Midwest Wireless Communications Headquarters

Mankato, Minnesota

A close working team and fast track construction schedule proved decisive in completing this all-precast/prestressed concrete building on time and within budget.

Precast/prestressed concrete was the preferred solution in constructing this two-story corporate headquarters building for Midwest Wireless Communications in Mankato, Minnesota. Midwest Wireless is a rapidly growing, regional telecommunications company located about 70 miles (100 km) southwest of Minneapolis-St. Paul.

The selection of an all-precast solution was made early in the planning phase by Paulsen Architects in consultation with the owner. During the preliminary design stage, Wells Concrete Products provided valuable input on how precast concrete could enhance the structure and improve the construction schedule. Larson Engineering carried out the detailed structural design of the building. The general contractor was Met-Con Construction. The success of this project was due largely to the close working relationship of the design-construction team.

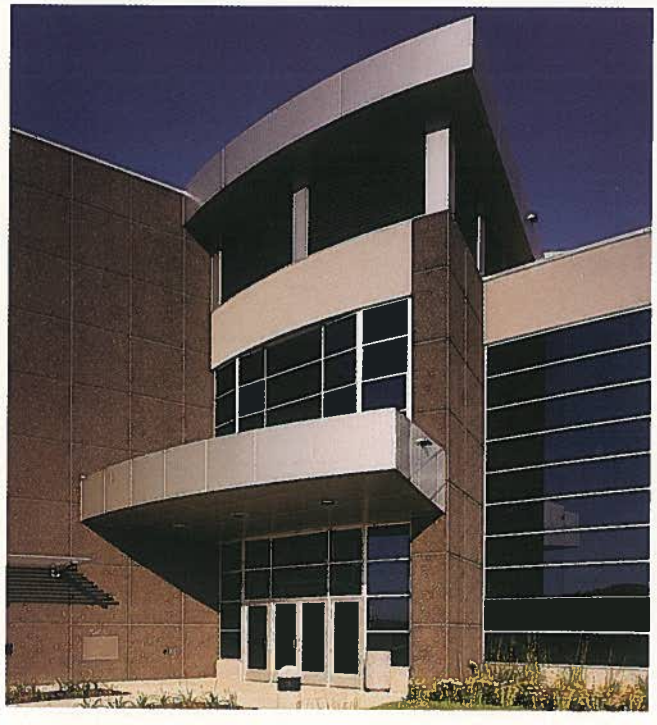
The frame of the building comprised precast columns, double tees for floors and roof, inverted tees and hollow-core slabs. Uninsulated wall panels were used to clad the exterior of the building.

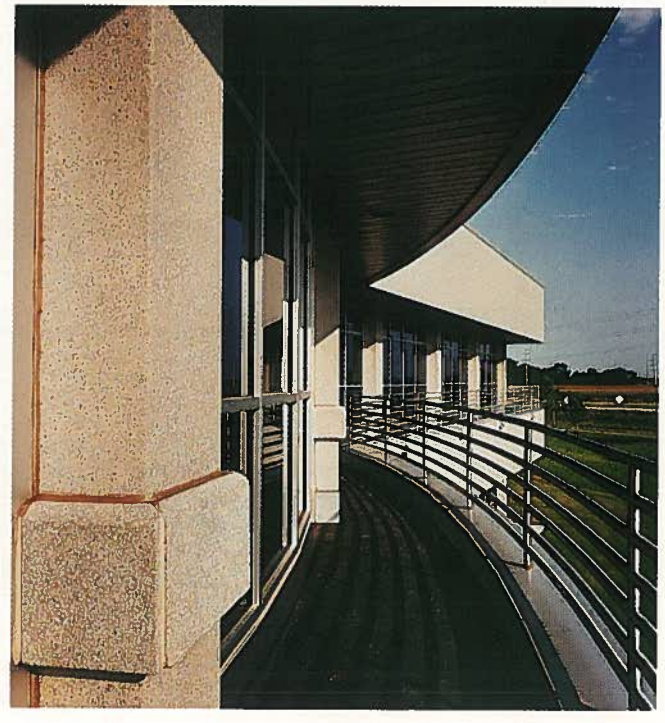
The building is located on 12 acres (4.86 ha) of land next to a major high-

