

User Manual for AluPro Towers

safe operation suggestions

Contents:

1. General Information
2. Periodic Inspections and Servicing
3. Safe Tower Climbing
4. Equipment Installation
5. General Notes

1. General Information

a. Typical Tower Construction:

AluPro structures are spatial trusses with either triangular or square cross-sections. The structural elements are typically made of thin-walled round aluminum tubes (alloys AW6060T6, AW6061T6, AW6063T6, AW6005T6, and AW6082T6) or steel (grades S235 and S355). The trusses are usually welded into 4-meter or 6-meter segments that are flange-connected. There are three types of standard towers:

- **T2000/T1800:** Width at the top of the shaft is 1.8 or 2.0 meters, featuring K-type bracing and an internal ladder along the center of the shaft.
- **T1000:** Width is 1 meter at tube centers, featuring Z and X bracing with an internal access ladder.
- **T500:** Shaft width at the top is 500mm, with Z-type bracing and optional climbing steps.

Segments smaller than 2.4m at their widest points are welded as a single element, while larger segments are assembled from edge beams, bracing, and an access ladder using node plates. The T1800/T2000 towers are an exception, as they are entirely bolted.

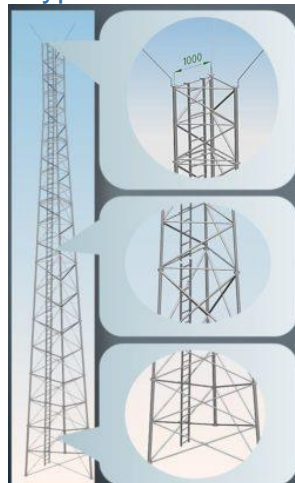
AluPro also designs and manufactures custom towers with different geometries as per customer requirements.

Variants are available for each type of tower based on investor requirements, such as load capacity (number and size of antennas), wind zone requirements, equipment, etc.

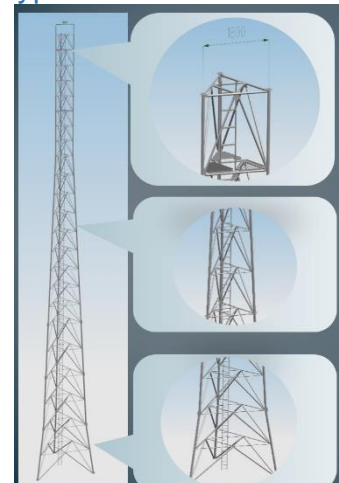
Typical tower T500



Typical tower T1000



Typical tower T1800/2000



b. Equipment:

AluPro towers can be equipped with elements such as:

- Access ladders with or without a safety cage
- Working and resting platforms
- Vertical safety systems, either cable-based (SKC Stop) or rail-based (Soll, Faba, etc.)
- Omni, yagi, directional, microwave, panel antenna mounts
- Lightning protection systems, including insulated HVI systems
- Cable ladders and trays
- Daytime obstacle marking (painting) and nighttime marking (lighting)

2. Servicing the Tower

Periodic inspections should be performed in accordance with building regulations, i.e., every 12 months. A geodetic verticality report must be prepared every 5 years.

Servicing activities include:

- Visual inspection of the tower's technical condition, accessories, anchoring elements, and seals (in the case of rooftop installation), with particular attention to corrosion, deformation, and cracks.
- Checking the tightening of bolts and clamps.
- Checking the vertical alignment of the tower.
- Adjusting the tension of the safety system cable (if applied).
- Checking the condition and resistance of the lightning protection system.

Inspections and servicing (repairs) should be performed by qualified personnel.

3. Safe Tower Climbing



Do not climb the tower in wind speeds exceeding 10m/s (36km/h)!

a. Pre-climb Checklist:

- Visually inspect the overall condition of the structure for any damage or defects.
- Visually inspect the anchoring elements and any loose components.

b. Technician Equipment:

- Harness for working at height (either for supported or suspended work)

- Lanyard with two hooks or carabiners for easy and safe attachment to the structure if there is no safety system on the tower
- Safety system clamp (compatible with the system used on the tower)
- Footwear with hard soles
- Helmet suitable for working at height (chin strap included)

c. Climbing and Descending the Tower:

- While climbing, always switch the hooks/carabiners so that at least one is attached to the tower at all times.
- If the tower is equipped with a fall protection system (SKC Stop or rail), connect the harness to the clamp using an energy absorber if possible.
- Once at the working height, attach the lanyard to the tower structure to allow supported work.
- Descend in the same manner as climbing (keeping at least one hook or carabiner attached to the tower).



Exercise extreme caution while working on the tower!

4. Equipment Installation

- Small devices such as panel antennas, small sector antennas, grid antennas, and omnidirectional WiFi antennas can be mounted directly to the tower structure.
- Larger devices, such as microwave links, parabolic antennas, large sector antennas, shortwave antennas, and omnidirectional radio system antennas requiring separation should be mounted on suitable brackets available from AluPro (standard or custom-made).
- **Do not use clamps with toothed connectors** – they damage the structure (they dent thin-walled aluminum tubes and damage the zinc coating on steel towers).

5. General Notes

- Only one technician, weighing no more than 120kg (including equipment), is allowed to climb the tower at a time.
- The maximum antenna area installed on the mast must not exceed the value specified in the design (structural strength calculations). The so-called windward area is considered, i.e., the area in the direction where it is the largest. The mass of antennas is not considered. If non-radio devices of considerable weight are to be installed on the mast, consult the manufacturer.
- **Note:** In the case of tower installation in a corrosive environment (e.g., coastal areas or near chimneys or sewage treatment plants), additional anti-corrosion protection is required (anodizing or painting for aluminum towers and painting for steel towers). Acid-resistant bolts are also recommended.
- Do not hang advertisements, flags, or any other items that increase the windward area on the tower.