

Sustainability with a Capital “S”

By Marcus H. von der Hofen

Today we are inundated with the goal of green building, LEED points, eco-communities, our ecological footprint, global warming, resource management, and many other accolades of sustainability. What often gets lost in the definition is the societal aspect of sustainability. The word itself, as defined, means to “maintain,” “support,” and “endure”; we seem to be only focused on it from an environmental focus—which is obviously important—but shouldn’t there be more?

Do we put enough importance in the preservation of the buildings, the landmarks—or better yet—the history and heritage that they possess? I’m proud to say that a great number of projects that I have participated in over the last two decades have involved the preservation, renovation, and reuse of buildings that might have ultimately been torn down, taking with them the history and human imprint they carry, along with the resources they used to build them. With innovation, we can sustain these structures for

generations to come, to be used and enjoyed with a positive impact on our environment.

The First Regiment Armory Annex—known to locals as the Portland Armory—was built in 1891 to house the Oregon National Guard. This impressive building was built in the Romanesque Revival style that was popular at that time. The semicircular arcades and stone cladding used many of the materials native to the Northwest. My first encounter with the building was during the late 1990s, early 2000s while working in the Pearl District of Portland. This industrial/warehouse area of Portland, OR, was in the process of going through a transition and becoming a residential retail zone. An area known as the Brewery Blocks was being redeveloped using major portions of the old Blitz-Weinhard facility that had been operating since 1862.

Massive brick and unreinforced masonry structures were upgraded with the use of structural shotcrete to seismically retrofit and renovate these structures while keeping the historic look intact. The development was a major success, as many local residences and businesses stormed to the area because of its old-school charm and modern amenities.

The last piece of this urban redevelopment was the Portland Armory. Before developers knew what they were going to with the structure, they had to stabilize the deterioration just to make it safe to explore. Shotcrete was used to address the most important historic structures so that exploration and design could proceed (refer to Fig. 1 and 2). Thus, my adventure began, helping to build what is today known as the “Gerding Theater at the Armory,” home of Portland Center Stage.



Fig. 1: Structure stabilization



Fig. 2: Structure stabilization



Fig. 3: Shotcrete soldier pile shoring



Fig. 4: Shotcrete walls and one-sided forming



Fig. 5: Shotcrete after stripping forms



Fig. 6: Building within a building

A general contractor from Oregon largely responsible for the Brewery Blocks projects took on the \$36.1 million renovation. To say this was an extremely difficult project would be an understatement. The first task was to excavate and shore two stories down while the historic structure remained. The system was comprised of a combination soldier pile tieback and soil nail wall using a temporary shotcrete facing. The majority of the structure—a building within a building—was constructed using structural shotcrete placed against one-sided forms and the in-place shoring systems. The process reduced forming by 50%, allowed placement against the existing brick structure without risk of damage, and solved access problems that would have been uneconomical with a conventional cast-in-place system. Crews placed over 1500 yd³ (1147 m³) of structural shotcrete in some of the most complex situations to help make this project a success.

In the end, the Portland Armory received a Platinum LEED Certification, becoming the first building to receive this recognition in the city of Portland and the first on the National Register of Historic Places. A building that has had three presidents speak in it, housed soldiers, a professional basketball team, and more is now a state-of-the-art theater at over 100 years old—now that's Sustainability.

Photos courtesy of Tony Johnson of Hoffman Construction and Mark Rado



Fig. 7: Outside during renovation

First Regiment Armory Annex Renovation

General Contractor
Hoffman Construction
Oregon

Excavating and Shoring
Versatile Drilling and NW Cascade

Shotcrete Placement
Johnson Western Gunite



Fig. 8: Today



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