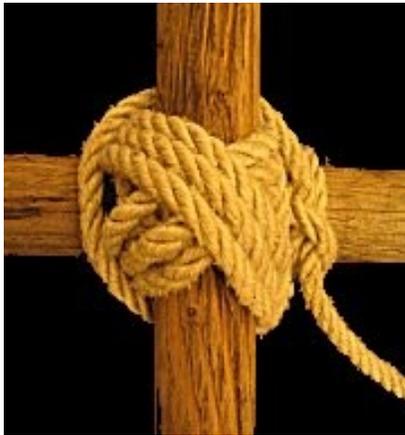


Square Lashing: Start by crossing the two poles or spars at roughly 90 degree angles. Make a Clove Hitch on the vertical pole or spar, near the point where the two spars cross. This fastens the rope to the spar.

Weave the rope under and over the crossed spars alternately. To do this, run the rope over the horizontal bar, around behind the vertical bar, then back over the face of the horizontal bar on the left. Tighten snugly, then bring the rope behind the vertical bar and up the right front side of the horizontal bar. Repeat this three or four times, keeping the rope tight.

When you have finished weaving the lashing, then frap (tighten) it by wrapping the rope between the poles (in front of the back spar and in back of the front spar), pulling tightly. This tightens the connected poles. Finish the lashing with another Clove Hitch.

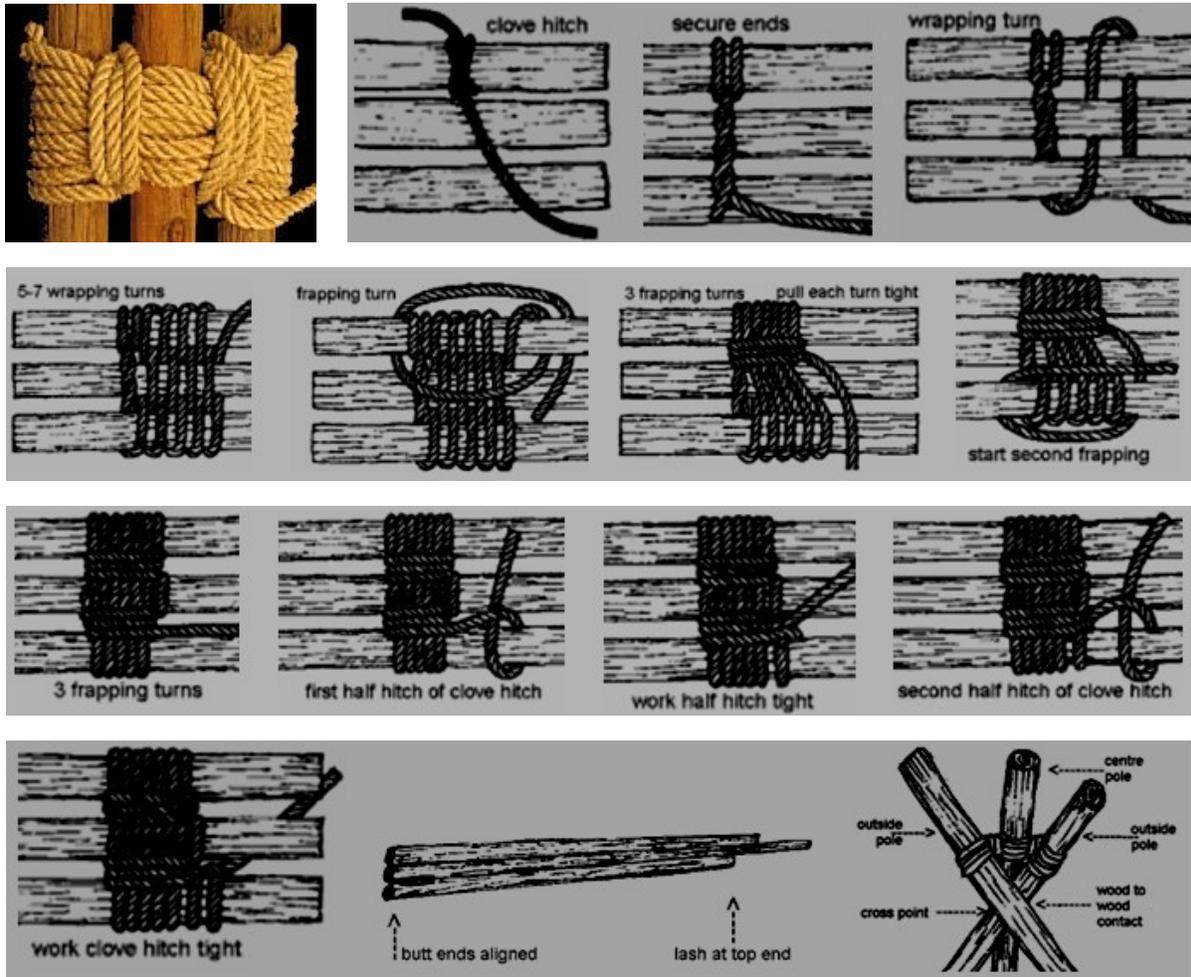




Diagonal Lashing: To make this lashing, first tie a timber hitch diagonally around both poles. Start the wrapping turns on the opposite diagonal to the timber hitch, by pulling the rope tight so that the poles contact each other. Take 3 to 4 wrapping turns; keep the wrapping turns parallel; pull each wrapping turn tight. (If the wrapping turns are allowed to cross, the increased friction between the strands of the rope will make it difficult to tighten the wrapping turns.)

Start the second set of wrapping turns by going past and around the vertical pole. (Going around the pole the rope allows the direction of the rope to be changed without crossing the first set of wrapping diagonally.) Take 3 to 4 wrapping turns; be sure to keep the wrapping turns parallel; pull each wrapping turn tight. Now start the frapping turns by going past and around one of the poles.

