

V-01 · Site overview — rooftop PV on the long wing

The PV array sits on the flat roof of the long wing of the main building. The equipment room is in the ground-floor corner directly below. Two mounting options are shown: **OPTION A** an elevated PV canopy (pergola) and **OPTION B** low-tilt frames on concrete blocks.



Overview, Option B. Option B: one low-tilt row along the roof, facing south (north arrow on the lawn). Frames sit on loose concrete blocks, so the roof slab is not drilled. The equipment room is cut away at the lower right.



Overview, Option A. Option A: an elevated canopy over the same roof, 17.15 m long and 2.00 m (front) to 2.54 m (rear) high. It turns the roof into a shaded terrace with solar panels overhead.

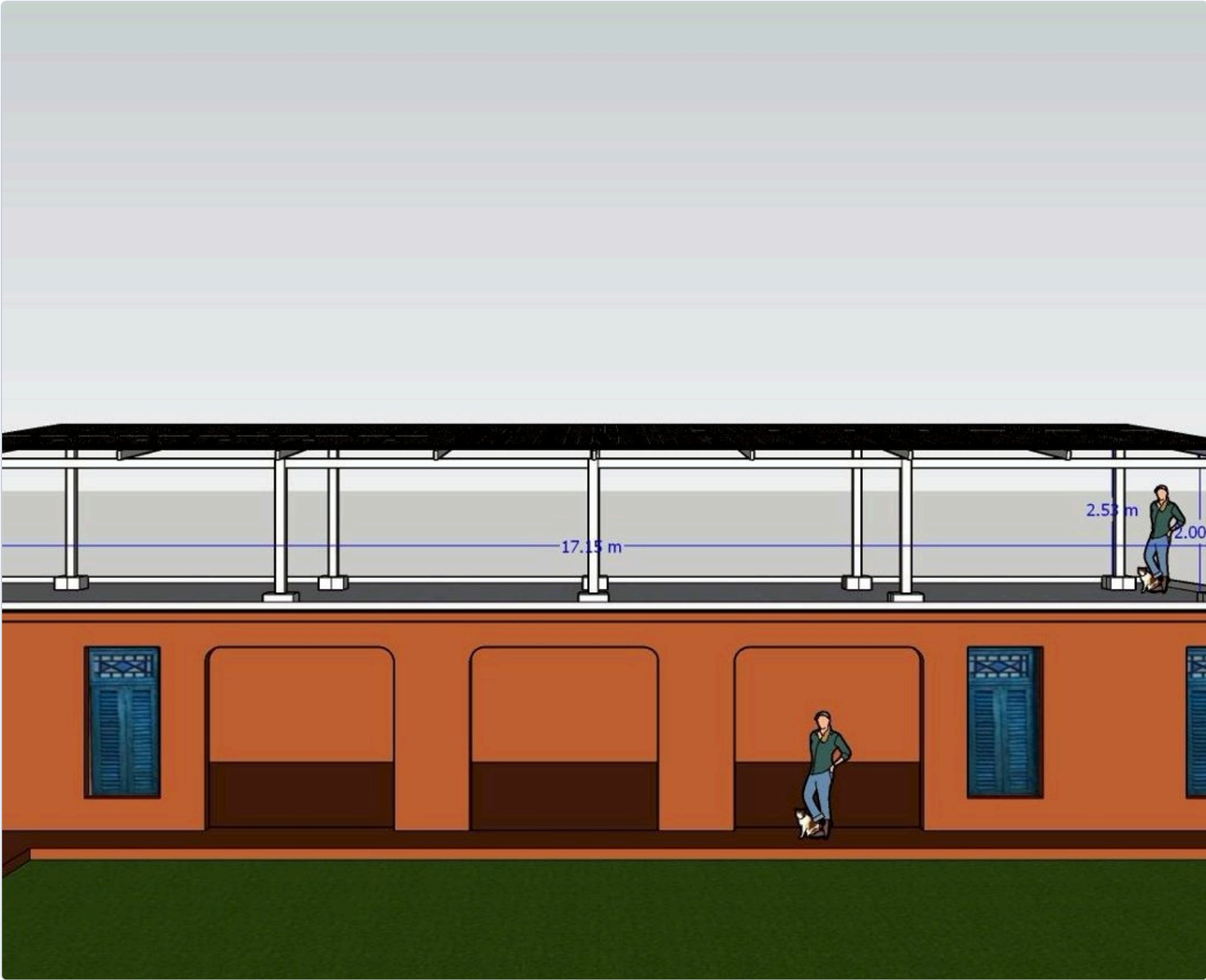
Location. Flat roof of the long wing, clear of the taller building on the north side, with open sky to the south.

