

## **CHANNELS**

Channels are defined as man-made structures that form entrenched waterways. These structures may be made entirely of concrete, with concrete sides and an exposed bottom, with riprap sides and an exposed bottom, or completely unlined. They are not to be confused with watercourses which are simply confined between levees. By definition, flood control channels range from the size of a street gutter to a few hundred feet wide in some cases. Flood control channels are found in most heavily developed urban areas.

### **References:**

#### *Engineering Regulations*

- ER 1105-2-101 Planning - Risk Analysis for Flood Damage Reduction Studies
- ER 1110-2-1150 Engineering and Design for Civil Works Projects
- ER 1110-2-1806 Earthquake Design and Evaluation for Civil Works Projects

#### *Engineering Manuals*

- EM 1110-1-1804 Geotechnical Investigations
- EM 1110-1-1904 Settlement Analysis
- EM 1110-1-1905 Bearing Capacity of Soils
- EM 1110-2-1205 Environmental Engineering and Local Flood Control Channels
- EM 1110-2-1418 Channel Stability Assessment for Flood Control Projects
- EM 1110-2-1421 Groundwater Hydrology
- EM 1110-2-1601 Hydraulic Design of Flood Control Channels
- EM 1110-2-1619 Risk-Based Analysis for Flood Damage Reduction Studies
- EM 1110-2-2000 Standard Practice for Concrete for Civil Works Structures
- EM 1110-2-2002 Evaluation and Repair of Concrete Structures
- EM 1110-2-2005 Standard Practice for Shotcrete
- EM 1110-2-2006 Roller-Compacted Concrete
- EM 1110-2-2007 Structural Design of Concrete Lined Flood Control Channels
- EM 1110-2-2100 Stability Analysis of Concrete Structures
- EM 1110-2-2102 Waterstops and Other Preformed Joint Materials for Civil Works Structures
- EM 1110-2-2104 Strength Design for Reinforced - Concrete Hydraulic Structures
- EM 1110-2-2105 Design of Hydraulic Steel Structures
- EM 1110-2-2502 Retaining and Flood Walls
- EM 1110-2-2504 Design of Sheet Pile Walls
- EM 1110-2-2611 Engineering for Prefabricated Construction of Navigation Projects
- EM 1110-2-2705 Structural Design of Closure Structures for Local Flood Protection Projects
- EM 1110-2-2902 Conduits, Culverts and Pipes
- EM 1110-2-2906 Design of Pile Foundations
- EM 1110-2-3400 Painting: New Construction and Maintenance
- EM 1110-2-3506 Grouting Technology
- EM 1110-2-4300 Instrumentation for Concrete Structures

- EM 1110-2-6053 Engineering and Design - Earthquake Design and Evaluation of Concrete Hydraulic Structures
- EM 1110-2-6054 Inspection, Evaluation and Repair of Hydraulic Steel Structures

Please note that some Engineering Manuals supersede each other, hence care must be used applying requirements of the Engineering Manuals. In addition, engineering judgment is required in the application of these manuals to certain structures. The manuals listed above can be obtained at <http://publications.usace.army.mil/publications/eng-manuals/>