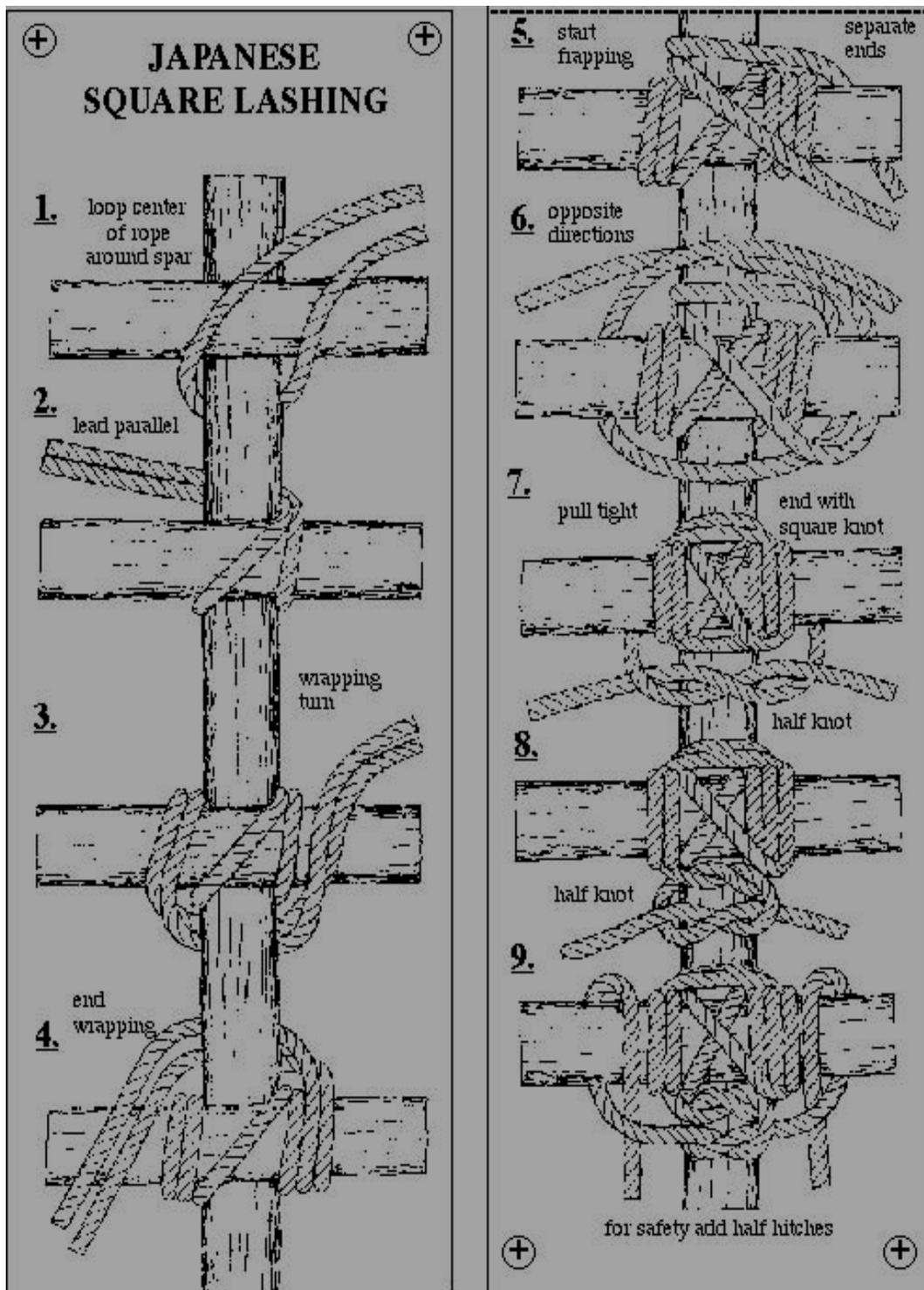
Take 2 to 3 frapping turns; keep the turns parallel. Be sure to pull each turn tight. End the lashing with a clove hitch. Take the first half hitch of the clove hitch by going past and then around one of the poles. Lock the half hitch tight against the lashing, by working it tight. Take a second half hitch around the pole. Work the second half hitch tight against the first half hitch, so that the clove hitch is locked against the lashing. Note: Very smooth rope can be made more secure, by adding a third or fourth half hitch to the clove hitch.



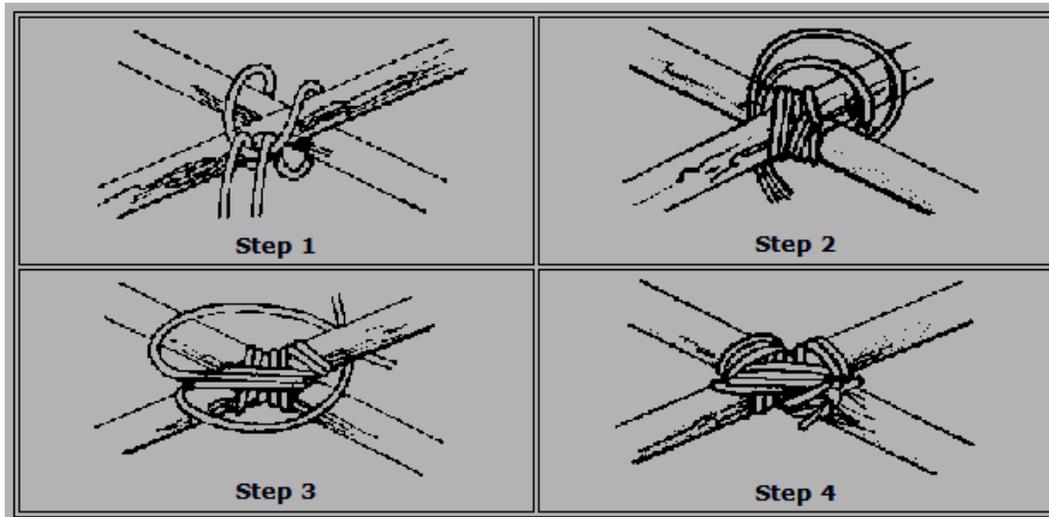
Tripod Lashing: Used to bind three poles together, for the construction of a tripod. The lashing is made with racking turns (the rope is woven between the poles), so that the rope contacts each pole around its entire circumference. This is the most secure form of tripod lashing.