Cable route. The PV cables go down the end wall in a vertical conduit to the equipment room below. The DC run is short, so voltage drop is well under 1%.

Roof check. A structural engineer should confirm that the roof slab can carry the concrete blocks, frames and panels before installation (a 40 × 40 × 20 cm block ≈ 77 kg; each panel 28.5 kg).

V-02 • OPTION A Elevated PV canopy (pergola)

The panels form the roof of an open pergola. People can walk and sit underneath, and the canopy shades the roof slab, which also keeps the rooms below cooler.



Elevation. Front elevation. Overall length 17.15 m. Clear height 2.00 m at the low (front) edge and 2.53 m at the high (rear) edge. Posts stand on concrete blocks along both edges of the roof.

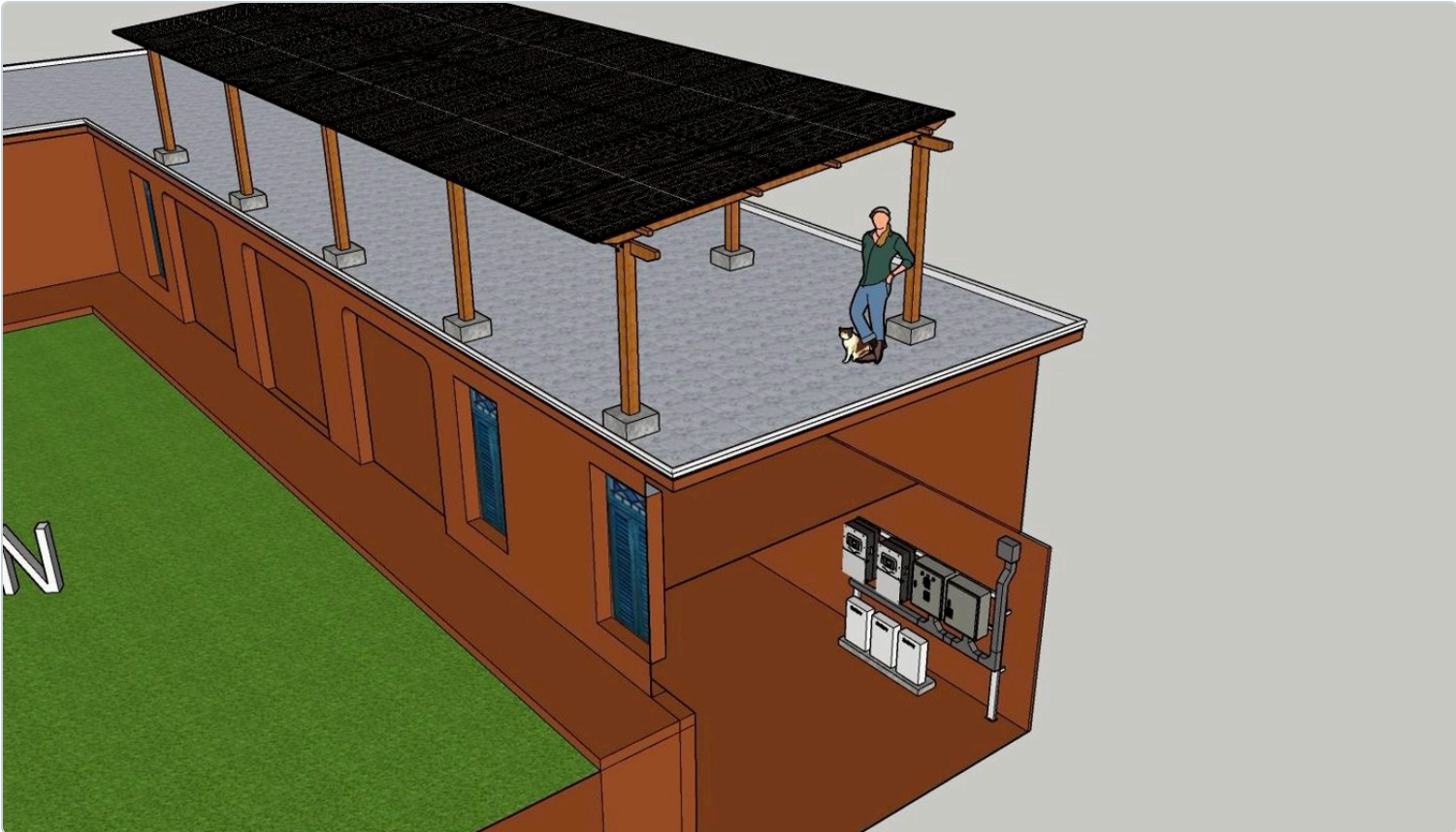


3D view. Seen from the courtyard side. Posts at about 3 m centres along the front and back; the panels overhang slightly at each end.

