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ACPA Names Recipients of 2018 "Excellence in Concrete Pavements" Awards

Rosemont, Ill. (December 5, 2018) - The American Concrete Pavement Association (ACPA) has named recipients of its 29th Annual "Excellence in Concrete Pavements" awards, which recognize quality concrete pavements constructed in the United States and Canada. The awards program encourages high-quality workmanship, quality, and creativity in concrete pavement projects.

The award-winning projects were paved by 22 different contractors. Projects are located in 13 states or regions represented by ACPA-affiliated Chapters and State paving associations. Winners were determined by 40 professionals who devoted their time and expertise to serve as judges.

The program recognizes contractors, engineers, and project owners who completed outstanding projects. Contractors noted with an asterisk (*) are ACPA members. Award recipients are:

Reliever & General Aviation Airports

(Silver Award)Lee's Summit Municipal AirportContractor:Emery Sapp & Sons, Inc.*Owner:City of Lee's Summit (MO)Engineer:Crawford, Murphy & Tilly

This is a story about the reconstruction of Lee's Summit Municipal Airport, but it's also about much more. It's about the importance of the airport to travelers and existing businesses, as well the airport's value in attracting and retaining news businesses.

The project consisted of the complete reconstruction and extension of runway 18/36 from 4,200 linear ft to 5,501 linear ft, as well as the extension of runway 11/29 from 3,800 linear

ft to 4,000 linear ft. In addition to increasing the overall runway length, the airport also elected to replace airfield lighting as well as increase the pavement thickness from 6 in. to 9 in., which increased capacity from a 30,000 lb. rating to a 60,000 lb. rating.

The contractor, Emery Sapp & Sons was scheduled to start this work at the beginning of April, but spring rains delayed the start. When the contractor was cleared to start, the crews worked around the clock to meet the aggressive completion timeline. Even though the rains persisted, the contractor still opened the runway within the 21-day requirement.

The second was the construction of the North and South portions of Runway 18/36 which was to be completed within a 182-day closure of Runway 18/36. The contractor completed the second phase in under 70 days, which allowed ample time for all remaining work to be completed prior to reopening the runway.

In all, the contractor paved 72,375 SY of concrete paving for a total project length of just over a mile or the equivalent of about 4 lane miles, and now the City and the region can boast of an airport that can meet the current and long-term needs of travelers and businesses alike.

(Gold Award)Sioux Falls Regional Airport 2017 ReconstructionContractor:T&R Contracting, Inc.*Owner:Sioux Falls Regional AirportEngineer:KLJ

Carefully planned and executed construction staging is important for any airport project, but it was particularly important considering the scale of the reconstruction and rehabilitation project at Sioux Falls Regional Airport, which is home to the South Dakota Air National Guard's F-16, "Fighting Falcon" jets.

The project consisted of the partial reconstruction of runway 3/21; partial reconstruction of taxiways A, B4, and B5; rehabilitation of taxiway K rehabilitation; reconstruction of the aircraft arresting system on runway 3/21; and the partial reconstruction of National Guard Drive.

The first phase consisted of the reconstruction of taxiways K and B5, as well as the demo, a 3.5 ft subgrade cut, and placing gravel for 800 feet for runway 3/21 and taxiway B4. The two

taxiways had to be completed before T&R Contracting could close the rest of the runway and taxiway A to allow for planes to taxi on K and B5.

The second phase consisted of the remaining demo, grading and placing gravel for runway 3-21, along with work on taxiway A. This work included removing 30-in. thick asphalt and a 3.5 ft subgrade

cut, placing a 17-in. thick concrete paving on runway 3/21 and taxiway A, and adding 30 ft.wide asphalt shoulders. All this work had to be completed in 70 calendar days.

Both phases included a four-step installation of lights, which involved pouring a base and paving over it, adding a 14 in. diameter core, adding an upper section, and then epoxying. In all, there were 128 in-pavement lights that had to be sequenced appropriately to allow room for the paver track and access by the concrete trucks to the paver.

After paving the runway, a 5 ft x 150 x 17 in.-thick section of new paving had to be sawed out for the construction of the Aircraft Arresting System, which serves as the emergency braking system for the F-16 jets.

Another notable detail about the project was the contractor demonstrated a commitment to sustainable construction by *in situ* recycling of the existing 15-in. concrete paving and reuse of the material for the 13-in. base.

The scope of the project, the schedule, and the other challenges proved to be no match for the contractor, which counted this project as the latest in their on-time, successful projects delivered for the airport in recent years.

Concrete Pavement Restoration (CPR)

(Silver Award)US 160/US 550 Concrete Pavement RehabilitationContractor:ACME Concrete Paving, Inc.*Owner:Colorado Department of TransportationEngineer:Colorado Department of Transportation, Region 5 Durango Residency

The Colorado DOT used a cost-effective strategy to rehabilitate a busy highway, and despite challenges, was able to complete the project ahead of a very busy tourism season.

The project involved work on the concrete surface and shoulder on a 27-year-old section of US Highway 160/660 through the City of Durango. The \$6 million project had a few challenges, including two change orders that pushed the project completion date out two

months. The project involved adding ADA ramps to 15 corners, unexpected bridge deck rehab, and additional manhole and valve-box adjustments.

The contractor also diamond-ground close to 150,600 SY of pavement and completed joint/ crack resealing on existing pavement.

Overall, the contractor improved the roadway smoothness, restored skid resistance, prolonged the life of the original pavement, and enhanced the safety of the highway. In addition to replacing and patching damaged concrete pavement, the contractor also removed conflicting stripe shadows, installed new pavement markings with bike lanes, and installed bike friendly inlet gates.

One of the greatest benefits of the project was that it was a more cost-efficient alternative to an estimated \$40 million to \$60 million that complete reconstruction would have cost. Concrete batching was allowed only during daytime hours because of local ordinances, but ACME Concrete Paving was allowed to work day and night for six days per week to complete the work on time. This schedule also allowed the contractor to avoid the local lane closure restriction, which in turn, allowed crews to work large sections with minimal traffic impact.

As a result of the efforts of the project team, the business owners, residents, and traveler in this area have are now driving on a 27-year-old pavement that has now has an additional 15 to 20 years of life added to it.

(Gold Award)	I-40 CPR Express Design-Build Project,	Winston-Salem,	NC
Contractor:	The Lane Construction Corporation*		
Owner:	North Carolina Department of Transportation		
Engineer:	Progressive Design Group, Inc.		

The goal of this project was to improve the cloverleaf interchange of I-40 and US52 to handle expected traffic volume increases from a two-year shutdown of Business 40. The project involved removing and replacing existing damaged jointed concrete slabs and placing new, jointed concrete pavement.

Facing a requirement to remove and replace significant amount of concrete pavement a single construction season, would have been challenging enough, but The Lane Construction Company also faced many other factors, including:

- Managing restrictions that limited lane narrowing or lane closures between 5 a.m. to 7 p.m. (Monday thru Friday).
- Completing undercuts that were required ahead of placing new concrete pavement, all within the same shift during the week or within the same weekend closure.
- Encountering continuously reinforced concrete or extra depth concrete that required modification of concrete removal methods.
- Contending with reduced work areas and night work.
- Managing high-volume, high-speed traffic on both I-40 and US52.
- Managing the project around event-related restrictions, which included all holidays, Wake Forest football home games, the 10-day long Dixie Classic Fair restrictions (which extended from 6 a.m. to 9 p.m.), Bowman Gray Stadium Racing events, and Winston-Salem State football games.
- Coordinating with surrounding projects and manage resources using a nonconventional work schedule.

Because of lane closure restrictions, the contractor used a very high early-strength concrete mixture to achieve the 400-psi flexural strength requirement prior to opening to traffic. Lane Construction used a combination of volumetric rapid set concrete during nightly closures and an accelerated, 12 hour/24 hour ready-mixed concrete when extended closures were permitted.

Equally important was a thorough work plan Lane Construction developed to meet the many challenges, while also maintaining productivity and quality. One factor that could have impacted quality was the risk of damage to recently placed concrete while removing concrete from adjacent areas. To protect the new concrete, expansion material was placed between the new and existing concrete pavement intended to be removed. Despite significant challenges, this exceptional project was delivered on time.

Industrial Paving

(Gold Award)CSX Intermodal Terminals, Bedford Park, ILContractor:K-Five Construction Corporation*Owner:CSX Intermodal Terminals, Inc.Engineer:Tigerbrain Engineering, Inc.

This project on involved the reconstruction of a craneway and trailer dolly pad, but it required a change in the original design, which was a 7 ft-wide structure reinforced with a double mat of steel and featuring 17 in.-thick crane pads.

