2019 Oregon Structural Specialty Code Amendments

Tsunami Design Standards (HB 2605)

Effective: Jan. 1, 2022

Building Codes Division

Department of Consumer and Business Services

Amendment summary:

The following amendments implement tsunami design standards for certain high-risk buildings to align with the requirements of 2021 Oregon Laws Ch. 360 (Enrolled HB 2605).

The changes are denoted as follows:

Blue/underline:	Added code language
~~Red/strikethrough:~~	Deleted code language
(Purple/italics):	Editorial note

Section 101—General scope and application

Section 101.2.1 and 101.2.2.2

This code language amends the interim chapter 1 amendments adopted April 1, 2021.

101.2.1 Optional local adoption. In addition to the work exempt from building *permit* in Section 105, the following matters are exempt from building *permits* unless specifically required by a *municipality's* local ordinance. If a *municipality* adopts an ordinance to require a *permit* for any of the items below, the construction standards of this code shall be applicable:

(Items 1-11 remain unchanged.)

~~12. Tsunami loads, in accordance with Appendix O.~~

12. Rodentproofing, in accordance with Appendix F.

13. The design and construction of in-ground *swimming pools* accessory to not more than four *dwelling units.*

101.2.2.2 Matters preempted by the state building code. The following matters are preempted by the *state building code* and may not be adopted by a local *municipality*:

1. Appendix B (Board of Appeals).
2. Appendix E (Supplementary Accessibility Requirements).
3. Appendix K (Administrative Provisions).
4. Appendix L (Earthquake Recording Instrumentation).
5. Appendix M (Tsunami-generated Flood Hazard).
6. Appendix N (Replicable Buildings).
7. Appendix O (Tsunami Loads), rescinded January 1, 2022. See Section 1615.

Section 202—Definitions

ESSENTIAL FACILITIES. *Risk Category* IV buildings and other structures ~~that are intended to remain operational in the event of extreme environmental loading from wind, snow or earthquakes~~ determined in accordance with Section ~~1803.2 and ORS 455.447~~ 1604.5.

MAJOR STRUCTURE. See ORS 455.447.

~~**TSUNAMI INUNDATION ZONE.** OAR Chapter 632, Division5.~~

TSUNAMI RISK CATEGORY III. The categorization for design of *Risk Category* III buildings and other structures located within the Tsunami Design Zone. See Section 1615 and ORS 455.447.

TSUNAMI RISK CATEGORY IV. The categorization for design of *Risk Category* IV buildings and other structures located within the Tsunami Design Zone. See Section 1615 and ORS 455.447.

Section 1613—Earthquake loads

Section 1613.5

1613.5 Earthquake Recording Instrumentation. In Seismic Design Category D, E, or F, ~~every~~ all new ~~building over six stories above grade in height with an aggregate floor area of 60,000 square feet (5574 m^2) or more, and every new building over 10 stories in height regardless of floor area~~ *major structures* and *Risk Category* III and IV buildings shall be provided with an *approved* system with not less than three *approved* recording accelerographs. The accelerographs shall be interconnected for common start and common timing.

Exception: In lieu of installing the earthquake recording instrumentation as outlined in this section, the applicant is permitted to make a deposit of an equivalent cost to the Earthquake Recording Instrument Fund in the Oregon Department of Geology and Mineral Industries (DOGAMI). Proof of this deposit shall be provided to the *building official*.

Section 1615—Tsunami loads

Section 1615.1 to 1615.2.8

1615.1 ~~Reserved~~ See Appendix O. General. The design and construction of *Tsunami Risk Category III* and *IV* buildings and other structures shall be in accordance with Chapter 6 of ASCE 7, except as modified by Section 1615.2.

1615.2 Modifications to ASCE 7, Chapter 6. The text of Chapter 6 of ASCE 7 shall be modified as indicated in Sections 1615.2.1 through 1615.2.11.

1615.2.1 ASCE 7 Section 6.1.1. Modify ASCE 7, Section 6.1.1, *Scope*, to read as follows:

Tsunami Risk Category III and *IV* buildings and other structures, as defined in Chapter 2 of the *Building Code*, located within the Tsunami Design Zone shall be designed for the effects of Maximum Considered Tsunami, including hydrostatic and hydrodynamic forces, waterborne debris accumulation and impact loads, subsidence, and scour effects in accordance with this chapter.

Tsunami Design Zone shall be determined using the ASCE Tsunami Design Geodatabase of geocoded reference points shown in Figure 6.1-1. The ASCE Tsunami Design Geodatabase of geocoded reference points of Runup and associated Inundation Limits of the Tsunami Design Zone is available at [asce7tsunami.online].

Designated nonstructural components and systems associated with *Tsunami Risk Category IV* buildings and other structures subject to this chapter shall be located above, protected from, or otherwise designed for inundation in accordance with Section 6.15 so that they are able to provide their essential functions immediately following the Maximum Considered Tsunami event.

1615.2.2 ASCE 7 Section 6.2. Modification to ASCE 7, Section 6.2, *Definitions.*

1615.2.2.1. The following terms are deleted:

CRITICAL EQUIPMENT OR CRITICAL SYSTEMS

CRITICAL FACILITY

NONBUILDING CRITICAL FACILITY STRUCTURE

TSUNAMI VERTICAL EVACUATION REFUGE STRUCTURE.

1615.2.2.2. Modify the term *Tsunami Risk Category*, to read as follows:

TSUNAMI RISK CATEGORY. See definitions in Chapter 2 of the *Building Code*.

