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Interim Australian Standard®

**Design of steel lattice towers and
masts**



STANDARDS AUSTRALIA 

DR 91087

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The following interests are represented on Committee BD/73:

Association of Consulting Engineers Australia

AUSSAT

~~Bureau of Steel Manufacturers of Australia~~

Division of Building, Construction and Engineering, CSIRO

Electricity Supply Association of Australia

Electricity Trust of South Australia

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PREFACE

This Interim Standard was prepared by the Standards Australia Committee on *Design of steel lattice towers and masts*.

This Interim Standard has made no attempt to address the issues outlined below. These issues are seen as a necessary part to a complete Standard for the design of steel lattice towers and masts. The following issues will be considered for inclusion in the final Standard:

- (a) Different materials, e.g. aluminium and cold-formed steel.
 - (b) Different sections, e.g. round or square hollow sections and solid rounds.
 - (c) Welded sections, analysis and design.
 - (d) Guy analysis and design.
 - (e) Foundation and guy anchorage design procedures.
 - (f) Design of ancillary items, e.g. ladders, platforms and mounting bars.
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- (g) Quality assurance versus reliability.
 - (h) Maintenance and inspection.
 - (i) Lightning protection and earthing.
 - (j) Lighting and obstruction markings.
 - (k) Criteria for analysis of existing structures.

Attention is drawn to the fact that this document is an Interim Australian Standard and should be regarded as a developmental Standard liable to future alteration.

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STANDARDS AUSTRALIA

Australian Standard

Design of steel lattice towers and masts

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard sets out the procedures for determination of design wind speeds and wind loads, and other appropriate Standards to be used in the structural design of lattice towers and masts, with or without ancillaries such as antennas, for communication purposes. It further sets out the basis for the strength assessment of members and connections of lattice towers and masts.

This Standard is not intended to apply to the structural design of transmission line structures.

For all other aspects of design not specifically mentioned herein, reference shall be made to the appropriate Australian Standards including AS 1170 Parts 1 and 2, AS 1554, AS 1559, AS 1650, AS 3569 and AS 4100.

1.2 REFERENCED DOCUMENTS The documents referred to in this Standard are listed in Appendix A.

1.3 DEFINITIONS For the purpose of this Standard, the definitions below apply.

1.3.1 Bracing members—members other than legs carrying the horizontal forces due to the imposed loads on the structure.

1.3.2 Leg members—members forming the main load-bearing components of the structure.

1.3.3 Linear ancillaries—ancillaries to the structure that are very long in relation to their sectional dimensions, and for which sectional drag force coefficients are available.

1.3.4 Secondary bracing members—members used to reduce the effective length of other members.

1.4 NOTATION The quantity symbols used in this Standard are listed below.

A	= compression section area
A_a	= reference area of any ancillaries attached to a tower section
A_e	= effective compression section area
A_o	= nominal plain shank area of a bolt
A_z	= projected area of tower members in one face of the tower, without ancillaries (except for Case (a) in Clause 2.2.8.3)
a	= constant in expression for f_a for cylindrical ancillary inside a square tower
B_s	= back ground factor
b	= average diameter or breadth of a section of an ancillary or tower member
C	= distance between stitch bolts
C_c	= constant for the determination of α_c
C_d	= drag force coefficient for the tower section without ancillaries
C_{da}	= drag force coefficient of the isolated ancillary
C_{dc}	= effective drag force coefficient for the tower section with ancillaries
c	= constant in expression for f_a for cylindrical ancillary inside a triangular tower
d_f	= nominal diameter of bolt
E	= gust energy factor
F_d	= drag force acting parallel to the wind stream
f_a	= correction factor for interference
f_i	= correction factor for wind direction
f_r	= aspect ratio correction factor
f_{vf}	= minimum shear strength of a bolt
f_y	= yield stress of steel
G	= dead load
G_s	= gust response factor
g_B	= peak factor for the background response
g_R	= peak factor for resonant response