Gold 2011

Celebrating Excellence

For more than ten years, the North Dakota Ready Mix & Concrete Products Association. has honored our industry partners who have demonstrated the excellence and overall dedication needed to win our highest project awards each year. This year, we again have identified projects and their promoters and builders who will earn well deserved distinctions in our industry. The people involved in planning and specifying the use of concrete, and ultimately building these projects, will hopefully be recognized and honored, at least at some small scale, with this Hardfacts Special Awards Edition. For it is these people who not only honor themselves with finding effective uses for concrete, but it is their clients, project owners, and the public in general who will benefit from the environmental benefits, the value and the aesthetics that can come from the use of concrete.

Hardfacts applauds all winners, past and present, as they should be proud of their achievements. We hope they continue to provide the highest level of quality and dedication to the concrete industry.

David C. Sethre
Marketing Director

Concrete Thinking
for a sustainable world

ndconcrete.com

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Count on Concrete

Innovation Award

Devils Lake City Embankmentsm - Creel Bay Reach
Utility Abandonment Plan with Low-Shrink Grout

Final End User:	City of Devils Lake
Construction Manager:	U.S. Army Corps of Engineers
Utility Abandonment	
Phase 1 Contractor:	Park Construction Company
Phase 3 Contractor:	United Crane & Excavating
Technology Support:	Midwest Testing Labs, Inc.
Concrete/Grout Supplier:	Strata Corporation, Inc.

Prior to the construction of the new earthen levees required to protect the City of Devils Lake from the rapidly rising Devils Lake waters, all of the utility pipes running through the existing levee had to be located and filled with nonshrink grout. This construction requirement presented a huge challenge to Park Construction Company (Park). First, due to the large amounts of grout needed to fill the existing utility lines, and the limited capacity of the commercially available grout pumps, the set time of most commercial nonshrink grout was far too short. Second, in order to modify commercially available grout to meet the longer set times the grout producers had to charge in excess of $2,000 per cubic yard for the mix alone. This figure did not include freight, mixing labor or delivery. Finally, due to the amounts of grout needed, mixing the grout in the grout pump's mixing tank was not an option. Park needed a nonshrink grout that could be mixed at the batch plant and delivered using standard concrete trucks. To solve this dilemma Park turned to its concrete supplier, Strata Corporation, for a value engineered solution.

Strata's mix design was an overwhelming success. Some of the utility lines Park had to fill and abandon were over 345' in length and up to 10" in diameter. This meant that it could take up to several hours to fill the lines with grout. The grout supplied by Strata was still extremely pumpable at the 3 hour point; and more importantly the grout contained within the utility line was still extremely fluid and easily moved by the commercial grout pump. In addition, the grout supplied by Strata was batched at the plant and could be delivered in a standard concrete truck. Moreover, the value engineered grout mix supplied by Strata offered a very substantial savings in material costs over a comparable modified bag grout mix that could have been supplied by the national non-shrink grout suppliers. And, the material that would have been supplied by the commercial grout suppliers could not have been mixed at the batch plant nor could it have been mixed in a standard concrete truck. Finally, in the area that matters most to the designers, performance, Strata's grout mix performed flawlessly and exceeded expectations. The U.S. Army Corps of Engineers had Park excavate an area that contained a portion of the utility that had been grouted to verify its performance and they could not have been more pleased with the results.

The task was to create a very fluid non-shrink cementitious grout that will stay fluid for 3-4 hours, and will be stable enough to pump through various size pipes up to 1000 feet. Then, the material had to be viscous enough not to experience any subsidence in the plastic state? This is a tremendous challenge.

The success of this value engineered solution is a model of how problems can be overcome through cooperative efforts between the owner, contractor, and supplier. Discussions started by identifying the constructability issues. With the help of the Corps of Engineers, we identified the desired material properties, and established laboratory tests to qualify these material properties. After identifying all the variables, a scientific method was created to address each variable. By utilizing various cementitious materials, combining them based on their properties, and applying chemical admixtures, we addressed each variable through a mix trial matrix. Once a target mix design was achieved, we turned to Midwest Testing Laboratory (MTL) to conduct qualifying test procedures. With the help of MTL the mix design was refined to the final product.

