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

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

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

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

6.10 Load Combinations

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

6.11 Design Concepts