

## Commercial & Entertainment **2A**

Office & Corporate _____	<b>2A-1</b>
Retail _____	<b>2A-5</b>
Stadiums & Arenas _____	<b>2A-9</b>
Parking Structures _____	<b>2A-13</b>
Mixed-Use _____	<b>2A-17</b>

## Institutional **2B**

Educational Facilities	
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Justice & Correctional _____	<b>2B-9</b>
Government &	
Public Buildings _____	<b>2B-13</b>
Religious Architecture _____	<b>2B-17</b>
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## Housing & Residential **2C**

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Condominiums _____	<b>2C-13</b>
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Retirement Housing _____	<b>2C-21</b>
Assisted Living _____	<b>2C-25</b>

## Industrial **2D**

Warehouses _____	<b>2D-1</b>
Distribution Facilities _____	<b>2D-5</b>
Manufacturing _____	<b>2D-9</b>
Food-Processing	
Facilities _____	<b>2D-13</b>

## Miscellaneous **2E**

Pedestrian & Bicycle Bridges,  
Soundwalls, Water Tanks,  
Towers, Unique Structures, etc.

# CHAPTER **two**

## BUILDING TYPES



DESIGNING WITH PRECAST & PRESTRESSED CONCRETE

## CHAPTER TWO

# a.

## COMMERCIAL & ENTERTAINMENT BUILDINGS

Commercial buildings must meet a wide range of needs while providing an aesthetically pleasing look. These facilities must adapt to users who visit the structures for short periods, as well as those who inhabit the facilities on a regular basis. Precast concrete helps meet these challenges with a variety of capabilities that aid the owner, designer, and contractor and provide long-term benefits to users.





Case-Highland Oaks Corporate Park, Tampa, Fla.;  
Architect: ADD Inc., Cambridge, Mass.;  
Photo: Rob Bovarnick, Rob/Harris Production Inc.

# office & CORPORATE BUILDINGS

## Design Challenges

## Precast Concrete Solutions

<i>Provide open interior spaces to create open-floor layouts and allow for rearrangement of spaces as needs change.</i>	<i>Hollow-core slab or double-tee floor and roof components have long span capabilities that eliminate columns and provide unobstructed runs for utilities in the cores of hollow-core or between double-tee stems.</i>
<i>Ensure sufficient structural support for computer and storage systems.</i>	<i>High-strength flooring provides support for heavy loads now and in the future.</i>
<i>Create secured parking beneath office levels.</i>	<i>Precast concrete structural systems can be used to create parking on lower levels, provide fire-rated separation, and allow flexible layout options for office space.</i>
<i>Increase energy efficiency.</i>	<i>Thermal mass helps regulate temperatures; insulated precast concrete sandwich panels provide added energy efficiency due to insulation in the core.</i>
<i>Offer superior fire resistance.</i>	<i>Inherently non-combustible composition, along with compartmentalization designs, contains fire to specific limited areas and allows for detection, evacuation, and suppression.</i>
<i>Provide early occupancy to meet leasing needs.</i>	<i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</i>  <i>Year-round, all-weather construction ensures that schedules are met.</i>  <i>Elimination of sub-framing, bracing, and scaffolding saves time and money.</i>  <i>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</i>
<i>Minimize congestion and safety concerns on site and in the general vicinity during construction.</i>	<i>Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during construction.</i>
<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.</i>
<i>Provide proper aesthetic style to blend with the surrounding neighborhood, whether contemporary or historic, and to create a distinctive image reflecting the owner's stature.</i>	<i>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.</i>



# office & CORPORATE BUILDINGS



*South Trust Bank of Charleston, S.C.; Architect: Liollo Architecture; Photo: ©2003 Brian Dressler/www.dresslerphoto.com.*



*Two Buckhead Plaza Office Building, Atlanta, Ga.; Architect: Corcoran, Nelson, Nardone Associates Inc.; Photos: Reel Video & Stills Inc./Brian Erkens.*



*Hearst Tower, Charlotte, N.C.; Architect: Smallwood, Reynolds, Stewart, Stewart & Associates Inc.; Photo: Carolina Photography Group.*



*Best Buy Corporate Campus, Richfield, Minn.; Architect: Opus Architects & Engineers; Photo: Jeff Gleason and Daniel Young Dixon.*





*Brighton Landing, Brighton, Mass.; Architect: ADD Inc.; Photo: Warren Jagger Photography Inc.*



*United Parcel Services Corporate Offices, Atlanta, Ga.; Architect: Thompson, Ventulett, Stainback & Associates (TVS&A); Photo: Brian Gassel, TVS&A.*



*Sabre Holdings Headquarters, Southlake, Tex.; Architect: HKS Inc.; Photo: ©Ed Lacasse, Lacasse Photography.*





Merrill Lynch Hopewell Campus, Pennington, N.J.;  
Architect: Thompson, Ventulett, Stainback &  
Associates (TVS&A); Photo: TVS&A.



Adtran Corporate Headquarters Phase IV, Huntsville, Ala.; Architect: Cooper Cary Inc.; Photo: ©Gabriel Benzur.



State Street Financial Center, Boston, Mass.;  
Architect: Jung/Brannen Associates Inc.,  
Boston, Mass.; Photo: Peter Vanderwarker.

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- "Stacking Precast Office, Parking Saves Space," *ASCENT*, Summer 2002, pp. 24-26.
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Las Olas Center, Ft. Lauderdale, Fla.;  
Architect: Cooper Carry Inc.;  
Photo: Ed Zealy, John Gillan Photography Inc.

# retail

## BUILDINGS

### Design Challenges

### Precast Concrete Solutions

Create tall, open interiors to allow for flexible merchandising space.	Architectural precast concrete panels can be designed to provide high ceilings.
Design a durable envelope that can withstand impact from forklifts.	Precast concrete's high strength and density provide durability that will withstand impacts.
Provide easily accessed delivery docking space.	Precast concrete panels' capability to be cast in 12 ft widths or wider allows docking doors to be built into a single panel, providing inherent stability and fast erection.
Provide for future expansion of the facility.	Expansion can be accomplished by removing end panels and adding new panels onto the sides. Original mixtures and aggregates can be replicated in added panels to match the existing structure.
Minimize congestion and safety concerns on site and in the general vicinity during construction.	Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during construction.
Expedite construction to provide faster return on investment.	<p>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</p> <p>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</p> <p>Year-round, all-weather construction ensures that schedules are met.</p>
Meet the area's seismic requirements.	Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.
Fit the structure into surroundings while meeting corporate-identity needs.	Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style. These looks can be used for warehouse-type retailers, additions to malls, stand-alone stores in upscale neighborhoods, and other specific location needs.



# retail

## BUILDINGS



*Lazarus Department Store, Pittsburgh, Pa.; Architect: Cooper Carry Inc.*



*Saks Majestic Square Complex, Charleston, S.C.; Architect: LS3P Associates Ltd.; Photo: ©Rick Alexander & Associates Inc.*



*Fashion Mall Expansion, Indianapolis, Ind.; Architect: CSO.*





*Target, Stamford, Conn.; Architect: Street-Works; Photo: Jeffrey M. Brown & Associates.*



*Rich's Department Store, Alpharetta, Ga.; Architect: Cooper Carry Inc.*



*Nordstrom Palm Beach Gardens, Palm Beach Gardens, Fla.; Architect: Callison Architecture Inc.; Photos: Vern Smith, Gate Precast.*





*Sherman Oaks Galleria, Sherman Oaks, Calif.; Architect: Gensler.*



*Tommy Hilfiger Retail Incorporated, Beverly Hills, Calif.; Architect: Allan Greenberg, Architect; Photo: David Rath.*

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MK-19-98: Precast Concrete Wall Panels: Retail Buildings (6 pp.).

MK-20-98: Precast Panels for Industrial Buildings (6 pp.).





Miller Park, Milwaukee, Wis.; Architect: HKS Sport & Entertainment Group/NBBJ Sports & Entertainment/Eppstein Uhen Associated Architects, a joint venture. Photo: Eric Oxendorf.

# stadiums & ARENAS

## Design Challenges

## Precast Concrete Solutions

<i>Design economical rows of seating that can withstand heavy loading.</i>	<i>Seating risers, especially economical double and triple risers, are the dominant choice for seating sections in outdoor stadiums and many indoor arenas. Shapes can vary to create needed sight lines, and vibrations can be controlled so that motion during use gives a sense of strength and security.</i>
<i>Create an interior structure with smooth traffic flow in and out as well as easy access to all sections.</i>	<i>Raker beams, columns, vomitory walls, and other structural components offer cost and time savings with close tolerances, while meeting the configuration requirements of any pedestrian-flow requirement.</i>
<i>Ensure all materials can withstand year-round weather for many years with minimal maintenance required.</i>	<i>Precast concrete mixtures ensure a long life cycle with the capability to withstand use by large-capacity crowds.</i>
<i>Minimize congestion and safety concerns on site and in the general vicinity during construction.</i>	<i>Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during construction.</i>
<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.</i>
<i>Create a fast construction pace to ensure that scheduled events occur on time or that new events can be scheduled quickly, providing faster revenue generation.</i>	<p><i>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</i></p> <p><i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</i></p> <p><i>Year-round, all-weather construction ensures that schedules are met.</i></p>
<i>Create an aesthetic design that fits the owner's need, whether it is a contemporary look or an old-fashioned stadium design with modern amenities.</i>	<i>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.</i>

# stadiums & ARENAS



Camden Yards Ballpark, Baltimore, Md.; Architect: Hellmuth, Obata & Kassabaum Sports Facilities Group.



Nebraska Memorial Stadium, Lincoln, Neb.;  
Architect: Sinclair Hills & Associates Inc. and DLR  
Group Sports of Tampa, Fla.



Gund Arena, Cleveland, Ohio; Architect: Ellerbe Becket Inc.; Photo: Timothy Hursley.





*Ericsson Stadium, Charlotte, N.C.; Architect: HOK Sports Inc.*



*Adelphia Stadium, Nashville, Tenn.; Architect: HOK Sports Group.*



*Staples Arena, Los Angeles, Calif.; Architect: NBBJ Sports & Entertainment.*



*U.S. Olympic Center, Colorado Springs, Colo.; Photo: John Miller, Hedrich Blessing.*





Rose Garden Arena, Portland, Ore.;  
Photo: Chris Eden/Eden Arts.



Centennial Olympic Stadium, Atlanta, Ga.; Photo: ©Aerial Innovations of Georgia Inc.



PNC Park, Pittsburgh, Pa.; Architect: HOK Sports and L.D. Astorino & Associates Ltd.; Photo: Massery Photography Inc.



Indian Wells Tennis Center, Indian Wells, Calif.;  
Architect: Rosetti Associates Architects.

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Emory University Parking Structure, Atlanta, Ga.;  
Architect: Thompson, Ventulett, Stainback and Associates  
Architects (TVS); Photo: Brian Cassel/TVS.

