

Development of the practical sand pack work method

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1. Definition of the sand pack work method

The sand pack work method is filling large cloth bags made of civil engineering use fibers with sand, which is field test ocean beach material and beach nourishment material. Research on this method began in response to a growing public demand for easily removable structures to replace concrete structures and for the reduction of overall project costs. To be used as a method to replace various kinds of shoreline structures, problems related to structural stability, workability, and durability must be solved.

This research has been carried out since the autumn of 2010 jointly by three private sector civil-engineering use fiber material makers, as “Research on technologies to evaluate the performance of sand-bag filling work for shoreline conservation.”

2. Efforts to realize the method

As shown in Figure 1, shorelines where the external force (waves, weather) differ were selected as the sites for field tests and exposure tests, while stability and material properties were tested in a laboratory. Figure 2 shows the locations of the shorelines where the exposure tests and execution tests were performed.

Beginning in the middle of March in 2012, on the Sumiyoshi Shoreline in Miyazaki Prefecture, sand packs were placed and tested as a supplementary

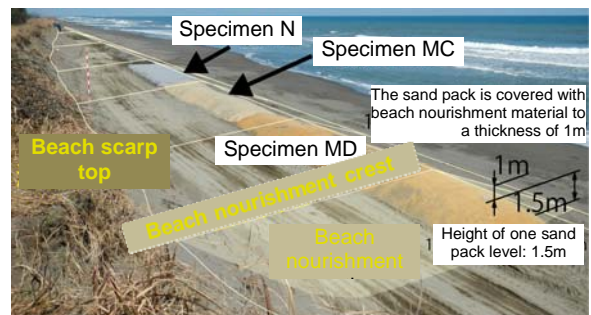


Photo 1. Sand Pack Field Experiment on the Sumiyoshi Shoreline

method to lower the loss of beach nourishment materials as shown in Photo 1 and then the site was monitored for one year, confirming its effectiveness and stability under rough waves. As a result of installing sand packs on the sandy ground in this way, the ground was deformed by localized erosion of the ground surface. Figure 3 shows the test performed to investigate the tensile force acting during deformation. Through these efforts, the practical application stage has been reached. We wish to systematize and provide the results in usable form as the Sand Pack Work Method Handbook (Draft). Information about this research is available on the web site of the Coast Division (<http://www.nilim.go.jp/lab/fcg/>).

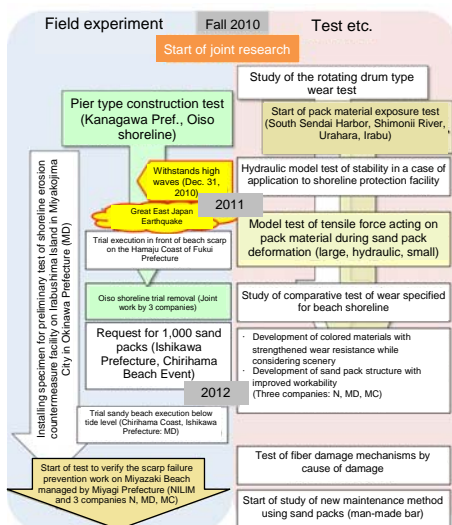


Figure 1. Chronology of the Course of the Research

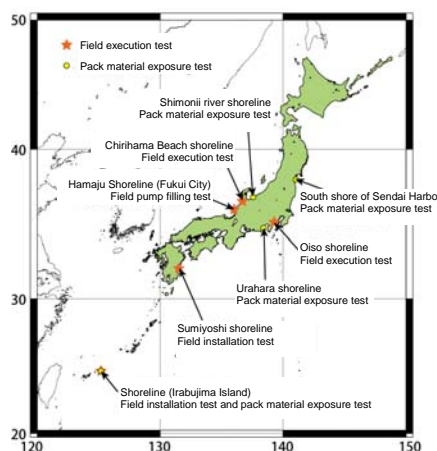


Figure 2. Shorelines where Pack Material Exposure Tests and Field Tests were Performed

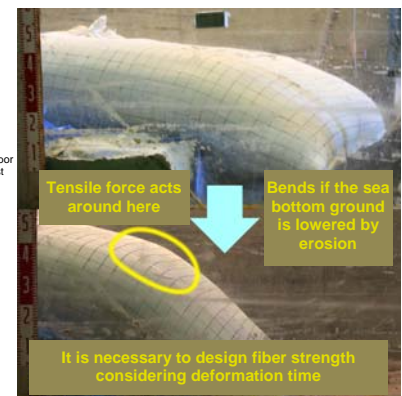


Figure 3. Model Test of Tensile Force Acting During Deformation Caused by Erosion