WAC 51-50[BS(1)]-1615 Tsunami loads. ~~**1615.1 General.** The design and construction of Risk Category III and IV buildings and structures located in the Tsunami Design Zones shall be in accordance with Chapter 6 of ASCE ((7)) 7-22, except as modified by this code.~~

~~USER NOTE: The intent of the Washington state amendments to ASCE 7 Chapter 6 (Tsunami Loads and Effects) is to require use of the Washington Tsunami Design maps to determine inundation limits, i.e., when a site is within a tsunami design zone, where those maps are available. If they are not available for a given site, ASCE 7 maps are to be used. For sites where the Washington state department of natural resources has parameters for tsunami inundation depth and flow velocity available, those parameters are required to be used in ((the energy grade line analysis methodology)) lieu of ASCE 7 methodology, and as a basis for comparison in the probabilistic tsunami hazard analysis in this chapter.~~

~~**1615.2 Modifications to ASCE 7.** The text of Chapter 6 of ASCE 7 shall be modified as indicated in this section.~~

~~**1615.2.1 ASCE 7 Section 6.1.1.** Modify the third paragraph and its exception in ASCE 7 Section 6.1.1 to read as follows:~~

~~The Tsunami Design Zone shall be determined using the Washington Tsunami Design Zone maps (WA-TDZ). The WA-TDZ maps are available at https://www.dnr.wa.gov/wa-tdz. For areas not covered by the extent of the WA-TDZ maps, the Tsunami Design Zone shall be determined using the ASCE Tsunami Design Geodatabase of geocoded reference points shown in Fig. 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 http://asce7tsunami.online.~~

~~EXCEPTION: For coastal regions subject to tsunami inundation and not covered by WA-TDZ maps or Fig. 6.1-1, Tsunami Design Zone, inundation limits, and runup elevations shall be determined using the site-specific procedures of Section 6.7, or for Tsunami Risk Category II or III structures, determined in accordance with the procedures of Section 6.5.1.1 using Fig. 6.7-1.~~

~~**1615.2.2 ASCE 7 Section 6.1.1.** Add new fifth paragraph and user note to ASCE 7 Section 6.1.1 to read as follows:~~

~~Whenever a Tsunami Design Zone or Fig. 6.1-1 is referenced in ASCE 7 Chapter 6, it shall include the WA-TDZ maps, within the extent of those maps.~~

~~USER NOTE: Tsunami inundation depths and flow velocities may be obtained from the Washington state department of natural resources. See https://www.dnr.wa.gov/wa-tdz.~~

~~**1615.2.3 ASCE 7 Section 6.2.** Modify ASCE 7 Section 6.2 definitions to read as follows:~~

~~**MAXIMUM CONSIDERED TSUNAMI:** A probabilistic tsunami having a 2% probability of being exceeded in a 50-year period or a 2,475-year mean recurrence, or a deterministic assessment considering the maximum tsunami that can reasonably be expected to affect a site.~~

~~**TSUNAMI DESIGN ZONE MAP:** The Washington Tsunami Design Zone maps (WA-TDZ) designating the potential horizontal inundation limit of the Maximum Considered Tsunami, or outside of the extent of WA-TDZ maps, the map given in Fig. 6.1-1.~~

~~**1615.2.4 ASCE 7 Section 6.2.** Add new definitions to ASCE 7 Section 6.2 to read as follows:~~

~~**SHORELINE AMPLITUDE:** The Maximum Considered Tsunami amplitude at the shoreline, where the shoreline is determined by vertical datum in North American Vertical Datum (NAVD 88).~~

~~**WASHINGTON TSUNAMI DESIGN ZONE MAP (WA-TDZ):** The Washington department of natural resources maps of potential tsunami inundation limits for the Maximum Considered Tsunami, designated as follows:~~

~~Anacortes Bellingham area~~	~~MS 2018-02 Anacortes Bellingham~~
~~Columbia River~~	~~DOGAMI SP-51 (L1 scenario) adopted by WA DNR~~
~~Elliott Bay Seattle~~	~~OFR 2003-14~~
~~Everett area~~	~~OFR 2014-03~~
~~Port Angeles~~	~~MS 2022-01~~
~~((Port Angeles and)) Port Townsend area~~	~~MS 2018-03 ((Port Angeles and Port Townsend))~~
~~Port Townsend~~	~~MS 2018-03 (Partially superseded by MS 2022-01)~~
~~Puget Sound~~	~~MS 2021-01~~
~~San Juan Islands~~	~~MS 2016-01 (Partially superseded on its eastern edge by MS 2021-01)~~
~~Southern Washington Coast~~	~~MS 2018-01~~
~~Tacoma area~~	~~OFR 2009-9~~

