AREMA
AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION

CHAPTER 15

STEEL STRUCTURES[1]

FOREWORD

Part 1 through Part 4, Part 6, and Part 7 formulate specific and detailed recommendations for the design, fabrication, erection, maintenance, inspection, and rating of steel railway bridges for:

- Spans up to 400 feet,
- Standard gage track,
- Normal North American passenger and freight equipment, and
- Speeds of freight trains up to 80 mph and passenger trains up to 90 mph.

The requirements, however, apply to spans of any length, but special provisions for spans longer than 400 feet should be added by the company as may be required. Part 5, Bearing Design and Construction, formulates specific and detailed recommendations for the design and construction of bearings for nonmovable railway bridges of all bridge and span types, including timber, concrete and steel structures. Part 6, Movable Bridges provides recommendations for the design and construction of movable bridges, including requirements for special movable bridge bearings not covered within Part 5. Part 8 covers miscellaneous items. Part 9 is a commentary, including references, for explanation of various articles in the other parts.

This chapter is presented as a consensus document by a committee composed of railroad engineers, engineers in private practice, engineers involved in research and teaching, and other industry professionals having substantial and broad-based experience designing, evaluating, and investigating steel structures used by railroads. The recommendations contained herein are based upon past successful usage, advances in the state of knowledge, and changes in design and maintenance practices. These recommendations have been developed and are intended for routine use and may not provide sufficient criteria for infrequently encountered conditions. Therefore, professional judgment must be exercised when applying the recommendations of this chapter as part of an overall solution to any particular issue.

In general, this chapter is revised and published anew on an annual basis. The latest published edition of the chapter should be used, regardless of the age of an existing structure. For purposes of determining historical

[1] The material in this and other chapters in the AREMA *Manual for Railway Engineering* is published as recommended practice to railroads and others concerned with the engineering, design and construction of railroad fixed properties (except signals and communications), and allied services and facilities (Reference 24). For the purpose of this Manual, RECOMMENDED PRACTICE is defined as a material, device, design, plan, specification, principle or practice recommended to the railways for use as required, either exactly as presented or with such modifications as may be necessary or desirable to meet the needs of individual railways, but in either event, with a view to promoting efficiency and economy in the location, construction, operation or maintenance of railways. It is not intended to imply that other practices may not be equally acceptable.

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recommendations under which an existing structure may have been built and maintained, it can prove useful to examine previously published editions of the chapter. However, when historical recommendations differ from the recommendations contained in the latest published edition of the chapter, the recommendations of the latest published edition of the chapter shall govern.

Grateful acknowledgment is hereby made to the American Association of State Highway and Transportation Officials and the American Welding Society for having made available their Bridge Welding Code (AWS D1.5) for use by reference in these recommended practices. In applying AWS D1.5, the term "allowable stresses" is to be construed as those allowed herein. Certain other modifications and exceptions to the Code are also recommended.

Grateful acknowledgment is also made to the Association for Materials Protection and Performance (AMPP) for use of their publications by reference in the recommendations cited in Part 8, Section 8.7, regarding the cleaning and painting of existing steel railway bridges.

Part 2, Design – High Strength Steels was combined with Part 1, Design in 1993.

Part 5, Special Types of Construction was combined with Part 1, Design in 2008.

Part 10, Bearing Design, and Part 11, Bearing Construction, were combined into a new Part 5, Bearing Design and Construction in 2013.

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INTRODUCTION

The Chapters of the AREMA Manual are divided into numbered Parts, each comprised of related documents (specifications, recommended practices, plans, etc.). Individual Parts are divided into Sections by centered headings set in capital letters and identified by a Section number. These Sections are subdivided into Articles designated by numbered side headings.

Page Numbers – In the page numbering of the Manual (15-3-1, for example) the first numeral designates the Chapter number, the second denotes the Part number in the Chapter, and the third numeral designates the page number in the Part. Thus, 15-3-1 means Chapter 15, Part 3, page 1.

In the Glossary and References, the Part number is replaced by either a “G” for Glossary or “R” for References.

Document Dates – The bold type date (Document Date) at the beginning of each document (Part) applies to the document as a whole and designates the year in which revisions were last published somewhere in the document, unless an attached footnote indicates that the document was adopted, reapproved, or rewritten in that year.

Article Dates – Each Article shows the date (in parenthesis) of the last publication of revisions to that Article.

Reaffirmed Dates - Each Article is being reviewed and reaffirmed every 6 years beginning with the year 2002. If no technical changes are made, the publication date of the last reaffirmation is shown following the title of the Article and the Article Date.

Revision Marks – All current year revisions (changes and additions) which have been incorporated into the document are identified by a vertical line along the outside margin of the page, directly beside the modified information.

Proceedings Footnote – The Proceedings footnote on the first page of each document gives references to all Association action with respect to the document.

Annual Updates – New manuals, as well as revision sets, will be printed and issued yearly.

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