



**US Army Corps  
of Engineers®**  
Engineer Research and  
Development Center

# Flood Fighting Products Research Facility

## Description

A wave research basin at the ERDC Coastal and Hydraulics Laboratory has been modified specifically for testing of temporary, barrier-type, flood fighting products. Modifications to the wave basin were sponsored by GI R&D through the Technologies and Operational Innovations for Urban Watershed Networks (TOWNS) Program. Modifications include construction of wing walls to which the flood fighting structures will be attached, installation of an 8-ft diameter sump with pumps and flow meters for measuring seepage rates and recirculating water during overtopping tests, and development of a cable towing system for debris impact studies.



*Flood Fighting Products Research Facility looking across the wave machine guide vanes towards the testing area.*

## Specifications

The research facility, located in building 6006, consists of a 100-ft wide by 150-ft-long basin with 4-ft high walls. At one end of the facility are three electric-driven piston-type wave generators, each driving a 25-ft wide wave paddle. The three wave generators are synchronized so that they all run together as a 75-ft wide generator. Guide vanes contain the wave train for the first 40 ft in front of the wave generators. The generators are computer controlled and capable of producing monochromatic or spectral wave fields. Two wing walls, 30 ft apart, are centered at the end of the basin away from the wave generators. The wing walls are each 30 ft long then turn towards the sides of the basin for 10 ft. Between the wing walls is an 8-ft diam by 8-ft deep sump. The sump is equipped with two 4-in diam pipes with float-controlled submersible pumps and flow meters, and also two external diesel-powered pumps with 15-in diam intakes and 12-in diam outfalls.

During testing of a flood-fighting product, seepage through the structure will be collected in the sump and pumped back into the basin via the sump pumps and 4-in diam pipes. The diesel pumps are used during the overtopping tests to return the water to the basin.

Seepage rates through the test structures are measured by the flow meters in the 4-in diam pipes and also by a laser pointing at a float in a standpipe in the sump measuring changes in water surface elevation. Several capacitance-type wave gauges measure the changes in water surface elevation within the basin to determine the incident wave fields. Eight lasers record any movement of the structure during testing.

A cable take-up reel has been modified to tow a log into the structure at a calibrated 5 mph for a debris impact test. The log trips a wire set a few inches in front of the test structure which turns off the drive motor on the take-up reel prior to impact.

Two webcams with 360-degree pan and telephoto zoom capabilities are used to record construction, testing, and disassembly of each product. The webcams may also be used to broadcast so that the tests may be viewed in real time by anyone with web access.

## Benefits

The Flood Fighting Structures Research Basin allows for the prototype-scale testing of flood fighting products under controlled and consistent testing environment. All products may be tested at the same static head, subjected to the same wave climate, overtopped at the same rate, and struck by a consistent impact load. The research basin allows real-world loads and conditions to be reproduced in a consistent manner to insure fair and equitable testing of different products.

## Application

The Flood Fighting Research Basin is currently being used to test commercial flood fighting products designed for expeditious rising of levees by means of temporary structures. Use of the basin for testing of other classes of food-fighting products is planned for the near future.

## Point of Contact

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