

Preface to the North American Design Comparisons

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The following two papers by Drs. Ted Galambos and Bruce Ellingwood examine the structural steel design standards and the loading codes in Canada, Mexico, and the United States. While the requirements for the fabrication of structural steel (welding, bolting, bolt holes, edge distances, and the like) are essentially the same, Galambos and Ellingwood explore other design similarities as well as their differences.

These papers are one outcome of a series of annual meetings begun in 1995 of a group identified as the North American Co-ordination Committee on Structural Steel Design. Ted Galambos briefly describes the background and constituents of this group in the paper. It was formed to provide a voluntary forum wherein common North American structural steel interests could be explored, technical information exchanged, and cooperative efforts, such as the ensuing two papers, initiated. Representation consists of 3 structural engineers from each country through the participation of the three structural steel associations: AISC (US), CISC (Canada), and IMCA (Mexico). Chairs and host sites for meetings have rotated among these three countries. From the North American steel group's inception in 1995, annual one-day meetings have been held in Edmonton (1995), Minneapolis (1996), Guadalajara (1997), and New Orleans (1998).

Another outcome of this North American steel group's activities has been the appointment as liaison members of

Ted Galambos to the CSA Technical Committee S16, Steel Structures for Buildings, and Laurie Kennedy to the AISC Specification Committee. The aim is to further the communication between the two committees, and the understanding of each other's technical requirements.

As pointed out by Galambos, the limit states design rules are based on the same research sources and lead to similar answers in many cases. Some differences arise due to differences in the philosophies adopted by separate and distinct committees. Other differences that arise are due to different products or product standards.

However, as noted in the paper by Ellingwood, there are more differences in actual building codes and loadings which govern the designs. With fewer jurisdictions in Canada and Mexico, there are less variations in local Code requirements than throughout the United States. Differences in building codes are far more evident as one progresses across the continent than are the substantial differences in the design of steel structures.

A major difference that separates the U.S. practice from that of Canada and Mexico is in the units of measure. Both Canada and Mexico use the metric system. In addition, Canada only permits the use of limit states design for proportioning steel structures, having officially retired the allowable stress design standard 14 years ago. So, while on the level of limit states design there is a great deal of similarity in the requirements across the three countries, in practice, they are not yet fully in step.

Further discussions and meetings of the North American Co-ordination Committee on Structural Steel Design are expected to continue based on the unanimous interest and consent of all participants. New directions in steel design, such as performance (objective) based criteria, and ongoing developments in seismic design and shape material properties, have been identified as possible subjects.

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