# parking

## STRUCTURES

### Design Challenges

### Precast Concrete Solutions

<i>Design open interior spaces to maximize parking layout and provide secure environment.</i>	<i>Double tees can span long distances to eliminate columns and provide unobstructed views through the levels.</i>  <i>Moment frames, K frames, litewalls, and other unique structural supports can open interiors and smooth traffic flow.</i>
<i>Provide early occupancy to ensure readiness when other buildings are ready.</i>	<i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</i>  <i>Year-round, all-weather construction ensures that schedules are met.</i>
<i>Maximize green space.</i>	<i>Precasters can help ensure the most economical, functional layout to maximize access, number of floors, ramp flow, and other factors that minimize the footprint.</i>
<i>Ensure high durability.</i>	<i>Concrete with low water–cement ratios and high-quality, plant-produced components projects against chloride penetration from deicing chemicals.</i>
<i>Allow for proper drainage.</i>	<i>Precasters ensure that joint placement and drainage in floors meet the needs of each unique design.</i>
<i>Provide easy long-term maintenance.</i>	<i>Maintenance is minimized by annual inspections at key joints and routine recaulking at long-term intervals.</i>
<i>Minimize congestion and safety concerns on site and in the general vicinity during construction.</i>	<i>Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during construction.</i>
<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.</i>
<i>Reduce the structure's scale so as not to overwhelm or dominate the landscape and create the proper aesthetic look to blend with the surrounding neighborhood, whether contemporary or historic.</i>	<i>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style and break up the mass of the structure's façade.</i>

# parking

STRUCTURES



*Fifth & Lafayette Parking Structure, Royal Oak, Mich.; Architect: Rich & Associates Inc.*



*South Spring Street Garage, Greenville, S.C.; Architect: Craig Gaulden Davis, Greenville, S.C.; Consulting Architect: LS3P Associates Ltd., Charlotte, N.C.*



*University of Denver College of Law Parking Structure, Denver, Colo.; Architect: University of Denver School of Architecture.*





*Resurrection Medical Center Southeast Parking Structure, Chicago, Ill.; Architect: Loeb Schlossman & Hackl.*



*Hull Street Parking Deck, Athens, Ga.; Architect: Smallwood, Reynolds, Stewart, Stewart & Associates Inc.; Photo: Jim Roof.*



*Orlando County Courthouse Parking Structure Expansion, Orlando, Fla.; Architect: Burke, Hogue & Mills Associates Inc.*



*Union Plaza Transit Terminal and Parking Garage, El Paso, Tex.; Architect: Synthesis Architecture Inc.*



Arcade Parking Structure, Providence, R.I.;  
Architect: Maguire Group.

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"Surgery Center Built Atop Precast Parking Structure," *ASCENT*; Spring 2001, pp. 24-28.

"Total Precast Parking Features Brick Blend," *ASCENT*; Summer 2005, pp. 18-20.

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Olympic Park Plaza, Louisville, Ky;  
Architect: Cooper Carry Inc.

# mixed-USE BUILDINGS

## Design Challenges

## Precast Concrete Solutions

<i>Create a distinctive character that projects an upscale image while allowing each function with the building to maintain its own in design.</i>	<i>The plasticity of precast concrete components, and the variety of finishes that can be used, ensure that designs blend with any surroundings and project any needed corporate image, while also allowing for diversity.</i>
<i>Ensure that parking areas do not overwhelm other functions in the building, and fit with the surrounding neighborhood.</i>	<i>Precast concrete designs can feature set-in brick, granite, and punched-window effects that replicate housing or other types of surrounding architecture. Reveals, finishes, and other techniques can reduce the visual mass of the building.</i>
<i>Ensure that code requirements for fire separation between parking and other functions are met.</i>	<i>Precast concrete hollow-core slabs and double tees provide the necessary separation between parking and other functional areas of the mixed-use facility.</i>
<i>Design open interior spaces to maximize parking layout and provide a secure environment.</i>	<i>Double tees can span long distances to eliminate columns and provide unobstructed views through the levels.</i>  <i>Moment frames, K frames, litewalls and other unique structural supports can open interiors and smooth traffic flow.</i>
<i>Provide structural support for many small rooms above open, column-free ballrooms and conference areas.</i>	<i>Hollow-core slabs span long distances while providing structural support, minimizing columns on lower floors.</i>
<i>Create high fire resistance.</i>	<i>Precast concrete's non-combustible composition minimizes the spread of fire, while compartmentalization design techniques provide time for detection, evacuation, and suppression.</i>
<i>Use durable materials that will not show dents and other misuse.</i>	<i>The compressive strength of the material minimizes chances for damage to interior walls or ceilings by guests.</i>
<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.</i>
<i>Expedite construction to provide faster return on investment and meet scheduling commitments.</i>	<i>A total precast concrete system expedites construction, minimizes component pieces by combining structural and architectural elements, and provides single-source responsibility.</i>  <i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</i>  <i>Year-round, all-weather construction ensures that schedules are met.</i>

# mixed-USE BUILDINGS



*South Carolina Aquarium Parking Structure, Charleston, S.C.; Architect: LS3P Associates Ltd.;  
Photo: ©Rick Alexander & Associates Inc.*



*St. Regis Museum Tower, San Francisco, Calif.;  
Architect: Skidmore, Owings & Merrill LLP*



*Fairbanks Chrysler/Jeep/Dodge, Tamarac, Fla.*



*The Ninth Square, New Haven, Conn.; Architect: Herbert S. Newman & Partners, PC;  
Photo: ©1995 Norman McGrath.*





116 Huntington Avenue, Boston, Mass.; Architect: CBT/Childs Bertman Tseckares Inc.;  
Photos: Wayne Soverns Jr. Architectural Photography.



MacArthur Center Mall, Norfolk, Va.; Architect: Hobbs & Black Inc.



Enterprise IV Corporate Center, Bridgeport, Conn.; Architect: Kasper Group Inc.; Photo: Blakeslee Prestress.





Esquire Plaza, Sacramento, Calif.; Architect: HOK/SF;  
Photo: Ed Asmus Photography.



Central Florida Chrysler/Jeep/Dodge, Orlando, Fla.



Mizner Park, Boca Raton, Fla.; Architect: Cooper Carry Inc.

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# b.

## CHAPTER TWO

### INSTITUTIONAL & PUBLIC BUILDINGS

Institutional and public buildings of all types require a strong, impressive façade to project the proper image to employees, visitors, and the general public. This need remains constant, whether these facilities are used for education, adjudication, administration, imprisonment, or worship services. But they must achieve that look, and all of their functional needs, on tight budgets that impress the public with economic stewardship. Achieving that balance, while meeting many other individual challenges, can be accomplished with precast concrete components in a variety of ways.

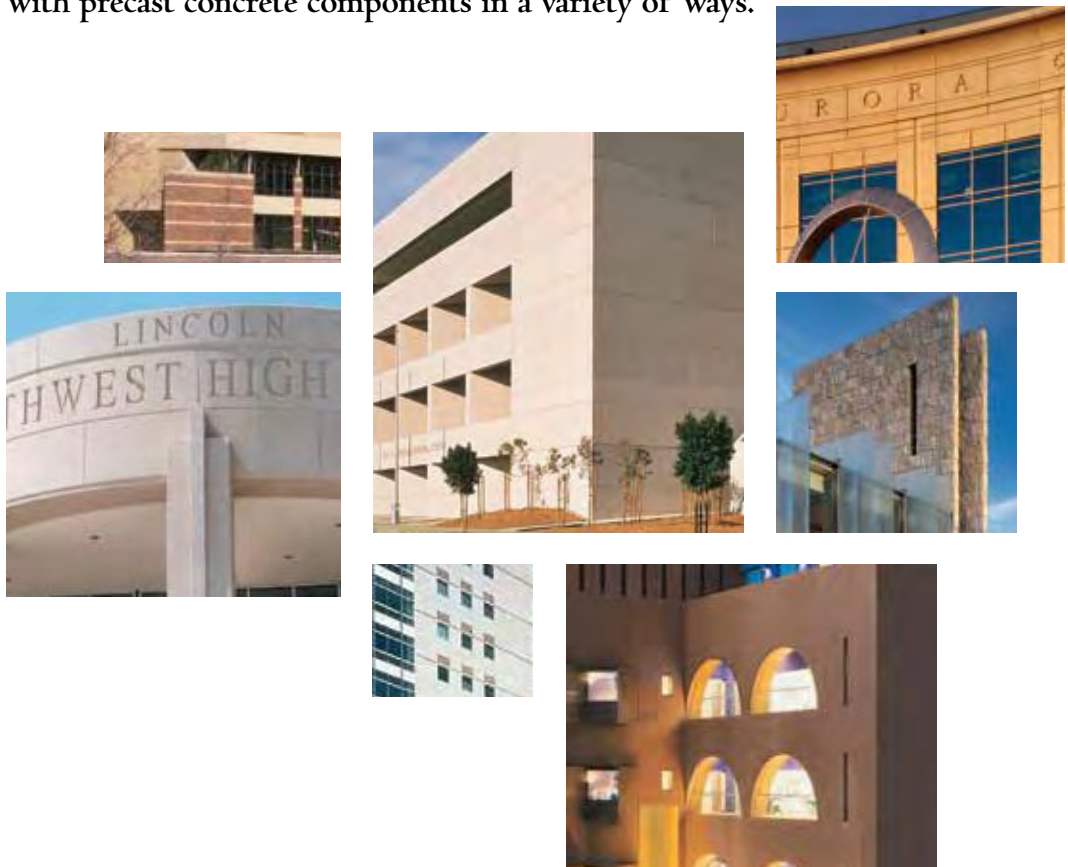








Photo: ©PhotoDisc

# GRADES K - 12 educational FACILITIES

## Design Challenges

## Precast Concrete Solutions

<i>Meet strict budgeting needs based on tax revenues.</i>	<i>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster, saving costs throughout the construction process.</i>
<i>Ensure that the building is ready for the school year in the fall or to meet other deadlines.</i>	<i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.  Year-round, all-weather construction ensures that schedules are met.</i>
<i>Maximize interior floor space.</i>	<i>Insulated sandwich wall panels offer an efficient, thin cross-section that maximizes interior floor space while minimizing the footprint.</i>
<i>Create needed long-span areas, such as gymnasiums and pools.</i>	<i>Hollow-core slabs and double tees can span long spaces to minimize or eliminate columns where needed.</i>
<i>Provide for future addition or expansion of classroom spaces.</i>	<i>Expansion can be accomplished by removing end panels and adding new panels onto sides. Original mixtures and aggregates can be replicated in added panels.</i>
<i>Create a highly fire-resistant structure.</i>	<i>Inherently noncombustible composition, along with compartmentalization designs, contains fire to specific areas and allows for detection, evacuation, and suppression.</i>
<i>Minimize operating costs throughout the life of the building.</i>	<i>Minimized joints, compared with brick or block construction, require less maintenance throughout the building's life.  Insulated sandwich wall panels provide high levels of energy efficiency, reducing HVAC costs.</i>
<i>Project an image of environmental friendliness by using low-impact products.</i>	<i>Precast concrete meets many of the rating criteria used by the LEED standards.</i>
<i>Minimize congestion and safety concerns on site and in the general vicinity during construction.</i>	<i>Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during construction.</i>
<i>Meet the area's seismic requirements.</i>	<i>Panelized wall systems and proven connection technology allow precast concrete components to be used in all seismic zones.</i>
<i>Provide a strong, institutional look that conveys an educational image.</i>	<i>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.  School names, emblems, and other custom touches can be embedded into panels, creating unique accents.</i>

# GRADES K-12 educational FACILITIES



*Jack Britt High School, Fayetteville, N.C.; Architect: Shuller Ferris Landstrom & Associates.*



*Lynwood High School, Lynwood, Calif.; Photo: ©1997 Wayne Thom.*





*Centralia High School, Centralia, Ill.; Architect: FGM Architects Engineers, Inc.; Photos: Gate Precast.*



*Woodmont High School, Piedmont, S.C.; Architect: Perkins & Will Design Architect; Architect of Record: Craig Gaulden Davis; Photo: Craig Gaulden Davis Architects/Photographer-Working Pictures.*



*Spring Union Free School, East Hampton, N.Y.*





*Durham Academy Elementary and Preschool, Durham, N.C.*



*Alberta Lea High School, Alberta Lea, Minn.; Photo: ©Don F. Wong.*



*Lincoln Southwest High School, Lincoln, Neb.*

#### **RESOURCES:**

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"Precast Offers Answers For High School Needs," *ASCENT*; Winter 2001, pp. 30-34.

