



A FRAMES AND SLOPE CONTOURS

For conservation and production



A-frames and slope contours

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To lay out a slope contour, there is a simple tool that you can make yourself. It has the shape of a capital "A", which is why it's called an **A-frame**.

But, however simple it may be, it is still an instrument of measurement, so when building and using it, certain precise measurements must be respected.

1. Building the A-frame

1.1. Prepare the tools and materials

To make an A-frame, you need:

- ✓ 1 hammer
- ✓ 1 machete or saw
- ✓ 1 tape measure
- ✓ 2 two-metre long posts, poles or sticks
- ✓ 1 x 1.10 metre long crossbar
- ✓ 1 two-and-a-half metre long string
- ✓ 2 short 30-centimetre stakes
- ✓ 3 x 3-inch nails
- ✓ 1 spirit level (optional)



1.2. Cut and nail the two legs

Join the posts by placing them one on top of the other and nailing them together five centimetres below one end, letting the nail protrude a little.

1.3. Measure the place of the crossbar and nail it on

- ✓ Once nailed, spread the two posts open on the ground until they measure about two metres from end to end.
- ✓ Nail the crossbar one metre from the end of each leg. Make sure that the frame has not closed at all, so that the distance between the ends of the two posts is still two metres.



1.4. Tie and calibrate the weighted string

- ✓ Tie the string to the nail at the top where the two legs intersect. Tie a stone to the other end so that it hangs at least a quarter below the crossbar.
- ✓ To calibrate the A-frame, place the two stakes two metres apart, after sharpening them with the machete.
- ✓ Position the legs of the A-frame on the stakes.
- ✓ After making sure that the A-frame is vertical so that the plumb line does not touch the crossbar, mark the crossbar with a pencil or with the machete on the spot where the string passes it.

Turn the A-frame around completely so that each leg is placed on the stake where the opposite leg was.

Mark with a pencil or machete the place where the plumb line passes the crossbar now.

With the help of the tape measure and a pen, mark the midpoint between the two previous marks on the crossbar. When the plumb line passes over this mark, it indicates that the A-frame, and therefore the terrain, is level.

If you can get a spirit level of the kind that builders use, you do not need to hang the weighted string. Attach the spirit level to the middle of the crossbar by masking tape or twine.

When the air bubble is in the middle of the spirit level tube, the A-frame is level.

2. Laying out a slope contour

2.1. What is a slope contour?

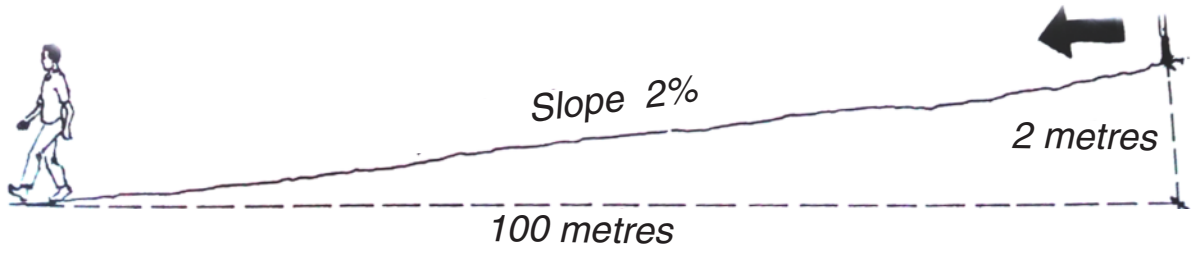
A slope contour is an imaginary line where all points are on the same level. In other words, if a person follows this line, they'll never go up or down.

In order to know at what distance to make the slope contours, you must measure the percent slope of the terrain.

2.2. How to know the average percent slope of a terrain?

■ The percent slope of a terrain is the number of metres that you descend or go up whenever you walk 100 metres in the direction of the slope.

