

A Case of Utilizing Results

Technical support in relation to resilient structures of coastal dikes

SUWA Yoshio, Head

KATO Fuminori, Senior Researcher

HATOGAI Satoshi, Researcher

Coast Division, River Department

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1. Introduction

In a 'Basic concept in relation to restoration of coastal dikes, etc. suffered from the 2011 off the Pacific coast of Tohoku Earthquake and tsunami,'⁽²⁾ which was compiled based on a view of 'Structures which can produce resilient effect of facilities even in case of exceeding the designed height of tsunami' presented in a report of Expert Examination Committee of Central Disaster Prevention Council⁽¹⁾, prevention of scour by back bottom slope protection works and prevention of washout by securing member thickness of back slope covering works, etc. were pointed out as structural devices of coastal dikes, etc. In order to reflect such structural devices in restoration after disaster, etc., River Department of NILIM conducted a technological study in cooperation with Coast Division of Water and Disaster Management Bureau and Tohoku Regional Bureau.

2. Scope of the study

Focusing on the scour of back bottom slope of coastal dikes with a general form of trapezoid cross section and the stability of back slope protection works, devices for improvements of scour resistance and stability were examined by hydraulic model experiments, etc.

3. An example of resilient structures

Main points to note among the devices confirmed by the hydraulic model experiments are shown in the table.

Table: Main points to note about structural devices

It is important to completely change the flow direction of overflow flowing down the back slope not to run into the foundation (securing the flat ground of back bottom slope) in order to keep the scour of back bottom slope away from the main body of the dike. → To lay down the soil stabilization as well as the foundation work and secure the flat ground of back bottom slope as shown in the Table.
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It is important to avoid unevenness because the unevenness increases the active surface of hydrodynamic force and the degree of destabilization if unevenness occurs in back slope covering works. → To form a structure difficult to produce unevenness against water flow by fitting together cutout blocks.
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It is important to form a structure in consideration of negative pressure produced at back slopes. → To integrate slope blocks and armoring work on crown so that one unit of block does not cover the negative pressure range.

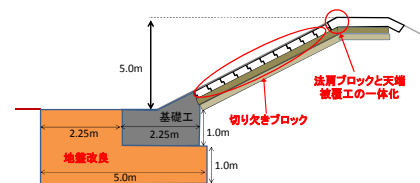


Figure: An example of resilient structures (dimensions are local equivalent value)

4. Conclusion

The results of this study were published in NILIM Technical Flash⁽³⁾ in May and August, 2012 and they were reflected in the disaster restoration works in South coast of Sendai Bay (partial completion scheduled at the end of March, 2013)



Photo: Laying works of cutout blocks

References

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