Warsaw, 12-11-2024

Service Instructions for AluPro Masts

Contents

1. General Information

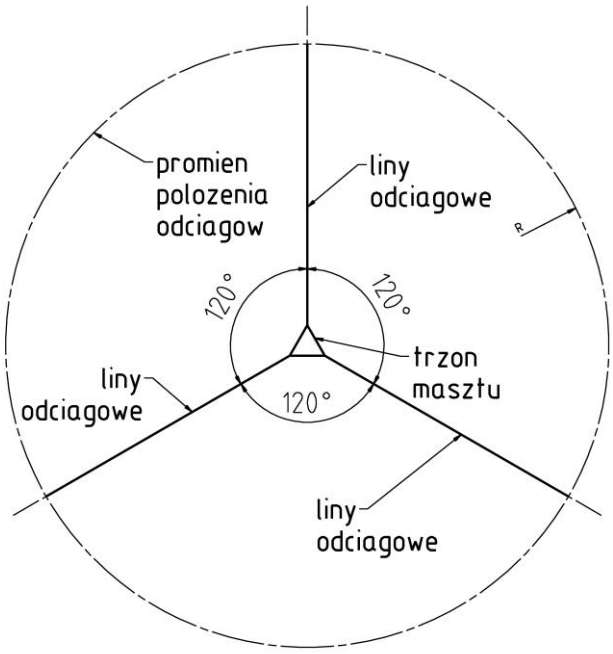
a. Lattice Structure

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). The trusses are usually welded into 4-meter segments that are flange-connected. Typical AluPro masts are triangular trusses with widths of 250mm, 500mm, 750mm, and 1000mm.

b. Mast Geometry

Typical mast geometry involves guy lines in three directions at 120° intervals.

TOP VIEW



An alternative mast geometry uses guy lines in four directions at angular spacings of 120°, 60°, 120°, and 60° (used for installations on narrow buildings).

TOP VIEW

c. Guy Lines

Galvanized steel guy lines with either a steel or hemp core are used, with diameters ranging from 4.0mm to 10.0mm. Each end of the guy line is terminated with a thimble and three clamps arranged alternately. Aluminum compression clamps are permitted at the upper end of the guy line. The guy lines are tensioned using a turnbuckle placed between the "lower" end of the line and the anchoring point or an external tensioner used only during installation/servicing.

2. Mast Servicing

The first service of the mast should be performed no later than 6 weeks after installation. The reason for this accelerated initial service is that new steel guy lines stretch relatively quickly (this does not apply to pre-stretched lines, steel core lines, or single-twist lines). Additionally, after this time, any revealed defects in the mast, accessories, anchoring elements, or seals can be corrected.

Subsequent mast services should be conducted seasonally, but not less than once every 12 months.
Service activities include:

