

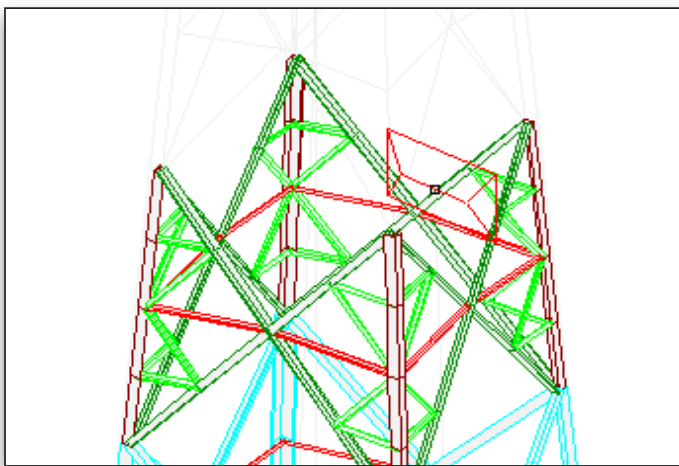
# MStower

## Specialty Software for Steel Tower Analysis and Design

MStower is specialized software for the analysis and design of steel transmission and communication towers, such as monopoles, lattice towers, and guyed masts, to a range of international standards. A comprehensive library of panel types and ancillary equipment allow for quick creation of the structure.

### Modeling Features

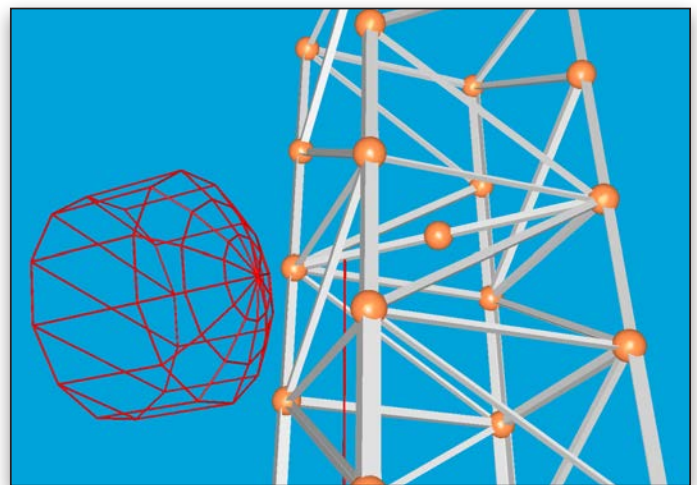
MStower offers both graphical-based and text-based definition of tower structures, including data describing panels, dimensions, sections, and ancillary equipment. Tower geometry can be defined and revised using a text-based tower data file, which can be built easily from the modeling wizard. In addition, the user defined panel geometry can be revised through the graphic interface, with commands such as move, linear copy, polar copy, rotate, mirror, stretch, member subdivide, insert node, and intersect. Panels can be defined by the user or selected from a comprehensive library of standard panel types. Standard libraries also include sections and ancillaries and can be edited by the user.



Standard panels in a tower.

### Analysis Features

Analysis methods in MStower include static linear and non-linear, elastic critical load, frequencies and modes of vibration, and response spectrum. Loads can be computed in accordance with a number of international standards. Wind and ice loads on members, antennas, and ancillaries are computed automatically. MStower can generate loading and application of wind gust factors to member forces. Member forces are extracted directly from the analysis results.



Rendered 3D view of tower and ancillary.

As with the definition of the tower geometry, tower loads can be specified with a text-based tower loading file, which can be automatically created by specifying the design code standard and basic code loading parameters.

### Member Design

Member capacities may be checked against the requirements of the most popular international design standards. The general types of checks performed by MStower include structural configuration, slenderness and buckling checks, ultimate strength, allowable stresses, and bolt strengths. The design capabilities in MStower are an excellent solution for both new towers and in the reassessment of existing structures subjected to modified loading, such as the installation of additional ancillary equipment or conductors.

### Results and Output

With MStower users can create reports with virtually any result – structure data, loading, static and dynamic results. MStower contains comprehensive facilities for plotting the structure, loading, and results. Analysis and member check results can be displayed graphically, used in reports, and printed as required. MStower also includes a report that gives both tower reactions and angular displacements of ancillaries under wind loading. The Query function can be used to access detailed information and results for any specific element in the structure including ancillary equipment.

