Renovation of Poindexter Office Building Kansas City, Missouri

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Precast and prestressed concrete played a prominent role in renovating two old deteriorated buildings in Kansas City, Missouri, into a single state-of-the-art office facility. The solution required the demolition of part of one building (Gatlin Building) with a stabilizing vertical core using a precast, prestressed structural frame. When this structural work was completed, the exterior façade of the Gatlin Building was clad with architectural precast panels using a thin brick in-fill to match the building's original appearance. Note that the larger Poindexter Building required significant masonry tuckpointing on the exterior surface but no precast cladding. The precast solution saved $750,000 on this project. The article describes the major features of the repair program.

Repairs to the distinguished Poindexter Building (see Fig. 1) on 330 W. North Street in downtown Kansas City, Missouri, were long overdue. Built in 1901, this seven-story timber-masonry structure had deteriorated to the extent that it needed a new roof, significant timber repair, decking repair and significant masonry tuckpointing (see Fig. 2).

Adjacent to the Poindexter Building to the south is the Gatlin Building, a seven-story cast-in-place reinforced concrete structure constructed of beams and slabs at the infancy of cast-in-place concrete construction technology. Built in 1910, this building needed extensive structural repair to meet present-day building codes. Important was the fact

Fig. 1. Newly renovated Poindexter Office Building, Kansas City, Missouri.

Fig. 2.
Old dilapidated Poindexter and Gatlin buildings.

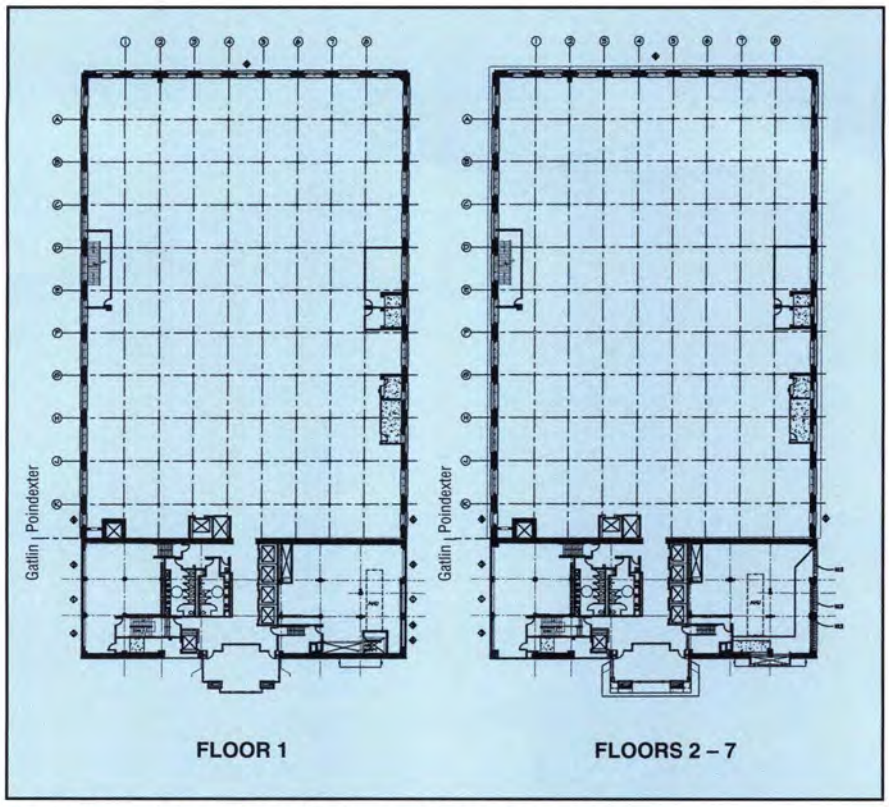

Fig. 3. Original floor plans of Gatlin and Poindexter buildings.

that the Gatlin Building had to be strengthened first before the larger Poindexter Building could be renovated.

Both buildings are located in the historic Garment District of downtown Kansas City. A major civic program was being initiated to revitalize this historic area. For this particular project, the intent of the owner and architects was to renovate these two turn-of-the-century warehouse buildings into a single state-of-the-art facility. The total cost of the entire renovation project was estimated to be $12,000,000.