~~The Washington state department of natural resources geodatabase of design parameters for tsunami inundation depth and flow velocity for a maximum considered tsunami from select published sources is available at the Washington TDZ website https://www.dnr.wa.gov/wa-tdz.~~

~~**1615.2.5 ASCE 7 Section 6.5.1.** Add new second paragraph to ASCE 7 Section 6.5.1 to read as follows:~~

~~6.5.1 Tsunami Risk Category II and III buildings and other structures.~~ ~~The Maximum Considered Tsunami inundation depth and tsunami flow velocity characteristics at a Tsunami Risk Category II or 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 Fig. 6.1-1.~~

~~Where tsunami inundation depth and flow velocity characteristics are available from the Washington state department of natural resources, those parameters shall be used to determine design forces in the Energy Grade Line Analysis in Section 6.6.)) the WA-TDZ maps. Those parameters shall be used as the Maximum Considered Tsunami inundation depth and tsunami flow velocity characteristics in lieu of the Energy Grade Line Analysis in Section 6.6. Where WA-TDZ maps are not available the tsunami inundation depth and tsunami flow velocity characteristics shall be determined using the Energy Grade Line Analysis of Section 6.6 using the inundation limit and runup elevation of the Maximum Considered Tsunami given in Fig. 6.1-1.~~

~~1615.2.6 ASCE 7 Section 6.5.1.1.~~ ~~Modify the first paragraph of ASCE 7 Section 6.5.1.1 to read as follows:~~

~~**6.5.1.1 Runup evaluation for areas where no map values are given.**~~ ~~For Tsunami Risk Category II and III buildings and other structures where no mapped inundation limit is shown in the Tsunami Design Zone map, the ratio of tsunami runup elevation above Mean High Water Level to *Offshore Tsunami Amplitude*, R/H_T, shall be permitted to be determined using the surf similarity parameter ξ_{100}, according to Eqs. (6.5-2a, b, c, d, or e) and Fig. 6.5-1.~~

~~**1615.2.7 ASCE 7 Section 6.5.2.** Add new second exception to the first paragraph ((to)) of ASCE 7 Section 6.5.2 to read as follows:~~

~~**6.5.2 Tsunami Risk Category IV buildings and other structures.**~~ ~~The Energy Grade Line Analysis of Section 6.6 shall be performed for Tsunami Risk Category IV buildings and other structures, and the site-specific Probabilistic Tsunami Hazard Analysis (PTHA) of Section 6.7 shall also be performed. Site-specific velocities determined by site-specific PTHA determined to be less than the Energy Grade Line Analysis shall be subject to the limitation in Section 6.7.6.8. Site-specific velocities determined to be greater than the Energy Grade Line Analysis shall be used.~~

~~EXCEPTIONS: For structures other than Tsunami Vertical Evacuation Refuge Structures, 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.~~

~~Where ((tsunami inundation depths and)) design flow velocities are available ((for a site from the Washington state department of natural resources, those parameters shall be used as the basis of comparison for the PTHA above and to determine whether the exception applies, in lieu of the Energy Grade Line Analysis)) from WA-TDZ maps, those parameters shall be used, in lieu of the Energy Grade Line Analysis, as the basis of comparison with the site-specific velocities determined by site-specific PTHA.~~

~~**1615.2.8 ASCE 7 Section 6.6.1.** Add new ((third paragraph)) user note to ASCE 7 Section 6.6.1 to read as follows:~~

~~**6.6.1 Maximum inundation depth and flow velocities based on runup.** The maximum inundation depths and flow velocities associated with the stages of tsunami flooding shall be determined in accordance with Section 6.6.2. Calculated flow velocity shall not be taken as less than 10 ft/s (3.0 m/s) and need not be taken as greater than the lesser of 1.5(~~$\cancel{gh_{max}}$~~)~~$\cancel{^{1/2}}$~~ and 50 ft/s (15.2 m/s).~~

~~Where the maximum topographic elevation along the topographic transect between the shoreline and the inundation limit is greater than the runup elevation, one of the following methods shall be used:~~

~~1. The site-specific procedure of Section 6.7.6 shall be used to determine inundation depth and flow velocities at the site, subject to the ((above)) range of calculated velocities defined in the first paragraph of this section.~~

~~2. For determination of the inundation depth and flow velocity at the site, the procedure of Section 6.6.2, Energy Grade Line Analysis, shall be used, assuming a runup elevation and horizontal inundation limit that has at least 100% of the maximum topographic elevation along the topographic transect.~~

