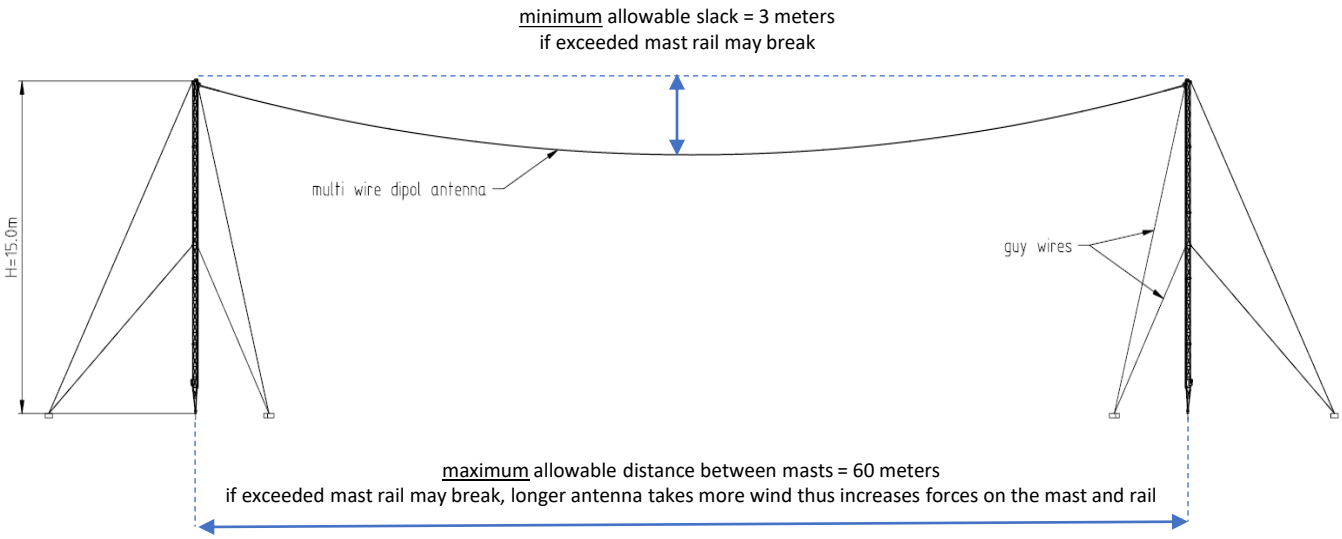
Installation Instructions for 2xM250-15 Dipole Antena Mast System

