BuildMath

Calculate an initial Height

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

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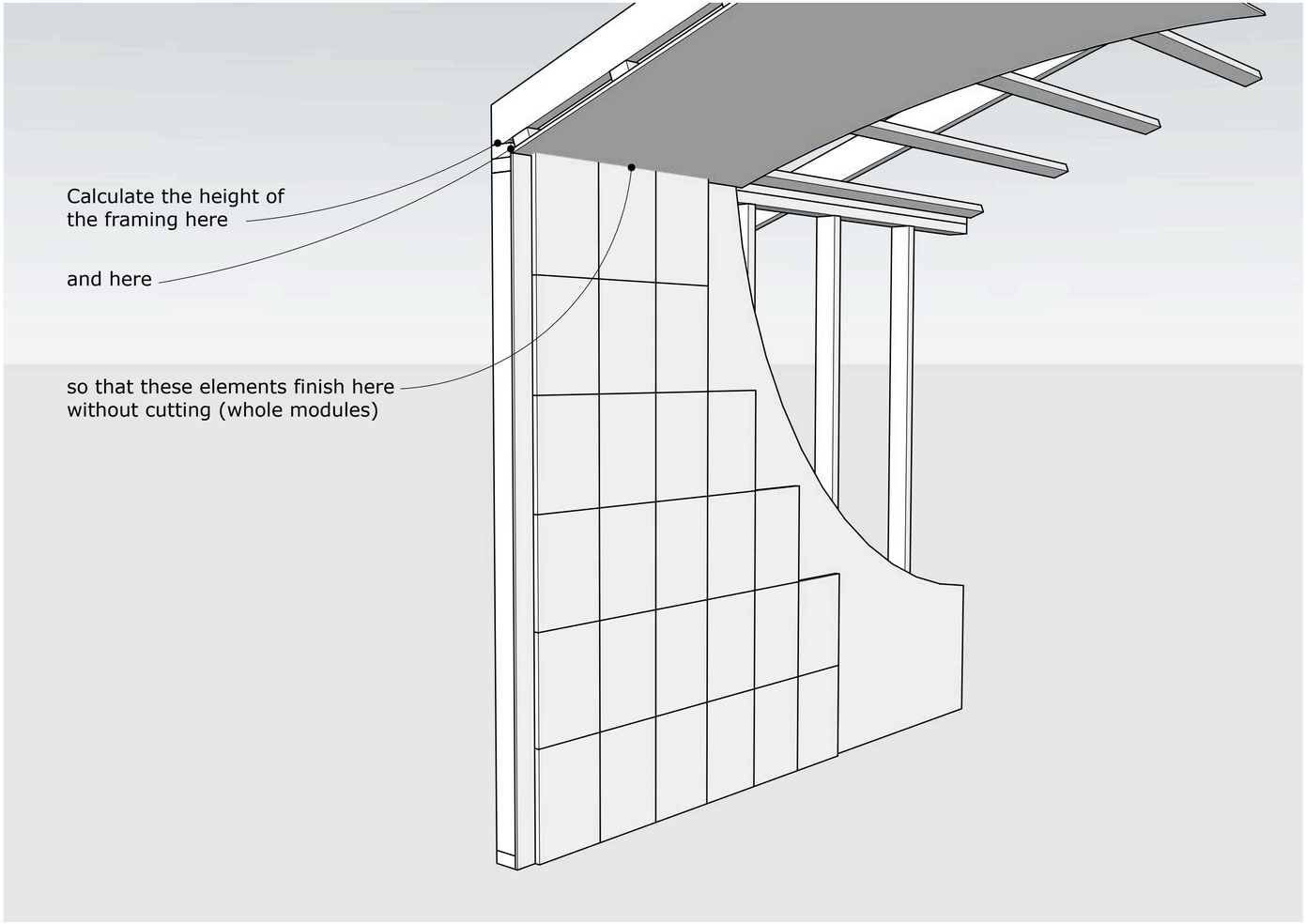

Calculate an Initial Height works back from a finished height to the framing height at the low end of a raking wall, allowing for the linings, battens and the rafter above.

A stone or tile feature wall with whole modules floor to ceiling is one use; any raking wall that has to finish at a set height works the same way.

Start height =
target height – wall cladding × tan(angle) +
(batten + ceiling cladding) ÷ cos(angle)

Note:
The result is the Initial Wall Height for the Raking Wall Framing calculator.

Inputs



Choose Raking Only or Include Rafter
Include Rafter also gives the height of the wall the rafters sit on. This example includes it.

Enter the values
Target height 2410 - where the face of the wall cladding meets the ceiling.
Here, the height that finishes on whole tiles.

Angle 20

Total Wall cladding	35	-	10 lining, 5 glue, 20 stone veneer.
Ceiling batten	35		
Total Ceiling cladding	13	-	one layer of plasterboard.

Enter the rafter

Wall width	90
Rafter depth	140

Use 20% birdsmouth (the default) - or specify your own height.

Entering values and saving configs: see Build Math - the basics.

Results



Raking framing start height
The wall cladding moves the finished face out from the framing. Over 35, the slope changes height by 35 × tan(20) = 12.7, so that comes off.
The ceiling layers are square to the slope. Straight up they measure (35 + 13) ÷ cos(20) = 51.1, so that goes on.
2410 – 12.7 + 51.1 = 2448

Birdsmouth
20% of 140 = 28, square to the rafter. Straight up: 28 ÷ cos(20) = 29.8
Length (square to height): 29.8 ÷ tan(20) = 81.9

Rafter Wall height
The underside of the rafter is level with the top of the raking wall. Across the 90 wall, the rafter changes height by 90 × tan(20) = 32.8, and the birdsmouth adds 29.8:
2448 + 29.8 – 32.8 = 2445

The next page shows how the rafter, the birdsmouth and the two walls fit together at the corner.

Rafter and Raking wall relationship