The new design called for wider, thicker pads to handle the 100,000 lb. point loads of the wheeled gantry cranes, which are used to offload double-stacked intermodal train cars.

K-Five was challenged to build the replacement pads while operations at this busy terminal continued. This included trains on a 12 rail spurs being loaded and unloaded continuously, with cranes operating just opposite of the construction zone.

The new pads were much wider and thicker than the original structure. The finished pads measure 25.5 ft wide and 22.5 in. thick, with a single mat of reinforcement. The concrete pavement was built on a 12 in., cement-stabilized subgrade and an 8 in. layer of cement-modified, dense-grade aggregate, giving the pads a total structural thickness of 42.5 in.

In all, the project involved 18,000 SY of paving, with the finished pads measuring the equivalent of 2 lane miles.

Because the project was completed in a live intermodal facility, phased construction was required to create only minimal impacts to the pace of the railway operations within the terminal.

The project was also on an accelerated schedule, so although speed of construction was important, so too, was careful planning and execution. The contractor's attention resulted in an exacting schedule that allowed paving materials to cure and reach desired strength during times that were less critical to the terminal operations. This remarkable project was so well managed that only 80% of the allotted schedule was used.

Roller Compacted Concrete (Industrial)

(Gold Award) Bayport Container Yard VI South, Seabrook (Houston), TX Contractor: AG Peltz Group, LLC* Owner: Port of Houston Authority

Engineer: LAN Engineering

As the nation's largest port for foreign waterborne tonnage and an essential economic engine for the Houston region, the state of Texas and the nation, the Port of Houston Authority (POHA) currently handles about two-thirds of all the containerized cargo in the U.S. Gulf of Mexico.

May 2018 was a record month in the history of the port, with a total of 245,000 TEUs (Transportation Equivalent Units) moving through port facilities, according to the POHA's website. When fully developed, the port authority's Bayport Container Terminal will have a total of seven container berths with the capacity to handle 2.3 million TEUs in a complex that includes 376 acres of container yard and a 123-acre future intermodal facility.

With such a significant capital investment in container facilities, the POHA is continually looking for value engineering options to reduce construction costs without compromising service or quality. Roller Compacted Concrete (RCC) has helped POHA meet this challenge since 2008.

In 2017, the POHA contracted with AG Peltz Group, LLC to place 40,448 CY of (88,621 square yards) of 14 in. and 18 in. RCC pavement and to mix 35,000 tons of CTB for Container Yard VI South. This was the contractor's third RCC project at Bayport and fifth overall at the Port of Houston. With four in-service facilities at Bayport, the POHA currently has more 200 acres of RCC in service.

RCC, which is often called the third pavement option, provides the POHA a durable concrete pavement with an initial cost competitive with hot mix asphalt. In addition, the facilities completed at Bayport were put into service almost immediately following the completion of paving. Port Authority personnel also informed the contractor they consider the RCC pavement at Container Yard VI South helped reduce the overall project schedule, while minimizing downtime. AG Peltz provided a quality RCC pavement and completed it a day ahead of the 40-day paving schedule.

RCC (Special Application)

(Gold Award) NCDOT Guilford and Randolph Shoulder Reconstruction, High Point, NC
Contractor: Andale Construction, Inc.*
Owner: North Carolina DOT
Engineer: NCDOT Department of Highways, Division 7

When the North Carolina DOT needed to reconstruct a failing asphalt shoulder along the heavily traveled Interstate in Guilford and Randolph Counties, the opted for roller compacted concrete.

This shoulder reconstruction marked the DOT's first use of RCC and served as a pilot project.

In addition to its use as a structural interstate shoulder and structural edge for the mainline, the shoulder was also expected to carry traffic when interior lanes needed to be closed for full depth patching.

The total project included 14 miles of 10 ft outside shoulder construction, which was expected at least 6 weeks, considering traffic restrictions, weather, and scope of the work. Andale completed the construction in 21 paving days.

This project was so successful that the DOT increased the original contract to install RCC on the 4 ft inside shoulders, as well as the removal and installation of an exit and entrance ramps. In all, the contractor placed 83,000 SY of 8 in. RCC pavement.

The contractor used a specialized trowel, which created a smooth, consistent, and durable surface. In fact, no corrective actions were required on any of the pavement.

Commercial Service & Military Airports

(Silver Award)Runway 13/31 Reconstruction - Phase I, Topeka/Shawnee Co, KSContractor:Emery Sapp & Sons, Inc.*Owner:Metropolitan Topeka Airport AuthorityEngineer:WSP

The Topeka Regional Airport has been in service since the time of World War II, so when it was time to replace the main runway and perform other upgrades, the owner specified concrete.

Originally built as a military base and later expanded to service both commercial and private air traffic, as well as both the Kansas Air National Guard and Army National Guard. The main runway (13/31) has been in use for many decades utilizing the original concrete pavement. In addition to needing new pavement with stabilized subgrade and a drainable base and under-

drain system, the facility also needed upgrades including new runway lighting and signage; updated navigational aids; an improved profile and geometry.

The contractor, Emery Sapp & Sons, Inc. had the challenge of replacing the runway while maintaining military and commercial air traffic. The project was divided into two phases to be constructed over two years.

Phase 1, an \$18 million project, was started in February 2017 and completed in October 2017. Emery Sapp crews completely removed 6,500 feet of main runway and replaced with 16.5 in. doweled JCPC pavement. The project also involved removing 154,000 SY of existing runway and taxiway; grading more than 265,000 CY; placing 123,000 SY of lime treated subgrade; and placing 54,000 CY of concrete and 20,000 CY of cement-treated permeable base. Additional features include over 18,000 LF of under drain, a new lighting and navigational system, new pavement markings.

The mix designs for both the concrete and cement-treated permeable base used granite and trap rock to increase the durability of the final product and potentially extend the life of the pavement. Fly ash was also added to the mixture to mitigate ASR and create a denser mixture.

This project was completed on time and under budget, with no accidents or safety-related incidents.

Also, as a testament of the quality of the product, it should be noted that more than 112,000 SY of concrete pavement were placed with corrective actions needed. With an average smoothness index of just over a 0.50 in. per mile, this smooth, durable pavement is expected to provide service for decades to come.

(Gold Award)	Taxiway Pavement Replacement at Hartsfield-Jackson Atlanta
International A	Airport,
	Atlanta, GA
Contractor:	McCarthy Improvement Company*
Owner:	Hartsfield-Jackson-Atlanta International Airport
Engineer:	Atkins

Completing any construction project at the world's busiest airport would be a challenge, but when ATL airport needed three taxiways and adjacent shoulders replaced, McCarthy Improvement Company met the challenges by delivering a quality concrete pavement reconstruction project.

The total contract was \$23.7 million, with the concrete portion accounting for more than \$5.1 million. In all, the work was completed in 10 phases. The overall project duration was 330 calendar days, with liquidated damages set at \$100/minute for any delays in reopening taxiways as specified, as well as \$3,000/day penalties for exceeding the 330-day schedule.

The demo sections depth varied from 16.75 in. to 22 in. During one phase of the demolition, crews found and removed two layers of concrete with strength at or above 3,000 psi.

The taxiway pavement replacement project consisted of full depth replacement of portions of three taxiways. In all, the work included 38,000 SY of concrete paving removal, new centerline lights, subgrade repairs, new underdrain system, and a complete rebuilding of asphalt shoulders.

The typical new taxiway section was comprised of new underdrains trunk lines and herring bones, new light can conduits & light cans, a P-401 bituminous leveling course on top of 6 in. of soil cement, fully rebuilt asphalt shoulders, and a 20 in. concrete pavement. The non-reinforced/reinforced concrete thicknesses were: 20 in., 20 to 26 in. thickened edges, and 16 to 20 in., and a 16 in. shoulder ramp.

Typical slab sizes were 25 ft x 25 ft, with two of the phases having outside slabs measuring 12.5 ft wide 25 ft long. The smaller slabs were reinforced, slip-formed, and extended for a total length of approx. 900 linear ft in one phase and 725 linear ft in another.

The required straight-edge smoothness was 12 in., with a maximum 0.25 in. deviation on 16 ft with anything over 0.5 in. removed and replaced. Despite the presence of new light cans installed in the center-line lanes, as well as intersecting taxiways, the concrete met the smoothness requirements with no grinding.

One of the keys to the successful completion of this project was the extensive planning and coordination, which ensured all the construction traffic and related operations were contained in the designated work area, thereby avoiding the disruption of airport operations. Haul routes were clearly marked on drawings provided to escorts and haul-truck drivers.

Scheduling was done for each hour of every 24-hour workday, which was divided into 12-hour shifts, with a 1-hour overlap for the crews. The project also benefited from strong support by the owner and engineer, along with real-time decision making to address unforeseen conditions, along with the contractor's ability to adjust operations efficiently.