Laying Out The Poles: For most tripod lashings, lay the poles side by side, with the butt ends aligned. The alignment of the butts of the poles insures that the tripod legs are the desired length. Note: Do not lay the center pole in the opposite direction of the outside poles, as this creates problems. If the poles are laid in opposite directions the wrappings must be put on loosely, so that when the center pole is rotated to its proper position, the lashing is tightened around the poles. If the wrappings are put on too tight, the rope is stretched, causing damage to the rope fibers, and weakening the lashing. If the rope is wrapped too loosely, the lashing will not tighten enough when the center pole is rotated, and the lashing will be able to slip along the length of the pole. Either way, a dangerous situation is created.

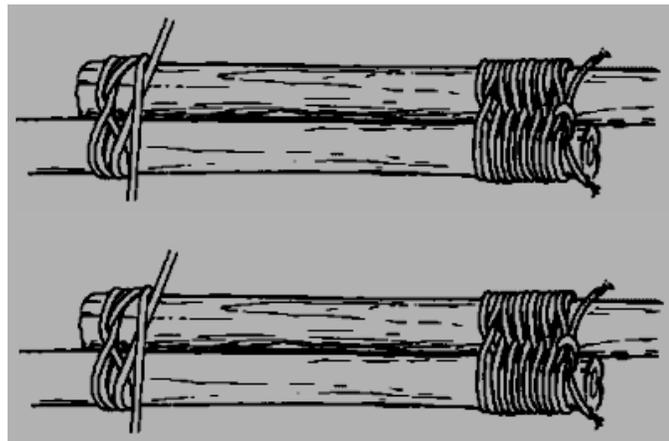
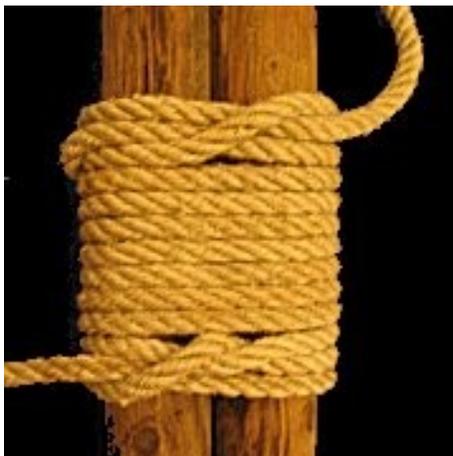
Setting Up A Tripod: Set up the tripod by crossing the outside poles, so that the cross point of the poles is under the center pole. Crossing the outside poles under the center pole causes part of the load that is placed on the tripod to be taken up by the wood to wood contact of the poles.



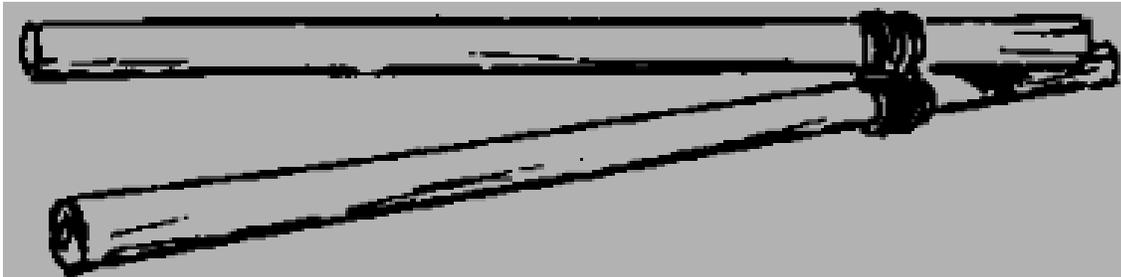
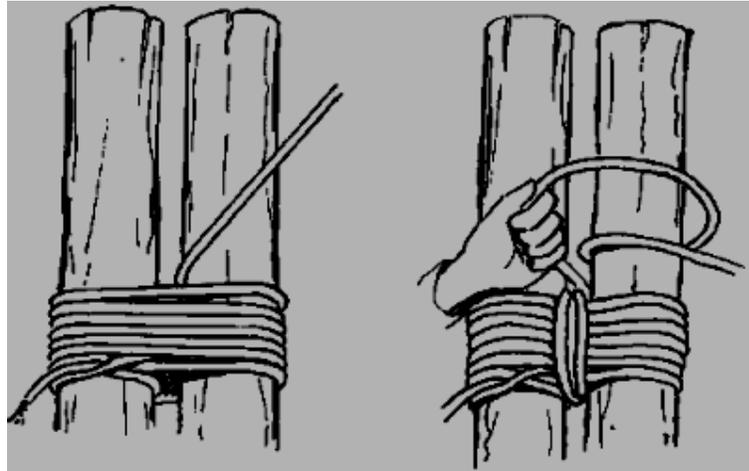
Japanese Square Lashing: This is a lashing used in lightweight construction work. It is equivalent to a Square Lashing, and when done correctly is just as strong, but much quicker to do than a square lashing. The knot is finished off with a Square Knot, and Half Hitches.



Filipino Diagonal Lashing: This is another lashing used in lightweight construction work. Start with the middle of the rope, tucking the running ends through the middle "loop" after going round both spars. Use the "loop" to pull the spars together. Now proceed as for a diagonal lashing, taking the running end round both spars, keeping both ends together. Separate the ends and take frapping turns between the spars, pulling the rope tight as you do so. Complete the frapping turns and finish off with a reef (square) knot.



Round Lashing: Used to lash two poles together (constructing a flagpole, etc). Tie a clove hitch around the bottom pole. Wind the rope around both poles six or seven times. Finish with two half hitches around both poles. The lashing can be tightened by driving a small wooden wedge between the poles, forcing the wedge under the lashings, to make them really tight.

