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# Discussion

## *Massachusetts Earthquake Design Codes* by S.A. Alsup & K.E. Franz, Vol. 4, No. 1, Spring 1989, pp. 79-82

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**T**he authors of "Massachusetts Earthquake Design Codes" have presented a brief review of the earthquake-resistant design provisions of the 1980 version of the Massachusetts State Building Code, with an emphasis on how the site geology may affect the building design and construction. Unfortunately, the state building code was revised as of July 1988, and some of the authors' comments are no longer applicable.

The most significant difference between the 1980 code provisions described by the authors and the 1988 code is the elimination of the Class A and B soil types, which were used in the assessment of the site factor (S-factor) part of the design lateral force equation. The current edition of the code has adopted the Applied Technology Council methodology of classifying soil profiles as Type S1, S2 or S3.<sup>1</sup> Basically, soil profiles with a total thickness of over 30

feet of soft or loose soils are designated Type S3, and are assigned an S-factor of 1.5. Soil profiles consisting of bedrock, glacial till, and dense sands or stiff clays less than 200 feet thick, are Type S1, with an S-factor of 1.0. All sites which do not satisfy either the S1 or S3 soil profile descriptions are Type S2 with the S-factor equal to 1.2.

The liquefaction criteria have been substantially altered in the 1988 code edition. The authors' Figure 1 (p. 81), which depicts the 1980 code recommended design response spectra for varying thicknesses of soft soils, is no longer in the 1988 code. Figure 1 (p. 81) also reproduces two errors from the 1980 code: the vertical axis should be labelled "spectral" acceleration, and the peak of the spectra should be at 0.30 g. The authors' Table 1 (p. 80), which is the 1980 building code Table 720 "Allowable Bearing Pressures for Foundation Materials," has been substantially revised in the new code, along with the addition of useful commentary on the table in Appendix X.

The Seismic Design Advisory Committee of the State Board of Building Regulations and Standards meets on a regular basis to review advances in the earthquake engineering field and discuss possible revisions to the code. The committee published an excellent overview and commentary on the 1988 revisions to the code in the Winter 1983 issue of the *Journal of the Boston Society of Civil Engineers Section/ASCE*.<sup>2</sup> This source contains a more detailed discussion of the earthquake design provisions of the 1988 code.<sup>2</sup>

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#### REFERENCES

1. Applied Technology Council, "Tentative Provisions for the Development of Seismic Regulations for Buildings," *Applied Technology Council Report 3-06*, 1978.
2. Seismic Design Advisory Committee of the Boston Society of Civil Engineers Section/ASCE, "Proposed Changes to Earthquake Design Sections, Massachusetts State Building Code," *Journal of the Boston Society of Civil Engineers Section/ASCE*, Winter 1983, pp. 209-233.