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Precast Concrete Meets Tight Deadlines

During the construction phase, the speed of precast concrete installation is unrivaled. A small crew can erect thousands of square feet per day and enclose the structure in days or weeks. Precast concrete construction is the most capable of meeting tight deadlines and enabling finishing trades to jump-start their work. Precast concrete's rapid speed of installation reduces enclosure time and eliminates the need for fire-proofing, termite treatments, and additional insulation. Faster completion time also reduces interim financing costs and contributes to other economic benefits.





TIME IS ON YOUR SIDE WITH PRECAST CONCRETE

Advanced Learning Library - Wichita Public Library



When the City of Wichita decided to build a new public library, they didn't want a sedate structure that faded into the background. City officials wanted a modern, sustainable facility that would engage the community and offer a "wow factor" for anyone passing by. Precast concrete offered the flexibility and performance to meet those goals and Enterprise Precast Concrete rose to the occasion.

The building's design features a collection of three curved tubes that end with exterior

glass walls facing the scenic Arkansas River. A grid pattern of pronounced precast concrete bump outs complemented by a curving "wave" de-sign on the other facades creates a striking solution that draws people into the library.

The multifaceted precast concrete exterior was created using custom coloring to resemble the appearance of granite. To achieve the look, three different mix designs were used along with a combination of acidetched, sandblasted, and retarder finishes.



Mica chips were added to lend additional sparkle and con-trasting terracotta prefinished metal panels and trim were used as accents.

The use of precast concrete also helped the owners meet the tight \$30 million budget and 18-month schedule for construction. By employing precast concrete, the designer was able to meet all of those goals while still creating a structure that will be used for generations.

Precast Concrete Components

- Project cost: \$30 million
- Project size: 105,000 square feet
- Three different mix designs were used in combination with acid-etched, sandblasted, and retarder finishes.
- The project included 257 solid precast concrete panels in a combination of 6and 8-inch thick panels.
- The project was bid in April 15, 2016 and the library opened in May 2018.

Owner: City of Wichita

Precast Concrete Producer: Enterprise Precast Concrete

Architect: GLMV Architecture

Precast Specialty Engineer: CEG International Contractor: Dondlinger Construction Photo Credit: Enterprise Precast Concrete and Jacia Phillips I Arch Photo KC



www.enterpriseprecast.com

NDSU Dorms



North Dakota State University sophomores have more living space on campus thanks to a \$39.5 million construction project on campus for the Catherine Cater Hall.

The six-story, 395-bed residence hall was ready for students in fall 2019, and is dedicated to sophomores who found themselves squeezed out of campus housing after their freshman year. The dormitory, along with other construction projects on or near campus, is meant to trim waiting lists for campus housing, and was paid for using student housing fees.

Every floor of the new residence hall has a study room and a lobby with seating. The suite-style double rooms share private bathrooms and the first floor has a doublesided fireplace for the living room and kitchen areas, a media room, game room, and large and small conference spaces.

Precast Solution

Wells Concrete produced and erected 73,657 square feet of precast concrete for this project. Precast construction includes 414 members of insulated wall panels show-casing a thin brick and sandblast architectural finish. Along with the architectural exterior walls, Wells provided structural solid walls for the stair shafts and elevator towers.

Key Project Attributes

- 87 days of plant fabrication
- 11 weeks of onsite erection
- Worked with the design team for efficient panel layout, budgets, finish options and mix designs.
- During the shop drawing phase Wells Concrete worked with all parties for clash detection on Revit models.

- Complex reveal pattern designed for repetition to help with production efficiency
- 13' wide horizontal panels cantilevering off building by steel columns & beams.
- Vertical panels cladding back to steel frame.