## System Requirements

### Processor

Intel Pentium or AMD processor 2.0 GHz or greater

### Operating System

Windows XP or later

### System memory

Minimum of 512 MB of RAM, 2 GB recommended

### Disk Space

Minimum of 500 MB free space required

### Display

Graphics card and monitor with 1280x1024 resolution, 256 color display (16-bit high color recommended)

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## MStower At-A-Glance

### Modeling

- Three or four sided towers
- Graphical-based modeling commands such as move, linear copy, polar copy, rotate, mirror, stretch, member subdivide, insert node, and intersect
- Text-based input for fast and easy model and loading revision
- Library of standard panel types includes D & V, X, K, M, W, XMA, XDMA, DM, DMH, DLM, KXM, and SH
- Specification of ancillary equipment through standard libraries
- Linear ancillaries (ladders, feeders, waveguides) and large ancillaries
- Dish antennas, including consideration of diameter, mass, center of gravity, surface area, and projected area

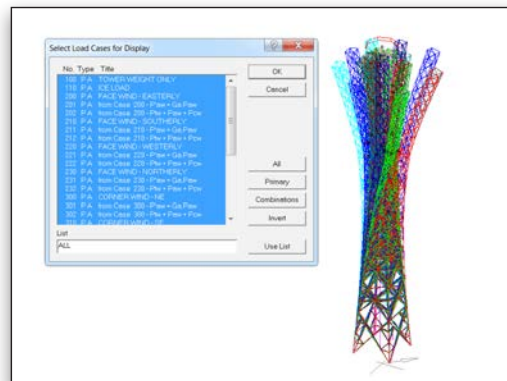
### Analysis

- Static linear and non-linear, elastic critical load, frequencies and modes of vibration, and response spectrum
- Automatic generation of dead, wind, and ice loads to the following standards:
  - » BS 8100 Part 1 1986
  - » BS 8100 Part 4 1995
  - » AS 3995-1994
  - » AS/NZS 1170.2:2011
  - » Malaysian Electricity Supply Regulations 1990
  - » EIA/TIA-222-F-1996
  - » TIA-222-G-2005
  - » Institution of Lighting Engineers Technical Report No. 7 High Masts for Lighting and CCTV 2000 Edition

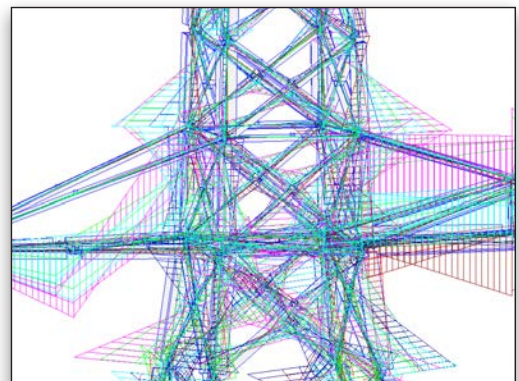
- » IS 875 (Part 3): 1987
- » BNBC 93 – Bangladesh National Building Code
- » ANSI/ASCE 7-95
- » NSCP C101-01 – Philippines National Building Code
- Comprehensive consistency check
- Wind analysis including amplification for dynamic effects
- User-defined wind velocity profiles
- Wind forces per gust speed or mean wind velocity
- Computation of patch loading for masts
- Tension-only members and catenary cable elements (guys)
- Six drag coefficients for each angle of incidence
- Fast solution time through profile optimization

### Design

- Design checks include structural configuration, buckling lengths, slenderness ratios, ultimate member strength, and bolt strength
- Available design provisions include:
  - » BS 8100 Part 3
  - » BS 449
  - » AS 3995-1994
  - » ASCE 10-90, ASCE 10-97
  - » EIA/TIA-222-F-1996
  - » TIA-222-G-2005
  - » Institution of Lighting Engineers Technical Report No. 7 High Masts for Lighting and CCTV 2000 Edition
  - » BS 5950-1:2000 (for tubular poles)
  - » IS 802 (Part 1 / Sec. 2):1992



Displaced shape for several load conditions.



Moment diagram for transmission tower.