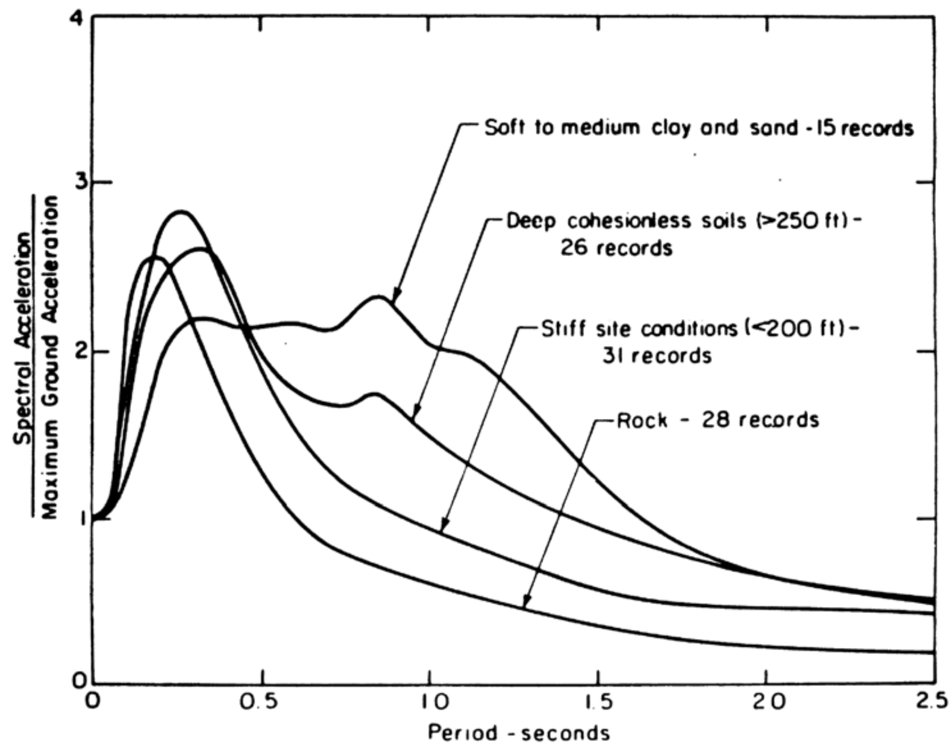


Figure 1. Effects of near surface soil conditions on 5% damped response spectral shapes (source: Seed, Ugas, and Lysmor, 1976).

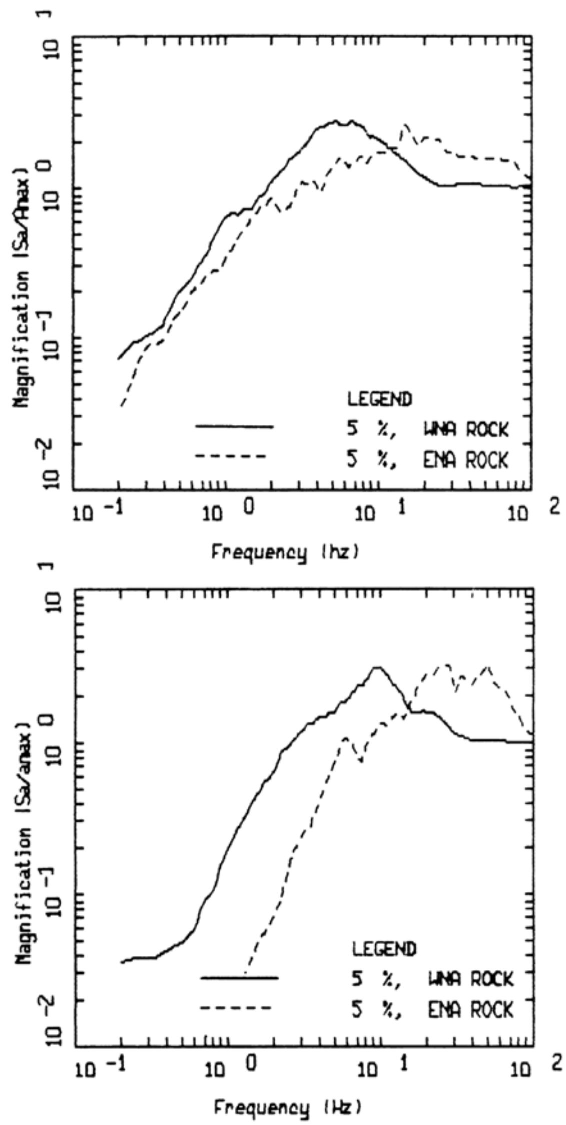


Figure 2. Effects of hard and soft rock site conditions and magnitude on 5% damped response spectral shapes for earthquakes with **M** ≈ 6.5 (upper) and **M** ≈ 4.5 (lower) (source: Silva and Darragh, 1995).

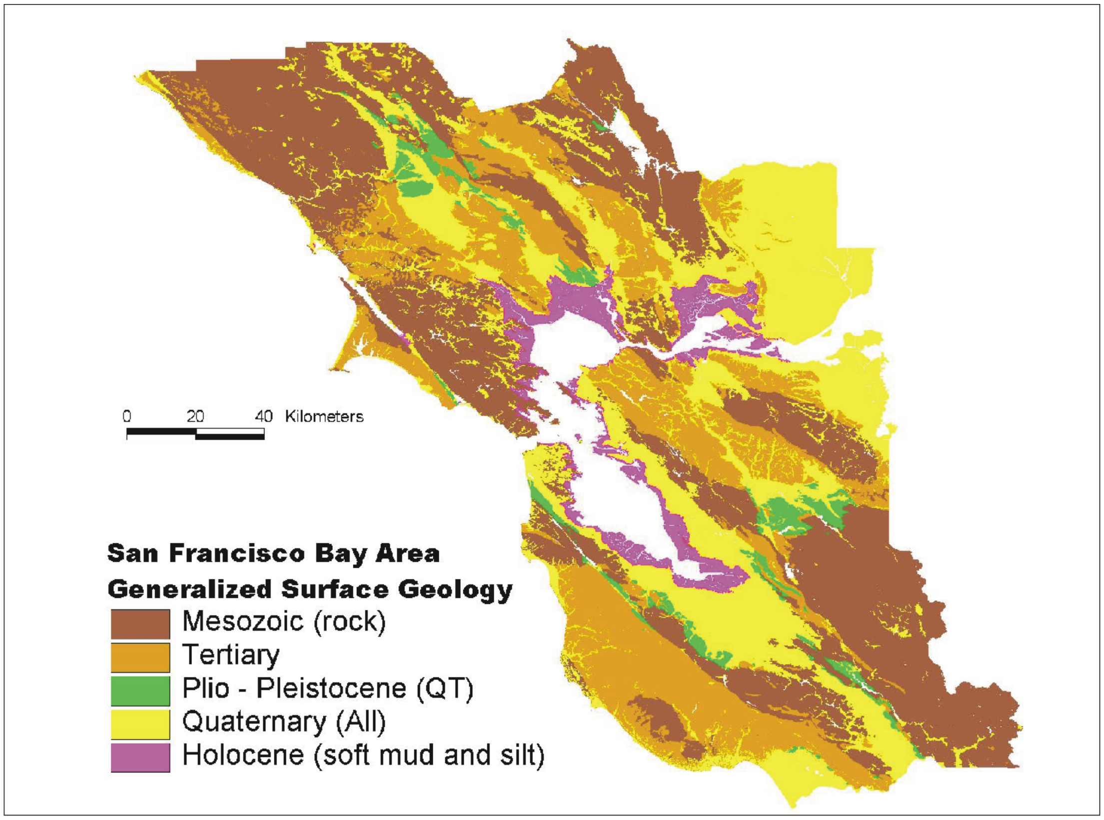


Figure 3. Mapped surface geology for the San Francisco Bay Area showing categories Bay Mud (Q_m) Quaternary Alluvium (Q_{al} + Q_{oa}), Quaternary/Tertiary (Q_{TS}), Tertiary Bedrock (T_S), and Franciscan (K_{jf}) (source: Wentworth (1997)).

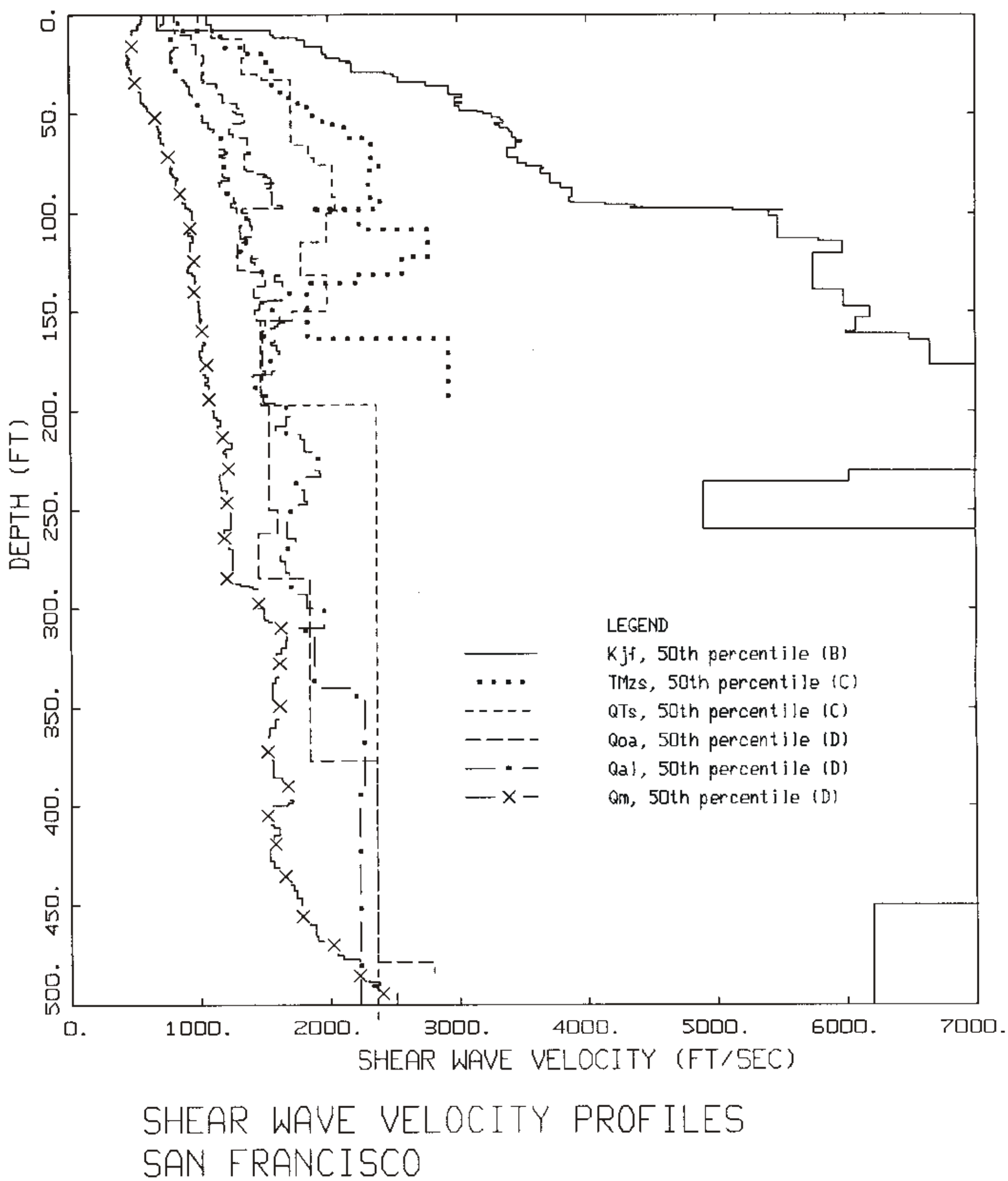


Figure 4. Surface geology based shear-wave velocity profiles for the San Francisco Bay area. Profiles are median estimates based on borehole measurements. Corresponding NEHRP categories are shown (Table 1).

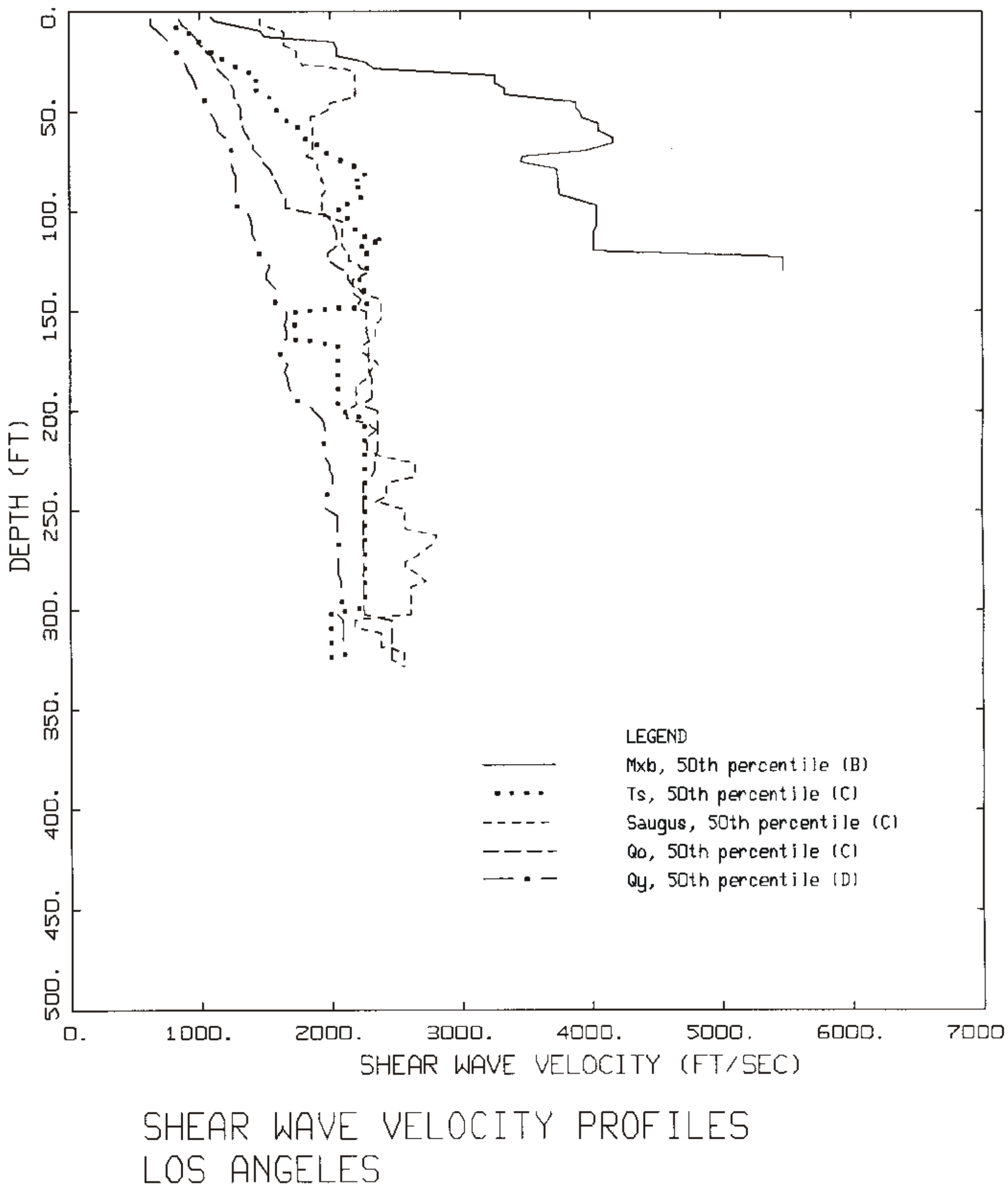


Figure 5. Surface geology based shear-wave velocity profiles for the Los Angeles area. Profiles are median estimates based on borehole measurements. Corresponding NEHRP categories are shown (Table 1).

