17th Symposium on Earthquake Engineering
November 14-17, 2022
IIT Roorkee, India
Paper No. 345

Assessment Of Proxy-Based V_{s30} Estimation in Roorkee, Uttarakhand

Mudit Srivastava[1], M L Sharma[2]

[1]Research Scholar, Dept. of Earthquake Engineering, IIT Roorkee
[2]Professor, Dept. of Earthquake Engineering, IIT Roorkee

Abstract

A well-liked measure for site characterization and classification is the averaged seismic shear-wave velocity with time for the top 30 meters below the surface, abbreviated $V_{s,30}$. It is associated with material property and thus has a strong influence on ground motions. $V_{s,30}$ is an important aspect of earthquake site effects and a crucial element for Ground Response Analyses (GRA) and localized site-specific effects. To examine shear wave velocity (V_s), Standard Penetration Test and Cone Penetration Test are a few in-situ field tests in practice. Additionally, there are surface wave techniques like Continuous Surface Wave Systems, Multi-channel Analysis of Surface Waves test and Spectral Analysis of Surface Waves test (SASW), etc. that provide a non-intrusive, non-invasive, economical, and expedient way to conduct site investigations. Complex geomorphology, geology, and lack of in-situ measurements emphasize establishing a more suitable approach for $V_{s,30}$ based site-classification. To deal with such issues, various proxy-based techniques have been proposed, such as topography slope, surface geology, and terrain-based approach. Among the three proxy-based approaches, the topography slope method is gaining importance for preparing site condition maps for seismic damage assessments. The goal of the current study is to carry out an MASW test at various locations, enumerate the shear wave velocity profile at each location, and compare those results to those from the proxy-based $V_{s,30}$ estimation. Both MASW and Proxy based $V_{s,30}$ estimations have emerged as an important tools. This paper presents important aspects of both techniques and their reliability for future site investigations and effectiveness in geotechnical seismic site characterization.

Keywords: V_{s30}, MASW, Slope-proxy, Site characterization