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Seattle District

Seattle District

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Levee Inspection Program

The Army protects and supports the American people in the event of natural or man-made disasters and emergencies. Army programs provide public works and engineering assistance to protect human life, reduce suffering, and mitigate damage and threats to improved property. Response activities are supplemental to State and local efforts. PL 84-99, Flood Control and Coastal Emergencies describes the authority to provide emergency response and disaster assistance. It authorizes disaster preparedness, advance measures, emergency operations (disaster response and post flood response), rehabilitation of flood control works (FCW) threatened or destroyed by flood, protection or repair of federally authorized shore protection works threatened or destroyed by coastal storm, provision of emergency water due to drought or contaminated sources, emergency dredging, and flood related rescue operations.



As a consequence of the levee failures in New Orleans to Hurricane Katrina, there has been a renewed interest in levee safety. Several initiatives have been pushed forward to categorize, quantify, and evaluate risk for the Nations levee systems. As part of the dam safety program there is a National Inventory of Dams that details all of the dams in the United States. There is currently a high Congressional interest in producing the same type of product for levees on a national scale. This will involve a huge effort on the part of Seattle District to collect the data required to make this effort a success. The Federal Emergency Management Agency (FEMA) also is updating the Flood Insurance Rate Maps (FIRMs) and has tasked the Corps to help with this effort by certifying or re-certifying levees as having 100 year level of protection. The Seattle District has 284 levees in the PL 84-99 program.

Definitions: Levees that the Corps tracks are of several different types and can be placed in one of the following categories:

Completed Works Levees – Levees constructed by the Corps of Engineers in cooperation with a local sponsor and turned over to the sponsor to Operate and Maintain. These levees have a Project Cooperation Agreement between the Corps and the local sponsor that binds the sponsor to maintain the project in accordance with the Operations and Maintenance Manual in perpetuity. Any modifications to the project must be approved by the Corps and any unauthorized changes or deficient maintenance practices and be corrected by the Corps and billed to the sponsor. These levees are inspected under the Inspection of Completed Works program (Appropriation 3123) and repaired under the PL84-99 Rehabilitation and Inspection Program at 100% Federal cost (Appropriation 3125). There are XX completed works levees in Seattle District.

Federal Levees - Levees constructed by the Corps of Engineers and maintained by the Corps of Engineers. These levees are considered Operating Projects and have a budget line in the Presidents budget. The Corps retains a real estate interest in the Projects themselves and actually owns some of the land in fee. They are Operated and Maintained using O&M General funds (Appropriation 3123) and repaired under the same funding if damaged during a flood event. There are 22 federal levees in the Seattle District.

Non-Federal Levees – Levees constructed by non-Federal entities and maintained by non-Federal entities. These levees can be classified into two sub-classes depending on what they protect. Urban levees or Agricultural levees have slightly different levels of protection and rules that apply to each. Local sponsors can elect to have a levee in their jurisdiction included in the PL84-99 Rehabilitation and Inspection Program by requesting an initial inspection. If the levee meets the minimum requirements in ER 500-1-1 it is placed in an active status in the RIP program and will be eligible for rehab if it is damaged in a flood event. If the levee does not meet the minimum requirements it is placed in an inactive state in the RIP program. The Sponsor is notified that the levee is inactive and ineligible for rehabilitation assistance but if the deficiencies are corrected, a new inspection could place the levee in an active state. Inspection and rehabilitation of these levees is done under the Flood Control and Coastal Emergency appropriation 3125. Maintenance costs are a local responsibility (100% local) and rehabilitation costs are shared (80% Federal, 20% local).