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Photo: ©PhotoDisc.

# HIGHER educational FACILITIES

## Design Challenges

## Precast Concrete Solutions

<i>Provide a strong, institutional appearance that conveys an educational image.</i>	<p>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.</p> <p>A total precast concrete system can be adapted to a variety of designs and functions, including theaters, dormitories, classrooms, laboratories, and other facilities.</p>
<i>Design a conceptual look that allows buildings with different functional uses (theaters, dormitories, classrooms, laboratories) to work together aesthetically.</i>	<i>School names, emblems, and other custom touches can be embedded into panels, creating unique accents.</i>
<i>Meet strict budgeting needs based on tax revenues.</i>	<i>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster, saving costs throughout the construction process.</i>
<i>Ensure that the building is ready for the school year by fall, or as soon as possible for additions onto existing structures.</i>	<p>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</p> <p>Year-round, all-weather construction ensures that schedules are met.</p>
<i>Maximize interior floor space.</i>	<p>Insulated sandwich wall panels offer an efficient, thin cross-section that maximizes interior floor space while minimizing the footprint.</p> <p>Hollow-core slabs and double tees can span long spaces to minimize or eliminate columns where needed.</p>
<i>Create a highly fire-resistant structure.</i>	<i>Inherently noncombustible composition, along with compartmentalization designs, contains fire to specific areas and allows for detection, evacuation, and suppression.</i>
<i>Minimize operating costs throughout the life of the building.</i>	<p>Minimized joints, compared with brick or block construction, require less maintenance throughout the building's life.</p> <p>Insulated sandwich wall panels provide high levels of energy efficiency, reducing HVAC costs.</p>
<i>Create an image of environmental friendliness by using low-impact products.</i>	<i>Precast concrete meets many of the rating criteria used by the LEED standards.</i>
<i>Minimize congestion and safety concerns on site and in the general vicinity during construction.</i>	<i>Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during the construction.</i>
<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.</i>

# HIGHER educational FACILITIES



*John A. Burns School of Medicine,  
Honolulu, Hawaii; Architect: Zimmer  
Gunsul Frasca Architects.*



*Social Sciences Building, University of North Florida (UNF), Jacksonville, Fla.;  
Architect: TLC Engineering for Architecture; Photo: Gate Precast Co.*



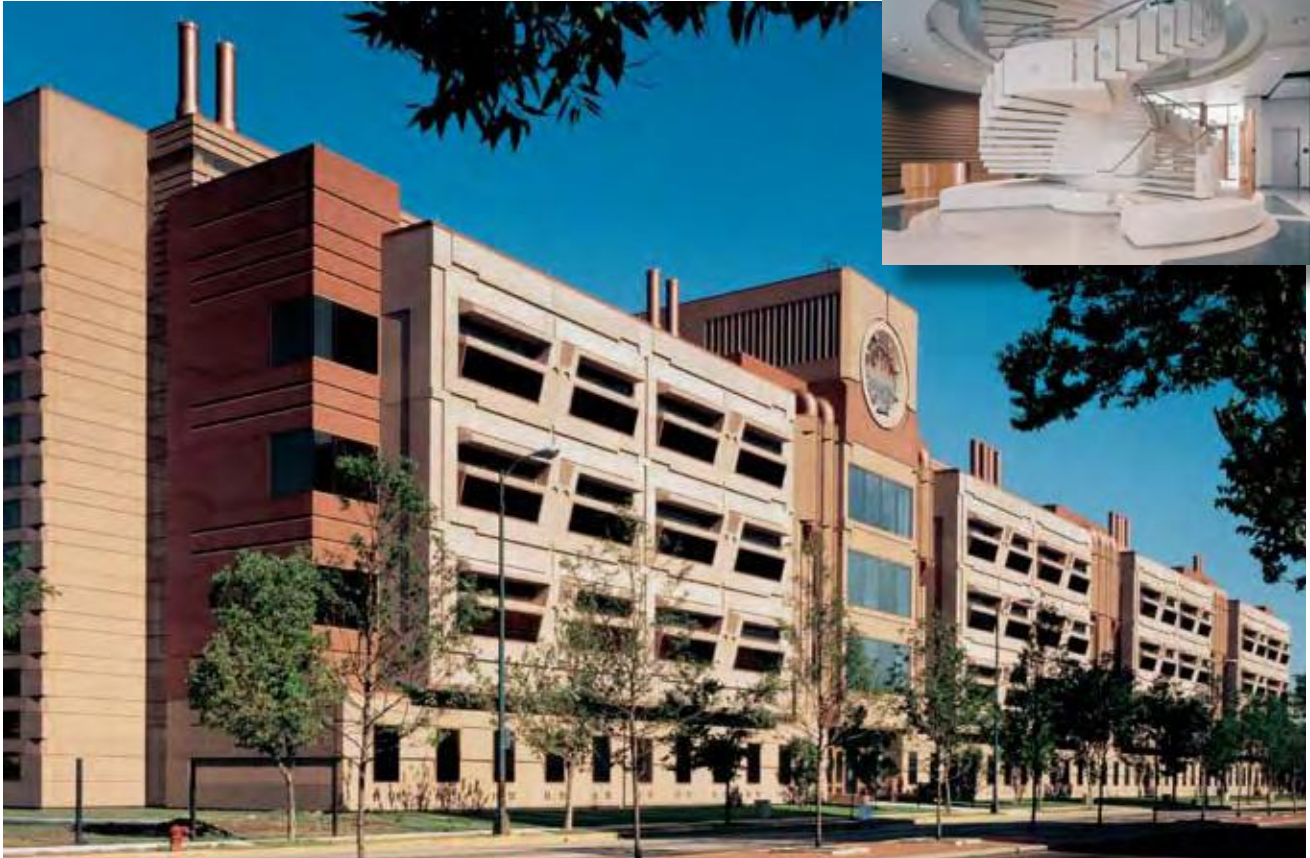




*Rectory Building at the University of Monterrey, Nuevo Leon, Mexico; Architect: Bernardo Hinojosa Architects & Planners; Photos: Francisco Lubbert.*



*School of Architecture at Florida International University, Miami, Fla.; Architect: Bernard Tschumi Architects and BEA International (joint venture); Photos: Thomas Dellback.*



University of Illinois Molecular Research Biology Building, Chicago, Ill.; Architect: Lohan Associates; Photos: Hedrich-Blessing.



Francois-Xavier Bagnoud Building, Harvard School of Public Health, Boston, Mass.; Architect: Payette Associates Inc.

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"School of Architecture at Florida International University," *ASCENT*; Fall 2004, p. 20.

#### PCI Journal:

"All-Precast Concrete Design Delivers On-Time Opening for Florida's LECOM Medical Students," *PCI Journal*; January-February 2006, pp. 82-97.

"All-Precast Concrete School of Architecture Creates Striking Identity for Florida International University," *PCI Journal*; July-August 2004, pp. 58-71.





Lloyd D. George United States Courthouse, Las Vegas, Nev.; Executive Architect: Langdon Wilson Architects; Photo: Langdon Wilson Architects.

# justice & CORRECTIONAL FACILITIES

## Design Challenges

## Precast Concrete Solutions

<i>Provide a durable, tough interior that will stand up to abuse.</i>	<i>Precast concrete's inherent toughness ensures no weaknesses in the walls, floors, or ceilings that can be exploited.</i>
<i>Offer long-span interiors in assembly areas to minimize supervision needs.</i>	<i>Hollow-core slabs and double tees can be used to span long distances, eliminating columns that could pose a security risk.</i>
<i>Create a secure facility with few joints that inmates can use to hide contraband.</i>	<i>Precast concrete components, including exterior loadbearing insulated wall panels, double tee roof slabs, precast concrete columns and beams, and interior precast concrete loadbearing and non-loadbearing walls, minimize joints compared to other construction products.</i>
<i>Construct the facility in the fastest time possible to alleviate overcrowded conditions.</i>	<p><i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</i></p> <p><i>Year-round, all-weather construction ensures that schedules are met.</i></p> <p><i>Large 10 by 30 or 40 ft. precast concrete walls can be erected quickly, enclosing the space early to allow interior work to begin sooner.</i></p> <p><i>Interior walls constructed of precast concrete minimize joints and are erected in a faster time frame than masons can provide, especially in rural areas where many prisons are built.</i></p> <p><i>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</i></p> <p><i>Prefinished cell modules arrive at the site with walls, ceiling, and floor constructed in one unit and many finishes in place. Typically, two-cell modules are cast together, although triples and quads can also be created. The modules are preplumbed and prewired, with furniture, toilets, sinks, electrical fixtures, windows, and doors already installed.</i></p>
<i>Minimize congestion and safety concerns on site and in the general vicinity during construction.</i>	<i>Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during construction.</i>
<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.</i>
<i>Design an appearance that is secure and imposing while meeting the needs of the local community.</i>	<i>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.</i>

# justice & CORRECTIONAL FACILITIES



*George R. Verno Center Addition, Rikers Island, New York; Architect: STV/Silver & Ziskind; Photo: S. Barker.*



*Thomas F. Eagleton United States Courthouse, St. Louis, Mo.; Architect: Hellmuth, Obata + Kassabaum.*



*United States Federal Courthouse, Jacksonville, Fla.; Architect: KBJ Architects Inc.; Photo: Aerial & Architectural Photo Inc.*



*East Los Angeles Municipal Courts Building, East Los Angeles, Calif.; Architect: Kanner Architects Inc.; Photo: Ron Pollard.*





*David L. Moss Criminal Justice Center, Tulsa, Okla.; Architect: BKL Inc./HDR Architecture Inc.*



*Douglas County Courthouse, Douglasville, Ga.; Architect: Cooper Cary Inc.; Photo: Brian Gassel/TVS.*





Charles Evans Whittaker United States Courthouse, Kansas City, Mo.; Architect: Ellerbe Becket/Abend Singleton Associated Architects; Photo: Timothy Hursley.



Michael D. Antonovich Antelope Valley Courthouse, Lancaster, Calif.; Architect: Mosakowski-Lindsey Associates.



Federal Metropolitan Detention Center, Philadelphia, Pa.; Architect: Ewing Cole Cherry Brott; Photo: Jeffrey Totaro.



DeKalb County Sheriff's Headquarters & Jail, Decatur, Ga.; Architect: Rosser International Inc.



El Paso County Jail, Colorado Springs, Colo.; Architect: CSNA Architects.