Key dimensions
Length 17.15 m · front height 2.00 m · rear height 2.53–2.54 m.
Finish shown as white steel (V-02) or wood-look (V-03).

V-03 • OPTION A Canopy structure & equipment room

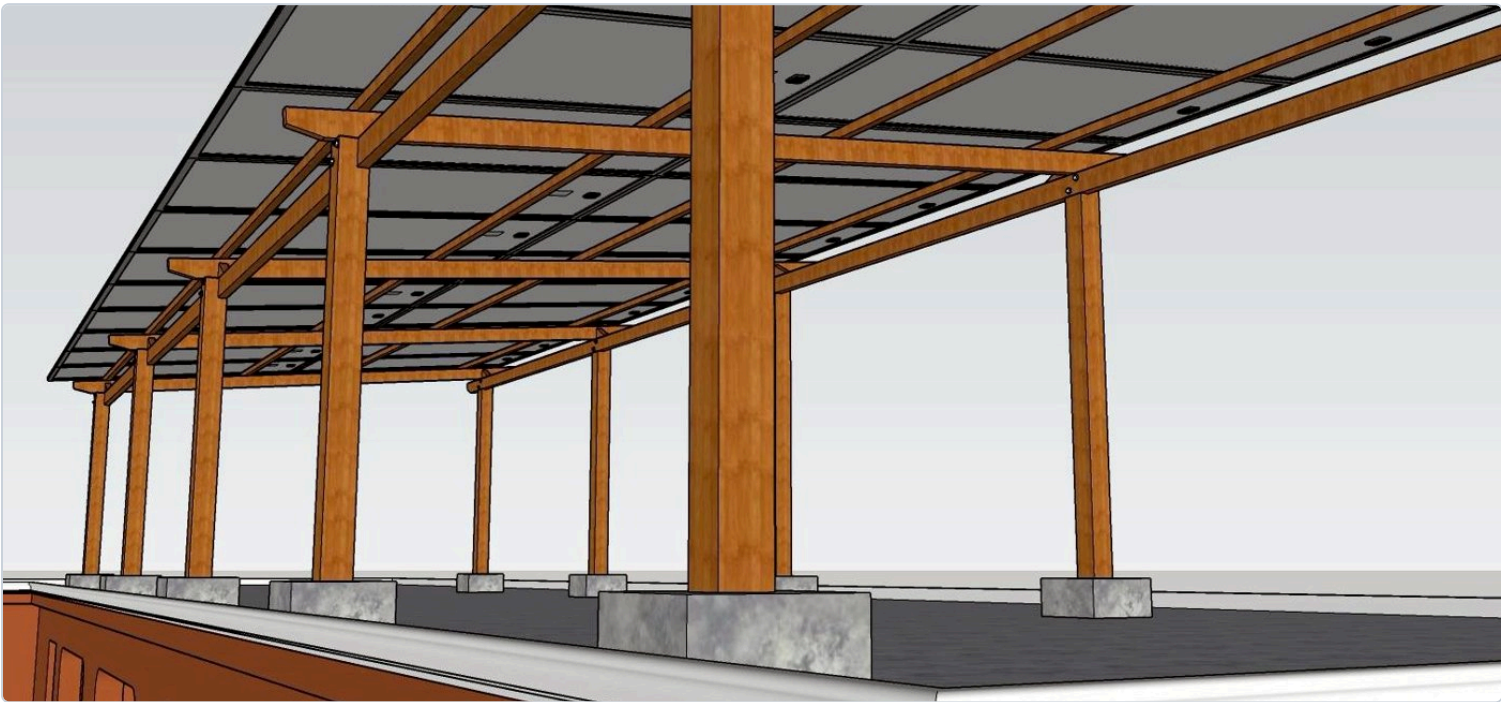
The frame is made of posts, cross beams and lengthwise purlins that carry the panels. It is shown here with a wood-look finish.



