Carlos Braceras replaces John Njord as UDOT’s Executive Director

Also:
Top General Contractor Rankings
Accelerated Bridge Construction
Pervious Concrete
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50 UC&D’s Top Utah General Contractor Rankings

Correction: In the April-May issue of UC&D we incidentally omitted Method Studio, Inc. of Salt Lake City in our Top Utah Architect Rankings. Method Studio was founded in 2007 and reported 2012 revenues of $2.59 million, up from $1.82 million from 2011 and $1.38 million from 2010. The firm’s top executive is Joe Smith, Principal, and it boasts 20 employees, including four licensed architects and five LEED-accredited professionals. Its largest completed project from 2012 is the Tooele Applied Technology College, and its largest project to break ground in 2013 is the UVU Classroom Building. The firm’s top markets include Higher Education (43%), Multi-Family (25%), and Office (16%). We apologize for the omission.

Correction: In the February-March issue of UC&D on page 34, first column, third paragraph, we inadvertently misspelled the name of WRNS Studio of San Francisco. We apologize for the error.

On the cover: Carlos Brazaone (left) was selected by Utah Governor Gary Herbert on May 6 to replace John Njord as Executive Director of the Utah Department of Transportation (UDOT). Njord retired in early 2013 after working at UDOT for 25 years, including the past 12 years as Executive Director. The men are pictured adjacent to the I-215 49th South Bridge, the first project in Utah to utilize self-propelled modular transporters to move a bridge into place via Accelerated Bridge Construction methods. (photo by Dana Sohm, Sohm Photography)
The Who’s timeless rocker ‘Won’t Get Fooled Again’ closes with the line “Meet the new boss….same as the old boss.” Some people may feel that statement is apropos in describing the replacement of outgoing UDOT boss John Njord with his Deputy Director of 12 years, Carlos Braceras. And while there will be something of a seamless transition from one to the other given their long-term relationship of working together at UDOT, Braceras is no doubt his own man and will likely run the department the way he sees fit. That’s not to say he’s going to go rogue and start upsetting apple carts along the way just for the sake of change. He knows what works, he’s on board with the strategic goals the Department instituted under Njord’s watch, and he’s confident that Utah’s transportation system will continue to thrive and provide greater economic opportunities for businesses and residents of the Beehive State.

One thing is certain: Njord seems to be enjoying being out of the often-times suffocating glare of UDOT’s critics, including the mainstream news media. Our cover photo shoot of Njord and Braceras near the I-215 45th South Bridge in early June spoke volumes as to who was in and out of the spotlight – Njord sported a leather jacket sans tie, while Braceras had on slacks, a striped button down shirt, and requisite tie. Readers can gain greater insight into UDOT’s ‘Changing of the Guard’ on page 46.

In addition, this issue of Utah Construction & Design looks at UDOT’s prowess and national reputation as a pioneer of Accelerated Bridge Construction (ABC) techniques (page 40) which started in 2002, about a year after Njord became Executive Director, but took off in earnest in 2007 with the state’s first-ever ABC bridge move via self-propelled modular transporters (SPMTs). Since 2007, UDOT has moved more than 40 bridges into place using various ABC methods, including SPMTs and lateral slides, and other state DOTs have taken notice.

This issue of UC&D also includes a ranking of Utah’s Top General Contractors, based on revenues earned from 2012. We literally sent Top GC Survey’s to nearly 100 general contractor firms in the state. We always hope for as much participation as possible from firms in regards to these surveys, but understand it’s not everyone’s cup of tea.

The rankings show some positive signs as local A/E/C firms continue to rebound from the ‘Great Recession’ of 2008-09. Ten firms reported 2012 revenues in excess of $50 million, including seven general builders and three heavy/hyway/civil general contractors.

Other topics/projects covered in this issue include a feature story on the Cache Water Restoration Project in northern Utah, and a look at pervious concrete. We also cast an eye toward the Utah Asphalt Paving Association (JAPA), and look at how that organization has progressed since its inception in the Utah market a couple of years ago. Finally, we’re pleased to announce that our website – utahcdmag.com – is LIVE and functioning. Readers can now view the current issue of UC&D, or any of our past publications, online via a computer or tablet device. The website will ultimately include regular updates to breaking industry news, as well as video clips of interviews and project features.

As always, we welcome your input and invite you to submit editorial information regarding topics, trends, issues, projects and people within Utah’s A/E/C Industry.

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UDOT’s in Good Hands with Braceras

Averages in construction are often times double that of what other jobs are even willing to pay, plus the work you do on a daily basis is satisfying and rewarding. At the end of the day, you can see the progress you’ve made; and once a building or infrastructure project is completed, you can always say that you had an integral role in building that important project!
Pitching Local Construction Talent to Out-of-State Businesses

By Brigham Mellor

Why Utah?

