

Bill of Materials: Ground-Mount PV Structure

Fixed-tilt, two-leg triangular frame with longitudinal rails · example table of 12 modules (2 high in portrait × 6 wide, approx. 6.9 m long), 4 frames at 2.3–3.0 m spacing



Reference: two-leg ground-mount tables of the type covered by this BOM.

1. Frame (one set per frame position)

#	Item	Typical specification	Qty / frame	Qty / table (4 frames)
1	Front post (short leg)	HDG steel C-channel, e.g. C 80×40×15×2.0 mm, approx. 0.6–0.9 m	1	4
2	Rear post (tall leg)	Same section, approx. 1.8–2.4 m (sets the tilt)	1	4
3	Rafter (inclined beam)	Same section, approx. 4.6–4.9 m for 2 portrait modules	1	4
4	Diagonal brace (rear post to rafter)	C 41×41 or C 80×40, approx. 1.5–2.0 m	1	4
5	Bottom tie (front leg to rear leg)	C 41×41, approx. 1.5–2.0 m	1	4
6	Post-to-rafter brackets / hinge plates	HDG plate, 4–6 mm	2	8
7	Base plates	HDG plate, approx. 150×150×8 mm	2	8

2. Rails and longitudinal bracing

#	Item	Typical specification	Qty / table
8	Purlins / module rails	HDG C-purlin or aluminium rail, approx. 6.9 m (2 rails per module row)	4
9	Rail-to-rafter connectors	L-bracket or rail clamp	16 (4 per frame)
10	Rail splice kits	Matching splice, if rails are supplied in shorter lengths	As needed
11	Longitudinal X-bracing between rear posts	Flat bar or C 41×41, in end bays	2–4

3. Module fixing

#	Item	Typical specification	Qty / table
12	Mid clamps	Aluminium, sized to module frame height (30 / 35 mm)	20
13	End clamps	Aluminium, matching mid clamps	8
14	Clamp bolts with T-nuts / spring nuts	M8 stainless steel (A2-70)	28 sets

4. Fasteners

#	Item	Typical specification	Qty / table
15	Structural bolts, nuts, flat and spring washers	M10 / M12, HDG or stainless steel	Approx. 60–80 sets
16	Anchor bolts or chemical anchors	M12 × 150 mm, 4 per base plate	32

5. Foundation (choose one)

#	Item	Option	Qty / table
17a	Concrete pad / pier footings	e.g. 400×400×600 mm, 240 ksc concrete with rebar cage	8 (1 per post)
17b	or ground screws / driven piles	Sized to site soil test	8
18	Levelling shims / grout	Non-shrink grout under base plates	As needed

6. Earthing and bonding

#	Item	Typical specification	Qty / table
19	Module earthing clips / bonding washers	Stainless steel, one per module, or bonding jumpers	12
20	Rail-to-rail and rail-to-frame bonding jumpers	6 mm ² Cu with lugs, or tinned braid	4–6
21	Earthing lug / clamp on structure	Stainless steel or tinned copper	2 (one each end)
22	Earth conductor, structure to earth rod	16 mm ² Cu, bare or green/yellow	Approx. 2 × 5 m
23	Earth rods	Copper-bonded, Ø16 mm × 2.4 m (EIT minimum)	2 (one each end)
24	Earth inspection pit / rod clamp	At each earth rod	2

7. Cable management

#	Item	Typical specification	Qty / table
25	DC cable clips under rails	Stainless clips or UV-resistant ties	Approx. 30
26	Cable tray or conduit to combiner box	HDG tray or metal conduit (preferred over PVC for lightning)	Per run

Points to confirm before ordering

- Tilt and clearance: for Chiang Rai, about 15–20° tilt, with the lower panel edge at least 0.5 m above ground.
- Steel sections: final sizes depend on span and wind load; check the frame design against the site wind speed.
- Corrosion protection: hot-dip galvanized, minimum approx. 80 µm (approx. 550 g/m²); touch up every cut with zinc-rich paint.
- Fasteners: use one system throughout (all stainless or all HDG) to avoid galvanic corrosion at joints.
- Earthing: bond every frame and rail into one continuous system and earth at both ends of each table; measure earth resistance at handover.
- Quantities are for the example 12-module table and scale with the final module count and row layout.