

TO: Ed Feser, Provost  
Ron Adams, Special Assistant to the President

FROM: Scott Ashford, Chair of the MSI Oversight Committee

DATE: December 13, 2017

SUBJECT: Progress Report on Marine Studies Building

This memorandum provides an update on the design and engineering of the Marine Studies Building based on the review of the MSI Oversight Committee. The committee was charged by President Ray in October 2016 to ensure that the design, engineering, and construction of the Marine Studies Building and associated housing to be built in Newport, Oregon, will meet or exceed the earthquake and tsunami performance commitments the university has made to the public. Additionally, the committee will ensure that these buildings are operated with the highest level of safety and evacuation procedures, preparation and training. The committee reports to Provost Ed Feser and Special Assistant to the President Ron Adams.

By fulfilling their charge, the committee will work to fully ensure that:

- The Marine Studies Building and student housing will survive a magnitude 9.0 earthquake.
- The Marine Studies Building will survive an associated tsunami resulting from a catastrophic natural event, such as a Cascadia Subduction Zone event.
- The Marine Studies Building will be repairable following an L-level tsunami.
- The Marine Studies Building will be built to provide a safe and accessible, vertical rooftop evacuation site alternative for those with impaired mobility in the event of an XXL-level tsunami.
- The HMSC campus will be fully served by preferred horizontal evacuation systems.
- The work of the university associated with these buildings' design, engineering, construction and safe operations is transparent, and that stakeholders remain informed.
- The projects are built within budget and on time.

Since the charge, the committee has met seven times of which three were informal organizational meetings and four were formal committee meetings. The formal meetings typically included presentations by the design team and discussions with the Technical Peer Review Panel. All formal meetings included participation by the committee liaisons to ASOSU, CEAOS, COE, CLA, and HMSC. The committee also participated in a public forum held on the Corvallis campus in May 2017.

The most recent meeting of the committee was held October 9, 2017, at the end of the conceptual design phase of the Marine Studies Building. By that time, essentially all comments and concerns raised by the peer review panel had been addressed by the design team.

## OVERSIGHT COMMITTEE CONCLUSION

Based on the information provided and reviewed during its meetings, the committee concludes that the design and engineering of the Marine Studies Building meets or exceeds the earthquake and tsunami performance commitments the university has made to the public. However, concerns remain about the horizontal evacuation route, as well as the balance between scope and budget. Specific criteria included in the committee charge are addressed below:

- **Charge:** The Marine Studies Building and student housing will survive a magnitude 9.0 earthquake.
  - **Response:** This was the basis used by the design team for the Marine Studies Building. The designers utilized the most stringent criteria from any of the three choices: the current building code, the newly proposed ASCE 7-16 building code, or the university imposed criteria. The design included site specific seismic analyses, as well as liquefaction analyses. The structural system is intended to mitigate the strong shaking hazard, and ground improvement is intended to mitigate the liquefaction hazard.
- **Charge:** The Marine Studies Building will survive an associated tsunami resulting from a catastrophic natural event, such as a Cascadia Subduction Zone event.
  - **Response:** This was the design basis used by the design team for the Marine Studies Building. The designers utilized the most stringent criteria from the current building code, the newly proposed ASCE 7-16 building code, or the university imposed criteria for this structure. The design included site specific tsunami analyses, as well as consideration of drag forces, scour, and extraordinary debris impact of ships due to the tsunami.
- **Charge:** The Marine Studies Building will be repairable following an L-level tsunami.
  - **Response:** This was design basis used by the design team for the Marine Studies Building. A limit of 70 percent of the replacement cost was used as the maximum repair cost. This is the same criteria used on the Corvallis campus.
- **Charge:** The Marine Studies Building will be built to provide a safe and accessible, vertical rooftop evacuation site alternative for those with impaired mobility in the event of an XXL-level tsunami.
  - **Response:** This was the design basis used by the design team for the Marine Studies Building. The design includes a ramp leading to the roof in order to provide refuge for over 900 people.
- **Charge:** The HMSC campus will be fully served by preferred horizontal evacuation systems.
  - **Response:** The university has removed the horizontal evacuation option from the Marine Studies Building project, and plans to separately pursue it with the local community partners. During the review process, it appears that the horizontal

evacuation route is at risk from liquefaction and lateral spreading. The MSI Oversight Committee is concerned that this risk is not being pursued in parallel with the design and construction of the Marine Studies Building. We recommend that the university lead the effort to collaborate with local community partners to ensure that a resilient horizontal evacuation route is available within a reasonable timeframe from occupation of the Marine Studies Building.

- **Charge:** The work of the university associated with these buildings' design, engineering, construction and safe operations is transparent, and that the stakeholders remain informed.
  - **Response:** The committee believes this is being adequately addressed through the committee meetings, the committee liaisons, and public forums.
- **Charge:** The projects are built within budget and time.
  - **Response:** The committee understands that the project is several months behind the original schedule, but that it is acceptable to both the university and the donors. The committee also understands that the project is significantly over budget at this time. Additional fund raising is being pursued, as well as possible reductions in scope. The MSI Oversight Committee is concerned about program impacts due to the budget shortfall. While reducing the scope of the project is a viable means of getting back within the budget, the committee recommends that this be balanced with the minimum necessary scope to achieve the programmatic goals of the Marine Studies Initiative.

The MSI Oversight Committee would like to highlight three additional points:

- The committee is very impressed with the work and input of the Technical Peer Review Panel and how it worked with the design team. The peer review panel is made up of international experts on seismic/tsunami design and analysis. The university was fortunate to have this independent group of experts, and a design team that was willing to work with the panel to make a better project.
- While beyond the specific scope of the design and engineering of the Marine Studies Building, the committee is concerned about planning for immediately after the earthquake and tsunami. For example, how do the people that did seek refuge on the rooftop physically get to longer term shelter in the area? Specifically, how do they get off the roof and cross the ground affected by the tsunami? Additionally, how do people that did seek refuge on Save Haven Hill cross the same ground to get to longer term shelter? We recommend the university to continue to work with the local community on system planning for after the earthquake and tsunami.
- The committee to this point has not reviewed any materials related to the proposed student housing in Newport.