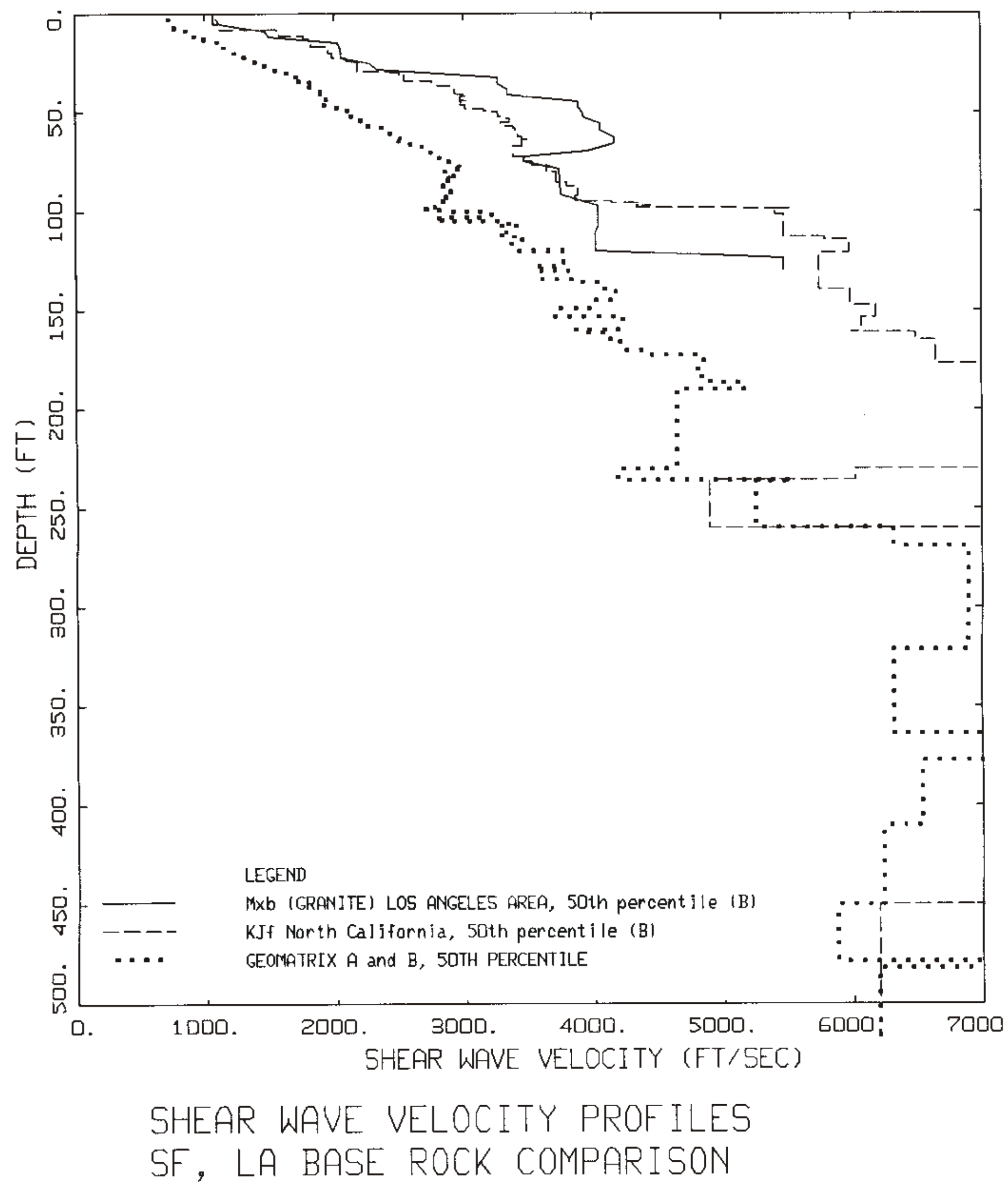
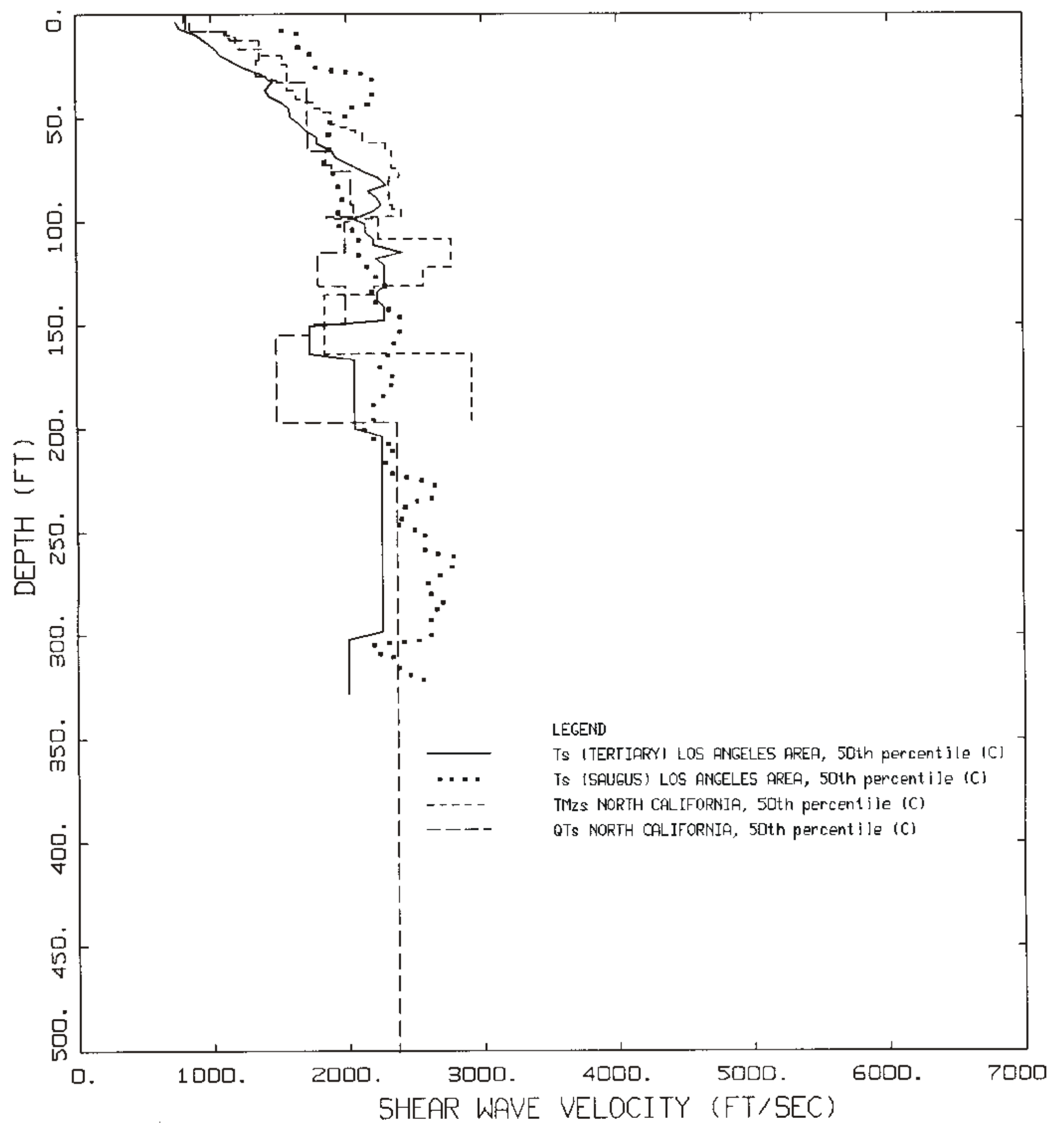
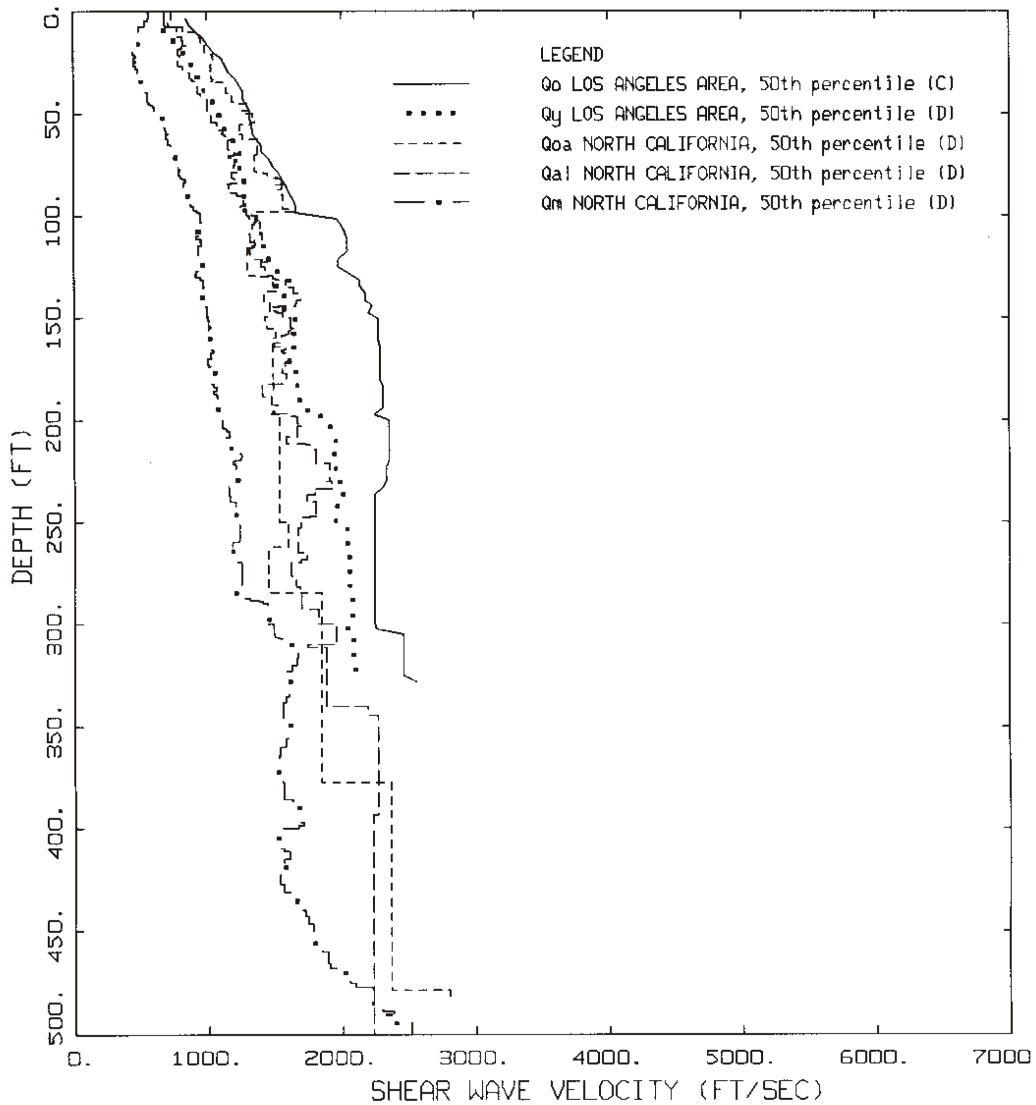


Figure 6. Comparison of median baserock shear-wave velocity profiles for San Francisco (Figure 4) and Los Angeles (Figure 5) areas. Dotted line is median profile for Geomatrix Category A and B, generally reflecting soft rock site conditions for California based empirical attenuation relations (Silva et al., 1997).



SHEAR WAVE VELOCITY PROFILES
SF, LA TERTIARY COMPARISON

Figure 7. Comparison of median Tertiary shear-wave velocity profiles for San Francisco (Figure 4) and Los Angeles (Figure 5) areas.



SHEAR WAVE VELOCITY PROFILES
SF, LA ALLUVIUM COMPARISON

Figure 8. Comparison of median Alluvium shear-wave velocity profiles for San Francisco (Figure 4) and Los Angeles (Figure 5) areas.

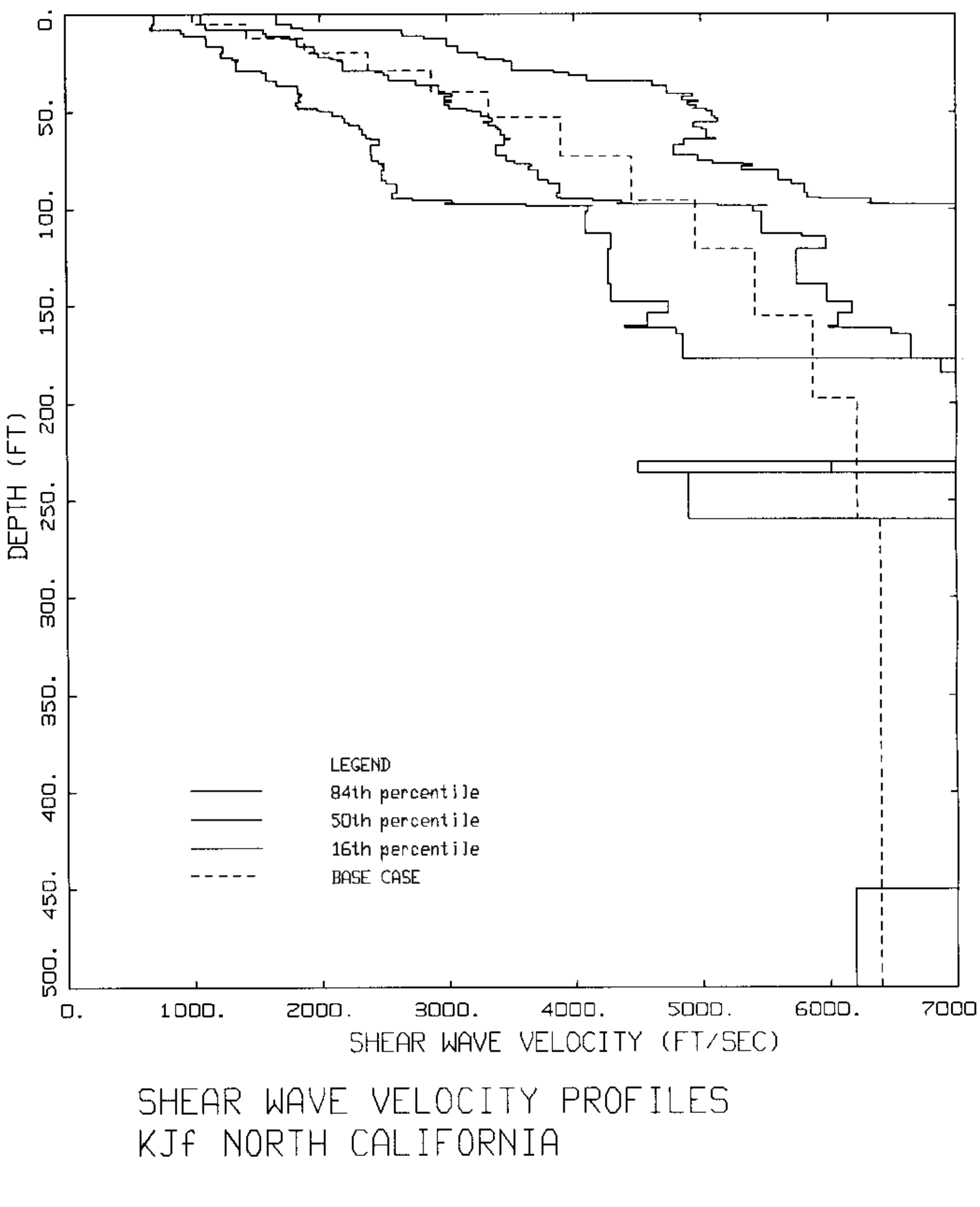


Figure 9. Median and ± 1 σ shear-wave velocity profiles for the San Francisco Bay area surface geologic unit K_{jf}, Franciscan (Table 1).

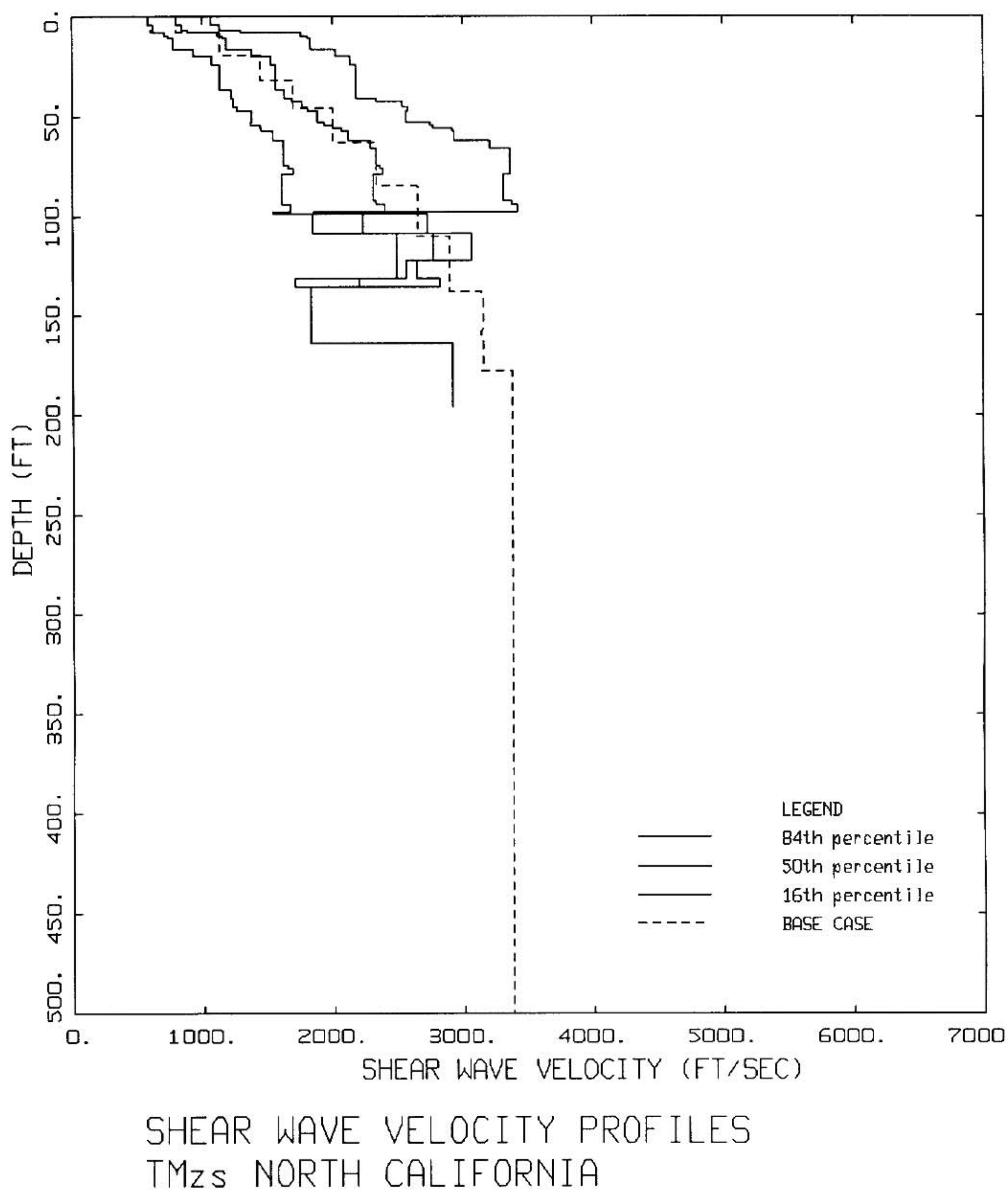


Figure 10. Median and ± 1 σ shear-wave velocity profiles for the San Francisco Bay area surface geologic unit TM_{zs}, Tertiary Bedrock (Table 1).

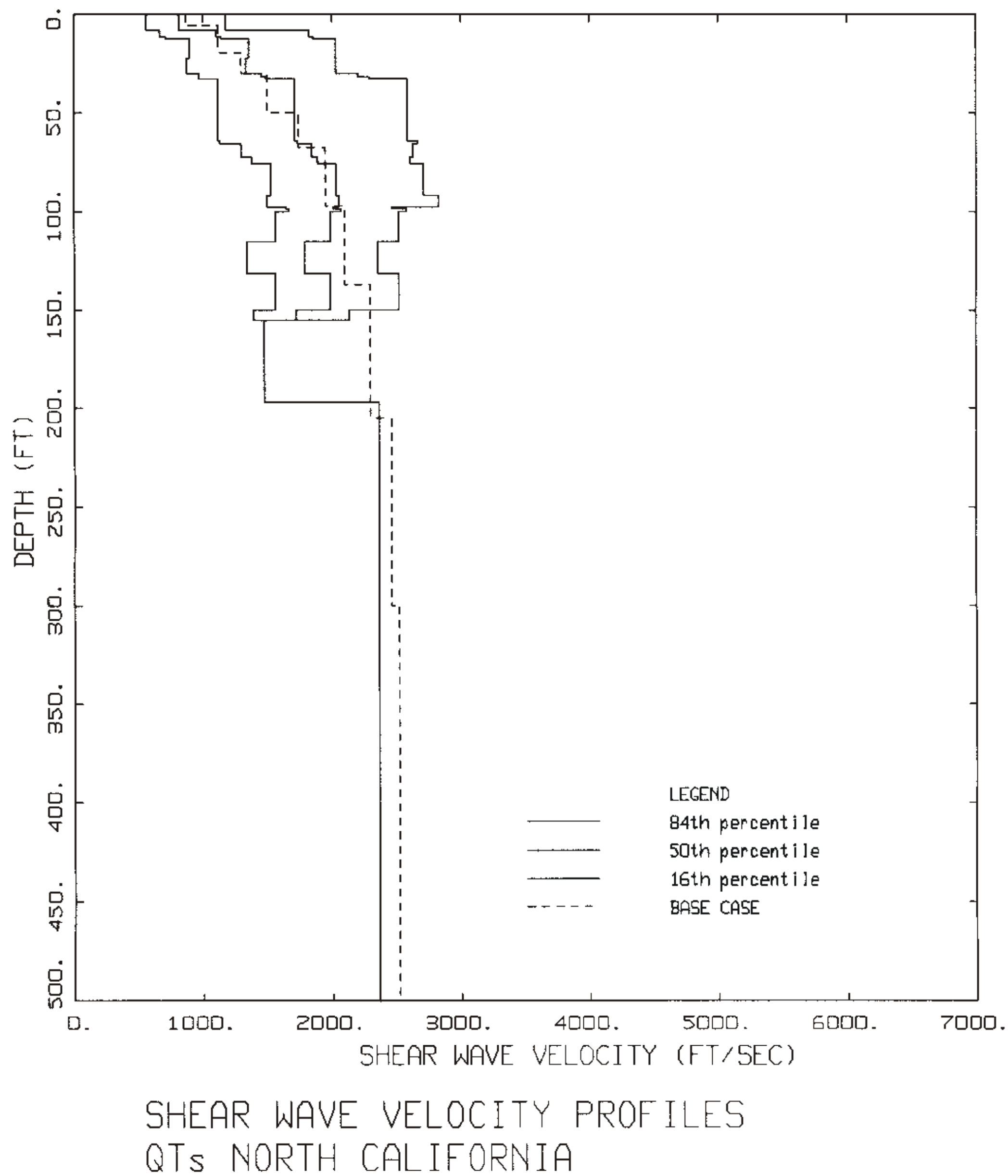


Figure 11. Median and ± 1 σ shear-wave velocity profiles for the San Francisco Bay area surface geologic unit QT_S, Quaternary/Tertiary (Table 1).

