

Chapter 1 Introduction

1-1. Purpose and Scope

a. Purpose. This engineer manual (EM) provides guidance for the structural design of closure structures for openings in levees and floodwalls of inland local flood protection projects (LFPPs).

b. Scope. The scope of this guidance includes the design requirements for aluminum and steel stoplog closure structures and steel swing, miter, trolley, and rolling gate closure structures for openings in levees and floodwalls of LFPPs. This guidance provides a framework for incorporating the required elements of design execution into the design process for closure structures.

1-2. Applicability

This manual is applicable to all HQUSACE elements, major subordinate commands, districts, laboratories, and field operating activities having civil works design and construction responsibilities.

1-3. References

a. EM 1110-2-38, Environmental Quality in Design of Civil Works Projects.

b. EM 1110-2-301, Guidelines for Landscape Planting at Flood Walls, Levees, and Embankment Dams.

c. EM 1110-2-2104, Strength Design for Reinforced-Concrete Hydraulic Structures.

d. EM 1110-2-2105, Design of Hydraulic Steel Structures.

e. EM 1110-2-2502, Retaining and Flood Walls.

f. EM 1110-2-2703, Lock Gates and Operating Equipment.

g. EM 1110-2-2906, Design of Pile Foundations.

h. EM 1110-2-3104, Structural and Architectural Design of Pumping Stations.

i. EM 1110-2-3400, Painting: New Construction and Maintenance.

j. Aluminum Association, Inc. 1986. "Specifications for Aluminum Structures," 900 19th Street, NW, Suite 300, Washington, DC 20006.

k. American Association of State Highway and Transportation Officials (AASHTO). 1989. "Standard Specifications for Highway Bridges," 14th ed., 444 North Capitol Street, NW, Suite 225, Washington, DC 20001.

l. American Institute of Steel Construction (AISC). 1986. "Manual of Steel Construction, Load and Resistance Factor Design (LRFD)," 1st ed., 400 North Michigan Avenue, Chicago, IL 60611.

m. American Institute of Steel Construction (AISC). 1989. "Manual of Steel Construction, Allowable Stress Design (ASD)," 9th ed., 400 North Michigan Avenue, Chicago, IL 60611.

n. American Railway Engineering Association. 1991. "1991 Manual for Railway Engineering," Volume I, Chapters 1 through 8, and Volume II, Chapters 9 through 33, 50 F Street, NW, Suite 7702, Washington, DC 20001.

1-4. Background

This manual was developed to provide uniform criteria for the design of closure structures for openings in levees and floodwalls of LFPPs. The development process involved reviewing and evaluating the design and performance of existing closure structures constructed throughout the Corps to identify the structures which are cost-effective and efficient in operation, and incorporating the design features of these projects into the criteria provided herein. The resulting guidance contained in this manual provides a series of design requirements and provisions that should be applied to the design of closure structures.