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*Ideas By Design*, Vol. 1 No. 1, March 2000: Justice Facilities (4 pp.).

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"Precast Panels Provide Secure, Historic Look for Philadelphia Federal Detention Center," *PCI Journal*; March-April 2001, pp. 22-33.





Center of Science & Industry, Columbus, Ohio;  
Architect: Arata Isozaki & Associates  
and NBBJ Architects Inc.

# GOVERNMENT & public BUILDINGS

## Design Challenges

## Precast Concrete Solutions

Create an imposing, stately appearance that reflects well on the city, state, or federal government while conveying an institutional function.	Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.  City emblems, names, and other aesthetic touches can be added to edifices to create imposing, unique elements.
Provide a low-maintenance façade that will be easy to fit into the operations budget for the life of the project.	Precast concrete's factory-controlled fabrication ensures consistency between panels and colorfastness in all mixtures to ensure no fading or inconsistencies in color.  Minimized joints, compared with brick or block construction, require less maintenance throughout the building's life.
Meet strict budgeting needs based on tax revenues.	A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster, saving costs throughout the construction process.
Minimize operating costs throughout the life of the building.	Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs.
Create a highly fire-resistant structure.	Inherently noncombustible composition, along with compartmentalization designs, contains fire to specific areas and allows for detection, evacuation, and suppression.
Meet all blast-resistance requirements and create a secure environment.	Modular components and durable composition provide key design ingredients for creating secure exteriors that meet federal requirements.
Create an image of environmental friendliness by using low-impact products.	Precast concrete meets many of the rating criteria used by the LEED standards.
Minimize congestion and safety concerns on site and in the general vicinity during construction.	Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during the construction.
Meet the area's seismic requirements.	Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.
Expedite construction to ensure no cost overruns for leases and scheduling needs.	Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.  Year-round, all-weather construction ensures that schedules are met.  A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.

# GOVERNMENT & public BUILDINGS



Walsh Library at Seton Hall University, South Orange, N.J.; Architect: Skidmore, Owings & Merrill;  
Photos: Edward Hueber/Archphoto.com.



Aurora Municipal Center, Aurora, Colo.; Architect: Barber Architecture.





*Salt Lake City Public Library, Salt Lake City, Utah; Architect: Moshe Safdie and Associates Inc. and VCBO Architecture; Photos: Timothy Hursley.*



*Washington Convention Center, Washington, D.C.; Architect: Thompson, Ventulett, Stainback & Associates.*



Utoy Creek Water Reclamation Center, Atlanta, Ga.; Architect: ; Photos: .



French Embassy, Mexico D.F., Mexico;  
Architect: Bernard Kohn Associates and Eduardo Terrazas y Asociates (joint venture); Photo: Bernard Kohn Associates.



Bartle Hall Conference Center, Kansas City, Mo.; Architect: Berkebile Nelson Immenschuh McDowell Architects.

#### RESOURCES:

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"Fresno Courthouse & Federal Building," *ASCENT*; Fall 2005, p. 30.

"Lloyd D. George United States Courthouse, Building Awards," *ASCENT*; Fall 2002, p. 20.

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"Precast Built Better Courthouse For Less, Building Awards," *ASCENT*; Fall 2002, pp. 28-29.

"Public Projects Favoring Design-Build Format," *ASCENT*; Winter 2006, pp. 24-21.

Salt Lake City Public Library, Building Awards," *ASCENT*; Fall 2003, p. 29.

"San Diego Convention Center, Building Awards," *ASCENT*; Fall 2002, p. 17.





Grace Church, Eden Prairie, Minn.; Architect: HGA.

# religious

## ARCHITECTURE

### Design Challenges

### Precast Concrete Solutions

*Create an imposing, impressive appearance that conveys the stature of the institution while providing a welcoming atmosphere for visitors.*

*Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to create any needed design style.*

*Design a low-maintenance façade that can be maintained in excellent condition on a low operating budget.*

*Minimized joints, compared with other types of construction (brick or block) require less maintenance through the building's life.*

*Provide traditional interior spaces for worship as well as all functional needs, including meeting rooms, kitchen facilities, and offices.*

*Hollow-core slabs and double tees can span long distances and provide maximum support to allow for open gathering spaces on lower floors.*

*Provide energy efficiency to help control operating costs throughout the life of the structure.*

*Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs.*

*Create a highly fire-resistant building.*

*Inherently noncombustible composition, along with compartmentalization designs, contains fire to specific areas and allows for detection, evacuation, and suppression.*

*Minimize congestion and safety concerns on site and in the general vicinity during construction.*

*Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during the construction.*

*Meet the area's seismic requirements.*

*Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.*

*Expedite construction to ensure schedules are met.*

*Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.*

*Year-round, all-weather construction ensures that schedules are met.*

*A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.*

# religious

ARCHITECTURE



*Grace Church, Eden Prairie, Minn.; Architect: HGA.*



*Prince of Peace Catholic Church, Taylors, S.C.; Architect: Craig Gaulden Davis; Photos: Metromont.*







*Old St. Mary's Church, Chicago, Ill.; Architect: Serena Sturm Architects Ltd.*



*Bigelow Chapel at United Theological Seminary of the Twin Cities, New Brighton, Minn.; Architect: Hammel, Green & Abrahamson Inc.*



*The Church of Jesus Christ of Latter-day Saints, Lake Oswego, Ore.; Architect: Lee, Ruff, Stark Architects and Leland Gray Architects.*

#### RESOURCES:

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#### **PCI Journal:**

"Precast Concrete Provides Function and Inspiration for Prince of Peace Church, Taylors, South Carolina," *PCI Journal*; March-April 2005, pp. 28-43.





Shriners Hospital for Children, Sacramento, Calif.;  
Architect: HDR.

# health care

## FACILITIES

### Design Challenges

### Precast Concrete Solutions

<i>Design a visually pleasing, reassuring façade that invokes an image of authority and comfort.</i>	<i>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to create any needed design style.</i>
<i>Provide flexibility in layout so spaces can be adapted as new technologies are introduced that require different access needs.</i>	<i>Hollow-core slabs can span long distances and allow open floor plans that can be adapted as needed for future uses.</i>
<i>Create a low-maintenance façade that will not be difficult to fit into maintenance budgets.</i>	<i>Minimized joints, compared with brick or block construction, require less maintenance throughout the building's life.</i>
<i>Minimize operating costs to keep budgets under control.</i>	<i>Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs.</i>  <i>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</i>
<i>Create a highly fire-resistant structure.</i>	<i>Inherently noncombustible composition, along with compartmentalization designs, contains fire to specific areas and allows for detection, evacuation, and suppression.</i>
<i>Minimize congestion and safety concerns on site and in the general vicinity during construction.</i>	<i>Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during the construction.</i>
<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.</i>
<i>Expedite construction to provide faster return on investment and to alleviate overcrowding.</i>	<i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</i>  <i>Year-round, all-weather construction ensures that schedules are met.</i>  <i>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</i>

# health care

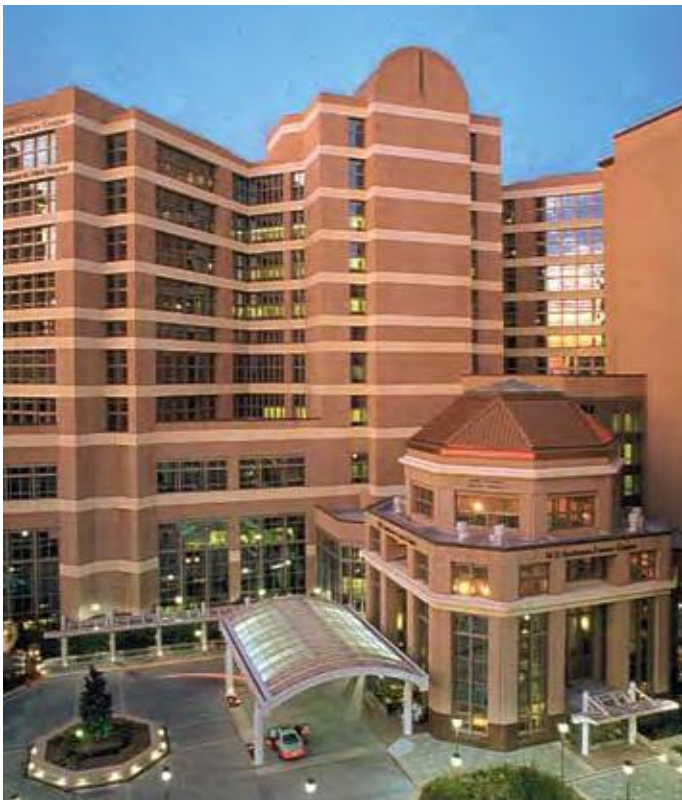
## FACILITIES



*Mary Birch Women's Hospital at Sharp Healthcare Center, San Diego, Calif.; Architect: HKS; Photo: TS Gordon.*



*Enders Research Laboratory, Boston, Mass.; Architect: Ellenzweig Associates; Photo: ©Steve Rosenthal.*



*MD Anderson Cancer Center, Houston, Tex.; Architect: LAN/HKS Inc. (a joint venture).*



*McLaren Regional Medical Center Patient Tower, Flint, Mich.; Architect: Perkins & Will; Photo: Marco Lornzetto/Korah Hedrich Blessing.*





*Children's Medical Center, Dallas, Tex.; Architect: HKS; Photo: Rick Grunbamm.*



*Abraham Pediatric Research Center, Children's Hospital of Philadelphia, Pa.; Architect: Ellenzweig Associates; Photo: Tom Crane.*



*Center for Women & Newborns, Brigham & Women's Hospital, Boston, Mass.; Architect: Tsoi/Kobus Associates Inc.; Photo: ©Steve Rosenthal.*



Hopi Healthcare Center, Polacca, Ariz.; Architect: FKW Architects Inc. and Gresham & Beach Inc. (formerly NBBJ).



Northwestern Memorial Hospital, Chicago, Ill.; Architect: Ellerbe Becket Inc., Hellmuth, Obata & Kassabaum Inc. and VOA Associates Inc.

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CD/IGS-1-00: Housing CD-ROM.

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Pharmacia Building Q, Skokie, Ill.; Architect: Flad & Associates; Photo: ©Burne Photo Imaging Inc.