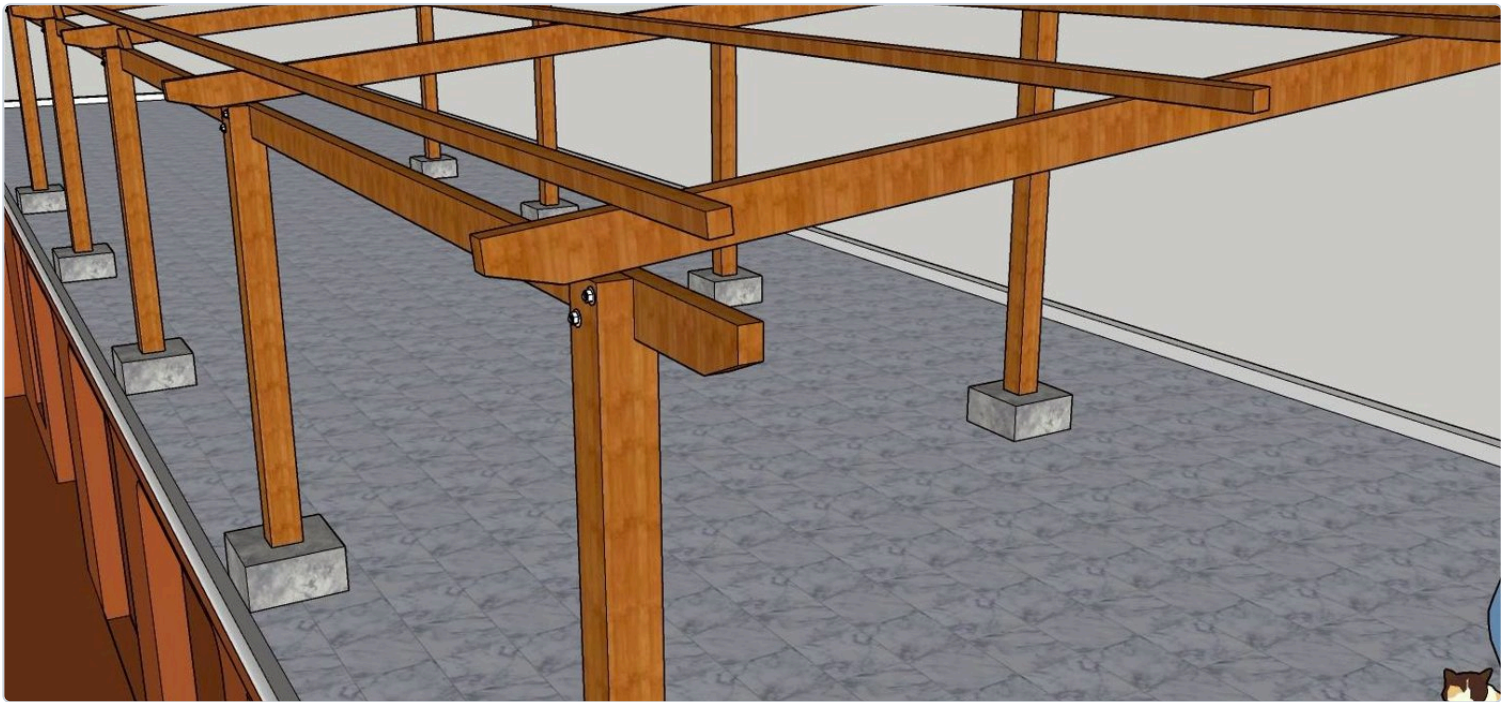
Canopy + equipment room. Finished canopy with the equipment room cut away below: inverters and DC/AC boxes on the wall, battery cabinets on a base, and a vertical conduit bringing the cables down from the roof.



Frame only. Bare frame before the panels go on. Two lines of posts, with cross beams bolted on top and purlins running the full length.