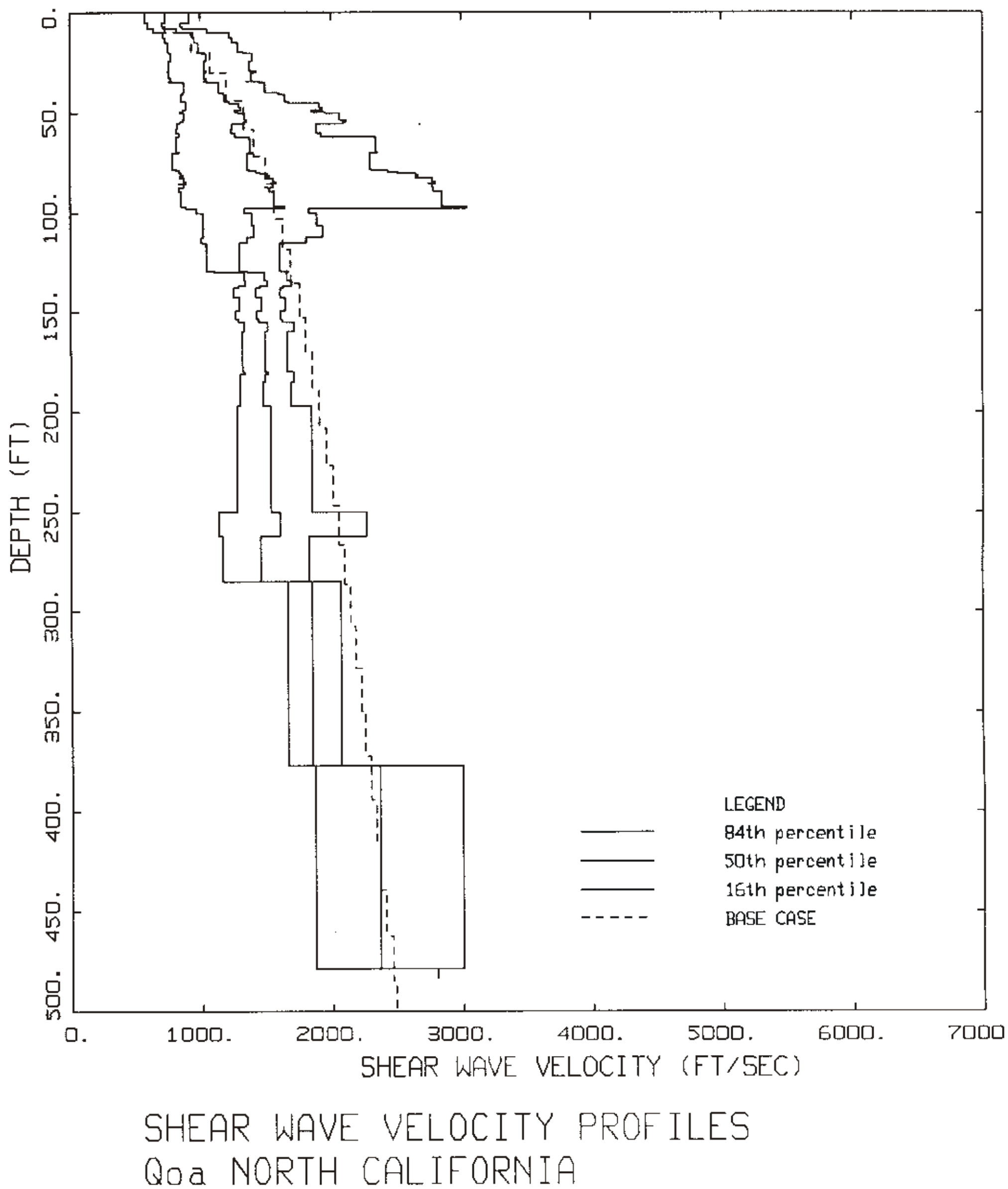


Figure 12. Median and ± 1 σ shear-wave velocity profiles for the San Francisco Bay area surface geologic unit Q_{oa}, Older Alluvium (Table 1).

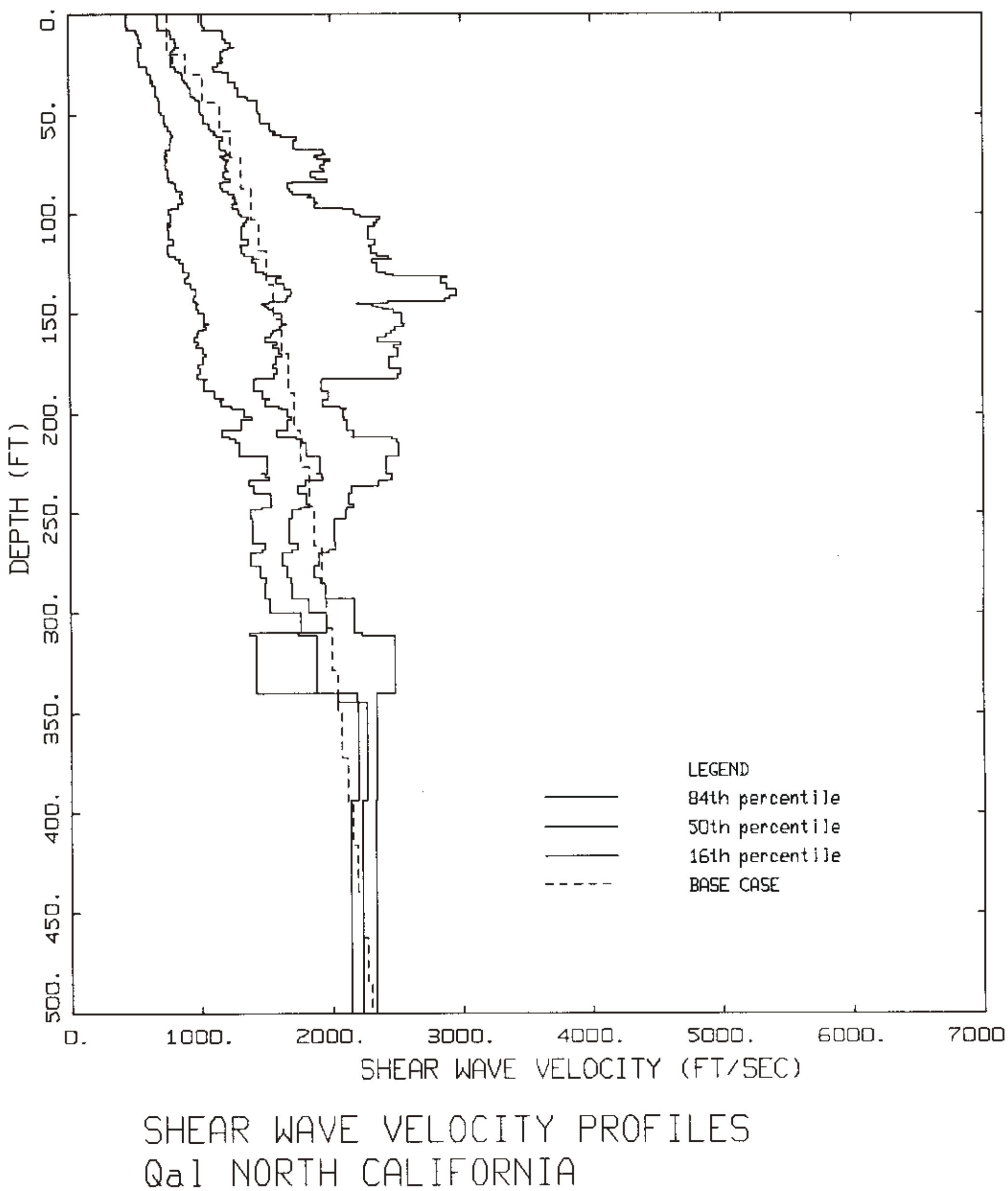


Figure 13. Median and ± 1 σ shear-wave velocity profiles for the San Francisco Bay area surface geologic unit Q_{al}, Quaternary Alluvium (Table 1).

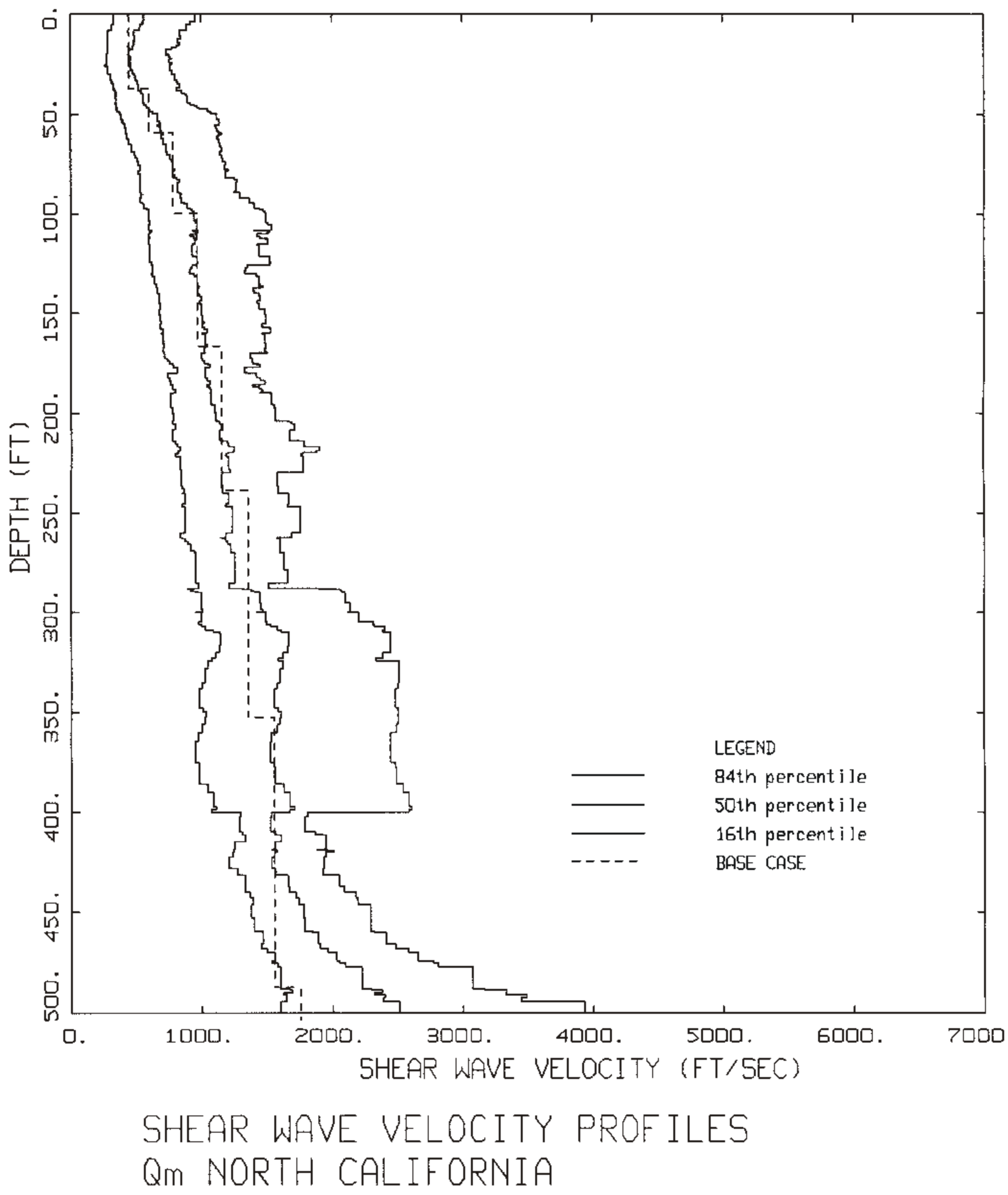


Figure 14. Median and ± 1 σ shear-wave velocity profiles for the San Francisco Bay area surface geologic unit Q_m, Bay Mud (Table 1).

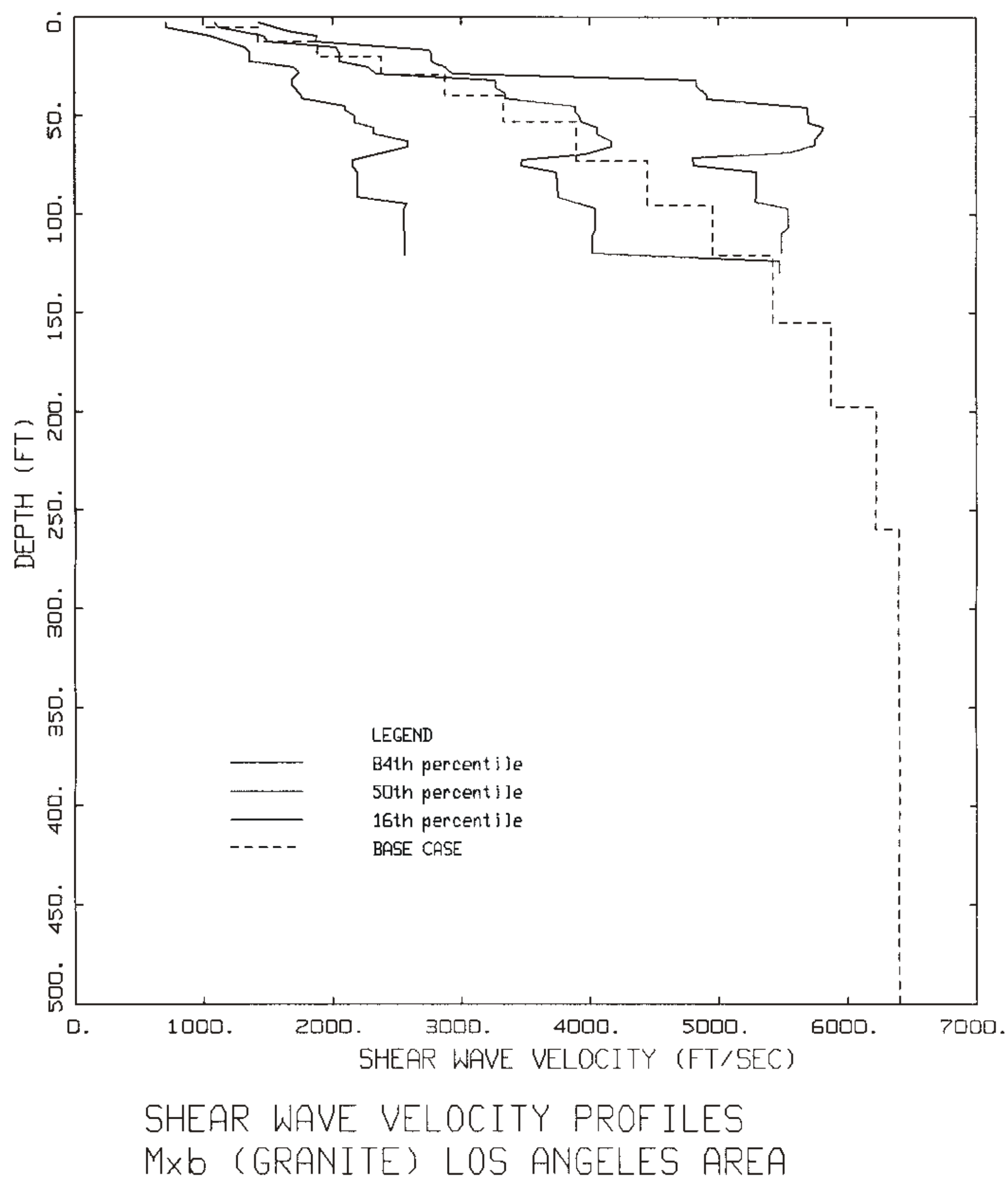


Figure 15. Median and ± 1 σ shear-wave velocity profiles for the Los Angeles area surface geologic unit M_{xb}, Granite (Table 1).

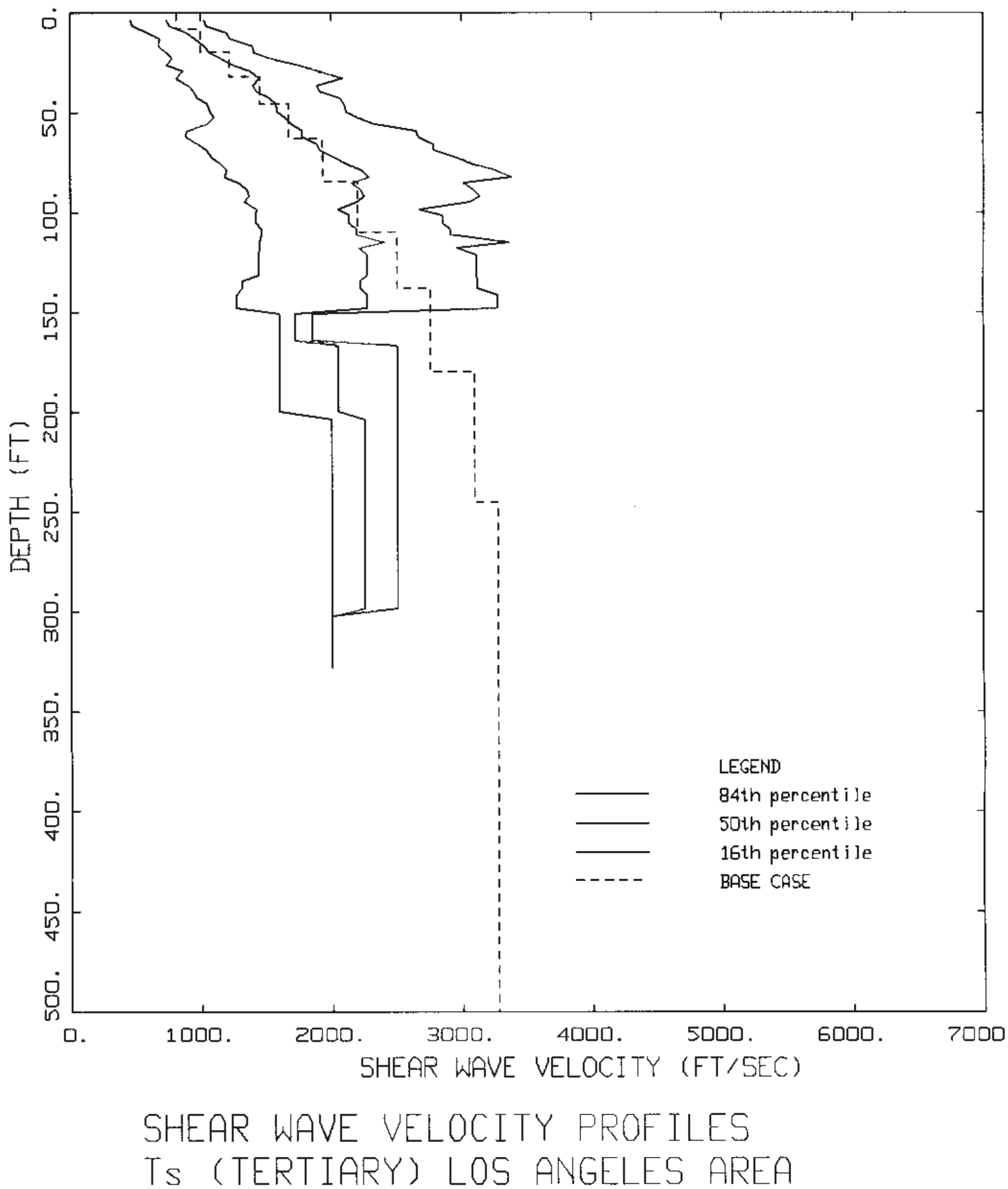


Figure 16. Median and ± 1 σ shear-wave velocity profiles for the Los Angeles area surface geologic unit T_S, Tertiary (Table 1).

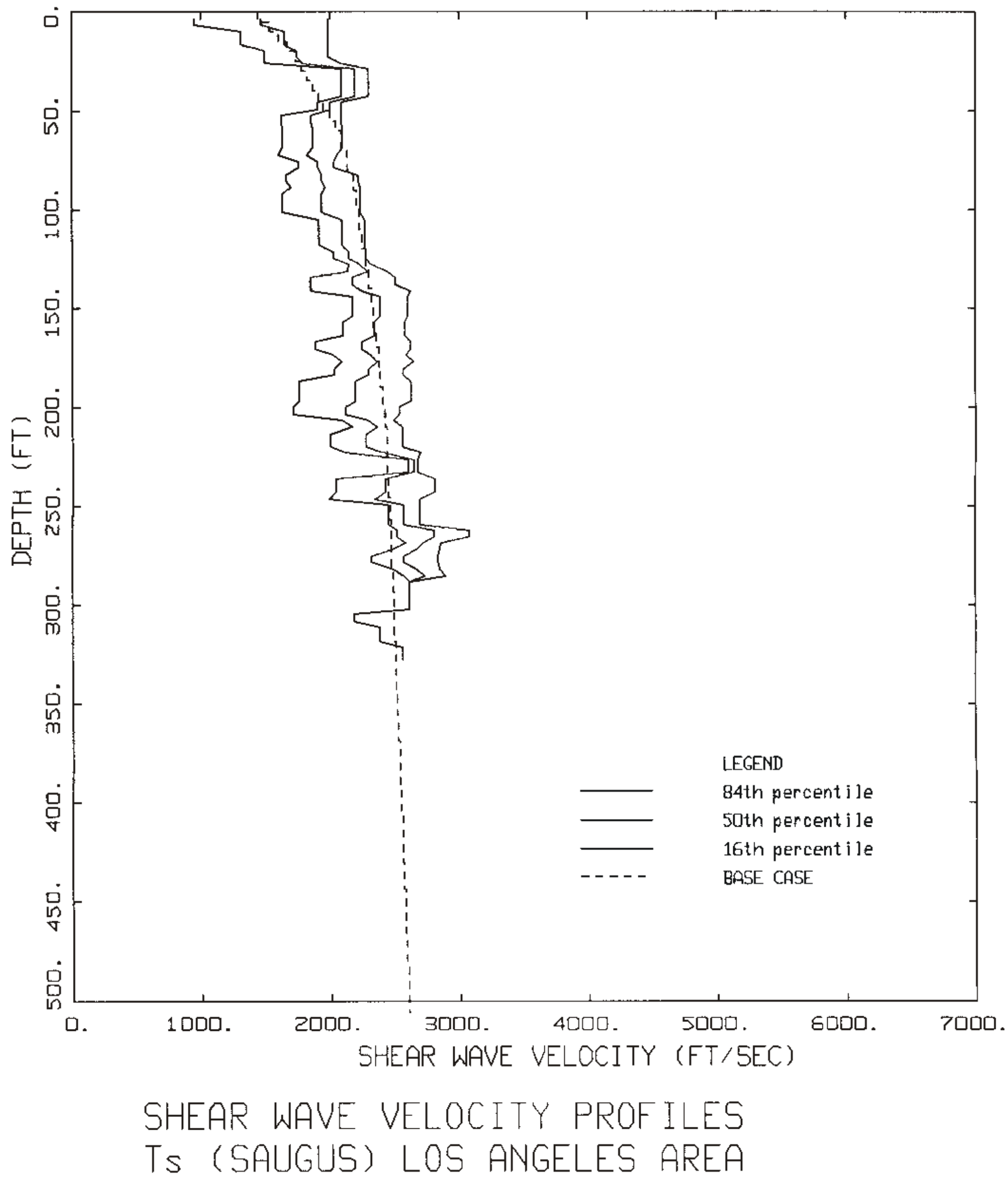


Figure 17. Median and ± 1 σ shear-wave velocity profiles for the San Francisco Bay area surface geologic unit T_S, Saugus (Table 1).

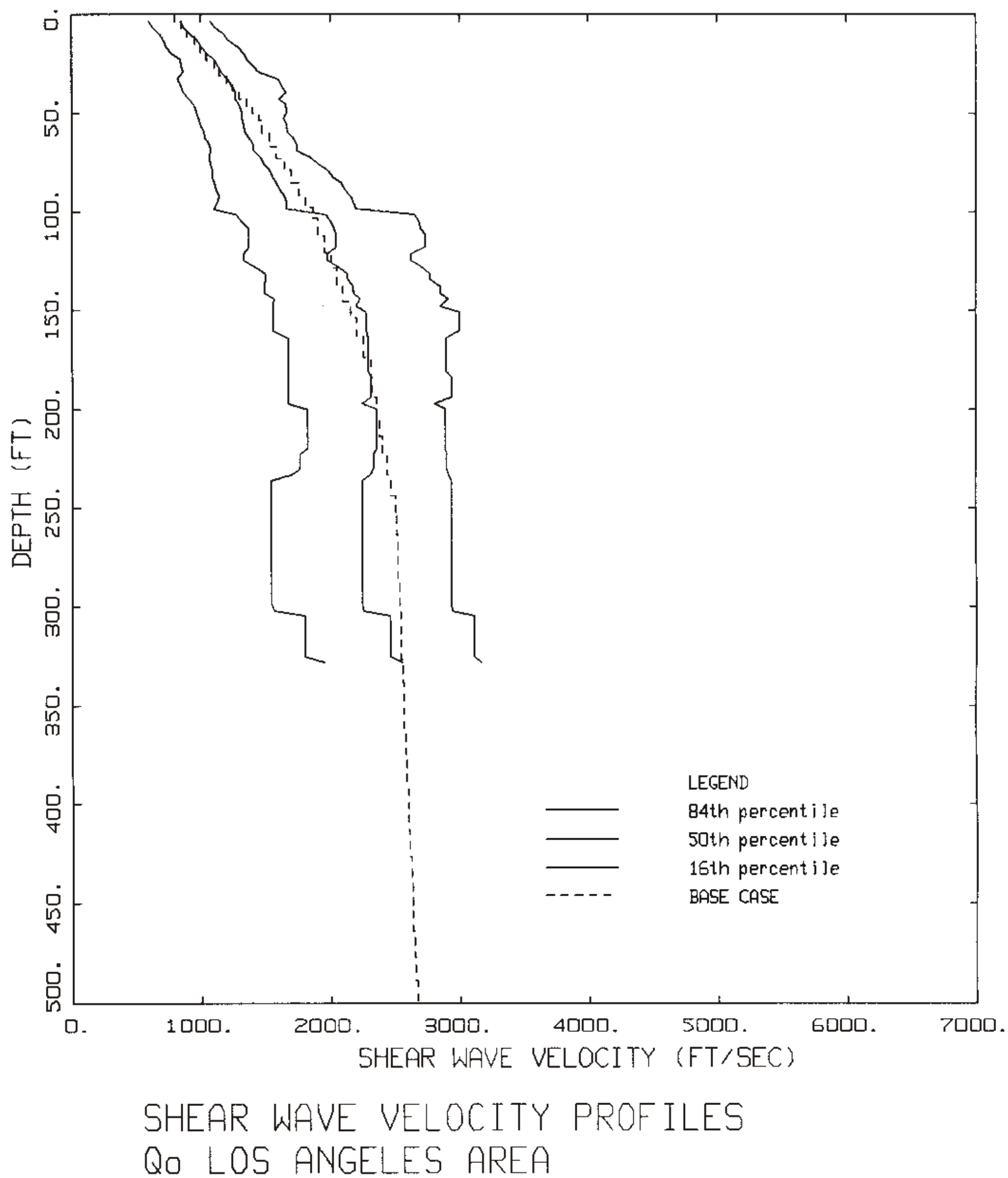


Figure 18. Median and ± 1 σ shear-wave velocity profiles for the Los Angeles area surface geologic unit Q_{oa}, Older Alluvium (Table 1).

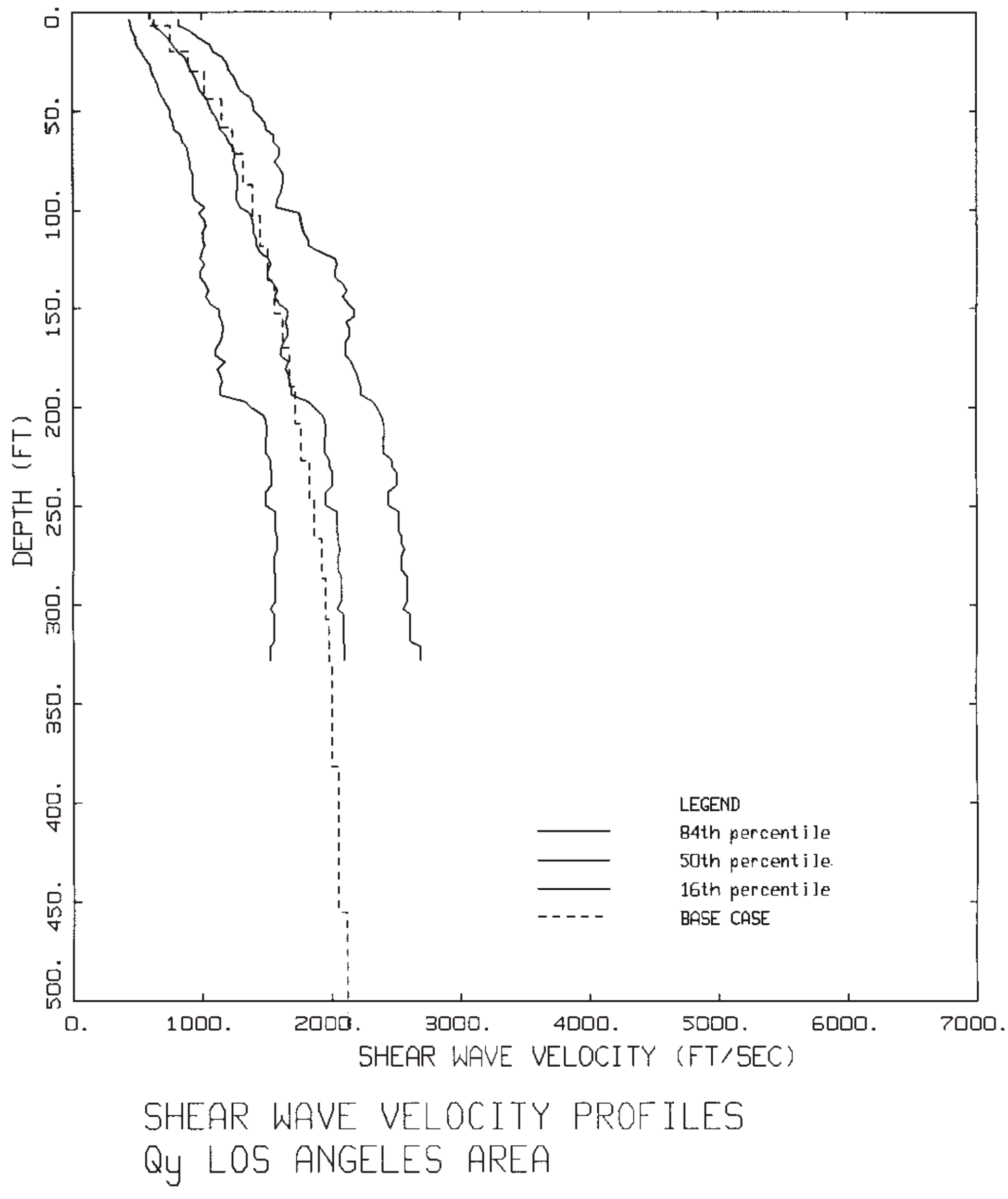


Figure 19. Median and ± 1 σ shear-wave velocity profiles for the Los Angeles area surface geologic unit Q_y, Younger Alluvium (Table 1).

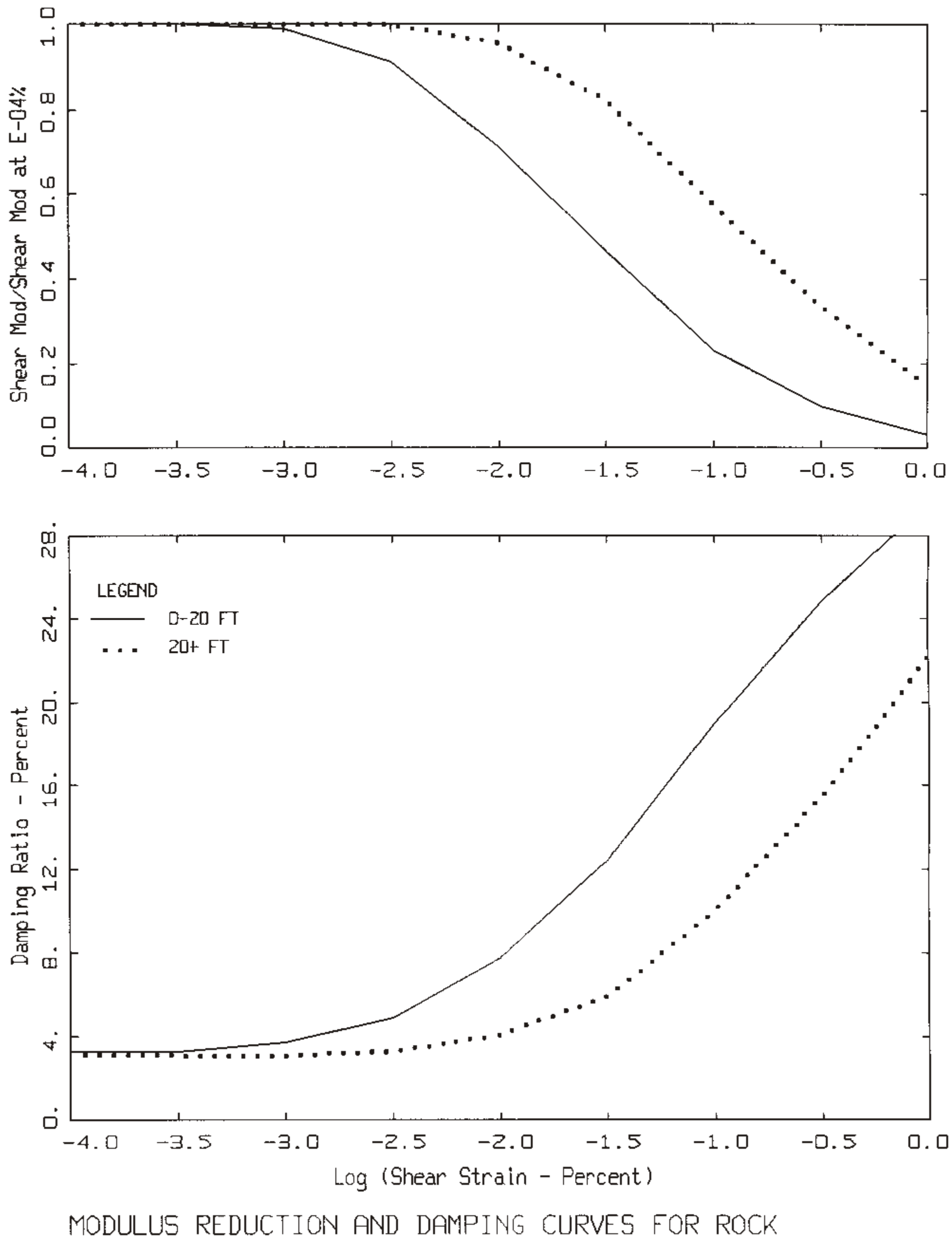


Figure 20. Generic G/Gmax and hysteretic damping curves for rock site conditions.