Warsaw 08/03/2021 rev. 1

Dipole antenna masts system basic specifications

Specifications

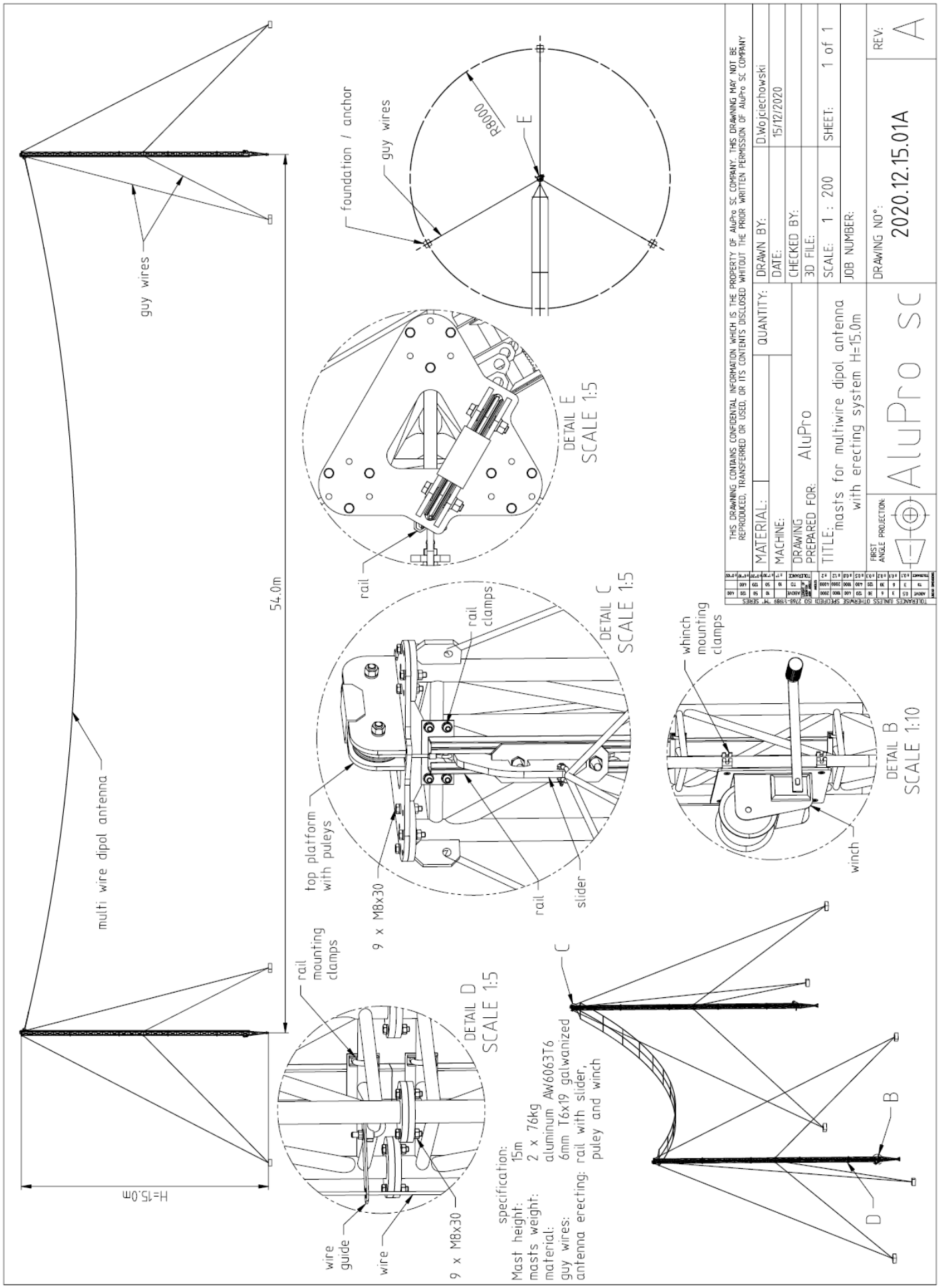
- Masts height: 15 meters each (two separate units)
- Mast total weight: 2 x 76 kgs (+ guy wires extra)
- Guy wires: 6 mm stainless steel or galvanized
- Minimal radius of guy wires anchoring: 8 meters (dia = 16 m)
- Maximum dipole antenna weight: 60 kgs / 4 wires
- Maximum allowable wind speed at sea level: 200 km/h



What is in the box…

- 10 x M250 mast sections - five for each mast, 3 meters long each
- Mast sections come preassembled with antenna rail
- 2 x top pulley assembly mounted on each top mast section
- 2 x winch assembly mounted on bottom mast sections
- Set of 12 guy wires, one end with thimbles:
    - 22 meters long for upper sections
    - 18 meters long for lower sections
- Set of mounting hardware:
    - 38 M10 shackles
    - 12 thimbles
    - 42 U-bolts (for guy wires)
    - 12 turnbuckles
- Set of M8x40 flanged inox bolts and nuts (6 extra as replacement if lost)
- Inox grease in syringe (use it on every thread you tigten)
- 6 pcs guy wire anchors
- 2 preassembled swivel bases
- 2 winch handles
- 2 inox pulley sets with dedicated shackles
- 2 rail end stops
- 6 wire guides (3 for each mast) – preinstalled on given sections