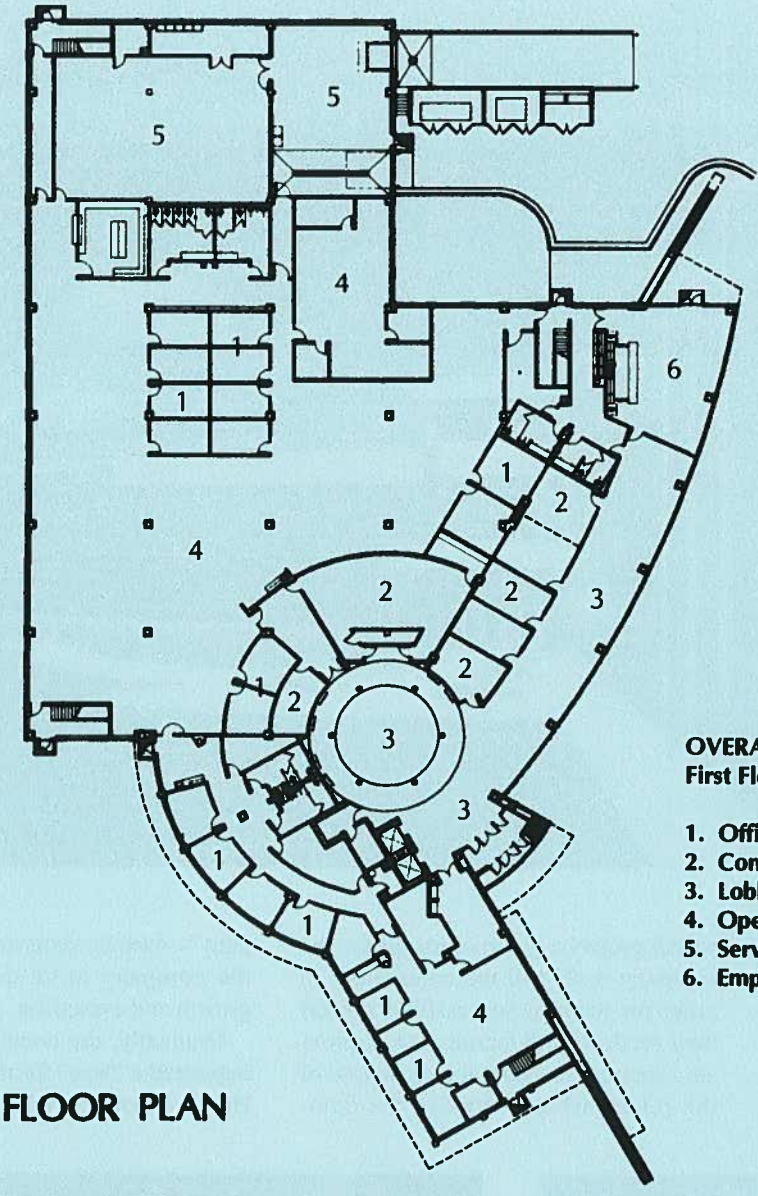
way and serves as the gateway to a 55,000-person regional hub city. It has been cited as the region's first truly "metro" corporate office building.

The challenge was to design and construct a corporate headquarters that would project a positive image for the company itself and the community in order for them to successfully market their products and recruit new employees, support the interactive matrix of the relationships between the company's various departments and lead the company to an era of expected growth and expansion.

Originally, the company's president requested a "box" for its new building. He was shown several design options



