

Project: UCSF IRM – San Francisco, CA
Product: Seismic Guardrail and Moat Covers
Architects: Rafael Viñoly
SmithGroup
General Contractor: DPR Construction
Engineers: Forell/Elsesser Engineers
Nabih Youssef Associates



About the Project

The University of California, San Francisco (UCSF) Ray and Dagmar Dolby Regeneration Medicine Building (also known as the Institute for Regenerative Medicine or IRM), is perched on a steep hillside overlooking the city. The campus was deemed an impossible challenge to build because of its location on Mount Sutro. However, prominent New York architect Rafael Viñoly envisioned a split-level horizontal design for easy flow between the labs. Viñoly assisted the Design-Build team of SmithGroup, DPR Construction and Forell/Elsesser Engineers to make this vision a reality and identify sustainable approaches.

Completed in 2010, the research facility supports 25 teams of UCSF scientists, operating in 125 labs dedicated to stem cell research and developing treatment strategies for heart disease, multiple sclerosis, Parkinson's disease, spinal cord injury, and other conditions.

Design Goals

The complex design and construction phase took only two years to complete and incorporated the latest green building measures and tools to date. Given San Francisco's heightened seismic activity, the building also had to be designed to move a maximum of 27" laterally during an earthquake and had to withstand seismic activity with little to no damage.

From a seismic design perspective, this was neither a typical situation nor an ideal location. The project required 60" of movement in any direction to provide stability in the event of an earthquake. To address this obstacle, the building was designed to rest on cantilevered steel trusses that branch out from concrete piers, minimizing excavation and incorporating seismic base isolation.

At a Glance: Seismic Railing & Moat Covers

- Complex building location & movement requirements
- First product of its kind: seismic railing
- Seismic railing and moat covers allow for 27" of tension and compression and 1 ½" of vertical movement

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SmithGroup contacted Construction Specialties, Inc. (C/S) to consult on the floor systems to tackle the seismic setback. C/S was then tasked with creating a solution to handle 27" of seismic displacement (tension and compression) and 1.5" of vertical movement. C/S proposed and tested a system of seismic moat covers for connecting areas and seismic railing, a first of its kind, for the perimeter of the bridges.

Some areas needed floor joint systems that supported an embedded seismic railing assembly, while other joint conditions changed direction or required a combination of fixed and seismic railing. The most significant consideration was for pedestrian safety, but all of the seismic railing assemblies needed to meet OSHA 1926.502 loading requirements and restrict the passage of a 4" sphere at all movement positions. Because some of the bridges were elevated, the seismic railing needed to survive the full movement requirements to maintain safe pedestrian egress on the bridges.



Throughout the process, the C/S Expansion Joint Covers division worked closely with prospective bidders to help them understand the complexity of the system and developed a schedule for the special seismic joint assemblies, outlining every process from submittal through delivery, to ensure the project's schedule requirements were met.

Results

The UCSF-IRM building sets high standards for new sustainable laboratory spaces. The project was awarded LEED-NC (Leadership in Energy and Environmental Design: New Construction) Gold Certification. The building also received the first LEED credit ever issued for Innovation in Design (ID) for its enhanced seismic performance. Using the integrated project delivery method, coordination of the key players resulted in the design receiving multiple awards from the American Institute of Architects (AIA) and Build Institute, including AIA/New York 2011 Design Award and the AIA/San Francisco 2010 Honor Award for Integrated Projects in Progress Award.

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