

Seismic Design for Liquid-Containing Concrete Structures

In-House Seminar

ONE DAY, 7.5 HOURS (7.5 PDHs/0.75 CEUs)

Based on the ACI 350 Standard

Who should attend: Consulting engineers, government agencies including municipalities, material suppliers, testing agencies, academia, and contractors

Program Content:

ACI published a Standard for the design of environmental engineering concrete structures, specifically liquid-containing structures (LCS). The main objective of this intensive seminar will be to familiarize the attendees with the requirements for seismic design of LCS and improve the state of practice. With the use of several design examples, LCS will be designed based on the current code approach.

Basic Theory

Housner's tank model; Dynamic characteristics (circular and rectangular tanks); Mode shapes and frequencies; Equivalent mass for impulsive and convective; Effective mass coefficients; Heights to center of gravity; Stiffness parameters

Tank Configurations

Rectangular—fixed and hinged base; Circular—fixed, hinged, and flexible base; Pedestal-mounted tanks

Design Loads

Dynamic lateral forces; Base shear and base moment; Vertical acceleration

Earthquake Pressures

Hydrodynamic pressure distribution; Shear transfer

Application of Site-Specific Response Spectra

SDF system; Equation of motion; Construction of acceleration and displacement response spectra; Damping coefficients and ductility; Elastic/inelastic response spectra

Stresses

Vertical and horizontal bending stresses; Membrane stresses in circular tanks

Freeboard

Calculation of sloshing displacements

Earthquake-Induced Earth Pressures

Design of buried tanks; Calculation of seismic forces due to earth pressures

Parametric Study

Effect of tank parameters on response of circular and rectangular tanks

Design Examples

Design of tall above-ground circular and rectangular tanks with different base conditions; Design of shallow and wide above-ground circular and rectangular tanks with different base conditions; Design of circular and rectangular buried tanks; Design of pedestal-mounted tanks

Related Documents:

To expand attendees knowledge, ACI In-House Seminar customers may purchase multiple copies of related documents at 50% off the regular price.

- Code Requirements for Environmental Engineering Concrete Structures and Commentary (ACI 350-20/350R-20)
- Code Requirements for Seismic Analysis and Design of Liquid-Containing Structures (ACI 350.3-20) and Commentary
- Special handout with notes and design examples authored by the instructors

Instructors:

Two industry experts will present this seminar.

Up to 40 copies of the presentation slides included. Additional copies can be purchased.

ACI is an approved education provider for AIA and ICC.



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