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## Overview

This damage assessment report is the product of a field investigation undertaken in September 2007 after the  $M_w$  8.0 August 15, 2007 Pisco, Perú earthquake. It provides a brief description of the event and the consequential damage to the highway system. It relies on government reports issued immediately after the event that include investigations from leaders in Perú's academia, and the authors' field observations. The purpose of the report is to document the performance of structures designed according to AASHTO specifications and to help assess the adequacy of the standards used at the time of construction. Another important benefit of the task is the exchange of information for the mutual benefit of engineers and policy makers here in the U.S. and in Perú.

Although there was widespread destruction of buildings in the Ica region of Perú, damage to the highway system was less severe. Traffic on the Pan-American Highway, which is the backbone of the highway system, was interrupted at numerous points but most repairs were made within a few weeks. The one exception was the Huamani Bridge, which was still closed for repair six weeks after the earthquake.

Highway infrastructure suffered some damage from shaking, but most damage resulted from earthquake induced liquefaction, which was accentuated by the earthquake's unusually long duration (>170 seconds). Liquefaction likely caused one major slope failure on the Pan-American Highway that led to 75 mm (3") wide shear cracks in a three-cell concrete box culvert. It also caused some parts of the roadway to shift laterally and the pavement to be broken up and faulted. It most likely precipitated damage to one abutment of the Huamani Bridge that was observed. This five-span bridge also had shear cracking of piers and a 100 mm (4") lateral movement of the superstructure.

There were 15 significant rockfalls that blocked roads, but most travel ways were opened again by the time of the field investigation. There were at least two instances of failed retaining walls observed by the team. At least two large bridges were hit by falling boulders, causing serious damage.

Although this report is produced in English, it contains a translation of technical terms so that it is more useful to a Spanish speaker. It also contains a set of suggestions from the authors on how to manage Perú's highway infrastructure for better performance in the future.

Both U.S. Customary (English) and SI (metric) units are used in this report. Perú uses SI units, but U.S. readers of this report may be more comfortable with English units. All dimensions noted from field observations should be considered to be approximate.

The photographs herein were taken by Jerome O'Connor unless otherwise noted.