The grout mix contained the following materials:

1.	Cement	Strength development
2.	Pozzalons	Paste volume and robustness
3.	Bentonite	Expansion agent
4.	Hydration Stabilizer	Control set and temperature
5.	MRWR	Initial cementitious dispersion and mixing efficiencies
6.	HRWR	Reduce water content to reduce shrinkage
7.	Slump Retainer	Maintain fluidity (works in conjunction with HRWR)
8.	SRA	Shrinkage reducing admixture
9.	VMA	Viscosity Modifying Admixture

This grout mix was used successfully on every following phase of the Devils Lake Levee project. It was pumped through pipes as narrow as 5/8" ID to 18" ID mainline as far as 1100 feet. Follow-up excavation inspections revealed full pipes with no subsidence or shrinkage.

Dakota Avenue Pavement Reconstruction - Wahpeton

Owner: NDDOT/ City of Wahpeton
Civil Engineer: Interstate Engineering
Contractor: Duininck, Inc.
Paving Subcontractor: Hoffman Construction Co.
Sidewalk Subcontractor: B. G. Amundson
Concrete Supplier: Aggregate Industries, Inc.

Street Paving Category

Every community is identified with their Main Street. Dakota Avenue in Wahpeton is the focus of this thriving community, location of most of the businesses in the city. Through a keen vision of the future of this main street, the citizens chose concrete pavement for this once in a lifetime opportunity of renewal.

Dakota Avenue serves not only as a main artery linking Breckenridge, Minnesota and Wahpeton, North Dakota, but also has many businesses with storefronts located on its 9/10ths of a mile reach. The west end of Dakota Avenue also joins up with ND State Highway 13 along with the 210 bypass. The project involved total sewer and water re-construction as well as new sidewalks, curb & gutter and concrete paving while maintaining access to local businesses. To accomplish this required starting with the effective engineering plan to achieve the major coordination for the local business community. In the end, the contractor provided the expertise and resources to complete this monumental construction project.

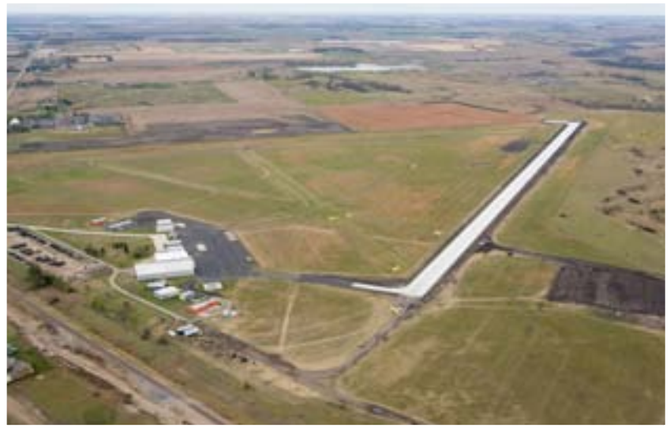
While not very efficient, by necessity the project was divided into 12 phases. Only 2 to 3 phases could be totally demolished at one time and then rebuilt and opened to traffic before demolition could proceed on the next phases. Crews from Duininck Incorporated were responsible for the underground work. Hoffman Construction did the paving work while B. G. Amundson poured the curb and sidewalk. Aggregate Industries' Wahpeton Plant furnished all 12,800 yards of paving concrete required. The paving of 38,598 square yards of 9 inch doweled non-reinforced concrete was placed primarily by slip-form paver with most pours running 300-400 yards per pour. Several days saw 400 yards poured in the morning and after resetting the paver 400 more yards poured in the afternoon. The phasing required many paver moves to assure access to the affected storefront businesses.

The future of Dakota Avenue looks bright. Not only will the light-colored pavement provide safety and environmental benefits, the 50 year or longer expected service life will mean good economy and little future disturbance for construction activity. But mostly, the aesthetic impact that concrete pavement provides will be the most appreciated.

Barnes County Municipal Airport Runway Reconstruction

Owner: Barnes County Municipal Airport Authority
Contractor: Northern Improvement Co.
Engineer: Kadrmas Lee & Jackson
Concrete Supplier: Aggregate Industries, Inc.

Airport Category



Barnes County Municipal Airport Runway 13-31 had a Pavement Condition Index (PCI) average value of 50 in 2009. The minimum service level for a general aviation runway is a PCI of 65. Despite routine maintenance and surface overlays the runway had severe longitudinal and transverse cracking. The existing pavement had met its useful life leading to reconstruction.