Our job at EDCUtah is to make the motives for doing business in Utah easily apparent to companies exploring the prospect of either relocating or expanding corporate operations. It is widely known by now, thanks to the many publications and professional journals, that Utah is the best place in the United States to do business. Whether it’s our business-friendly legislative environment, the low cost of utilities, or the loyal workforce that costs 10% less than the national average—almost every company can save money by locating in Utah.

Most of our clients are industrial users with demand for larger than 150,000 SF of industrial space. Roughly 65% are looking to occupy existing space and 35% are building new buildings. This is a shift from two years ago where 80% of our clients were occupying existing space and 20% were building new. As the abnormal supply of Class A office space and large industrial space runs out, more prospective owners are choosing to build new. Our mission is to make sure the economic impact of the company’s expansion is the largest it can be on the local economy, for that to happen ideally, a company will opt to hire local service providers—architects, engineers, contractors, attorneys.

It became evident a few years ago that some of our clients were selecting contractors from out of state for their

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Safety and availability are must-have characteristics of critical infrastructure. This especially holds true when considering security for SCADA systems that monitor and control remote operations across a wide array of communications technologies. All Schneider Electric’s Telemetry and Remote SCADA solutions incorporate solid security at all levels, from the field to the enterprise.

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Convincing clients that Utah firms can meet their construction needs is similar to convincing clients that Utah in general can meet their corporate needs, while at the same time reducing their capital and labor expense. EDCUtah is presently working on a video that highlights the strengths of Utah’s construction industry.

Convincing clients that Utah firms can meet their construction needs is similar to convincing clients that Utah in general can meet their corporate needs, while at the same time reducing their capital and labor expense. EDCUtah is presently working on a video that highlights the strengths of Utah’s construction industry. This includes:

- All construction services needed are locally provided - companies can avoid a logistical nightmare by having easy access to managers handling the construction services and products avoiding unnecessary expenses and delays.
- Local contractors have access to better pricing because of forged subcontractor relationships, lower prices for materials and supplies to ensure repeat business.
- Local contractors have strong local municipality relationships, which means inspection and permitting processes are expedited.
- Clients benefit from the local knowledge of Utah firms with meteorological, engineering, and geotechnical conditions. Weather is always a factor in constructing new buildings. Some regions of Utah can average a low of 15 degrees Fahrenheit, others peak at 120 degrees Fahrenheit as an average high. Understanding fluctuating weather patterns and the unique geological conditions of Utah insures a successful project completion.
- Projects benefit from a local knowledge of economic trends, local contractors recognize how certain local and nationwide events affecting the Utah economy can have a significant impact on keeping project costs down.

According to the 2012 RS Means weighted average, Utah is the second most cost-effective place to construct a building in the Western U.S. These figures are comparable to the national index score, set at 100. RS Means rates Utah’s construction cost at 86.8% below the national average. Lower than average union participation is also seen as a welcoming signal to companies looking at coming to Utah. While there may be a wide range of opinions on the necessity of unions in business, a contributing factor to Utah’s lower-than-average construction cost is a lower-than-average cost of construction labor. Utah is a right-to-work state, only 6% of Utah workers are represented by unions, which helps reduce the cost of labor.

The law of supply is a fundamental principle of economic theory which states that, all else equal, an increase in supply shifts the supply curve and reduces the price of that which is being supplied. Utah has a highly-skilled construction labor pool to draw from, making the state’s construction market very competitive. While wages in Utah are 10% below the national average, construction labor wages are closer to 20% less than the national average. Utah, per capita, has a high density of labor in the construction industry (per Bureau of Labor Statistics, 2012 Occupation Profiles):

- Utah has the third highest concentration of construction laborers in the United States.
- Utah has the fourth highest concentration of drywall installers in the United States.
- Utah has the second highest concentration of concrete finishers.
- Utah has the third highest concentration of pile driver operators.
- Utah has the third highest concentration of stucco finishers.

At EDCU we are proud of the local construction industry, and grateful for their support of economic development efforts in this state. We are thrilled when we can assist local contractors with new business opportunities. There are many positive signs indicating that the best economic times in Utah are yet to come.

Brigham Mellor oversees the economic and business research for EDCUtah by aiding companies that are looking to expand or relocate by helping them with their due diligence. He also helps create and update key EDCUtah research publications and is a research resource for EDCUtah investors and other decision-makers in the State of Utah. Mellor holds a Masters of Economics Degree. In December 2011 Brigham was appointed to the Farmington City Planning Commission.

“R&O kept a laser focus on all critical dates and did everything necessary to get the job completed on time and on-budget, including working weekends and many, many late nights.”

Jamie Dunn, Managing Partner, Peak Capital Partners

www.randoco.com

Life is Full of Tough Choices

Choosing a contractor shouldn’t be one of them.