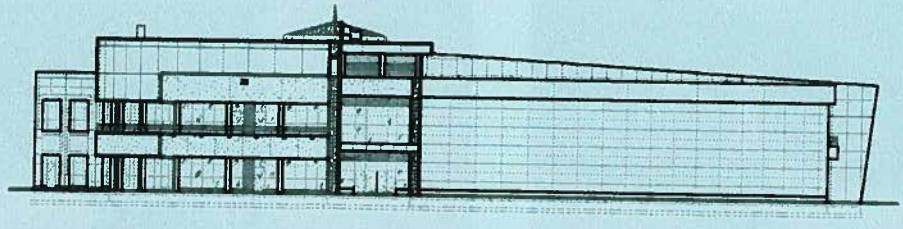




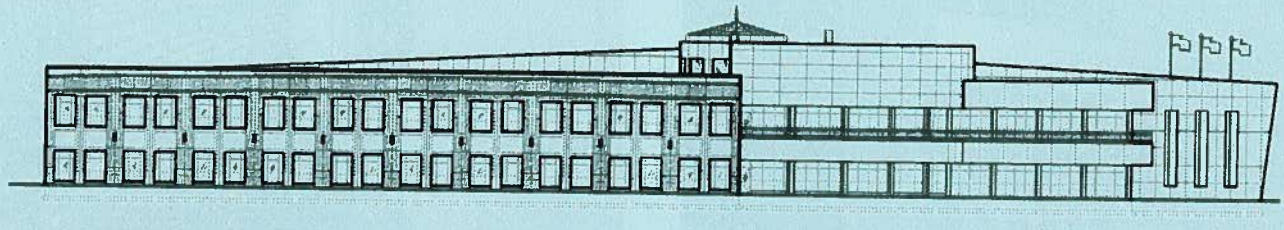
OVERALL-BUILDING LEGEND
First Floor

1. Offices
2. Conference rooms and training rooms
3. Lobby
4. Open office area
5. Service area
6. Employee break room

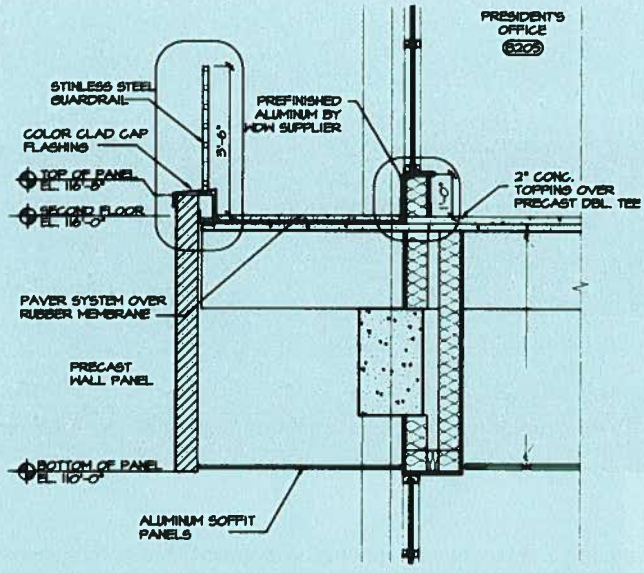
FIRST FLOOR PLAN



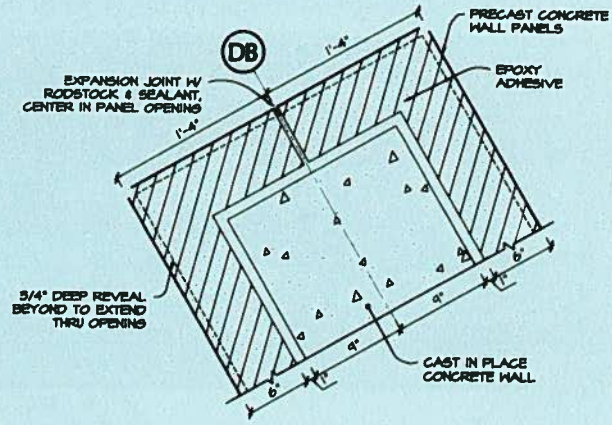
SOUTHEAST EXTERIOR ELEVATION



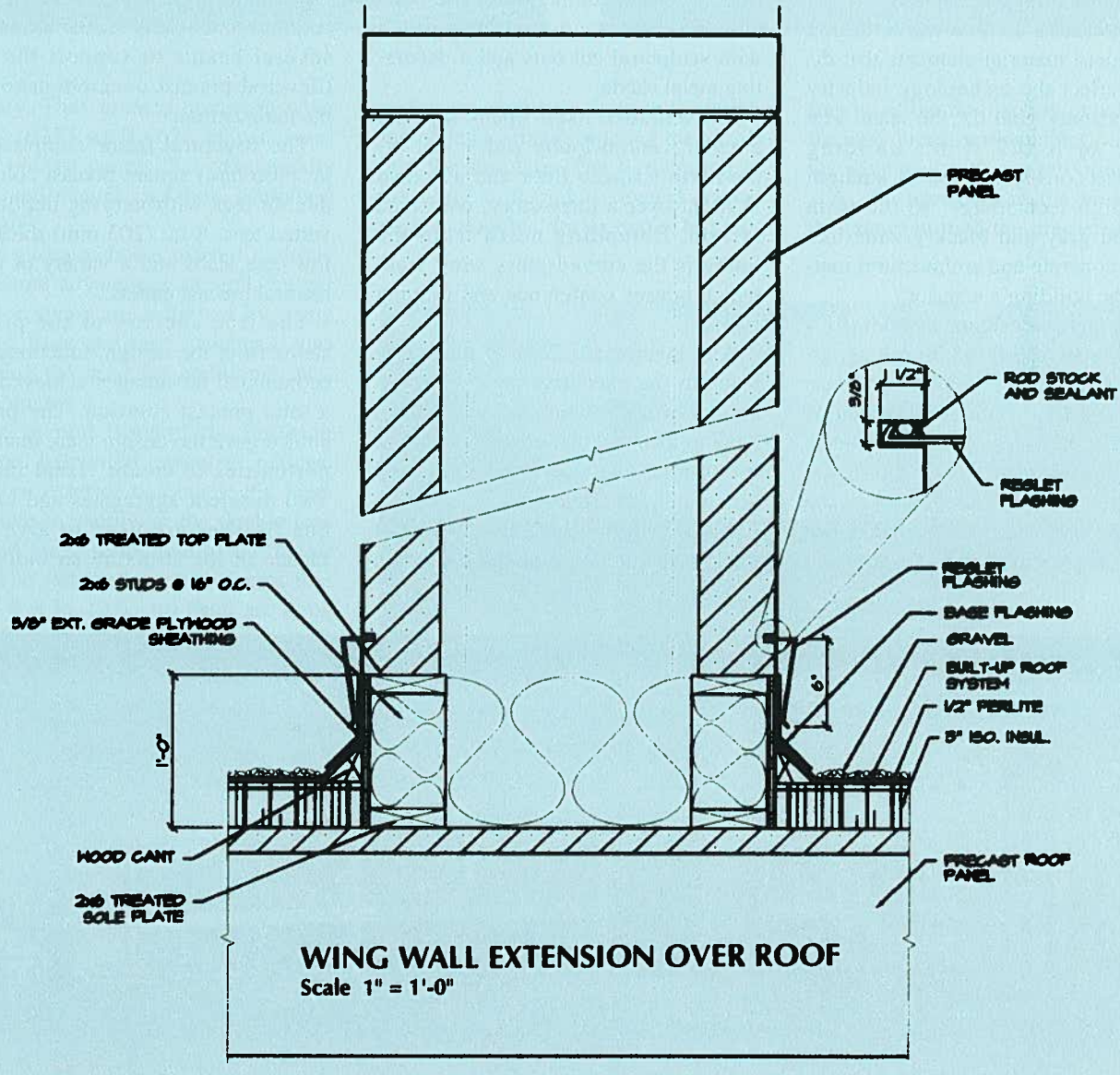
WEST EXTERIOR ELEVATION



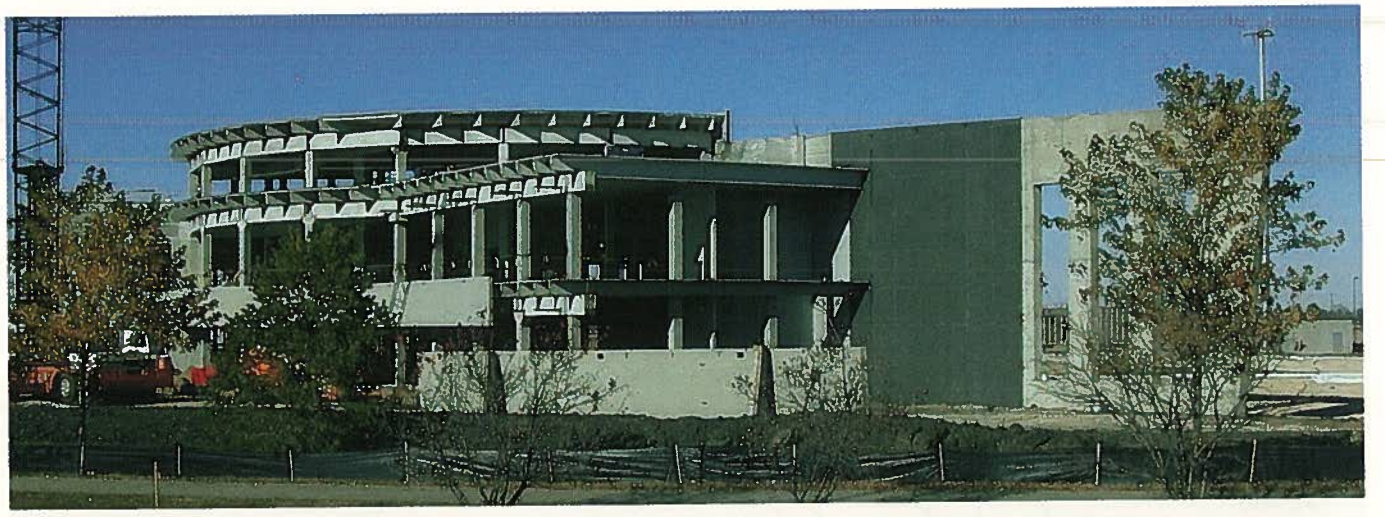
BALCONY DETAILS
Scale 1/2" = 1'-0"



WING WALL OPENINGS
Scale 1 1/2" = 1'-0"



WING WALL EXTENSION OVER ROOF
Scale 1" = 1'-0"



