

ASCE-7 Seismic Site Classification/Seismic Design Category Determination Process for Improved Sites



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Abstract

The Seismic Site Classification and Seismic Design Category (SDC) directly impact the seismic structural detailing required by building codes. In ASCE 7-16, the SDC is a function of the structure's Risk Category, the Maximum Considered Earthquake (MCE) at the site, and the ground response characteristics of the soil/rock profile. Ground improvement techniques can be implemented to improve the response characteristics of the soil deposit and thereby improve the SDC. However, little guidance is offered in literature on this methodology. Accordingly, the goal of this report is to identify the required input parameters and summarize the generic and site-specific approaches for determining the SDC with particular interest for improved sites. Flowcharts and examples are provided to outline the key steps for SDC selection.

Report Objectives

The objectives of the report are:

1. to provide flowcharts to simplify sections of ASCE 7-10 and -16 relevant to determine the SDC;
2. to highlight three approaches to determine the SDC; and
3. to provide guidance on site-specific SDC analysis for improved sites.

Report Contents

The report contains the following sections:

1. Introduction
 2. Regulatory Process
 3. Seismic Design Category Determination
 - 3.1. The Generic Approach
 - 3.2. The Site-Specific Site Response Analysis Approach
 - 3.3. The Probabilistic Seismic Hazard Analysis (PSHA) Approach
 4. Closing Remarks
 5. References
- Appendix A: Generic SDC Examples
Appendix B: 1-D Equivalent Linear Site Response Analysis Example
Appendix C: Tables and Additional Flowcharts
- ASCE 7-16 Tables
 - ASCE 7-10 Flowcharts
 - ASCE 7-10 Tables