A-Frame Levels:

Build and use your own

Sometimes you will decide that you need to stop or slow water running down a slope. Whether you want to build a retaining wall or an earthen berm, you'll need to make it level so that water doesn't build up in some places and not others. This means that you will need to mark a level line across your slope- this line is called a contour. The job can be made a lot easier by using an A-frame level, and it's easy to build.

MATERIALS

- 3/8"x2"x36" pine craft board (2)
- 3/8"x2"x26" pine craft board
- Power drill
- 3/16" drill bit
- 5/64" drill bit
- 10-24x1 ¼ machine screws (4)
- 10-24 wing nuts (3)
- 10-24 regular nut
- #212x15/16" eye screw
- 3ft string
- Plumb bob (or other weight such as a fishing sinker).

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Construct your own

STEP 1: Drill Holes

A. Using the 3/16” drill bit, drill a hole 1” in from each end through the center of the smaller 3/8”x2”x**26”** pine craft board.

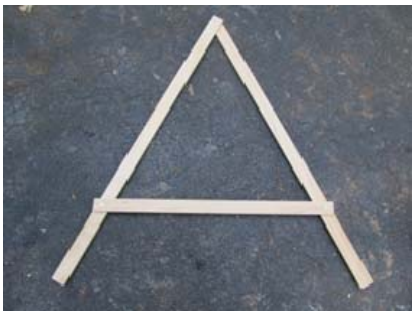

Figure 1: Overlap Boards

Figure 2: Holes through overlapped ends

B. Next, drill a hole 9” in from *one* end of both of the longer through the center 3/8”x2”x**36”** pine craft boards. Loosely bolt (using the machine screws and wing nuts) the 3/8”x2”x**36”** pine craft boards to the 3/8”x2”x**26”** pine craft board, then overlap the undrilled ends of the 3/8”x2”x**36”** pine craft boards . (Figure 1)

C. Lastly, carefully drill two holes though both overlapped boards at the same time (Figure 2). It isn’t important exactly where the two holes are so long as they go through both boards and are far enough from the edges not to break through.

Figure 3: Wing and regular bolts

STEP 2: Temporarily Assemble Frame

A. Use two machine screws through the holes to fasten the overlapping boards together. Use one wing nut and one regular nut (Figure 3). The wing nut allows you to take it apart enough to fold it for storage.

STEP 3: Placing Eye Screw

A. In this step you will attach an eye screw to the top of the A-frame for the plumb bob to hang from. Mark a spot ½” down from the point where the boards overlap.

Figure 4: Sink eyescrew

B. Unscrew the overlapped boards and drill a small hole at the place you just marked, about ½” deep. This is called a pilot hole.

C. Now screw the eye screw into the pilot hole. You can use a drill bit to make turning easier (Figure 4).

D. Sink the eye screw fully into the board so that only the loop is showing.

E. Now you can screw the overlapped boards back together (Figure 5). Tighten all screws.

Figure 5: Eye screw in final position

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STEP 4: Attach Plumb Bob

A. Tie one end of the three foot string to the eye screw.

B. Tie the other end to the plumb bob; you want the plumb bob to hang past the bottom rung but not touching the ground (Figure 6). Note: You can use anything as a plumb bob as long as you can firmly attach it and it is heavy enough to pull the string tight.

Figure 6: Attach plumb bob

C. Cut away any excess string. Your A-frame should now look like Figure 7.

Figure 7: Finished A-Frame

STEP 5: Calibration

Before you can use your level you need to calibrate it by finding the center point. Set the frame on a non-level surface.

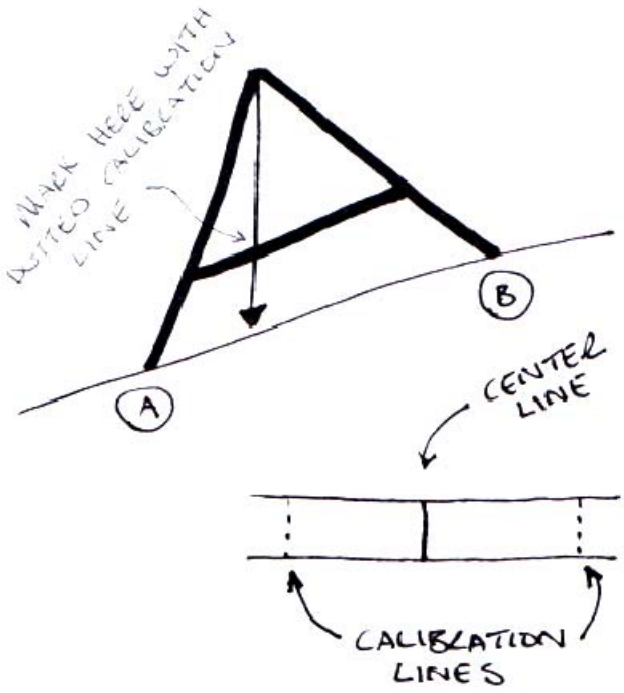

Figure 14: Calibration

The first leg is in position “A” and the second leg is in position “B” (Figure 14).

Mark where the plumb line comes to rest with a dotted line. Now flip the A-frame around so that the first leg is where the second leg was (position “B”) and the second leg is where the first leg was (position “A”).

