

## Guide for Waterfront/Coastal Concrete Marine Structures (ACI 357.3R-??)

1 Maintenance (MOTEMS, 2007) UFC 4-152-01(2005), or similar guidance. For larger projects,  
2 site-specific studies and criteria are usually prepared. The return period for the earthquakes  
3 should be defined by the owner.

4 Seismic loads are often divided into two levels of intensity, such as an Operating Basis  
5 Earthquake (OBE) and Strength Level Earthquake (SLE), each with differing performance  
6 expectations. These are often referred to as Level 1 and Level 2 earthquakes, respectively. The  
7 SLE/OBE should be survived with only minor non-structural damage and no loss of serviceability  
8 to the structure. The SLE should be survived with controlled and repairable damage. Structures  
9 can remain in service following the event with only minor repairs and minimal interruption of  
10 operations. In the SLE, the structure should not collapse, but may sustain damage requiring  
11 repair prior to resuming normal operations. Damage should be limited to areas which can be  
12 inspected and overall structure deformations should not preclude a return to normal service  
13 within a relatively short time.

14 Seismic loads should include the effects of potential soil liquefaction and slope instability.  
15 Kinematic loading due to ground deformations associated with liquefaction and cyclic  
16 degradation of soils near piles should be considered.

### 17 6.10 Load Combinations

18 It is recommended to proportion piers and wharves to safely resist the load combinations as  
19 represented in Tables 3-6 and 3-7 of UFC 4-152-01 (2005). The designer should analyze each  
20 component of the structure and the foundation elements for all the applicable combinations.  
21 Tables 3-6 and 3-7 list the load factors ( $f$ ) to be used for each combination and the percentage of  
22 unit stress applicable for service load combinations.

### 23 6.11 Design Concepts