

CE6113

SOIL DYNAMICS

HOMEWORK#1

A structure subjected to simple harmonic loading responds with simple harmonic motion. Measurements show that the amplitude of structure's displacement is 1.5cm. An accelerometer mounted on the structure shows a measured amplitude of 0.10g. Recalling that $1g=9.81\text{m/sec}^2$, analytically determine:

- a) The frequency, circular frequency and period of the harmonic loading.
- b) The amplitude of the velocity of the structure in cm/sec.
- c) Plot the point that describes the motion of the structure on the attached tripartite plot. Use the tripartite plot confirm the accuracy of your answers to Parts (a) and (b).

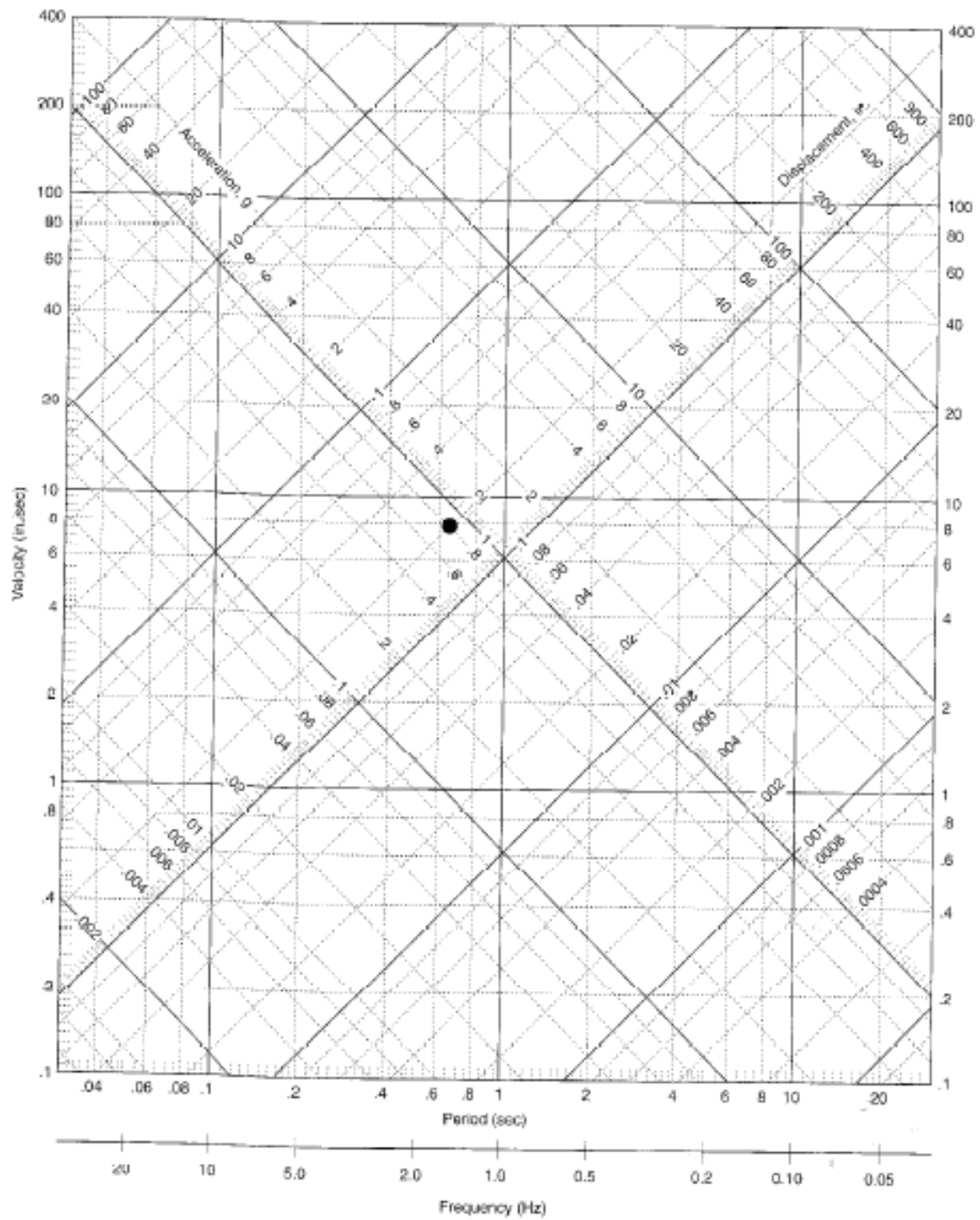


Figure A.9 Tripartite plot for harmonic motion. Point at center describes harmonic motion at a period of 0.65 sec with displacement amplitude of 0.8 in., velocity amplitude of 8.0 in./sec, and acceleration amplitude of 0.20g. (After Richart, et al., 1970.)