

1. Steel Towers for Communication Services - G/TBT/N/TZA/957 dated 4-May-2023

Notifying Member	Tanzania
Type of Notification	Regular Notification
Economic relevance	High
Technical Relevance	Technical-New

Proposal in brief

- a. Tanzania has issued a standard which specifies the technical requirements for the designing, fabrication, installation, inspection and maintenance operations for steel towers, masts and their accessories used in communication industry.
- b. It covers monopoles, roof mount/ rooftop, self-supporting towers, and guyed masts.
- c. This standard ensures that the performance, reliability, public safety and safety of working personnel and equipment during installation, operation, inspection, and maintenance. The requirements of the local operating environment are also taken into consideration by this standard alongside the need to achieve substantial conformity with applicable international best practices.
- d. The maximum height for steel towers (lattice and monopoles) mounted on top of buildings (rooftops/roof mounts) shall not exceed 12m.
- e. All lattice structures (mast and tower) must conform strictly to TCAA and ICAO guidelines with respect to obstruction lighting of tall structures specified as:
 - a. For every 50 m of height above ground level, a tower shall have installed on it, one lamp on top and two lamps at the sides.
 - b. Obstruction lamps shall be always maintained in a working condition on all structures within 15 km of an airport or helipad.
- f. To construct a tower an individual or entity must demonstrate responsible step to investigate TOWER SHARING (co-location) before applying to the permitting agencies to construct a new tower within a specified radius of 400m of the proposed site. Where tower heights are shorter, a smaller search radius can be used as follows:
 - a. Two towers above 46m, a radius of 400m shall apply; and
 - b. Two towers below 46m towers, a radius of 300m shall apply.
- g. The steel tower co-location should be considered during designing. The possible antenna load, possible wind speed and allowable tilt and sway angle should be:
 - a. Loading Requirements for self-supporting steel towers:

	Categories			
Parameter	Very Light	Light	Medium	Heavy Duty
Possible antenna load (in m ²)	from 4 to 6	from 6 to 10	from 10 to 20	from 20 to 25
Possible wind speed (in km/h)	from 120 to 200	from 120 to 200	from 120 to 200	from 120 to 200
Tilt and sway (in degree)	± 1°		±1°	±1°
Application	Very light antenna load	Light antenna load	Medium antenna load	Heavy duty antenna load

- b. Loading requirements for guyed masts:

Parameters	Categories			
	Very light	Light	Medium	Heavy Duty
Possible antenna load (in m ²)	from 1 to 3	From 3 to 8	From 8 to 20	From 20 to 50
Possible wind speed (in km/h)	From 120 to 200	From 120 to 200	From 120 to 200	From 120 to 200
Tilt and sway (in degree)	± 1	± 1	± 1	± 1
Application	Very light antenna load	light antenna load	Medium antenna load	Heavy duty antenna load

- h. All members shall be made of structural steel material complying with BS EN 10025-2:2019. Therefore, leg and bracing members shall be of structural steel grades of S235JR, S235JO or S355JO. Each structural member shall be made of hot dip galvanized structure steel sections before being painted. All structural members shall be hot dipped galvanized according to TZS 2893/ISO 1461:

Chemical composition for product analysis

Designation		Method of deoxidation	C in % max. For nominal product thickness in mm			Si % Max	Mn % Max	P % Max	S % Max	N % Max	Cu % Max	Other % Max
Steel name	Steel number		≤ 16	> 16 ≤ 40	> 40c							
S235JR	1.0038	FN	0.19	0.19	0.23	-	1.5	0.045	0.045	0.014	0.60	-
S235JO	1.0114	FN	0.19	0.19	0.19	-	1.5	0.040	0.040	0.014	0.60	-
S355JO	1.0553	FN	0.23	0.23	0.24	0.6	1.7	0.040	0.040	0.014	0.60	-

Mechanical properties – Tensile test properties at room temperature

Designation		Minimum yield strength, ReH MPa Nominal thickness, mm					Tensile strength, Rm MPa Nominal thickness, mm				Other % MAX.
Steel Name	Steel Number	Min. yield strength	ReH	MPa	Nominal Thickness, mm	Tensile Strength	Nominal Thickness, mm				
		≤ 16	>16 ≤ 40	>40 ≤ 63	>63 ≤ 80	> 80 ≤ 100	> 80 ≤ 100	<3	≥ 3 ≤ 100	≥ 3 ≤ 100	
S235JR	1.0038	235	225	215	215	215	195	360-510	360-510	350-500	-
S235JO	1.0114	235	225	215	215	215	195	360-510	360-510	350-500	-
S355JO	1.0553	355	345	335	325	315	295	510-680	470-630	450-600	-

- i. Location and preparation of samples and test pieces for mechanical testing shall be done in accordance with ISO 377. Tensile tests shall be carried out in accordance with ISO 6892-1. Test

methods for chemical analysis shall be in accordance with ISO 17054, ISO 15350 or ISO 19272 depending on the elements to be analysed and their content.

- j. The communication towers shall not be constructed near high voltage (11kV and above) electrical power transmission and distribution lines. The nearest distance of a tower to a high voltage electrical power transmission line shall be according to TANESCO specifications. No steel towers (irrespective of the height) may be installed without prior approval and permits from relevant authorities, including NEMC, TCRA and TCAA.
- k. Each completed communication tower must have a name plate attached to one of its legs on which the following particulars are detailed:
 - i. Name, address and telephone numbers of the owner, fabricator, and installer
 - ii. Tower Height
 - iii. Base Section area (in m²)
 - iv. Tower loading requirements for Antenna (in m²), Cabling (in m²) and Weight (in kN) e) Maximum wind speed considered (in m/s or km/h)
 - v. Payback Period (in years) and
- l. The antenna of each tower should contain:
 - i. Date of erection
 - ii. Height
 - iii. Number of antennas
 - iv. Operating Frequencies
 - v. Location address
 - vi. Geographical coordinates
 - vii. Name of operator and licensee
 - viii. Effective Isotropic Radiated Power
 - ix. Records showing inspection dates and types of inspections performed and detailed particulars of the inspector.

Analysis

- This standard ensures that the performance, reliability, public safety and safety of working personnel and equipment during installation, operation, inspection, and maintenance.