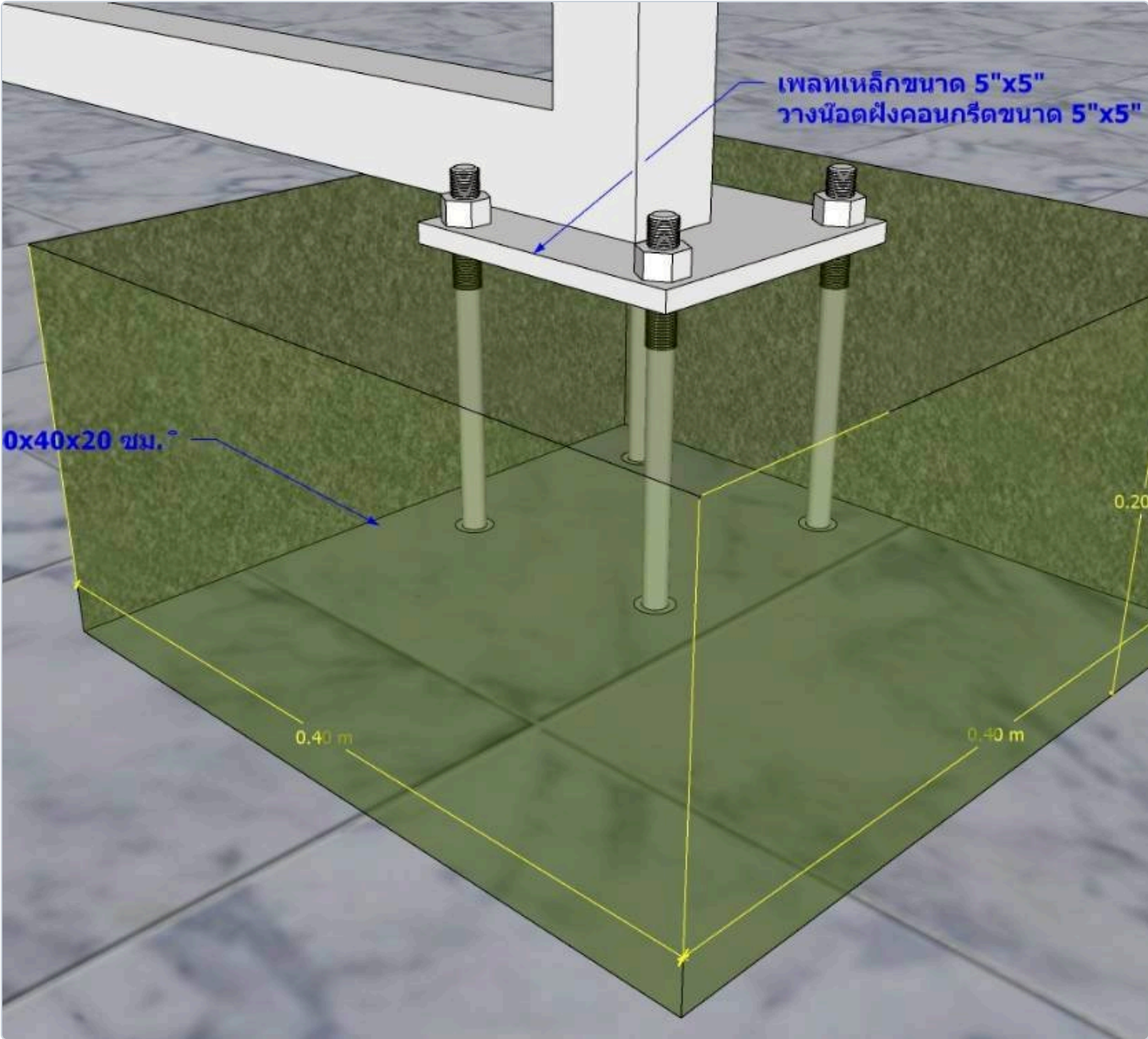
Underside. Underside. Each panel spans two purlins, and the beam-to-post joints are through-bolted.



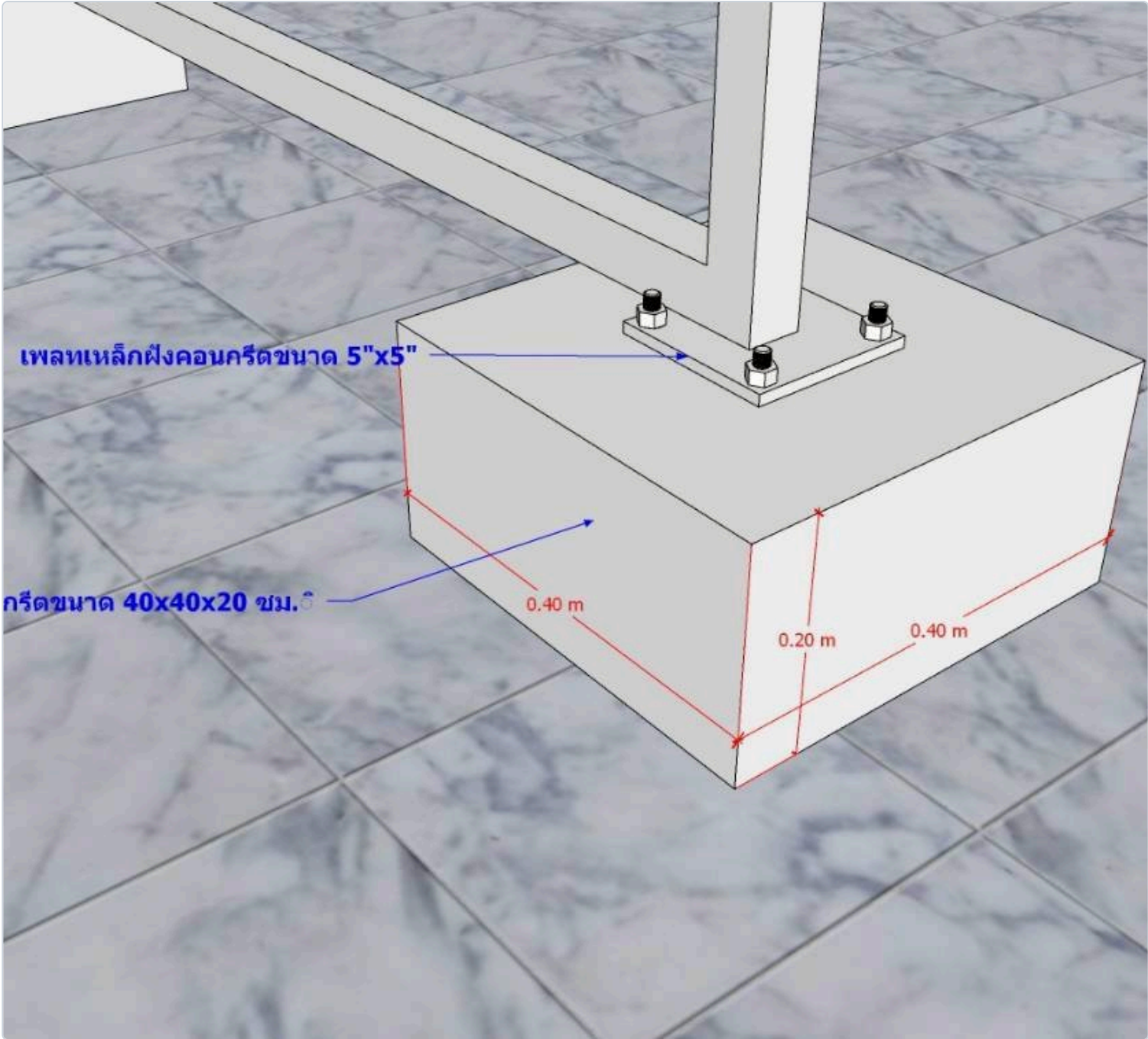
Connection. Joint detail. Each cross beam is fixed to a post with two through-bolts, and the purlins sit on top of the beams.