# high-tech

## RESEARCH

### Design Challenges

### Precast Concrete Solutions

Create specialized spaces for technical processes and equipment.	Precast concrete components can provide the design flexibility and durability needed to provide added HVAC infrastructure, such as larger clearances in shafts, ceiling spaces, plenums, and chases. They can also help meet needs for floors that are accessible.
Eliminate vibration that could disrupt sensitive experiments.	Precast concrete's solid mass and structural support for HVAC and other equipment helps ensure that rooms are not impacted by equipment operating elsewhere.
Design clean rooms that can remain completely free of dust or particles.	<p>Treatments are available to help precast concrete panels ensure that no outside particles interfere with clean-room research. Precast concrete systems can also provide the large open-span spaces that are required for mechanical equipment to filter air, while providing the vibration resistance needed to ensure that sensitive equipment performs properly.</p> <p>The panels can be rubbed with mortar after casting to fill every pin-sized air void before the final finish is applied, ensuring a solid surface with no microscopic ledges to hold contaminants. They also can be treated to fight bacteria growth and resist mildew.</p>
Provide a durable interior environment that can be kept clean and withstand harsh chemical treatments.	Precast concrete insulated sandwich wall panels provide a durable, finished interior side that can withstand cleaning, as well as high humidities that would corrode metal. They can also be designed to achieve a maximum four-hour fire rating to help contain accidents.
Provide a secure enclosure that protects research and prevents disruptions.	Precast concrete's high durability and impenetrability ensures no security breaches through wall penetrations. Inherently noncombustible composition, along with compartmentalization designs, contains fire to specific areas and allows for detection, evacuation, and suppression. The material also provides strong resistance to harsh weather.
Minimize operating costs to keep budgets under control.	Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs. A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.
Meet the area's seismic requirements.	Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.
Expedite construction to provide faster return on investment.	<p>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</p> <p>Year-round, all-weather construction ensures that schedules are met.</p> <p>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</p>

# high-tech

RESEARCH



*Levine Science Research Center at Duke University, Durham, N.C.; Architect: Payette Associates Inc.; Photo: Brian Vanden Brink.*



*Stovers Institute, Kansas City, Kans.; Architect: Peckham Guyton Albers & Viets Inc. Architects; Photo: P-Tn/Photo-Technique.*





*Apple Computer Inc., Cupertino, Calif.; Architect: Hellmuth, Obata + Kassabaum (HOK); Photo: ©John Sutton.*



*Chiron Corp. Life Sciences Center, Emeryville, Calif.; Architect: Flad & Associates.*



*Biochemistry Building at the University of Wisconsin, Madison, Wis.; Architect: Flad & Associates; Photo: Christopher Barrett-Hedrich Blessing.*



Dell Computer Corp.'s PS1, PS2, PS3 & Link, Austin, Tex.; Architect: DLR Group; Photo: ©Don F. Wong.



Bayer Corp. B27 Building, West Haven, Conn.; Architect: Flad & Associates; Photo: ©Burne Photo Imaging Inc.

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## CHAPTER TWO

# HOUSING

Housing designs must encompass a wide range of needs, as users may be owners or permanent residents, or they may be transient guests. Privacy, safety, and durability are key in constructing these projects to meet owners' needs, as is an aesthetically pleasing exterior that will attract users and project a welcoming, attractive appearance. Precast concrete components help meet many of these needs.









Craftsman-style Home, Inner Grove Heights, Minn.; Architect: Sala Architects Inc.

# single - FAMILY HOMES

## Design Challenges

## Precast Concrete Solutions

Create an attractive, comfortable appearance that fits with the surrounding neighborhood, whether historic or contemporary.	Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.
Provide a high-quality, easily maintained façade.	Durable concrete and few joints help ensure minimal maintenance of the exterior, even when using thin-brick insets to match nearby brick homes.
Ensure fire resistance to reduce insurance costs.	Inherently noncombustible composition helps contain fire, providing more time for detection, evacuation, and suppression. Concrete roofs and façade help ensure that fires in nearby homes do not spread.
Minimize energy use.	Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs.
Maximize lower-level space and eliminate columns for more flexibility.	Hollow-core flooring can span long spaces, especially on sloped elevations, to add and open up below-grade spaces.
Control acoustics to provide privacy from neighbors.	Precast concrete wall panels minimize noise between units.
Design a foundation that minimizes chances for moisture penetration.	Precast concrete panels used as foundation walls minimize joints and maintenance to control moisture penetration.
Construct the home quickly to expedite occupancy.	<p>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</p> <p>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</p> <p>Year-round, all-weather construction ensures that schedules are met.</p>
Minimize congestion and safety concerns on site and in the general vicinity during construction.	Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during the construction.
Meet the area's seismic requirements.	Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.

# single FAMILY HOMES



*Fortified Home, LOCATION; Architect; Photo: Dukane Precast.*



*Frinfrock Residence; Lake Mary, Fla.; Architect: Burke, Hogue & Mills & Associates Architects.*





Precast Concrete Log Home, Missoula, Mont.; Architect: Beaudette Consulting Engineers with Cultured Log Systems; Photo: Cultured Log Systems.



Scattered Site Housing, Chicago, Ill.; Architect: Piekarz Associates P.C. Architects.

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"NU Precast Concrete House Provides Spacious and Energy Efficient Solution for Residential Construction," *PCI Journal*; May-June 2005, pp. 26-39.







808 Berry Place, St. Paul, Minn.; Architect: Walsh Bishop Associates Inc.; Photo: Molin Concrete Products Co.

# multi FAMILY BUILDINGS

## Design Challenges

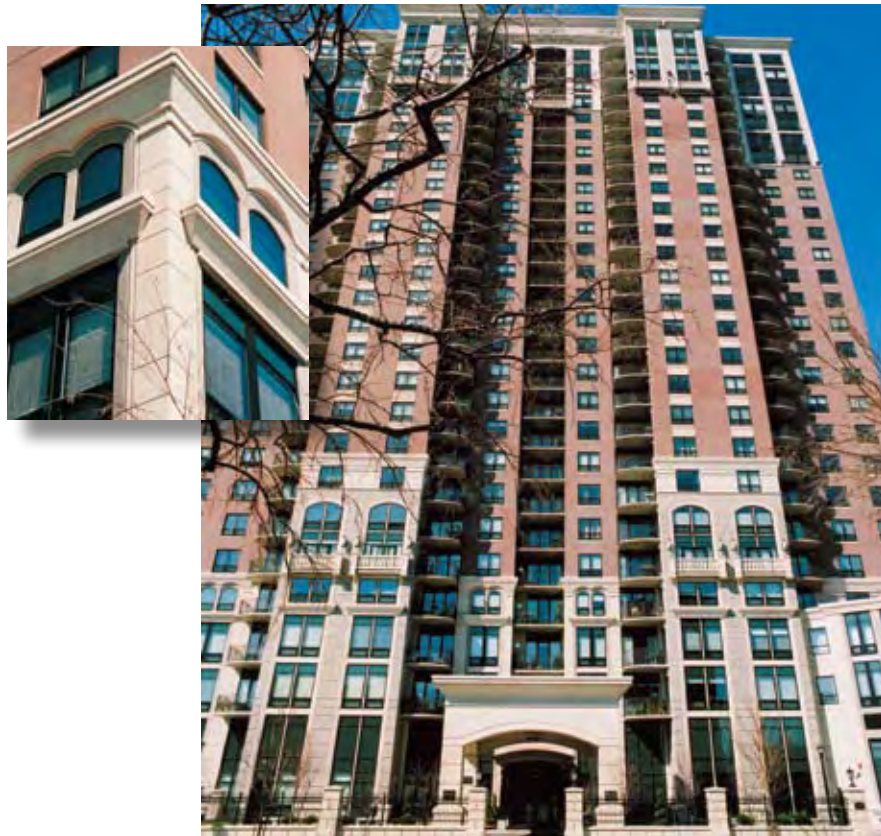
## Precast Concrete Solutions

Create an attractive appearance that appeals to tenants and fits into the surrounding neighborhood.	Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.
Provide a high-quality, easily maintained exterior.	Durable concrete and few joints minimize maintenance of the exterior, even when using thin-brick insets to match nearby brick homes.
Control acoustics so adjoining tenants' activities do not disturb neighbors.	Precast concrete wall panels, especially insulated panels, minimize noise between units.
Eliminate impact noise and vibration between floors.	Hollow-core slabs' ability to absorb impact and vibration helps minimize disturbance to those on lower floors. Their sound-transmission qualities help mitigate unwanted noises between living units.
Ensure fire resistance to reduce insurance costs.	Inherently noncombustible composition helps contain fire, providing more time for detection, evacuation, and suppression.
Minimize energy use.	Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs.
Add secure, structurally sound balconies to all units.	Cantilevered hollow-core slab or solid slabs can provide monolithic balconies that are secure and quick to construct.
Minimize floor-to-floor heights to meet zoning codes and maximize the number of levels.	Hollow-core slabs serve as a combined ceiling/flooring unit, reducing building height and saving material costs.
Construct the building quickly to provide faster return on investment and reduce interest on construction loans.	<p>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</p> <p>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</p> <p>Year-round, all-weather construction ensures that schedules are met.</p>
Minimize congestion and safety concerns on site and in the general vicinity during construction.	Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during the construction.
Meet the area's seismic requirements.	Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.

# multi FAMILY BUILDINGS



*Trinity Place, Boston, Mass.; Architect: CBT/Childs Berman Tseckares Inc.*



*Grant Park Tower, Minneapolis, Minn.; Architect: Opus Northwest, LCC.*



*Park Terrace Row Houses, Milwaukee, Wis.; Architect: Vetter Denk Architects; Photo: The Spancrete Group.*





*University of Nebraska House, Omaha, Neb.; Architect: Kenneth Hahn Architects; Photo: Tadros and Associates.*



*Metropolitan Tower, Seattle, Wash.; Architect: Callison Architecture; Photo: ©2002 Chris Eden/Callison Architecture.*



*The Woodlawns, Chicago, Ill.; Architect: Campbell Tiu Campbell; Photo: Dukane Precast Inc.*



Arcadia Place, Chicago, Ill.; Architect: Landon/Bone/Baker Architects; Photos: Prestress Engineering Corp.



Velocity, Hoboken, N.J.; Architect: Bodnar Architects & Associates and Equus Design Group; Photo: ©Thomas H. Kieren.

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"840 N. Lake Shore Drive, Building Awards," *ASCENT*; Fall 2005, p. 33.

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"Precast Lofts Help Build Chicago Neighborhood," *ASCENT*; Summer 2003, pp. 16-19.

"Trinity Place, Building Awards," *ASCENT*; Fall 2003, p. 30.

"University Village Mid-Rise Condominiums, Building Awards," *ASCENT*; Fall 2004, p. 34.

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"Project Study: 840 North Lake Shore Drive Tower, Chicago, Illinois," *PCI Journal*; November-December 2005, pp. 102-109.

"St. Regis Hotel & Residences—A Vibrant Gem in San Francisco's Fire Arts Center," *PCI Journal*; March-April 2006, pp. 56-75.

"University Village Mid-Rise Condominiums, Chicago, Illinois," *PCI Journal*; May-June 2005, pp. 108-111.





Residential Hall at Bryan College, Dayton, Tenn.;  
Architect: The Troyer Group.

# dormitory

## BUILDINGS

### Design Challenges

### Precast Concrete Solutions

Create a durable facility that can withstand hard use.	Precast concrete's compressive strength and impact resistance minimize the chance for damage by guests to interior walls or ceilings.
Design an exterior treatment that fits with the campus style.	Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.
Provide a high-quality, easily maintained exterior.	Durable concrete and few joints help ensure minimal maintenance of the exterior, even when using thin-brick insets to match nearby campus buildings.
Allow open spaces on lower floors for gathering areas, cafeteria, etc., while providing support for smaller living spaces overhead.	Hollow-core slabs can span long distances to eliminate columns on lower floors and provide support for walls on upper floors.
Control acoustics between rooms and the exterior to aid studying and maintain privacy.	Precast concrete wall panels, especially insulated panels, minimize noise between units.
Minimize impact noise and vibration between floors.	Hollow-core slabs' ability to absorb impact and vibration helps minimize disturbance to those on lower floors.
Ensure fire resistance.	Inherently noncombustible composition helps contain fire, providing more time for detection, evacuation, and suppression.
Minimize energy needs throughout the life of the building.	Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs.
Minimize congestion and safety concerns on site and in the general vicinity during construction.	Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during the construction.
Meet the area's seismic requirements.	Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.
Expedite construction to ensure occupancy for new term.	<p>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</p> <p>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</p> <p>Year-round, all-weather construction ensures that schedules are met.</p>

# dormitory

## BUILDINGS



*Residence Hall One, University of South Florida, St. Petersburg, Fla.; Architect: KBJ Architects Inc.; Photos: Gate Precast Co.*



*Western Connecticut State University Dormitory, Danbury, Conn.; Architect: Herbert S. Newman & Partners PC; Photos: Blakeslee Prestress Co.*





University Center of Chicago, Ill.; Architect: Antunovich Associates and VOA Associates; Photos: Antunovich Associates.