in the initial stages including a "box with a smaller box on top" as well as an ingenious design by the architectural and precast team that was ultimately chosen for construction.

Incorporating an innovative design and modern material elements that directly reflect the technology industry was a primary goal for the team. The 78,232 sq ft (7276 m^2) building needed to convey a sense of strength and a high-tech image, so the team specified gray and black granite-like precast concrete and architectural metals on the building's exterior.

The architect designed a 300 ft (91.4 m) radius per 150 ft (45.7 m) long, architectural precast and curved-glass curtain wall to replicate the idea of constant motion which is important to the telecommunications business. From the circular central lobby of the building, three wing walls radiate out at 120-degree angles to imitate the three guy wires that anchor a telecommunications tower.

The building has three different façades emanating from the main entrance. To the south side of the main entrance is a stand-alone wing wall with sculptural cut-outs and a decorative metal shade.

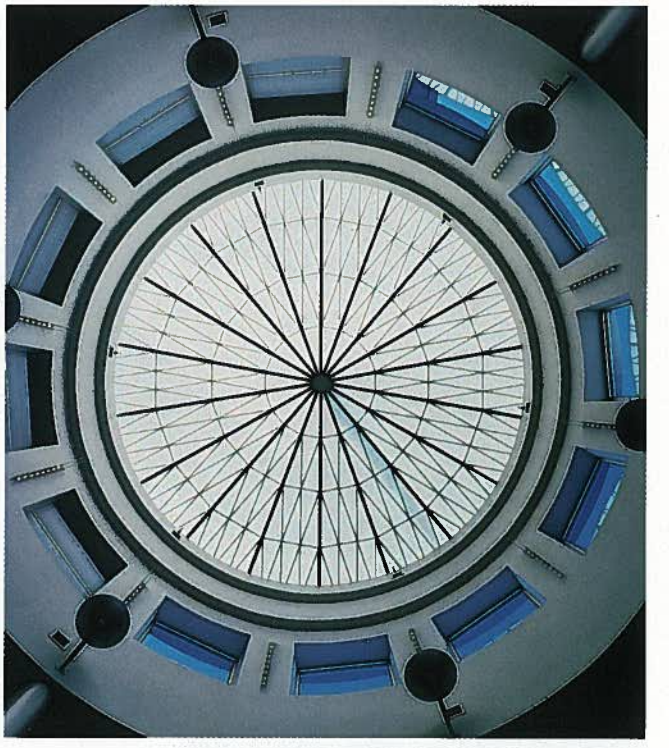
The entrance itself opens into the circular, central lobby with a star-of-the-north terrazzo floor and a domed skylight over a three-story, balconied atrium. Extending north from the lobby is the curved-glass wing wall, which houses conference and training rooms.