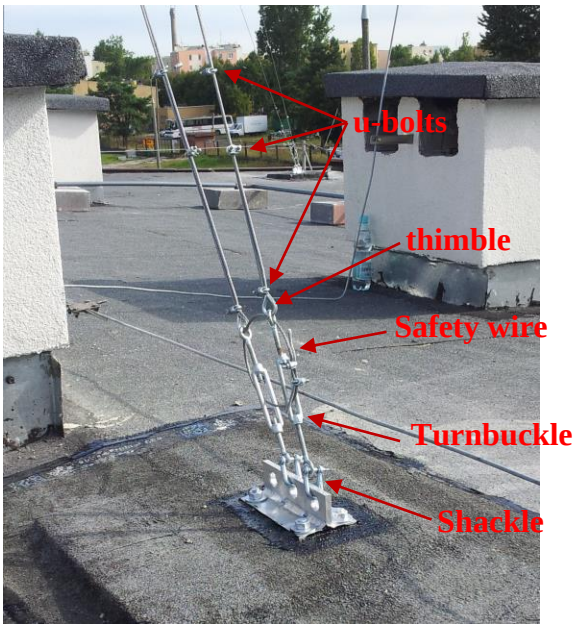
- Visual inspection of the mast's technical condition, accessories, anchoring elements, and seals (for rooftop installations), paying particular attention to corrosion and the condition of guy clamps, shackles, and turnbuckles (if used).
- Checking the tightening of shackles at anchoring elements in the foundation, ground anchor, or building attachment. Replace damaged shackles with new ones of the same type. Temporarily secure the guy line during replacement to maintain partial tension.
- Tightening the mast's articulated base, including bolts securing the base to the foundation or building anchor and bolts acting as hinge pins. Tighten hinge bolts to ensure contact between mating surfaces (to reduce play) while allowing free hinge movement (without excessive resistance). Preferred method: Tighten with 80Nm torque, then loosen by half a turn. Replace damaged or corroded nuts and washers. If the hinge bolt is damaged or corroded, contact an AluPro technician.
- Tensioning the guy lines while monitoring the vertical alignment and shape of the mast (improper tension can deform the mast shaft). Adjust guy line tension using a turnbuckle. Ensure symmetric positioning of the turnbuckle (threaded elements on both sides should be screwed in to the same depth). If installed without turnbuckles, use an appropriate tensioner to tension the lines. Apply static force to the line per the mast's static calculations.
- Tightening the guy line clamps, ensuring three clamps per line end, installed with the u-bolt towards the free end of the line, and verifying proper thimble positioning. Replace damaged or corroded clamps with new ones of the same type.
- After tensioning the guy lines, secure turnbuckles to prevent loosening (thread an additional line through the body and the top eye of the turnbuckle, securing with at least one line clamp).
- Check the tightening of all bolts connecting mast segments from the bottom to the top. Replace damaged or corroded bolts with new ones of the same type (see "Safe Mast Climbing").
- Visually inspect the condition of guy line clamps and shackles securing the guy line to the mast shaft. Replace damaged or corroded clamps. During replacement, install a new clamp first, then remove the

damaged one. Perform this and the above tasks simultaneously during one mast climb (see "Safe Mast Climbing").

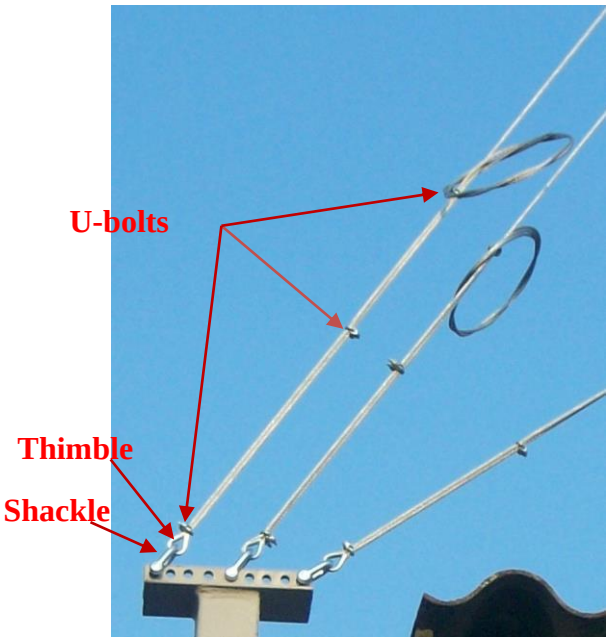
- Inspect the lightning rod. Replace if damaged.
- Check the mast's lightning protection system. Replace corroded elements with new ones. Protect clamps and other connection points with grease.

Note: Always use turnbuckles of the eye-eye type when replacing elements.

Tensioning the guy lines using turnbuckles



Tensioning the guy lines using an external tensioner



3. General Notes

- One technician is allowed on an M250 mast, while a maximum of two technicians can be on M500, M750, and M1000 masts. The allowable combined weight is 160kg for M500 and M750 masts, and 200kg for M1000 masts.
- 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, consult the mast manufacturer.
- **Note:** In the case of mast installation in a corrosive environment (e.g., coastal areas or near chimneys), additional anti-corrosion protection is required (anodizing or painting).

No.	Service or fix *	Date of Srv.	Works description
1	service/fix		
2	service/fix		
3	service/fix		
4	service/fix		
5	service/fix		
6	service/fix		
7	service/fix		
8	service/fix		
9	service/fix		
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*) delete unnecessary