Expert planning, communications, and paving resulted in this project being completed on time. Thanks to this team effort, the three durable, concrete taxiways can be expected to meet the demands of this busy and bustling airport for many years to come.

County Roads

(Silver Award) Dover Oklahoma County Road EW-73, Kingfisher, OK
Contractor: Duit Construction Company, Inc.*
Owner: Oklahoma Department of Transportation
Engineer: Circuit Engineering District 8

At first glance, County Road EW-73 in Kingfisher County may appear to be indistinguishable from other roads, but there's much more to this recently paved road than meets the eye.

First, the daily traffic count is nearly triple the population of its nearest town, thanks to major sand pits in the area that serve a large area that includes Oklahoma City. The road provides the fastest east/west access between US-81 and SH-74 for trucks hauling from these plants.

Second, EW-73 is one of the few concrete county roads in the state of Oklahoma, and there are few exceptions other than roads designed for high truck traffic.

The success of this project began with the competitive bidding process. This is the first of four projects that will resurface 16 miles of EW-73 between Dover and Crescent. The designer

included concrete as an alternate bid option with the competing design of an asphalt typical section of identical thickness.

The contractor, Duit Construction, had previously completed concrete sections roads that provided industrial access to wind-energy farms and fertilizer plants in the area. Duit saw the most competitive option for the first segment would be consistent road surfaces on the remaining 13 miles of pavement.

The contractor coordinated with one of the nearby sand plants for set-up of a mobile batch plant location and optimizing the use of sand in our mix designs. Duit was the low-bidder on the project, dispelling any preconceived notions that asphalt pavements first costs are inherently lower.

The project consisted of 45,407 SY of doweled, jointed pavement along a 3.4-mile alignment. Most the concrete was 7-in. thick concrete, except for 10-in. thick pavement used at the intersection of US-81 and the sand plant entrance. The existing asphalt road was milled and re-used for shouldering material and driveways, except for excess millings repurposed by the county.

The greatest hurdle during the project was maintaining local traffic at all times. The alignment included 30 drives, two cross streets and a high production sand plant facility.

Coordination with residents and the plant manager, along with maintenance of temporary access routes were vital to ensuring the traveling public were not negatively affected. In some cases, the contractor was able to detour traffic long enough to place and cure concrete adjacent to driveways, and in a few instances, homeowners opted to stay in area hotels during the construction.

Several sustainability factors where addressed in this project, including:

 Most of the alignment exists within a FEMA zone AE, which are at high risk for flooding. This underscored the importance of grading and elevations. This paired with Duit Constructions desire to provide the smoothest ride possible even without a ride bonus specification, resulted in a ride well within specification and ensured this roadway serves as shining example of concrete's use on county roads. The road was closed to through traffic and Duit only maintained local traffic into the construction zone (including sand plant trucks).

- Biological studies determined that culverts on the project were used as nests for Cliff and Barn Swallows, protected by the Federal Migratory Bird Treaty Act, and measures were taken to prevent nesting and finish construction efforts prior to the next migration season.
- Duit has implemented an idle-time analysis system on its fleet. The goal is to reduce idle time on all equipment, maximize productivity and minimize fuel usage.

The contractor kept property owners (including the homeowners and the sand pit operators) informed with construction signs and door-to-door communication prior to the start of construction. As the project neared completion, Duit staff went door-to-door to share the news verbally. Duit credits the crews for the effective communications and goodwill that came from this personal outreach. As a result of the ingenuity, hard work, and extra efforts, the paving project was completed without delays and a week ahead of schedule.

(Gold Award)Weld County Road 49 Design-Build: I-76 to US 34, Weld County, COContractor:Interstate Highway Construction, Inc.*Owner:Weld County, Colorado, Division of EngineeringEngineer:Felsburg Holt & Ullevig

As the first design-build pavement project for Weld County, this was also the largest single contract awarded in the county's history. The selection of concrete pavement was a big step for the owner, which historically used their own asphalt paving crews and, until recent years, had not constructed any major concrete roadway projects.

As one of only two major north-south farm-to-market routes within the County, WCR 49 is essential to the area, but the existing roadway was also one of the most dangerous in the county. About 53% of the traffic is from heavy haul trucks serving the local farming/ranching and oil/gas industries. Roadway conditions and numerous sight distance issues meant the failing roadway needed attention. The roadway crossed two major flood plains and was often inundated during heavy rainfall events. Considering all these factors, county officials expedited the roadway reconstruction and issued the two-year design build-effort project in place of one originally planned for 10 years.

The design-build team was challenged to eliminate the sight distance issues; provide acceleration/deceleration lanes at most of the project's 19 county road intersections;

eliminate overtopping of the roadway; establish both a general purpose and passing lane in both directions; and create a full-length 16 ft. center turn lane.

The project also involved 183 private parcel acquisitions and relocation of almost 110 miles of existing utilities. The right-of-way acquisition was completed until almost nine months after the notice to proceed was issued, and in turn, this slowed the utility work and delayed the overall project by six months.

The design-build team worked closely to identify and address environmental impacts. IHC completed environmental surveys for wetlands, historic resources and potential hazards along the corridor and the designer then incorporated information into the design to minimize potential impacts.

The total project length was 19.96 miles and included 937,000 SY of concrete paving over 19.96 miles. The project called for 500,000 tons of aggregates for the concrete. Transporting the materials to the project site would have created an enormous environmental impact, so Interstate Highway Construction (IHC) worked with a local aggregate supplier to use an existing aggregate and sand pit on the project site. This change had a significant sustainability benefits, eliminating about 1.26 million truck miles, 2,347 tons of CO2 emissions, and almost 21,000 truck trips from state roadways. Mining the aggregates on-site also improved the mix design optimization.

Close communications and teamwork among the design-build team members resulted in many other innovations, including the use of a geogrid, which eliminated 230,000 CY of excavation and embankment from the project scope. This also reduced CO2 by more than 2,100 tons and water demand by almost 10.6 million gallons.

The contractor also recycled the existing asphalt roadway and used it for construction of about 70% of the base course. This had the double benefit of sparing 202,000 tons of new base material, while also diverting the same amount from waste. This change resulted in the elimination of more than 2.1 million truck miles and almost 4,000 tons of CO2 emissions.

Other innovations included the use of automatic plate-load testing to verify the geogrid/base calculations in the field; reduction of dowels and dowel diameters; and the use of a fusion-bonded epoxy on dowel bars and baskets to improve corrosion resistance.

Over the span of 14 months, the contractor's crews removed and replaced 20 miles of outdated pavement, dirt, drainage and utilities. The complete 27-month project duration included design, construction, acquiring remaining right of way, working with 17 utility companies and Union Pacific Railroad. Despite a delayed start to the project, the the reconstruction of this important roadway under budget and almost 30 days ahead of schedule.

Municipal Streets & Intersections (>30,000 SY)

(Silver Award) Lindsey Street (from 24th Ave. SW to East of Berry Rd.), Norman, OK
Contractor: Sherwood Construction Company*
Owner: City of Norman
Engineers: Poe & Associates, Inc. and Atkins

This important stretch of roadway is lined with restaurants, businesses and homes, and is also a vital like to the University of Oklahoma. With about 25,000 vehicles (including delivery trucks) using this roadway every day, it's easy to see why there was a lot of attention on this project.

This project was the second portion of a major upgrade to this important corridor. After citizens of Norman approved a major bond issue, crews went to work on utility relocation and other work, including the upgrade of a water line through this area.

Sherwood Construction coordinated closely with hundreds of businesses located along the corridor to maintain access throughout the whole project. The project was phased almost as if it were two separate projects.

The contractor first established a detour by removing the existing curb, then connecting all the driveways with a 6 in. fiber reinforced concrete pavement on untreated base.

To construct the base, Sherwood used a modified cement-treated base/econocrete base, which they developed to allow the use of ready mixed concrete. Placing the econocrete base with a slipform paver had its challenges because of it was only 4 in. thick. To meet the challenge, Sherwood developed a sliding rail forming system to place the material by hand. Pins where set on grade and a steel channel was set on the pins. The channel would slide from pin-to-pin and served as a strike off for base material.

The contractor moved traffic out to install a new storm sewer system which, at some locations, was an 8 ft. x 7 ft. box that was almost 20 ft deep to the flowline. The

replacement storm sewer extended to two side streets to alleviate flooding in the residential areas north of the corridor.

Sherwood then detoured traffic to one side of the grade to construct half the new driveways and the 8 in. jointed plain concrete pavement. The traffic was then moved to the new pavement to allow construction of the other half of the roadway. Next, the median and islands were constructed to complete the middle of the roadway.

