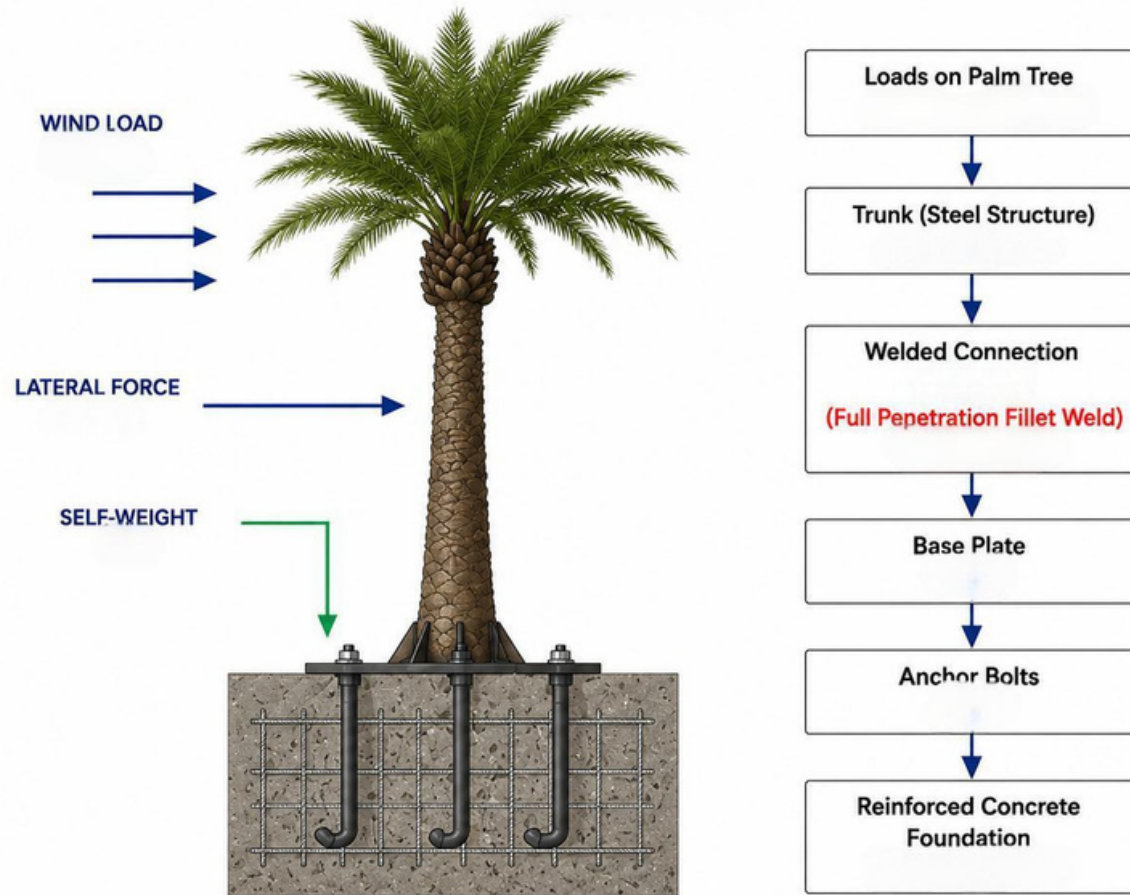


Artificial Tree Base Connection Structural Instructions

*Load Transfer · Welded Connection · Base Plate · Foundation
System*

Structural Load Transfer Diagram

1. STRUCTURAL LOAD TRANSFER DIAGRAM



Key message

Wind load, lateral force and self-weight are transferred from the palm tree to the steel trunk, then to the welded connection, base plate, anchor bolts, reinforced concrete foundation and soil subgrade.

