

What factors affect the bearing capacity of new cable-supported photovoltaic modules?

The pretension and diameter of the cables are the most important factors of the ultimate bearing capacity of the new cable-supported PV system, while the tilt angle and row spacing have little effect on the mechanical characteristics of the new type of cable-supported photovoltaic modules.

What is a new cable-supported photovoltaic system?

A new cable-supported photovoltaic system is proposed. Long span, light weight, strong load capacity, and adaptability to complex terrains. The nonlinear stiffness of the new cable-supported photovoltaic system is revealed. The failure mode of the new structure is discussed in detail.

How does cable force affect bearing capacity?

When the initial cable force increases from 10 kN to 50 kN, the bearing capacity decreases by 14%. When the diameter of the cable increases from (14,16) mm to (24,32) mm, the bearing capacity increases by 272%. Table 11. The ultimate static wind load bearing capacity (Case 180°) of the new structure under different structural parameters. 6.

How does cable spacing affect load bearing capacity?

When the row spacing increases from 1.24 m to 2.98 m, the bearing capacity slowly decreases by 0.72%. When the tilt angle increases from 0° to 30°, the bearing capacity increases by 6.16%. However, the initial force of cables and cable diameter obviously affects the load bearing capacity of the structure.

Does the new cable-supported PV system have a stronger span ability?

Therefore, the new cable-supported PV system has a stronger span ability. Fig. 7. The vertical displacement of the two cable-supported PV system under self-weight.

Does row spacing and tilt angle affect load bearing capacity?

The results show that row spacing and tilt angle has little influence on the load bearing capacity of the structure. When the row spacing increases from 1.24 m to 2.98 m, the bearing capacity slowly decreases by 0.72%. When the tilt angle increases from 0° to 30°, the bearing capacity increases by 6.16%.

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