Seismic Design Categories

The International Building Code (IBC) classifies structures into *Seismic Design Categories* (SDC): this is different from the Uniform Building Code (UBC) which classified them into *Seismic Zones*. Seismic Design Categories go much further then merely outlining various regions of the country. Seismic Design Categories include classifications of A, B, C, D, E, and F and are based on the following three (3) basic criteria.

1. **PROBABLE SITE GROUND MOTION:**
   Probable site motion is based on Federal Emergency Management Agency (FEMA) maps, the maximum spectral acceleration and the design acceleration response.

2. **SOIL (SITE CLASS):**
   Site class is based on the type of soil. Soil classifications are A, B, C, D, E, or F.
   A. Hard Rock
   B. Rock
   C. Very Dense Soil, Soft Rock
   D. Stiff Soil (default)
   E. Soft Soil
   F. Special Soil

3. **BUILDING OCCUPANCY USE:**
   Building occupancy groups are broken into four (4) types.
   - Type IV: Agricultural Buildings
   - Type III: Essential Buildings
   - Type II: Structures that represent a substantial hazard in the event of collapse or failure
   - Type I: For buildings that do not fit Type II, III or IV

The process to determine the Seismic Design Categories must be done by an engineer. However, for ceilings, Seismic Design Categories D, E and F are roughly equivalent to seismic zones 3 & 4. Seismic Design Categories A and B are roughly equivalent to seismic zones 0 – 2. Seismic Design Category C has no UBC equivalent.

Once the Seismic Design Category is established, the placement and the installation of the lateral force bracing (compression post and splay wires) can be determined. Lateral force bracing for Seismic Design Categories D, E, and F for the IBC requirements are illustrated in the TSIB Technical Bulletin 40.101.

Note: "Seismic Zones" were introduced into the building codes in 1935 and have been continually updated over the years. The "Seismic Zone" would determine if lateral force bracing (compression post and splay wires) was needed in an acoustical lay-in ceiling and this requirement would also vary from region to region in the United States. A seismic zone is solely dependent on the probable site ground motion for a region. This was developed through experience of where earthquakes were most likely to happen and to what severity.

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