Looking at a worn out asphalt airport pavement north of Valley City, Kadrmas Lee and Jackson engineers developed reconstruction options including a new bituminous or Portland Concrete Cement (PCC) pavement. A pavement life cycle cost analysis determined the most economical pavement for the runway project was a PCC surface. The analysis included a 30-year service life and estimated each pavement type's required maintenance. Results indicated present value cost of bituminous pavement at $54.98 per square yard and PCC pavement at $50.32 per square yard, leading to the final choice of PCC.

The project utilized a combination of a ready mix plant and an onsite batch plant. Ag¬gregate Industries proposed a well-graded aggregate mix design versus the standard FAA P-501 specification. The well-graded aggregate mix was designed to minimize segregation and resulting joint spalling, an important goal for any airport project. Mixture uniformity was achieved, even with dual plant production. The result was a consistent and uniform product to the paver which produced a smooth riding surface.

Sustainable Design Considerations: Project costs were reduced through the use of a blended base course that consisted of 80 percent recycled bituminous pavement from the existing runway milling and 20 percent virgin Class 5 aggregate. Recycling the entire existing bituminous pavement reduced the amount of virgin aggregate necessary and saved natural resources.

A typical section of reconstructed runway consisted of three layers: six inches of concrete on top, eight to 12 inches of blended base course and subgrade prep. The 6 inch slab combined with the blended base was selected to create a runway capable of carrying heavier and more frequent loads than required for the design aircraft weighing up to 12,500 pounds. Pavements were generally non-reinforced with the exception of irregularly shaped panels prone to cracking. High visibility of the light colored pavement surface will add to safety considerations and assist pilots in locating the airport. Skid resistance will be maintained for the life of the pavement with little maintenance. Plus, the durability of the pavement will provide 50 plus years of life with little ongoing maintenance compared to competing pavement products.

Kadrmas, Lee & Jackson performed the preliminary and final design in 2010 and provided fulltime construction observation and construction administration from May through October 2011. Aggregate Industries of Valley City supplied 6,375cu¬bic yards of concrete to reconstruct the runway, turnaround and taxiway. The contractor was Northern Improvement Company. Construction cost was $2.36 million.

Brandt Crossing 1st Addition Park - Multi-Use Pathways

Owner: Fargo Park District
Civil Engineer: MBN Engineering
Contractor: Northern Improvement Company
Subcontractor: Midwest Concrete Pumping
Concrete Supplier: Knife River Materials

Pathway Category

One of the improvements for 2011 was a new park which included a 12' wide concrete bike trail in the new Brandt Crossing development in fast growing southwest Fargo. The park includes over 3,800' of reinforced concrete path, benches, two park shelters, basketball court, and playground.

The Fargo Park District chose reinforced concrete for its durability and low maintenance. Work began in early June, and was completed at the beginning of October.

Midwest Concrete Pumping used a laser screed to pour the basketball court, utilizing the efficiency, speed, and precision that concrete allows. Northern Improvement Co. used a slipform paver to construct the main path. This maximized efficiency and maintained a clean and uniform surface throughout the extents of the path. Knife River Materials provided a constant stream of trucks to keep the paver moving at a steady pace, and the main branch of the path was completed in less than two days.

A total of 5,370 square yards of 4" reinforced concrete bike path, 560 square yards of 4" reinforced concrete basketball court, and 266 square yards of 4" reinforced concrete playground sidewalk was used on this project.

Making the choice to use concrete will allow the Fargo Park District to continue to expand and improve its network of recreational trails, and will allow the residents of Fargo and the surrounding region to enjoy these trails for years to come.

Drayton Bridge Project

Final End User: State of North Dakota/Minnesota
Construction Manager: North Dakota Department of Transportation
Prime Contractor: Lunda Construction - Black River Falls
Concrete Supplier: Strata Corporation, Inc.

Bridge Category

This $27 million project has now solved an enormous problem during the many floods which hit the Red River Valley; i.e. get from one side of the river to the other. The bridge was constructed to ensure that traffic could flow during flood events up to 100 recurrence intervals. This will mean a major improvement in economic development for the rural region in northern North Dakota and Minnesota. The new bridge is 4,090 feet long, about 400 feet shorter than the Four Bears Bridge near New Town, thus making it the second longest bridge in the state.

We have certainly come to respect the power of the Red River in recent years. To attempt to construct a bridge during two of the biggest floods in history made this a challenge beyond comparison. The project began in late January of 2009 with pile driving. By late March of 2009, the job site was hit by the first of the high waters inundating the jobsite. Due to the largest flood on record, the job site remained flooded for 82 days before Contractors were able to access the site. The next flood hit the area the following year in 2010 during critical phases including deck construction. The prime contractor was limited to very little activity during the extended flood and was completely shut down for 25 days due to the high river levels.

The project included 30 piers through the flood plain, 80,000 linear feet of H-pile, 1.5 million pounds of reinforcing steel, 5,700 cubic yards of concrete,

ND Highway 200 Concrete Overlay - Hillsboro

Owner: State of North Dakota
Design Engineer: Ulteig Engineers, Inc.
Construction Engineer: NDDOT – Fargo District
Contractor: Dakota Underground, Inc.
Ready Mix Supplier: Aggregate Industries, Inc.

Concrete Overlay Category

Looking for opportunities to test the concrete overlay product, NDDOT engineers found an interesting test site near Hillsboro on ND 200. The American Crystal Sugar processing plant and Rahrs Malting terminal are both served by ND 200 there. Between these two facilities, this route probably has the highest truck traffic of any primary highway route in the eastern part of the state.

Design engineers had to consider multiple existing pavement types on which to place the overlay. The south end of the project was an old 20 foot wide concrete pavement, while the north end of the project was a rutted asphalt section with poor subgrade. In front of the sugar beet processing facility, other designs were provided for widening to allow truck turning movements.

Designer's effort to achieve agreement with local road users to close portions of the roadway during construction was a very favorable development. Through effective sequencing and considerable effort to keep traffic flowing, public and business response was very positive during construction.

Project widths were affected by current design standards. The south end 28 foot wide design provided tie bars to secure the overlay slabs which hung over the outside of the old narrow pavement. The north portion benefited from milling into the old asphalt to reduce grade increases. Both sections still needed significant grading work to match existing overlay grades and provide widening for safety.

Working on a tough schedule, Dakota Underground crews were able to fight extreme wet weather to meet final construction deadlines. The concrete supplier was able to supply consistent mixes compatible to quality paving. In the process, they were able to meet and exceed tough NDDOT ride performance requirements of 54 IRI with 80 IRI local roughness. More than $100,000 in ride incentive was earned with their quality paving operations, with less than $20,000 expended for remedial grinding; a truly remarkable feat. Some claim the average IRI of 41 out of the paver may be the smoothest concrete pavement ever constructed in North Dakota.

Professional Services Building

Architect/Engineer: ICON Architectural Group
Civil Engineer : AE2S
General Contractor: Construction Engineers
Paving/Landscaping: Opp Construction
Ready Mix Supplier: Aggregate Industries

Sustainable Design Category

Congratulations to Advanced Engineering and Environmental Services and Icon Architectural Group as they enjoy their first year in a new corporate headquarters. The project achieved a LEED Gold Certification through the application of innovation and green practices in reducing their environmental footprint in development.

As part of the LEED application, the site was recognized for green practices in handling storm water generated from the site. Through a combination of pervious pavement surfaces and a retention pond, the storm water was collected and treated to the highest nominal level before discharge into the city storm sewer system. Not only does the system reduce sediment and other contaminants from the onsite storm water, the pervious services were able to filter suspended solids prior to entrance into the pond. Many times pervious pavement is used to cool storm water prior to discharge, reducing the impact of heated runoff from roofs and pavements. The Red River has a history of fish kills due to urban run-off issues due to heat and contaminants in the storm water.

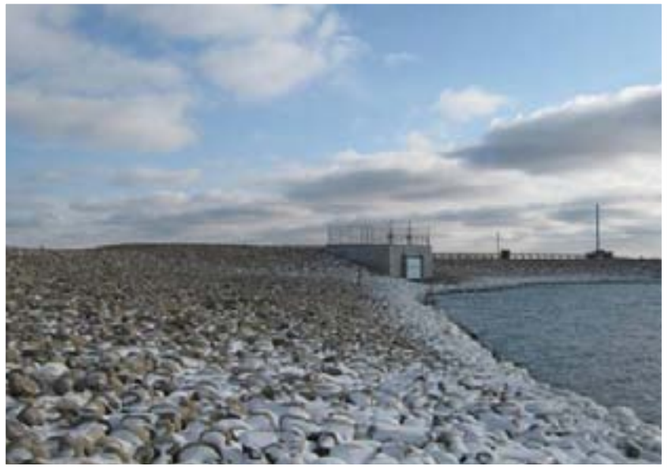
Opp Construction was given the task to complete the site paving portion of the project. The contractor constructed two types of permeable pavement surfaces as part of the storm water collection system. One consisted of precast concrete turf reinforcement blocks which, from a distance, look like normal turf. However, through the use of a concrete matrix surrounding cells of soil, the surface is useful for daily traffic without compaction and deterioration of permeable soils and turf. The other permeable surface was constructed of permeable style paving stones.

Other project components required an additional 1,000 cubic yards of concrete, both plain and integrally colored.

Devils Lake City Embankments Phase I, Creel Bay Reach - 100,000 GPM Pump Station and Gatewell

Final End User: City of Devils Lake
Construction Manager: U.S. Army Corp of Engineers
General Contractor: MiTy Construction Company, Inc.
Structural Prime Contractor: Park Construction Company
Concrete Supplier: Strata Corporation, Inc.

Governmental Category

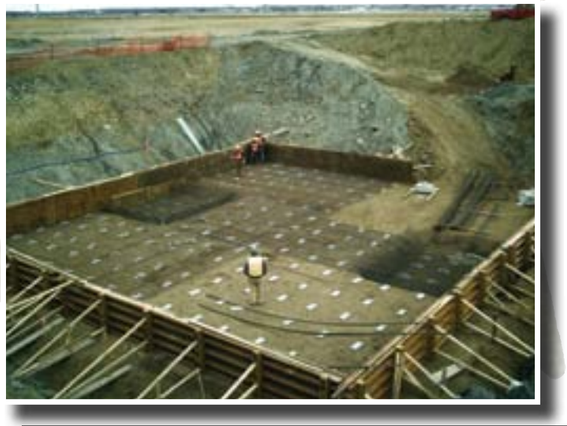


The construction of the pump station and gatewell was a U.S. Army Corps of Engineered managed project in Devils Lake. Both of these concrete structures were designed to remove waste water from the north side of the levee system protecting the City of Devils Lake. The pump station and gatewell was a portion of the overall project that included raising 7,200 lineal feet of earthen levee. Park Construction Company (Park) was the Primary Contractor responsible for the construction of the pump station.

The primary structures encompassing this waste water removal system are cast-in-place concrete structures. All three concrete structures presented very unique challenges. Over half of the concrete was placed in cold weather. Special needs for the project included mass concrete procedures, special workability requirements for tight reinforcement, and extreme quality control. Due to Strata's efforts, no concrete delivered to this site failed to meet the U.S. Army Corps of Engineers stringent strength or delivered temperature requirements.

Other features of this difficult project included fighting rain and high water tables, massive dewatering, and difficult site conditions. Concrete had to be pumped long distances to reach extreme locations of the structure, some 25 feet below grade or thirty feet in the air.

The total cost of the project was $8.4 million. To complete this project Park's employees placed and Strata employees delivered over 4,000 cubic yards of concrete.



Baker-Hughes Joint Facility Industrial/Parking Ramp

Owner: Baker-Hughes Corporation
Architect/Designer: Energy Architecture
Engineer: Pinnacle Structural Engineers
General Contractor: Crossland Construction Co.
Concrete Contractor: Potter Concrete
Concrete Supplier: Dickinson Ready Mix Co.

Parking Category

Baker-Hughes is a major player in the western North Dakota oil fields. In order to keep pace with the western North Dakota oil-boom Baker-Hughes is undertaking several major facility expansions in the state. One of those projects is the construction of a new joint facility in Dickinson, ND.

This massive project undertaking provided 735,000 square feet of industrial/truck parking and 91,000 square feet of light vehicle parking. A primary consideration for the use of concrete was the safety advantage of the light colored surface. The light color was able to enhance the service lighting of the site plus add contrast for objects and people working at night. Another major consideration was the ability to construct the high strength pavement with optimized components, including minimal aggregate base, a product in short supply in the oil fields.

The parking facility will service 8 separate buildings on the property. Engineers selected a 7.5" thickness for the heavy duty areas and a 5" thickness for the light vehicle parking. A special placement of 10,000 square feet of decorative concrete at the entrance to the main office building added a nice touch. Here, a dark gray integral concrete slab enhanced the entrance plaza, providing contrast and aesthetics for this important location.

A unique feature of the slab involved some southern construction amenities with the installation of redwood lumber expansion joints at 90 foot spacing. These were protected at the pavement surface with a special joint sealant to minimize water entrance.

The combined parking area for this project totaled more than 835,000 sf and utilized 20,000 CY of concrete. Construction on the parking areas began on July 1, 2011 and was completed in just 52 days.

Bismarck Public Schools – Career Academy

Architect: Tvenge Architects & Planners
Contractor: Northwest Contracting, Inc.
Structural Engineers: CW Structural
Precast Supplier: Wells Concrete

Precast Category

Cost efficiencies and sustainability are key factors in a school building project. This project was no exception. High energy efficiency capabilities and durable exteriors with precast start a project down the road to value. Designers were able to achieve substantial aesthetics through the many exterior options, while providing an easy fit to the local campus theme. In the end, the ability of precast to meet a very rapid construction schedule for this project was key.

The Center, located on the Bismarck State College campus, has enrollment of nearly 800 students annually from nine different public and private high schools. The academy offers hands-on coursework in Aviation, Horticulture/Botany, Pre-Engineering, Medical, Electronics, and Graphic/Digital Design. Located near the existing Career & Technical Education Center, Bismarck Public Schools has a history of working with precast.

The building was produced in Wells Concrete's Grand Forks plant and shipped to the site where Northwest Contracting installed the product. The design offered an aesthetically pleasing mix of precast, metal panels, and mirrored glass. Working the design into a hillside site made for challenges, but the final outcome was worth the effort. These architectural features really make the building stand out on campus. .

St. Alexius Medical Center – Administration Building

Contractor: Northwest Contracting, Inc.
Architects: Jiran Architects (Jeff Welch)
Comp Plan Associates - Karl Kilgore
Civil Engineer: Swenson Hagen & Associates
Structural: C. W. Structural Engineers, Inc.
Supplier: Knife River - ND

Commercial Category

The skyline of Main Street in Bismarck changed over the past two seasons with the addition of a 100,000 square foot four story administrative building for the St. Alexius Hospital. The building also houses the information technology department.

The building and surrounding concrete parking lots were constructed by Northwest Contracting of Bismarck during the 2010 and 2011 construction seasons. The building consisted of traditional steel frame construction with concrete floors and included a concrete roof to support the mechanical penthouse.

Choosing to bid the parking lots with asphalt and concrete options, engineering evaluations using life cycle cost analysis showed positive benefits with the concrete option. In total, four separate concrete parking lots were built, two lots on the north side and one on the south and one of the east. The project also included sidewalks, ADA ramps and lighting foundations.

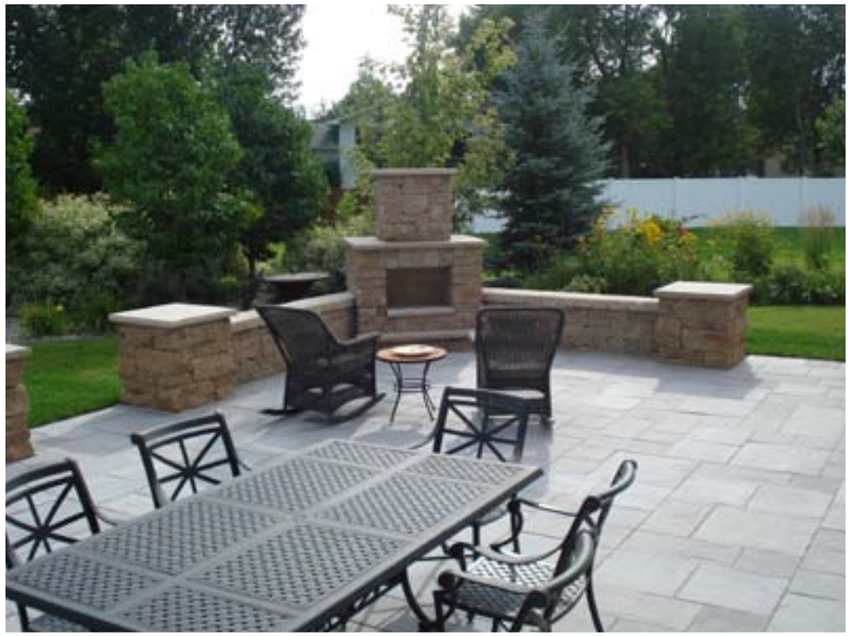
Downtown Bismarck is now the beneficiary of the light colored parking lots, a contributor to a "Sustainable Communities" agenda through reduction in "Urban Heat Island Effect". Light colored pavement surfaces are noted to reduce pollution and decrease peak temperatures during hot weather, leading to reduction in energy consumption and healthier living. We compliment St. Alexius for their choice of concrete which will provide the aesthetics and durability demanded in this competitive business age.

Trish & Phil Gisi Residence

Concrete Products Category

Landscape Architect: Opp Construction – Wayne Pietruszewski

Contractor: Opp Construction



One cannot escape the cozy feeling of this outdoor destination with a wood-burning fire pit and grill center as the focus. Designers were able to make all the materials work together to achieve this award winning project. Other components included a sitting wall to enclosed the patio.

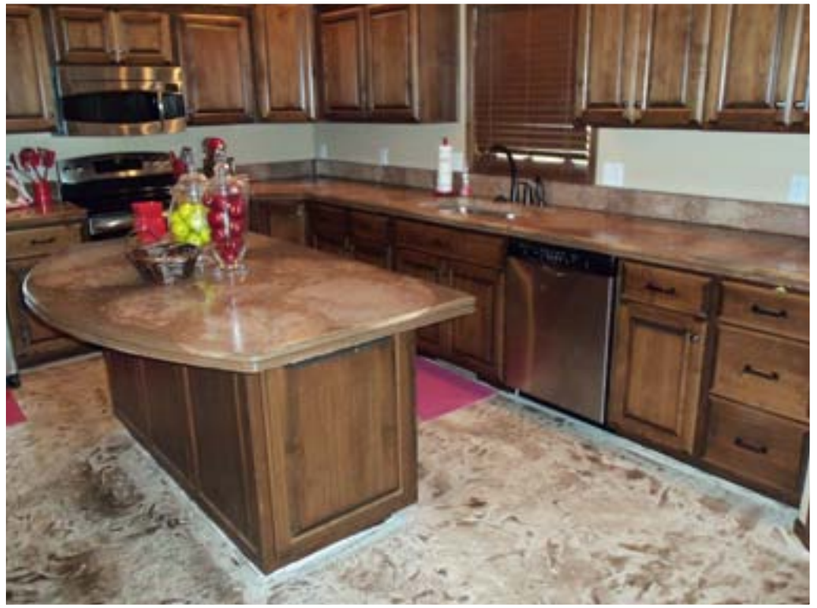
Materials were selected to make a uniform statement. The fireplace was built of the same block as the walls allowing a unification of appearance. The fireplace block was dry stacked and glued rather than a traditional masonry block system. Fire brick was used to protect the concrete for a long lasting structure. Slated blue stone tile was used to create the patio surface. This concrete product has the look and feel of real stone. All products were concrete except the grill counter-top, pillar caps, and hearth stone.

Lyons Residence

Decorative Concrete Category

Contractor / Designer: Grizzly Construction Services

Concrete Supplier: Dickinson Ready Mix Co.



Jeremy Lyons has designed and placed all types of decorative concrete in this area for the past several years. His projects range from the custom imprinted team logos on grandstand walls at the Southside Municipal Ballpark to chemically stained floors and even custom concrete furniture. So when it came to finishing his own home, he wanted to showcase the types of decorative concrete that he usually creates for others.

The first thing you see when you step into the Lyons home is a ¼" stamped polymer concrete overlay floor. The entry floor was acid stained with a Mission Brown stain and was textured with an Italian Slate texture skin and cut freehand into a diamond tile pattern. Floors in the kitchen and bathrooms also feature a ¼" stamped polymer concrete overlay which also were stamped with an Italian Slate embossing skin. White Portland Cement was used for the floors and they were colored with Java colored release. The sinks in the bathrooms are concrete sinks which were integrally cast with the countertops. The countertops were integrally colored with a San Diego Buff color and accented with Cocoa Brown. The kitchen counter tops include an integrally cast backsplash with a medallion stamp pattern. They were also integrally colored with a San Diego Buff color with a Cocoa Brown accent. All counter tops were precast with #4 rebar and fiber reinforcement throughout. The kitchen island was also fitted with a precast concrete countertop, arced on one side and cast with the same colors and variegated pattern as the other countertops.

There is more decorative concrete on display when you step into the backyard. The patio was imprinted with an Arizona Flagstone stamp pattern. It was colored using a Dry Shake Arizona Buff color hardener application with a Mocha color release.

Weaving all of the different decorative concrete elements together in this home created functional work spaces that still have the look of elegance and serve to enhance the value of the home.