Project And Precast Scope

- Architectural Insulated Wall 12"x13' 234 pieces – 33,620 SF
- Architectural Insulated Wall 12"x14' 180 pieces – 40,037 SF
- Structural Solid Walls 8"x12' 66 pieces – 16,606 SF (stair & Elevator Shafts)
- **\$39.5 million project**
- Six stories
- 395 beds

Architect: Zerr Berg Architects

Engineer: Heyer Engineering, PC Contractor: Kraus-Anderson Construction Co. Owner: North Dakota State University Precaster: Wells Concrete Location: Fargo, ND



www.wellsconcrete.com



Construction Speed and Weather are Factors for Specifying Precast Concrete Boxes Over Cast-in-Place



Efficient installation on this project was critical because of the simultaneous construction of the nearby I-44 fly-over bridge. Situated a few miles from the outskirts of St. Louis, MO, Interstate 44 is a major corridor in and out of the city. Small and large businesses alike, along with recreational destinations, relied on the speedy construction of this interchange. KCI Construction favored precast concrete box sections manufactured by County Materials to meet these challenges.

The Missouri Department of Transportation (MoDOT) originally specified a cast-in-place concrete culvert system. KCI Construction immediately knew a precast concrete system would be a better alternative. The contractor offered MoDOT plans for using a precast system, and MoDOT quickly approved the new plans.

The contractor considered several factors to determine that precast was the best option. First and foremost was speed. Precast components are manufactured ahead of time in a state-of-the-art facility. This eliminates the need for a contractor to construct forms on site, pour wet-cast concrete, wait for the pieces to cure, and remove the forms. In this case, using precast concrete components, the contractor only needed to prep the site then set in place the completed box culverts.

Another concern was the possible impact weather could play on cast-inplace systems. Frames and rebar could be damaged and unusable if it were to rain during the curing process, causing construction delays and additional costs. The contractor estimates that using readyto-install components made offsite saved a minimum of three to four weeks of construction time.

In total, 140 feet of 5' x 5' precast concrete box sections and end sections were manufactured and delivered by County Materials. The box sections run underneath 44' of covering. Precast box sections were a clear solution determined by the contractor from the beginning of the project and successfully met project demands during installation.

Precast Solution

- Speed, cost, and efficiency were all benefits of using precast box culverts.
- 140 feet of 5' x 5' precast concrete box sections and end sections were manufactured and delivered by County Materials.

Engineer: MoDOT

Contractor: KCI Construction Company Owner: State of Missouri Precaster: County Materials Corporation Location: Kansas City, MO



www.countymaterials.com



Lester Buresh Family Community Wellness Center

The Lester Buresh Family Community Wellness Center serves both as a formal and informal gathering space for community groups and residents as well as a multipurpose wellness facility.

The building is located at a busy intersection and is adjacent to the local high school, so it was critical that the design be welcoming and encouraging for patrons. The design takes advantage of the site to create a spacious entry plaza and pushes the building into the raised topography at the gymnasium corner to create an intimate sunken courtyard. These exterior spaces compliment the multi-purpose and flexible nature of the interior spaces, while maintaining flexibility for a future pool expansion at the opposite end of the building.

The simple, axial layout was conceived of as two bars slightly offset from each other. One bar groups programs that require solid walls and organizes them along a linear connection spine that runs the full length of the building to physically and visually connect all spaces at both levels. The other bar houses the gym where symmetrical acoustic walls create two of the defining elements of the building – the clean geometry of the stair, which serves as circulation to



the activities on the second floor, and the rock wall. Both sit below skylights that help accentuate them as dictation points and draw the eye up in the two-volume space.

Three materials define the building's exterior palette: precast, glass and brick. These are used to define the two bars and cut away to clear glass at strategic locations to allow translucent volumes to float, to direct views to the exterior from the track, and to reveal activity from within.

Precast concrete was chosen due to its versatile functions of creating an aesthetically pleasing design, providing a solid structure, and fast erection. Not only did precast concrete save time in the

construction phase, but it also added more safety features to the building. Precast concrete's high fire resistance ratings and ability to withstand extreme weather made it an essential choice when designing a community wellness center. The building offers a wide variety of activities for the community while providing a safe, durable structure.

Key Project Attributes

- 34,000 square feet
- Includes two basketball courts, multipurpose space, walking track, cardio equipment, walking track, yoga/fitness room, locker rooms, rock wall, and batting cages.
- Connected to trail network
- Adjacent to school district campus

Project and Precast Concrete Scope

- 12,190 square feet of precast concrete
- **54** panels
- Two stories
- Erection time: three days

Architect: **OPN**

Engineer: **M2B Structural Engineer** Contractor: **Garling Construction** Owner: **City of Mount Vernon** Precaster: **Advanced Precast Company** Precast Specialty Engineer: **Apex Structural** PCI Certified Erector: **Cedar Valley Steel** Image Credits: **Abbie Leigh Film & Photography** Location: **Mount Vernon, Iowa**



www.advancedprecastcompany.com

Austin Community Recreation Center

This 10,000-square-foot community recreation center took over the former power site. Formed by the partnership of the City of Austin and the YMCA, and supported by Vision 2020, this facility provides community members a safe, affordable, and healthy environment to meet, play, and exercise.

The site is in downtown Austin at the decommissioned power plant and the site was chosen for its ability to create a central, easily accessible community destination and in order to redevelop a large, underutilized site.

The two-story facility includes a gymnastics area, community education and event space, leisure and lap lane pools, a wellness center and an indoor play area, as well as a gymnasium, track, and basketball courts. The overall design allows the YMCA to operate designated areas, while Cityfinanced spaces like the youth activity center and indoor playground are free and open to the public. The building and site has been planned to enable expansion possibilities in the future. Construction began in mid-2018 and was completed January 6, 2019. Including land acquisition, design fees, construction, furnishings, and equipment, the total cost will be between \$35-40 million.

Precast Solution

Wells Concrete designed, manufactured and erected nearly 120,000 sq. ft, of precast for the new recreation center. This project was large, with many different room configurations and usages in a design with multiple floors requiring a unique precast solutions. The precast walls had many large openings to accommodate the desired room layouts. Wells was invited to numerous early design meetings and was able to work through these issues to help provide the desired layout. The exterior walls at the pool building consist of thin brick with polished white precast window mullions and a black acid etch at the base below, which gives the wall a very unique look. At the same time, Wells was able to accommodate the desire for 2-foot wide vertical windows with only one foot of precast panel between.



Key Project Attributes

The precast walls are unique in both their shape and finish. A series of 2'-0" wide windows were used with only a 1'-0" section of the precast wall between windows. These same walls were produced with two different colored architectural mix designs are tree different finishes, thin brick in a stack bond / polished white / dark charcoal acid etch.

Project and Precast Scope

- Architectural Insulated Wall 12"x1' (6-3-3) – 6 pieces – 120 SF
- Architectural Insulated Wall 12"x12'12" arch – 50 pieces – 17,347 SF
- Architectural Insulated Wall 12"x12'12" brick – 23 pieces – 5,085 SF
- Architectural Insulated Wall 12"x12' gym – 32 pieces – 11,240 SF
- Architectural Insulated Wall 14"x12' brick – 22 pieces – 7,045 SF
- Architectural Solid Wall 4"x3' 21 pieces – 689 SF
- Hollowcore Plank 12" 598 pieces 55,212 SF
- Hollowcore Plank 8" 7 pieces 180 SF
- Ledge Beam 24x56 4 pieces 97 LF
- Stick Column 24x24 5 pieces 105 LF
- Standard Double Tee 32"x10' 21 pieces – 11,972 SF
- Solid Slab 12" 50 pieces 3,671 SF
- Structural Solid Wall 12"x12' gym 20 pieces – 6,416 SF
- Structural Solid Wall 12"x4' pool 4 pieces – 304 SF
- Structural Solid Wall 8"x12' gym interior - 9 pieces - 3,035 SF
- Structural Solid Wall 8"x8' 6 pieces 513 SF

Architect: BWBR Architects Engineer: Ericksen Roed & Associates Contractor: McGough Construction Owner: City of Austin Precaster, PCI Certified Erector: Wells Concrete Drafter/Checker: Precast Detailing, Inc Location: Austin, MN



www.wellsconcrete.com

Stillwater Road

Mahtomedi, MN, is nestled between urban Saint Paul and the city's rural outskirts. Considered a 'small-town-city' by its residents, Mahtomedi is a busy municipality for its population of just over 8,000 people. Stillwater Road, which runs through the community's business district, serves nearly 10,000 vehicles per day. The road is a significant east-west corridor for local and regional travel. The roadway connects several cities and essential community resources, including the Mahtomedi High School and Middle School, Wildwood Elementary School, the Mahtomedi Fire Station, Wildwood Library, as well as commercial and residential property.

