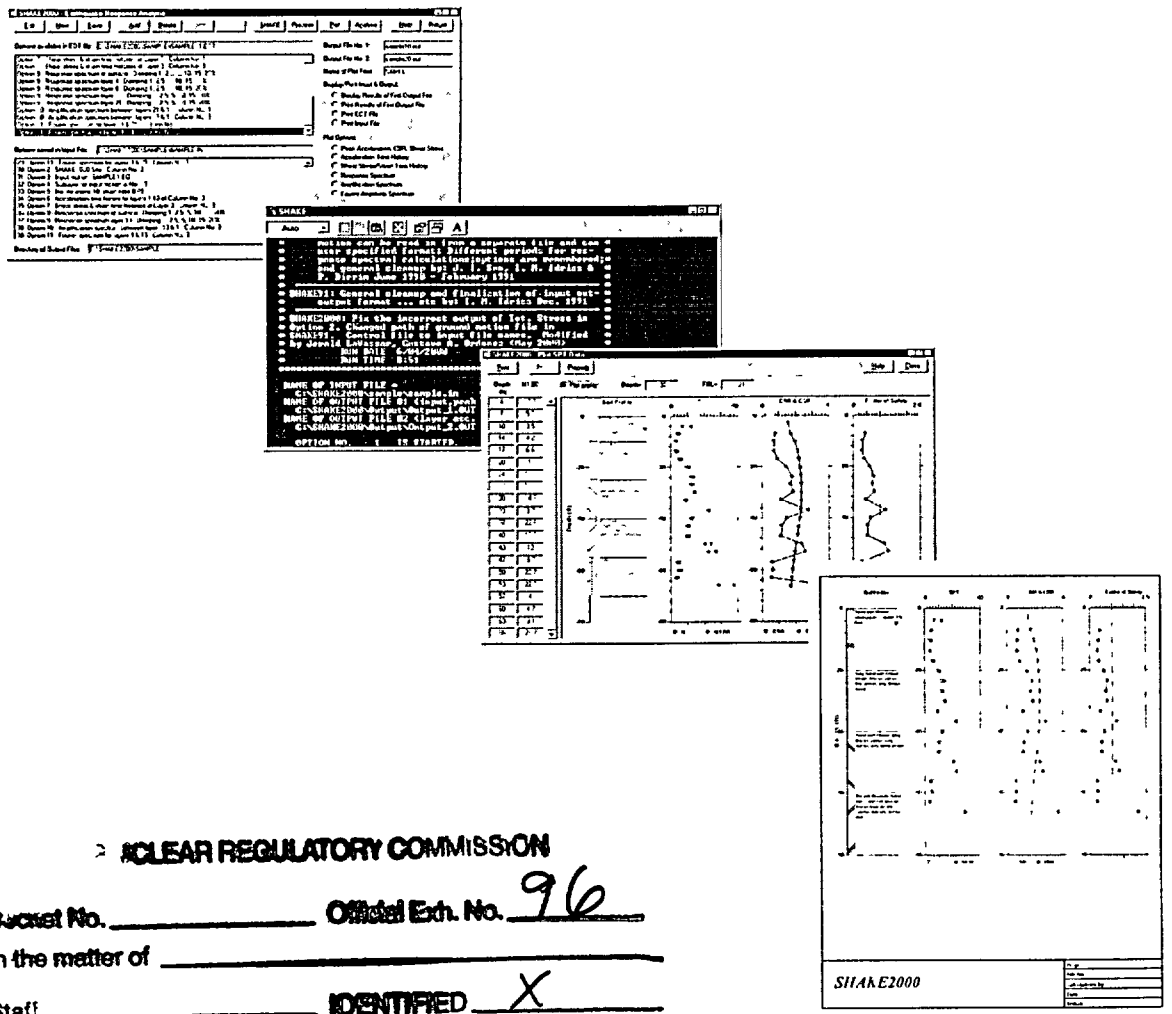
RAS 5281 72-22-ISFSI — Applicant Exhibit 96 — Rec'd 5/9/02

SHAKE2000

A Computer Program for the 1-D Analysis of Geotechnical Earthquake Engineering Problems



Gustavo A. Ordonez

Template = SECY-028

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A Computer Program for the 1-D Analysis of Geotechnical Earthquake Engineering Problems

User's Manual

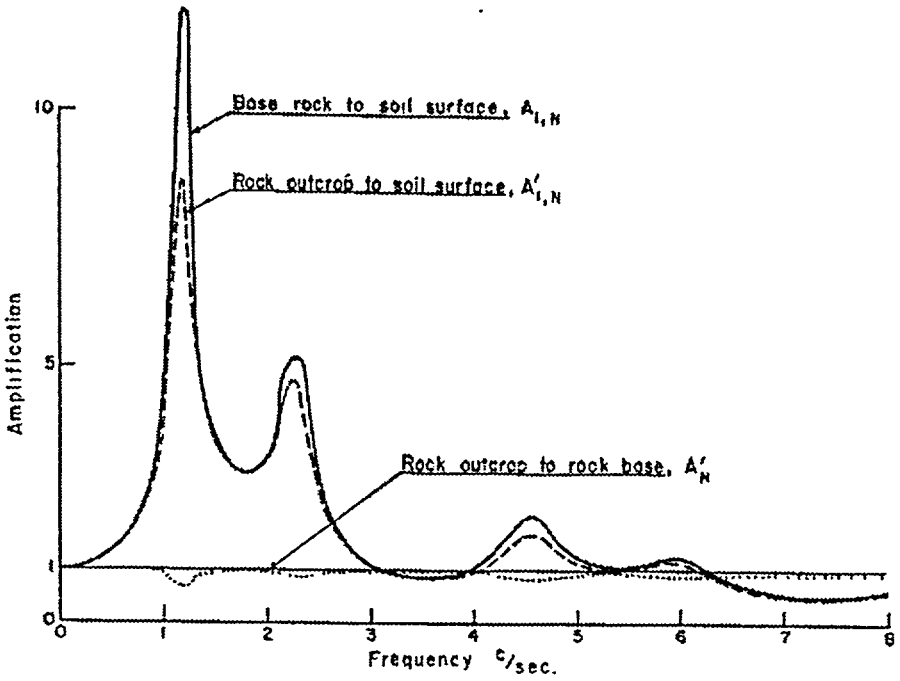

Figure 4: Transfer Functions (after Schnabel, et al. 1972).

the halfspace. This is the case for example, in sedimentary rock layers overlying a crystalline rock base. For a more accurate solution, the motion in outcropping layers must be computed in a separate system from the motion in the halfspace.

2.5 Transient Motion

The expressions developed above are valid for steady state harmonic motions. The theory can be extended to transient motions through the use of Fourier transformation.

A digitized seismogram with n equidistant acceleration values, $\ddot{u}_j(j\,\Delta t), j = 0, \ldots, n-1$, can be represented by a finite sum of harmonic motions:

$$\ddot{u}(t) = \sum_{s=0}^{n/2} \left(a_s e^{i\omega_s t} + b_s e^{-i\omega_s t} \right) \tag{27}$$

where $\omega_s, s = 0, \ldots, n/2$ are the equidistant frequencies:

$$\omega_s = \frac{2\pi}{n \cdot \Delta t} \cdot s \tag{28}$$

a_s and b_s designate the complex Fourier coefficients: