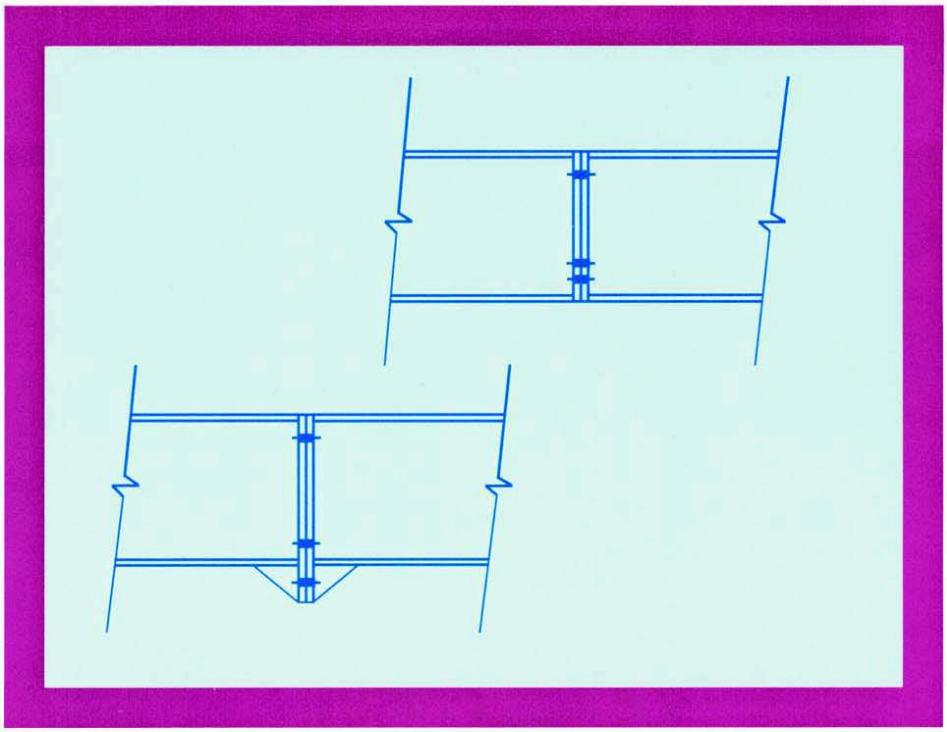
Steel Design Guide Series

16

Flush and Extended Multiple-Row Moment End-Plate Connections



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Flush and Extended Multiple-Row Moment End-Plate Connections

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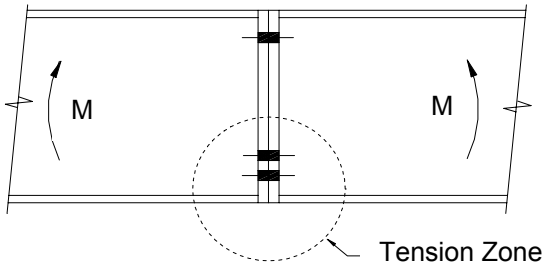
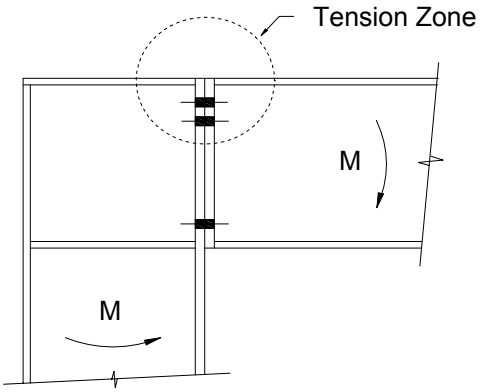
Chapter 1
USE AND CLASSIFICATION OF MOMENT END-PLATE CONNECTIONS

1.1 Introduction

The low-rise metal building industry has pioneered the use of moment end-plate connections in the United States. These bolted connections are used between rafters and columns and to connect two rafter segments in typical gable frames as shown in Figures 1-1 and 1-2. Hence, built-up shapes used in the metal building industry are exclusively used in the examples; however, the design procedures also apply to hot-rolled shapes of comparable dimensions to the tested parameter ranges (i.e. Tables 3-6 and 4-7).



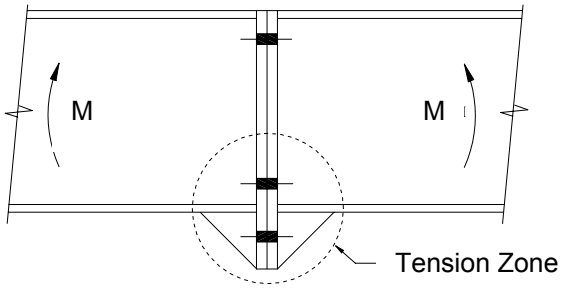
(a) Beam-to-Beam Connection



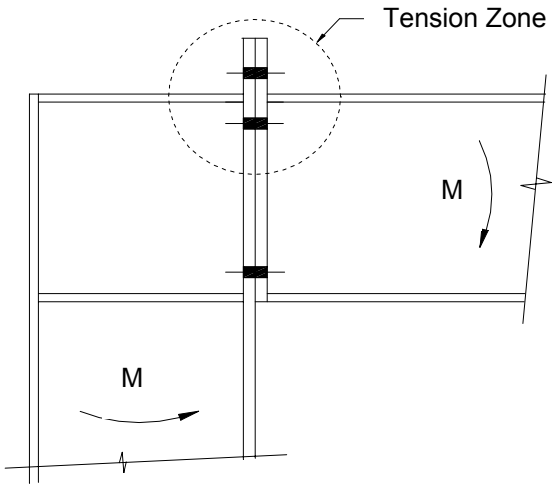
(b) Beam-to-Column Connection

Figure 1-1 Typical uses of end-plate moment connections (flush).

Rigid frame or continuous frame construction, designated Type FR in the American Institute of Steel Construction (AISC) Load and Resistance Factor Design (LRFD) Specification or Type 1 in the AISC Allowable Stress Design (ASD) Specification, is usually assumed for the design of the frames. The moment end-plate connection is one of three fully restrained moment connections, as defined in the AISC *Manual of Steel Construction, Load & Resistance Factor Design, 2nd Ed.* (1994), that can be used for FR (or Type 1) beam-to-column connections.



(a) Beam-to-Beam Connection



(b) Beam-to-Column Connection

Figure 1-2 Typical uses of end-plate moment connections (extended).

A typical end-plate moment connection is composed of a steel plate welded to the end of a beam section with attachment to an adjacent member using rows of high-strength bolts. End-plate moment connections are classified as either flush or extended, with or without stiffeners, and further classified depending on the number of bolts at the tension flange. Depending on the direction of the moment and whether the connection will see a moment reversal, the bolted end-plate may be designed to carry