Dipole Mast Technical Drawing – Assembly Idea

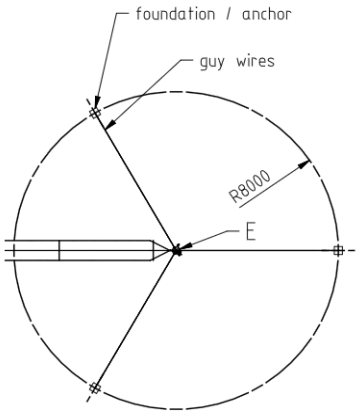


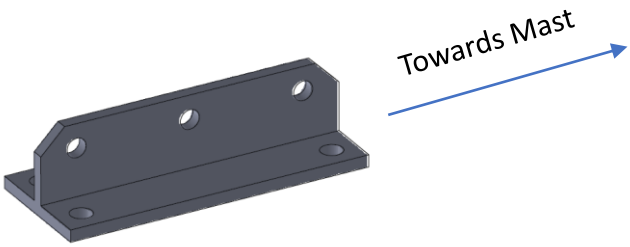
Steps to set up masts

Prepare foundations, suggested layout is on product technical drawing. Foundation shall be designed by local civil engineer after analyzing ground survey.

In most cases some form of steel reinforced concrete block will be used.

Use our guy wires anchors as template and drill holes (25 - 30 cm deep minimum) in these concrete blocks. Blow holes with compressed air through pipe run to the very bottom of each hole. You need them completely dry and clean from dust. Use chemical anchor (resin) to glue threaded rods in (M16x250-350). Observe product instructions for timings and conditions. After resin hardens – mount our T – anchors and tighten all nuts (230 Nm minimum).





All mast sections are labelled with AluPro stickers and direction stickers. They look as in photos below

Separate all sections named M1 from these named M2, put them around their final installation places. There will be 5 sections called M1 and 5 sections M2. Letter „S" + number defines where given section goes in each mast.

M1-S1 – bottom section (with winch)
M1-S2 – one above

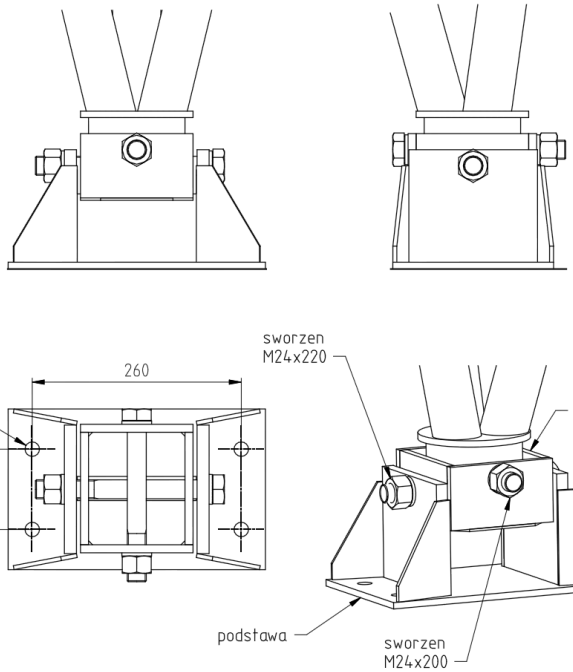
M1-S4 – one above
M1-S5 top section (with pulley base plate)