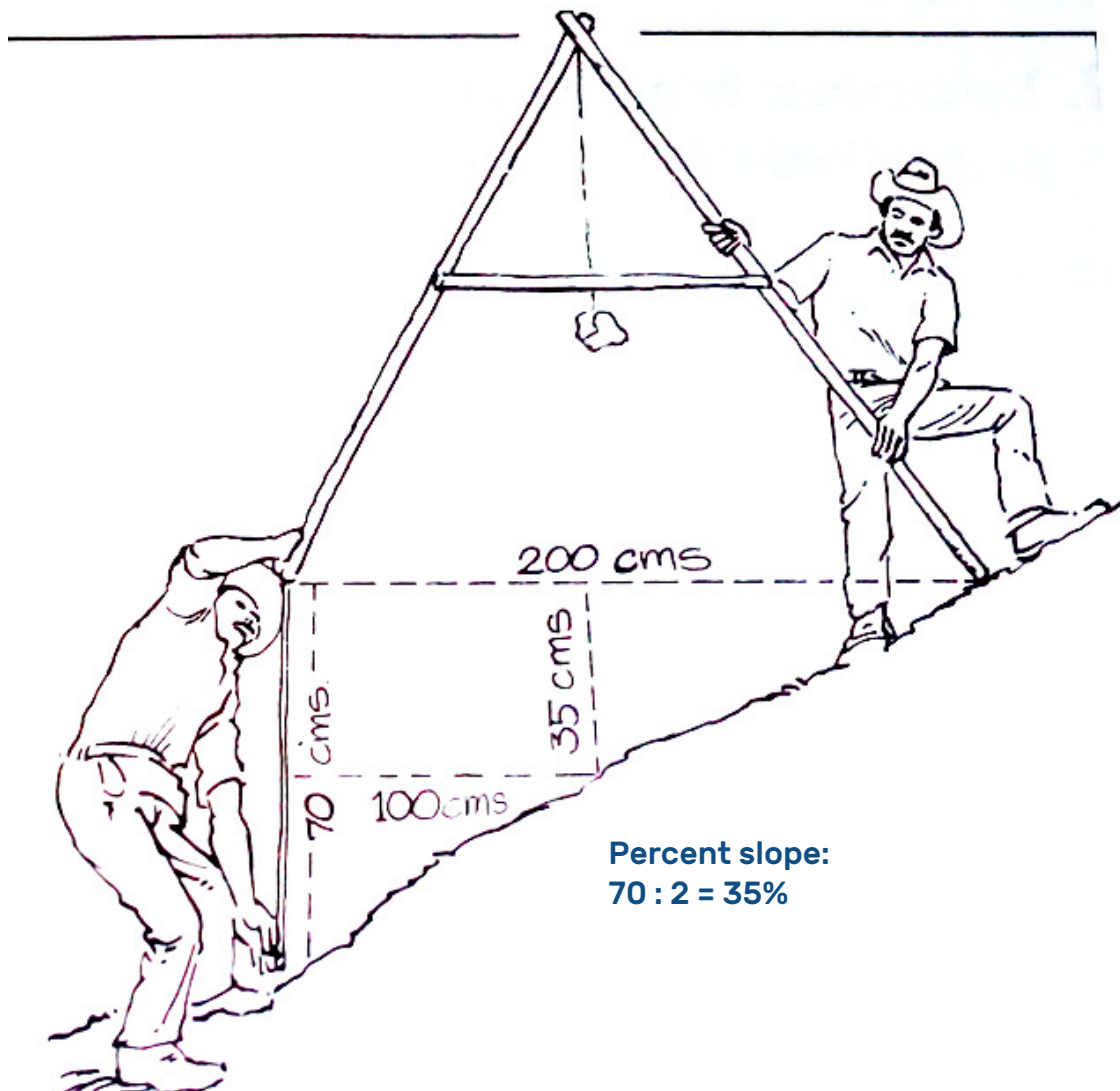




- With the A-frame, without having to change position, we can measure the difference in elevation between one point and another. Since the distance between the ends of the two legs of the A-frame is two metres, the measurement we get will be double the slope percentage.
- To measure the unevenness or the percent slope at one point of the plot,

place the A-frame with one leg on the ground and the other in the air, perpendicular to the ground, pointing towards the lower part of the plot.

Measure the distance between the ground and the end of the leg in the air. Divide the result in centimetres by 2 to obtain the percent slope.



Percent slope:
 $70 : 2 = 35\%$

■ To know the average percent slope of a plot of land, it is necessary to repeat this measurement five times in five different points throughout the whole plot.

■ Get the average of the five measurements by dividing the sum of the five measurements by five.

According to the average, the following table will give you the recommended distance between contour lines.

Percent slope	Distance between contour lines (in metres)
2%	30
5%	28
8%	24
10%	20
14%	18
16%	16
20%	14
25%	12
30%	10
35%	8
40%	6
45%	4



2.3. Layout of the centre line

- To measure the distance between contours, it is necessary to first mark a line through the centre of the plot, called the **centre line**, which goes from the highest point to the lowest point of the terrain.
- For that, a person stands at the highest point, a second at the lowest point, and a third comes down with the A-frame. If the slope is 40%, the distance between contours should be 6 metres, so for every 6 metres or 3 steps taken with the A-frame, place a stake aligned on the centre line that runs between the other two people.

2.4. Laying out the first contour line

- Begin the contour lines from the top of the slope.
With one leg of the A-frame set on the first stake on the centre line, move the other leg up or down to get the plumb line of the A-frame level. When you find the midpoint, use a stake to mark the spot of the leg you moved.
- Repeat this process until you reach the edge of the plot. Afterwards, return to the first stake on the centre line and follow the same procedure until you reach the opposite edge of the plot.

2.5. Correcting the alignment of the stakes

- Maybe the line formed by the stakes "snakes" a lot. To soften the curve a bit, the staking should be corrected. By sight, try to line up by groups of ten the stakes that seem to be too high or too low on an average middle line.

2.6. Laying out the subsequent contour lines

- Proceed in the same way with the subsequent contours, starting each time from the next stake on the centre line.

Recommendations

- You only need to make contour lines that correspond to the conservation works you can build during the week. Otherwise the stakes of the other contours can be lost.
- Always start building the conservation works from top to bottom of the terrain.

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