Again, mark where the plumb line comes to rest with a dotted line. You should now have two dotted lines.

Measure halfway between these lines and mark with a heavy solid line; this is your center line.

Now any time the plumb bob hangs over the center line, you know you’re level!

How to Use an A-Frame

STEP 6: How to Use Your A-Frame to Find Contours

You can use your new A-frame level to mark a contour across a slope.

A. Begin by placing the A-frame where you want to start the contour line. Adjust the second leg of the A-frame until the plumb bob rests over the center line and then mark where the two legs for the A-frame rest (positions “A” and “B” in Figure 15).

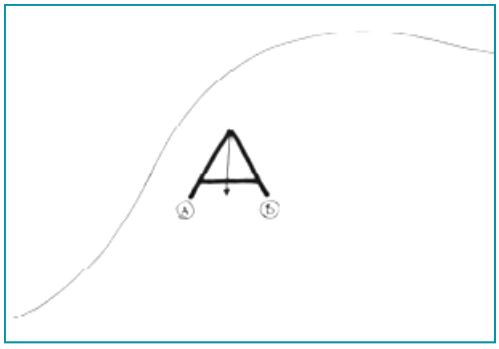

Figure 15: Starting position

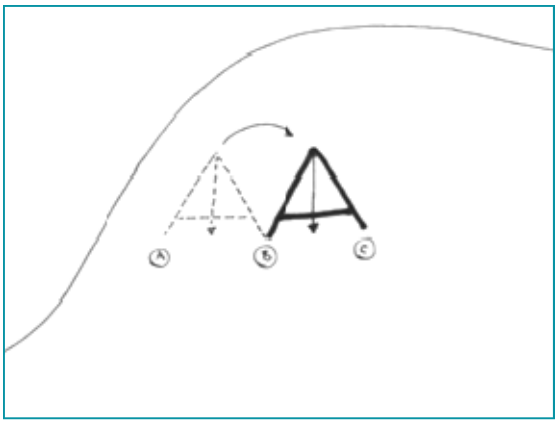

Figure 16: Starting position

B. Now move the A-frame so that the first leg is where the second leg was. Adjust the second leg of the A-frame until the plumb bob rests over the centerline, just as you did before, and mark where the second leg rests (position “C” in Figure 16). Move along the slope in the same pattern until you’ve marked a contour as long as you need (Figure 17). Easy!

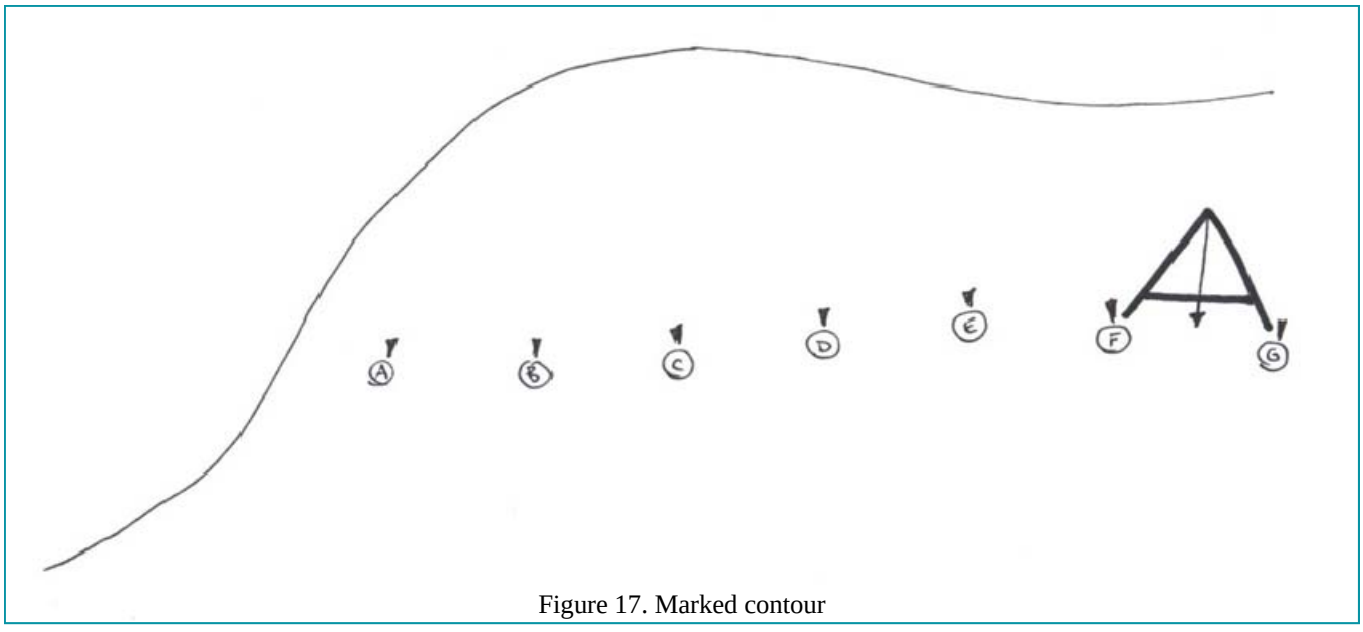

Figure 17. Marked contour