UPDATE ON ASCE/COPRI PIERS AND WHARVES DESIGN CODE STANDARD

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ABSTRACT

There are many standards in the United States that engineers refer to for the analysis and design of piers and wharves. The purpose of developing an American Society of Civil Engineers/Coasts, Oceans, Ports and Rivers Institute (ASCE/COPRI) standard is to provide consistent guidance on loads and load combinations for mooring, berthing, and wave/current forces. The seismic portion of this standard has already been completed with the introduction of the new ASCE/COPRI Standard 61-14, titled “Seismic Design of Piers and Wharves.” This effort will result in a standard that includes all facets of the structural analysis and design of piers and wharves.

This presentation provides an update on a newly forming committee for ASCE/COPRI standard that will provide a national consensus regarding the analysis and design of piers and wharves. Users of this standard would include port authorities; state, local or federal regulators; and consultants. This proposed standard will include commercial terminals not intended for public occupancy such as container terminals, general cargo terminals, and petrochemical terminals. These terminals may be “fixed” to shore via a trestle or may be “island” types with some means to transfer cargo to shore.

While many resources are available as public documents, there is no single, overall U.S. standard for the design and analysis of piers and wharves. Current practice is that engineers use “default” Building Code Requirements for determining loads, load combinations and load factors, which could be sourced from the International Building Code (IBC), state-mandated, or even more stringent local codes. These defaults require design engineers to research multiple source documents to determine the appropriate and applicable design criteria to a specific structure. This case-by-case design basis can potentially result in conflicting recommendations, depending whether the basis of design is specified by type of use or the owner’s requirements.

The following list of current, existing guidance and recommended practice documents is representative of the many resources that a design engineer may have to consult when designing

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a pier or wharf.

- ASCE/COPRI 61-14 “Seismic Analysis and Design of Piers and Wharves,” 2015
- UFC 4-152-7 “Design: Piers and Wharves,” 2016
- UFC 4-152-01 “Design: Piers and Wharves,” 2017
- UFC 4-159-03 “Design: Moorings,” 2005
- MOTEMS (Marine Oil Terminal Engineering and Maintenance Standards), Chapter 31F of the California Building Code,” 2016
- “Port of Long Beach Wharf Design Criteria,” 2015
- “Port of Los Angeles – Code for Seismic Design, Upgrade and Repair of Container Wharves,” 2010
- International Navigation Association (PIANC) – Multiple documents

Therefore, consistent guidance in a standard can provide clear and concise guidance for both designer and client in the design of piers and wharves.