



LiteSteel beam Part 1 Introduction

Design Capacity Tables For LiteSteel® beam

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1.1 General

The LiteSteel beam (LSB) is a cold-formed high strength steel beam manufactured from a single steel strip on a custom designed and built Dual Electric Resistance Welding (DERW) mill similar to that used for manufacturing circular, square and rectangular hollow sections. It has a channel shape with hollow flanges which give the section high torsional rigidity, contrary to traditional channels.

Figure 1.1: LiteSteel beam



Although it is a cold-formed steel product, the unique profile of LSB avoids many of the difficulties commonly associated with other open cold-formed sections, while maintaining a high level of structural efficiency. The channel shape with parallel hollow flanges was chosen over other possible shapes because of the practical advantages for connections. The particular advantages of the LSB sections are:

- There are no free edges because all elements are stiffened, so the propensity for local plate buckling is very much reduced.
- Because of the hollow flanges, the LSB sections have a high level of torsional stiffness and hence stability.
- Flat width to thickness ratios (b/t) are low compared to many cold-formed sections.
- It provides an excellent light weight alternative to the range of smaller hot rolled steel sections.

This publication and the tables contained herein provide the structural engineer with all of the basic design procedures and design aids for member design using the LSB, without the need for reference to AS/NZS 4600 or extensive calculations. LiteSteel Technologies have produced other publications for connection design (LST 2005c) and for specific applications (LST 2005a and 2005b).

1.2 Cold-formed Steel Structures Standard

The Tables in this publication have been calculated generally in accordance with the Australian / New Zealand Standard AS/NZS 4600: 1996 Cold-Formed Steel Structures. However, there are some instances where this standard does not provide adequate provisions for the unique shape of the LSB. In these instances the design methods adopted and their justification is provided in the relevant part. The two main areas where there is a deviation from the standard are lateral distortional buckling of beams and bearing under concentrated loads.

As far as possible, the notation and terminology used are the same as those adopted in AS/NZS 4600.

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1.3 Limit States Design

All values presented in the Tables are limit state values in accordance with the Limit States Design requirements of AS/NZS 4600 and AS/NZS 1170.0.

1.4 Units

The units in the Tables are consistent with those in the SI (metric) system. The base units used in the tables are:

Property	Units	Symbol
Force	Newton	N
Length	Metre	m
Mass	Kilogram	kg
Stress	Megapascal	MPa

Except for some minor exceptions, all values in the Tables are rounded to three (3) significant figures.

1.5 Table Format and Usage

Within this publication the terms "Table" and "Tables" refer to information in this edition of the Design Capacity Tables for LiteSteel® beam by LiteSteel Technologies.

The main tables listing design capacities and other member information are located at the end of the text portion of each Part of this publication. Tables are numbered firstly in accordance with the Part number in which they occur, and then by the type of information being provided. Some tables are further separated, forming a series of tables providing the same type of information. For example:

Table 5.1 is found in Part 5 and contains Section Moment and Web Capacities.

Tables 5.4-1 to 5.4-8 are a series of tables in Part 5 containing Maximum Design Loads for beams with full lateral restraint based on strength or various serviceability criteria.

1.6 References

1.6.1 Standards

'AS/NZS 1170.0' refers to AS/NZS 1170: 2002 Structural design actions Part 0: General Principles

'AS 1391' refers to AS 1391-1991 Methods for tensile testing of metals

'AS 4100' refers to AS 4100: 1998 Steel structures

'AS/NZS 4600' refers to AS/NZS 4600: 1996 Cold-formed steel structures

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1.6.2 Other References

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