Slipform paving proved to be challenging. String line was set to get the most productive run of each paving section, typically from intersection to intersection. The contractor would then block out alternating driveways to maintain access to the businesses. The block-outs would be poured by hand later using a high early strength concrete mixture that would allow for reopening the driveways 24 to 48 hours later.

This high-profile project required excellent communications. The City of Norman had several public meetings before the project started to inform businesses and residents along the project of the upcoming work.

During construction Sherwood and the engineers would meet with city officials on a bi-weekly basis to go over project schedule. Businesses or residents that were would also be notified in advance of work, and in time for city officials to issue press releases and media advisories about upcoming closures or traffic switches.

The contractor earned a \$400,00 incentive for early completion of the project and now, local residents and roadway users have a long-lasting, high quality concrete that will serve this busy corridor for many years to come.

(Gold Award) 6th Street/US Hwy 14 Reconstruction (from 20th Ave. to 34th Ave.),

Brookings, SD

Contractor:BX Civil & Construction*Owner:South Dakota DOT - Brookings OfficeEngineer:South Dakota DOT - Pierre Group

This complex reconstruction project was originally scoped by the South Dakota DOT for a twoyear completion time frame, but after further discussions with business owners, City of Brookings officials, and the contractor, it was agreed the completion in one year would be best. The total cost of the project was \$17 million, putting it in South Dakota DOT's Top 10 by dollar volume for 2017. The contract was jointly awarded with the DOT and the city. With the aim of attracting efficient, high quality contractors, the DOT placed significant incentives and disincentives on various phases of the project.

BX Civil & Construction was the prime contractor for the project, which included removing existing pavement, grading, and construction of storm sewer, water main, sanitary sewer, concrete paving (70,000 SY), curb & gutter, and sidewalks. The project also included traffic signals, decorative railings, decorative street lighting, signing and signals along 6th Street (US Hwy 14). In addition, the entire Interstate 29 Brookings Interchange was removed, and a new bridge and ramps were constructed.

Almost 95% of the \$17 million was spent with companies located within 60 miles of Brookings.

This project involved 30 to 50 employees working at all times.

- The intersection at 6th Street & 22nd Avenue was the most time sensitive component of this project. Originally scoped for no more than 75 days, the project team completed it in only 55 days.
- Four ramps were allowed 21 days each for a total of 84 days, but the team completed the work in only 68.5 days.
- Phase 2 of the project was completed 11 days ahead of schedule and Phase 3, which was anticipated to be completed on June 30, 2018, but most of the work was completed in the fall of 2017.

In all, the contractor placed 70,385 SY of concrete with a project length equating to about 4 lane miles. With nine intersections/interchanges, a bridge, and 21 businesses along the route, this six-phase project had many complexities.

In addition to the project complexities and accelerated time frame, the project team was also mindful of potential impacts beyond the immediate area. The project involved a major interchange on Interstate 29 and could have made vehicle and pedestrian travel difficult to and from South Dakota State University (SDSU), the state's largest campus. BX collaborated with SDSU leadership to keep traffic flowing in and around the construction area during peak events, including fall move-in day and five home football games.

Positive TV and newspaper coverage recognized the project team for keeping things running smoothly and quickly.

The challenges were no match for the BX-CC, which worked closely with the DOT and city, landowners, subcontractors, and their own staff to coordinate details closely and carefully. BX-CC was able to successfully complete the project and collect incentives of \$411,000, and after the project was completed, the BX-CC employees, subcontractors, and project owners celebrated with a catered barbecue. The project team also gave businesses, residents and travelers something to celebrate, too. They now have a durable roadway that was completed in less than half the time of the original two-year project scope.

Municipal Streets & Intersections (<30,000 SY)

(Silver Award)Clear Creek Parkway Construction (Clare Rd. to Hedge Lane Ter.), Cityof Shawnee, KSOwner:City of ShawneeContractor:Realm Construction, Inc.*Agency:Shafer, Kline & Warren

This roadway was constructed as part of strategy to link existing and planned developments in Shawnee. The 5,100 ft Clear Creed Parkway project followed the construction of a bridge over the nearby K-7 highway. The parkway provides motor vehicle connectivity within the corridor, including connecting to Clare Road on the west and Hedge Lane Terrace on the east.

The Parkway also is designed to enhance the city's recreational trails, a system that is intended to have multiple connections to new and future facilities.

The project scope included land acquisition, permitting, and intersection and road layout for construction of three major intersections at a roundabout. It also included grading, storm sewer facilities, decorative lighting, utility coordination, pavement design and construction, and other work.

A golf cart path and tunnel built under the roundabout includes a decorative wall that shares its design with the landscaping of the roundabout center island. The base of the roundabout features decorative rock and street light towers that use the same LED lighting as the K-7 bridge. The lights can change colors to highlight events (such as breast cancer awareness month) or other purposes determined by the city.

Realm Construction faced many challenges, including water and electrical transmission line, but quick thinking and clear communications with the utilities avoided any damage claims. The contractor also discovered a potential issue on the golf cart path through the tunnel, but the problem was solved by placing a 4 in. subfloor to ensure proper elevation, and then texturizing the path for better traction.

The project also required wetland and streambank mitigation, and a required archeological survey to accommodate and best preserve historical Native American settlements in the area. The project also required trees in a 2.5 acres area to be cleared, mulched, and used on site as temporary erosion control prior to sod placement.

Construction required 22,880 SY of concrete pavement over the equivalent of 2.9 lane miles. Construction slowed down during heavy rainstorms, which required removal and replacement of a 300-foot-long section of concrete, but this did not prevent the project from being completed on time.

(Gold Award)	STH 42, Lincoln Avenue, City of Two Rivers (Manitowoc County), WI
Contractor:	Vinton Construction Company*
Owners:	Wisconsin Department of Transportation
	City of Two Rivers, WI
Engineer:	McMahon Group

The reconstruction of STH 42 (Lincoln Ave) in the City of Two Rivers included a complete replacement of all facets of the transportation system.

The first set of operations included replacement of all sanitary sewer, storm sewer, and water main facilities, including lateral and service facilities. Private sewer laterals and water services that were found to be defective were replaced from the right-of-way into residential and commercial buildings during construction.

The pavement typical section consisted of 6-in. base of dense aggregate beneath 8-in. of jointed plain concrete pavement with dowels. A thicker typical section with 16-in. of select crushed material was placed on the southern half of the project to address poor subgrade soils.

Bike paths and alternating side parking presented challenges throughout the entire project. New sidewalks were constructed throughout the project were constructed to enhance the connectivity of the corridor. An off-road multi-use trail was constructed on the north end, with ultimate plans to extend the trail toward Two Rivers High School. Aesthetic enhancements included LED street lighting, colored concrete crosswalks, and more than 100 trees planted within the right of way. Restoration, including sod in the terrace areas, rounded out the project providing an immediate finished look. Wisconsin DOT officials were quoted in the state award presentation, saying, "Vinton performed exceptionally all the way, from prior to the project beginning through the end of the project."

Advance communications provided residents and business owners an understanding of what to expect. Quick completion of advance work allowed Vinton to start pouring concrete almost a month ahead of schedule. Once the paving operations started, Vinton planned their operations strategically, maximizing the time available to complete other tasks, according to the Wisconsin DOT.

Vinton focused on completing the south half while utility work continued on the north end. Using zero-clearance pavers and belt placers allowed all mainline concrete to be placed without sacrificing pedestrian access. The contractor also reduced project costs by \$200,000 through the recognition of different subbase soil conditions. Because the soils were very good, and sand was well-drained on the north end, they contractor saved money for the DOT by eliminating the same crushed material used on the south end.

Forward thinking was also evident in the decision to delay the pouring of the colored concrete on the project. Waiting until almost all other work was complete allowed subcontractors to start their work sooner to have greater access to the work site. The quality of the colored concrete was also enhanced in that it was more uniform, and the timing prevented any unsightly marks on the new surface from other operations, the DOT added.

With 10 paving gaps planned on the project, there was a good the ride quality would have been affected, but Vinton coordinated with the city officials and business owners to eliminate every gap, creating continuity and a smooth ride on the mainline pavement.

Communication with the city and the DOT highlighted a potential issue with the closing of 35th Place, the northern-most intersection on the project. Many local motorists were using this intersection as a shorter detour route around the construction. Although contract documents allowed the intersection to be closed, Vinton identified a solution to avoid unnecessary impacts to that traffic. Instead of closing the intersection, Vinton constructed a temporary bypass, allowing the intersection and mainline pavement to be completed without interruption to the normal traffic flow through the intersection.