In 2016, Stillwater Road was a patchwork of cracked asphalt from years of heavy traffic. Also, it was clear to the community that several intersections with four-way stop signs were not enough to manage the traffic along the route. Later that year, Washington County conducted a study and received community input to develop project goals, concepts, needs, and desired outcomes. The key considerations included updating the roadway with ADA and pedestrian routes, increasing safety, enhancing parking, improving public and private utilities, and dealing with the increased traffic demands from the community's growth.

The final plan called for expanding the roadway and adding traffic signals to improve safety and traffic efficiency. Also, construction allowed for upsizing underground utilities and making drainage improvements.

The original plans called for the removal of fifty-year-old precast pipe and replacement with a precast arch system to increase storm water drainage capacity. However, project managers were concerned that specifying a local supplier's arch system – because it's manufactured with a wet-cast process - would slow down construction. The wet-cast process requires additional curing time compared to a dry-cast process used by County Materials Corporation to produce elliptical concrete pipe. Representatives from County Materials met with project engineers and explained how elliptical concrete pipe would meet the same standards and performance requirements and overcome the project's challenges, while being able to be produced five times faster.

Project engineers knew that arch units could be produced at a pace of approximately one or two per day. County Materials told them to expect their production schedule to be closer to ten elliptical pipe units each day. Also, County Materials' elliptical pipe is available with gasketed joints, an industry preferred option in storm water management projects.

Elliptical pipe was an ideal solution for this project because site conditions required a shallow storm water management system. Mahtomedi sits on a high-water table, so the contractor could not excavate as deep as a typical storm water project utilizing round pipe. Additionally, there were several underground utility lines, including a 12" gas line, located under the pipe run. Elliptical pipe overcame these obstacles because its oblong shape allows for a shallow trench height while providing hydraulic efficiencies for high storm water flow capacities. In addition, elliptical concrete pipe handles loading with minimal embodiment support. County Materials' project coordinators worked directly with the contractor to determine proper grading for the elliptical pipe installation.

"Successful planning, communication, and execution was made possible on this job thanks to the County Materials team," said Jeremy Kuechle, Vice President and Safety Manager for Kuechle Underground. "We have a strong relationship with County Materials because we know we can trust them as a leading supplier in the region."

The project also required fifteen manholes with monolithic bases ranging in size from 96" to 120". County Materials produced the high integrity monolithic base structures that added strength in the shallow depths.

County Materials began deliveries in early July 2019. Each delivery was on time,



worked around the contractor's schedule, and was safe and quick. Only a month later, the contractor was pouring sidewalks and curbs, and by mid-August, the business district of Mahtomedi had freshly paved roads and was re-opened to traffic. By November, most of the project was completed with only final touch ups left, which are expected to resume in spring 2020.

In total, the project utilized 654 In. ft. of 72" CL3, 536 In. ft. of 66" CL3, 812 In. ft. of 54" CL3, and 320 In. ft. of 91"x58" elliptical CL3 Pipe. County Materials' ability to quickly manufacture precast concrete pipe contributed to the early completion of this project.

Precast Solution

Dry-cast process affords faster production, and elliptical shape accommodates shallow depths

Project Info

- Stillwater Road, in Mahtomedi and Willernie, MN.
- Approximate Timeframe: May 2019 to October 2020
- Products: 654 In. ft. of 72" CL3, 536 In. ft. of 66" CL3, 812 In. ft. of 54" CL3, and 320 In. ft. of 91"x58" elliptical CL3 Pipe. 15 monolithic manholes from 96" to 120".

