

EARTHQUAKE ENGINEERING RESEARCH AT THE PAPUA AND NEW GUINEA INSTITUTE OF HIGHER TECHNICAL EDUCATION

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1. Introduction

The Papua and New Guinea Institute of Higher Technical Education enrolled its first students in 1967 and moved to Lae at the beginning of 1968. An active building programme is underway.

At the suggestion of Professor J.H. Lavery, University of Queensland, the first project undertaken by the writer on taking up his appointment in February 1968 was research on earthquake engineering problems. Two accelerographs were purchased from New Zealand and installed on the campus in November, 1968.

2. Projects

Analysis of Accelerograms

A computer programme has been written for the I.B.M. 1130 computer in Port Moresby. Starting with a digitized accelerogram the programme operates in three stages:

- (a) integration of accelerogram to obtain velocity and displacement as a function of time.
- (b) For a given period and damping to calculate the response of a simple oscillator (relative velocity and displacement and absolute acceleration as a function of time).
- (c) For five values of damping and 24 periods to calculate the relative displacement response spectra for a simple oscillator.

At stage (a) a choice of baseline corrections may be made, either no correction or

- a parabolic baseline correction assuming zero initial velocity (used at Caltech),

or - a parabolic baseline correction using a calculated initial velocity

(described in a paper "A Note on the Integration of Accelerograms" to be published in the Bulletin of the Seismological Society of America)
Response of Water Tower

The two accelerographs have been installed at a simple steel water tower (30 ft. high) on campus. One at the base records ground accelerations and one on the platform records structure accelerations. The absolute acceleration calculated by part (b) of the programme is being compared with the structure acceleration. It is proposed also to install strain gauges on the tower legs and record dynamic strains during an earthquake.

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