Foresight and communication were keys to resolving issues, often well before they became big problems. With vast experience in urban construction, Vinton was well suited to handle all that was presented, resulting in outstanding performance and construction. The result was a project that Vinton

Construction Company, Wisconsin DOT, McMahon Group, and the City of Two Rivers will be proud of for decades to come.

<mark>State Roads</mark> (Silver Award) OK	Intersection of SH-51 (6th Street) & US-177 (Perkins Road), Stillwater,
Contractor:	Duit Construction Company, Inc.*
Owner:	Oklahoma DOT
Engineer:	Benham

Stillwater, OK, is home to more than 49,000 people, but thanks to Oklahoma State University (OSU), the population increases by almost 26,000 students every August.

The intersection of SH 51 and SH 177 was the site of a test section of 4 in. fiber-reinforced concrete placed on asphalt pavement. The section was in service for 19 years, but with ADT of 21,167 ADT and 4% trucks, the owner to replace the intersection as part of a plan to increase capacity and upgrade the bridges adjacent to the intersection.

The Oklahoma DOT (ODOT) and City of Stillwater chose concrete because of how well it performed for them at in the 4 in. section. In addition to increasing the capacity and reconstructing the pavement, Duit Construction had to reconstruct all the water and sewer lines in this intersection, along with the entire storm sewer.

Because of the large volume of traffic on the intersection, ODOT and the city put internal milestones in place to ensure that traffic was flowing during all the OSU football games. Knowing that as many as 60,000 fans could be drawn to the area during football games, ODOT wanted to make sure this intersection was open in time for the beginning of the season. Duit was required to start the day after the final football game in 2016 and to ensure the pavement was operating at full capacity by the first game in September for 2017.

Thanks to the team efforts between Duit, ODOT, the City of Stillwater, and the Benham Group, the team was able to complete the project in time for the first football game.

Along the way, there were several challenges, beginning on the first day of the project. Telephone and power utility issues were quickly identified. There were also two bridge boxes located within 75 feet of the intersection that needed to be constructed.

The original drawings indicated the bridge could be demolished in two phases, but the team discovered the bridge was built on four footings. If two of the footings were removed as indicated in the plan, the bridge carrying traffic would have an increased chance of tipping

over. Duit revised the plan that would enable them to construct the project and demolish the bridge all in one phase—and without closing the road.

Although Duit worked to thread sewer and water lines through fiber optic lines and phone lines that were not identified by the phone company. ODOT, the city, and the contractor decided the best solution was to close SH 51 west of SH 177.

To proceed with the plan, ODOT officials had to talk to all the businesses in the area to get consensus agreement. Afterward, it was decided that an internal milestone would be added to the contract to allow Duit to close the road, but to reopen it within 40 days. Within that time frame, the single-span bridge had to be removed and the triple barrel box structure had to be demolished. Within the same time frame, two triple barrel box structures had to be reconstructed, and crews had to backfill, stabilize soil, and place the asphalt base. ODOT offered Duit an incentive of \$100,000 to achieve this. With the help of subcontractors, Duit was able to complete the required work within the 40 days.

Even so, the utility delays impacted the overall project schedule, so the contractor developed a plan to move traffic onto the 3 in. asphalt base, so the intersection could be open to traffic during football game weekends. During the week, Duit closed the lanes to continue the concrete paving, opening the intersection to traffic only on the weekends.

For the paving, Duit placed more than 18,800 SY of concrete 8 in. thick, jointed reinforced pavement, equaling more than 2.8 lane miles. Duit used a central mix plant, but it had to be 8 mi. from the project because of limited space and permitting issues. As such, the mixture had to be dialed in precisely to handle the relatively long haul and traffic delays.

In spite of the utility delays, the project was completed on time. Now "Stilly" residents, business owners, and OSU students and football fans can travel through this area on a project that was built to last.

(Gold Award) Iowa Highway 196, Sac County, IA Contractor: Cedar Valley Corp., LLC* Owner/Engineer: Iowa Department of Transportation

This nearly 10-mile project involved the removal of 135,000 SY of existing pavement, completion of 900,000 CY of earthwork, and placement of almost 109,000 tons of base and

shoulder aggregates. The contractor, Cedar Valley Corp., paved almost 200,000 square yards of detour, mainline, and shoulder paving on the project.

The existing pavement was originally placed in 1938 and had received at least four asphalt overlays in its history. This project ran from the intersection of Highway US 71/175 on the south end, north to newly constructed US Highway 20. The Iowa DOT chose to rebuild Highway 196 and then relocate US Highway 71 from its current location in to best use the 10 miles of new US Highway 20.

The contract period was stated to be 255 calendar days with goal of opening to traffic by the day before Thanksgiving, but it was an especially wet year in Sac County. Almost 40 inches of rain hit the area, more than 9 in. more than normal. In the key Iowa construction month of August, the job was hit with 9 in. inches of rain, 6 in. of which fell in one day alone. Also, it rained on 40 percent of the days, spanning from June through September.

Two bridges were also constructed on this project. The new earth berms each had assigned settlement periods, but wet weather severely delayed completion of the berms, and the saturated soil conditions impacted the rate of settlement.

The prime contractor first scheduled the paving to start on August 3, but as the job progressed, the start date slid to September 20, again to October 5, and finally to October 12. When paving started, the contractor was able to continue for five days per week over five weeks. However, when mid-November arrived, Cedar Valley caught up with the prime contractor's grading and base operation, so the chances of opening Highway 196 to traffic during the calendar year was looking pretty bleak.

As cold weather arrived, Iowa DOT officials expressed concerns about leaving a potentially dangerous 12-mi. detour in-place during inclement weather, mainly because it included three four-way stops and a very sharp curve on the south end of the project.

Therefore, out of concern for the safety and convenience of the traveling public, the DOT allowed a defined amount of "emergency/critical" operations to ensure the mainline of Highway 196 was opened in the winter.

All parties involved realized and agreed that this meant the roadway would need to be closed down again the following spring to complete the project. The contractor developed a plan

that outlined the extra measures and expenses needed in order to make sure Highway 196 was opened to traffic in the late fall. Snow was falling as the last few days of paving were executed, but exceptional planning and execution allowed Cedar Valley to pour the two outside 14-ft. wide lanes and the 16-foot median on the south end of the project, effectively closing the detour until spring.

On the following April 4, work started up again and traffic was rerouted and placed back on to the established project detour, so CVC could complete the remaining 16 miles of paved shoulders, along with a couple of paved driveways. The concrete road work was completed on April 25.

The project also included matching two newly built concrete bridges and approach pavements. Stopping the paving operation at these locations and passing over the bridges impacted smoothness in these sections. The bridge approaches, CD baskets, intakes, maintaining the many access restraints, and the extremely wet job conditions and haul roads all had the potential to negatively impact CVC's ability to attain the maximum pavement smoothness incentive. Even so, because of preplanning and expertise on the grade, the contractor achieved almost 71 percent of the maximum zero band smoothness incentive on the mainline paving, thereby earning \$111,050.

Cedar Valley used Shilstone principles to design an optimized concrete mixture, which enabled the contractor to earn the maximum mixture bonus of \$121,857, as allowed by IDOT specifications. However, the money was returned to the citizens of Iowa in the bid.

In spite of the many challenges and the extraordinary steps needed to battle the weather and meet the schedule, Cedar Valley had no injuries or recordable vehicular accidents after 35,500 man-hours.

According to CVC, the best public relations a contractor can do is to get in, build the job, and get out as quickly as possible. In spite of very wet weather and other challenges, the Cedar Valley lived up to their goal by successfully battling the elements, working through the winter, and doing everything possible to meet the schedule.

Owner/Engineer: McLeod County Public Works

When an existing bituminous roadway needed to be rehabilitated, the McLeod County Public Works department decided on a concrete overlay to provide a long lasting, durable, pavement that not have the future road-user delays associated with traditional bituminous maintenance. The concrete overlay is also expected to provide better fuel economy than a bituminous solution, thereby lowering the road's carbon footprint.

State Aid Project (SAP) 043-603-032 was a 6.4 mi. concrete overlay on County State Aid Highway (CSAH) 3 in McLeod County, which is located approximately 60 miles west of the Twin Cities. CSAH 3 is a major collector and serves as a primary connection between the City of Glencoe and Trunk Highway 15 to the west, serving many farm-to-market haulers.

The existing bituminous roadway was 24 ft. wide and had 8 ft. aggregate shoulders with several horizontal curves. The project consisted of milling the existing asphalt pavement to a designed profile and cross slope to improve the ride as well as correct deficient super elevation transitions

associated with the existing horizontal curves.

The concrete section consisted of 6 in. of undoweled, plain concrete that was jointed in 6 ft by 6 ft panels with a tied shoulder, all of which was placed in a single 32-foot wide operation.