~~((Where tsunami inundation depths and flow velocities are available from Washington state department of natural resources, those parameters shall be used to determine design forces in the Energy Grade Line Analysis in Section 6.6.2.))~~

~~3. Where the site lies within a completely overwashed area for which inundation depth points are provided in the ASCE Tsunami Design Geodatabase, the inundation elevation profiles shall be determined using the Energy Grade Line Analysis with the following modifications.~~

~~a. The Energy Grade Line Analysis shall be initiated from the inland edge of the overwashed land with an inundation elevation equal to the maximum topographic elevation of the overwashed portion of the transect.~~

~~b. The Froude number shall be 1 at the inland edge of the overwashed land and shall vary linearly with distance to match the value of the Froude number determined at the shoreline per the coefficient α.~~

~~c. The Energy Grade Line Analysis flow elevation profile shall be uniformly adjusted with a vertical offset such that the computed inundation depth at the inundation depth point is at least the depth specified by the ASCE Tsunami Design Geodatabase, but the flow~~

~~elevation profile shall not be adjusted lower than the topographic elevations of the overwashed land transect.~~

~~USER NOTE:~~ ~~Where tsunami inundation depths and flow velocities are available from the WA-TDZ maps, those parameters shall be used as the Maximum Considered Tsunami inundation depth and tsunami flow velocity in lieu of the Energy Grade Line Analysis in Section 6.6.2.~~

~~**1615.2.9 ASCE 7 Section 6.7.** Modify ASCE 7 Section 6.7 and add a user note to read as follows:~~

~~When required by Section 6.5, the inundation depths and flow velocities shall be determined by site-specific inundation studies complying with the requirements of this section. Site-specific analyses shall use an integrated generation, propagation, and inundation model that replicates the given offshore tsunami waveform amplitude and period from the seismic sources given in Section 6.7.2.~~

~~USER NOTE:~~ ~~((Washington Tsunami Design Zone maps and inundation depths and flow velocities from Washington state department of natural resources)) WA-TDZ maps are based on an integrated generation, propagation, and inundation model replicating waveforms from the seismic sources specific to Washington state. ((Model data can be obtained by contacting Washington state department of natural resources.)) See https://www.dnr.wa.gov/wa-tdz.~~

~~**1615.2.10 ASCE 7 Section 6.7.5.1**((, **Item 4**)). ((Modify)) Add new exceptions to ASCE 7 Section 6.7.5.1, Item 4, Item 5, and Item 6, to read as follows:~~

~~**6.7.5.1 Offshore tsunami amplitude for distant seismic sources.** Offshore tsunami amplitude shall be probabilistically determined in accordance with the following:~~

~~4. ((The value of tsunami wave amplitude shall be not less than 80% of the shoreline amplitude value associated with the Washington state inundation models as measured in the direction of the incoming wave propagation.)) The extent of offshore tsunami amplitude points considered for the site shall include the following:~~

~~a. For sites within Washington, Oregon, California, and Hawaii, the extent shall include points within at least 40 mi (64.4 km) but not exceeding 50 mi (80.5 km) of projected length along the coastline, centered on the site within a tolerance of plus or minus 6 mi (9.7 km);~~

~~b. For sites within Alaska, the extent shall include points within at least 100 mi (161 km) but not exceeding 125 mi (201 km), centered on the site within a tolerance of plus or minus 15 mi (24.1 km);~~

~~c. For sites within bays, the designated center of the computed offshore tsunami amplitude points shall be taken either offshore of the mouth of the bay or centered in accordance with criteria a. or b. above, whichever produces the more severe flow conditions at the site.~~

~~d. For island locations where the projected width of the island is less than 40 mi (64.4 km), it shall be permitted to consider the extent of offshore tsunami amplitude points corresponding to the~~

~~projected width of the island. Shorter extents of offshore tsunami amplitude points shall be permitted for island locations, but shall not be less than 10 mi (16.1 km). In addition, the tsunami source development and inundation modeling are subject to an independent peer review by a tsunami modeler approved by the authority having jurisdiction, who shall present a written report to the authority having jurisdiction as to the hazard consistency of the modeling with the requirements of Section 6.7.~~

~~EXCEPTION:~~ ~~Where tsunami inundation depths are available from the WA-TDZ maps, the shoreline tsunami amplitudes shall be used as the basis of comparison, in lieu of the offshore tsunami amplitudes. The extents of shoreline tsunami amplitude points considered for the site shall be determined along the coastline, in the same manner as those of offshore tsunami amplitude points, but without projecting from the coastline toward the offshore.~~

