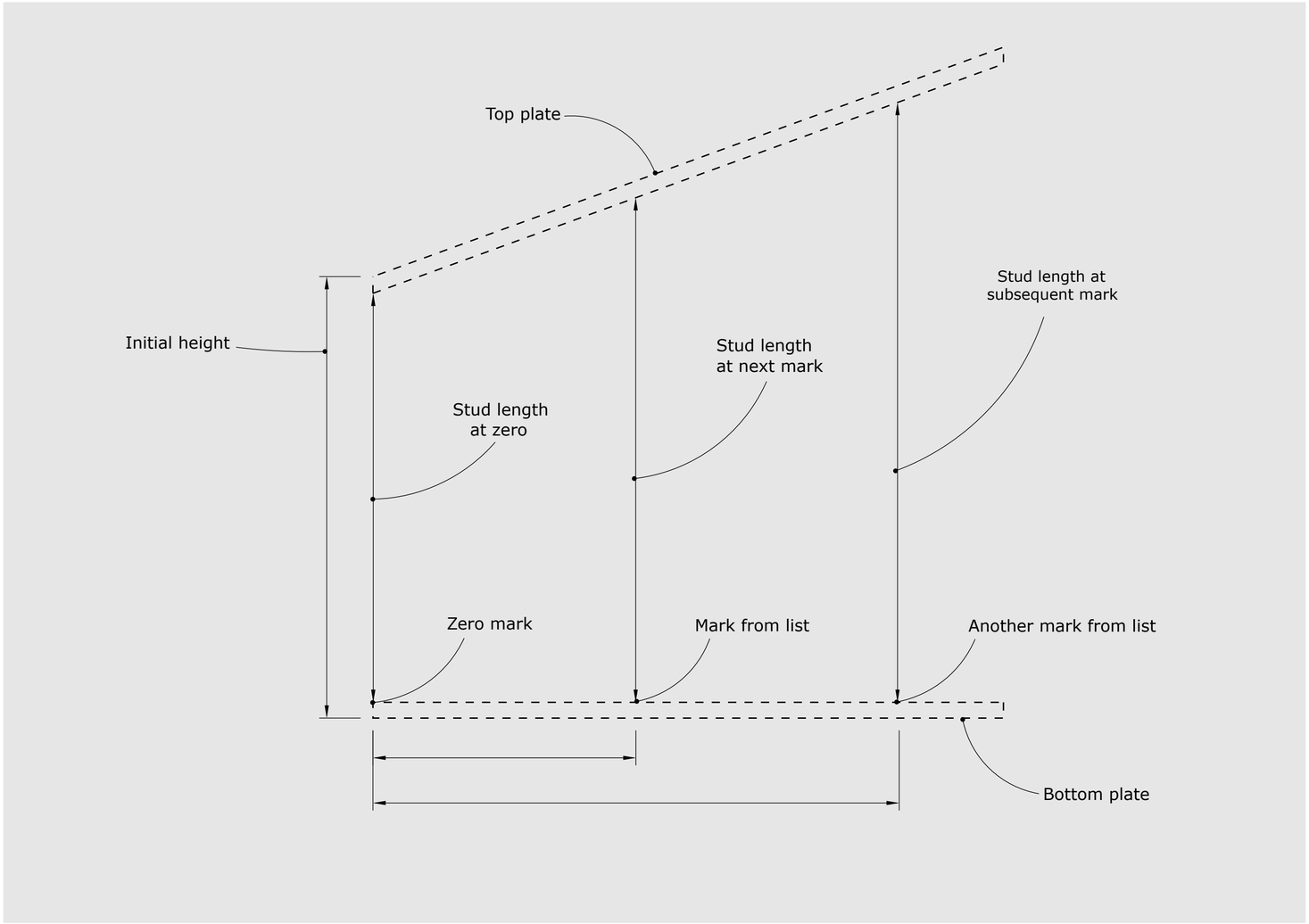
BuildMath

Raking studs from markout

One worked example, with the maths behind each result - follow it in the app and check it by hand.

