

# Montgomery Court Residence Hall

## Seismic Rehabilitation Project at Portland State University

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Montgomery Court Residence Hall at Portland State University (PSU), Oregon, was seismically upgraded as a demonstration project to increase its earthquake safety and community awareness. Montgomery Court is an unreinforced masonry (URM) building, which are notoriously for their serious structural deficiencies. This four-story university dormitory was constructed in 1916 and 1925 as a 4-story plus basement URM by a famous architect, A.E. Doyle. The U-shaped building has over 50,000 sq-ft and houses about 150 students year round.



**Figure 1. Montgomery Court residence hall. Final Inspection with Dennis Sigrist and Stan Prihar, Oregon Emergency Management and Francis McBride, PSU Facilities and Planning Department Architect.**

In April 2004, the Oregon Department of Geology and Mineral Industries was funded by the DHS- Federal Emergency Management Agency (FEMA) Predisaster Mitigation Program to conduct a partial seismic upgrade to significantly reduce the potential for a catastrophic collapse. Although this building is not on the state's historic registry, the project was conducted in accordance with the State Historic Preservation Office (SHPO) regulations.

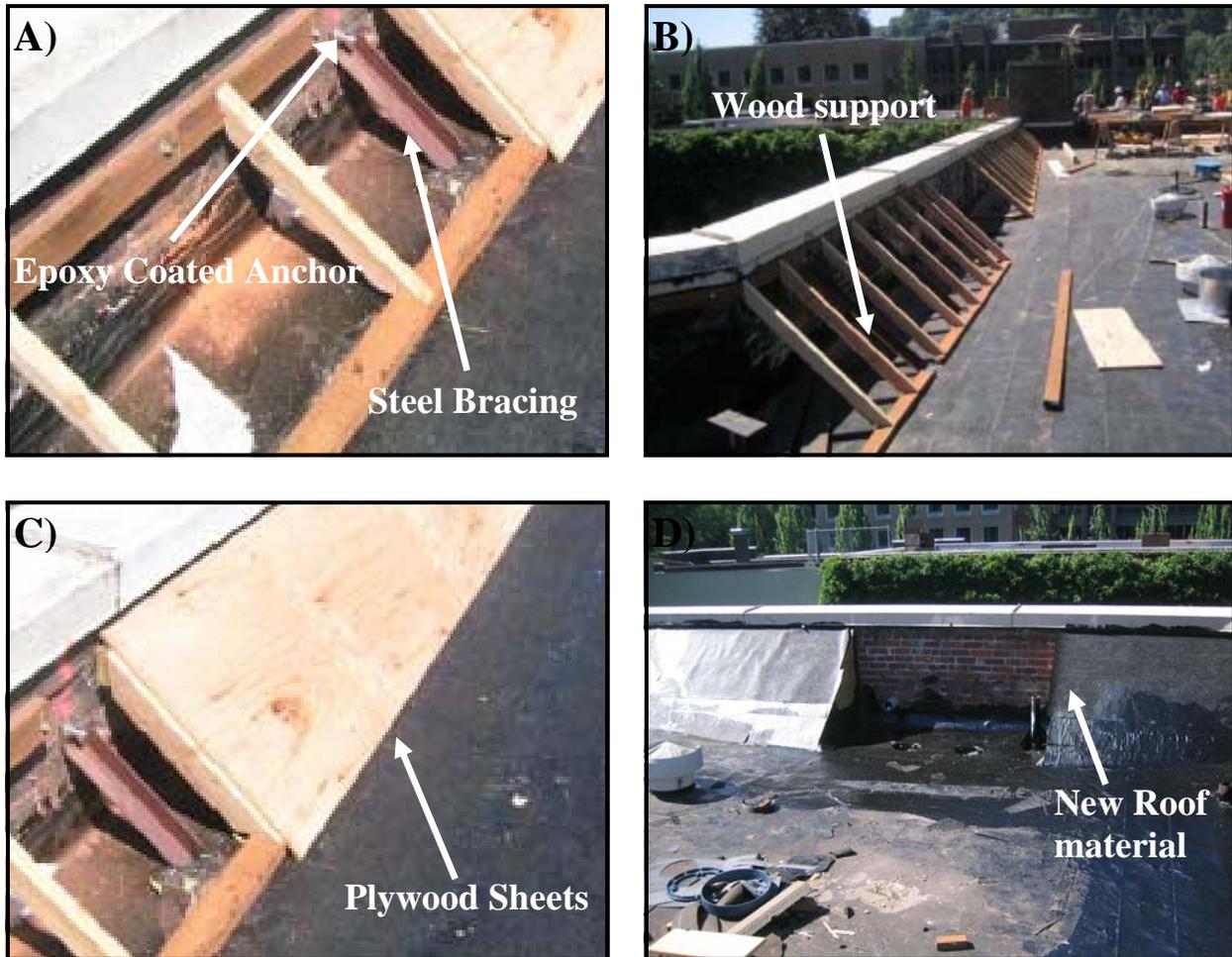
As with most URMS, Montgomery Court lacks shear strength to withstand earthquake shaking, structural connections to remain intact, and ductility to rebound back to an upright standing position. Upon inspection, it was verified that the roof and the top floor were not well connection (Figure 2).



**Figure 2. Exploration of the attic space to examine the top diaphragm connection**

The seismic rehabilitation design, which cost \$685,000, includes four mitigation measures:

- Connecting the top diaphragm/floor to a new roof
- Adding reinforcement to the stairwells for safe exiting
- Anchoring the falling hazards, such as ornaments and chimneys
- Securing the parapets (Figure 3)



**Figure 3. Construction process used for securing the unusually tall parapets, which posed a significant falling hazard because they are situated over high traffic walkways**

As part of the demonstration project, several tours were organized, including a VIP tour during construction (Figure 4). In addition, a commemorative plaque is mounted at the building's front entrance to remind the public of the pre-disaster mitigation measures taken and express gratitude to FEMA, Oregon Emergency Management, Oregon University System, and others involved in making this rehabilitation project a success.



**Figure 4. Group photo taken at Portland State University VIP tour in August of 2005. Individuals include PSU President Dan Bernstine and FEMA Region X Sharon Loper (both center front), and OEM, university faculty, community leaders and the project team**