

COSMOS Recommended Characterization of the Nearby Environment of a Ground Response Strong Motion Station

When characterizing the conditions of a ground response strong motion station it is important to include a description of the nearby environment, since near-site conditions may significantly influence the recorded motion.

Important near-site conditions may reside below the ground surface, or at or above the ground surface. Ideal site conditions for a simple ground response site are a small, lightweight housing, no structures nearby, and simple underlying geology. For most sites practical tradeoffs are necessary; many site conditions listed below should be avoided if practical, but documented if they exist.

- 1) Conditions of the Structure Housing the Instrument
 - a) Size of structure or slab (length, width, area)
 - b) Height of structure or housing (meters, or number of stories)
 - c) Type of construction, light (e.g., wood frame and light roof), or heavy (masonry or concrete)

- 2) Conditions Below the Ground Surface
 - a) Loose near-surface materials – glacial drift and moraine materials, landslide material, poorly compacted fill, dry riverbeds
 - b) Underground voids – large pipes, tanks, caves and other voids
 - c) Buried cables – telephone, power, etc.

- 3) Conditions At or Above the Ground Surface
 - a) Tall trees, signboards, power poles and/or towers, flag poles or telephone poles, and associated guy wire anchorages
 - b) Areas of steep topography, including ridges, valleys, cliffs and embankments (natural or otherwise)
 - c) Presence of nearby buildings or other structures – distance, dimensions (base and height) and type of construction (heavy or light, e.g., concrete or wood frame) should be given
 - d) Sources of significant ongoing vibratory noise – machinery, large motors or pumps, etc.

If any of these conditions is present, supplemental information (size, height, distance away, etc.) should be included for the site characterization to be complete.

Station Photograph and Other Information Photographs are very valuable to characterize the instrument site and its nearby environment. If the instrument is in a small building or other structure, a description of where within the building the instrument is located is valuable.