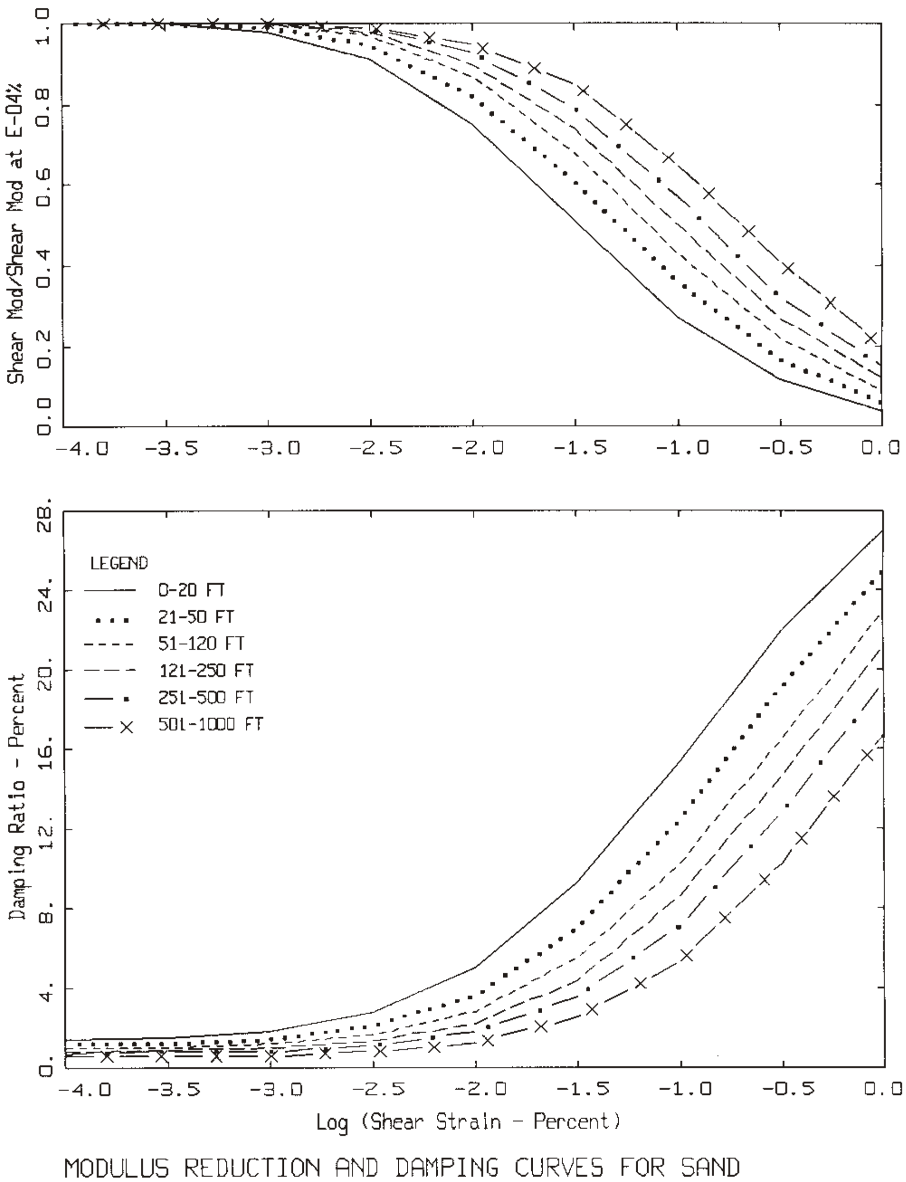


Figure 21. Generic G/Gmax and hysteretic damping curves for North Coast cohesionless soil site conditions (EPRI, 1993).

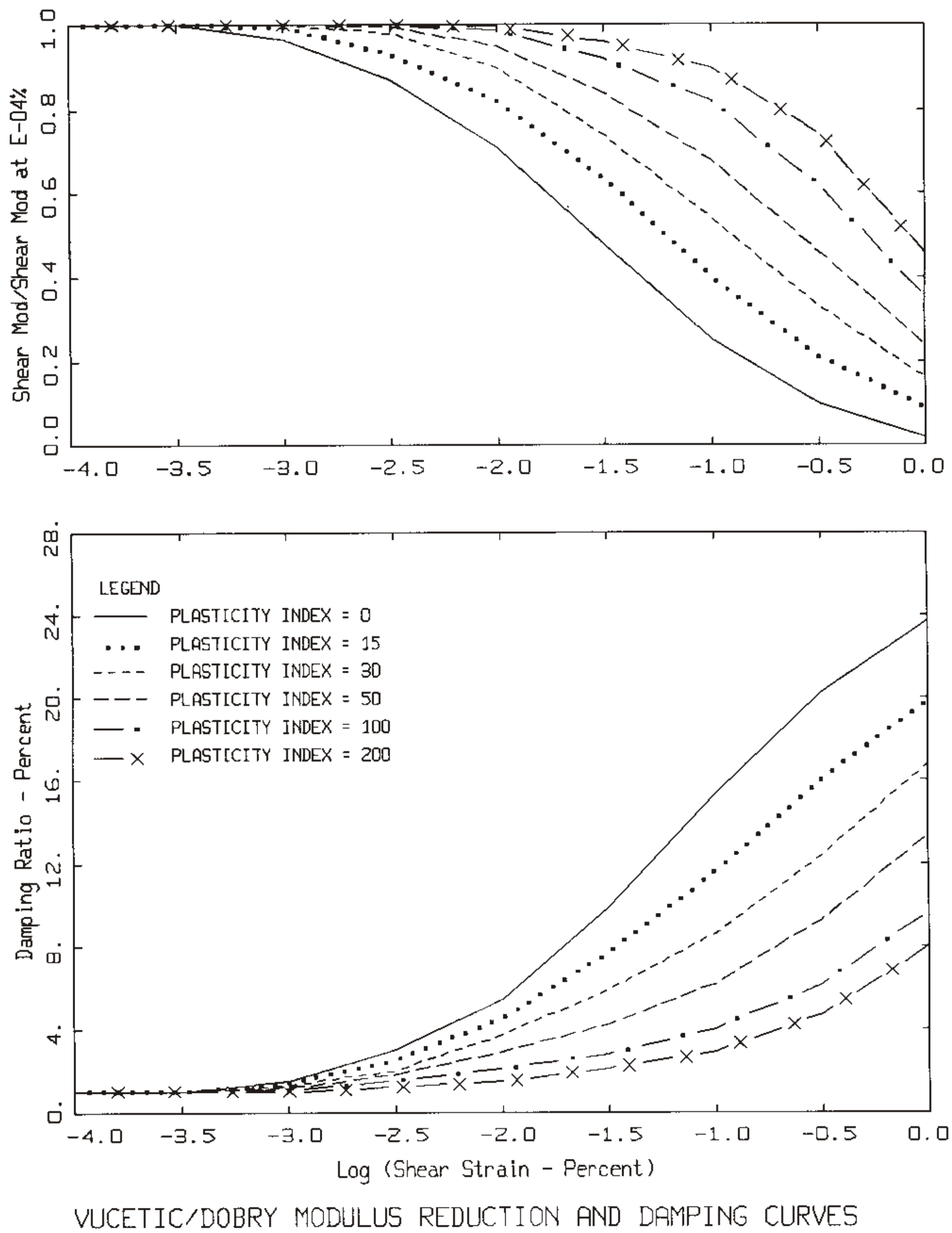


Figure 22. Generic G/Gmax and hysteretic damping curves for cohesive soil site conditions (Vucetic and Dobry, 1991).

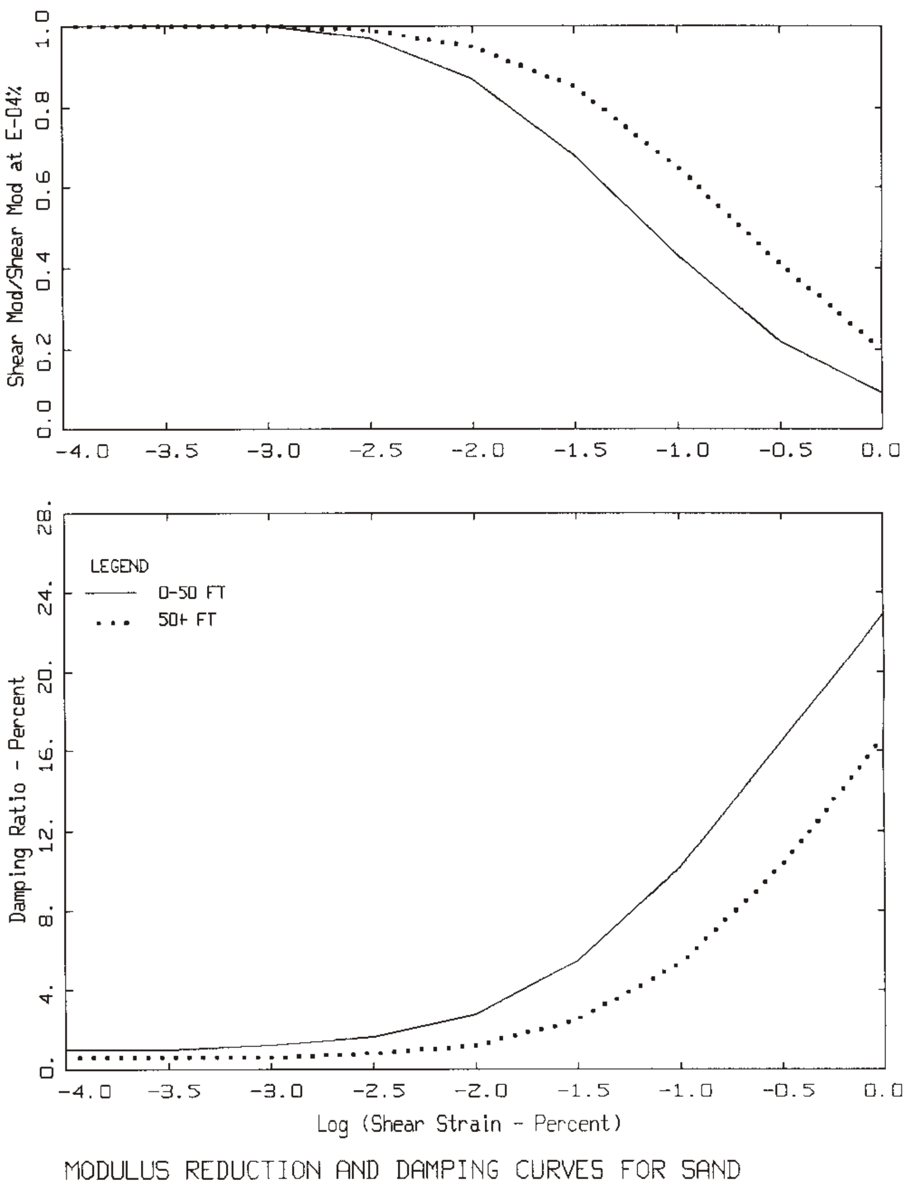


Figure 23. Generic G/Gmax and hysteretic damping curves for Peninsular Range cohesionless soil site conditions (Silva et al., 1997).

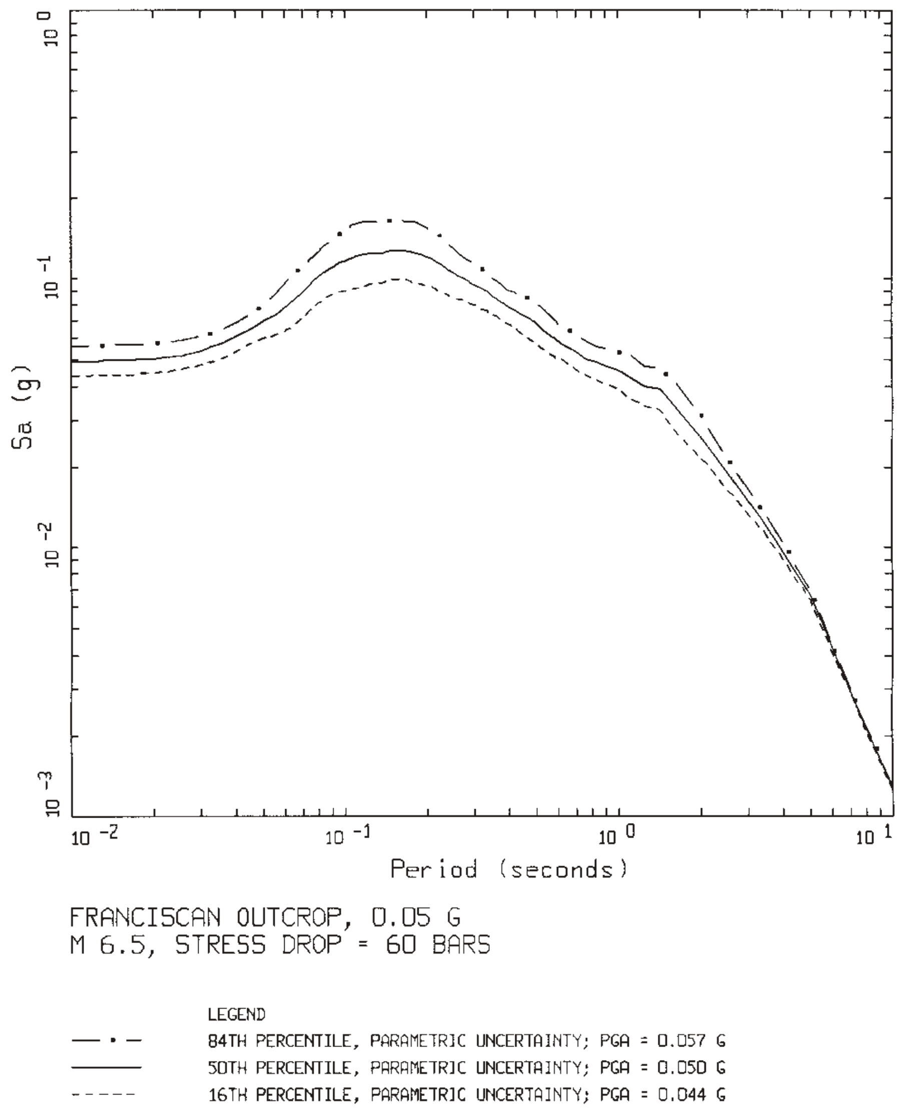


Figure 24. Median and ± 1 σ 5% damped baserock (Franciscan) motions for 5%g (Table 4): **M** = 6.5, stress drop = 60 bars. Parametric variation includes top 250 ft of the profile (Figure 15) and nonlinear properties (Figure 20).

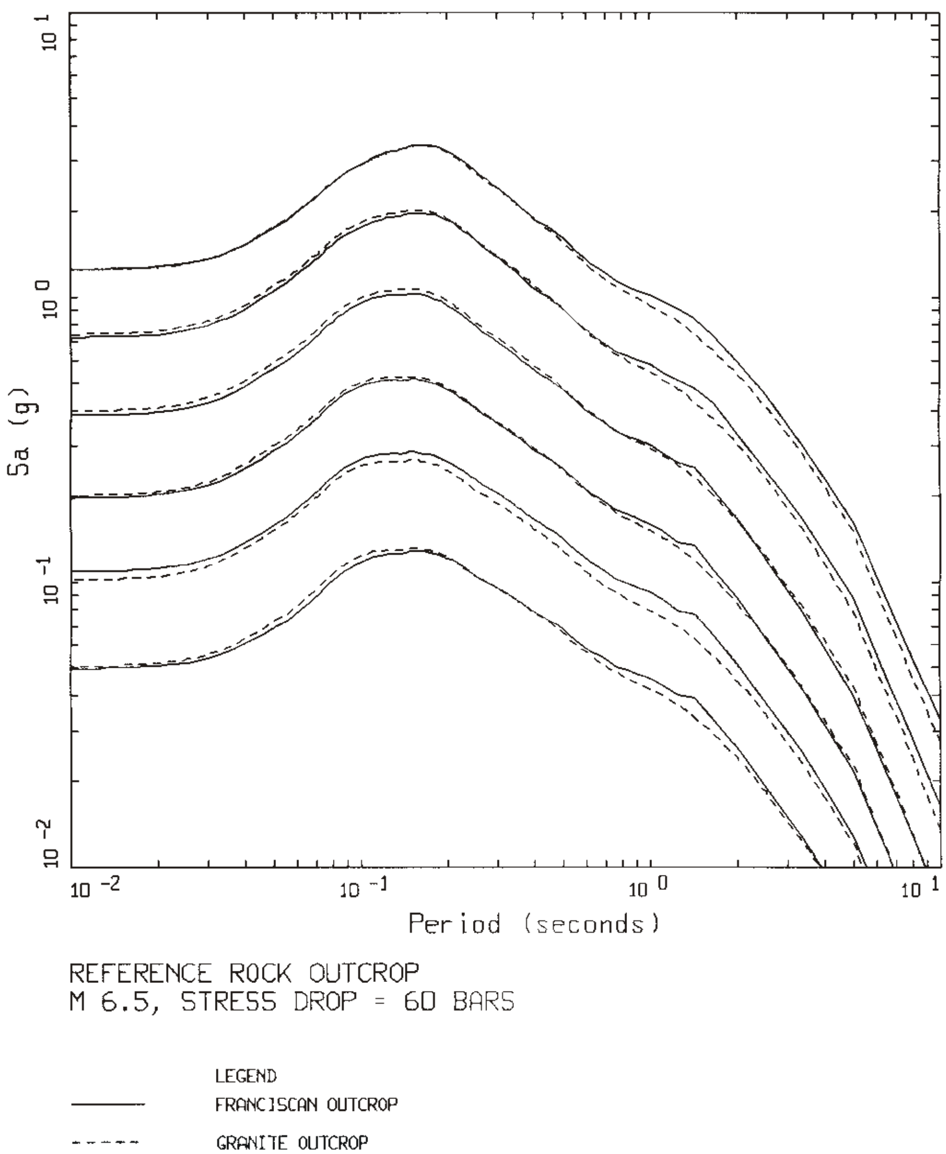


Figure 25. Comparison of median 5% damped response spectra computed for San Francisco (solid) and Los Angeles (dashed) area baserock site conditions for suite of outcrop peak acceleration values (Table 4): **M** = 6.5, stress drop: 60 bars.