© Robert Butwell 2026



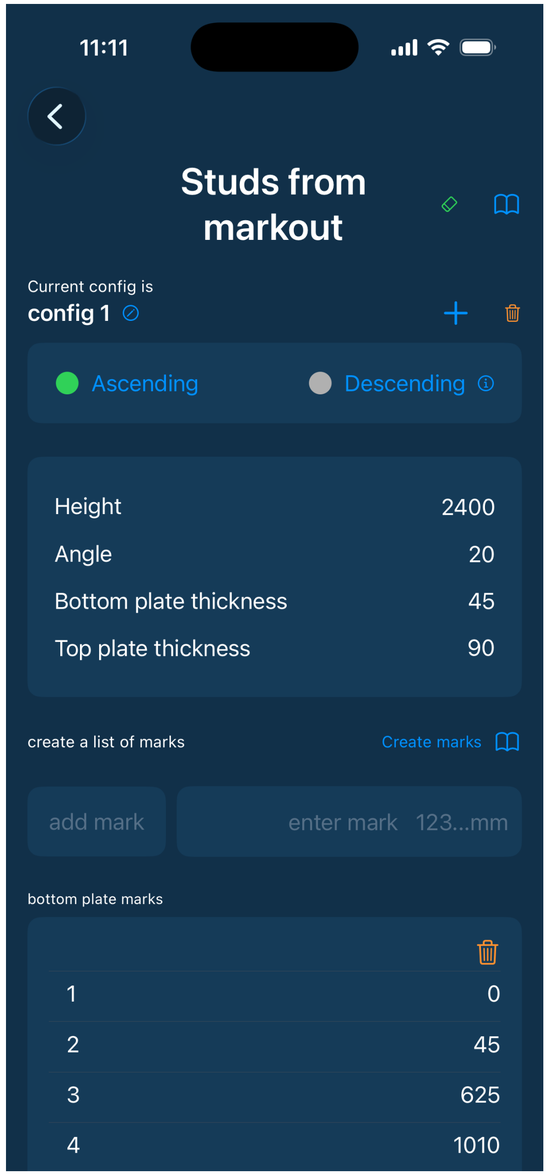
Raking studs from markout gives the height from a level line up to a sloping one, at any mark along it.

Raking wall studs are the obvious use; fence palings on a slope and balustrade posts work the same way.

Height = initial height + mark × tan(angle)

Note:
To calculate raking studs for a whole wall, including around windows, doors and openings, use the Raking Wall Framing calculator.

Inputs



Choose Ascending or Descending
Ascending: lengths get bigger moving away from your reference point.
Descending: lengths get smaller.
This example is Ascending.

Enter the values
Height 2400 - the overall height, including both plates, at your reference point. Usually the end of the bottom plate, where your tape is hooked over.
Angle 20
Bottom plate 45
Top plate 90 (a double top plate)

Add the marks
Mark out the bottom plate, then enter each mark from the same reference point: 0, 45, 625, 1010.
Tip: measure to the same side of every stud, long or short, to avoid confusion.
Mark 0 gives the short point of the first stud. 45, 625 and 1010 are the long points (45 mm studs).

Note:
Set the height to 0 to see only how much the lengths grow or shrink with distance. Set the plates to 0 for overall heights, or for any job without plates.

Saving and naming configs
See Build Math - the basics.

Results



Stud lengths

The plates come off first.
Bottom plate: 45, as entered.
Top plate: 90 is measured square to the slope, so its height straight up is 90 ÷ cos(20) = 95.8

Stud at 0 = 2400 – 45 – 95.8 = 2259

Each mark then adds mark × tan(20):

45 2259 + 16.4 = 2276
625 2259 + 227.5 = 2487
1010 2259 + 367.6 = 2627

Top plate marks

The top plate is on the slope, so the marks along it are longer than on the bottom plate:

Top plate mark = mark ÷ cos(20)

45 → 48
625 → 665
1010 → 1075