Engineer: MnDOT

Contractor: **Kuechle Underground** Precaster: **County Materials Corporation** Location: **Mahtomedi, MN**



www.countymaterials.com

Mountain Iron-Buhl High School Expansion

Molin Concrete Products produced the precast and prestressed concrete products for the Mountain Iron-Buhl High School Expansion project located in Mountain Iron, MN.

The plan developed was for the high school to be moved from the downtown Mountain Iron location and constructed as an expansion to the existing Merritt Elementary allowing which allowed for shared infrastructure, a centrally located common auditorium, and general operational efficiencies.

Precast Solution

"The district's goal was to construct an energy-efficient facility," said Reggie Engebritson, Mountain Iron-Buhl District Superintendent. "We wanted a building that would provide the best education at an affordable cost to the students and the community." Schools often look at energy-saving opportunities differently than commercial businesses. Instead of demanding a quicker return on investment, schools can consider long-term energy savings into the future. Given the Mountain Iron-Buhl High



School project was the school district's first new high school in 100-years, it is easy to see how this project was a long-term investment.

Along with equipping the new facility with environment-friendly equipment, the design for the project incorporated insulated architectural precast wall panels and other thermally efficient products to achieve an energy efficient building system. Molin staff worked with the project's team early in the construction process to find the appropriate combination of brick, formliner and face-mix to achieve an approved match (including colors, textures and a tooled grout joint) of the existing field laid brick used in the existing elementary school.

Key Project Attributes

- Energy-efficient facility
- Speed of construction and completed while school was in session
- Minimal site disturbance outside footprint of the project

Project And Precast Scope

- 64,000 square feet (246 pieces) of insulated and non-insulated structural and architectural precast wall panels with cast-in thin brick veneer
- 13,600 square feet of 8" and 12" Hollow Core plank

Architect: Architectural Resources, Inc. Engineer: Northland Consulting Engineers Contractor: Johnson Wilson Constructors Owner: Mountain Iron-Buhl Public School ISD #712 Precaster, Precast Specialty Engineer, PCI Certified Erector: Molin Concrete Products Company Location: Mountain Iron, MN



www.molin.com



Illinois State Toll Highway Authority Maintenance Facility

The Illinois State Toll Highway Authority was established in 1958. Currently, it encompasses and maintains 294 miles of roadway in twelve northern Illinois counties. The average daily traffic for the system is estimated to be over 2,700,000 vehicles, Speed of construction on a maintenance building that would house and repair the vehicles used to service the system was of paramount importance. Erection of the main building and maintenance area was completed in three weeks.

Precast Solution

ISTHA, since its original construction, has used precast/prestressed concrete girders as well as many other precast products on the roadway systems with very good results. Precast concrete for this facility and other maintenance buildings on the system was a natural solution.

Key Project Attributes

- The use of prestressed wall panels allowed for fast construction
- Erection of main building and maintenance area was approximately three weeks

Project And Precast Scope

- 176 12' insulated wall panels were used on the project.
- 34 architectural solid wall panels were used on the project.
- 4,484 square feet of 1' double tees were used on the project
- 6,600 square feet of hollowcore plank was used on the project
- Main Building = 42,000 square feet of insulated wall panels
- Maintenance area = 13,000 square feet of insulated wall panels
- Truck Wash = 2,700 square feet of double tees (roof)
- Office Area = 5,000 square feet of

architectural wall panels

Interior Mezzanine = 6,600 square feet of hollowcore

Finish

- Insulated Wall Panels Light Sandblast w/ Gray cement
- Architectural Wall Panels Acid Wash w/ White cement

Architect: Epstein Architecture Engineer: ESI Consultants, LTD Contractor: Stenstrom General Contractors Owner: Illinois State Toll Highway Authority Precaster: MPC Enterprises, Inc. MPC Project Managers: Matt Moehle/Greg Fisher Precast Specialty Engineer: e.Construct USA-LLC PCI Certified Erector: Continental Erectors Hollowcore Producer: Strescor,Inc Double Tees: Illini precast Location: Marengo, Illinois



www.mpcent.com



Learn & Earn Box Lunches

PCI Midwest provides continuing education programs on a variety of topics. These programs are easily tailored to conference room or classroom lunch programs. Architects and engineers can learn about precast concrete hollow-core floors and walls, architectural precast concrete, precast parking structures, glass fiber reinforced concrete, high performance precast concrete and much, much more. Contact mike@pcimidwest.org to request a program for you or your company.