~~5. The mean value of the computed offshore tsunami wave amplitudes shall be not less than 100% of the mean value for the coinciding offshore tsunami amplitude data given by the ASCE Tsunami Design Geodatabase.~~

~~EXCEPTION:~~ ~~Where tsunami inundation depths are available from the WA-TDZ maps, the computed shoreline tsunami amplitudes shall be used as the basis of comparison, in lieu of the computed offshore tsunami amplitudes, with the coinciding shoreline tsunami inundation data associated with the WA-TDZ maps as measured in the direction of the incoming wave propagation.~~

~~6. The individual values of the computed offshore tsunami wave amplitude shall be not less than 80% of the coinciding offshore tsunami amplitude values given by the ASCE Tsunami Design Geodatabase.~~

~~EXCEPTION:~~ ~~Where tsunami inundation depths are available from the WA-TDZ maps, the computed shoreline tsunami amplitudes shall be used as the basis of comparison, in lieu of the computed offshore tsunami amplitudes, with the coinciding shoreline tsunami inundation data associated with the WA-TDZ maps as measured in the direction of the incoming wave propagation.~~

~~**1615.2.11 ASCE 7 Table 6.7-2.** Modify ASCE 7 Table 6.7-2 to read as follows:~~

~~**Table 6.7-2**~~

~~**Maximum Moment Magnitude**~~

~~**Subduction Zone**~~	~~**Moment Magnitude M_{Wmax}**~~
~~Alaskan-Aleutian~~	~~9.2~~
~~Cascadia~~	~~9.0~~
~~Chile-Peru~~	~~9.5~~
~~Izu-Bonin-Mariana~~	~~9.0~~
~~Kamchatka-Kurile and Japan Trench~~	~~9.4~~

~~**1615.2.12 ASCE 7 Section 6.7.5.2.** ((Modify)) Add new exception to the first paragraph of ASCE 7 Section 6.7.5.2 to read as follows:~~

~~**6.7.5.2 Direct computation of probabilistic inundation and runup.** It shall be permitted to compute probabilistic inundation and runup directly from a probabilistic set of sources, source characterizations, and uncertainties consistent with Section 6.7.2, Section 6.7.4, and the computing conditions set out in Section 6.7.6. ((The shoreline amplitude values computed shall not be lower than 80% of the shoreline amplitude value associated with the Washington state inundation models as measured in the direction of the incoming wave propagation.~~

~~**1615.2.13**)) The offshore wave amplitudes computed shall comply with the requirements of Sections 6.7.5.1.4, 6.7.5.1.5, and 6.7.5.1.6.~~

~~EXCEPTION: Where tsunami inundation depths are available from the WA-TDZ maps, the computed shoreline tsunami amplitudes shall be used as the basis of comparison, in lieu of the computed offshore tsunami amplitudes for complying with the requirements of Sections 6.7.5.1.4, 6.7.5.1.5, and 6.7.5.1.6.~~

~~**1615.2.13 ASCE 7 Section 6.7.5.3.** Add new exceptions to ASCE 7 Section 6.7.5. 3.1(b) and (c) to read as follows:~~

~~b. The mean value of the computed offshore tsunami amplitudes is at least 85% of the mean value for the coinciding offshore tsunami amplitude data of the ASCE Tsunami Design Geodatabase.~~

~~EXCEPTION: Where tsunami inundation depths are available from the WA-TDZ maps, the computed shoreline tsunami amplitudes shall be used as the basis of comparison, in lieu of the computed offshore tsunami amplitudes, with the coinciding shoreline tsunami inundation data associated with the WA-TDZ maps as measured in the direction of the incoming wave propagation.~~

~~c. The values of the computed offshore tsunami wave amplitude are not less than 75% of the coinciding offshore tsunami amplitude values of the ASCE Tsunami Design Geodatabase.~~

~~EXCEPTION: Where tsunami inundation depths are available from the WA-TDZ maps, the computed shoreline tsunami amplitudes shall be used as the basis of comparison, in lieu of the computed offshore tsunami amplitudes, with the coinciding shoreline tsunami inundation data associated with the WA-TDZ maps as measured in the direction of the incoming wave propagation.~~

~~**1615.2.14 ASCE 7 Section 6.7.6.2.** Modify ASCE 7 Section 6.7.6.2 and add a user note to read as follows:~~

~~**6.7.6.2 Seismic subsidence before tsunami arrival.** Where the seismic source is a local earthquake event, the Maximum Considered Tsunami inundation shall be determined for an overall elevation subsidence value shown in Fig. 6.7-3(a) and 6.7-3(b) or shall be directly computed for the seismic source mechanism. The GIS digital~~