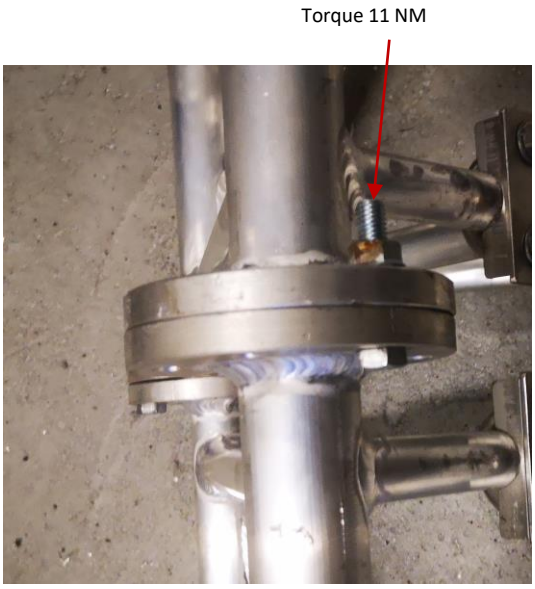
Repeat accordingly for M2 mast. It is important not to mix order as given sections have mounting points for guy wires welded at right heights. Random order will change expected guy wires locations on the masts and severely impact structure safety. Proper heights are 7,5 and 15 meters – that means middle section (S3) has ears in the middle and top section (S5) at the top.

Steps to set up masts

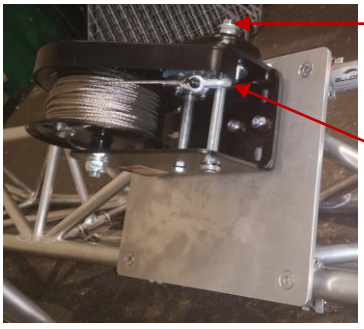
Red label with white arrow helps position section within the mast. Each section have its top and bottom. Arrow should point up (sky). Sections have water drainage holes. Mounting sections up-side-down may lead to filling pipes with water. Below freezing point water will form ice and break pipes open through expansion (example in the photo below). This again will severely impact structure safety and may lead to mast collapse.

Glue swivel base with M16 threaded rods to the foundation and assemble all sections together using provided M8x40 bolts and nuts. Recommended torque 11 Nm.





Next dethatch steel wire from winch (1 small shackle) and pull circa 25 meters from its spool. Next straighten all wire guides, but do not fasten them yet. Run winch wire through eyes.



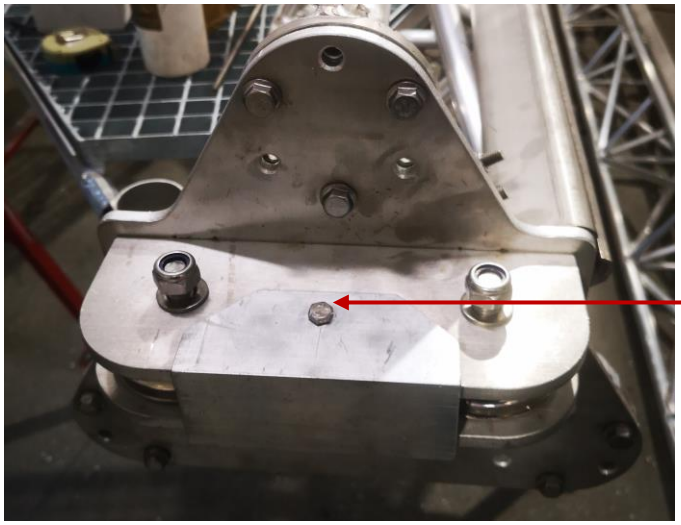
You may want to use cordless drill to drive shaft for unwinding