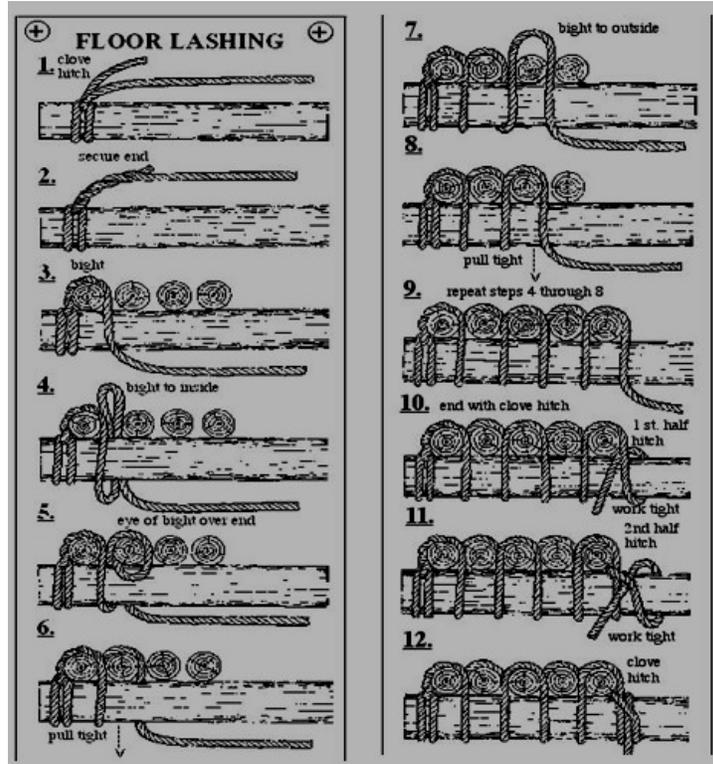


Shear Lashing: Used to bind parallel poles together. A (loose) shear lashing made around the ends of two poles will allow the poles to be opened out and used as an A-frame. A (loose) shear lashing made at the mid-point of two poles will allow them to be opened into an X shape, for bracing pole structures. The shear lashing is also a good way to reinforce a broken or weak pole, by tying a strong pole across the break, or weak point.

To make a shear lashing, first lay out the poles. For most lashings you will want to lay the poles side by side with the butt ends aligned (thicker ends). Tie a clove hitch around one of the outside poles and secure the standing part by wrapping it around the running part (or trap it under the first turns). If you are only lashing two poles together it may be better to simply tie the clove hitch around both poles and pull tight. Pass the rope around the poles to form a first turn.

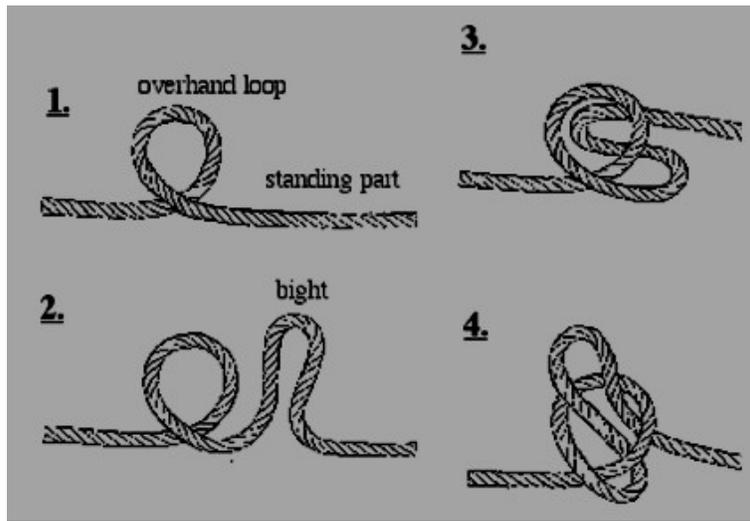
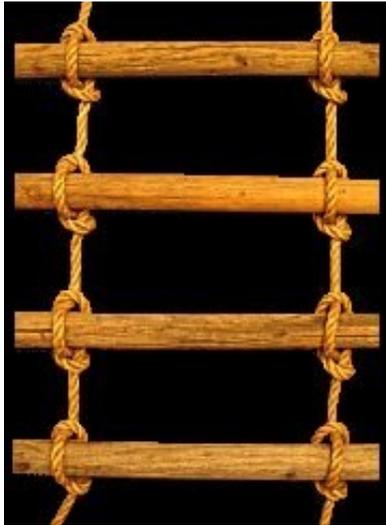
Pulling each turn tight, make a series of turns until the lashing is at least as long as the combined diameters of the two poles (usually a set of 4 to 6 turns will be sufficient). Tighten the lashing with a frapping turn by taking the rope down between two poles at one end of the turns. This should be difficult to do if the turns have been pulled tightly (as they should be). Bring the rope back up between the poles at the other end of the lashing and pull tight. Repeat 2 or 3 times.

Start the second set of frapping turns by taking the rope around the centre pole and frapping. Take the second set of frapping turns in the opposite direction, and repeat for any additional poles. Pass the rope once more between the poles then around one pole and tuck it under itself to form a half hitch. Pull this tight and make a second half hitch forming a clove hitch by taking the rope around the same pole and tucking it under itself.



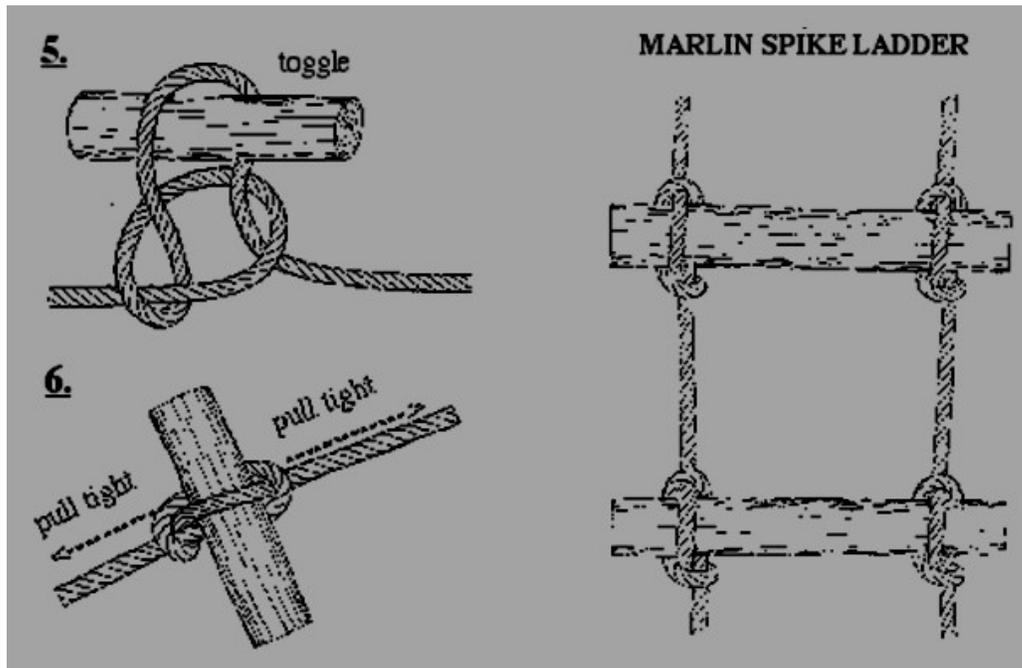
Floor Lashing: This lashing is used to lash a series of poles to a framework, to form a flat surface such as a tower platform, a table top, or a walkway on an improvised bridge. When using a floor lashing, both ends of the poles should be lashed at the same time, to insure a firm, even surface. When placing the decking poles on the frame poles, lay the decking poles so that their butt ends are in alternating directions. Alternating the butt ends of the decking poles helps to compensate for the natural taper of the poles.