The Poindexter Building lacked today's strict code requirements for access and egress, such as stairs and elevators, but its floor layout of 27,000 sq ft (2510 m^2) per floor was ideal for office use. The adjacent Gatlin Building, with its relatively small [about 150 x 50 ft (45.7 x 15.2 m)] foot print was the ideal area to locate the new elevator core walls, uti-

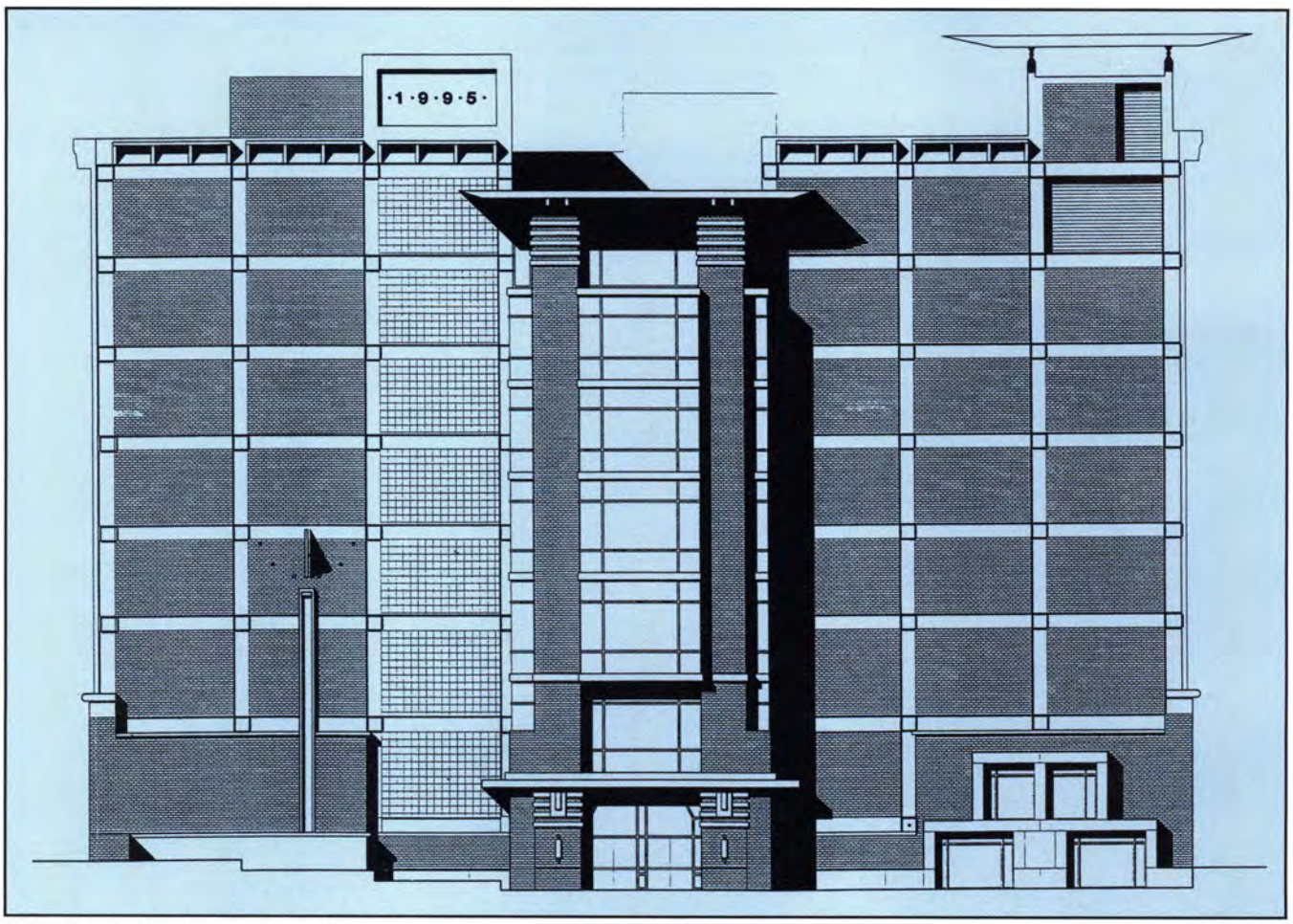

Fig. 4. South elevation of Gatlin Building.