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Concrete Industries, Inc. (Randy Schultz) Lincoln, NE, 402-434-1800 • www.concreteindustries.com			•	•		•		•	•			•		•
Coreslab Structures (Kansas) Inc. (Mark Simpson) Kansas City, KS, 913-287-5725 • www.coreslab.com											•	•	•	•
Coreslab Structures (Missouri) Inc. (Michael Saint) Marshall, MO, 660-886-3306 • www.coreslab.com	•		•	•			•	•	•				•	•
Coreslab Structures (Omaha) Inc. (Todd Culp) Bellevue, NE, 402-291-0733 • www.coreslab.com	•	•	•	•				•	•	•	•	•	•	•
County Materials Corp. Roberts, WI (Steve Hoesing, 800-289-2569) Bonne Terre, MO (Scott Boma, 573-358-2773) www.countymaterials.com	•	•	•	•		•			•	•	•	•	•	•
Crest Precast Concrete, Inc. (Gary Mader) La Crescent, MN, 507-895-2342 • www.crestprecastconcrete.com	•	•		•							•		•	
Crossland Prefab (Rob Newsom) Columbus, KS, 620-429-1414 • www.crossland.com	•		•	•										
Enterprise Precast Concrete, Inc. Omaha, NE (Shawn Wentworth) 402.895.3848 • Overland Park, KS (Dirk McClure) 913-312-5616 • www.enterpriseprecast.com	•	•		•										
Fabcon Savage, MN (Jim Houtman) 952-890-4444 Columbus, OH, Mahoney City, PA and Pleasanton, KS - www.fabcon-usa.com				•							•	•		
Forterra Building Products (Joel Mich) Maple Grove, MN, 763-545-7473 • www.forterrabp.com					•						•	•	•	•
Gage Brothers Concrete Products, Inc. (Tom Kelley) Sioux Falls, SD, 605-336-1180 • www.gagebrothers.com	•	•	•	•		•		•	•		•			•
Mid America Precast, Inc. (Rod Tanner) Fulton, MO, 573-642-6400 • www.midamericaprecast.com	•	•	•	•	•					•	•			
Molin Concrete Products Co. (John Saccoman) Lino Lakes, MN, 651-786-7722 • www.molin.com	•		•	•		•			•					
MPC Enterprises, Inc. (Jeff Moehle) Mt. Pleasant, IA, 319-986-2226 • www.mpcent.com	•	•	•	•	•		•	•	•	•	•			
PDM Precast, Inc. (Adam Petersen) Des Moines, IA, 515-243-5118 ● www.pdmprecast.com	•		•	•		•	•	•	•					
Prestressed Casting Co. (David Robertson) Springfield, MO, 417-869-7350 • www.prestressedcasting.com	•		•	•			•	•	•		•			
Prestressed Concrete (Chris Goevert) Newton, KS, 316-283-2277 • www.prestressedconcreteinc.com	•		•	•			•	•	•		•	•	•	•
Stress-Cast Inc (Jim Markle) Assaria, KS, 785-667-3905				•		•								
Taracon Precast (Paul Nelson) Hawley, MN, 507-380-9423 • www.taraconprecast.com	•		•	•		•	•	•	•		•			
Wells Concrete Wells, MN, Albany, MN and Maple Grove, MN (Spencer Kubat, 800-658-7049) • Grand Forks, ND (Mike Mortenson, 800-732-4261) • www.wellsconcrete.com	•	•	•	•		•		•	•		•		•	