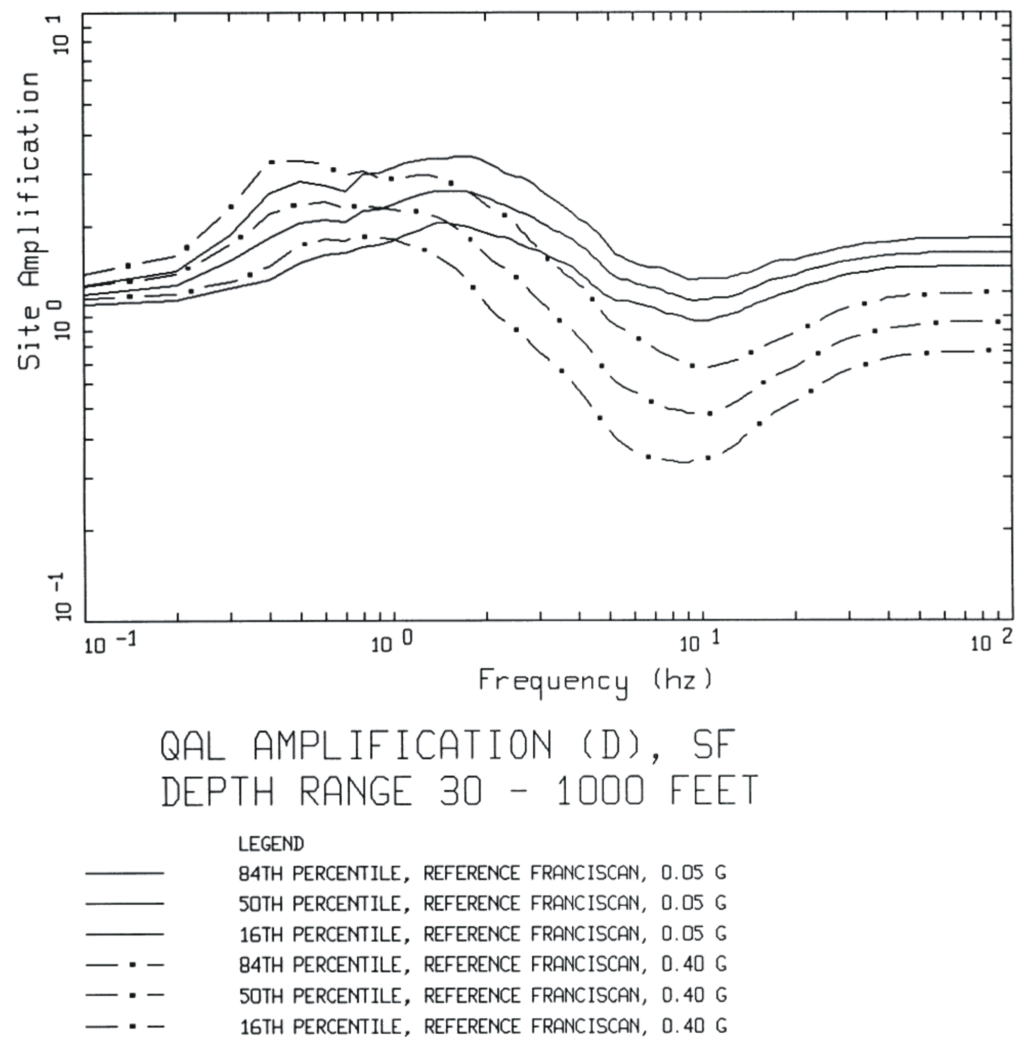


Figure 26. Comparison of median and ± 1 σ amplification factors (5% damped response spectra) for San Francisco area Quaternary Alluvium (Q_{al}) depth category 4 (30 to 1,000 ft) for reference Franciscan rock outcrop median peak acceleration values of 0.05g and 0.40g.

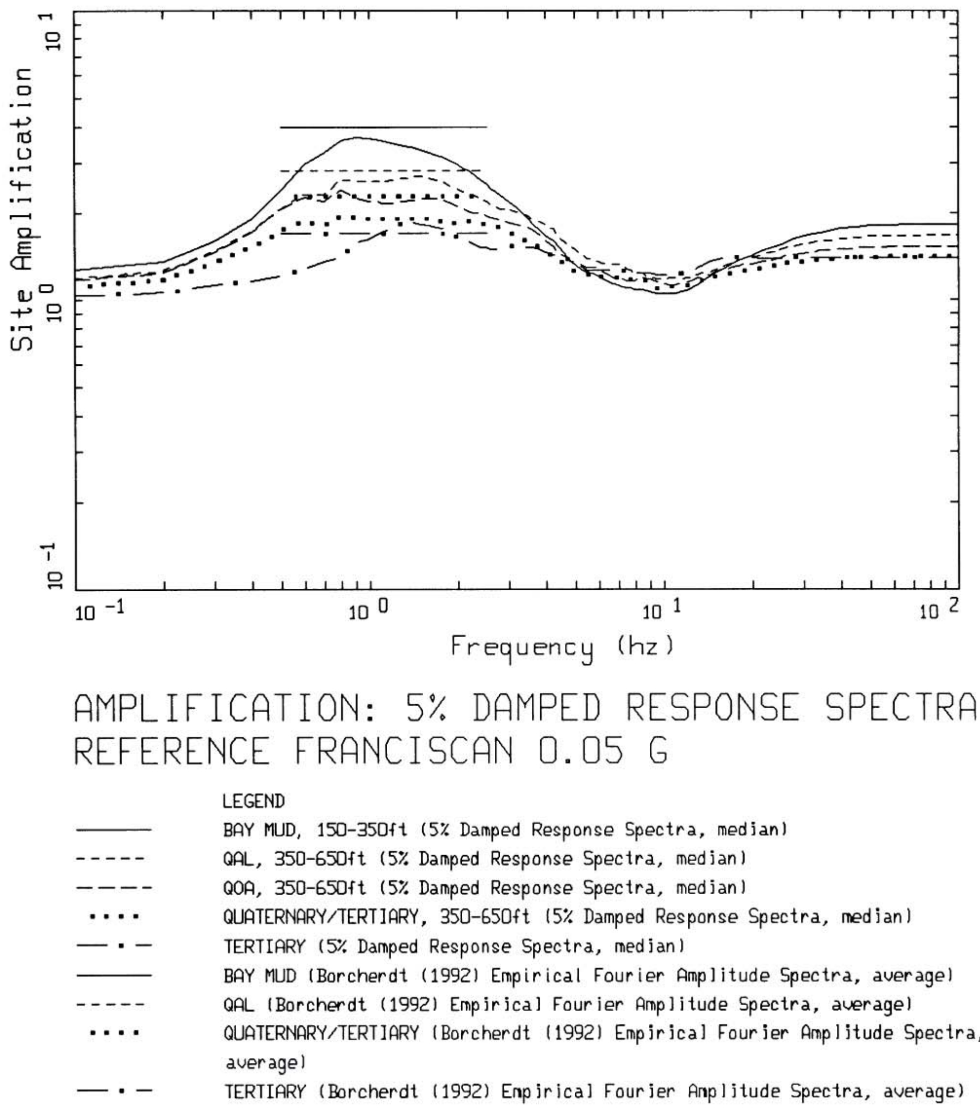


Figure 27. Comparison of median amplification factors (5% damped response spectra) computed for reference Franciscan outcrop peak acceleration of 0.05g with empirical factors (smoothed Fourier amplitude spectra; Borcherdt and Glassmoyer, 1992). Empirical factors were computed using low levels of loading (generally ≤ 0.10g).

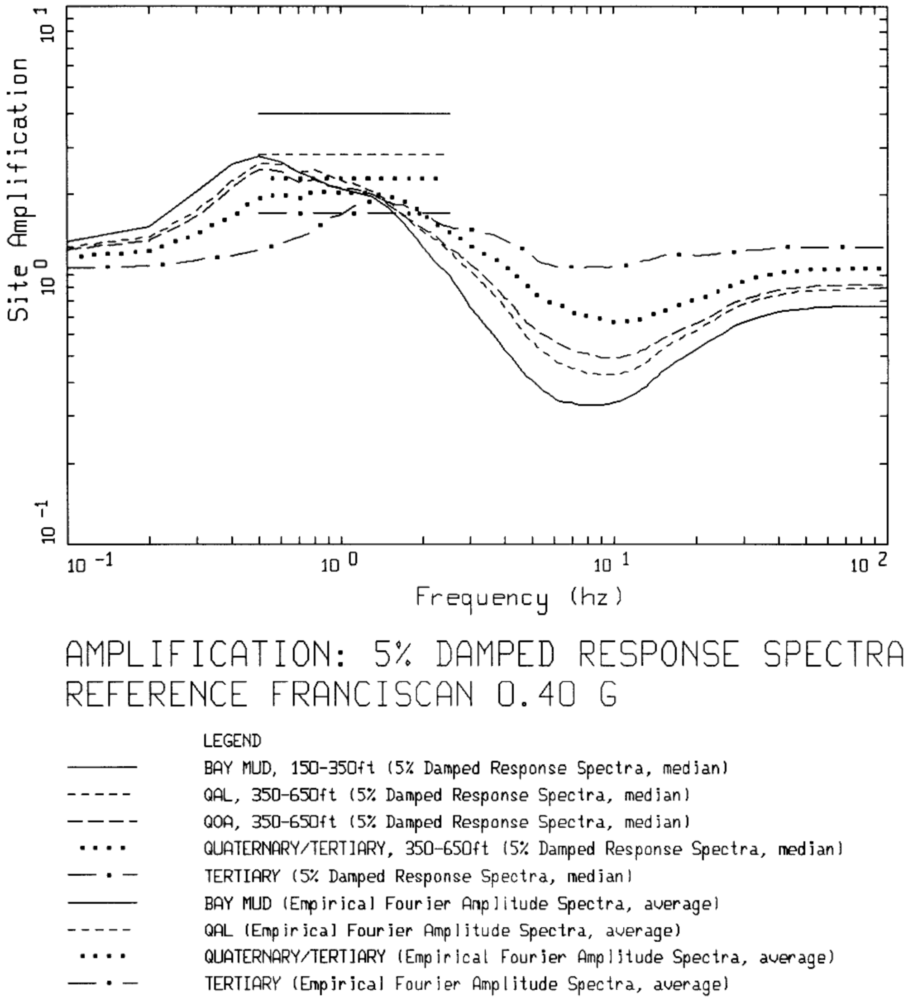


Figure 28. Comparison of median amplification factors (5% damped response spectra) computed for reference Franciscan outcrop peak acceleration of 0.40g with empirical factors (smoothed Fourier amplitude spectra; Borcherdt and Glassmoyer, 1992). Empirical factors were computed using low levels of loading (generally ≤ 0.10g).

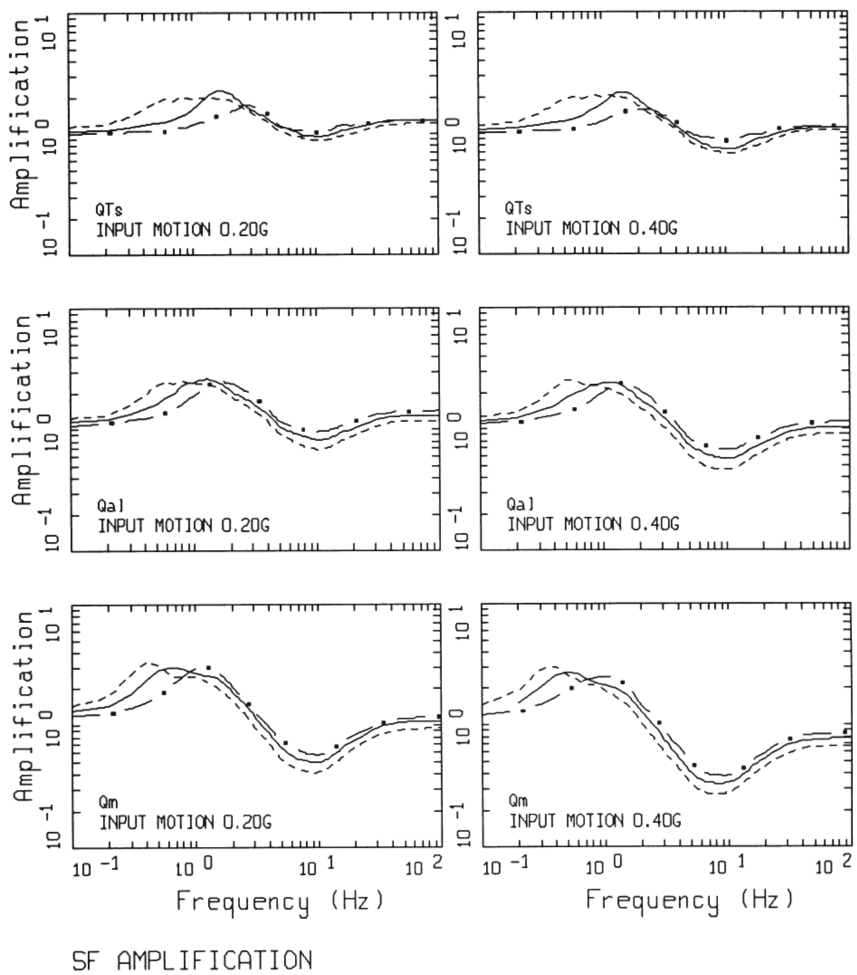


Figure 29. Median amplification factors computed for QT_S, Q_{al}, Q_m, for different depth categories: 30 ft to 150 ft, dash dots; 150 ft to 350 ft, solid; 350 ft to 650 ft, dashes.

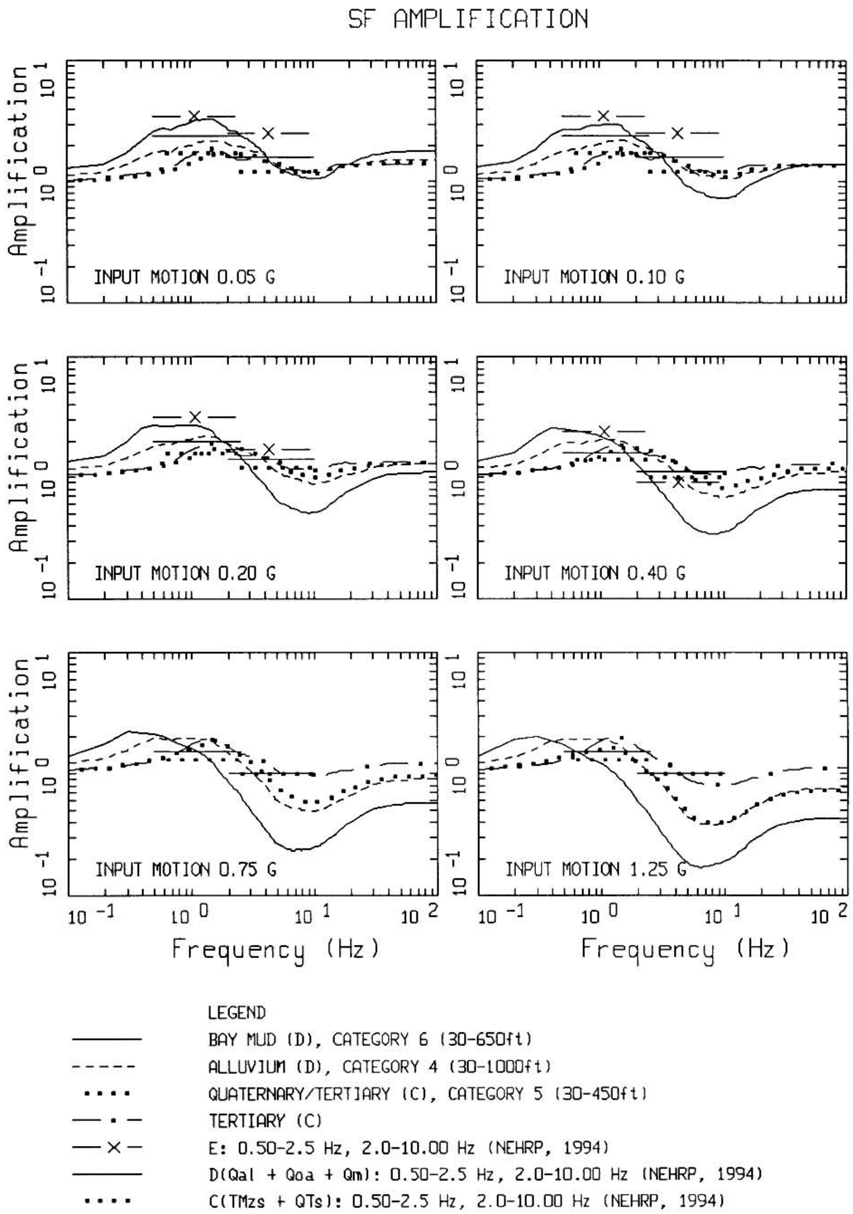


Figure 30. Comparison of median amplification factors with NEHRP provisions.

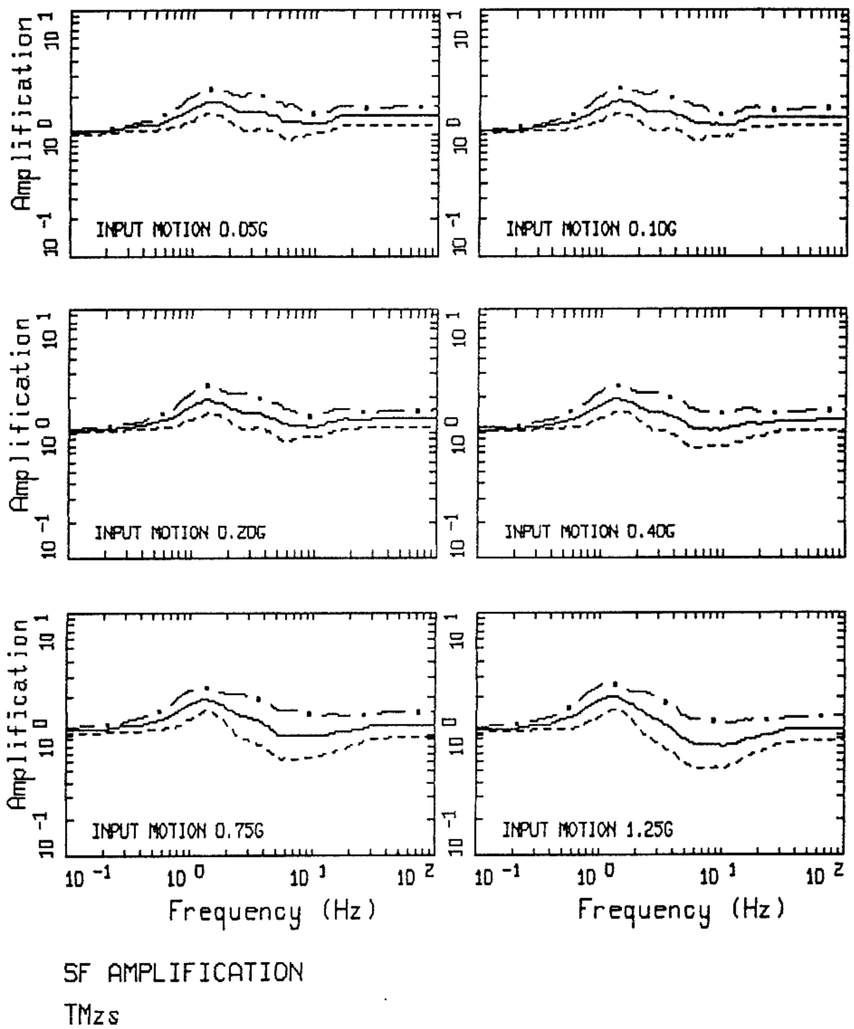


Figure 31. Median and ± 1 σ amplification factors computed for San Francisco area surficial geologic unit TM_{zs} (Table 1).

