

Team Approach, Inside And Out, Aids Growth

Ellerbe Becket uses a coordinated approach to the building process and a newly restructured team approach to its staff to stay at the forefront

Ellerbe Becket long has been a proponent of an integrated, team approach for achieving maximum results, and its work on the Rose Garden Arena in Portland, Ore., proved a classic example. Even though the massive, 750,000-square-foot project wasn't constructed in a design/build format, the designers knew its complexity would be lessened by working closely with the other key construction members. So they brought in the precaster and others 10 months before bids went out.

"If the owner will allow it and doesn't insist on closed bids, we ask the subs for their input in advance," says Bob Huddleston, president of Ellerbe Becket's Construction Services division. "Making the subcontractors part of the design team before they sign a contract offers the opportunity to bring the subcontractor's knowledge into the design process at the most advantageous time."

Although projects with fully integrated architecture, engineering and construction services represent only 17 percent of total billings, the integration of all three services is continually growing. The company hopes to keep it that way, and it also has adapted that team concept to its own internal staff through a recent reorganization.

Early Input Pays Off

"Incorporating the precaster's knowledge into the solution avoids the necessity for redesign," Huddleston explains. "It also avoids forcing the fabricator into a solution that might be

inefficient for him." That's particularly true in projects like the Rose Garden Arena, which included a 21,212-seat arena made of structural precast, as well as an office building, restaurants and shops and two parking garages, all of which were clad in architectural precast panels (see the Project Spotlight).

Stadium, arena and ballpark designs represent a major market for the 700-member firm, headquartered in Minneapolis. Ellerbe Becket's entrance

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into the field of sports facilities began with the 1991 renovation of New York City's Madison Square Garden and the 1992 completion of the American West Arena in Phoenix, Ariz. Today, its architecture and engineering expertise in sports/entertainment facilities is centered in the Kansas City office, and the company says it has designed more new sports projects worldwide than any other U.S. design firm. Recent projects include the 1996 Olympic Stadium in Atlanta, the enormous Phoenix Bank One Ballpark complex, and the Saitama Arena in Tokyo.

Many of these stadia feature innovative design solutions. For example, the Saitama Arena will be

Special Forms Simulate Limestone

As a response to nearby structures, the textured precast accent bands on Gund Arena in Cleveland were designed to simulate clefted Indiana limestone in both color and texture. After attempting unsuccessfully to obtain actual clefted limestone large enough to fabricate form liners, the design architect and precasters at National Precast Inc, Roseville, Mich., decided to create a custom form. The precaster made a wood form in the correct size and filled it with fine wet sand, trowelled to a smooth surface. The architect then used a 12" x 12" sample of clefted limestone to randomly emboss the surface.

The rough edges of displaced sand were carefully touched up with a fine paintbrush to eliminate areas that might collect water and spall during winter weather. After sealing the sand, a plaster mold was poured, from which multiple rubber forms were fabricated in the required lengths.

fully convertible from a 20,000-seat arena for basketball and hockey into a 30,000-seat stadium for American-style football and professional soccer. The transformation will take place in less than 20 minutes by means of a movable roof and a relocatable 14,000-ton section of walls and seating.



The use of both structural and architectural precast concrete on the state-of-the-art Gund Arena in Cleveland benefited the project in many ways, including allowing components to be fabricated while the superstructure was being erected. Photo: Timothy Hursley

PROJECT SPOTLIGHT

Gund Arena

Location: Cleveland, Ohio.

Project Type:

Sports/entertainment arena

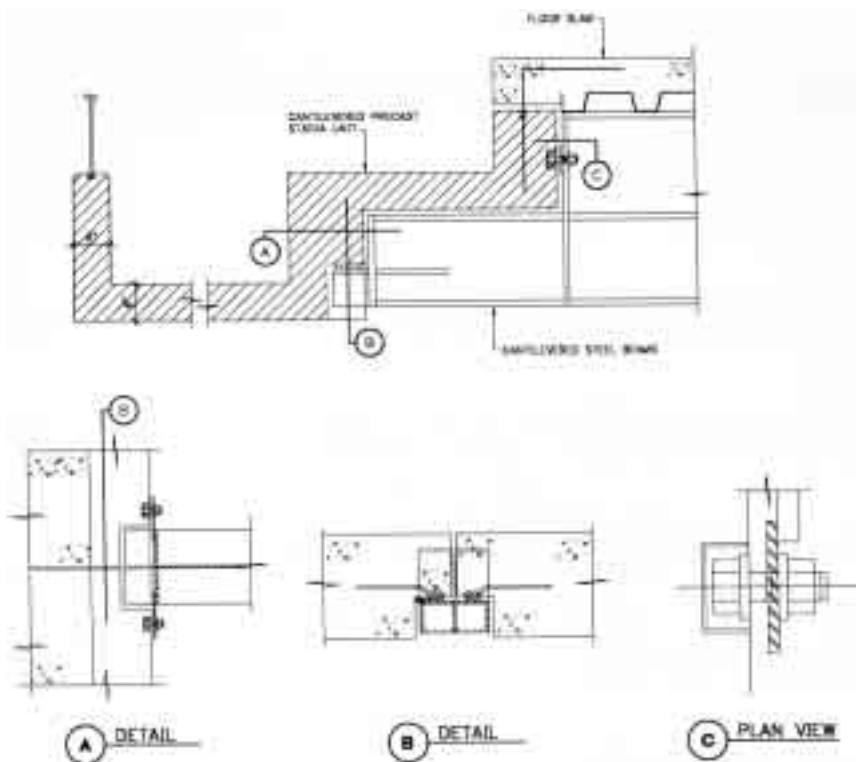
Area: 750,000 square feet

Owner: Gateway Economic Development Corp.

Construction Manager: Turner Construction Co.

Precaster: National Precast Inc., Mich. (for technical information contact precaster—see p. 44)

Description: Home to the NBA's Cleveland Cavaliers and the IHL's Cleveland Lumberjacks, this multi-purpose 22,000-seat, state-of-the-art sports and entertainment arena includes a basketball practice court and restaurants. Precast concrete was used for both structural elements and cladding. The interior bowl seating area consists of precast concrete stadia, vomitory walls, stairs, and parapets. The precast components were chosen for their capacity to span long distances while minimizing self weight loads and for their ability to dampen vibration. Other considerations included acoustical properties for concerts, versatility in accommodating various structural design criteria, ability to accurately cast in material to accommodate other trades, and the material's overall quality and appearance. The selection of precast prestressed exterior wall panels for the exterior skin allowed the exterior wall to clear span the distance between floors, without any unsightly and expensive structural steel back-up. Veneers of insulated precast panels provided an economical means of accommodating an exterior finish of high quality. The finishes include granite- and brick-faced precast, as well as pigmented, acid-washed precast simulating smooth Indiana limestone combined with accent bands of pigmented, custom-formed precast mimicking clefted Indiana limestone (see the sidebar).



In order to eliminate sightline obstructions below the first rows of the middle and upper levels in the Gund Arena, the first row of precast stadia at these levels was cantilevered from the supporting raker beams. This drawing shows details of the upper and mid deck stadia units.

Stadia Demand Precast

Almost all stadium projects use precast concrete for the seating units, and it also is frequently used for other structural components and cladding, notes James Poulson, senior project designer. "Precast is ideal for tread and riser applications," he says. "It's better than steel for seating areas, because it's fireproof, and the finish is completed as soon as the casting is done. Precast also has excellent spanning capabilities, and since it's easy to erect, it speeds construction. It's also an economical material for exterior cladding, offering great flexibility in design and finishes. It gives you a more interesting finish than other materials."

PROJECT SPOTLIGHT

Charles Evans Whittaker United States Courthouse

Location: Kansas City, Mo.

Project Type: Federal courthouse

Area: 600,000 square feet

Owner: General Services Administration

Contractor: J.E. Dunn Construction Co.

Precaster: Wilson Concrete Co., Neb. (for technical information contact precaster—see p. 44)

Description: Designed in association with Abend Singleton, Associated Architects, this \$92-million courthouse facility in downtown Kansas City is currently under construction, with completion scheduled for fall of 1998. Sixty percent of the exterior cladding is precast panels that simulate limestone, fabricated with a white cement and a light sandblasted finish. Typically 150 millimeters thick, the 2,243 panels vary in width from 2 to 12 feet. The shapes include three radiuses to cover inside and outside curves in the facade. The panels are fastened to the cast-in-place concrete framing system using weld plates with headed studs and deformed bar anchors. In order to meet the construction schedule, the precast was erected at night, using two tower cranes dedicated to erection of the structure during the day. A precast skin was selected to relate to the surrounding limestone government buildings, because it was economical, and because it adapted well to the complex geometry of the building.



Designed in association with Abend Singleton, Associated Architects, the crescent-shaped Charles Evans Whittaker United States Courthouse in Kansas City, Mo., features curved walls, with shaped pieces of precast concrete cladding wrapped around the corners. Precast was selected for the facade because it related to surrounding limestone government buildings and adapted well to the building's complex geometry. Photo: Architectural Photographics 1994, Kansas City, Mo.

Building On Long-Term Principles

Founded in 1909 by Franklin Ellerbe, Ellerbe Becket is one of the oldest and largest architecture, engineering and construction firms in the United States. After his father's death in 1921, Thomas Ellerbe presided over the firm for nearly 50 years and initiated many management concepts that benefited employees. At retirement in 1966, he turned ownership of the firm over to a group of his employees, and today it is entirely employee-owned.

Thomas Ellerbe was a Modernist, and during his leadership, the firm developed a tradition of functional design, streamlined organization, and an enthusiasm for new technology. These principles still guide the firm today. The firm was known as Ellerbe Inc. until the 1987 acquisition of Welton Becket Inc., a Los Angeles-based architectural firm with a reputation for design excellence and a strong presence on the West Coast.

The significance of Ellerbe Becket's longevity and strong track record can be seen in its many long-term relationships. Those include the Mayo Clinic, one of its oldest clients. Franklin Ellerbe designed the first Mayo Clinic group practice building in Rochester, Minn., in 1914. As the medical practice expanded in Rochester and added regional clinics, Ellerbe Becket has continued to design new facilities. Among other important long-term clients are the University of Notre Dame, which has been a client for 45 years, and State Farm Mutual Automobile Insurance Co., a client for 46 years.

In addition to architecture and all types of engineering, Ellerbe Becket offers strategic and facilities consulting, planning, interior design, post-occupancy services, program management, design/build, and construction management and administration. The firm has six offices in the U.S. and five overseas. In 1995, posted revenues reached \$105 million.

The State Farm Insurance Support Center-East in Alpharetta, Ga., is strongly built to ensure the continuous operation of the computer equipment inside. To give it the necessary stability and durability, the structure was built almost entirely of precast concrete, with seven- and nine-inch-thick insulated precast panels as walls.
Photo: Peter Styx/Ellerbe Becket

Another advantage he exploits is precast's ability to cast stone elements right into the component. "Precast offers the easiest, fastest and most efficient way to erect stone, because it's applied in a more controlled environment," he says. "Especially when you have curved walls, precast is much easier to use than stone, and it is easier to apply in large pieces than stone." He also uses it frequently to wrap the corners of the building. The firm is using this solution on the Charles

PROJECT SPOTLIGHT

Laurel Regional Hospital

Location: Laurel, Md.

Project Type: Medical facility addition/renovation

Area: 38,265 square feet

Owner: Dimensions Health Care Corp.

Contractor: Whiting Turner Contracting Co.

Precaster: Exposaic Industries Inc., Va., now Shockey Bros. Inc., Va. (for technical information, contact precaster—see p. 44)

Description: The project includes a three-story addition to a 17-year-old hospital, plus alterations that replaced the existing Emergency and Intensive Care departments. Architectural precast concrete was chosen as the primary exterior material because it could match the existing precast exteriors and its ability to meet a construction schedule of 13 months. The 66 precast panels, totaling 7,016 square feet, were fabricated with a brownstone exposed aggregate with a medium sandblasted finish. The pieces ranged in size from 34' x 9' to 7'3" x 1'4".

The new Patient's Entrance at Laurel Regional Hospital in Laurel, Md., is part of a 38,265-square-foot addition to the existing 17-year-old building. Precast concrete panels with an exposed aggregate on the exterior tie the addition to the original structure.
Photo: Walter Smalling Photography



PROJECT SPOTLIGHT

State Farm Insurance Support Center-East

Location: Alpharetta, Ga.

Project Type: Data/computer center

Area: 254,000 square feet

Owner: State Farm Mutual Automobile Insurance Co.

Contractor: Holder Inc.

Precaster: Metromont Materials Corp. (for technical information, contact precaster—see p. 44)

Description: The Insurance Support Centers are technology warehouses with dual electrical power and extra mechanical systems to prevent any interruption of electrical power to the computers. This building is constructed almost entirely of prestressed concrete, with two separate roofing systems designed to withstand 200-mph winds. The roofs feature prestressed double tees with two-inch-thick poured concrete topping. The prestressed tees allowed the roof to be installed quickly so interior work could begin prior to enclosing the building. Exterior walls are seven- and nine-inch-thick insulated prestressed panels with a natural exposed river stone aggregate finish. The structural system also included prestressed inverted tee and L-beams and columns, and took six weeks to erect.





Located in the Convention Center District of downtown Minneapolis, the Leamington Municipal Transit Hub relates in material and color to the nearby Convention Center. The architects decided to use precast cladding to express the design as a veneer instead of having the structural system dictate the design.
Photo: Jon Miller/Hedrich-Blessing

PROJECT SPOTLIGHT

Leamington Municipal Transit Hub

Location: Minneapolis

Project Type: Parking structure/multi-modal transit station

Area: 630,000 square feet

Owner: City of Minneapolis

Contractor: Kraus Anderson

Precaster: Gage Brothers Concrete Products Inc., S.D. (for technical information, contact precaster—see p. 44)

Description: This 2,100-car parking structure and multi-modal transit station for the Convention Center District in downtown Minneapolis includes a seven-gate bus station, a bus transfer area, and a future Light Rail Transit connection. The precast concrete selected for the exterior relates to the precast cladding on the nearby Convention Center and was fabricated by the same precaster. Using a Minnesota granite mixed with St. Cloud black sand, the precaster produced the dark and light tones of reddish maroon that make up the banding on the facade. The darker color is acid-etched, while the light color is sandblasted. Made to resemble Indiana limestone, the stair towers are finished in panels with a white cement and an off-white limestone mix, which were given a very light acid etch. The 800 pieces of precast amounted to 75,000 square feet.

Evans Whittaker Courthouse project in Kansas City, Mo., where the precast resembles limestone (see the Project Spotlight). “I don’t like mitered corners, and you have to miter stone corners to resemble limestone.”

Ellerbe Becket also specified precast concrete to great advantage on its

expansion and renovation plan for the football stadium at the University of Notre Dame, where construction is on a tight schedule and had to continue during the 1996 football season. Precast concrete shear walls allowed for a rapid construction schedule at relatively low temperatures without the need for

shoring, explains Randy Bredar, project designer.

“Precast also enabled us to relate the addition to the existing structure, which is brick and limestone,” he adds. “It let us combine structural characteristics with a handsome architectural finish and gave us the details and reveals we wanted. In other areas, we combined precast with brick. The precast gives the structure the permanent look of limestone.”

Integration Saves Time, Money

The firm’s principals regard Ellerbe Becket’s ability to offer construction services in addition to architecture and engineering as a key strength that sets it apart from other major A/E firms. “One of our primary goals is to achieve shorter building cycles and lower building costs through the integration of architecture, engineering and construction,” says Randy Wood president of engineering. “We hope to increase our construction volume in the future to further emphasize this.”

He stresses the company’s firm belief that the best way to deliver service is through an integrated approach. “It brings the owner into the process in a more informed way, in addition to the

PROJECT SPOTLIGHT

Rose Garden Arena

Location: Portland, Ore.

Project Type: Sports arena

Area: Arena: 725,000 square feet;
garage: 380,000 square feet;
annex building: 65,000 square feet;
annex garage: 150,000 square feet

Owner: Oregon Arena Corp.

Contractor: Drake/Turner, Joint Venture

Precasters: Structural: Morse Bros. Inc., Ore.; Architectural: Buehner Corp., Utah (for technical information, contact precaster—see p. 44)

Description: This enormous project included an annex building containing the NBA's Portland Trail Blazer offices, with restaurants and shops at the plaza level; an associated garage; an arena garage; and the 21,212-seat arena. Precast concrete was used for structural components, including raker beams, stadia, vomitory walls, and fascia pieces, as well as for exterior cladding on all the buildings. Using precast concrete for the raker beams, which could be isolated from the structure's lateral loads, offered a definite advantage in an area of high seismic risk. The stadium units were constructed with a magnesium-float tread finish to provide slip-resistant walking surfaces. The architectural precast panels on the exterior combine a medium sandblasted finish with basket weave accent bands at the floor lines featuring a light sandblasted finish. Special handling and masking were required by the precaster on some of these panels, as they featured both light and heavy sandblasts together on one panel. Granite panels were embedded in the precast at the building's base.

subs, and it eliminates an adversarial relationship between architects, engineers, owners and contractors."

While a design/build style is hardly new, this approach to construction most often is initiated by owners who want to save time and control costs. Other design/build firms often have their own trades people, but Ellerbe Becket offers mainly construction management and administration services. "That eliminates any bias in the scheduling of work," explains Huddleston. Examples of the

firm's recent projects using its construction services include the East Texas Medical Center in Tyler, Texas, a \$55-million ongoing project, and the Special Events Center at MGM's Grand Resort in Las Vegas, Nev.

Ellerbe Becket positions its architects and engineers as independent consultants who perform services for a fee. Their solutions are tested when they meet with the owner and contractors. "When everyone meets at the same bid table, the subs fully understand the scope of work," says Huddleston. "They have an

'Face to face communication is invaluable.'

opportunity to refine the contract and adjust their prices then. This process also allows the owner, architects and construction manager to evaluate the bidder

and his bid. Face-to-face communication is invaluable."

This method is different from traditional design/build with a fixed price, he adds. "It lets all parties share knowledge of the same goal to the benefit of the client. By marrying design and construction, we take full responsibility for the outcome of the project so the owner has only one place to go if something doesn't work. It also relieves the architects and engineers of contractual issues, leaving them free to concentrate on finding the best design solution."

Reorganization Improves Efficiency

To further maximize efficiency to clients in different market sectors, Ellerbe Becket recently has restructured its work force, dividing the bulk of its staff into teams within its three divisions of architecture, engineering and construction. Currently the staff is organized into

The exterior material on the Rose Garden Arena in Portland, Ore., is largely precast concrete, featuring details in relief and several types of aggregates and finishes. The precast cladding enabled the architects to create details such as deep reveals, staggered panel joints and texture, which break up the mass of the building and add visual interest to the exterior.

Photo: Chris Eden/Eden Arts





Six-inch-thick precast panels on the exterior of the National Archives & Records Administration building in College Park, Md., prevent much sunlight from penetrating the interior, where valuable records are stored. The use of precast also helps maintain the required temperature and humidity.
Photo: Maxwell Mackenzie

15 architectural teams, eight engineering teams and four construction teams. Any or all of them can combine or separate, dominate or subordinate, according to the needs of a specific client in a specific market, explains Bob Degenhardt, Ellerbe Becket's chief executive. "Our integrated approach allows us to bundle or unbundle our services so we can provide the best product, at the best total cost, and the best total solution."

Although the firm has had experience in every building type, it presently focuses on five primary markets: healthcare, corporate, higher education, government, and sports and entertainment. "We spend a lot of time looking toward the future," Wood says. "We concentrate on expanding our accumulated knowledge of specialized building systems and their applications to satisfy our customer's needs."

They also continually try to improve their knowledge of how clients work to better serve them, he notes. "With our new team-centered approach, our teams are in constant contact with our clients. Through surveys administered by consultants, we study how best to ask questions and communicate better with clients. Communication makes it all happen."

Applying Advanced Technology

Ellerbe Becket has a history of embracing the latest technology, beginning with the purchase in 1958 of its first office computer, a Bendix G-15, which sliced off one third of the time needed for structural calculations. Today the firm uses a variety of hardware and software to provide electronic design simulations that allow architects to test their designs through 3-D models and animations. These tools also help the architects communicate their ideas to clients.

In the healthcare sector, the firm's medical planners have created more than 200 room templates, incorporating computer-aided design into AutoCAD. Often the firm incorporates a client's CAD standards into the final project documentation so the client can receive a disk when the project ends to use for facility management. Networking between Ellerbe Becket's various offices around the world makes it possible for team members in different disciplines to share documents.

Future Growth Markets

This year, Ellerbe Becket's international projects represent 35 percent of its work, and the firm's principals would like to see this amount increase

PROJECT SPOTLIGHT

Archives II, National Archives & Records Administration

Location: College Park, Md.

Project Type: Research and storage facility

Area: 551,000 square feet

Owner: General Services Administration

Contractor: The George Hyman Construction Co.

Description: The design of this enormous building was a joint venture with Hellmuth, Obata & Kassabaum. In addition to sizable areas for long-term storage, the six-level building includes offices, conference rooms, a power plant, a fitness center, laboratories and a research center complex. Precast concrete was the preferred exterior material because the six-inch-thick panels lessen the impact of the sun on the interior and the thermal mass of the precast aids in maintaining the strict temperature and humidity control. The material's durability also allows for a life expectancy of 50-plus years. The building is clad in 1,800 precast panels made with white cement combined with an exposed quartz-type aggregate. The precast fabricator completed the cladding in less than 36 weeks.

to 50 percent within the next five years. "We do a lot of design/build overseas," Wood says. That includes the recently completed Moscow Bank for the Russian Federation Savings Bank, a 30,000-square-meter project, which was produced as a design/build turnkey project. "We are doing more and more work in Russia today."

Other overseas markets with good potential for new work are Eastern Europe, the Pacific Rim, the Middle East, and South America, according to Wood. "Growing industries in the U.S. are renovation, multi-use sports complexes, and educational facilities," he adds. "We support our customers by understanding their business and continually investing in knowledge and process."

— Anne Patterson