Why this matters

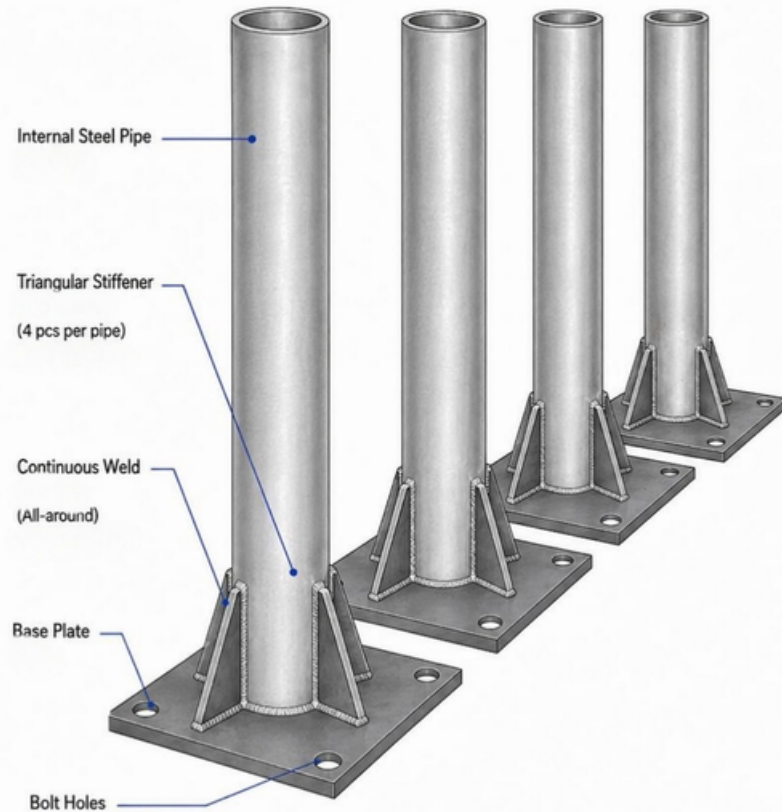
The welded connection is part of the load path, but it is supported by the base plate and anchor system. The system is designed to distribute forces rather than concentrate them at one weld line.

Normal behavior

For tall palm structures, slight movement at the upper canopy can occur under wind or handling. This does not imply base connection failure when the base system remains fixed and vertical.

