SHEAR WAVE VELOCITY DEPOSIT ZONATION IN CITY OF BABOLSAR

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The experience of large earthquakes in recent decades such as Mexico city (1985), Manjil, Iran(1990), Loma Prieta, USA (1989), Bam, Iran (2003) indicate the importance of site effects. Based on these observations, it could be shown that the seismic response of the ground surface and volume failures is affected by not only the characteristics of the source and distance from the fault, but also by mechanical and geometrical characteristics of the layers.

In this study, based on the results of standard penetration test (SPT) from geotechnical tests carried out for typical sites of Babolsar city, the zonation map was presented. The Location of the boreholes are shown on Figure 1.

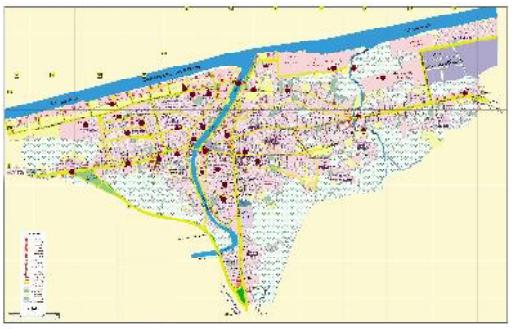

Figure 1. The logs locations

While it is preferable to determine shear wave velocity directly from field tests, it is often not economically feasible to make V_s measurements at all locations and to determine shear wave velocity directly from field tests, so, the relation between V_s and penetration resistance could be useful. Many studies have been done to find the correlation between shear wave velocity and the uncorrected SPT-N values. Table 1 shows the results of some of these studies.

Table 1. Some existing correlation presenting V_s as a function of SPT blow count, N

Author	All soils	sand	silt	clay
Seed & Idriss (1981)	$Vs=61.4N^{0.5}$			
Jafari et al. (1997)	$Vs=22N^{0.85}$			
Jafari et al. (2002)			$Vs=22N^{0.77}$	$Vs=27N^{0.73}$
Dikmen (2009)	$Vs=58N^{0.39}$	$Vs=73N^{0.33}$	$Vs=60N^{0.36}$	$Vs=44N^{0.48}$
Hasancebi and Ulusay (2006)	$Vs=104.79(N_{60})^{0.26}$	$Vs=131(N_{60})^{0.205}$		$Vs=107.63(N_{60})^{0.237}$

In the present study, by fitting a curve from the results of several down hole geotechnical tests and based on N (SPT),

empirical correlation between V_s, N(SPT) and Z(depth) was generated for the site (equation 1):

$$V_s = 130N^{0.068}Z^{0.227} \quad (1)$$

In many cases, V_s data does not extend to a depth of 30 m. In these cases, extrapolation of shallow velocity data have been done to estimate the V_{s30}, using Boore (2004) proposed relation (equation 2)

$$IogV_{s30} = a + b.IogV_{sd} \quad (2)$$

The results of the zonation map are shown in Figure 2.

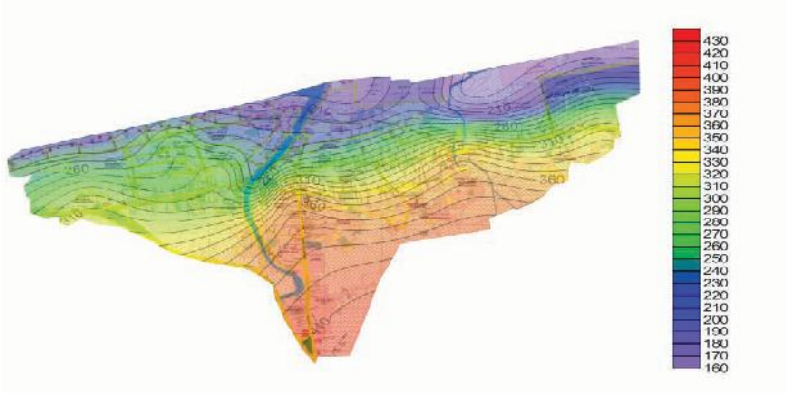

Figure 2. Shear wave velocity zonation map of Babolsar

The results of this study could be used for seismic study of structures in the site of interest and also, practical application for engineering purposes.

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