

# Solar Mounts LLC Carport Foundations for Various Soil Types and Applications

## Background:

Solar Mounts LLC ("SM") is a solar carport and metal shade structure design and fabrication company with installation and post-install repair services provided by our affiliated company, Solar Construction LLC.

Solar Construction is licensed in a number of States and has worked under the most challenging of conditions. Over the years, Solar Construction has installed cement foundations for both Carports and Ground-mounted systems. Today, we install both Pier Footings and Spread Footings. Over the years, we have come to prefer Spread Footings over Pier Footings and normally recommend Spread Footings to our customers, reducing their exposure to change orders and project delays.

## Why Spread Footings Are Preferred

1. **Cost-Effective** – Uses less concrete / requires less excavation compared to pier footings.
2. **Faster Installation** – Easier to form and pour, reducing labor costs and project timelines.
3. **Better Load Distribution** – Spreads the weight over a larger surface area, minimizing settlement and improving stability.
4. **Ideal for Solar Carports** – Since solar carports distribute loads over a wide area, spread footings provide the necessary support without requiring deep drilling.
5. **Works Well in Most Soils** – As long as the soil is compacted and stable, spread footings provide excellent support with minimal ground disturbance.

| Factor                               | Pier Footings   | Spread Footings   |
|--------------------------------------|---|---|
| <b>Design</b>                        | Vertical columns embedded into deep cylindrical holes filled with concrete. | A wide, shallow base that spreads the load over a larger surface area.                |
| <b>Load Distribution</b>             | Concentrates load on small areas, requiring deeper excavation.              | Distributes weight more evenly, reducing pressure on the soil.                        |
| <b>Soil Requirements</b>             | Works well in stable soil or when reaching deeper strata.                   | Ideal for firm, moderately compacted soil that can support weight over a larger area. |
| <b>Excavation and Concrete Usage</b> | Requires deep drilling, more labor, and often more concrete per column.     | Uses more surface area but requires less depth, reducing concrete volume per unit.    |

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| <b>Construction Speed</b>   | Slower due to deep drilling and column reinforcement.                                    | Faster installation due to shallower depth and easier formwork.              |
| <b>Cost Efficiency</b>      | Higher costs due to excavation, concrete, and reinforcement.                             | Generally more cost-effective due to less excavation and material usage.     |
| <b>Structural Stability</b> | Suitable for point loads and deep foundations but may require additional reinforcements. | Provides excellent stability for wide-load applications like solar carports. |
| <b>Adaptability</b>         | Useful in areas with weak upper soil layers needing deep anchoring.                      | Works well in uniform, stable soil conditions.                               |

## Foundation Selection Based on Soil Type

| <b>Soil Type</b>              | <b>Recommended Foundation</b>                                      | <b>Reasoning</b>   |
|-------------------------------|--|--|
| <b>Sandy Soils</b>            | Spread Footings (with soil compaction)                             | Sandy soils have low cohesion, so a larger footing helps distribute weight. Proper compaction is necessary to prevent settlement.  |
| <b>Sandy Loam Soils</b>       | Spread Footings  | This soil type provides a good balance of drainage and stability, making spread footings an ideal choice.  |
| <b>Clay Soils</b>             | Pier Footings (or modified spread footings with deeper excavation) | Clay expands and contracts with moisture changes, making deep pier footings more stable. If using spread footings, they should be placed below the frost line to avoid shifting. |
| <b>Rocky / Gravelly Soils</b> | Spread Footings  | This type of soil provides excellent bearing capacity, making spread footings a stable and cost-effective option.  |

Pier footings require the installer to excavate 10-12 feet using a 36" auger (see images below). The installer will place a concrete forming tube and rebar cage in the hole and fill with concrete.



However, Spread Footings do not require as deep an excavation, requiring a much shorter concrete forming tube and flatter rebar mat with pier uprights in the center (see images below).



Finally, Solar Mounts, LLC can design and build **hybrid** spread footings that include Helicals to provide greater foundational support.

If you have any questions about cement foundations and the different options for footings when working with Solar Mounts and Solar Construction, please contact us and let's talk about it!

## Contact Us

For technical support, specification questions, or sales inquiries:

Solar Mounts, LLC.

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