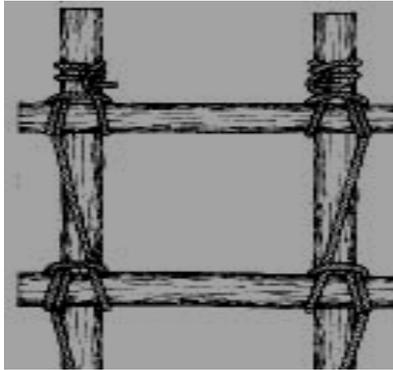
(1) Tie a clove hitch around each frame pole. (2) Secure the short end of the rope by wrapping it around the running end (wrap with the lay of the rope). (3) Place the decking poles on the frame poles, and take a bight around the first pole. (4) Next, on the inside of the frame pole, pull a bight up between the first decking pole and the next decking pole. (5) Place the eye of the bight over the end of the decking pole. (6) Pull tight. (7) On the outside of the frame pole, place a bight over the next decking pole. (8) Pull tight. (9) Repeat steps 4 through 8 until all decking poles are lashed in place. (10) Tie the first half hitch of the ending clove hitch. Work half hitch tight. (11) Tie the second half hitch of the ending clove hitch. Work half hitch tight (12) to form clove hitch.



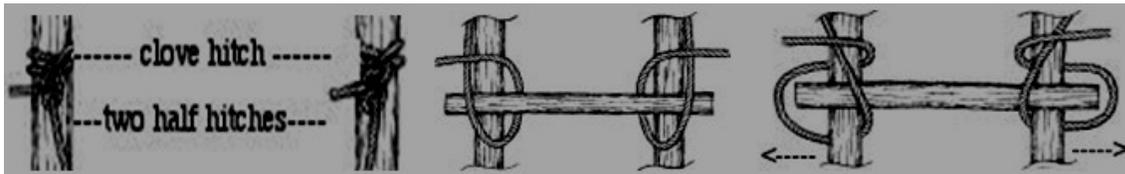
Rope Ladder Lashing: (Marlinspike Hitch) Used to hold the rungs of a rope ladder, this knot is just a slip-knot with a spar in the loop (the ladder rungs), to keep it from coming undone.

(1) Form an overhand loop. (2) Then form a bight in the standing part. (3) Place the bight under the overhand loop. (4) Then pull the bight through the underhand loop. (5) Pass a toggle through the bight, and (6) Tighten the hitch. Repeat for each rung, and secure the end of the ropes around the bottom spar, with a clove hitch and half hitches, to prevent the knots from working loose. The rope ends can also be tied to any available anchors, if desired, to help keep the ladder from swinging.

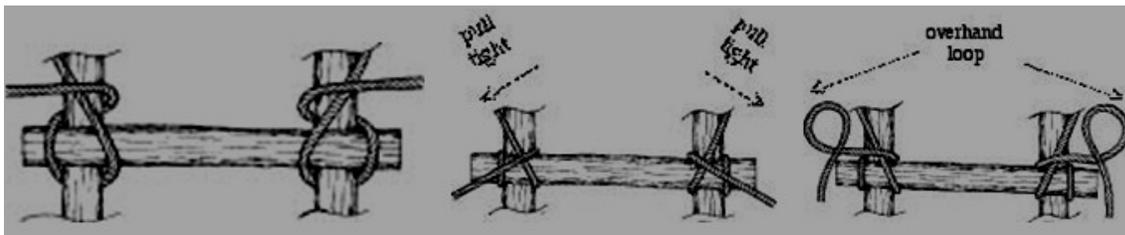




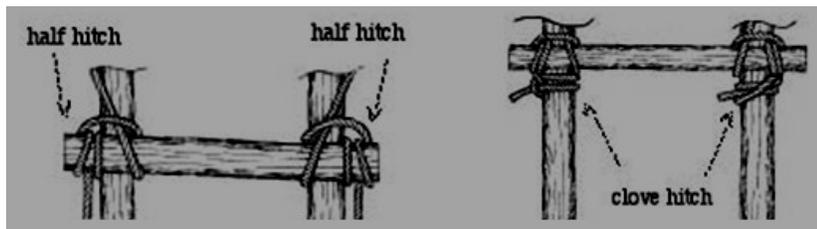
Ladder Lashing: Ladder lashing is a quick and secure method for constructing a ladder, or for constructing decking with evenly spaced decking pieces. The ladder lashing has two forms; left and right, each is a mirror image of the other. The ladder lashing is started by using a clove hitch stopped with two half hitches to secure a rope to the top end of each rail.



Place a rung across the rails so that the standing part of each overhand loop is over the end of the rung and the running part of each overhand loop is under the rung. Pull the running part side of each overhand loop behind and to the outside of each rail. Pull the loop over the end of the rung.



Work each rope until it is tightened around the rung and the rung is in its desired position. Form an overhand loop in each running part. Place the overhand loops over each end of the rung to form a half hitch around each end of the rung.



