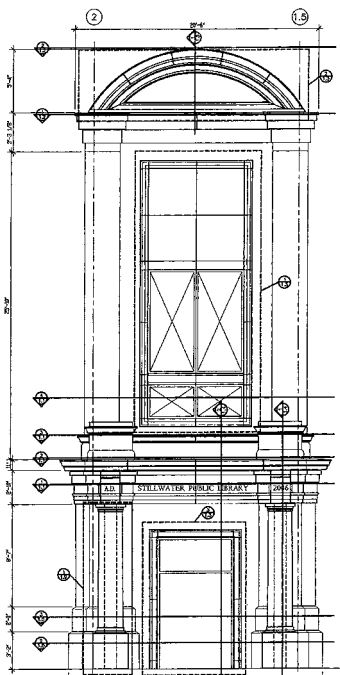




# Turning a New Leaf

— Donald P. Merwin

Redesigning to create a total-precast concrete structure saved about \$250,000 for Minnesota library addition



**W**hen administrators at the Public Library in Stillwater, Minnesota, decided to put the construction of their new addition project on hold to raise more money, their efforts were negated by continually climbing costs. To counter the increases, the general contractor suggested creating a total-precast concrete structure, which could save time and money.

How much time? Laura Faucher, the project architect from Miller Dunwiddie Architecture of Minneapolis, estimates that the redesign saved three to four months of construction.

How much money? Lisa Kline, project manager for general contractor Adolfson & Peterson, estimates that the precast structure saved as much as \$100,000 in construction costs under winter conditions. Combined, the savings in time and direct costs saved the library about \$250,000, estimates Bill Hickey, who was chairman of the library board during construction.

## Addition to Historic Structure

The \$10.2-million project was not a typical add-on. The original library, built in 1902 with a grant from steel baron Andrew Carnegie, stands at the top of a slope. Wings were added on either side in the 1970s, but since then the library faced growing challenges of inadequate

space, meeting the demands of the public, and providing off-street parking. The new addition was designed to provide all that and more. It was built behind the original building, on a lawn leading down from the library. Although attached, it leaves the outer walls of the 1902 building largely untouched.

"The town has grown around the library, and they needed more space for books, common areas, and meeting rooms," explains Erik Molin, a sales representative with precaster Molin Concrete Products Co. of Lino Lakes, Minnesota. But the project, as originally conceived, was coming in over budget and with a tight schedule.

The architect, contractor, and precaster discussed value-engineering options that would take advantage of precast concrete's capabilities to erect during the winter, making up schedule time. During those early meetings, Molin's engineers were creating shop drawings to determine which components could best be replaced with precast.

Retaining and complementing the original building were key ingredients to determining the proper approach, notes Faucher. The structure is one of about 2,500 built in the United States, Canada, Great Britain and other English-speaking countries with more than \$43 million

Value engineering converted the addition from a cast-in-place design to a total-precast concrete structure.



*The new entrance to the Stillwater Library is located in the new addition, which features precast concrete panels that replicate the look of the original building.*

donated by Carnegie. The people of Stillwater, a city of 15,000 on the St. Croix River about 10 miles east of the Twin Cities, appreciated their Carnegie library and wanted to keep the original building intact.

"We were able to ensure the existing building's façade was not obscured except for a small area where we attached the new building at the lower level," says Faucher. The existing lower level of the old building then became the mezzanine level for the new building below.

#### **Fact Sheet**

**Project:** Stillwater Public Library

**Type:** Structure containing bookshelves, meeting rooms and a parking garage

**Location:** Stillwater, Minn.

**Architect:** Miller Dunwiddie Architecture, Minneapolis, Minn.

**Contractor:** Adolfson & Peterson, St. Louis Park, Minn.

**Precaster (structural components):** Molin Concrete Products Co., Lino Lakes, Minn.

**Owner:** City of Stillwater, Minn.

**Project Size:** 56,000 sq ft

**Precast Components:** 300 pieces of architectural precast including columns, decorative coping, and carved signage; 444 pieces of structural precast including shear-wall panels, beams, columns, and hollow-core slabs

**Project Cost:** \$10.2 million



'The big point in favor of precast was that we were able to work without concrete pumps and tower cranes.'



*A precast concrete structural frame provides the building's complete skeleton. Photo: Molin Concrete Products Co.*



### Precast Replicates Original

The library's main entrance was moved to the addition from the original building at the top of the hill and reflects the signature architecture of the old Carnegie building, with an elliptical covered archway. A parking structure with more than 40 spaces occupies part of the lower level.

The 56,000-sq-ft addition includes bookshelves, an expanded children's area, meeting and group-study rooms and historical pictures of Old Stillwater called the St. Croix Collection, plus the parking garage. Even without the parking facility, the addition nearly tripled the library's size.

The addition's original plan included cast-in-place concrete and replications of the carved-limestone features of the old building, consisting of columns, window surrounds, and name plates. The value-engineering sessions determined that the high cost of such work was prohibitive.

An architectural precaster worked with the designers to create 300 architectural precast components that included columns, cornice, window surrounds and carved signage. Together, they created samples and experimented with different colors before a final decision was made.

Most of the precast in the addition, however, is structural, which created the biggest savings. As the architect and contractor completed plans for the redesign, Molin started producing wall panels, cutting the time needed before the building's envelope could begin to rise.

"We had always toyed with the idea of designing a precast structure," says Faucher. The rising costs that essentially were offsetting fund-raising activities spurred the changes. "During the redesign, the precast concrete helped us simplify and standardize certain features."

The redesign eliminated the most expensive features, such as the carved limestone, which were replicated with precast finishes. It also did away with a support column, because a single 50-ft-long precast concrete beam could span the space, providing flexibility for a large conference room. Hollow-core slabs were used in the flooring, allowing the spanning of large distances on each level, providing layout flexibility.

### Design Saves Time

Time was a critical issue beyond cost savings achieved, Kline notes. "The library had been moved out of its existing space, and they had to get back to their building in nine months. With the precast concrete design, we were able to put up the wall panels through the winter. Our value-engineering sessions allowed us to get the most out of the building without making it look like a box." In addition to the structural wall panels, the beams and columns for the framing, as well as hollow-core flooring, were installed during the winter months.

The structural precast provides the building's complete skeleton, Molin notes. Brick was used on the exterior, highlighted by precast concrete accents. Hollow-core slabs were used as structural diaphragms to transfer large soil pressures to the shear elements.

Hickey, himself an architect, says he is "very pleased with precast. We had a planned halt in the project for fund raising, and by the time we restarted, construction costs had risen and we came in over budget. We decided then we had to get down to brass tacks and get the costs down."

Without the use of precast, he says, "We would have had to pay for heating during the winter, providing gas blowers and temporary enclosures, all at considerable cost. The big point in favor of precast was that we were able to work without concrete pumps and tower cranes. That provided a great efficiency of construction." The end result, the developers and owners agreed, was a seamless integration of the much needed additional space with the 105-year-old original building. ■

For more information on this or other projects visit [www.pci.org/ascent](http://www.pci.org/ascent)



Photo: Molin Concrete Products Co.

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