DESIGN AND CONSTRUCTION OF RETAINING DIKES FOR CONTAINMENT OF DREDGED MATERIAL

by

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August 1977
Final Report

Approved For Public Release; Distribution Unlimited

Prepared for Office, Chief of Engineers, U. S. Army
Washington, D. C. 20314

Monitored by Environmental Effects Laboratory
U. S. Army Engineer Waterways Experiment Station
P. O. Box 631, Vicksburg, Miss. 39180

Under Interagency Agreement No. WESRF 74-51
(DMRP Work Unit No. 2C04)
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TO: All Report Recipients

1. The report transmitted herein represents the results of one of the research efforts (work units) initiated to date as part of Task 2C (Containment Areas Operations Research) of the Corps of Engineers Dredged Material Research Program (DMRP). Task 2C is included as part of the Disposal Operations Project of the DMRP which among other considerations includes research into the various ways of improving the efficiency and acceptability of facilities for confining dredged material on land.

2. Confining dredged material on land is a relatively recent disposal alternative to which practically no specific design or construction improvement investigations (much less applied research) have been addressed. Being a form of a waste product disposal, dredged material placement on land has seldom been evaluated on other than purely economic grounds with emphasis nearly always on lowest possible cost. There has been a dramatic increase within the last several years in the amount of land disposal necessitated by confining dredged material classified as polluted. Attention necessarily is directed more and more to the environmental consequences of this disposal alternative and methods for minimizing adverse environmental impacts.

3. DMRP work units are in progress to investigate and improve facility design and construction and to investigate concepts for increasing facility capacities for both economic and environmental protection purposes. However, the total picture would be incomplete without considering methods for improving the performance of containment areas. To this end the investigation reported herein was accomplished by the U. S. Army Engineer District, Savannah, Soils Section. This group was selected because of the excellent theoretical background of the personnel as well as their practical experience with the design and construction of retaining dikes. Input from other Districts and Divisions was also important in reaching the goal of providing a set of usable guidelines. It is felt that the guidelines presented in
this report may be applied to provide a sound engineering basis for the design and construction of retaining dikes.

4. Guidelines and recommendations are presented in this report for the proper investigation, design, and construction of retaining dikes to aid in assuring that these dikes will be constructed with a minimum of problems and will serve their project requirements. Raising of existing dikes is covered as well as construction of new dikes. Recommendations are based on a survey of past Corps of Engineers design and construction practices for retaining dikes and current state-of-the-art design procedures for construction of earth embankments.

JOHN L. CANNON
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# Design and Construction of Retaining Dikes for Containment of Dredged Material

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**Abstract:**
Past experience has indicated a major problem exists in the area of dike construction for dredged material containment areas. Frequent dike failures have been reported along with problems associated with high maintenance requirements. These problems can usually be traced to inadequate design and construction practices compounded by very poor site conditions. Site conditions will continue to be poor, but this in itself indicates the need for more comprehensive planning and design efforts along with improved construction practices.

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20. ABSTRACT (Continued).

This report presents recommendations for proper investigation, design, and construction of retaining dikes to aid in ensuring that these dikes will be constructed with a minimum of problems and will serve their project requirements. Raising of existing dikes is covered as well as construction of new dikes. Recommendations are based on a survey of past Corps of Engineers design and construction practices for retaining dikes and current state-of-the-art design procedures for construction of earth embankments.
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