Some of the bituminous millings taken from this project were used for part of the shoulders, while the remaining materials were stockpiled and will be used on future County projects, thereby avoiding minimizing the use of virgin materials.

The concrete mixture called for a low water/cement ratio to impart durability. The owner also specified 100% class A (granite) coarse aggregate.

The contractor encountered some random areas where the old transverse cracks in the bituminous pavement were very deep, but to address the problem, the areas were monitored closely, and filled with washed sand to prevent formation of paving lugs and to keep the concrete quantities in line.

CSAH 3 was closed to all through-traffic during construction, but the contractor provided access to residents and businesses along the project route during portions of the project.

In advance of the project, McLeod County Highway Department sent letters to all property owners in the area two months prior to the project. The letters detailed the project schedule and traffic concerns and included contact information for owners wanting more information. Agricultural businesses that were in operation and potentially affected during the construction phase were also contacted, and in addition to the outreach by the highway department, the contractor also communicated with owners prior to paving to help determine how and when they would leave and re-enter their property.

A press release was also used to inform the general public of the project which included details about the road closure and project schedule, and this effort was also augmented with social media posts.

As a result of the expert project management and execution, along with the effective communications, PCI finished the project on time, leaving property owners and travelers with a durable roadway that will handle vehicle traffic of all types for many years.

(Gold Award)Western Avenue Corridor Improvements (Bendix Dr. to Olive St.) South Bend,
INContractor:Selge Construction Co., Inc.*Owner:City of South Bend, Department of Public Works
Engineer:Abonmarche Consultants, Inc.

Concrete was once again the pavement of choice in the ongoing efforts to improve urban aesthetics and restore neighborhoods, while also providing a longer service life of arterial routes into downtown South Bend. This project constitutes a segment of a multi-phase corridor improvement on Western Avenue, and it runs approximately 2500 lineal ft. from Bendix Drive to Olive Street.

The project scope included reconstruction of the existing pavement and redesign of traffic flow patterns to include designated turn lane; permeable parking spaces; and a mix of full-depth concrete and a thin concrete overlay. The project also included placement of new underground utilities, storm/sanitary separation, and construction of new sidewalks and curbs, and the addition of updated street lighting.

The contractor, Selge Construction, placed 10-in. of full-depth pavement was placed where new underground utility work was performed, as well as a 4 in. concrete overlay over existing asphalt pavement. In all, the project consisted of 3,800 SY of 10 in. full depth concrete, and 4,300 SY of 4 in. concrete overlay, and 727 SY of 6 in. concretes. The project also included 2,500 SY of 4 in. sidewalks; 2,653 lineal ft of 6 in. and 8 in. curb; 1,300 lineal ft of ribbon curb; and 1,050 SY of permeable pavers in the designated parking lanes.

Traffic was maintained in one direction throughout the entire project, thus minimizing the impact on local business.

The Western Avenue Corridor has endured several economic upturns and downturns, but the area is now experiencing a resurgence of neighborhood pride and ethnic diversity. This and other corridor updates are well served by concrete pavement because it provides a longer service life, improved night-time visibility, and a reduced urban heat island effect. The concrete roadway will require little to no maintenance, which reduces the city's cost of ownership.

The vibrancy of the neighborhood can be seen in the murals painted on buildings and the colorful storefronts. The central character in the renewal is the long-lasting concrete, which will provide many years of service to the residents and visitors to this area.

Overlays, Highways

(Silver Award) Chester Unbonded Concrete Overlay Project, Chester, WV Contractor: Golden Triangle Construction Co., Inc.* Owner/Engineer: West Virginia Department of Transportation

The West Virginia State Highway Route 30 unbonded concrete overlay project was the first concrete overlay constructed in West Virginia.

The project consisted of 20,000 SY of 7 in. concrete overlay on Route 30; a concrete overlay on four ramps; variable depth concrete reconstruction at the overlay transition areas; and concrete preservation

(patching) operation on Route 2, which runs north and south at the interchange of Route 30.

There was also some minor drainage work in the median and upgrades to signage, guardrail and other roadside work. The proposed overlay was constructed on a 1 in. asphalt separation layer on the existing 9 in. plain concrete pavement roadway. The project plan also called for 8 in. deep asphalt shoulders adjacent to the overlay.

After the project was awarded, Golden Triangle approached the West Virginia Department of Highways with some welcome changes to the scope of the project. The contractor proposed to construct 8 in. deep concrete shoulders in lieu of asphalt at no additional cost to the Department.

Golden Triangle replaced the entire Route 2 concrete roadway for the same cost as patching the roadway would have been. The contractor also was able to minimize disruption to the business owners by designing a traffic scheme to allow Route 30 traffic to continue during the overlay construction. The new traffic plan eliminated the 20 mi. detour, which was popular with business owners and municipal authorities. The overlay portion of the schedule was originally supposed to be complete in 9 days with a \$10,000 per day incentive/disincentive clause. The revised plan allowed more time to construct the overlay without the major disruption of the long detour, and as a result, contract was complete on schedule in just under 4 months without the cost of liquidated damages.

Golden Triangle requested permission for the Department of Highways to use an optimized concrete mixture in lieu of West Virginia's standard slip form mix. This allowed the Golden Triangle the ability to lower the cement content, provide a well graded mix which in turn, resulted in IRI numbers in the 50's and 60's and hopefully a more durable pavement.

Non-destructive testing was used in lieu of cores to determine actual pavement depths. Round metal discs were nailed to the asphalt layer prior to paving. Each disc was surveyed to determine a

location. After the pavement had hardened sufficiently to use a MIT-2 scanner, the disc was located, and the scanner was passed over the disc to determine depth. This method eliminated the 40+ cores typically required for this amount of pavement.

The widths of the shoulders ranged from 4 ft to 11 ft, so a variable width slip form mold was used to slip form the shoulders, thus combining multiple placements into one operation.

West Virginia DOH expressed their happiness with the project and indicated their readiness complete more concrete overlays throughout the state. The cold/wet spring delayed our paving schedule from an April-to-August paving schedule to a May-to-August schedule. Crews worked 10 hours per day, 6 days a week during to complete the paving in time for the first day of school in late August.

Golden Triangle actively engaged with the local government and businesses in the area. The contractor attended City Council meetings, which area business owners, residents and city/ county officials also attended. It was at one of these meetings, where the revised traffic plan and schedule were presented. Traffic plans and phase changes also were communicated through the local newspaper and on the city's website.

The contractor was able to minimize disruptions on the Route 2 reconstruction work by using night and weekend closures of intersections that allowed completion of intersections that are too busy during weekdays.

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(Gold Award) US Highway 71, Clay County, IA Contractor: Cedar Valley Corp., LLC* Owner/Engineer: Iowa Department of Transportation

US Highway 71 is a major north-south artery that intersects east-west US Highway 20. The highway was originally paved with 7 in. concrete in 1931. Over the years, the roadway received numerous asphalt overlays, and in some places, it had deteriorated so badly that full depth asphalt repairs had been performed.

The highway was plagued with thermal cracks, failing joints, severe joint roll-down, and bottom-up cracking. The contractor, Cedar Valley Corp. performed the work on this 6.88 mi. project, which called for milling the existing highway and placing a 124,000 SY of nominal 6 in. unbonded concrete overlay.

During the design process, the Iowa DOT determined that different saw cut patterns were necessary over the full-depth asphalt compared to the pattern called out for over the composite sections. The DOT specified sawing the concrete overlay on top of the full depth asphalt sections in 6 ft. x 6 ft. panels. Therefore, five longitudinal saw cuts and crosscuts on 6 ft centers were made on the 32 ft wide pavement in the full-depth asphalt sections.

The composite sections, which made up about 47 percent of the project, were treated differently. The sawing pattern for those sections created 8 ft x 9 ft panels. The composite sections required three longitudinal saw cuts and crosscuts on 8 ft centers. On a typical paving day more than 35,000 lineal feet of sawing was required. The entire project required a total of 305,700 lineal ft of sawing.

To transition between the full-depth asphalt sections and the composite sections, the DOT specified that 15 lineal feet of 16 in. concrete was to be placed on the 32 ft wide pavement. The project contained five of these transition sections. The plan did not address how to transition successfully between the two different saw cut patterns, which did not line up. The plan also did not address how local traffic and haul traffic would be able to pass through the full-depth asphalt pavement removal areas during construction.

CVC proposed a mutually beneficial solution that was accepted by the owner. The joint at each edge of the five transitional 15 lineal foot, full depth sections was sawed full-depth transversely to stop the longitudinal saw joints from propagating across the panel.