Ramapo College Phase 8, Mahwah, N.J.; Architect: PS&S Engineering; Photos: PS&S Engineering.





Villanova University, Villanova, Pa.; Architect: Hillier Group.



Residential Hall at the Art Institute, Chicago, Ill.; Architect: Booth Hansen Associates Inc.; Photo: Brian Fritz Photography.

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"Precast Cladding Gives Dorm Terra Cotta Look, Building Awards," *ASCENT*, Fall 2002, pp. 16-17.

#### PCI Journal:

"GFRC Panels Give Terra Cotta Look to Chicago Art Institute Residence Hall," *PCI Journal*, January-February 2002, pp. 14-25.





Bookends, Greenville, S.C.; Architect: Johnston Design Group LLC

# condominium

## BUILDINGS

### Design Challenges

### Precast Concrete Solutions

Create an attractive appearance that provides comfort to tenants while blending with the surrounding neighborhood.	Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.
Provide a high-quality, easily maintained exterior.	Durable concrete and few joints help ensure minimal maintenance of the exterior, even when using thin-brick insets to match nearby buildings.
Control sound transmission between rooms and the exterior to maintain privacy.	Precast concrete wall panels, especially insulated panels, minimize noise between units.
Minimize impact noise and vibration between floors.	Hollow-core slabs' ability to absorb impact and vibration helps minimize disturbance to those on lower floors.
Ensure fire resistance.	Inherently noncombustible composition helps contain fire, providing more time for detection, evacuation, and suppression.
Minimize energy needs throughout the life of the building.	Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs.
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Meet the area's seismic requirements.	Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.
Expedite construction to provide faster occupancy.	<p>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</p> <p>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</p> <p>Year-round, all-weather construction ensures that schedules are met.</p>

# condominium

## BUILDINGS



840 N. Lake Shore Drive, Chicago, Ill.; Architect: Lucien Lagrange Architects; Photo: Steinkamp/Ballogg Photography.



The Belvedere Residences, Boston, Mass.; Architect: CBT/Childs Bertman Tseckares Inc.; Photo: Jonathan Hillyer Photography Inc./Esto.



Bookends, Greenville, S.C.; Architect: Johnston Design Group LLC





*The Metropolitan, San Francisco, Calif.; Architect: Heller Manus; Architects and HKS.*



*Villa d'Este, Houston, Tex.; Architect: Ziegler Cooper Architects; Photo: Aker/Zvonkovic Photography.*



*Glen Lakes Condominiums, Chicago's North Side; Architect: Andrian-Zemenides Inc.*





University Village Mid-Rise Lofts, Chicago, Ill.; Architect: FitzGerald Associates Architects;  
Photos: Jess Smith Photography.



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"Trinity Place, Building Awards," *ASCENT*, Fall 2003, p. 30.

"University Village Mid-Rise Condominiums, Building Awards," *ASCENT*, Fall 2004, p. 34.

#### PCI Journal:

"Project Study: Archer Courts Townhouses, Chicago, Illinois," *PCI Journal*; November-December 2005, pp. 96-101.

"Project Study: 840 North Lake Shore Drive Tower, Chicago, Illinois," *PCI Journal*; November-December 2005, pp. 102-109.

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"University Village Mid-Rise Condominiums, Chicago, Illinois," *PCI Journal*; May-June 2005, pp. 108-111.



800J Lofts, Sacramento, Calif.; Architect: LPA Sacramento Inc.; Photo: John Swain.





*Third Avenue Marriott ExecuStay, New York City;  
Architect: H. Thomas O'Hara Architects.*

# hotel

## BUILDINGS

### Design Challenges

### Precast Concrete Solutions

<i>Minimize floor-to-floor heights to increase the number of levels, even under strict zoning requirements.</i>	<i>Hollow-core slabs can serve as a combined ceiling/flooring unit, reducing the building's height.</i>
<i>Reduce noise between rooms.</i>	<i>Precast concrete wall panels, especially when insulated, and precast concrete floors block noise transmission.</i>
<i>Minimize impact noise and vibration between floors.</i>	<i>Hollow-core slabs' ability to absorb impact and vibration helps minimize disturbance to those on lower floors.</i>
<i>Provide structural support for many small rooms above open, column-free ballrooms and conference areas.</i>	<i>Hollow-core slabs span long distances while providing structural support, minimizing columns on lower floors.</i>
<i>Create high fire resistance.</i>	<i>Precast concrete's noncombustible composition minimizes the spread of fire, while compartmentalization design techniques provide time for detection, evacuation, and suppression.</i>
<i>Use durable materials that will not show dents and other misuse.</i>	<i>The compressive strength and impact resistance of precast concrete minimize chances for damage by guests to interior walls or ceilings.</i>
<i>Offer low moisture penetration around facilities such as pools.</i>	<i>Precast concrete, along with long spans with no joints, ensures that water penetration is minimized and moisture is controlled, even in pool areas.</i>
<i>Minimize congestion and safety concerns on site and in the general vicinity during construction.</i>	<i>Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during the construction.</i>
<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology allow precast concrete components to be used in all seismic zones.</i>
<i>Expedite construction to provide faster return on investment and meet reservation commitments.</i>	<i>A total precast concrete system expedites construction, minimizes component pieces by combining structural and architectural elements, and provides single-source responsibility.</i>  <i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</i>  <i>Year-round, all-weather construction ensures that schedules are met.</i>
<i>Blend the structure with the local neighborhood, whether it is contemporary or historic.</i>	<i>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.</i>

# hotel

## BUILDINGS



*Marriott Hotel, Bloomington, Minn.; Architect: Eleness Swenson Graham Architects Inc.*



*Plaza Towers, Grand Rapids, Mich.; Architect: A. Epstein & Sons International Inc.*

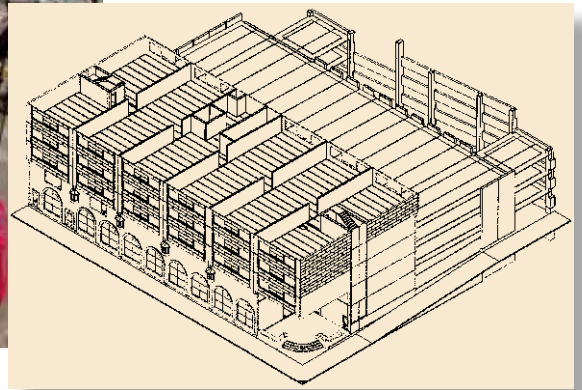


*Woodlands Waterway Marriott Hotel & Conference Center, The Woodlands, Tex.; Architect: Gensler.*





Photo: Barry Coon, Commercial Photographers Inc.



Davenport Hotel Tower, Spokane, Wash.; Architect: Bernardo Willis Architecture PC;  
Photo: Shawn Toner-Explosive Illusions Photography.



Fairmont Hotel, San Jose, Calif.;  
Architect: HOK Architects;  
Photo: George Cott.



*Sheraton Grand Hotel, Sacramento, Calif.; Architect: HOK San Francisco;  
Photo: Michael Sechman.*



*Ballantyne Resort Hotel, Charlotte, N.C.; Architect: LS3P Associates Ltd.*

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Photo: Liquid Library.

# retirement

## FACILITIES

### Design Challenges

### Precast Concrete Solutions

<i>Create an attractive appearance that provides comfort to tenants while blending with the surrounding neighborhood.</i>	<i>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.</i>
<i>Provide a high-quality, easily maintained exterior.</i>	<i>Durable concrete and few joints help ensure minimal maintenance of the exterior, even when using thin-brick insets to match nearby buildings.</i>
<i>Control sound transmission between rooms and the exterior to maintain privacy.</i>	<i>Precast concrete wall panels, especially insulated panels, minimize noise between units.</i>
<i>Minimize impact noise and vibration between floors.</i>	<i>Hollow-core slabs' ability to absorb impact and vibration helps minimize disturbance to those on lower floors.</i>
<i>Ensure fire resistance.</i>	<i>Inherently noncombustible composition helps contain fire, providing more time for detection, evacuation, and suppression.</i>
<i>Minimize energy needs throughout the life of the building.</i>	<i>Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs.</i>
<i>Minimize congestion and safety concerns on site and in the general vicinity during construction.</i>	<i>Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during the construction.</i>
<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.</i>
<i>Expedite construction to provide faster occupancy.</i>	<p><i>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</i></p> <p><i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</i></p> <p><i>Year-round, all-weather construction ensures that schedules are met.</i></p>

# retirement

## FACILITIES



*San Francisco Towers, San Francisco, Calif.; Architect: Wurster Bernardi & Emmons Inc.; Photo: Clark Pacific.*





*USAA Retirement Center, San Antonio, Tex.; Architect: HKS Inc.*



*Homewood Residence, Westover Hills, Tex.; Architect: Earl Swensson Associates.*



*Lester Senior Housing, Whippany, N.J.; Architect: NK Architects.*

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Photo: Liquid Library.

# assisted living

## FACILITIES

### Design Challenges

### Precast Concrete Solutions

<i>Create an attractive appearance that provides comfort to tenants while blending with the surrounding neighborhood.</i>	<i>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.</i>
<i>Provide a high-quality, easily maintained exterior.</i>	<i>Durable concrete and few joints help ensure minimal maintenance of the exterior, even when using thin-brick insets to match nearby buildings.</i>
<i>Allow open spaces on lower floors for gathering areas, dining room, etc., while providing support for smaller living spaces overhead.</i>	<i>Hollow-core slabs can span long distances to eliminate columns on lower floors and provide support for walls on upper floors.</i>
<i>Control sound transmission between rooms and the exterior to maintain privacy.</i>	<i>Precast concrete wall panels, especially insulated panels, minimize noise between units.</i>
<i>Minimize impact noise and vibration between floors.</i>	<i>Hollow-core slabs' ability to absorb impact and vibration helps minimize disturbance to those on lower floors.</i>
<i>Ensure fire resistance.</i>	<i>Inherently noncombustible composition helps contain fire, providing more time for detection, evacuation, and suppression.</i>
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<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.</i>
<i>Expedite construction to provide faster occupancy.</i>	<p><i>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</i></p> <p><i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</i></p> <p><i>Year-round, all-weather construction ensures that schedules are met.</i></p>

# assisted living

FACILITIES



*Senior Quarters at Riverdale, Bronx, N.Y.; Architect: Architects Design Group.*



*Emerson House Residential Care Facility, Portland, Ore.; Architect: Chilless Nielsen Architects; Photo: Bob Boll Photography.*





*Prospect Heights Care Center, Hackensack, N.J.; Architect: Herbert Beckhard Frank Richlan & Associates; Photo: Norman McGrath.*





Brighton Gardens, Winston-Salem, N.C.; Architect: Ray Troxell Associates Inc.