~~map layers of subsidence are available in the ASCE Tsunami Design Geodatabase at http://asce7tsunami.online.~~

~~USER NOTE: The WA-TDZ maps include computed subsidence~~ and uplift (where applicable) ~~in the inundation~~ results. ~~Subsidence data may be obtained from the Washington state department of natural resources. See https://www.dnr.wa.gov/wa-tdz.~~

~~((**1615.2.14**))~~ **1615.2.15** ~~**ASCE 7 Section 6.8.9.** Modify the first sentence of ASCE 7 Section 6.8.9 to read as follows:~~

~~**6.8.9 Seismic effects on the foundations preceding maximum considered tsunami.** Where designated in the Tsunami Design Zone map as a site subject to a tsunami from a local earthquake, the structure shall be designed for the preceding coseismic effects.~~

1615.1 General. The design and construction of Risk Category III and IV buildings and structures located in the Tsunami Design Zones shall be in accordance with Chapter 6 of ASCE 7-22, except as modified by this code. Wherever ASCE 7 is referenced herein, it shall refer to ASCE 7-22, within the extent of ASCE 7 Chapter 6 and WAC 51-50-1615.

USER NOTE: The intent of the Washington state amendments to ASCE 7 Chapter 6 (Tsunami Loads and Effects) is to require use of the Washington Tsunami Design Zone maps to determine inundation limits, i.e., when a site is within a tsunami design zone. The Washington state department of natural resources has parameters for tsunami inundation depth and flow velocity available for all of Washington's coastal waters and tidally influenced riverine systems (WA-TDZ). These parameters are required to be used in lieu of ASCE Tsunami Design Geodatabase, and as a basis for comparison in the probabilistic tsunami hazard analysis in this chapter.

1615.2 Modifications to ASCE 7. The text of Chapter 6 of ASCE 7 shall be modified as indicated in this section.

1615.2.1 ASCE 7 Section 6.1.1. Replace the third paragraph of ASCE 7 Section 6.1.1 with the following and remove the associated

Exception:

The Tsunami Design Zone shall be determined using the Washington Tsunami Design Zone maps (WA-TDZ). The WA-TDZ maps are available at https://www.dnr.wa.gov/wa-tdz.

1615.2.2 ASCE 7 Section 6.1.1. Add new fifth paragraph and user note to ASCE 7 Section 6.1.1 to read as follows:

Whenever a Tsunami Design Zone or Fig. 6.1-1 is referenced in ASCE 7 Chapter 6, the WA-TDZ maps shall be used.

USER NOTE: Tsunami design zone and design parameters may be obtained from the Washington state department of natural resources. See https://www.dnr.wa.gov/wa-tdz.

1615.2.3 ASCE 7 Section 6.2. Modify ASCE 7 Section 6.2 definitions to read as follows:

ASCE TSUNAMI DESIGN GEODATABASE: Not Adopted.

USER NOTE: The ASCE tsunami design geodatabase is not adopted for design purposes in Washington State.

MAXIMUM CONSIDERED TSUNAMI: A probabilistic tsunami having a 2% probability of being exceeded in a 50-year period or a 2,475-year mean recurrence, or a deterministic assessment considering the maximum tsunami that can reasonably be expected to affect a site.

TSUNAMI DESIGN ZONE MAP: The Washington Tsunami Design Zone maps (WA-TDZ) designating the potential horizontal inundation limit of the Maximum Considered Tsunami found at www.dnr.wa.gov/wa-tdz.

1615.2.4 ASCE 7 Section 6.2. Add new definitions to ASCE 7 Section 6.2 to read as follows:

WASHINGTON TSUNAMI DESIGN ZONE MAP (WA-TDZ): The Washington

Department of Natural Resources maps of potential tsunami inundation limits for the Maximum Considered Tsunami, designated as follows:

Columbia River	DOGAMI SP-51 (L1 scenario) adopted by WA DNR
Outer Coast and Strait area	MS 2022-01
Port Townsend	MS 2018-03 [Partially superseded by MS 2022-01]
Puget Sound	MS 2021-01 [revised 2022]
San Juan Islands	MS 2016-01 [Partially superseded on its eastern edge by MS 2021-01]
Southern Washington Coast	MS 2018-01

The Washington State Department of Natural Resources geodatabase of design parameters for tsunami inundation depth, flow velocity, offshore tsunami amplitude, predominant period, and tsunami design zone maps for a maximum considered tsunami is available at the Washington TDZ website [https://www.dnr.wa.gov/wa-tdz].