V-04 · Post foundation — concrete block with anchor plate

The posts are not fixed into the roof slab. Each one sits on a precast concrete block, which protects the roof waterproofing.



Inside the block. Section through a block: 5" × 5" steel base plate held down by 4 anchor bolts cast into the concrete.



Finished block. Finished block: 40 × 40 × 20 cm concrete, with the base plate and nuts on top.

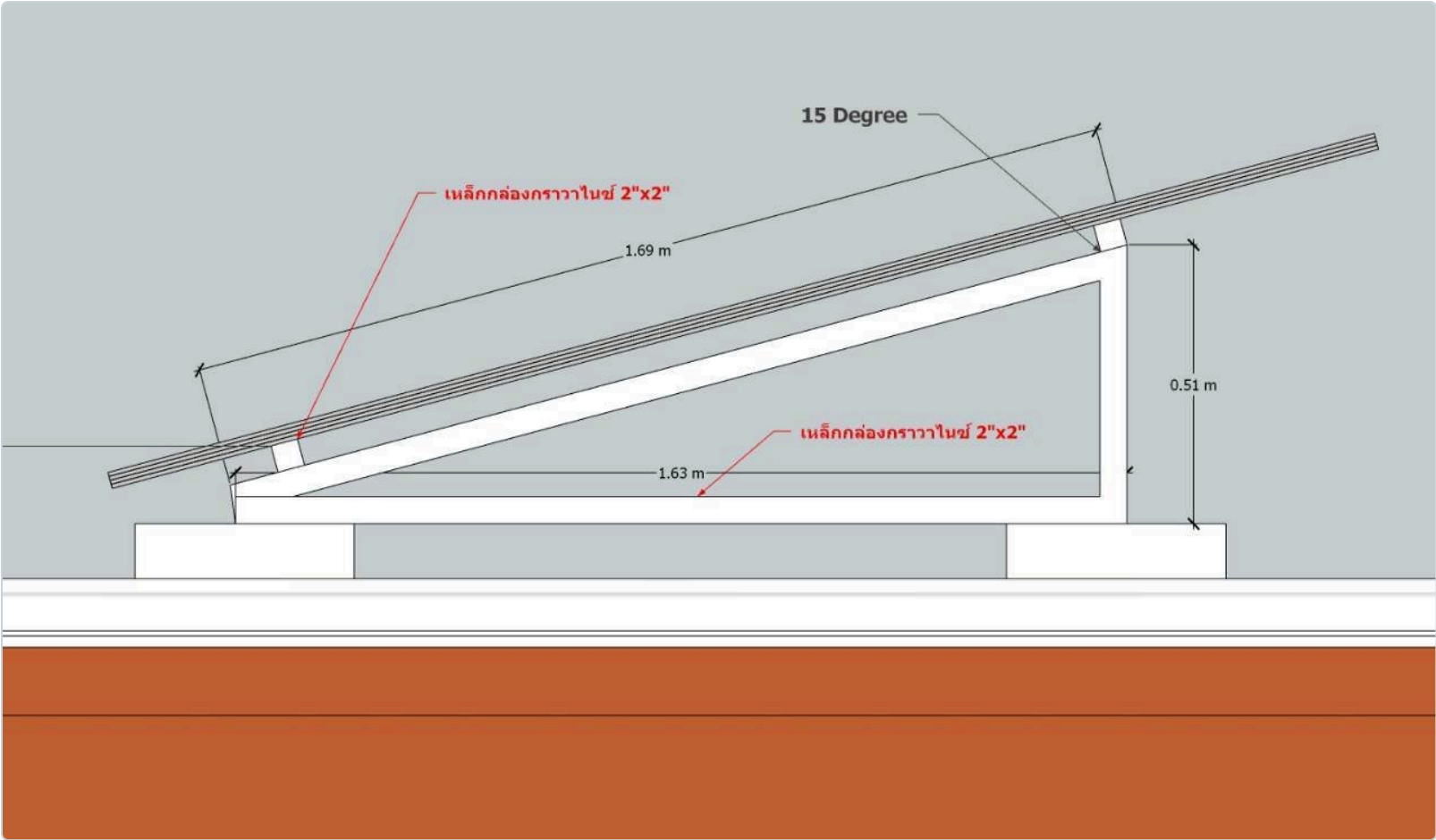
Block
Concrete 40 × 40 × 20 cm (≈ 77 kg each).

