



**MOUNTAIN AMERICA CREDIT UNION
HEADQUARTERS ANNEX**

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CASE STUDY



GROUNDING IN STRENGTH.

Forterra Structural & Specialty Products

GFRC Panels Offer Flexible Design Possibilities

Project Description

When Mountain America Credit Union made the decision to establish its headquarters in the commercial and retail center at Jordan Landing, they envisioned a class A office building that could house their extensive data center and that spoke to their company ideals of permanence, strength, and refinement. Architect Don Mahoney of EMA Architects LLC captured this vision in a stately office design which incorporated a cutting edge concrete technology—glass fiber reinforced concrete cladding (GFRC) from Forterra Structural & Specialty Products.



The 106,000-square-foot headquarters building was completed in 2002 and contains 20,780 square feet of GFRC panels.

In 2009, a four-story annex to the structure was completed directly across the street. The 155,750-square-foot annex features a structural steel frame and Forterra precast concrete GFRC wall panels. It includes a three-story entrance lobby with a glass-railed staircase, teller training space, a 142-seat theater and employee exercise and locker room facilities. Also designed by Mahoney, the new annex contains 38,277 square feet of GFRC panels. A total of 347 GFRC panels were installed. The average panel size is 8 feet by 16 feet, but some two-piece panels are as large as 8 feet by 32 feet; others are as small as 8 feet by 6 feet.

“The [annex],” says the architect, “needed to be in aesthetic harmony with the original building. They [Mountain America] wanted an upgrade from what you might see in a developer-style building. They also wanted to make the [annex] building obvious to those passing by and to make a strong visual and functional link to the original office structure. Instead of putting a huge parking lot in front and setting the building back, we chose to bring the building to the front and let it occupy the most prominent portion of the site. Two sides of the annex define the edge of the street. This gave us closer proximity to the existing office for those who need to track back and forth.”

High-strength GFRC precast panels

GFRC precast was chosen for the annex, says Mahoney, “because they [Mountain America] wanted a building that had a greater sense of permanence than you get from stucco or other monolithic-type products. It also gave us the ability to play with color.

Project Type:	Commercial
Location:	West Jordan, Utah
Owner:	Mountain America Credit Union
Architect:	EMA Architects LLC, Park City, Utah
Architectural Consultant:	BGW Services, Ogden, Utah
Structural Engineer:	BHB Consulting Engineers, Salt Lake City, Utah
General Contractor:	Camco Construction Inc., Salt Lake City, Utah
Precaster:	Forterra Structural & Specialty Products Mountain Region/Salt Lake City facility
Precast Products:	Glass Fiber Reinforced Concrete

The owner wanted to express a contemporary aspect that they felt couldn't be achieved with masonry." Two different colors were specified for the precast panels: a warm sand tone and a salmon orange color.

GFRC panels are a thin-shell, cementitious skin with an integral steel frame. Individual GFRC panels are erected to the steel or concrete building frame and form the building skin. GFRC is extremely durable and freeze/thaw resistant, qualities that Mountain America wanted in its new facilities. GFRC is also light-weight due to its thin shell configuration. Walls and spandrels can appear to be massive solid concrete elements when, in fact, they are light-weight. The 15-20 PFS weight of the GFRC panels greatly reduces the lateral forces due to earthquake loads on the supporting structure.

GFRC precast panels utilize high-strength glass fibers and polymers embedded in a cementitious matrix. This produces a high-strength but low-weight product that is highly flexible. Architectural precast panels made with GFRC can be adapted to intricate and decorative shapes. The panels are highly durable and their lighter weight reduces the cost of transporting the material to the jobsite.

Forterra's Salt Lake City precast facility has extensive GFRC experience, having been the precast supplier for 39 projects, including the Mountain America annex, with over 800,000 square feet of GFRC panels.

For the annex building, the two complimentary panel colors were provided with a lightly acid-etched finish that imparted the look of hewn limestone to the surface of the panels. One of the greatest design freedoms of GFRC is that it can be produced in practically any configuration allowing radiused walls, sweeping or warped shaped panels or detailed cornice shapes.

A major advantage of precast concrete, agrees Mahoney, is its plasticity: "Its ability to be molded and shaped in whatever forms we can come up with; its ability to be reflective of whatever colors we want; its long-term durability, permanence and regularity. On most stucco buildings, once the sun is parallel to the plane of the building, you see all kinds of irregularities and you have a very difficult time controlling the flatness of any given surface. With [precast] panels you can get a much flatter, truer wall that lends to the overall aesthetic aspect of the building. It gives you a much greater sense of wholeness and a contemporary look, instead of wavy walls with other types of materials."



Colored caulk was selected to enhance the overall look of the building.

On the headquarters annex, Mountain America chose to incorporate a large radiused wall as one of its focal features. Long-radius walls are also featured on the original office building. The radiused panels for the annex were produced on special custom-made forms at Forterra's indoor plant. The forms resembled a shallow skateboard ramp where the panels were produced in a curved configuration. Great care was taken to ensure that proper radiuses and lengths were maintained so all the pieces would be neatly framed together in a precise overall installation.



Construction efficiency, energy savings

Having the exterior of the building show up on trucks and be erected at the site was an advantage to the general contractor, as the impact to the site was minimal. In addition, precast installation was directional so that portions of the building could be turned over to other trades as the work proceeded around the perimeter. As the panels were erected, adjustments were made for variations that occurred in the supporting structure. After the panels were connected to the building, the whole building was cleaned, chips were repaired and a final water wash was completed.

Mountain America's decision to use GFRC paid off shortly after the completion of the annex construction when the building suffered an extensive graffiti attack. Using high-end solvent, acid, and hot-pressurized water to remove the graffiti, the building was restored to its original condition in less than 3 days. Without a concrete exterior surface, significant damage may have resulted from efforts to remove the paint.

The precast building envelope system was also a major energy-saving feature of the annex project. "In our climate," Mahoney explains, "building mass works really well to control energy use because it delays the effects of heat gain during the day. The precast GFRC panels provided mass on the outside of the building, helped shield the building and allowed us to have additional insulation on the inside." Recycled content of the GFRC panels is about 25%.

All precast components were locally produced.

The annex also includes a two-stage evaporative cooling system equipped with chillers. "The system," says Mahoney, "rarely taps into the chilling capacity. So, for the most part, it works as a sophisticated swamp cooler." The roof consists of reflective roofing with thick polyisocyanurate insulation. Stormwater is held on the site and metered out slowly.

"The final construction is a gem," says Jim McGuire, sales manager for Forterra's Salt Lake City facility. "The ownership beams as they describe this office as the fulfillment of their founder's vision for the company."

The previously completed headquarters structure sits on five acres and features two four-story wings, joined at a round glass atrium, with views of the nearby Wasatch Mountains. A two-level parking structure, with one level below grade, provides 311 car spaces and is connected to the building. This structure was built by Big-D Construction. Structural engineer was J.M. Williams Associates. Civil engineer was McNeil Engineering. All three are located in Salt Lake City. The original building's HVAC system features under-floor delivery of conditioned air and a two-stage evaporative cooler that reduces energy use and cuts long-term operating costs. This has reduced heating costs by 25%, resulting in a \$40,000 to \$50,000 annual savings. Sun-shading devices are also incorporated into the design and low VOC-emitting finishes were specified. The interior features maple and cherry wood accent panels and furnishings.