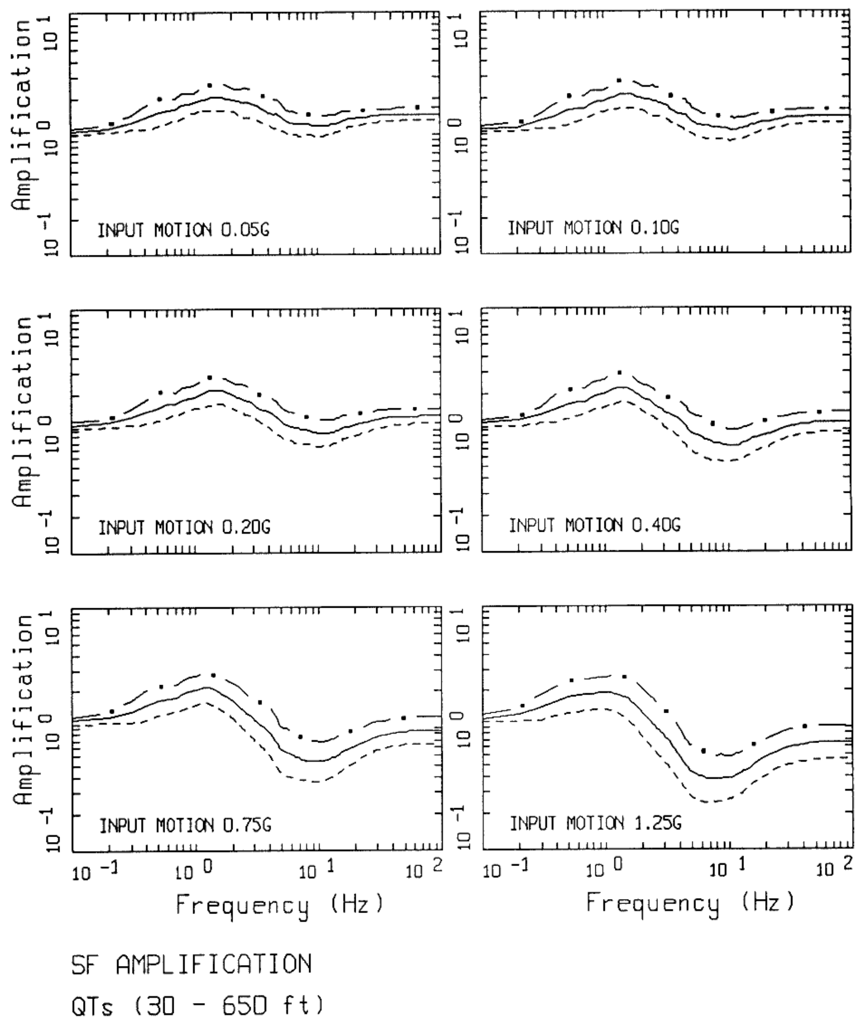


Figure 32. Median and ± 1 σ amplification factors computed for San Francisco area surficial geologic unit QT_S (Table 1).

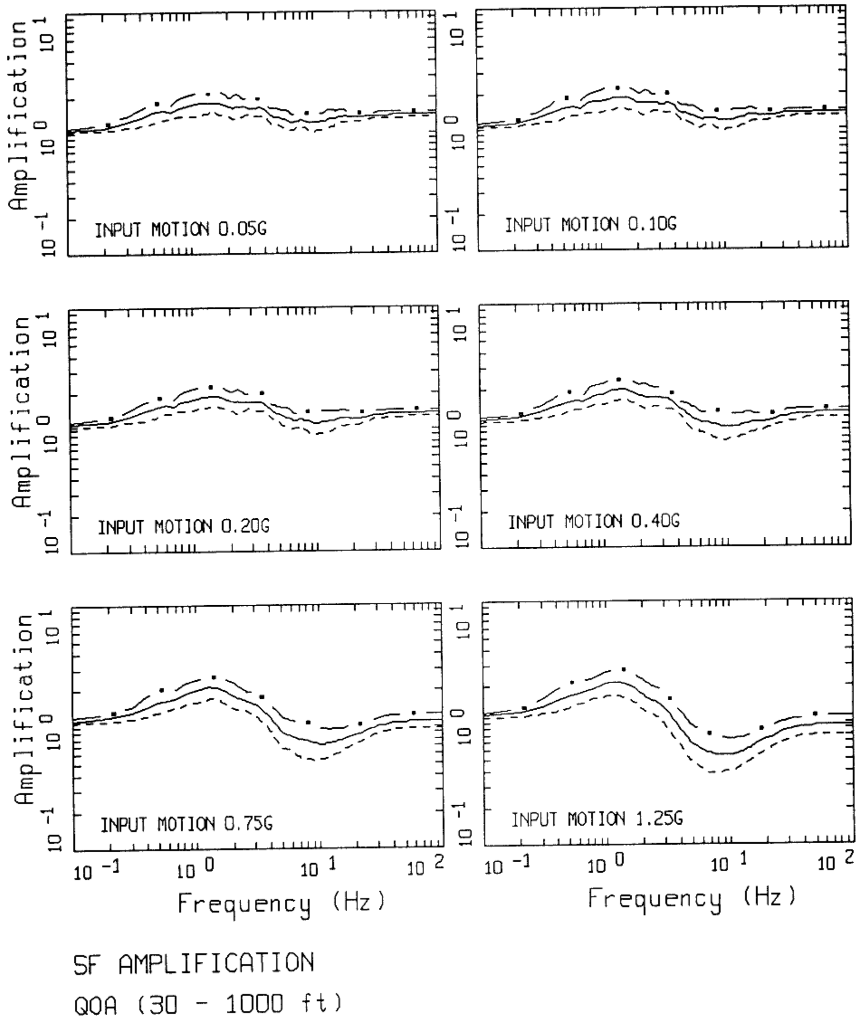


Figure 33. Median and ± 1 σ amplification factors computed for San Francisco area surficial geologic unit Q_{oa} (Table 1).

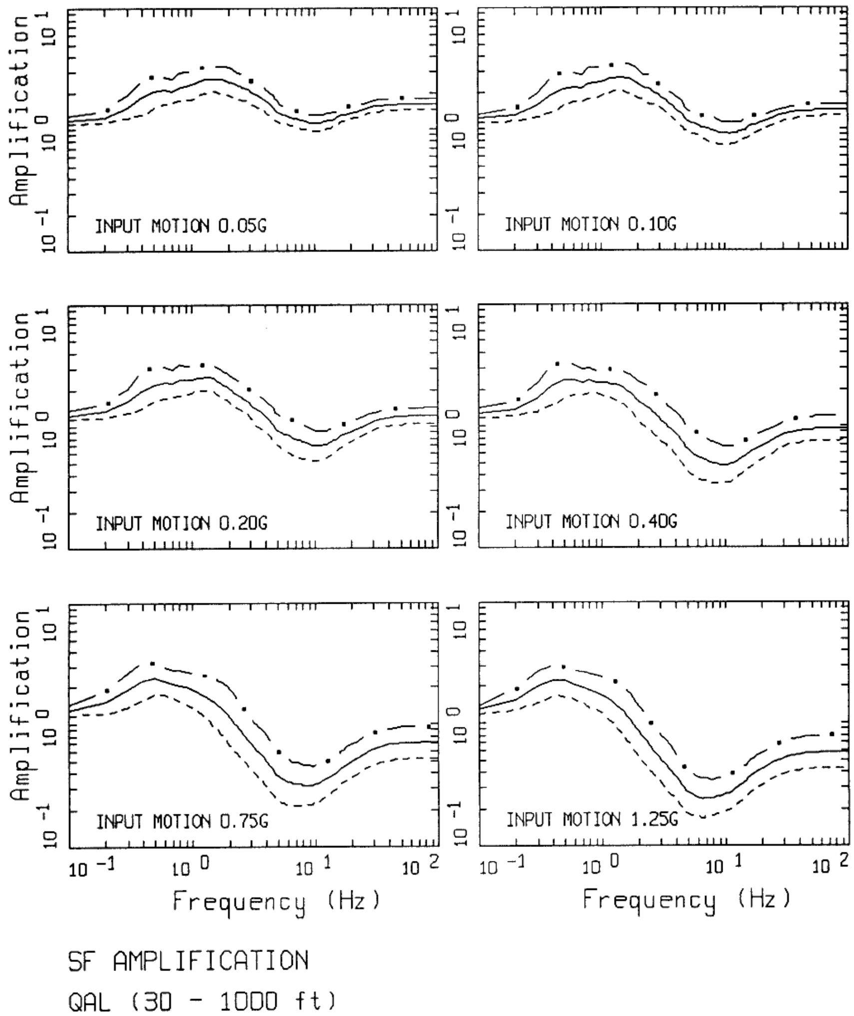


Figure 34. Median and ± 1 σ amplification factors computed for San Francisco area surficial geologic unit Q_{al} (Table 1).

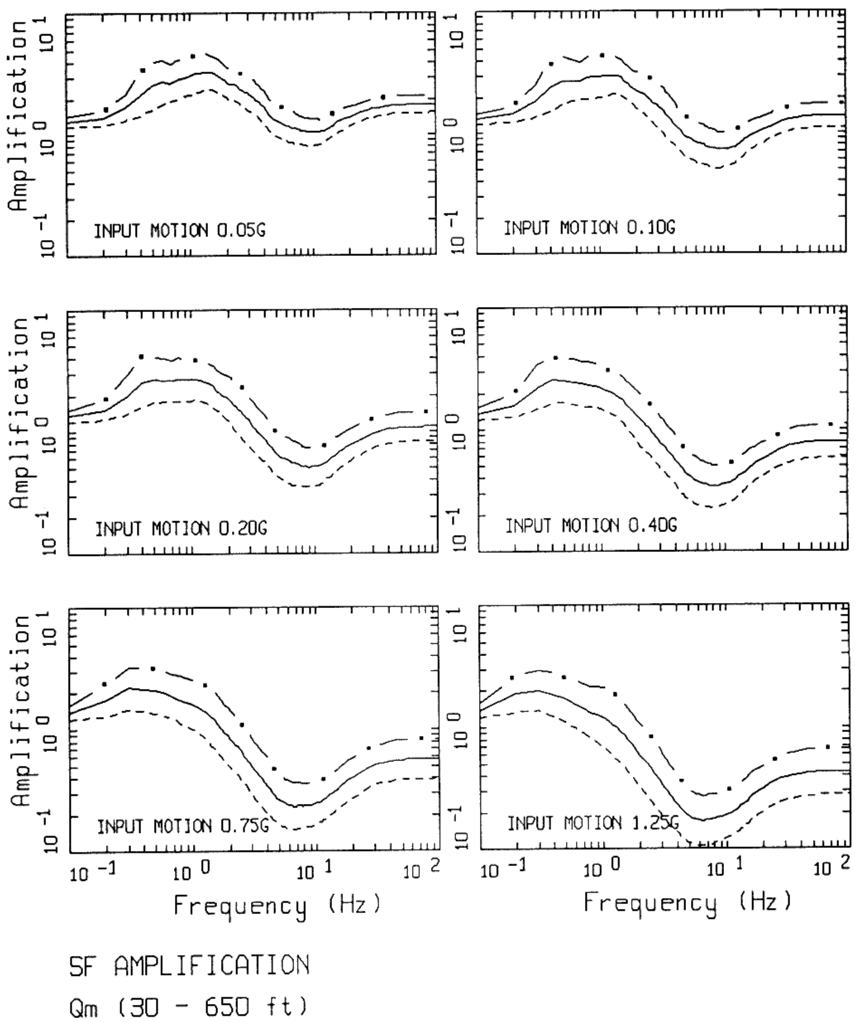


Figure 35. Median and ± 1 σ amplification factors computed for San Francisco area surficial geologic unit Q_m (Table 1).

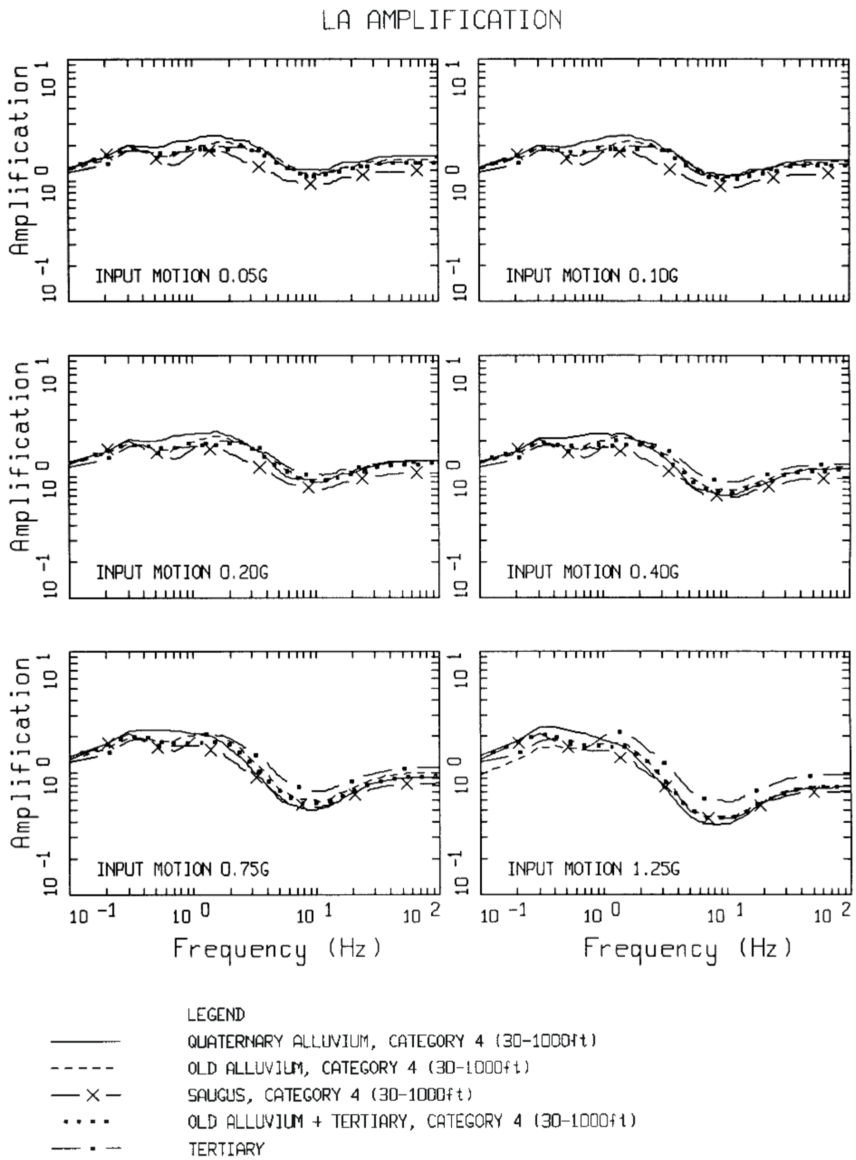


Figure 36. Comparison of median amplification factors computed for units Q_y, Q_o, Saugus (T_S), T_S, and $Q_o + T_S$ (Table 1) for the depth categories with the widest depth ranges (Table 5).

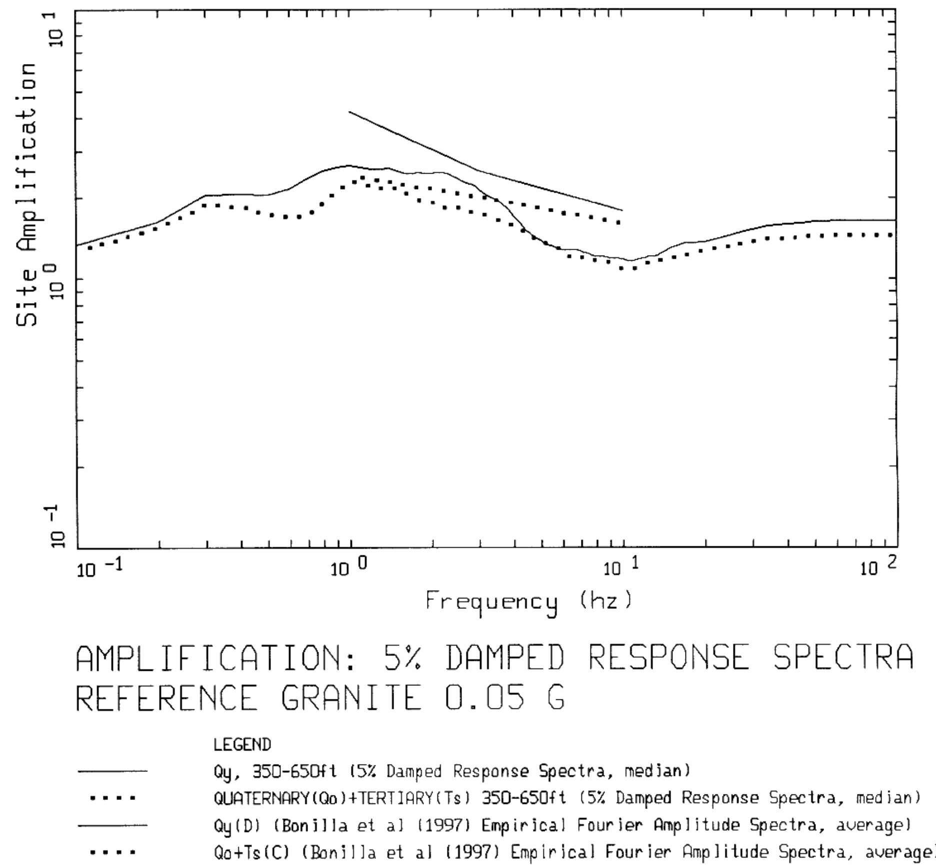


Figure 37. Comparison of median amplification factors (5% damped response spectra) computed for reference Granite outcrop peak acceleration of 0.05g with empirical factors (smoothed Fourier amplitude spectra; Bonilla et al., 1997). Empirical factors are based on small earthquakes.

