Casa Adelante is a seismically resilient nine-story affordable housing project for low-income seniors, with 25% of the units reserved for formerly homeless seniors.

Context – We know that conventional code-conforming buildings can sustain significant structural damage in the process of protecting the safety of the occupants during a major earthquake. However, damage can lead to loss-of-use and – in the case of the Casa Adelante residents – the potential for experiencing homelessness. On the other hand, we know that more housing is much more important than better seismically performing housing given the region’s acute shortage of affordable housing. With this as context and constraint, we challenged ourselves to create affordable seismic resilience.

The Design – Casa Adelante addresses these challenges with a building that has been evaluated to have zero days of downtime for repair after a major earthquake with a near-zero high-performance cost premium (only 0.24% extra cost). The specially “tuned” reinforced-concrete building uses self-centering walls on a rocking mat foundation. Lead extrusion dampers within the foundation control the seismic response. The developers CCDC and MEDA, as well as the SF Mayor’s Office of Housing and Community Development greenlighted our proposed high-performance design. Prof. Geoff Rogers (University of Canterbury) developed the foundation dampers and applied his state-of-the-art technology to a real project and a great cause. He led the efforts to prototype, test, and produce the dampers – all while staying within tight cost controls. He also donated all his time to the project. Prof. Greg Deierlein (Stanford) was the peer reviewer. His critical work was also provided pro bono. The project received a Gold Rating from the US Resiliency Council. Casa Adelante is the first multi-unit housing project to be rated by the USRC. We believe it is one of the first high-performance designs for under-resourced occupants constructed in the US.

Below left to right: First two images show exterior elevations of the completed building, shortly before opening. Third image shows the dampers being installed within the mat foundation. The workers are installing the protective shroud that forms the concrete void. The damper and its linkage system are designed to go through MCEs without damage. However, the damper can be accessed, inspected, and replaced if needed after an earthquake, by removing the bolted connection. Fourth image shows workers installing the bottom layer of the mat slab reinforcement.

US RESILIENCY COUNCIL GOLD RATING

100% AFFORDABLE SENIOR HOUSING

25% OF UNITS FOR FORMERLY HOMELESS