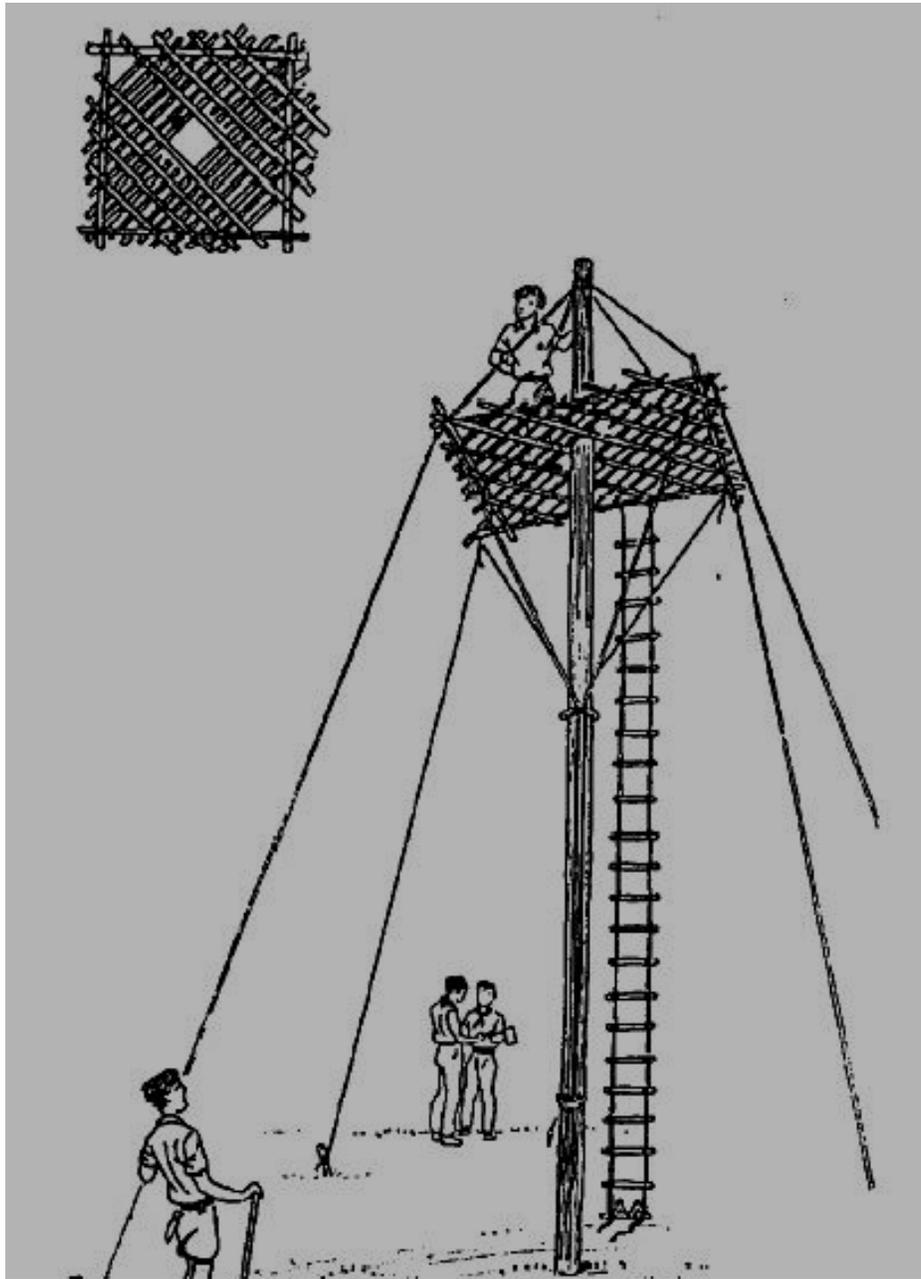
Work the half hitches tight. Repeat these steps for each additional rung. Finish the lashing by tying a clove hitch around each rail so that the clove hitch is directly under the bottom rung, and add extra half hitches. (These ropes must be strong, as they will support most of the climber's weight.)

Types of Improvised Towers:

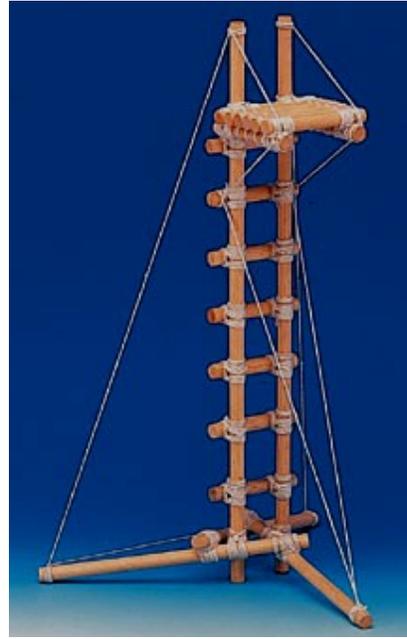
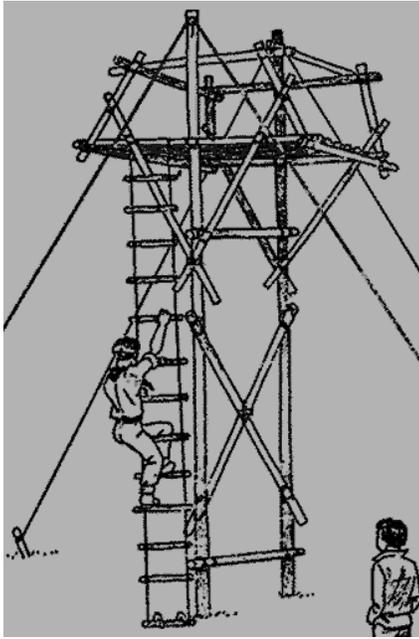
Here are a number of designs for improvised towers, that can be made using the lashings just described. These pioneering structures can be built with logs and wooden tree limbs, or large bamboo stalks and bamboo poles. Towers such as these can be used as Lookout Towers, Signal Towers, Hunting Stands, Feral Dog Defense Platforms, and Elevated Shelters:



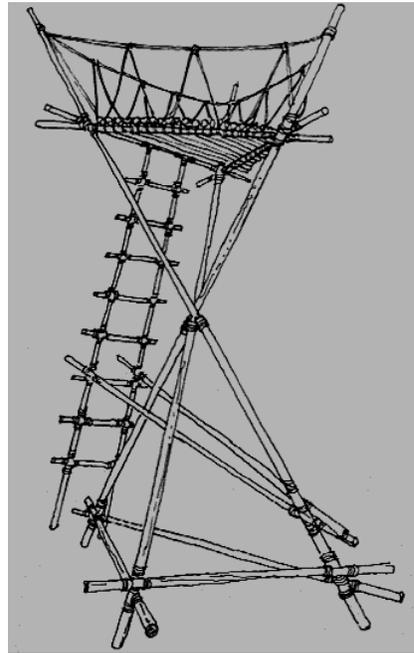
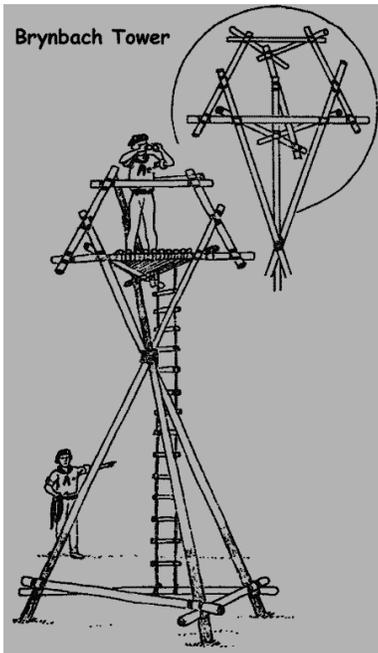
Treehouse Tower: any sturdy tree can be made into a tower, by building a platform on top, and making a ladder to reach the platform. The platform can be open, roofed, or fully enclosed, and the tree can be left whole, or the top can be removed (before constructing the platform). Existing branches can be used as supports, and extra supports can be lashed to the tree, as shown here.



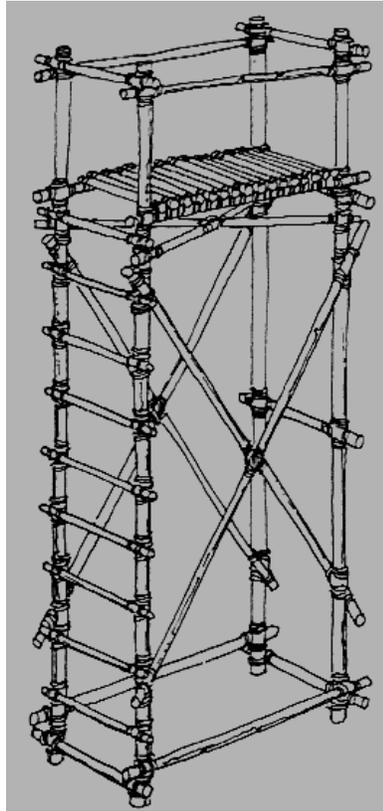
Single-Pole Tower: This tower design uses one pole set in the ground (or a straight tree with all the limbs removed). The platform is lashed together around the pole while at ground level, and then it is hoisted up with ropes, and tied into place. Rope guy lines above and below the platform keep it stable, and guy ropes to the ground keep the whole tower secure. The support pole should be set as deeply into the ground as possible, for extra stability. The platform can be reached using a rope ladder, an improvised A-frame ladder, or a ladder made by lashing steps to the support pole (with a trap door opening in the platform). The guy ropes for this tower must be strong enough to support all of the stresses that will be placed upon them.



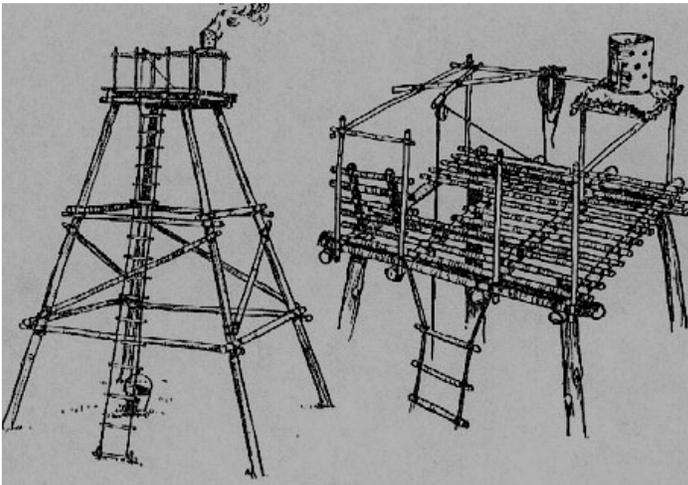
Two-Pole Towers: Both of these towers use two main support poles, and both depend on sturdy guy ropes, to keep them stable. The example on the right shows how a ladder can be made by lashing rungs to the main support poles. Note how the three base poles overlap, for stability.



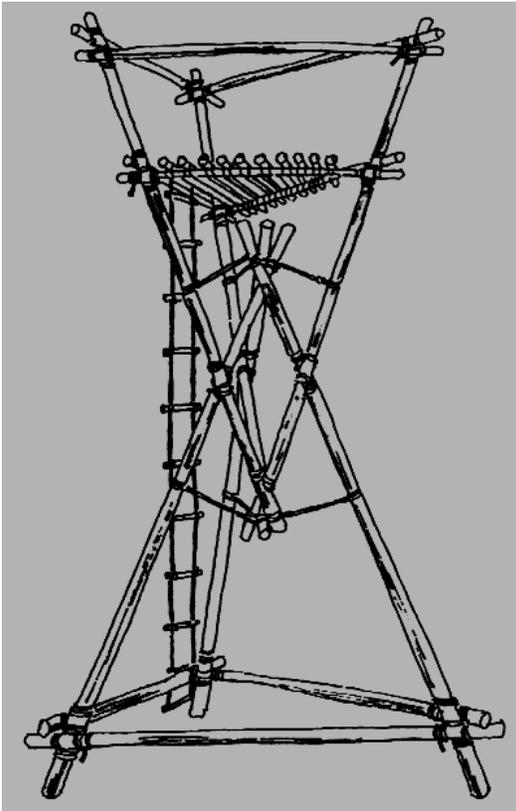
Three-Pole Towers: These towers are made with three main support poles, which form large tripods. The tripod shape is simple, and very sturdy. Guy ropes are not required for these self-supporting designs, but towers like this are more stable if the base is made larger and heavier than the top. Extra logs can be added to the base of the tripod, to act as anchor weights, or a platform can be constructed at the base, and loaded with piles of heavy stones, to get the same effect.