Roosevelt Place, Chicago, Ill.; Architect: Piekarz Associates PC; Photos: Prestress Engineering Corp.

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CD/IGS-1-00: Housing CD-ROM.



# d.

## CHAPTER TWO

### INDUSTRIAL

Industrial facilities are highly functional projects that need to be able to handle a high volume of delivery vehicles, provide expansive operational working spaces, and perform specialized activities that can challenge designers working to blend them together. Owners of these facilities are also aware of how important an attractive image can be in maintaining good relations with the local community and enhancing market value throughout the life of the building. Precast concrete can help meet these and other challenges for space requirements that can be specialized, focused, and demanding.









Peoria Production Shop, Peoria, Ill.; Architect: River City Construction LLC.

# warehouse

## FACILITIES

### Design Challenges

### Precast Concrete Solutions

<i>Design a durable, attractive exterior that blends with surrounding buildings.</i>	<i>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.</i>
<i>Provide open interiors.</i>	<i>Hollow-core slabs and double tees can create long spans, allowing column-free areas for installing or rearranging equipment.</i>
<i>Create easy support options for HVAC and processing equipment.</i>	<i>Precast concrete panels can carry the structural load of the roof system, reducing costs and expediting construction while creating large, open interiors. This structural support can be used for installation of mechanical equipment.</i>
<i>Install efficient delivery bays for easy truck access.</i>	<i>Precast concrete panels can be cast at 12 ft widths or wider to allow installation of delivery doors in one panel, providing structural support and fast construction.</i>
<i>Minimize energy requirements.</i>	<i>Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs.</i>
<i>Allow for potential horizontal expansion of the building if needed.</i>	<i>Non-loadbearing panels can be removed from one end of the building, with new panels (using the same type of concrete) added to the sides and the original panels reattached to add space.</i>
<i>Minimize congestion and safety concerns on site and in the general vicinity during construction.</i>	<i>Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during the construction.</i>
<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.</i>
<i>Expedite construction to provide faster return on investment.</i>	<p><i>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</i></p> <p><i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</i></p> <p><i>Year-round, all-weather construction ensures that schedules are met.</i></p>

# warehouse

## FACILITIES



*Damark International, Brooklyn Park, Minn.; Photo: Koyama Photographic.*



*Fletcher Park, Indianapolis, Ind.; Architect: Ratio Architects Inc.; Photo: ©Mardan Photography.*





*Toppan Printing Company America Inc., Franklin Township, N.J.; Architect: Herbert Beckhard Frank Richlan & Associates; Photo: Otto Baitz.*



*Gannett Newspapers, Appleton, Wis.; Architect: McMahon Associates.*



*Quad Graphics, Wis.; Architect: Wheeler-Kearns Architects; Photo: William Kildow.*



Peoria Production Shop, Peoria, Ill.; Architect: River City Construction LLC.



Centro de Distribucion Elektra Guadalajara, Mexico;  
Architect: Springall + Lira S.A. de C.V.

#### RESOURCES:

Chapter 1, Section 1.2, "Applications of Architectural Precast Concrete," PCI MNL-122-07: *Architectural Precast Concrete, Third Edition*.

Chapter 1.2.1.3, "Warehouses and Industrial Buildings, PCI MNL-120-04: *PCI Design Handbook, Sixth Edition*.

MK-34-03: Precast Concrete Makes The Grade For K-12 School Facilities (12 pp.).

CD/IGS-5-01: Industrial CD-ROM.

#### ASCENT:

"Precast Panels Provide Flexibility For Printing Plant," *ASCENT*; Summer 2001, pp. 12-14.

"Precast Structure Provides Handsome, Economical Center, Building Awards," *ASCENT*; Fall 2002, pp. 22-23.

"Precast Wall Separates, Spotlights Plant and Offices, Building Awards," *ASCENT*; Fall 2002, pp. 20-21.

#### Other:

Ideas By Design, Vol. 1. No. 4, August 2001: Industrial Buildings (12 pp.).

MK-14-98: Precast Concrete Wall Panels: Sandwich Wall Panels (6 pp.).

MK-15-98: Precast Concrete Wall Panels: Warehouse/Distribution Centers (6 pp.).

MK-20-98: Precast Panels for Industrial Buildings (6 pp.).





Federal Express, Hagerstown, Md.;  
Architect: Coakley Williams Construction Co.

# distribution

## FACILITIES

### Design Challenges

### Precast Concrete Solutions

<i>Design a durable, attractive exterior that blends with surrounding buildings.</i>	<i>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.</i>
<i>Provide open interiors.</i>	<i>Hollow-core slabs and double tees can create long spans, allowing column-free areas for installing or rearranging equipment.</i>
<i>Create easy support options for HVAC and processing equipment.</i>	<i>Precast concrete panels can carry the structural load of the roof system, reducing costs and expediting construction while creating large, open interiors. Precast concrete roof systems can be used to support mechanical equipment.</i>
<i>Install efficient delivery bays for easy truck access.</i>	<i>Precast concrete panels can be cast at 12 ft widths or wider to allow installation of delivery doors in one panel, providing structural support and fast construction.</i>
<i>Minimize energy requirements.</i>	<i>Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs.</i>
<i>Allow for economical future horizontal expansion of the building, if needed.</i>	<i>Non-loadbearing panels can be removed from one end of the building, with new panels (using the same type of concrete) added to the sides and the original panels reattached to add space.</i>
<i>Minimize congestion and safety concerns on site and in the general vicinity during construction.</i>	<i>Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during the construction.</i>
<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.</i>
<i>Expedite construction to provide faster return on investment.</i>	<p><i>A total precast concrete system speeds construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</i></p> <p><i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</i></p> <p><i>Year-round, all-weather construction ensures that schedules are met.</i></p>

# distribution

FACILITIES



*United Parcel Service, Hodgkins, Ill.; Architect: McClier Corp.*



*Department 56, Rogers, Minn.; Architect: Ryan Companies; Photo: Koyama Photographic.*





*Federal Express, Hagerstown, Md.; Architect: Coakley Williams Construction Co.*



*SuperValu Minneapolis Distribution Center, Hopkins, Minn.; Architect: Planmark Inc.; Photo: Koyama Photographic.*



*Federal Express, Crofton, Md.; Architect: Morgan Glick & Associates.*



*Lily Popcorn Co., Bethpage, N.Y.; Architect: Billow & Goldberg Associates.*



*Pepsi-Cola General Bottlers, Morton, Ill.; Architect: River City Design Group; Photo: Don Phelps, Photo Creations.*

#### RESOURCES:

Chapter 1, Section 1.2, "Applications of Architectural Precast Concrete," PCI MNL-122-07: *Architectural Precast Concrete, Third Edition*.

Chapter 1.2.1.3, "Warehouses and Industrial Buildings, PCI MNL-120-04: *PCI Design Handbook, Sixth Edition*.

MK-34-03: Precast Concrete Makes The Grade For K-12 School Facilities (12 pp.).

CD/IGS-5-01: Industrial CD-ROM.

#### **ASCENT:**

"Precast Panels Provide Flexibility For Printing Plant," *ASCENT*, Summer 2001, pp. 12-14.

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"Precast Wall Separates, Spotlights Plant and Offices, Building Awards," *ASCENT*, Fall 2002, pp. 20-21.

#### **Other:**

Ideas By Design, Vol. 1. No. 4, August 2001: Industrial Buildings (12 pp.).

MK-14-98: Precast Concrete Wall Panels: Sandwich Wall Panels (6 pp.).

MK-15-98: Precast Concrete Wall Panels: Warehouse/Distribution Centers (6 pp.).

MK-20-98: Precast Panels for Industrial Buildings (6 pp.).





Digital Monitoring Products Inc., Springfield, Mo.; Architect: Sapp Design Associates Architects P.C.

# manufacturing

## FACILITIES

### Design Challenges

### Precast Concrete Solutions

<i>Design a durable, attractive exterior that blends with surrounding buildings.</i>	<i>Architectural precast concrete panels use colors, textures, reveals, finishes, formliners, or thin-brick insets to match any needed design style.</i>
<i>Include design flexibility so fabrication or processing activities can be changed as needed.</i>	<i>Hollow-core slabs and double tees can create long spans, allowing column-free areas for installing or rearranging equipment.</i>
<i>Provide easy support options for HVAC and processing equipment.</i>	<i>Precast concrete panels can carry the structural load of the roof system, reducing costs and expediting construction while creating large, open interiors. Precast concrete roof systems can be used to support mechanical equipment.</i>
<i>Install efficient delivery bays for easy truck access.</i>	<i>Precast concrete panels can be cast at 12 ft widths or wider to allow installation of delivery doors in one panel, providing structural support and fast construction.</i>
<i>Minimize energy requirements.</i>	<i>Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs.</i>
<i>Allow for economical future horizontal expansion of the building, if needed.</i>	<i>Non-loadbearing panels can be removed from one end of the building, with new panels (using the same type of concrete) added to the sides and the original panels reattached to add space.</i>
<i>Minimize congestion and safety concerns on site and in the general vicinity during construction.</i>	<i>Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during the construction.</i>
<i>Meet the area's seismic requirements.</i>	<i>Precast concrete systems, using proven connection technology, allow precast concrete components to be used in all seismic zones.</i>
<i>Expedite construction to provide faster return on investment.</i>	<p><i>A total precast concrete system expedites construction, minimizes the number of component pieces by combining structural and architectural attributes into a single piece, and offers single-source responsibility from the precaster.</i></p> <p><i>Component casting begins when the shop drawings are complete, ensuring that erection begins as soon as the site is prepared.</i></p> <p><i>Year-round, all-weather construction ensures that schedules are met.</i></p>

# manufacturing

FACILITIES



*Digital Monitoring Products Inc., Springfield, Mo.; Architect: Sapp Design Associates Architects P.C.*





*Phillip Morris Plant, Concord, N.C.; Architect: Herbert Beckhard Frank Richlan & Associates (HB+FR); Photos: ©Rick Alexander.*



*Poblocki & Sons Exterior and Interior Sign Systems, Wis.*



Phillips Communications, Lancaster, Pa.; Architect: Greenfield Architects.



AT&T Corp., Chicago, Ill.; Architect: MFH Associates.

#### RESOURCES:

Chapter 1, Section 1.2, "Applications of Architectural Precast Concrete," PCI MNL-122-07: *Architectural Precast Concrete, Third Edition*.

Chapter 1.2.1.3, "Warehouses and Industrial Buildings," PCI MNL-120-04: *PCI Design Handbook, Sixth Edition*.

MK-34-03: Precast Concrete Makes The Grade For K-12 School Facilities (12 pp.).

CD/IGS-5-01: Industrial CD-ROM.

#### ASCENT:

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"Precast Wall Separates, Spotlights Plant and Offices, Building Awards," *ASCENT*, Fall 2002, pp. 20-21.

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MK-14-98: Precast Concrete Wall Panels: Sandwich Wall Panels (6 pp.).

MK-15-98: Precast Concrete Wall Panels: Warehouse/Distribution Centers (6 pp.).

MK-20-98: Precast Panels for Industrial Buildings (6 pp.).





Gerry Baby Products, Thornton, Colo.;  
Architect: Intergroup.