Base plate
Steel plate 5" × 5" (≈ 127 mm), 4 cast-in anchor bolts with double nuts for levelling.

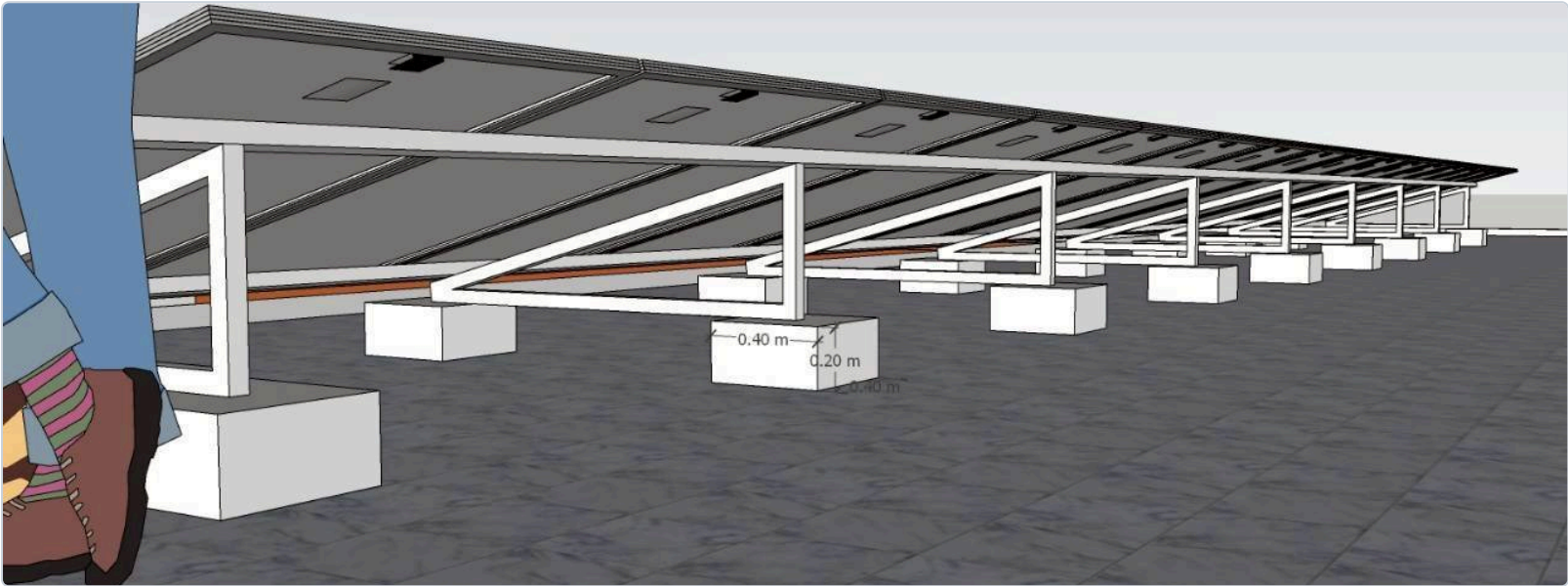
Roof protection
Put a rubber pad under each block and do not drill the slab, so the roof waterproofing stays intact.