Another problem was how to maintain local access and haul concrete through these transitional areas. To address the problem, the contractor recommended filling half the pavement transition area with rock and haul material. Then after reaching the transition area, the paving crew stopped long enough to allow a fine-grade crew to remove the rock and fine-grade the transition panel to the correct 10-in. depth.

The transition areas presented their own set of challenge, including the paving thickness, which abruptly changed from 6 in. to 16 in. The contractor was concerned about smoothness, and the likelihood of creating either a bump or a dip. To solve the problem, CVC paved the 10 inches by hand, with the help of a material placement/transfer machine, to bring the transition panel up to the existing elevation. This allowed the contractor to pave the remaining 6 in. with the paver while the 10 in. of concrete was still plastic.

The DOT assigned 116 working/calendar days to this project. Cedar Valley started the project on June 17, and completed the entire project by October 28, earning \$118,500 in time incentive pay.

The varying depths, transitions, and other factors had the potential to impact Cedar Valley's ability to attain the maximize pavement smoothness incentive. However, excellent preplanning and execution enabled the contractor to achieve excellent smoothness. In fact, the contractor earned 83.3% of the maximum zero band smoothness incentive on the mainline paving, earning a \$95,500.

Urban Arterials and Collectors

(Silver Award)159th Street Reconstruction (Nall Ave. to Mission Rd.), Overland Park, KSContractor:Miles Excavating, Inc.*Owner:City of Overland ParkEngineer:Affinis Corp.

This project is in one of the fastest-growing area in the county. Increased traffic volumes had elevated the need for this project, which expanded the 159th Street from a two-lane country toad to a four-lane, divided roadway.

The approximately \$8.93 million project also included other improvements, including bike lanes; a new roundabout at the Mission Road intersection; curb and gutter; and storm sewers.

The project also called for a reinforced concrete box culvert under the road; street lighting; sidewalks; and a multi-use trail.

Some of the challenges on this project were anticipated, including the need for significant grade changes that required large solid rock excavation; utility relocations before and during construction; and continuous access to a utility substation and three nearby schools.

One factor that was less predictable was the number and frequency of 100-year rain events during the project. The project team worked together to rise to the challenge and overcome each one without sacrificing safety or schedule along the way.

Miles Excavating placed the roadway on a base comprised of 8-in. fly ash compacted subgrade and 6-in. AB-3 modified aggregate.

Large areas of rock required over-excavating the rock to a 9-inch depth below the normal subgrade, then replacing it with a drainable base layer. The modified AB-3 remained above as the base. A layer of shale was discovered at the Mission Road intersection, so after consulting with a geotechnical engineer, the fly ash treated subgrade was replaced with an additional 6 inches of modified AB-3 for a total thickness of 12 inches.

During construction, the city and contractor focused attention on sustainability measures. For example, concrete was chosen for the roadway because of its inherent sustainability benefits, including reduced maintenance and reduction of waste, such as millings associated with asphalt overlays. The contractor and city also hired a water pollution control manager to oversee erosion control on the project. Because of the steep slopes and large areas affected by the project, this was instrumental in combatting the large rain events. Some of the measures used included hydraulic erosion control; erosion control mats; biodegradable logs; and temporary seeding. The project also included post-construction stormwater treatment devices and four hydrodynamic separators installed at low points on the project. These units will collect sediment and trash from the roadway in the future.

The contractor place 35,377 SY of concrete for a total of just over 5 lane miles of roadway. The contractor used both slip form paving (for the mainline portion) and fixed form paving, mainly at the roundabout and its approach legs, as well as at main intersections. As a result of the exceptional team effort, this rapidly-growing area now has an arterial roadway that will serve the city for many years.

(Gold Award) SH 45 Pueblo Boulevard (SH 96 to US 50), Pueblo, CO. Contractor: Castle Rock Construction Company* Owner/Engineer: Colorado DOT Region 2

State Highway 45 in Pueblo is a 3.5 mi. stretch of heavily-trafficked roadway that connect the town of Pueblo west of US 50 to the downtown area.

The existing asphalt roadway was severely damaged with transverse cracking and need complete replacement.

Several concrete contractors, including Castle Rock Construction, met with the Colorado DOT prior to the bid process to discuss constructability of concrete on SH 45. The existing median curb & gutter sections needed to remain in place for a portion of the project, and adjacent to the curb & gutter, the paving needed to be constructed with zero clearance for paver tracks. The industry worked through those concerns with the DOT, and the project was bid as a concrete paving job.

The project included 190,000 SY of asphalt planning and 170,000 SY of full-depth reclamations, as well as 38,000 CY of excavation and mitigation of unsuitable subgrade using aggregate base course with geogrid reinforcement.

The project also called for 160,000 SY of 8.25 in. doweled concrete pavement. Additional work included traffic signal reconfigurations; bridge jacking, rehab, and resurfacing; and rock check dams and drainage grading.

In addition to performing its own contract work, Castle Rock also provided direct oversight of 22 subcontractors while working with 14 contract modifications totaling approximately \$1M.

The project had three main phases, with multiple smaller phases. Dividing the paving into these so many phases, along with the three bridges and gaps at all four intersections could have adversely impacted the pavement smoothness, but with proper planning, the effects were minimized.

Sustainability features included a 10% limestone replacement cement, which lowers the carbon footprint. The use of fly ash and a batch plant on site also significantly reduced the fuel and emissions that would have been associated with trucking the materials. The concrete and asphalt removed from the project were crushed and used as part of the full-depth repairs on the base.

In addition to the sustainability features of the project, the owner, taxpayers, and travelers have a long-lasting concrete roadway that will provide many years of service.

Divided Highways (Rural)

(Silver Award)	Muskogee Turnpike (MU-MC-42), Wagoner County, OK
Contractor:	Koss Construction Company*
Owner:	Oklahoma Turnpike Authority
Engineer:	Craig & Keithline, Inc.

The construction of this project on Oklahoma's The Muskogee Turnpike was a challenging project that required a major commitment from Koss Construction and their subcontractors. Plans called for the project to be completed in 370 days, however, days were added to the contract for additional work that was added to the contract after work was in progress.

Koss was tasked with removing the existing four lane highway, which was a difficult and timeconsuming operation. The existing concrete was crushed and used as aggregate base in the roadbed. Crushing the existing pavement and reusing it as aggregate base proved to be both cost effective and environmentally responsible, as it reduced the amount of virgin aggregate by 100,000 tons.

Koss placed the 10.5 in. doweled, jointed concrete pavement over 12 in. of base material. In all, Koss crews placed 450,300 SY of concrete, for the construction of 36.32 lane miles of highway pavement. The project was divided into five phases of construction, with each phase divided into two parts.

The contractor's control department continually testing the concrete to ensure a quality pavement was constructed. Koss QC Technicians used a type B pressure pot and a Super Air Meter to monitor air content and air spacing in the plastic concrete.

Koss project superintendents regularly talked with landowners and business owners to keep them informed before any traffic switches or lane closures were activated. Arrow boards were placed at the beginning of the project in both directions to benefit the traveling public.

The skill and hard work of the project team resulted in a quality reconstruct of this important toll highway.

(Gold Award)	US119 CoLine-Crossover Rd, Mt. Pleasant, PA
Contractor:	Golden Triangle Construction Co., Inc.*
Owner:	Pennsylvania DOT
Engineer:	SAI Engineers

Golden Triangle Construction Co., Inc was awarded this two-year, \$37.8 million reconstruction project by the Pennsylvania DOT (PennDOT). This highway reconstruction project was located on State Route 119 in East Huntingdon, PA.

The roughly 5-mi. long, two-lane divided highway project included more than 190,000 SY of 12 in. jointed concrete pavement; almost 3.4 miles of upgraded drainage and stormwater retention systems, median upgrades with concrete barrier separation; paving inside shoulders; and mine stabilization.

Some major project highlights include: cement soil stabilization, a roller compacted concrete truck-inspection area, recycled concrete for site stabilization and toe bench rock, ASR concrete, long-life concrete, roughly 14,500 lineal ft of concrete glare screen barrier, and mine shaft repair with concrete support columns. The project also included lime soil stabilization, an onsite concrete batch plant and a DBI concrete paver along with other emerging technologies.

A winter shutdown was mandated, during which no work could take place from November 1 to April 1. With the amount of work that needed to take place in two seasons, the winter presented a challenge to an already tight schedule.

During the paving season, Golden Triangle crews worked overtime to allow the adjacent paving to coincide with cure times for the mainline and ramps. A utility delay in the project schedule occurred when a utility company did not move their line before the planned date.

