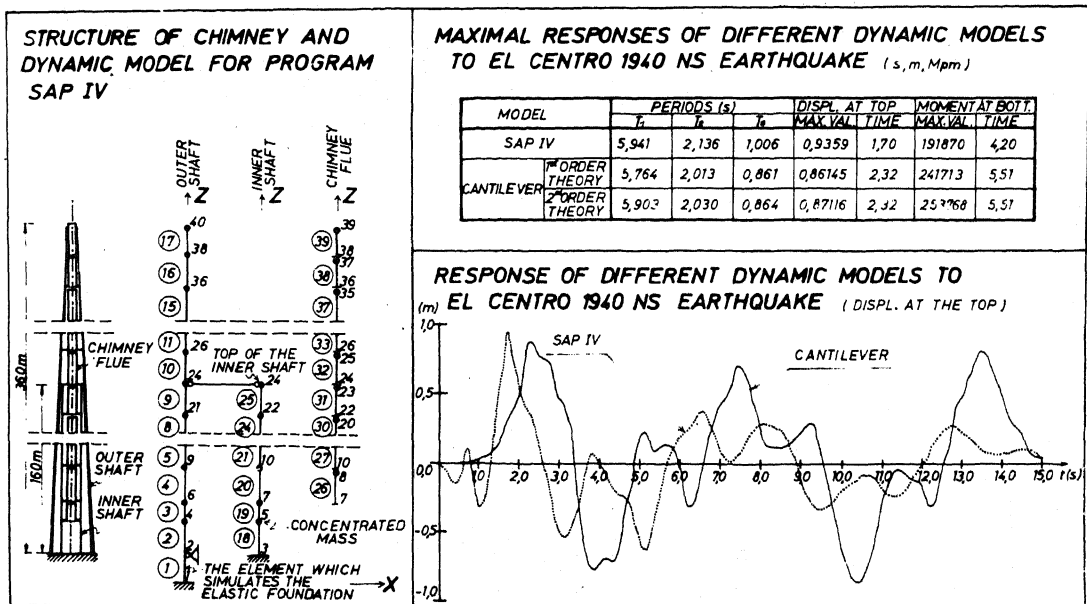


EARTHQUAKE RESPONSE ANALYSIS OF A 360 M HIGH CHIMNEY

by
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Some results of the earthquake response analysis of a 360 m high concrete chimney are presented. The chimney is situated in a region, where moderate earthquakes and strong winds are expected, therefore an elastic analysis was performed. The structure was first idealized as a simple cantilever beam (16 degrees of freedom, 6 modes) and then a more exact model (115 degrees of freedom, 15 modes) was used. There were considered 4 per cent of critical damping in all modes. The chimney response to the El Centro and Port Hueneme earthquakes was studied and compared with the results obtained according to the Yugoslav code (response spectrum method). The code is for flexible structures conservative and it gives considerably higher response than adequately reduced El Centro earthquake. The response to the short ground motion (Port Hueneme earthquake) is not decisive. Lower-mode periods and maximum displacements obtained for both models are in good agreement, while a noticeable discrepancy was found between internal forces, where the higher-mode contributions are more important. Internal forces in the inner shaft and in the chimney flue can not be determined using the simple cantilever beam model. The effect of gravity loads and soil-structure interaction (foundation on the rock) are not significant.



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