V-05 • OPTION B Low-tilt frames on concrete blocks

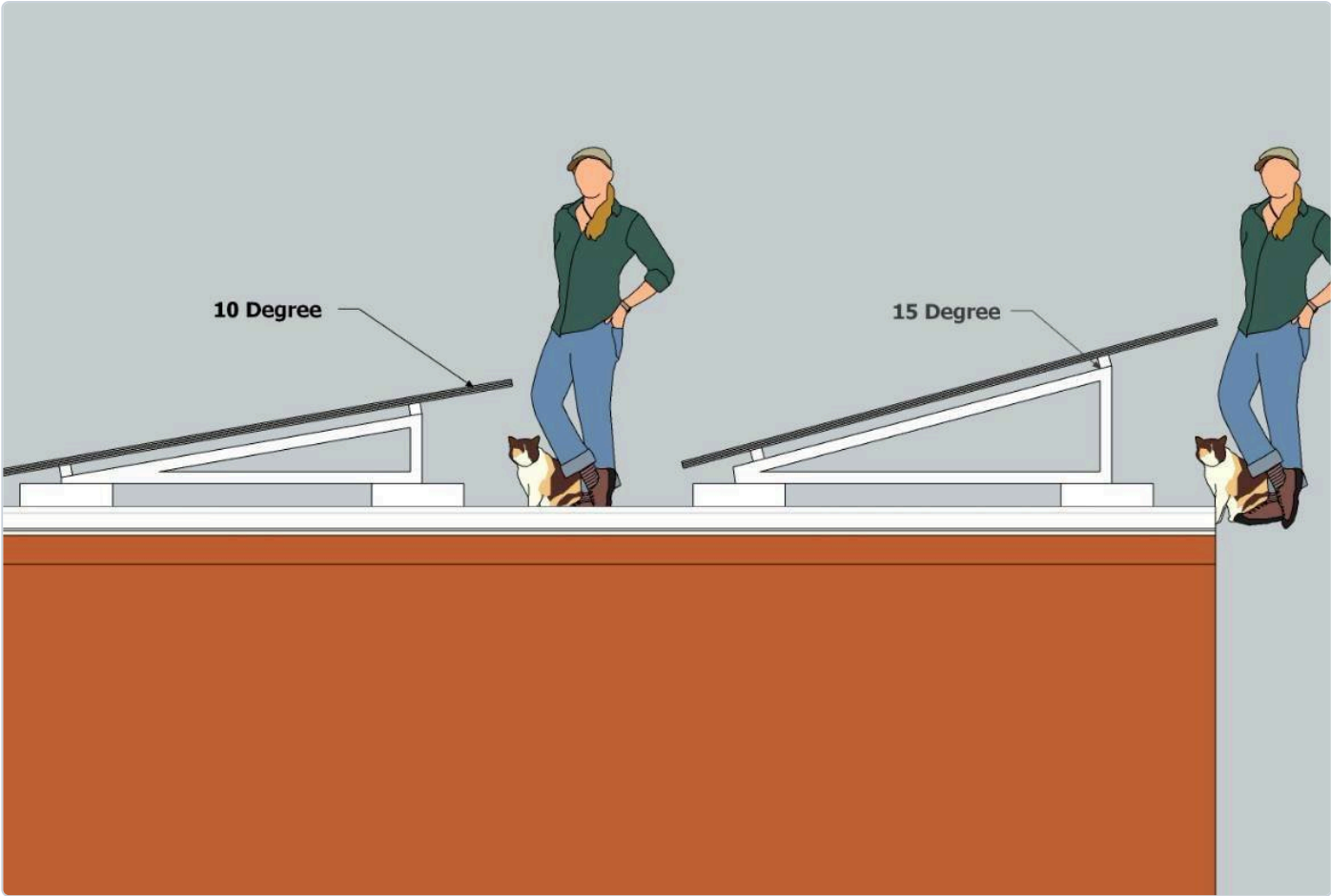
Triangular frames in 2" × 2" galvanised box steel sit on the same 40 × 40 × 20 cm blocks. The structure is lower, lighter and cheaper than the canopy, but you can't use the roof space underneath.



Frame section. Frame section at 15° tilt: sloped member 1.69 m, base 1.63 m, rear post 0.51 m high, all in 2" × 2" galvanised box steel on two blocks.



Row view. Along the row: frames are repeated at even spacing, with longitudinal rails for the panels and each frame on two blocks.



Tilt options. 10° vs 15° tilt. At 10° the row is lower and catches less wind. At 15° the panels self-clean better in the rain and give a little more in the cool season.

Option A vs Option B

	A · Canopy	B · Low-tilt
Height	2.00–2.54 m	≈ 0.5 m
Roof use	Shaded terrace	Not usable
Wind load	Higher	Lower
Steel & cost	More	Less
Maintenance access	Needs a ladder	Easy