Welded Connection Detail

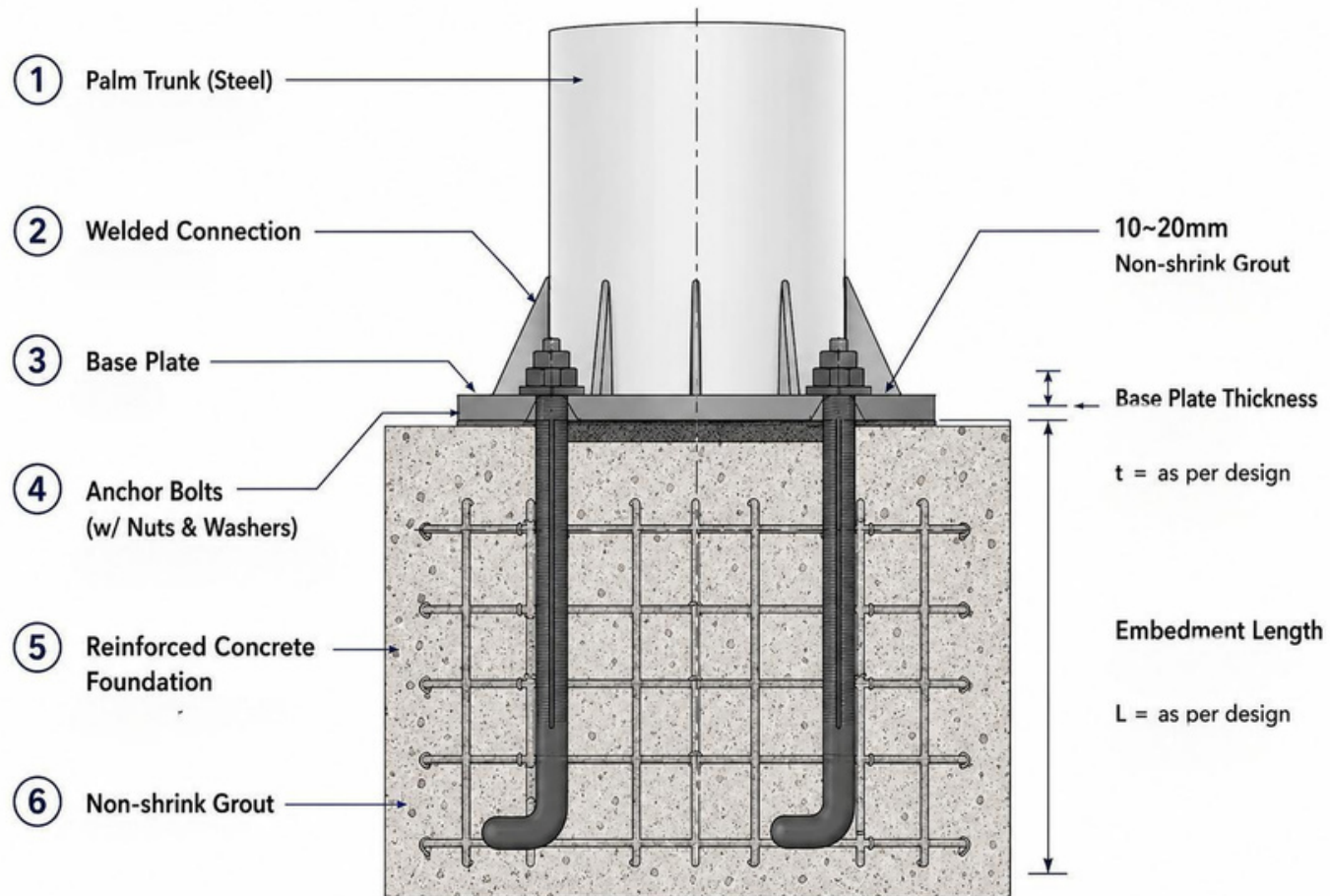
*All-around continuous weld is used around the trunk/base interface.
Triangular gusset plates increase stiffness and reduce local stress concentration.
Welded connection works together with internal steel pipes and base plate.
Weld size and quality should be controlled according to design and inspection requirements.*



The base connection follows the same structural principle used in municipal pole-type structures, such as street lighting poles and traffic signal poles: wind and lateral forces are transferred from the steel pole/trunk to the welded base plate, anchor bolts, reinforced concrete foundation, and finally into the ground.

Base Connection Detail Sheet

BASE CONNECTION DETAIL



Component function

- 1) Steel trunk carries main axial/lateral load.
- 2) Welded connection fixes trunk to base plate.
- 3) Base plate distributes force to anchors.
- 4) Anchor bolts resist uplift/shear.
- 5) Reinforced concrete foundation provides mass and embedment.
- 6) Non-shrink grout levels and fills the contact surface.

Anti-loosening logic

Double nuts and washers provide mechanical locking. After final verticality adjustment, bolts should be tightened and checked. The base plate and grout layer reduce movement and vibration at the connection.

