

Uppgjord (även faktaansvarig om annan) - Prepared by (also subject manager if other) 2003 Pontus Bergström	Fac. sign/Type/Project XATM	Doc. group 031	Dokument nr- Document no XATM101629	
Dokumentansvarig/Godkänd - Document manager/Approved Bengt Järpenge	Datum - Date 10.04.2006	Rev C	Filekod/Ref -File code/Ref	S class K

Requirements regarding installations in Teracom's masts

1.0 Purpose

The purpose of this instruction is to ensure that antenna mounts and other equipment installed in Teracom's masts are sufficiently strong and are professionally installed so that they do not:

- cause injuries to personnel
- cause damage to other equipment
- constitute an unnecessary obstacle to future installations

2.0 Scope

This instruction covers requirements as regards properties and versions of installed equipment in Teracom's masts. Equipment refers to everything that is intended to be installed in masts, such as antennas, antenna mounts, bracing constructions, cables, feeders, falling ice protection, cable ladders, etc.

The instruction does not cover the actual assembly process.

3.0 General requirements for the installation

Equipment must be installed in such a way that it does not disrupt the maintenance of existing equipment nor render it more difficult, and so that it does not make climbing on the mast or using a mast lift more difficult.

During installation, no mechanical damage may be inflicted on the mast, such as drilling, welding or anything else that impairs its mechanical properties. Equipment and the assembly of equipment must also be carried out in such a way that mechanical damage to the mast's surface protection is avoided.

Installed equipment that does not belong to Teracom must be marked with the customer's name, both indoors and outdoors.

3.1 Location of the equipment

Equipment must be installed in the location indicated by Teracom. Equipment should normally be installed in the first instance on the mast's or the truss's chords. In order to facilitate future maintenance, equipment must be installed at least 200 mm from the chord flanges. The installation of equipment on the mast's diagonals requires specific approval from Teracom.

3.1.1 Masts with 2.4 m lateral dimension equipped with a lift

No assembly may take place inside the mast, with the exception of mountings on diagonals or braces that do not extend further than 50 mm into the mast calculated from the inside of the diagonal. See figure 1.

Feeder cables may only be routed on existing internal cable ladders on the mast's guide side as long as the depth of the cables or clamps is not greater than 200 mm measured from the inside of the diagonal.

No assembly may be carried out in the climbing space (described below).

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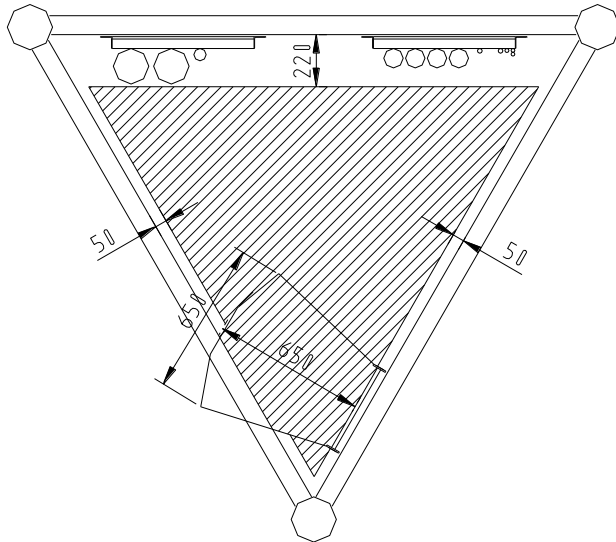


Figure 1 No assembly may take place within the shaded area.

3.1.2 Other masts

No assembly may take place on the mast within the climbing space, the size of which comprises a circular arc with a length of 650 mm and a radius of 650 mm, measured from the centre of the climbing ladder. The area is limited to the sides by two imaginary lines from the ends of the circular arc to the side profiles of the climbing ladder (stringers). See figure 2.