An elevator adjacent to the lobby leads to the executive area with balconied offices, which adjoins a third form to the west that contains cubicles for customer service, engineering and accounting departments.

Faced with the challenges of a "fast track" construction schedule, the team quickly concluded that a total precast solution was essential to meet the deadline. The majority of the structural shell is precast concrete. The only structural steel used are the columns and beams for the atrium and several beams to support the cantilevered precast concrete canopy at the main entrance.

The structural frame comprises 16 in. (406 mm) square precast columns, double tees with varying depths, inverted tees, 8 in. (203 mm) thick hollow-core slabs and a variety of architectural precast panels.

The true success of the project stems from the design, functional and economical advantages achieved with a total precast solution. The precast choice gave the design team many opportunities to create visual impact. Two different aggregates and numerous finishes are used to give each façade of the structure an individual



identity. They created dominant wing walls [6733 sq ft (626 m^2) in area] from precast panels that dramatically slope and feature signature, sculptural openings.

The precast choice offered multiple functional advantages as well. Larger interior spans are achieved by using precast floor and roof structures, thus reducing the need for additional interior columns.

The second floor of the building features balconied executive offices. At these exterior balconies, the team was able to cantilever the double tees beyond the exterior line of the building. The radiused precast panels that are 6 ft 8 in. (2.03 m) deep are hung from the end of the double tees to create a large fascia between floors.

By using double tee floor panels for the balcony structure, the concrete topping could be omitted and instead waterproofing and rubber walkway pads could be used to maintain a smooth floor transition. Thru-wall scuppers were cast into the precast fascia panels to allow the balcony to drain properly.

In the roof, by projecting the precast columns up beyond the structure and attaching the black precast panels horizontally, the team was able to continue the appearance that the black wing wall is projecting up through the building without actually running the panels into the structure. The termination of the wing wall makes several conveniences possible; for example, less cutting up of the floor space, creation of a thermal break with insulation below the wing wall and easy reroofing.

At the openings in the wing wall, the team returned the precast concrete

into the openings using a composite placement to maintain the appearance of a single panel.

This kept the precast joint in the middle of the narrow openings. These cast-in returns at the opening and ends give the panels a monolithic appearance.

The ultimate functional advantage is the structure's expandability. By removing one exterior wall, contractors can build up to 40,000 sq ft (3720 m^2) of additional work space, then enclose the addition by replacing the exterior wall. The exterior beams and columns along this wall are designed to receive future floor and roof bearings.

Economically, the precast choice is ideal. The shorter lead times for materials and the ability to erect the floor, roof and wall panels quickly helped meet the accelerated schedule. Repetitive use of the same panel design and size minimized the number of forms that needed to be built by the precaster. The concept of a "single" source of responsibility garnered through the total precast solution reduced the risk of lack of coordination, therefore, saving time and money.

By involving the precaster as part of the design team, the architect was able to use the precaster's expertise to coordinate construction details and accelerate shop drawings. By using a precast shell, this premier building was completed for less than $100 per sq ft. The total cost of the building came to about $6 million.

A total of 700 precast concrete components were fabricated for the project. The casting of the members was fairly routine but was done with utmost care to attain the highest quality possible. One of the most intricate operations was producing arced panels with three different radii.

The precast concrete components were fabricated by Wells Concrete Products Co. at their plant in Wells, Minnesota. The pieces were hauled by tractor-trailer to the project site – a distance of about 40 miles (65 km). The precast contract was $1,510,000.

The precaster was responsible for both the transportation and erection of the precast products. Erection of the precast components took only five weeks for completion.

The project was finished at the end of March 2000 and was officially opened a month later.

Since its opening two years ago, the company has already achieved full occupancy and is doing very well financially. The facility is much liked by its tenants and admired by its many clients and visitors. In retrospect, there is no question at all that precast concrete was the right material for this building in terms of function, future expansion, maintenance and aesthetics.

CREDITS

Owner: Midwest Wireless Communications, Mankato, Minnesota

Architect: Paulsen Architects, Mankato, Minnesota

Engineer of Record: Larson Engineering, White Bear Lake, Minnesota

General Contractor: Met-Con Construction, Faribault, Minnesota

Precast/Prestressed Concrete Manufacturer: Wells Concrete Products Co., Wells, Minnesota