The propagation of vibration in the idealised situation of an infinite, homogeneous, isotropic medium is well understood, and can be predicted from theory. The propagation of vibration in the ground is much more complex. Soils are not homogeneous, but are granular, with the voids between grains sometimes being filled with water. The medium is also usually non-isotropic,consisting of a number of strata or layers, each with different elastic properties. Additional types of waves arise from interactions at the boundaries between layers, and between waves propagating in the solid soil grains and the water surrounding them. There is usually inadequate or incomplete information about the thicknesses and extent of the various layers, and about the relevant elastic properties of each soil or rock type ie elastic moduli, density, wave speeds and damping constant.

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