

# The Sand Trapping Trench As A Countermeasure to Control Wind-Blown Sand on Beaches

Shintaro Hotta<sup>1</sup> Katsumori Hatanaka<sup>1</sup>,  
Hiroyoshi Tanaka<sup>2</sup> and Kiyoshi Horikawa<sup>3</sup>

## Abstract

The sand trapping trench for controlling wind-blown sand is proposed and general functioning, evaluation of sand trapping efficiency, process of trench development, and usage methods are described.

## 1 Introduction

One of the important problems in the beach stabilization and the effective utilization of beaches is how to control wind-blown sand. Different types of countermeasures are employed in different parts of the world depending on the local conditions at the beach, such as weather, sea, and geographical conditions as well as the economical importance of the region. At the latest ICCE (25th), Hotta and Horikawa (1996) proposed a new type of prevention work, a sand trapping trench, for controlling wind-blown sand. The trench is given a rectangular shape with a depth of more than 1 m and a width of around 5 or 6 m by excavating the backshore of the beach (see Fig. 1). However, the details of trench could not be described in the paper since the main focus of the paper was not to discuss the trench itself. The purpose of this paper is to report the design and use of the trench in more detail.

## 2 Procedure

### **2.1 Background and Process of Trench Development**

The idea of a sand trapping trench for controlling wind-blown sand stems from the results of several previous studies.

Inspiration to the trench came from an early paper that described a case where cultivated land close to a sandy beach was protected from wind-blown sand by excavating a stream upwind the beach, letting sand grains fall into the stream, and then returning the sand to the sea (Iwagaki, 1950).

Considering this case, Horikawa et al. (1983, 1984) tried to measure the sand transport rate in the field by using trenches those were 1 m deep and several meters wide. Figure 2 shows examples of the sand accumulation process in the

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<sup>1</sup>Dept. of Const. Eng., Nihon Univ., 7-24-1, Narashino-dai, Funabashi,  
Chiba 274-8501, Japan

<sup>2</sup>Central Research Institute of Electric Power Industry, Abiko, Chiba, Japan

<sup>3</sup>Musashi Institute of Technology, Tokyo, Japan