1615.2.5 ASCE 7 Section 6.5.1. Add new second paragraph to ASCE 7 Section 6.5.1 to read as follows:

6.5.1 Tsunami Risk Category II and III buildings and other structures. The Maximum Considered Tsunami inundation depth and tsunami flow velocity characteristics at a Tsunami Risk Category II or III building or other structure shall be determined by the WA-TDZ maps. Those parameters shall be used as the Maximum Considered Tsunami inundation depth and tsunami flow velocity characteristics in lieu of the Energy Grade Line Analysis in Section 6.6.

1615.2.6 ASCE 7 Section 6.5.1.1. Modify the first paragraph of ASCE 7 Section 6.5.1.1 to read as follows:

6.5.1.1 Runup evaluation for areas where no map values are given. For Tsunami Risk Category II and III buildings and other structures where no mapped inundation limit is shown in the Tsunami Design Zone map, the ratio of tsunami runup elevation above Mean High Water Level to Offshore Tsunami Amplitude, R/HT, shall be permitted to be determined using the surf similarity parameter ξ100, according to Eqs. (6.5-2a, b, c, d, or e) and Fig. 6.5-1.

1615.2.7 ASCE 7 Section 6.5.2. Modify the paragraph and the exception, to read as follows:

6.5.2 Tsunami Risk Category IV buildings and other structures. A site-specific Probabilistic Tsunami Hazard Analysis (PTHA) shall be performed for Tsunami Risk Category IV buildings and other structures. Site-specific velocities determined by site-specific PTHA determined to be less than the design flow velocities determined from the WA-TDZ maps shall be subject to the limitation in Section 6.7.6.8. Site-specific velocities determined to be greater than the WA-TDZ map velocities shall be used.

EXCEPTIONS: 1. For structures other than Tsunami Vertical Evacuation Refuge Structures, a site-specific Probabilistic Tsunami Hazard Analysis need not be performed where the inundation depth determined from the WA-TDZ maps is determined to be less than 12 ft (3.66 m) at any point within the location of the Tsunami Risk Category IV structure.

1615.2.8 ASCE 7 Section 6.6.1. Replace ASCE 7 Section 6.6.1 to read as follows:

6.6.1 Maximum inundation depth and flow velocities. The maximum inundation depths and flow velocities associated with the stages of tsunami flooding are determined by the WA-TDZ maps. Flow velocity for design purposes shall not be taken as less than 10 ft/s (3.0 m/s) and need not be taken as greater than the lesser of 1.5(ghmax)^1/2 and 50 ft/s (15.2 m/s).

1615.2.9 ASCE 7 Section 6.7. Replace ASCE 7 Section 6.7 with the following and add a user note:

When required by Section 6.5, the inundation depths and flow velocities shall be determined by site-specific inundation studies com- plying with the requirements of this section. Site-specific analyses shall use an integrated generation, propagation, and inundation model that replicates the given offshore tsunami waveform amplitude and period from the seismic sources given in Section 6.7.2.

USER NOTE: WA-TDZ maps are based on an integrated generation, propagation, and inundation model replicating waveforms from the seismic sources specific to Washington state. See https:// www.dnr.wa.gov/wa-tdz.

1615.2.10 ASCE 7 Table 6.7-2. Modify ASCE 7 Table 6.7-2 to read as follows:

Table 6.7-2

Maximum Moment

Magnitude

Subduction Zone	Moment Magnitude M_{Wmax}
Alaskan-Aleutian	9.2
Cascadia	9.0
Chile-Peru	9.5
Izu-Bonin-Mariana	9.0
Kamchatka-Kurile and Japan Trench	9.4

1615.2.11 ASCE 7 Section 6.7.5.1. Modify ASCE 7 Section 6.7.5.1 Item 4, Item 5, and Item 6 to read as follows:

6.7.5.1 Offshore tsunami amplitude for distant seismic sources. Offshore tsunami amplitude shall be probabilistically determined in accordance with the following:

4. The extent of offshore tsunami amplitude points considered for the site shall include the following:

(a) For outer coast sites, the extent shall include points within at least 40 mi (64.4 km) but not exceeding 50 mi (80.5 km) of projected length along the coastline, centered on the site within a tolerance of plus or minus 6 mi (9.7 km);

(b) Reserved;

(c) For sites within bays or inland waterways (such as the Strait of Juan de Fuca), the designated center of the computed offshore tsunami amplitude points shall be taken offshore of the mouth of the bay or waterway centered in accordance with criteria (a) above.

(d) For island locations where the projected width of the island is less than 40 mi (64.4 km), it shall be permitted to consider the extent of offshore tsunami amplitude points corresponding to the projected width of the island. Shorter extents of offshore tsunami amplitude points shall be permitted for island locations, but shall not be less than 10 mi (16.1 km).

