

SOMCHAI SOONTORNVEERA : RESPONSE OF BUILDINGS TO EARTHQUAKES IN BANGKOK METROPOLITAN AREA. THESIS ADVISOR : PROF.THAKSIN THEPCHATRI, Ph.D., 104 pp. ISBN 974-579-591-7

The research presents a comparison study of the response of buildings to earthquake in Bangkok Metropolitan area. Two theories, statics and dynamics were employed to obtain the structural response. Direct Integration method, Response Spectrum method and Equivalent Static Force method were used in this research. By Direct Intergration method : earthquake data was simulated by using maximum earthquake intensity data recorded by Meteorological Department during 1912 - 1989 in Bangkok Metropolitan area. The maximum earthquake accleration was $0.058g \text{ m/s}^2$. By Response Spectrum method : response spectrum data was obtained by using real earthquake data which affects Bangkok Metropolitan area.

In analysing the results, a dynamic plane frame analysis program was written for microcomputer in order to expedite the analysis. The method of subspace iteration was employed to obtain mode shapes and periods of structures in solving the eigenproblem. The structural responses were calculated using response spectrum method by Square Root Sum Square.

It has been shown that the program in this research can give satisfactory results. Horizontal deflections and internal forces obtained have discrepanay about 0.30 - 7.89 percent compare with those obtained from program ETABS in 2 dimension.

It was found that for a 7, 15 story reinforced concrete building the structural responses calculated by Equivalent Static Force method in UBC code with Zone 1 yielded conservative results compared to those calculated by Response Spectrum method.