Two basic parameters are needed to evaluate liquefaction analyses. While one of these parameters is the level of cyclic loads formed in the soil by the earthquake, the other is the liquefaction resistance of the soil. The objectives of the present study are: 1) to determine the levels of cyclic loads using shear wave velocity, soil and earthquake parameters; 2) to determine the shear resistance ratio which depends on the shear wave velocity and the magnitude of the earthquake event; 3) to present a liquefaction analysis method derived from the shear resistance ratio, the cyclic stress ratio and the thickness of the soil. The proposed method was examined by using in situ measurements of soils ranging from fine sands to sandy gravel and also soil containing layers of silt clay. This study is based on 315 case history data gathered from 22 earthquakes. In addition, these data were examined using another liquefaction analysis method and the results were compared with the proposed method. The proposed method was applied to 315 data collected from liquefied or non-liquefied regions. This method determined the liquefaction potential of 118 data collected from liquefied regions with 100% reliability. Additionally, the method correctly predicted the non-liquefaction conditions of 197 data from non-liquefied regions with 66% reliability. In order to increase the reliability of this method, additional region work for either liquefied or non-liquefied soil types is required, using denser soils (Vsc > 250 m/s) subject to more powerful ground movement (amax > 0.48 g), especially in deeper deposits (z > 15 m).