



Sediments quality and its relationship with the distribution of damage in the earthquake; a case study The 26 December 2003 Bam area, SE Iran

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Abstract:

The physical properties of the soil and subsurface sediment units were related to the damage observed in the Bam area, southeast Iran, after the earthquake of 26 December 2003 ($M_s = 6.6$). Properties, such as mean grain-size distribution, sorting, geo-electric resistivity and P and S wave velocities, were measured in order to classify characterize the soil and subsurface sediments for urban planning and to correlate their mechanical behavior with the damage observed, which increased in severity from west to east across Bam. We investigated: the vertical and horizontal gradient in mean grain size, clay mineralogy by XRD, sediment texture, sedimentary structures, rock types by XRF and thin sections and depositional environments and finally, We prepared two cross sections in S-N and W-E directions and a 3D block diagram to visualize the subsurface sediment architecture and compare this to the destruction map of Bam city. All maps are prepared in GIS environment. Based on our studies the paleo environment in Bam area is braided river. The clay minerals have resulted from weathering of continental environments in upstream. Rock samples are from various volcanism stages in Eocene magmatism. According to our observations, a great number of recently constructed buildings were also damaged in city areas far from the faulted zones. These

are areas where silty and clayey soils dominate, exhibiting very low electric resistivity and low wave velocity, together with high thickness, plasticity and compressibility.

Key Words: Bam, Sediment, Earthquake, Site effect.