# FOOD - processing FACILITIES

## Design Challenges

## Precast Concrete Solutions

Meet government regulations for providing an environment in which dust and dirt cannot accumulate.	Precast concrete designs can ensure that the structure contains no horizontal surfaces where dust, dirt, or other contaminants can lodge. The most effective approach uses precast concrete panels as a loadbearing element to eliminate most columns and beams where dust could accumulate.
Provide completely smooth walls where no particles can lodge.	Durable precast concrete panels can be rubbed with a mortar after casting to fill pin-sized air voids before the final finish is applied. This ensures a solid surface that leaves no microscopic ledges to hold contaminants.
Create specialized spaces for technical processes and equipment.	Precast concrete components can provide the design flexibility and durability needed to allow for added HVAC infrastructure, such as larger clearances in shafts, ceiling spaces, plenums, and chases.
Provide controlled-atmosphere or freezer areas for storing food and produce prior to processing.	Precast concrete panels can provide the insulation required, while also supplying separation from surrounding surfaces that can induce humidity or groundwater to freeze and disrupt the structure.
Create a durable interior environment that can withstand regular cleaning with harsh chemicals.	Precast concrete insulated sandwich wall panels provide a durable, finished interior side that can withstand regular cleaning, as well as high humidities that would corrode metal. They can also be designed to achieve a maximum four-hour fire rating to help contain accidents.
Design a façade that blends storage spaces, processing plants, and office areas into one aesthetically pleasing design.	Precast concrete insulated sandwich wall panels provide an interior finished wall that blends these diverse functions, while offering aesthetics that complement them all. The exterior side can provide smooth, textured, or other types of finish, which can visually separate functions or blend them together. They can also include embedded logos and other corporate designs that project a professional image.
Allow for expansion potential of the facility as business grows.	Precast concrete panels can expand an existing building by adding new adjacent space or merging new space with the existing structure. The non-loadbearing panels on the end wall can be disconnected from the framing, and new panels and framing can be added on each side, with the end panels replaced.
Install efficient delivery bays for easy truck access.	Precast concrete panels can be cast at 12 ft widths or wider to allow installation of delivery doors in one panel, providing structural support and fast construction.
Minimize energy requirements.	Insulated sandwich wall panels offer an energy-efficient façade that aids in controlling heating and cooling costs.
Minimize congestion and safety concerns on site and in the general vicinity during construction.	Precast concrete components can be brought to the site as needed for that day's erection, and staging areas can be arranged nearby. Fabrication of components off site ensures less traffic on the site and less congestion in the vicinity during construction.

# FOOD - processing FACILITIES



*Malt-O-Meal Co., Northfield, Minn.; Architect: Professional/Design Group.*



*Premium Standards Farms (PSF), Milan, Mo.; Architect: Rietz Consultants Ltd.*





*Hershey Food Pasta Group, Va.*



*Pepperidge Farm, Denver, Pa.; Photo: Loomis Shade Photography.*



Fieldale Corp. Hatchery, Toccoa, Ga.; Photo: ©Hank Somma.



U.S. Durum Products Ltd., Lancaster, Pa.; Photo: J&D Graphics.



General Mills Inc., Albuquerque, N.M.; Architect: United Engineers & Constructors Inc.

#### RESOURCES:

Chapter 1. Section 1.2, "Applications of Architectural Precast Concrete," PCI MNL-122-07: *Architectural Precast Concrete, Third Edition*.

Chapter 1.2.1.3, "Warehouses and Industrial Buildings," PCI MNL-120-04: *PCI Design Handbook, Sixth Edition*.

CD/IGS-5-01: Industrial CD-ROM.

#### Other:

Ideas By Design, Vol. 1. No. 4, August 2001: Industrial Buildings (12 pp.).

MK-14-98: Precast Concrete Wall Panels: Sandwich Wall Panels (6 pp.).

MK-16-98: Precast Concrete Wall Panels: Food-Processing (6 pp.).

MK-20-98: Precast Panels for Industrial Buildings (6 pp.).



## CHAPTER TWO

# e

## MISCELLANEOUS

Precast concrete components can be used to create a wide range of unique and custom structures to meet owners' specific needs.

As part of their design, some building projects require structural spans to be used as bridges. Spanning highways, connecting to retail facilities, and providing access to higher levels of nearby structures are key applications of bridge technology to building construction. Precast concrete designs can provide a wide range of attractive, functional, and easily constructed spans.



*Minnesota Library Access Center at the University of Minnesota, Minneapolis; Architect: Stageberg Beyer Sachs Inc.*



*Colonial Williamsburg Bridge To The Past, Williamsburg, Va.; Architect: Carlton Abbott & Partners PC.*



*Washington County Fair Park West Bend Multipurpose Building, West Bend, Wis.; Architect: BHS Architects; Photo: BHS Architects.*



*Le Veck Bridge, Los Angeles, Calif.; Architect: David Jay Flood Architect.*

# BICYCLE & pedestrian BRIDGES

Spans can be created by a variety of methods. For longer spans, cables can be strung between abutments at each end, with post-tensioned precast concrete panels resting atop the cables, similar to a suspension bridge. Graceful precast concrete arches, colored to match the surrounding landscape, can also be created, as well as balustrades and other decorative pieces.

Deck panels and spandrels can be combined to create quickly constructed and aesthetically pleasing designs that can connect portions of a campus, or allow access over a highway to retail spaces from parking or transportation hubs. The spandrels are cast with a continuous ledge on the lower interior surface, and the panels are laid on top. The spandrels' exterior sides can be inset with brick, or feature a variety of visually pleasing finishes.

Precast concrete manufacturers are aware of the latest techniques and state-of-the-art approaches to aid designers in achieving spans that provide access to buildings or between structures.



# BICYCLE & pedestrian BRIDGES



*Westminster Promenade Pedestrian Bridge, Westminster, Colo.*



*Padden Parkway Pedestrian Bridge, Vancouver, Wash.*



*Angels Flight™ Railway & Funicular Trestle, Los Angeles, Calif.*



*AirTrain Light Rail System, Queens, N.Y.*



*Nepperhan Avenue Pedestrian Bridge, Yonkers, N.Y.*





*Kennesaw State University Phase II Pedestrian Bridge, Kennesaw, Ga.; Architect: Niles Bolton Associates.*

# unique STRUCTURES

Contact your local precast manufacturer to determine how best to approach the challenges of unique structures and how precast concrete components can meet those individual requirements. These designs can include:

Railroad ties,  
Soundwalls for freeways,  
Water tanks and reservoirs,  
Air-traffic control towers,  
Floating piers,  
Outdoor structures such as terraces and canopies.





# unique STRUCTURES



*Lincoln Heights Reservoirs, Spokane, Wash.*



*Riverside Plaza, Hartford, Conn.; Architect: Carol R. Johnson Associates and Goedes Brecher Qualls & Cunningham Inc.; Photos: Jerry Howard, Landscape Photography.*



*Maryland 216 Sound Barrier, Howard County, Md.; Designer/Engineer: JTE Civil Inc.; Photo: Creative Design Solutions.*



*The Clock Tower, Albion, Mich.; Architect: MacLachlan, Cornelius & Filoni Architects.*



*Metronome Building, New York City; Architect: Fredenburgh Wegierska-Mutin Architects Inc. and Kristin Jones and Andrew Ginzel, art wall designers; Photos: David Sunberg/ESTO.*

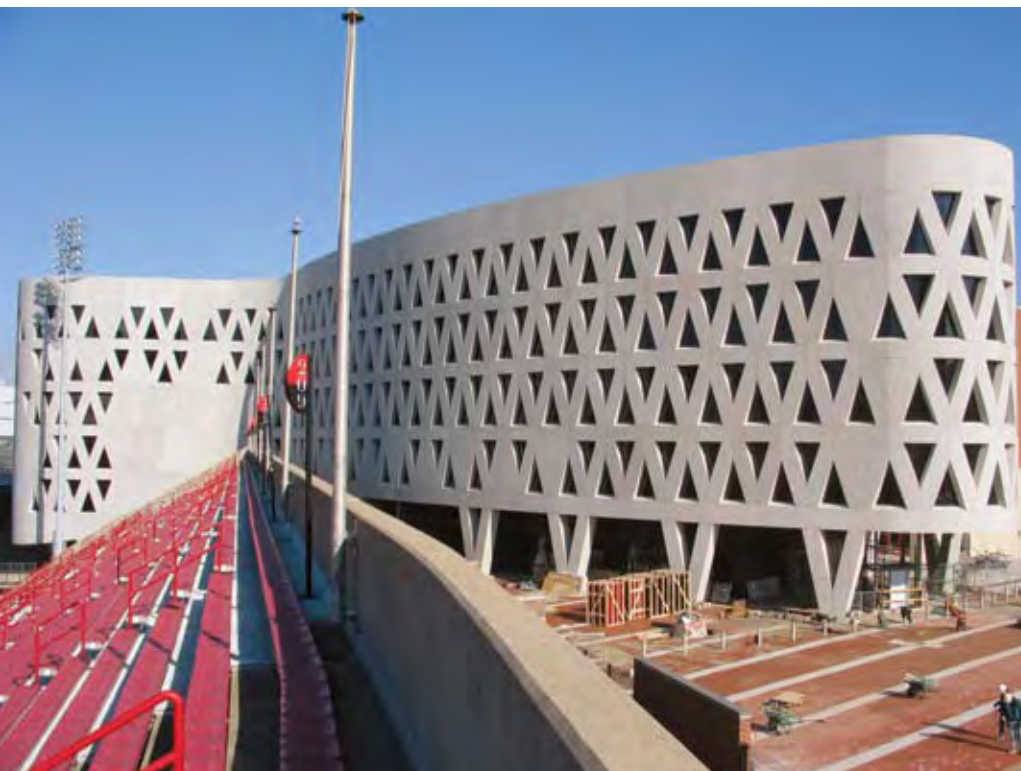


*Children's Museum of Indianapolis, Ind.; Architect: Browning Day Mullins Dierdorf Architects; Photos: High Concrete Group.*



*Commonwealth Edison Cooling Tower, Bryon, Ill.*





Richard E. Lindner Athletics Center, University of Cincinnati, Ohio; Architect: Bernard Tschumi Architects; Design Architect: Glaserworks; Photo: Bernard Tschumi Architects.



Millennium Carillon, Naperville, Ill.; Architect: Charles Vincent George Design Group Inc.; Photo: Charles Vincent George Design Group Inc.



U.S. Navy Modular Hybrid Floating Pier, San Mateo/Alameda Counties, Calif.

#### RESOURCES:

Chapter 1, Section 1.2, "Applications of Architectural Precast Concrete," PCI MNL-122-07: *Architectural Precast Concrete, Third Edition*.

Chapter 1.2.1.4, "Other Building Structures," PCI MNL-120-04: *PCI Design Handbook, Sixth Edition*.

#### ASCENT:

"Metronome Art Wall, Building Awards," *ASCENT*; Fall 2002, p. 28.

"Millennium Carillon, Building Awards," *ASCENT*; Fall 2002, p. 26.

"Precast's Flexibility Aids Diverse, Specialized Projects," *ASCENT*; Summer 2001, pp. 28-30.

"U.S. Navy Modular Hybrid Floating Pier," *ASCENT*; Fall 2005, p. 20.