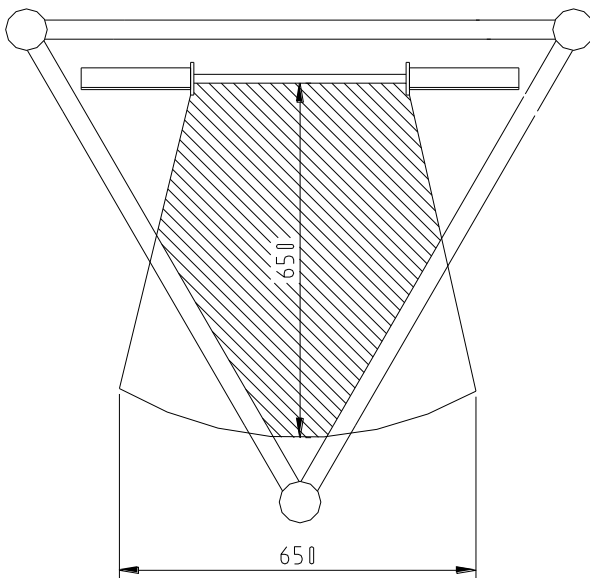


Figure 2 No assembly may take place within the shaded area.

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Other internal mast assembly has no direct limitations, but should still not take up unnecessary space. For example, surplus lengths on panning guys, pin bolts, threaded rods, etc., must be cut as short as possible.

3.2 Fall protection

When installing equipment in masts fitted with fall protection such as a fall protection rail with shuttle, it is necessary to ensure that the climber has the potential, when climbing down, to lean back so that the shuttle can slide down freely.

This means that extra cable ladders should be positioned on the mast's outside on masts with fall protection and lateral dimensions of less than approx. 1600 mm. If the inside has to be used, the size of the climbing space must comprise the shaded area specified in figure 2.

3.3 Clamping cables

Clamping distances for cables are normally specified by the manufacturer. In the absence of such information, the following guidelines should be used:

Cable diameter	Clamping distance
< 28 mm	500 mm
28-150 mm	1000 mm
> 150 mm	1500 mm

Cable clamps must be of a type such that they do not risk damaging the cable during attachment/tightening, and must be adapted to the cable dimension in question. Clamping can also take place with the aid of special cable ties made of stainless steel. UV-resistant plastic ties may be used for temporary installations (max. 6 months.). The maximum distance between ties on cables is 500 mm. The choice of clamping method must be adapted according to cable type.

3.4 Routing of cables

Cable routing from the cable ladder to the antenna must take place in such a way that future cable routing is not obstructed. In order to protect the cables, these must be routed on the underside of the diagonals, if possible.

Cables must be clamped to devices intended for cable installation, normally a cable ladder or cable support.

3.5 Marking cables

Marking must be carried out according to Teracom's marking system, see regulation XADN 101077.

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3.6 Falling ice protection

Falling ice protection must be installed horizontally with mountings against the braces. The mountings must be designed such that the load is distributed over the brace, so that there is no risk of the brace being deformed during tightening. The falling ice protection must have braces or supports that form an angle of at least 45° from the plane of the falling ice protection.

4.0 Requirements regarding mechanical properties

The equipment must be dimensioned, manufactured and surface-treated in accordance with Swedish or other internationally recognized standards. Steel constructions manufactured in Sweden must be dimensioned in accordance with applicable Provisions for steel constructions (BSK) and New building regulations. The dimensions must ensure that the structure can withstand the static and dynamic loads that can be anticipated during its lifetime, bearing in mind the ice and wind loads that may arise. Load-bearing components must be designed such that the risk of fatigue is minimized.

Materials must be suitable for outdoor use. In the event of combinations of metallic materials, consideration must be given to the risk of corrosion due to electrochemical effects, which can jeopardize the function or durability in the long term. The part of the equipment that is in contact with the mast may only be made from hot-dip galvanized steel, anodized aluminum or stainless steel.

The equipment must be designed with good drainage so that accumulations of standing water are avoided in pipes and pockets in the construction.

The equipment's surface protection must cope with the intended operational time without the need for maintenance. Bolted joints must be hot-dip galvanized or stainless steel. Electro-galvanized components may be used for temporary installations (max. 6 months.).

Metallic materials must be well burred so that the risk of cuts in conjunction with handling is eliminated. "Zinc whiskers" must not occur on hot-dip galvanized components.

Bolted joints and clamps etc. must have a locking system that prevents them from coming loose as a result of vibrations. Permitted locking methods are double nuts, center punches or lock washers.

Clamps for mountings must be adapted to the relevant pipe/beam dimension. Clamps comprising fully threaded rods may not be used.