

New Seismic Building Code — Using Technology to Help Clients

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The 2000 and newer versions of the International Building Code (IBC), now adopted in most northeast US states, have more rigorous criteria for soil seismic site classification than the preceding Building Code of America (BOCA).

While more stringent, the IBC also encourages the use of modern subsurface exploration techniques for seismic site classification. These techniques can reduce construction costs compared with using older, conventional test boring methods. Recently, GeoDesign successfully utilized these modern techniques on three projects that provide valuable examples.

At the Dartmouth College Alumni Gymnasium in Hanover, New Hampshire, planned interior renovations prompted the design team to evaluate the clayey silt soil profile and the seismic site classification per the IBC 2000 code. GeoDesign used seismic Cone Penetration Tests (CPT) for downhole shear wave measurements, which indicated a soil seismic site classification of D, per the IBC. Had conventional Standard Penetration Test (SPT) boring results been relied upon alone, they would have indicated a site classification of E. In this case, the difference between the site classifica-

tions saved \$50,000 to \$100,000 in construction-related costs. Following the success at the Alumni project, GeoDesign performed similar seismic CPT evaluations at two nearby projects with similar deep clayey silt soil conditions. In both cases, the soil seismic site classification was improved, saving construction costs.

Determining which seismic soil site characterization method is most appropriate at a site depends largely on the particular site geology. CPT has the advantage of four to six times faster production rates than conventional soil borings. With conventional borings to obtain samples, CPT probes can be a cost-effective tool for site characterization and seismic design. ■



Modern techniques, like seismic Cone Penetration Tests, now allowed under the International Building Code, saved \$50,000 - \$100,000 in construction costs at the Dartmouth College Alumni Gymnasium in Hanover, New Hampshire.