Pull rope after unfastening shackle

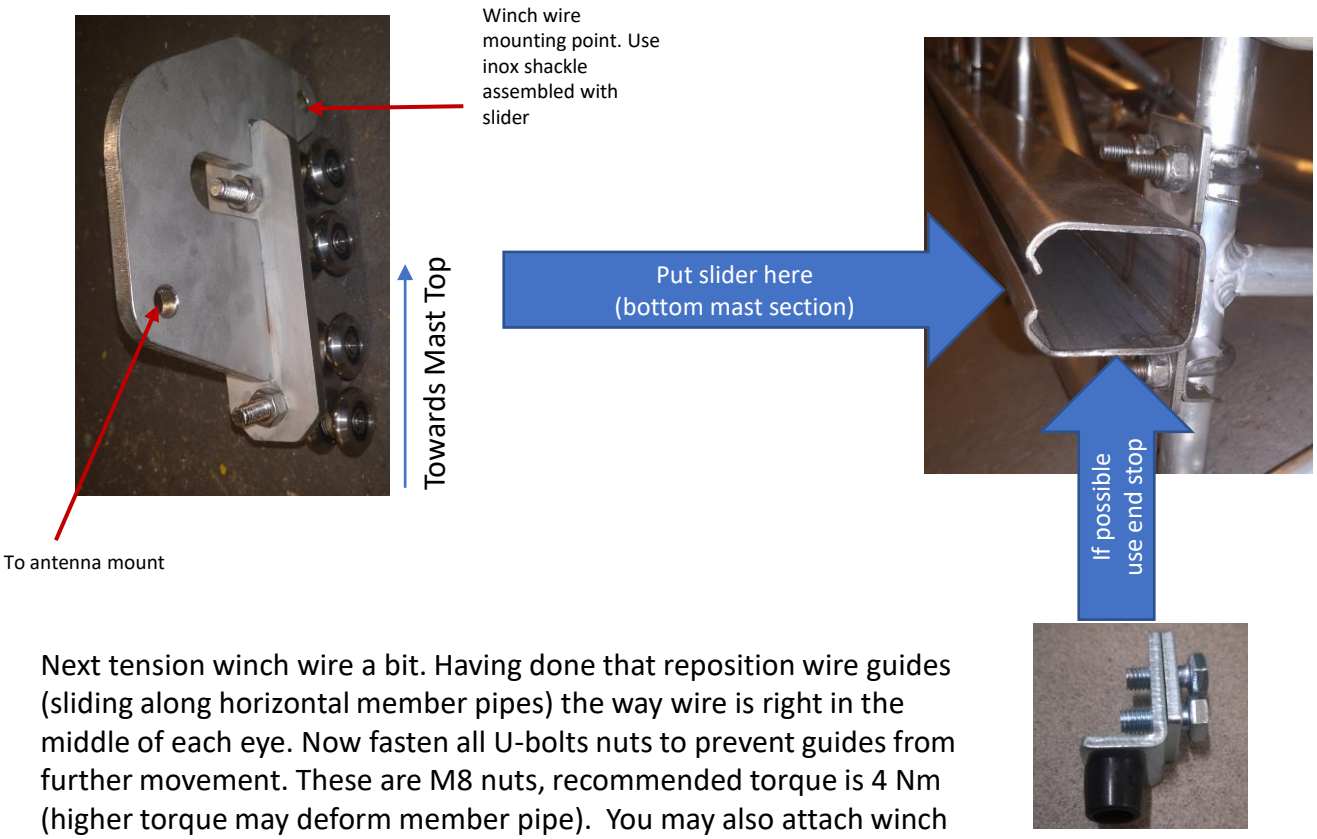
Turn this wire guide 90 deg. and run winch wire through the eye, do not fasten U-bolt screws just yet.

Steps to set up masts

Run winch wire through upper pulley system. To do that unscrew upper C-channel as shown in photo, run the wire and put C-channel back on its place.



