

E-11) – (REPORT IV) PRELIMINARY REPORT CONCERNING WITH THE SEISMIC MICROZONATION STUDIES IN THE HOLY CITY MAKKAH

Medvedev, 1961 used the product of the velocity of the longitudinal wave (V_p) and density (ρ) of the material, the impedance as a basis for estimating the relative difference in intensity, also rendered by the water content of the ground.

He determined that,

$$\eta = 1,67. [\log (V_s. \rho_s) - \log (V_n. \rho_n)] + e^{-0.04 h^2}$$

where “ η ” is the increase in intensity on the “GEOFIAN” scale, for ground with characteristics ρ_n and V_n , with respect to standard ground (granite), with characteristics V_s (5600 mps), and ρ_s (2,9 gr/cm³), and “ η ” equals depth of ground water level.

Increase in seismic intensity from the ground at the Holy City Makkah is about 2.

The increase in intensity “ η ” is given small unity, However , the recent earthquake results have shown that one unite increase in intensity associated with 20 times increase in structural damage.

For this reason, the microzonation map pf the Holy City Makkah shall be prepared immediately.

Since some historic and receent earthquakes have been recorded within the investigated area, preparation of the dynamic properties of the soil under the Al-Haram Ash-Sharif shall also be made.

Merghelani, 1979, suggested that some of the transform faults that may be capable of producing earthquakes large enough to cause damage in the heavily populated area.