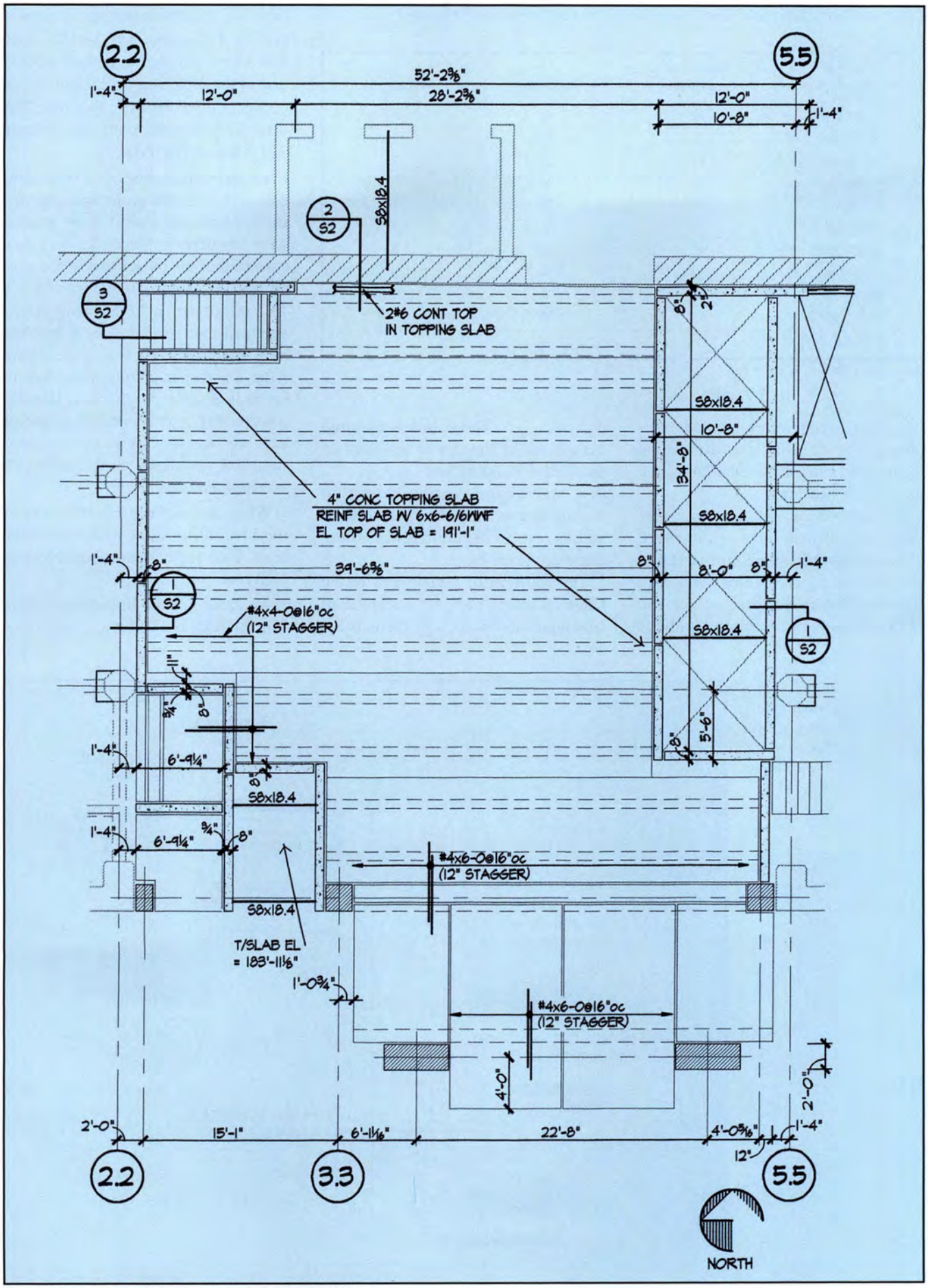

Fig. 5. Second floor framing plan of Gatlin Building.

Table 1. Number and principal dimensions of precast/prestressed concrete components.

Precast component	Number of components	Depth (in.)	Width (ft)
Stair	18	8	8
Single tee	1	24	2
R-beam	14	24	2
Panel	75	8	12
L-beam	14	36	1
Flat slab	42	7	9
Double tee	42	24	8
Column	15	24	5
Brick panel	46	8	12
Arch panel	11	36	5
Total	278	—	—

Note: 1 ft = 0.305 m; 1 in. = 25.4 mm.

lize the existing stairs, provide mechanical space and provide a new main south entrance for the combined use of both structures.

The renovation and connection of these two separate buildings involved structural modifications in the Gatlin Building to align its floor level with the Poindexter Building, since the floor elevations of the two buildings did not align. The solution required demolition of the center one-third of the Gatlin Building and creation of a new stabilizing vertical core that would house the lobby, elevators, stairs, restrooms, conference room, and mechanical room.

The addition of a new core to the Gatlin Building provides a significant structural modification to the existing building, thereby requiring it to meet present-day codes. The vertical core addition would allow greater utilization of the 27,000 sq ft (2510 m^2) floor planks of the Poindexter Building. The total floor area of both buildings is 260,000 sq ft (24180 m^2).

To build this stabilizing core, several materials and structural systems, including a structural steel frame, were considered. Since this core area consisted of the demolition of the center portion [about 50 x 50 ft (15.2 x 15.2 m)] of the Gatlin Building, it was assumed that structural steel was the most economical type of construction. After all, the stabilizing frame had to be built in a very tight area, literally constructing a new structure inside an existing structure. With this assumption, the structural steel framework was designed and bid.

When the bids came in, the cost of the structural steel was extremely high. Two factors contributed to this high cost:

- An extremely tough bidding market in the Kansas City area.

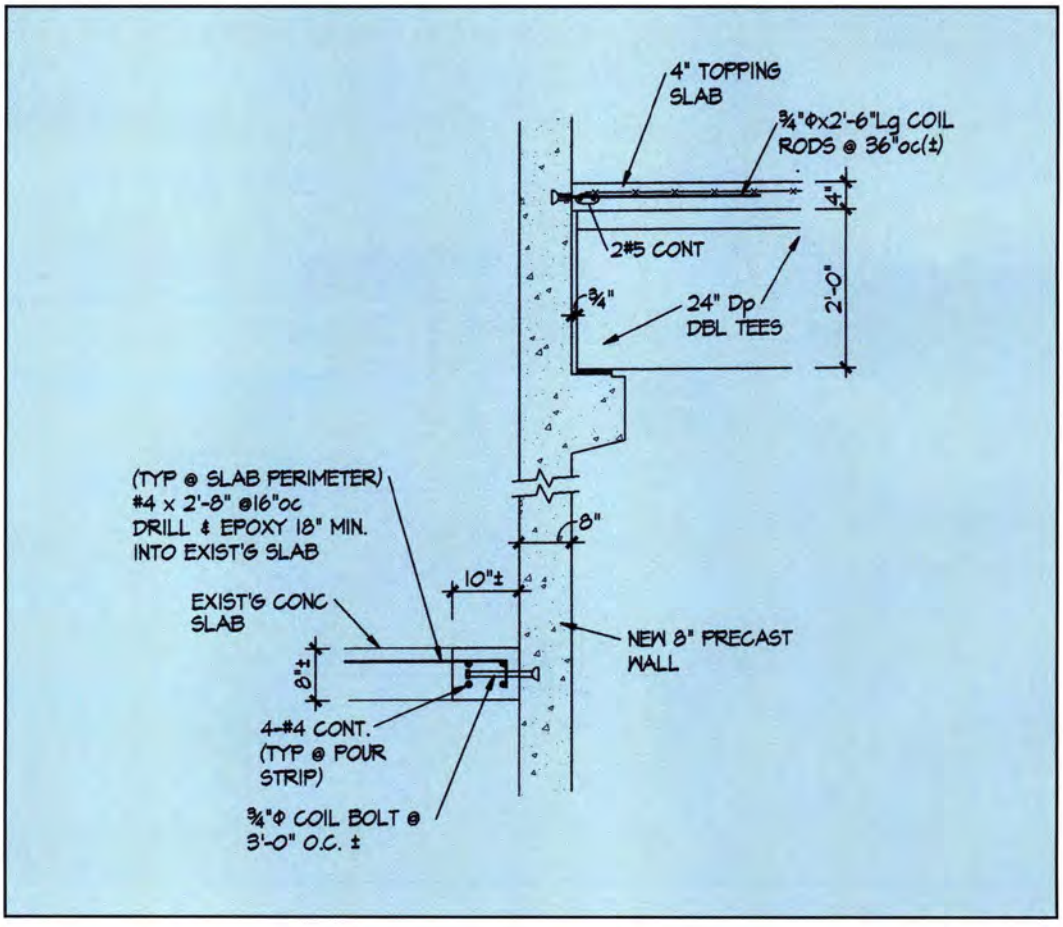

Fig. 6. Section showing tie-in of new precast wall with existing concrete slab (Gatlin Building).

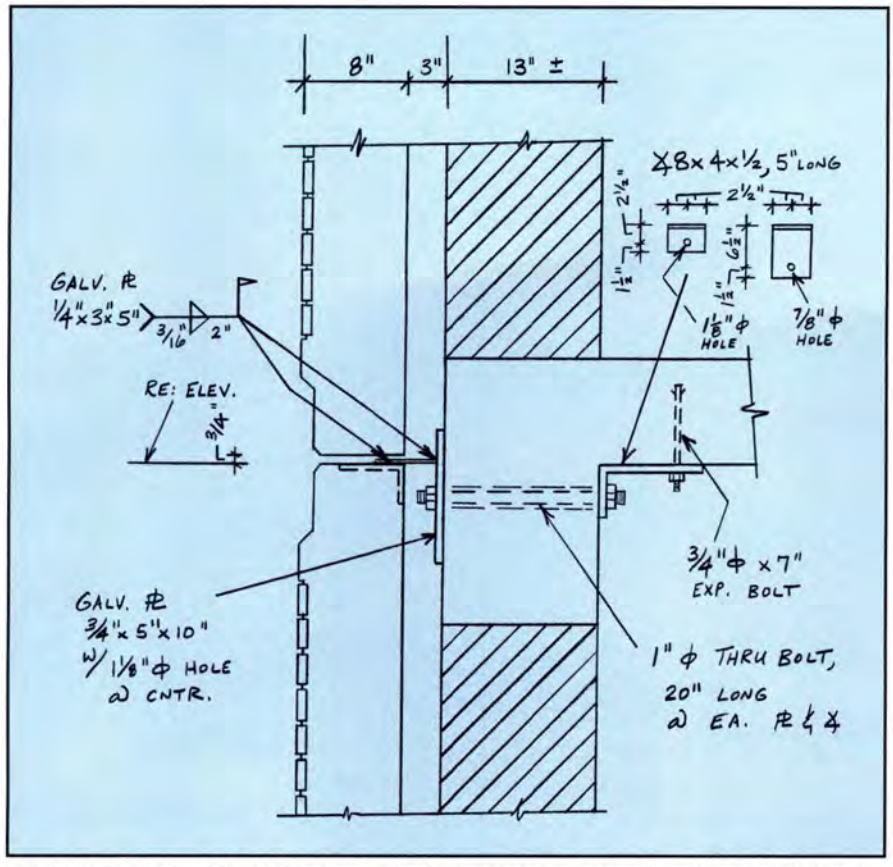

Fig. 7. Connection detail showing tie-in between precast panel and structural frame (Gatlin Building) (see Fig. 8).

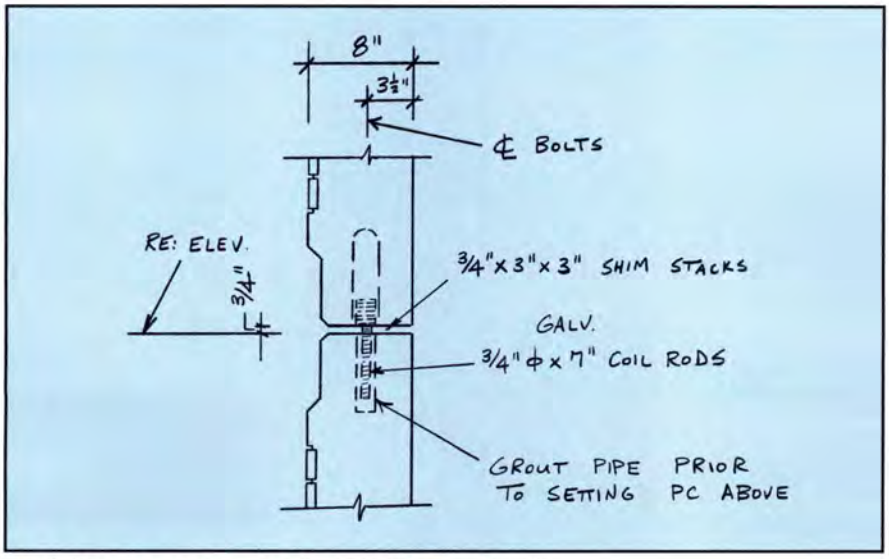

Fig. 8. Precast panel-to-panel connection (see Fig. 7).

- A complicated structure to construct, namely, connecting a new structure to an existing concrete structure.

In essence, there were easier structural steel projects to construct in the Kansas City economy at that time. Faced with a budget problem, the contractor and the design team explored the feasibility of utilizing precast concrete. It soon became apparent that, despite tight precast erection conditions, a precast, prestressed structural solution would be the most efficient and economical system to use. The precast system also satisfied Seismic Zone IIA requirements and code safety regulations.

Another advantage of precast concrete was that while demolition operations were being carried out, the precast components could be manufactured in a nearby protected plant. In addition, production and erection scheduling were easier to pin-down with precast concrete. It thus became logical for the precaster to work with the engineer in order to produce the most effective and economical solution.

Fig. 3 shows the original floor plans of the Gatlin and Poindexter Buildings. Fig. 4 shows the south elevation of the original Gatlin Building and Fig. 5 is a second floor framing plan of the same building. Fig. 6 is a section showing the tie-in of the new precast wall with the existing concrete slab of the Gatlin Building. Figs. 7 and 8 are connecting details showing the tie-in between the precast panel and frame and panel-to-panel, respectively.

When the designated partial demolition of the Gatlin Building was completed and the precast, prestressed stabilizing core was in place, the exterior facade of the Gatlin Building was ready to be installed. These façades were clad with architectural precast panels with thin brick to match the original picture frame appearance of the concrete frame and brick in-fill. The precast parapet cornice was designed to match the existing cornices on the building.

The entrance to the new office facility is at the south facade. The facade, which was originally a part wall to another building, has a brick veneer applied to its exterior. A new curtain wall projects out into a pedestrian plaza to emphasize the interior lobby and entrance.

A total of 278 precast, prestressed concrete components were used on this project (for details of these components, see Table 1). The structural components (such as single and double tees, beams, columns, and staircases) were used to form only the core of the Gatlin Building, whereas architectural precast components were used to clad the exterior of the building. For the larger Poindexter Building, no precast cladding was used but extensive masonry tuckpointing was necessary.

The precast concrete components were manufactured in the winter of

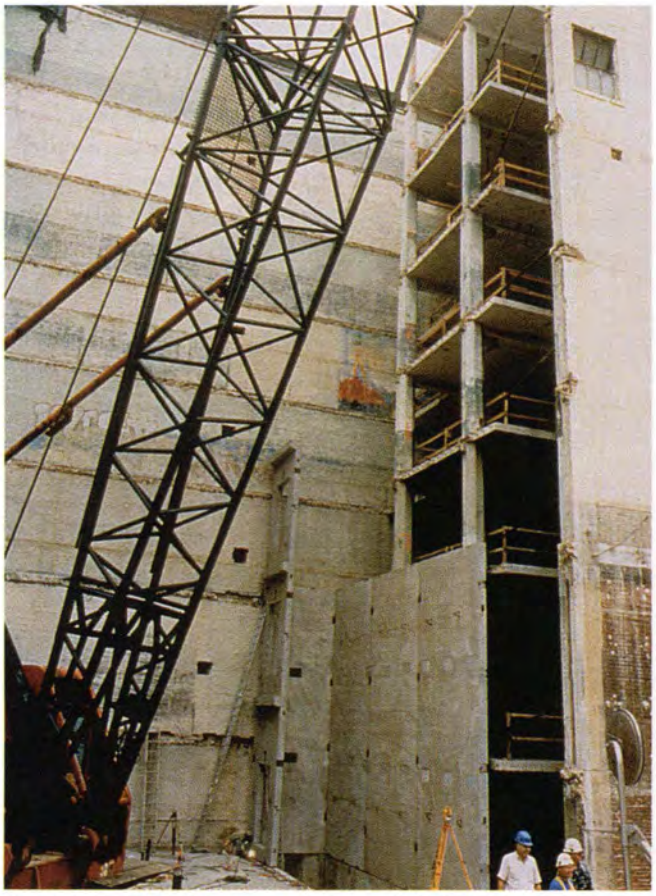

Fig. 9. Erection of precast concrete stabilizing core.

Fig. 11. Front façade of finished building.

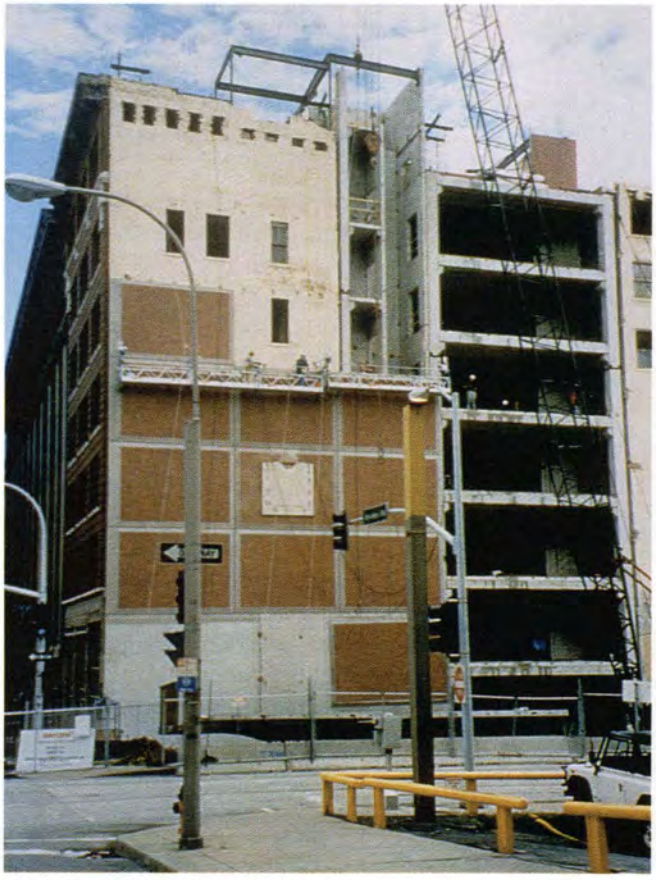

Fig. 10. Erection of precast façade.

Fig. 12. Construction of Gatlin Building.

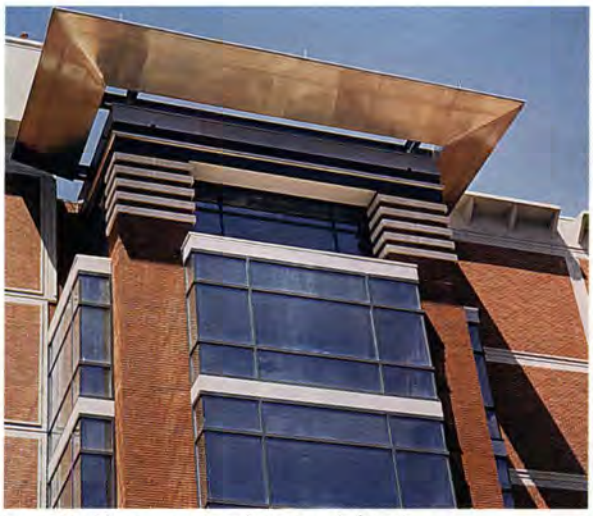

Fig. 13. Close-up of architectural detail showing eyebrow.

Fig. 14. Finished Poindexter Office Building.

1996-1997 by CSR Quinn at their plant in Marshall, Missouri. From there, the components were hauled 100 miles (160 km) by truck-trailer to the project site in downtown Kansas City. The erection of the precast components was carried out by the contractor, J. E. Quinn Construction Company.

Figs. 9 through 12 show various shots of the erection operation.

The total cost of the precast renovation work (production, hauling, and erection) was $800,000.

The Poindexter Office Building was completed in May 1997. Figs. 13 and 14 show various views of the completed project.

CONCLUSION

The end result of the renovation of the old Gatlin and Poindexter buildings into a modern office complex is that an entire city block has been revitalized, keeping the historic Garment District of downtown Kansas City intact and vibrant.

The Poindexter Building project won an Honorable Mention in the Rehabilitated Office Buildings category of the 1997 PCI Design Award Program. The jury commented as follows:

> "This project demonstrates a bold application of precast and prestressed concrete in rehabilitating an old dilapidated building. First, structural precast concrete was used to stabilize the frame of the adjacent building in order that architectural precast concrete could be applied safely on the exterior face of the main building. With much of the nation's infrastructure needing major repair, precast, prestressed concrete can play a prominent role in urban renovation."

The newly renovated office building has been in operation for nearly a year. The owner, design-construction team, and tenants of the building are pleased with the new facility. Indeed, instead of being an "eye-sore," the renovated building has played an important role in rejuvenating the historical heritage of downtown Kansas City.

CREDITS

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