In the second year, work on a mainline section was halted for a month in order to allow the utility contractor to move a line that would have been exposed if not lowered under the subgrade. In the first year, unusually high temperatures impacted daytime placement of concrete placements. During that time, most the concrete was placed at night during cooler temperatures. High temperatures in both years necessitated installing a water chiller at the contractor's batch plant.

Also, in the second year, large rain storm events delayed concrete paving almost a month. From April to July, it rained and average of three days per week almost every week. It was difficult to coordinate concrete pours with the weather and other project demands, but crews once again worked weekends when rain was not forecasted.

A late warm spell in the first year allowed the crews to into November and December for smaller concrete pours. This was a huge help as progress was delayed in late fall due to some unforeseen conditions and changes to the subgrade and pavement design. Warm weather in the late fall, early winter is unusual in the northeast where the end of October is usually the end of concrete paving, without being forced to use artificial heat or concrete blankets.

There were also design issues with two of the on ramps, which forced Golden Triangle to reschedule the ramp closure work. In the first year, construction of a ramp was scheduled during the school season but was pushed to later summer so that ramp could remain open to school buses and the elevated traffic levels. In the second phase, a ramp closure was unexpectedly prolonged for a full year, instead of just 42 days as planned. To solve the Golden Triangle worked out of sequence to reconstruct the ramp and correct the grade issues in the beginning of the season rather than later in the year. This allowed the work to be performed safely and quickly. The ramp closure work was completed in 39 days and opened early in order to open in time for the Memorial Day traffic.

This project also had several sustainability factors, including:

- Selection by PennDOT for the study of preventive measures to address Alkali-Silica Reactivity in pavement, based on the AASHTO PP65-11 program.
- Construction of a 500 ft section using an optimized long-life concrete mixture, which the contractor requested to be used in the mainline pavement as a trial for future optimized mixes.
- Use of a central mix batch plant to produce 64,000 CY of concrete, cement-treated permeable base course, and roller compacted concrete. This allowed a more

consistent concrete mixture and fewer trucks to deliver the material, thereby burning less fossil fuel and minimizing the environmental impacts. The plant also used threephase power instead of diesel generators, which saved thousands of gallons of fuel, plus even more fuel to deliver the diesel to the site.

• Recycled and reused materials throughout the project. This included more than 25,000 CY of concrete pavement, 4,500 linear ft of concrete median barrier, and limestone aggregate.

Despite the complexity of the project, as well as unforeseen delays, Golden Triangle completed the work in just 20 working months. The hard work and dedication by more than 130 employees showcased a beautiful concrete highway which provides the owner, tax payers and motorists a superior and durable project.

Divided Highways (Urban)

(Silver Award) Elgin O'Hare Western Access Tollway (IL Rte 390 & I-290 Interchange), Cook County, IL
Contractor: Acura, Inc.*
Owner: Illinois State Toll Highway Authority
Engineer: CH2M Hill

Negotiating the busy interchange between Illinois 53/I-290 and Thorndale Avenue in the Northwest suburbs of Cook County could be a challenge, but thanks to this Illinois State Toll Highway Authority (ISTHA) project, this interchange is now known for its convenience and efficiency.

Completely rebuilding and expanding that interchange while maintaining traffic volumes of more than 176,000 vehicles per day on the Interstate and over 78,000 vehicles per day on Thorndale Ave. can best be described as a marvel of bridge and road construction management, as well as construction staging to maintain the lane capacity to handle high volumes. These sections of roadway and highway are considered main arteries for much of the busy commerce and many commuters in the Northwest suburbs, as well as traffic feeding into the growing areas west of O'Hare airport. Closure of these heavily-trafficked facilities simply was not an option.

This complex project required using two agencies' requirements and specifications - the tollway authority and the Illinois DOT's. Acura, Inc., as part of its subcontract to build the pavement on these busy IDOT and tollway sections was able to do so while maintaining a high level of quality required by both agencies.

The project involved placing almost 83,000 SY of concrete for a total of 11.78 lane mi. Within the project there were 10 intersections/interchanges and 10 bridges along the route. The concrete pavement thickness was 10.5 in. on 3 in. asphalt base. The ternary concrete mixture was developed to the tollway's specifications and was transported by ready-mixed trucks/agitors. Stringless paving meant up to three trucks could discharge ahead of the paver simultaneously, increasing efficiency of the paving operation.

The extremely heavy traffic on this busy tollway/DOT interchange necessitated the use of both lane reductions and staging to ensure a minimum of six lanes open on the northbound/ southbound sections and four lanes on the eastbound/westbound sections. In addition, all ramps were required to maintain at least one lane open for traffic during the construction.

This project also dovetails into the tollway's experimental CRCP sections. Though not part of this actual contract, Acura had to provide transitions to CRCP in order to accommodate future contracts that did implement the various research sections. To accomplish this, a jointed concrete to CRCP transition section was required. The combination of stringless paving and the use of a dowel-bar inserter ensured high productivity and the ability to have access to most of the points in the project.

(Gold Award)US 24 Westbound - Constitution Ave. to Garrett Rd., Colorado Springs,
COCO
Contractor:Castle Rock Construction Company*
Colorado DOT Region 2

US 24 Westbound connects Colorado Springs and Falcon, CO. The existing asphalt roadway was showing severe deterioration, it was determined the roadway needed complete replacement. The Colorado DOT decided to bid the project as an alternate bid/alternate design.

Castle Rock Construction was awarded the project, which was awarded by a wide margin with the life-cycle cost adjustment. The project had a life-cycle cost adjustment of more than \$1 million, and in contrast, the low asphalt bid was \$100,000 under the second-place concrete bid. The sections were 7 in. hot mix versus 8.25 in. concrete.

The project included 10,000 SY of asphalt planing and more than 75,500 SY of full-depth reclamation; more than 65,000 SY of 8.25 in. doweled concrete pavement; and traffic signal reconfigurations. During the concrete portion of this project, it rained every afternoon. However, the rain was no match for the project team, which was able to make up the time, so much so that the contractor earned most of the early completion incentive.

The concrete pavement required no corrective action for smoothness, thanks to an optimized concrete mixture and quality paving, curing, sawing, and sealing. Castle Rock used an innovative testing procedure for the aggregates. Combined gradations were done three times daily in a pug mill to assure the mix was within the specified range for coarseness and workability, as well as to attain the amount of free water in the aggregates. This allowed the contractor to adjust batch water to maintain a very consistent batch.

Sustainability was also a consideration with this project, and the contractor demonstrated a commitment to source reduction and recycling in several ways. The cement used featured a 10% lime stone replacement, which lowered the carbon footprint. Fly ash was also part of the mix, which not only yields a stable, durable slab, but also diverts a potential waste material away from landfill. The asphalt FDR materials from the project were crushed onsite and used as road base, thus allowing a significant reduction in trucking and fossil fuel use, as well as a less virgin material.

As a result of the hard work, commitment to quality, and attention to detail Castle Rock completed the project on time and within budget and delivered a quality concrete pavement that will provide excellent service to travelers, residents, and visitors to these two popular Colorado cities.

About the Excellence Awards

The ACPA Excellence in Concrete Pavements awards are made possible, in large measure, because of the generous time commitment of independent judges from across the country. The judges each spend many hours reviewing executive summaries, project details, photographs, and other details and aspects of project submittals.

ACPA presents awards in both gold and silver levels. Judging is based on a point system, with independent judges awarding points for quality construction, addressing unique and unusual challenges, innovation, traffic management, and other criteria. In the case of ties, award judges present awards to co-winners.

About the American Concrete Pavement Association

The American Concrete Pavement Association is the national trade association for the concrete pavement industry. The primary mission of the ACPA is to lead the promotion of concrete paving, and align its members, chapters/state paving association affiliates and partners for effective and valued concrete pavement promotion, advocacy and technical support on behalf of the concrete pavement industry.

Founded in 1963, the American Concrete Pavement Association is headquartered in Chicago at 9450 West Bryn Mawr Ave., Suite 150, Rosemont, Ill. 60018. Telephone: 847.966.2272. The Association's metropolitan Washington, DC-office is located at 3925 Chain Bridge Road, Suite 300, Fairfax, Va. 22030. Phone: 202.638.2272. Visit us on the web at <u>www.acpa.org</u>.

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Contact information: Photos of award-winning projects, along with award recipients, are available by following this <u>link</u>. This system requires no user ID or password. Please note: Subfolders contain project photos, as well as recipient folders (marked "people." In cases where there is no recipient folder, this indicates the recipients were not present for our photo session. For more information, or if you would like specific photos and/or information, please contact: Bill Davenport, ACPA, at 847.423.8703 or <u>bdavenport@acpa.org</u>. If highlighted link does not work, please cut & paste this to your browser: <u>https://goo.gl/pauJwS</u>.