(e) In addition to the above, the tsunami source development and inundation modeling are subject to an independent peer review by a tsunami modeler approved by the Authority Having Jurisdiction, who shall present a written report to the Authority Having Jurisdiction as to the hazard consistency of the modeling with the requirements of Section 6.7.

5. The mean value of the computed offshore tsunami wave amplitudes shall be not less than 100% of the mean value for the coinciding offshore tsunami amplitude data given by the WA-TDZ maps.

6. The individual values of the computed offshore tsunami wave amplitude shall be not less than 80% of the coinciding offshore tsunami amplitude values given by the WA-TDZ maps.

1615.2.12 ASCE 7 Section 6.7.5.3. Modify ASCE 7 Section 6.7.5.3.1(b) and (c) to read as follows:

(b) The mean value of the computed offshore tsunami amplitudes is at least 85% of the mean value for the coinciding offshore tsunami amplitude data of the WA-TDZ maps.

(c) The values of the computed offshore tsunami wave amplitude are not less than 75% of the coinciding offshore tsunami amplitude values of the WA-TDZ maps.

1615.2.13 ASCE 7 Section 6.7.6.2. Modify ASCE 7 Section 6.7.6.2 and add a user note to read as follows:

6.7.6.2 Seismic subsidence before tsunami arrival. Where the seismic source is a local earthquake event, the Maximum Considered Tsunami inundation shall be determined for an overall elevation subsidence value directly computed for the seismic source mechanism.

USER NOTE: WA-TDZ maps include computed subsidence and uplift (where applicable) in the inundation results. See https:// www.dnr.wa.gov/wa-tdz.

1615.2.14 ASCE 7 Figure 6.7-3. Remove Figure 6.7-3 and the associated note.

1615.2.15 ASCE 7 Section 6.8.9. Modify the first sentence of ASCE 7 Section 6.8.9 to read as follows:

6.8.9 Seismic effects on the foundations preceding maximum considered tsunami. Where designated in the Tsunami Design Zone map as a site subject to a tsunami from a local earthquake, the structure shall be designed for the preceding coseismic effects.

WAC 51-50-480200 Section 201.3—Definitions.

SUBSTANTIAL DAMAGE. For the purpose of determining compliance with the flood provisions of this code, damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the value determined ~~using the latest building valuation data published by the International Code Council. If ICC building valuation data is not applicable to this building or structure, the value may be established using an approved market valuation of the structure before the damage occurred.~~ by one of the following methods:

1. Values developed for property tax assessment, adjusted to the approximate market value where the land is appraised separately from the structure.
2. Through a professional appraiser using estimates of a structure's actual cash value, including depreciation and improvements.
3. The latest building valuation data published by the International Code Council.
4. ~~1.~~4. Qualified estimates based on the professional judgement of the building official. However, when the ratio falls between 40 and 60 percent, the building official may require the applicant to provide a detailed list of costs.

SUBSTANTIAL IMPROVEMENT. For the purpose of determining compliance with the flood provisions of this code, any repair, alteration, addition, or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the value determined ~~using the latest building valuation data published by the International Code Council. If ICC building valuation data is not applicable to this building or structure, the value may be established using an approved market valuation of the structure, before the improvement or repair is started.~~ by one of the following methods:

1. Values developed for property tax assessment, adjusted to the approximate market value where the land is appraised separately from the structure.
2. Through a professional appraiser using estimates of a structure's actual cash value, including depreciation and improvements.
3. The latest building valuation data published by the International Code Council.
4. Qualified estimates based on the professional judgement of the building official. However, when the ratio falls between 40 and 60 percent, the building official may require the applicant to provide a detailed list of costs.

If the structure has sustained substantial damage, any repairs are considered substantial improvement regardless of the actual repair work performed. The term does not, however, include either of the following:

1. Any project for improvement of a building required to correct existing health, sanitary or safety code violations identified by the code official and that is the minimum necessary to ensure safe living conditions.

2. Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure.

[Statutory Authority: RCW 19.27.031 and 19.27.074. WSR 21-12-103, § 51-50-480200, filed 6/2/21, effective 7/3/21; WSR 20-21-021, § 51-50-480200, filed 10/9/20, effective 11/9/20.]

Option 1

306.7.1 Alterations affecting an area containing a primary function. Where an alteration affects the accessibility to, or contains an area of primary function, the route to the primary function area shall be accessible. The accessible route to the primary function area shall include toilet facilities and drinking fountains serving the area of primary function. Priority shall be given to the improvements affecting the accessible route to the primary function area.