Installation Control Points



Bottom rebar layer



Anchor cage + concrete pouring

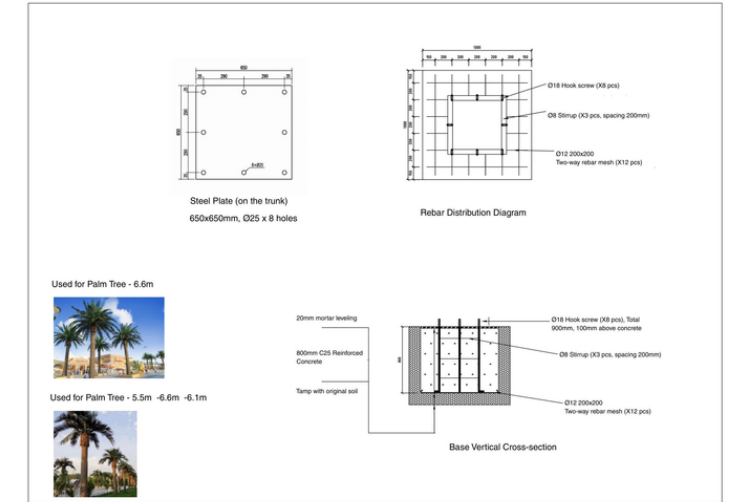
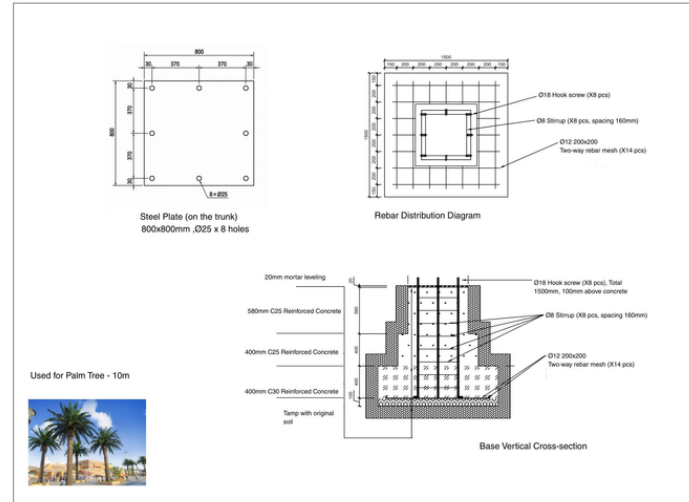
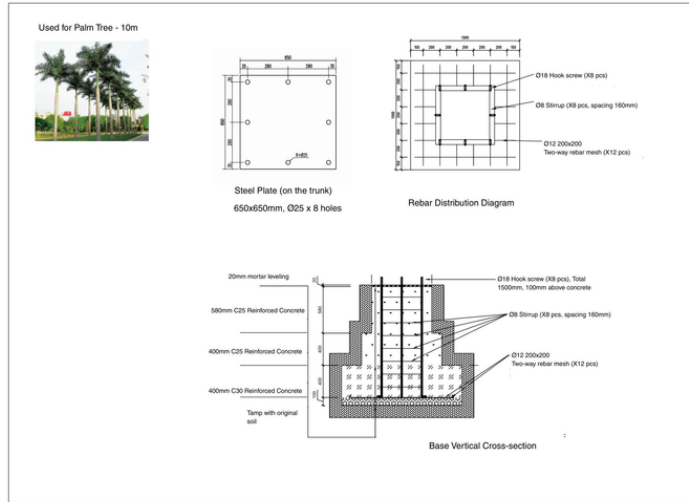
Reinforced foundation base to distribute vertical load and prevent settlement

The bottom rebar layer is placed inside the foundation pit to reinforce the concrete base and distribute the palm tree load over a wider area. This helps improve foundation integrity and reduce the risk of local settlement or uneven sinking.

Embedded anchor cage integrated with concrete foundation for stable support

The anchor cage is embedded and cast together with the reinforced concrete foundation. After curing, the concrete mass, rebar layer, and anchor system work together to support the palm tree, resist lateral movement and overturning force, and prevent the base from sinking under long-term load.

Foundation & Anchor Bolt Design by Tree Height



Engineering-based foundation and anchoring design selected according to palm tree height and base plate size

Foundation and anchor bolt layouts are designed according to different palm tree heights and base plate sizes. Larger trees are matched with larger base plates, reinforced concrete foundations, rebar mesh, and embedded anchor bolts to ensure adequate strength, stability, and resistance to settlement, lateral movement, and overturning.

Previous Applications in Similar Site Conditions from Sea Side

Similar coastal, windy and sandy environments where comparable palm tree base connection principles have been applied



Similar palm tree installations have been applied in coastal, sandy-ground and high-wind outdoor environments. These references demonstrate the practical reliability of the base connection concept when the foundation, anchor bolts, base plate and welded steel structure are properly designed and installed according to site conditions.