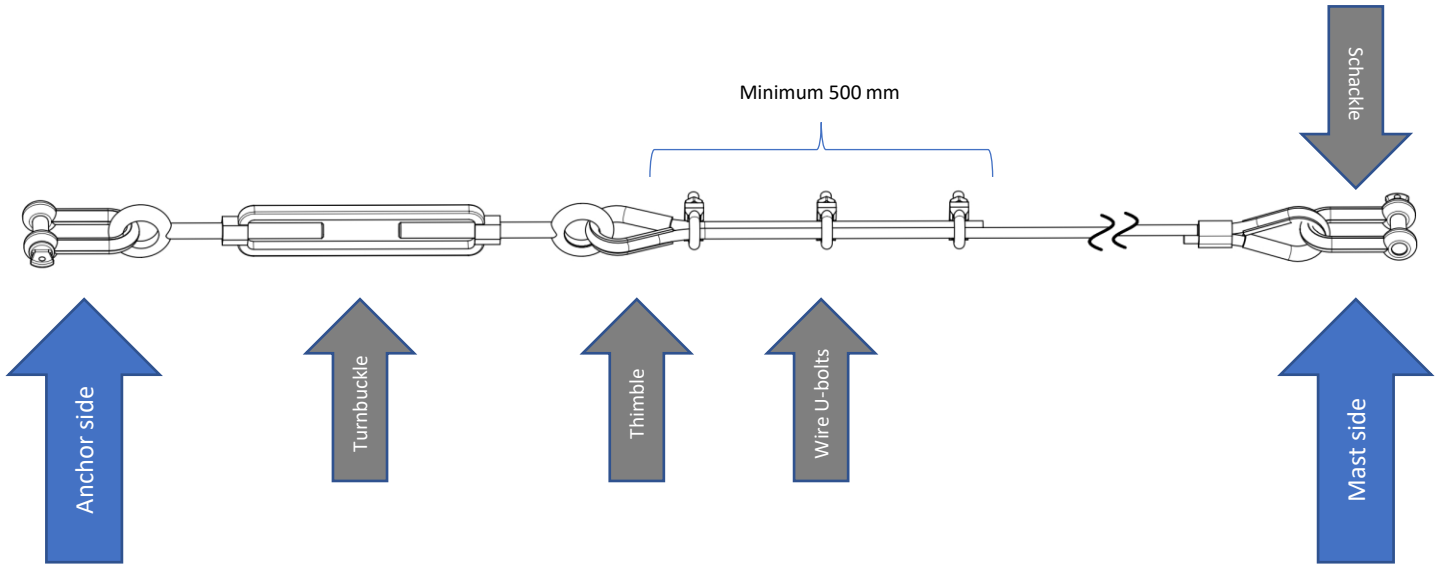
Put winch wire into rail, insert slider into the rail at the mast bottom, connect slider to winch wire first (use special inox shackles provided). Mount end stop.



Next tension winch wire a bit. Having done that reposition wire guides (sliding along horizontal member pipes) the way wire is right in the middle of each eye. Now fasten all U-bolts nuts to prevent guides from further movement. These are M8 nuts, recommended torque is 4 Nm (higher torque may deform member pipe). You may also attach winch handles at this stage.

Steps to set up masts

At this point mast shall be ready for guy wires installation.
Shorter wires are for h=7,5 meters level and longer for h=15 meters.
Please observe schematic use of provided wire hardware – duplicate this on each guy wire



By this point masts should be ready for hoisting. This may be done in several ways, using gin pole and electric winches (more advanced) or rented crane (easier but not always possible). Description of this process exceeds purpose of this manual. This step cannot be executed by untrained personnel. Remember to recheck all bolts and nuts if they are tightened correctly, visually check all structure, try slider movement and mast winch for proper operation – before hoisting masts. After masts are up, use turnbuckles to tighten all wires to approx. 1kN next use theodolite to check if mast are straight. Regulate wire tension until truss is straight. Maximum allowable deviation is 1/1000 of its height which means 15 mm in our case.

Final thoughts…

Operating winch may require additional certification/license in chosen countries. Consult job safety department in your company for additional info.

All inox bolts and nuts have to be greased before tightening with provided inox grease, otherwise joints may seize up.

Setting up masts and hoisting them is complicated process that has to be conducted by highly trained specialized company with right experience in similar installations. This guide is not step-by-step instruction and does not cover all possible steps to safely build described installation. Moreover hoisting process requires specialized tools like wire tensioners and electrical winches. Contact specialist contractor in your area to discuss right technique to pull masts up. We do provide technical guidance to facilitate process. When in doubts contact AluPro engineer Darek Woyciechowsky cell number +48 502 218 191