EXCEPTIONS: 1. The costs of providing the accessible route are not required to exceed 20 percent of the costs of the alterations affecting the area of primary function.

2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.

3. This provision does not apply to alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.

4. This provision does not apply to alterations undertaken for the primary purpose of increasing the accessibility of a facility.

5. This provision does not apply to altered areas limited to Type B dwelling and sleeping units.

Option 2

306.7.1 Alterations affecting an area containing a primary function. Where an alteration affects the accessibility to or contains an area of primary function, the route to the primary function area shall be accessible. ~~The accessible route to the primary function area shall include toilet facilities and drinking fountains serving the area of primary function.~~ Toilet facilities and drinking fountains serving the area of primary function, including the route from the area of primary function to these facilities, shall be accessible.

EXCEPTIONS: 1. The cumulative costs of providing the accessible route of travel, toilet facilities, and drinking fountains are not required to exceed 20 percent of the costs of the alterations affecting the area of primary function.

2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets, and signs.

3. This provision does not apply to alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems, and abatement of hazardous materials.

4. This provision does not apply to alterations undertaken for the primary purpose of increasing the accessibility of a facility.

5. This provision does not apply to altered areas limited to Type B dwelling and sleeping units.

Option 3

306.7.1 Alterations affecting an area containing a primary function. Where an alteration affects the accessibility to, or contains an area of primary function, the route to the primary function area shall be accessible. ~~The accessible route to the primary function area shall include toilet facilities and drinking fountains serving the area of~~

~~primary function.~~ Toilet facilities and drinking fountains serving the area of primary function, including the route from the area of primary function to these facilities, shall be accessible. Priority shall be given to the improvements affecting the accessible route to the primary function area.

EXCEPTIONS:

1. The cumulative costs of providing the accessible route of travel, toilet facilities, and drinking fountains are not required to exceed 20 percent of the costs of the alterations affecting the area of primary function.
2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to alterations undertaken for the primary purpose of increasing the accessibility of a facility.
5. This provision does not apply to altered areas limited to Type B dwelling and sleeping units.

401.4 Demolition and replacement. Where a building or structure is effectively demolished by damage or where the intended method of repair is demolition and replacement, the replaced building, including its replaced foundation, ~~or remaining foundation as approved by the code official,~~ shall comply with requirements for new construction in the *International Building Code*.

Exception: Existing foundations are permitted to remain and be reused where approved by the code official.

503.13 Voluntary lateral force-resisting system alterations. Structural alterations that are intended exclusively to improve the lateral force resisting system and are not required by other sections of this code, shall not be required to meet the requirements of Section 1609 or 1613 of the *International Building Code*, provided that all of the following apply:

1. The capacity of existing structural systems to resist forces is not reduced.

2. New structural elements are detailed and connected to existing or new structural elements as required by the selected design criteria. ~~*International Building Code* for new construction.~~

2.1 Where approved, new lateral force-resisting systems are permitted to be of a type designated as "Ordinary" or "Intermediate" where ASCE 7 Table 12.2-1 states these types of systems are not permitted provided that both of the following apply:

2.1.1 The selected design criteria is the International Building Code.

2.1.2 The new "Ordinary" or "Intermediate" system provides deformation compatibility with the existing lateral force-resisting system.

~~EXCEPTION: New lateral force-resisting systems designed in accordance with the *International Building Code* are permitted to be of a type designated as "ordinary" or "intermediate" where ASCE 7 Table 12.2-1 states these types of systems are not permitted.~~

3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by the *International Building Code* for new construction.

4. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.

805.4 Voluntary lateral force-resisting system alterations. Structural alterations that are intended exclusively to improve the lateral force resisting system and are not required by other sections of this code shall not be required to meet the requirements of Section 1609 or Section 1613 of the *International Building Code*, provided that the following conditions are met:

1. The capacity of existing structural systems to resist forces is not reduced.

2. New structural elements are detailed and connected to existing or new structural elements as required by the selected design criteria. ~~*International Building Code* for new construction.~~

2.1 Where approved, new lateral force-resisting systems are permitted to be of a type designated as "Ordinary" or "Intermediate" where ASCE 7 Table 12.2-1 states these types of systems are not permitted provided that both of the following apply:

2.1.1 The selected design criteria is the International Building Code.

2.1.2 The new "Ordinary" or "Intermediate" system provides deformation compatibility with the existing lateral force-resisting system.

~~EXCEPTION: New lateral force-resisting systems designed in accordance with the *International Building Code* are permitted to be of a type designated as "ordinary" or "intermediate" where ASCE 7 Table 12.2-1 states these types of systems are not permitted.~~

3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by the *International Building Code* for new construction.

4. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.