

## Chapter 1 Introduction

### 1-1. Purpose

This manual is issued for guidance of engineers and design offices within the Corps of Engineers engaged in the planning, engineering layout, analysis, and design of navigation locks for civil works navigation projects on inland waterways.

### 1-2. Applicability

This engineer manual applies to HQUSACE elements and USACE commands having responsibilities for the design and construction of civil works navigation projects.

### 1-3. Policy

This guidance will be followed in the design and layout of navigation locks, unless site-specific conditions or proposed innovative designs warrant deviations from the guidance contained in this manual. Deviations from this guidance should be approved by CECW-ED and subsequently documented in design memoranda.

### 1-4. References

Required and related publications are listed in Appendix A.

### 1-5. Scope

*a. General.* This engineer manual provides guidance and criteria for the planning, engineering layout, and design of navigation locks and appurtenant structures. These structures may include gatebay and lock walls, approach walls, sills, lock floors, miscellaneous walls, river training structures, galleries and cable trenches, lock wall accessories, control houses, visitor access, handicapped access, and administration and maintenance complexes. This manual is structured so that Chapters 1 through 3 contain planning and project engineering guidelines, while Chapters 4 through 11 provide detailed design guidance. Chapter 12 describes guidance for the operation, safety, and maintenance of the locks which contribute to the efficiency and safety of operation of the lock and the life-cycle durability of the project. The manual's appendices contain references, design and planning information, line-item list of quantities, scheduling and budgeting guidelines, a loadings checklist, and sample computations.

*b. Other guidance.* The design of structural steel lock gates is covered in EM 1110-2-2703. Detailed design of concrete U-frame and W-frame locks is contained in other engineering guidance manuals cited in Appendix A. Analysis of massive reinforced concrete structures for nonlinear, incremental structural analysis (NISA) and reliability evaluation of existing navigation structures are also cited in Appendix A.