



Oregon

Kate Brown, Governor

Seismic Safety Policy Advisory Commission

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To: Governor Kate Brown, Oregon Senate President Peter Courtney,
House Speaker Tina Kotek, State Resilience Officer Mike Harryman,
Oregon Coastal Caucus, Legislative Assembly

From: Oregon Seismic Safety Policy Advisory Commission (OSSPAC)

Subject: Recommendations to Improve the Resilience of Critical Buildings on the Oregon Coast

The mission of the Oregon Seismic Safety Policy Advisory Commission (OSSPAC) is to reduce earthquake risks by developing and influencing policy at the federal, state and local levels; facilitating improved public understanding; encouraging identification of risk; and supporting research, mitigation, and resilience. A key role of the Commission is to advise the Governor and Legislative Assembly on plans and proposals addressing seismic hazards. OSSPAC would like to provide recommendations on how to improve the seismic safety of critical buildings on the Oregon coast now that HB3309 has passed this legislative session.

As documented in the Oregon Resilience Plan (ORP, 2013), in a major Cascadia event on the Oregon Coast, a powerful tsunami wave of 20 to 100 feet is expected to arrive 15-20 minutes after the earthquake causing massive devastation. In 1995, the State of Oregon passed legislation (ORS 455.446 and 455.447) limiting the construction of new essential facilities, hazardous facilities, major structures and special occupancy structures in the tsunami inundation zone. As part of this legislation, the Oregon Department of Geology and Mineral Industries (DOGAMI) developed tsunami regulatory maps often called the “SB 379 maps” that were based on the best scientific knowledge available at that time.

In the intervening 23 years, a great deal of new knowledge has been gained about the tsunami threat at the Oregon coast, and important new tools have been created that enable safe designs for the first time in an inundation zone. In 2013 DOGAMI developed comprehensive new tsunami inundation maps (TIMS, also referred to as the “t-shirt size” maps) based on pioneering research conducted at Oregon State University to more accurately predict the extent of inundation on the Oregon coast. These maps have yet to be adopted by the DOGAMI Board for the regulatory line but have been used throughout coastal communities for land use planning overlays.

Meanwhile, a new edition of ASCE 7-16, a reference standard for loads on structures that is part of the International Building Code, has been published. It includes nationally accepted design provisions for building safe structures within inundation zones for the first time. This update is the result of a four-year consensus process involving experts from all over the United States. Oregon’s Building Code Structures Board has recently adopted ASCE 7-16 including Chapter 6 into the 2019 Oregon Structural Specialty Code to be published in October of this year. However, because Oregon’s already has tsunami inundation regulatory maps, they have directed engineers to use those maps rather than the maps in ASCE 7-16. This is very problematic as the old maps are not consistent or compatible with the new code provisions and would result in an excessive risk of failure to our critical structures on the coast.

During the current legislative session, HB3309 was drafted and passed. It removes altogether the moratorium established in 1995 on constructing critical buildings in Oregon's existing tsunami inundation zone but does not address the safety and resilience of critical buildings within the community.

The question now has become how best to move forward. As part of the Tsunami Line Working Group convened by the DOGAMI Board earlier this year, OSSPAC was fortunate to hear from diverse stakeholders including state agencies, tsunami experts at Oregon State University, and coastal community representatives. It was clear that any lasting solution would need to thread together a number of competing priorities:

1. Ensuring the safety of Oregonians and visitors following a Cascadia earthquake and tsunami on the Oregon Coast based on the best available science of tsunami hazards.
2. Ensuring the resilience of coastal communities.
3. Providing the state, counties and cities with certainty regarding the tsunami line, building regulations, and planning zones for present and future.
4. Providing regulations that allow local communities to determine for themselves how to address each building within a known regulatory framework.
5. Limiting to the greatest extent possible impacts to the economic development of coastal communities.

Balancing public safety with the need for autonomy of coastal communities and continued economic vitality on the coast is not easy or straightforward. Compromise is needed in order to gain a reasonable and sustainable solution that benefits everyone. Toward this end, the following proposal was discussed and approved at the OSSPAC meeting on May 14, 2019:

1. Adjust the proposed legislation in HB3309 to rescind the entirety of ORS 455.446 and 455.447 including both the moratorium on the building of critical structures within the inundation zone and the requirement for DOGAMI to create a statutory tsunami inundation line.
2. In its place, adopt ASCE 7-16 including the tsunami provisions and maps as written without State amendments. Since the new printing of the Oregon Structural Specialty Code (OSSC) cannot be intercepted, this can be adopted through code amendment.

There are a number of reasons why we believe this proposal greatly improves the current situation and offers a prudent balancing of the priorities listed above:

- The proposal eliminates the current moratorium in Oregon statute on constructing critical buildings within the tsunami inundation zone and allows all buildings regardless of type to be constructed there.
- DOGAMI is removed from its current roles of adopting new tsunami regulatory lines and approving the development of critical structures on the coast.
- The new ASCE provisions create a reasonable alternative to moving buildings out of the inundation zone as they are variable based on the location of the structure within that zone. Buildings close to the code-mandated line will likely need no significant changes from standard structures. As the location of the building gets closer to the water, the requirements get more stringent.
- As in the original legislation, the extra requirements in ASCE 7-16 apply only to important and critical buildings already identified in the Code as Category III and IV — not to normal buildings such as single family homes, commercial buildings or existing structures.

- The costs to implement the building code provisions within the tsunami inundation line are reasonable. For the few buildings already constructed or designed using the new code, the cost has accounted for only a few percent of the total construction budget.
- The ASCE tsunami maps are based on a probabilistic basis that aligns with the same 2500-year return period for the seismic provisions in the building code and are updated regularly to integrate the latest science. The proposal's adoption means there would no longer be any uncertainty about if and when the line could change, and there would be consistency with the line across state borders.
- The proposal removes state bureaucracy and eliminates any uncertainty for developers as they already follow the building code for all other natural hazards and loads such as wind, snow and seismic.
- Adopting ASCE 7-16 gives the discretion back to local coastal communities to decide where to place their essential, major and special facilities – either outside the inundation zone or inside it but designed to meet the new building code provisions.

As an alternative to the proposal above, the DOGAMI board could be directed to adopt the ASCE 7-16 line as the state's regulatory line. In addition, due to HB3309 deleting portions of the law defining essential structures, the code language referencing those sections could be modified. We would propose simply using the existing definitions in the building code for Occupancy Category III and IV structures. In our opinion, this alternative is not as desirable as our original proposal but it could be a second path forward.

OSSPAC respectfully recommends that the Governor, State Agencies, Coastal Caucus and Legislature work together to implement the proposal. The Commission is happy to answer questions or assist in any way toward this end.