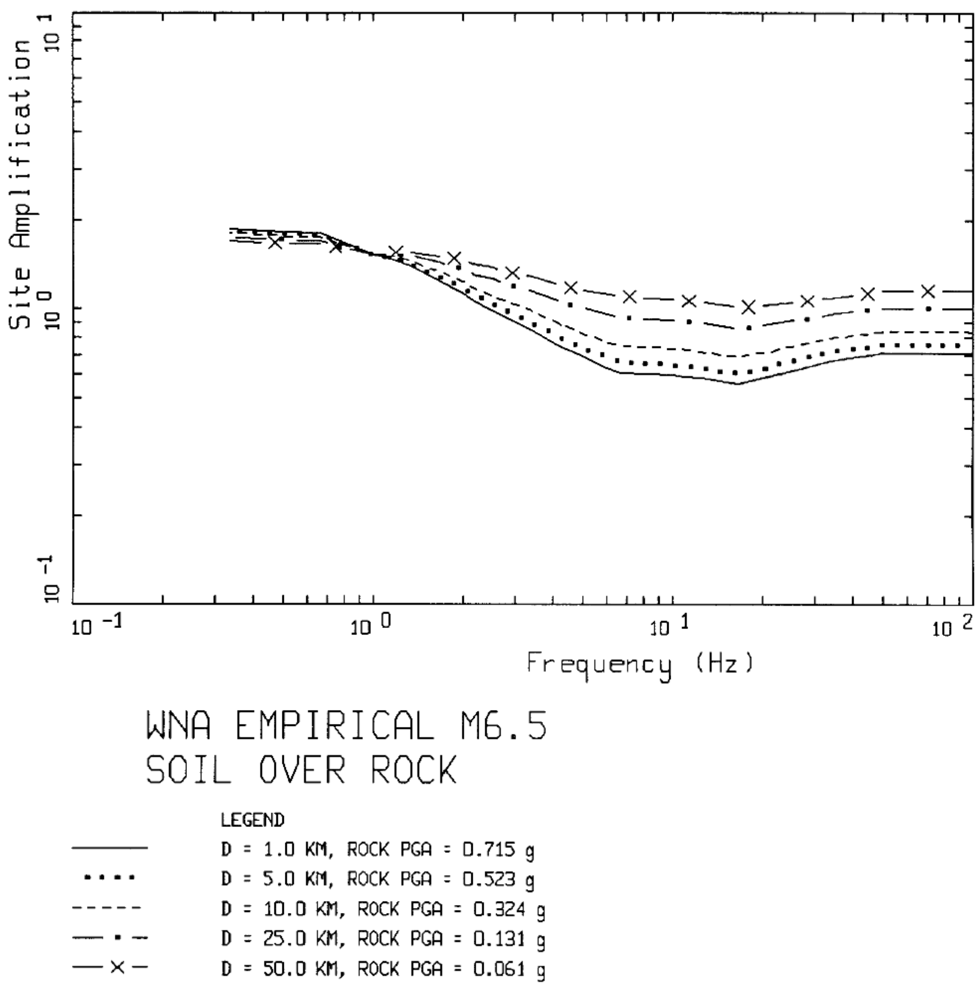


Figure 38. Deep firm to stiff soil (Geomatrix C + D, Table 2) amplification of 5% damped response spectra relative to soft rock (Geomatrix A + B) from an empirical attenuation relation (Abrahamson and Silva, 1997).

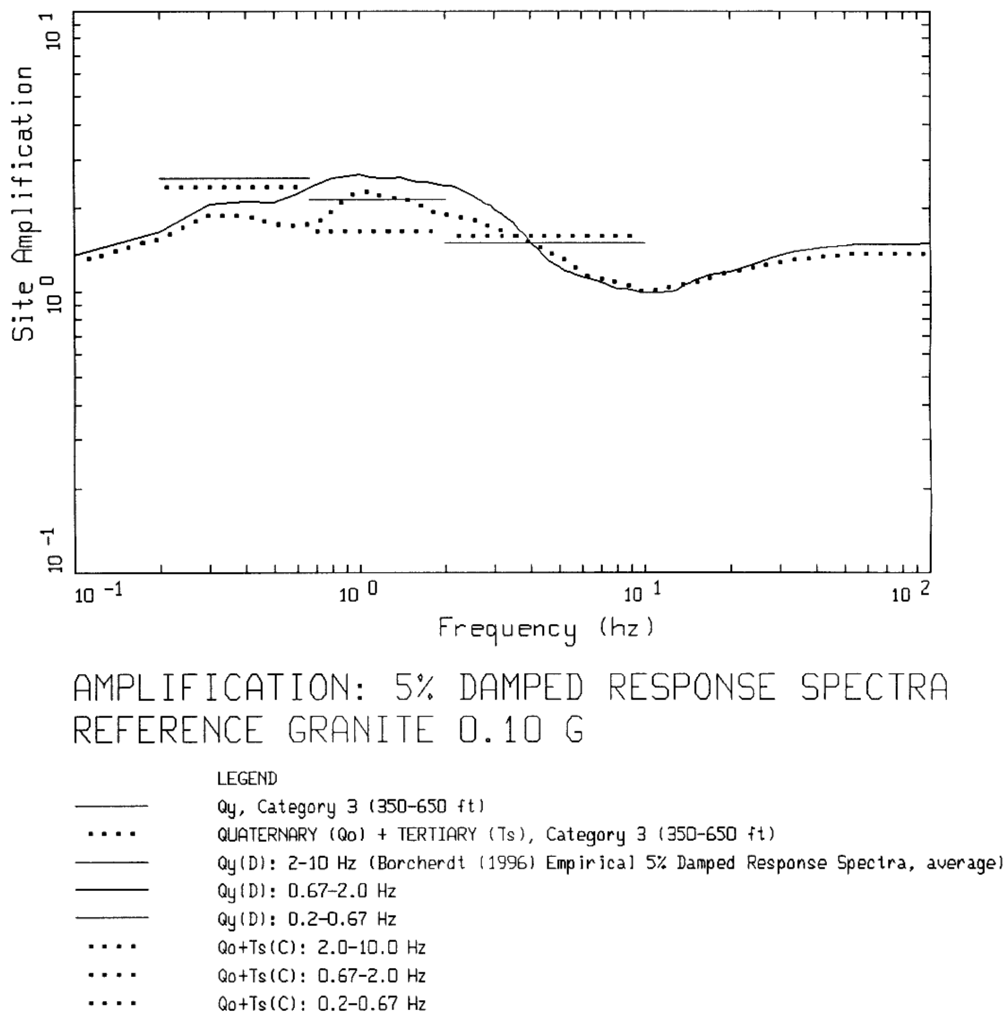


Figure 39. Comparison of median amplification factors (5% damped response spectra) computed for reference Granite outcrop peak acceleration of 0.10g with empirical factors (5% damped response spectra; Borcherdt, 1996). Empirical factors are based on recordings of the 1994 **M** 6.7 Northridge.

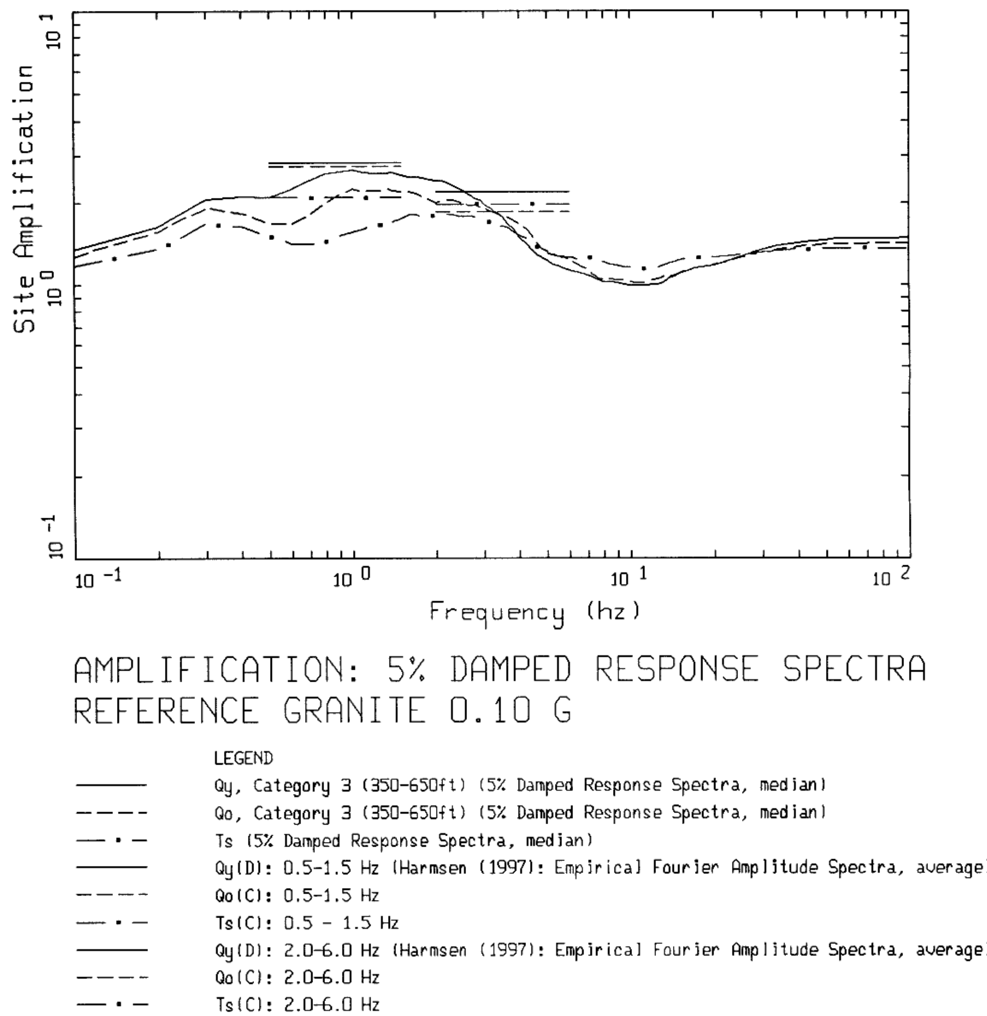


Figure 40. Comparison of median amplification factors (5% damped response spectra) computed for reference Granite outcrop peak acceleration of 0.10g with empirical factors (smoothed Fourier amplitude spectra; Harmsen, 1997). Empirical factors are based on the 1971 San Fernando, 1987 Whittier Narrows, 1991 Sierra Madre, and 1994 Northridge earthquakes.

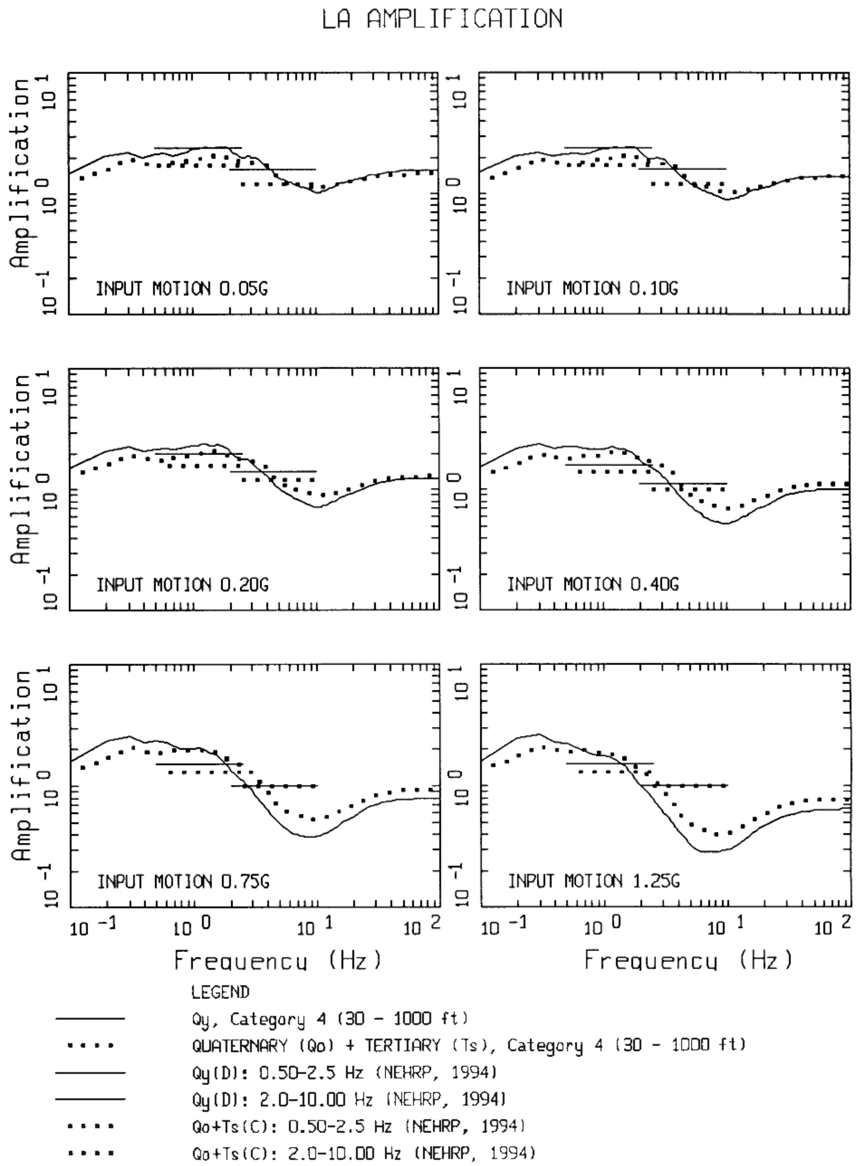


Figure 41. Comparison of median amplification factors with NEHRP provisions.

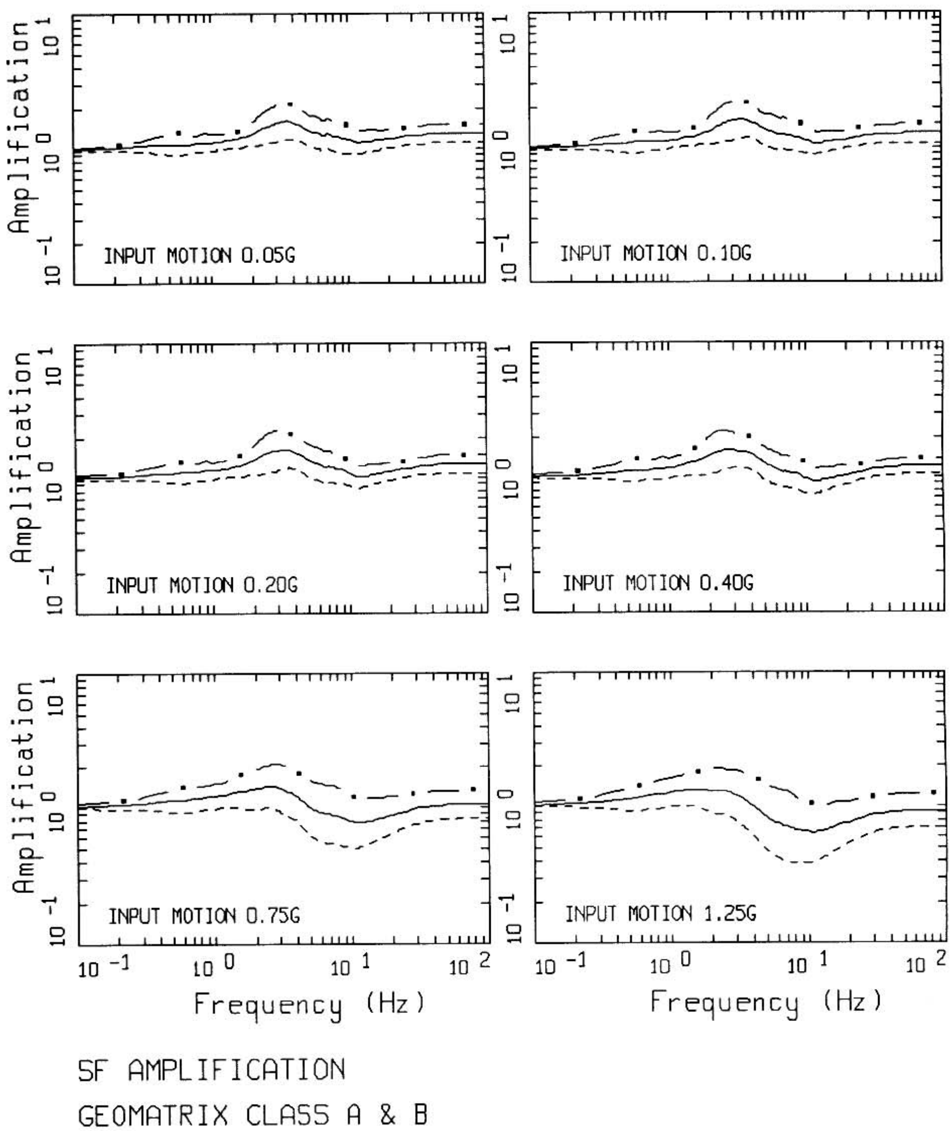


Figure 42. Amplification factors computed for Geomatrix site categories A and B (Figure 6, Table 2) relative to San Francisco area reference rock outcrop Franciscan.

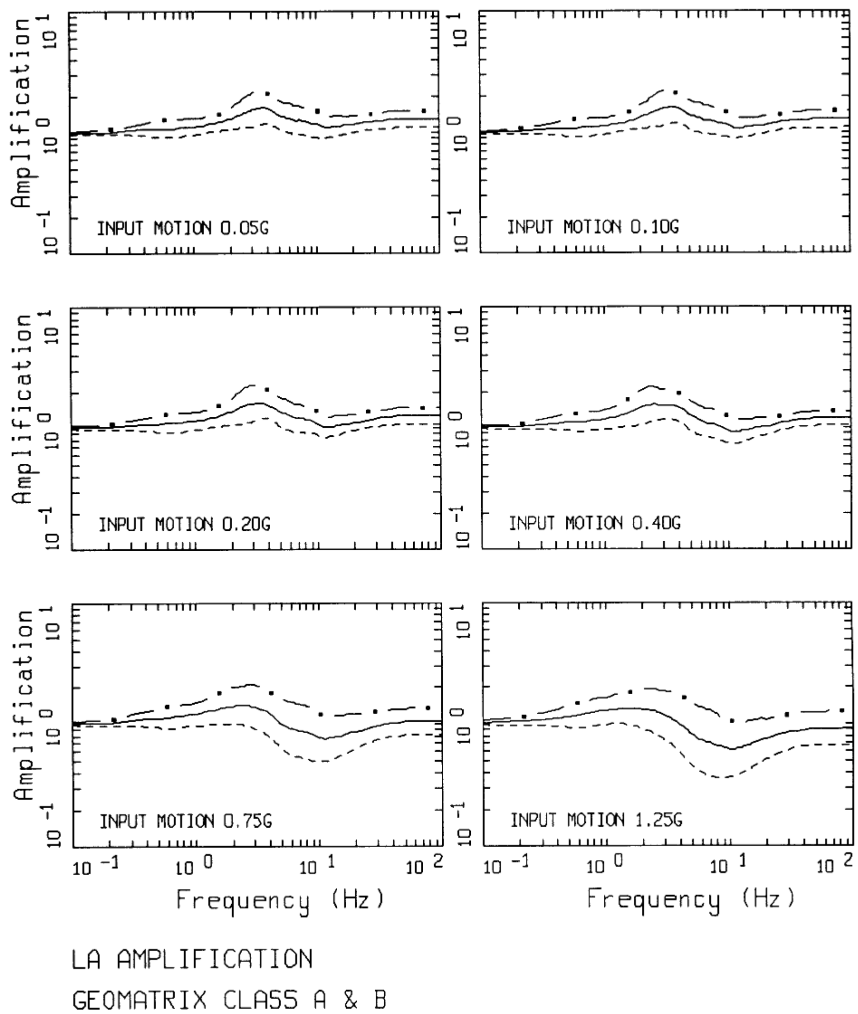


Figure 43. Amplification factors computed for Geomatrix site categories A and B (Figure 6, Table 2) relative to Los Angeles area reference rock outcrop Granite.