National Levee Inventory: The Corps has received \$30 million from Congress in a special appropriation to conduct a national inventory and risk analysis study. Most of the work to date has been conducted by the Corps Corps- Engineering Research and Design Center (ERDC) developing a geodatabase framework that each District can use to input standard data about levees that can be shared across the Corps and easily queried for use by HQ and Congress. The data model that ERDC has come up with is called Spatial Data Standards for Facilities Infrastructure and Environment (SDSFIE). This data model when finalized, will be given to each District to populate. The data and data maintenance will reside with each District, but having a generic standard will help realize the goal of a National database of levee data. Seattle District has already compiled data for approximately 170 non-Federal levees that SDS compliant, however it is missing data fields that have been included in the new SDSFIE model. The data fields required by the new geodatabase will entail much more in depth data gathering than has been done to date for Seattle's existing database. Most of the data will be relatively easy to obtain, but some data will require much more work. The physical attributes of the levees will require field visits to obtain and possibly subsurface exploration work. Questions relating to inundation areas, levels of protection, impacted populations and dollar values associated with a levee failure will require detailed surveys and hydraulic



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modeling. The first step for completion of the levee inventory is a web based survey of Districts for all non-Federal levees that are active in the PL 84-99 program, Federal Levees and completed works levees. The levee survey was completed by NWS on June 30, 2006. There were 37 questions for each levee and Seattle has 271 levees that were input. The first step will be to create a cost estimate for doing the work and a funding request. Five Districts are currently compiling data and standing up their geodatabase. Funding should soon be available for Seattle to begin this work as well. The work must be coordinated with in-house labor and if the workload is too high for Seattle staff to execute the work, contracts will have to be let to facilitate this effort. Whether or not the work is done in-house may have some affect on the cost estimate depending on the bids received. The most likely scenario will be that the work will be completed using a mix of in-house and contracted labor.

FEMA Levee Certification: The map modernization program is an effort by FEMA to update the FIRM maps for the entire country. The effort is extensive, costly and is going slowly. The Corps has been asked by FEMA to assist in this work by re-certifying levees that we have previously certified. There are very few levees in the District that have been certified, so the remaining 15 Federal levees and approximately 12 Non-Federal levees will need to be certified. FEMA may task us to do certifications for any number of non-federal levees that the FIRM maps currently show as holding back the 100 year flood. This will require much more work and will need to be funded by FEMA and staffed appropriately at the District. Currently, if a levee has failed to meet the minimum requirements of the PL84-99 program, it will not be considered for certification under the FEMA program.

Inspection of Completed Works Levee Inspection Program: The failure of the flood walls in New Orleans has created a desire at the Corps to quantify how many miles of i-wall we have in the Completed Works Program and the risks associated with those walls failing during a flood event. The normal inspection of all of the projects in the Inspection of Completed Works Program is to determine the local sponsors compliance with the Project Cooperation Agreement (PCA) and Operation and Management manual. This is done by meeting with the locals and conducting a visual inspection of the project each year. Items such as the condition of pumping plants, concrete headwalls, rip-rap, and flap gates are typical features that are evaluated. Readiness of the project to perform during an emergency and the readiness of the staff that will respond are also considerations for evaluating the projects status. I-wall inspections are done using only visual means. The condition of the seals and whether there is excessive spalling of the concrete are things that can be evaluated under the annual inspection. There is currently a request that all i-walls in the country undergo extensive evaluation to determine risks of failure. Seattle District has four projects that have been identified for evaluation based on the Interagency Performance Evaluation Task Force's report. The Phase II evaluations are almost complete and a report will be forwarded to the Corps' Northwestern Division shortly. The walls in Seattle District are not problematic and do not currently pose a threat of failure under the current evaluation program.

Non-Federal Levee Inspection Program: Seattle District has the vast majority of levees under the non-Federal program. The inspection program coordinates with local sponsors to determine whether the levees meet the minimum requirements under Engineer Regulation (ER) 500-1-1. The program is voluntary and if a sponsor chooses not to do the maintenance to bring the levee in to compliance with the ER than the levee is placed in an inactive state and will be ineligible for assistance if the levee is damaged in a flood event. The minimum requirements detailed in the ER are not stringent. If a levee fails to meet the requirements for the non-Federal program, then the levee will not be able to be certified in the FEMA flood insurance program since the standards for that program are much higher. Seattle District is working directly with FEMA to cross check levees in each program to insure inactive levees in the PL 84-99 program are not considered certified in the FEMA flood insurance program. The history of non-federal levee inspections has been captured in the geographic information systems (GIS) levee database and is currently available to the Seattle District. Work is under way to expand this effort and make a portion of the data available on the web to local sponsors and emergency response organizations.

For more information: Charles Ifft or Doug Weber, Seattle District, U.S. Army Corps of Engineers, (206) 764-3406.

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