

Guide to Handbook of Steel Construction

In principle, the Canadian Handbook of Steel Construction is simple to use, however, sometimes it appears that the information is scattered around in 1000 pages. This section is a guide to the use of the HSC.

There are eight parts to the book. The parts are:

Limit States Design of Steel Structures

This includes the Code CAN/CSA-S16-2001 which governs the design of the members which will be considered in the course. There are many equations in this part and if the meaning of the terms are unknown or vague, check out the Nomenclature on pages viii onwards. The Code is the most important part of the design. The Appendices at the end of Part 1 should also be checked.

The Commentary

is a companion to the Part 1 as it is a Commentary on the Code clauses in Part 1. Much description is included as well as occasional examples. Parts 1 and 2 should be studied together.

Connections and Tension Members

Connections always have to be kept in mind in designing members, but tension members in particular require a consideration of the area of the member removed by bolts, or the effectiveness of the tension member because of connections of bolts or welds. This latter effect is termed **Shear Flow**. Many tables of safe loads for various types of connections are given which makes design quite simple.

Compression Members

Design of compression members in trusses or frames require a close consideration as these are the members that if they fail this could cause collapse of the structure. Among the details considered are :

- a. Required width/thickness ratios;
- b. Beam column section classes
- c. Factored resistance for given slenderness ratios
- d. Effects of uniform bending moment
- e. Amplification factor for column deflection or tilt.
- f. Safe load tables for various cross sections in various steel strengths. This will show that design of simple cases can be taken directly from these tables without the labour of calculating strengths from scratch using the equations of Part 1.
- g. Beam-column design, double angle struts for simple trusses, design example, bracing systems and a base or bearing plate design.

Flexural Members

Beams are probably the most common type of member to design in any building structure as they are the elements that carry vertical loads horizontally to columns. In a sense this Part is like a computer as it allows the selection of beams, either with laterally supported compression flanges, or where flanges are not supported laterally. Simplified deflection calculation methods are given as well as shear, moment and deflection equations for most of the kinds of loads. It is suggested that the formulas for these values not be used as it is useful to work them out from scratch from time to time. The sections on Composite beams will be covered if there is sufficient time. Useful simplified tables and an example for built-up girder design including transverse and bearing stiffeners are also given.

Properties and Dimensions

Not all problems of design can be solved using safe load tables and it may be necessary to work with the dimensions of actual sections. These are included in this Part with properties of rolled sections such as area, moments of inertia, radii of gyration and torsional inertia. Properties of double angle sections are also included. Particularly the **Flat Metal Products** table on 6-145 should be noted as it is sometime a question of what thickness of plates can be used in a design.

CISC Code of Standard Practice for Structural Steel

This part will not be of much use in the course. It is directed to people working in a design office as a guide to good practice in contracting for supply of materials or labour. Note the conversion table between SI and Imperial units on page 7-74. It is invaluable.

General Index

When all else fails and information cannot be found, check the Index.