AWS D1.7/D1.7M:2010
An American National Standard

Guide for Strengthening and Repairing Existing Structures

American Welding Society

Approved American National Standard
ANSI

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Guide for Strengthening and Repairing Existing Structures

1st Edition

Prepared by the
American Welding Society (AWS) D1 Structural Welding Committee

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This guide provides information on strengthening and repairing existing structures. Included are sections on weldability, evaluation of existing welds, testing and sampling, heat straightening, and damage repair.

American Welding Society
550 N.W. LeJeune Road, Miami, FL 33126

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American Welding Society
550 N.W. LeJeune Road, Miami, FL 33126

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Advisors to the AWS D1F Subcommittee on Strengthening and Repair

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Foreword

This foreword is not part of AWS D1.7/D1.7M:2010, *Guide for Strengthening and Repairing Existing Structures*, but is included for informational purposes only.

This guide has been developed to assist in the task of strengthening and repairing existing structures. The guide includes information to assist both Engineers and Contractors in order to provide general direction and guidance on weld repairs, weld strengthening, and other procedures to correct challenging issues faced while dealing with existing structures.

Informative Annexes. These annexes are not part of this guide but are provided to clarify the guide's recommendations by showing examples, providing information, or suggesting alternative good practices.

Errata. It is the Structural Welding Committee's Policy that all errata should be made available to users of the code. Therefore, any significant errata will be published in the Society News Section of the *Welding Journal* and posted on the AWS web site at: http://www.aws.org/technical/d1/.

Suggestions. Your comments for improving AWS D1.7/D1.7M:2010, *Guide for Strengthening and Repairing Existing Structures* are welcome. Submit comments to the Managing Director, Technical Services Division, American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126; telephone (305) 443-9353; fax (305) 443-5951; e-mail info@aws.org; or via the AWS web site <http://www.aws.org>.

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Guide for Strengthening and Repairing Existing Structures

1. General Provisions

1.1 Scope. This document contains basic information pertinent to the welded strengthening and repair of existing steel structures. The information contained in this guide is intended for both Engineers and Contractors with the purpose of providing direction and guidance to perform weld repairs, weld strengthening, and other weld procedures to correct problematic issues with existing structures. This guide contains background information that will be useful to the Engineer who is obligated under AWS D1.1/D1.1M:2008 Clause 8 to provide a comprehensive plan to address projects that involve strengthening and repairing of steel structures. The approach to the strengthening and repairing of these materials is to be developed using the information provided herein.

This guide is intended to apply to the strengthening and repair of existing structures made of the following materials:

(1) Steel with a minimum specified yield strength of 100 ksi [690 MPa] or less

(2) Cast iron

(3) Wrought iron

Strengthening or repairing an existing structure includes modifications to meet new serviceability or load requirements as well as corrections made to repair conditions unsuitable for future use specified by the Engineer. The Engineer should prepare a contract for the work including, but not limited to, design, workmanship, inspection, acceptance criteria, and documentation. Except as modified in this clause, provisions of this guide should apply to the strengthening and repair of existing structures, including heat straightening of distorted members.

1.2 Limitations. This guide is intended to assist in the evaluation of existing structural elements and the development of appropriate procedures for repairing those elements. It does not provide exhaustive coverage of any specific topic.

This guide is intended to apply to the strengthening and repair of existing buildings and other structural systems. It is not intended to apply to:

(1) Structures made of steels less than 1/8 in [3 mm] thick

(2) Pressure vessels and pressure piping

(3) Structures made of materials other than those listed under the scope

(4) Seismic upgrades

(5) New construction

Whereas this guide is not intended to apply the application outside the scope, the principles contained in this guide may be applied to other materials and applications. The Engineer is advised to use caution and engineering judgment for application outside the scope of this guide.

More importantly, it is critical to state here that this document does not provide detailed specific procedures and direction to correct any specific strengthening or repair operation regardless of how common or standard the procedure may be. Instead, information supplied herein as well as that material referenced in Annex A is intended to provide users with an overall approach to weld modifications as they pertain to: strengthening and repair; technical resources to develop