Four-Pole Towers: This four-pole tower uses crossed bracing poles for stability, and would be unsafe without them. It can also be improved by making the base wider than the top, and by making a platform on the base, and piling rocks or logs on the base platform, for weight.



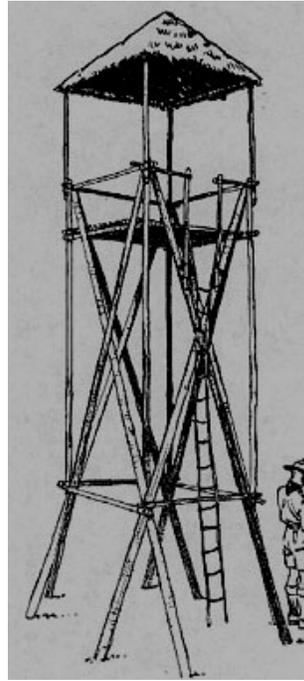
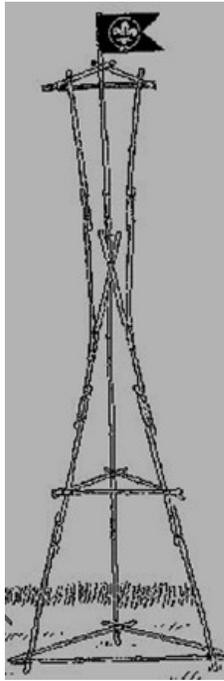
Here is an improved four-pole tower, which has a wide, stable base. Note the fire platform, which can be used for cooking, and for signaling. It is made from sticks, covered with a thick layer of clay or mud, and this example has a stove made from a metal bucket. This design is sturdy enough to support a lightweight elevated shelter, but more crossed bracing sticks would improve stability.



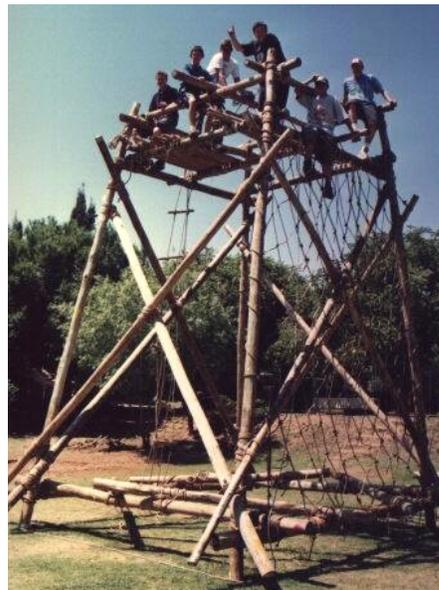
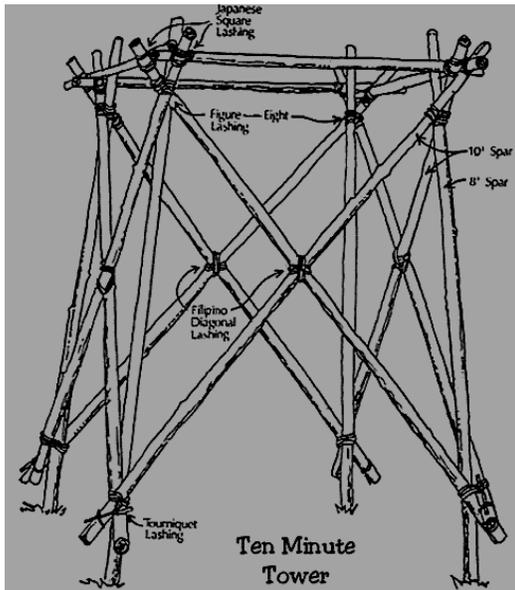
Six-Pole Towers: Here is a six-pole tower design, that uses two tripods. Stacking tripods like this results in a tower that is taller than the longest support poles. The lower tripod should always be larger and wider than the upper one, or weighted with anchor logs or stones, for structural stability.



Here are two variations of the dual-tripod tower design.



Other Variations: The example on the left uses three extra poles to extend the height of a tripod. This is a lightweight design that makes a good flagpole tower, or a sturdier version can be used as a one-man lookout tower, if guyed securely. The base of the tower can also be lashed to sturdy stakes driven into the ground, or buried anchor logs. The example on the right is made from four pairs of crossed support poles, one pair on each side of the tower. This tower is also narrow enough to require extra bracing, or guy ropes, for safety.



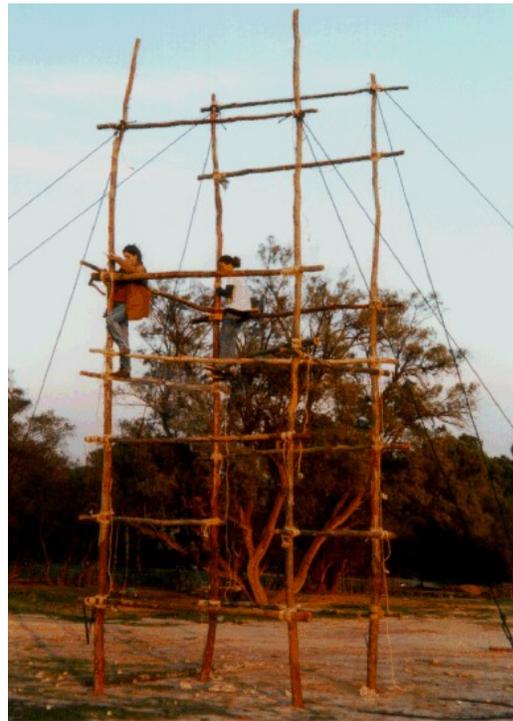
Twelve-Pole Tower: This tower is very quick to assemble, and is a very stable design (as long as the base is made wider than the top), but it requires twelve long poles to construct.



Tower Assembly Tips: First collect all of the poles needed to make your tower design.



Assemble tower sections on the ground, and then use guy ropes to lift the sections, and to hold them in position, until they can be connected with cross-poles.



After raising and securing tower sections with guy ropes, lash on bracing poles and crossed sticks, starting from the bottom, and working your way up. Build and use an improvised ladder, if needed.