

# Local Site Effects and Ground Classification at Muscat City – Sultanate of Oman

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This paper presents the results of local site effects and ground classification as a tool for earthquake disaster mitigation of Muscat city. It is well known that, ground shaking and associated damage to engineering structures can be strongly influenced by local geological and topographical conditions. Softer alluvial soils generating surface waves propagate through the alluvium causing a large amplification or stronger shaking. Surface geology of Muscat area is dominated by oceanic crust Ophiolite and Sedimentary rocks mostly (limestone and alluvial deposits). Microtremor Array Observation -Spatial Autocorrelation(SPAC)- method was conducted at several sedimentary sites and close to the available boreholes namely in Mutrah, Witaya, Al-khoir\_Gobra, Boshier, Ghala, Mualeh and Sultan Qaboos University(SQU) to determine the underground shear wave ( $V_s$ ) velocity structure based on short period microtremor. SPAC results show that the first 30m depth consists of mostly stiff to hard/rock sediments where  $AVS_{30m}$  between (400m/sec to 800m/sec). This result is coincidence with other results from boreholes and public works cross-sections data available at each site. (NEHRP, 2005) based on  $AVS_{30m}$  defines two site classes predominate in the sediments area which should have attention for designing ground motion or Seismic Hazard Assessment, those are class (C) has very dense soil and soft rock with  $AVS_{30}$  ( $360 \text{ m/s} < V_s > 760 \text{ m/s}$ ) and class (B) is rock where ( $760 \text{ m/s} < V_s > 1500 \text{ m/s}$ ).

keyword : Microtremor, Site effect, Seismic Hazard