1615.2.3 ASCE 7 Section 6.4. ASCE 7, Section 6.4, *Tsunami Risk Categories*, is deleted.

1615.2.4 ASCE Section 6.5.1. Modify ASCE 7, Section 6.5.1, *Tsunami Risk Category II and III Buildings and Other Structures, to read as follows:*

6.5.1 Tsunami Risk Category III Buildings and Other Structures. The Maximum Considered Tsunami inundation depth and tsunami flow velocity characteristics at a Tsunami Risk Category III building or other structure shall be determined by using the Energy Grade Line Analysis of Section 6.6 using the inundation limit and runup elevation of the Maximum Considered Tsunami given in Figure 6.1-1.

The site-specific Probabilistic Tsunami Hazard Analysis (PTHA) in Section 6.7 shall be permitted as an alternate to the Energy Grade Line Analysis. Site-specific velocities determined by PTHA shall be subject to the limitation in Section 6.7.6.8.

1615.2.5 ASCE Section 6.5.1.1. ASCE 7, Section 6.5.1.1, *Runup Evaluation for Areas Where No Map Values Are Given*, is deleted.

1615.2.6 ASCE Section 6.5.2. Modify the exception to ASCE 7, Section 6.5.2, *Tsunami Risk Category IV Buildings and Other Structures*, to read as follows:

Exception: A site-specific Probabilistic Tsunami Hazard Analysis need not be performed where the inundation depth resulting from the Energy Grade Line Analysis is determined to be less than 12 ft (3.66 m) at any point within the location of the *Tsunami Risk Category IV* structure.

1615.2.7 ASCE 7 Section 6.8.2. Modify ASCE 7, Section 6.8.2, *Performance of Tsunami Risk Category III Critical Facilities and Tsunami Risk Category IV Buildings and Other Structures*, to read as follows:

6.8.2 Performance of Tsunami Risk Category IV Buildings and Other Structures. *Tsunami Risk Category IV* buildings and other structures located within the Tsunami Design Zone shall be designed in accordance with the following requirements.

1. The operational nonstructural components and equipment of the building necessary for essential functions and the elevation of the bottom of the lowest horizontal structural member at the level supporting such components and equipment shall be above the inundation elevation of the Maximum Considered Tsunami.
2. Structural components and connections in occupiable levels and foundations shall be designed in accordance with Immediate Occupancy Structural Performance criteria. Occupiable levels shall be permitted where the elevation equals or exceeds the Maximum Considered Tsunami inundation elevation.

1615.2.8 ASCE 7 Table 6.8-1. Modify ASCE 7, Table 6.8-1, *Tsunami Importance Factors for Hydrodynamic and Impact Loads*, to read as follows:

Table 6.8-1 Tsunami Important Factors for Hydrodynamic and Impact Loads

Tsunami Risk Category	I_{tsu}
III	1.25
IV	1.25

1615.2.9 ASCE 7 Section 6.11. Modify the last paragraph of ASCE 7, Section 6.11, *Debris Impact Loads*, to read as follows:

Tsunami Risk Category IV buildings and other structures determined to be in the hazard zone for strikes by ships and barge in excess of 88,000 lb (39,016 kg) Deadweight Tonnage (DWT), as determined by the procedure of Section 6.11.5, shall be designed for impact by these vessels in accordance with Section 6.11.7.

1615.2.10 ASCE 7 Section 6.11.7. Modify the first sentence of ASCE 7, Section 6.11.7, *Extraordinary Debris Impacts*, to read as follows:

Where the maximum inundation depth exceeds 12 ft (3.66 m), extraordinary debris impacts of the largest deadweight tonnage vessel with ballasted draft less than the inundation depth within the debris hazard region of piers and wharves defined in Section 6.11.5 shall be assumed to impact the perimeter of *Tsunami Risk Category IV* buildings and other structures anywhere from the base of the structure up to 1.3 times the inundation depth plus the height to the deck of the vessel.

1615.2.11 ASCE 7 Section 6.14. ASCE 7, Section 6.14, *Tsunami Vertical Evacuation Refuge Structures*, is deleted.

Section 1803—Geotechnical investigations

Sections 1803.1 and 1803.3.2

1803.1 General. Geotechnical investigations shall be conducted in accordance with Section 1803.2 and reported in accordance with Section 1803.6. Where required by the *building official* or where geotechnical investigations involve in-situ testing, laboratory testing or engineering calculations, such investigations shall be conducted by a *registered design professional*.

Exception: Sites for structures and facilities defined by ORS 455.447 as ~~*essential facilities, hazardous facilities,*~~ *major structures* or ~~*specialty occupancy structures*~~ *Risk Category* III or IV structures shall be evaluated on a site-specific basis for vulnerability to seismic-induced geologic hazards as required by Section 1803.3.2.

1803.3.2 Site-specific seismic hazard investigation. Sites for structures and facilities defined by ORS 455.447 as ~~*essential facilities, hazardous facilities,*~~ *major structures* or ~~*specialty occupancy structures*~~ *Risk Category* III or IV buildings and other structures shall be evaluated on a site-specific basis for vulnerability to seismic-induced geologic hazards and reported in accordance with Section 1803.6.1. The degree of detail of investigation shall be compatible with the type of development and geologic complexity, and the structural system required by other parts of this code. This evaluation shall be done by an especially qualified engineer or engineering geologist registered by the state to practice as such. Such an evaluation and report may require the services of persons especially qualified in fields of engineering seismology, earthquake geology or geotechnical engineering.

Appendix O—Tsunami loads

(Appendix O is rescinded, effective Jan. 1, 2022)

See Section 1615 for tsunami loads.