

Autodesk Renovates Their One Market Building Using Revit

Revit Community

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By Lauren Browne, Revit Community Editor

Renovating a historic building definitely presents many challenges like how to preserve historic features, how to complete a modern renovation, how to keep the building's voice and how to improve the layout without removing too much of the original character. All of these how-to's and more were experienced with Autodesk's One Market building, located at One Market St. in San Francisco. The renovation used Autodesk Revit, Navisworks, AutoCAD, Architectural Desktop, CAD-Duct and Ecotect. It houses office space and the Autodesk Gallery, which features the design processes of Autodesk customers' most innovative and interesting projects. For example, The Autodesk Gallery showcases everything from the Bay Bridge Seismic Safety Project, which details the design process from start to what is completed currently, to 42 Surfboard's Hollow-Body Surfboard that shows the design process of making a sturdy yet light and agile surfboard.

While Autodesk was the owner of the project, the renovation was designed by both Anderson Anderson Architecture and HOK design firms. DPR Construction was contracted for the construction portion.

Revit was used for all of the architectural design for the project, Navisworks was used for coordination, AutoCAD platforms were used for the laser scanning that was done of the original building, and Ecotect was used for lighting analysis. Because the building is historic, there were many limitations to design because the many elements of the building had to remain the same. Laser scanning was used to help with modeling the original characteristics of the building that were not originally documented well. Autodesk's Architectural Desktop was used for the laser scanned data, and then the data was imported into Revit Architecture, and designers could see where column lines were about a foot off, said Jason Medal-Katz, senior manager, Autodesk Gallery. Navisworks was also used to help coordinate and compile the models together. Navisworks proved its value in the project by helping with things like ceiling options. "We were using Navisworks to visually see the options, and we were able to figure out things like the best routing for MEP systems. With the coordination between Revit and Navisworks, working out things like lighting fixtures and ducts was much easier," said Chris Rippingham, BIM manager for DPR Construction on the Autodesk One Market project. All together, according to Medal-Katz, there were around 14 models compiled into Navisworks. Then the sub-contractors used platforms on top of AutoCAD like CAD-Duct, which was used by the mechanical detailer.

An important aspect of the project was the goal Autodesk set to design a green renovation. Ultimately they achieved LEED Platinum certification for commercial interiors. There are many points that buildings must achieve to be rewarded a LEED rating, and some of the points gained at One Market were for the indoor environmental quality because of using low-emitting materials, thermal comfort with monitoring systems, 90 percent of seated spaces having views to the exterior, using recycled content in the building, using materials manufactured regionally, using wood that is certified from the Forest Stewardship Council, diverting 75 percent of construction waste away from landfills, reducing water use of 30 percent, and optimizing energy performance.

One of the most interesting LEED points received was for the exemplary performance with green power. Autodesk purchased Renewable Energy Certificates from 3Degrees for 1104 megawatts of green power

sourced from wind farms and biomass facilities. The environmental benefits are the 1104 megawatts of green power that prevents the emission of 683 metric tons of carbon dioxide.

There were challenges around making the building LEED Platinum certified; the largest challenge revolved around the fact that “there were just certain things we couldn’t do because of the historic nature of the building. We couldn’t touch the exterior walls, and because of this there were a number of limitations to what points could be achieved. We knew from the start we couldn’t even consider some of the points,” said Medal-Katz. Medal-Katz also said at one point, it looked like the team was not going to be able to achieve a platinum certification and that they might have to settle for gold certification, but the team decided to keep asking, “What else can we do?” One of the last points received was for reused materials for furniture and furnishings. “We had explored getting used chairs, but couldn’t find what we needed. We just kept looking and finally we ended up finding used chairs. That got us one of those critical points that pushed us beyond the platinum threshold,” said Medal-Katz.

Both Medal-Katz and Ripplingham agreed that the BIM and IPD (Integrated Project Delivery) enabled the team to achieve a LEED Platinum certification. IPD, where the architect, the contractor and the owner sign one agreed contract with everyone sharing the same risk and reward, was established from the beginning of the project. Because of BIM, the communication in the project was superior. “BIM was a huge communication tool and IPD let that happen. I don’t think that without the IPD contract that BIM would have been as successful,” said Ripplingham. He continued, “It was a heavy effort made to make sure what was designed in the model was what was being built out in the field and that communication was through the BIM platform.”

As Autodesk has proved in its past buildings, it sets the bar high and provides good examples to its customers on how to design sustainably, use BIM and implement IPD. It is clear from One Market that building green spaces is a priority for Autodesk. As for Autodesk’s future buildings, according to Autodesk, office spaces will aim to achieve some level of LEED certification in all new projects.

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