Why not choose one with proven experience.
Assisted Listening Solutions Should Be Incorporated Early in Design

By Cory Schaeffer

Assistive listening is required to be provided where there is amplified sound. If there is a microphone and/or speakers, there needs to be an assistive listening system. In the original standards, the number of assistive listening devices was 4% of seating capacity, which became prohibitive. Now, the number of receivers has been scaled to match the total occupancy of the venue. Reciever Hearing-Aid Compatibility: A percentage of receivers are required to be hearing-aid compatible and interface with telecoils in hearing aids. Induction or Hearing loops are becoming more pervasive because the signal is fed directly into the person’s hearing aid—no headphones or other listening devices are required. With new legislation and rapid technological advancements, it is becoming increasingly important for architects to actively design assistive listening solutions into the project as early as possible. Too often, the planning for assistive listening technology is partitioned under the audio visual team; but in doing so, it forces unnecessary limitations. In an RF system, the signal is transmitted over radio frequencies (specifically the FCC mandated 72 and 216 MHz bands) to a personal receiver. The advantage of RF technology is that there are no “line-of-site” issues and the technology can cover a wide area indoors or outdoors. An IR system uses infrared light to transmit audio. The advantage of IR technology is that the system is secure—the audio signal will never leave the room. The challenge is a listener should be within line-of-site of the emitter/radiators. Also, the shape of the room, the coverage and line-of-site issues usually require more thought and consideration during the design stage. In an Induction Loop system, an integral wire is installed around the room in a variety of ways creating an induction field that can be picked up by hearing aids with a tele-coil, which more than 60% of hearing aids today and 100% of cochlear implants have. Many venues and users alike enjoy this type of assistive listening system because the users’ disability is invisible as they simply use their hearing aids to receive the audio signal. There would be no need to ask for a receiver. Architects strive to create beautiful, functional and inclusive buildings where every individual can make a personal connection to the space. Regardless of how aesthetically pleasing a building is, if any of the 38 million Americans who suffer from hearing loss enter an area where they cannot hear clearly, they become disconnected from their environment—the opposite of the architect’s intention.
Sahara breaks ground on Petzl Headquarters; R&O opens SLC office;
Hunt recognized for safety efforts; Best of State honors A/E/C firms;
Hogan breaks ground on Murray hotel project.

Salt Lake City-based Wheeler Machinery Co. sent 14 employees in April to the small mountain village of Tixmacadejo in Mexico’s Acambay region as part of a humanitarian mission to build cisterns and lay pipeline so villagers can have better drinking water. Located at 5,200 feet, the remote village has little access to modern amenities. Wheeler employees and villagers worked side-by-side building cisterns for four of the village families. Cisterns are cylinder-shaped waterproof receptacles for harvesting rain water and protecting it from contamination. Employees and villagers laid the foundations, bent and tied the wire and mixed concrete to construct the cisterns. They also

constructed one mile of a proposed five-mile pipeline that will bring much-needed water from a reservoir to the village. "I feel the water project will make such a huge impact on their lives," said Susan Anderson of Wheeler’s parts department. "It will save them so much time and give them time to work on projects to earn money to feed their families. I felt part of my heart in that little village."

"Lack of water is undoubtedly the most significant barrier to economic success in the Acambay region. The cisterns will not only provide water for household use but will allow for increased animal husbandry and livestock cooperatives."

"The villagers want a better life for their families and with CHOICE this is possible," said Kathy James, sales office manager. "This gives the villagers hope that their dreams and needs can come true." More than $108,000 was raised in nine months via Wheeler employee payroll contributions and a generous 2-to-1 company match. When the corporate partnership launched, the goal was to raise $50,000. If the goal was met, Wheeler committed to sending a group of employees on a fully-funded humanitarian expedition including covering each participant’s vacation pay. Wheeler will continue to send a group of employees on a CHOICE humanitarian expedition each year if the goal of raising $50,000 is reached annually.

"Without the support from our corporate partners, the work of CHOICE Humanitarian wouldn’t be possible," said Leah Barker, CEO of CHOICE. "We are really excited about the impact Wheeler and CHOICE is making together. Thousands of lives are changing for the better."

A/E/C Firms Honored at 2013 Best of State Event
Ten firms who work primarily in Utah’s

A/E/C industry were honored May 11 at the 2013 ‘Best of State’ event at the Salt Palace Convention Center. The following ‘Best of State’ awards were presented:

Architects: FFKR Architects, SLC
Commercial Building Subcontractor: Mountain Crane Service, SLC
Construction - Commercial: Big-O Construction, SLC
Construction - Heavy: Ralph L. Wadsworth Construction, Draper
Analytical Laboratory: Raba Kistner Infrastructure, Orem
Civil Engineering: Raba Kistner Infrastructure, Orem
Electrical Engineering: Spectrum Engineers, SLC
Lighting Design: Spectrum Engineers, SLC
Structural Engineering: Reaveley Engineers + Associates, SLC
Project Development: Wadsworth Development Group, Draper
Small Business: Lisman Studio Interior Design, SLC

Sahara Breaks Ground on Petzl’s New Headquarters
Sahara, Inc. of Bountiful broke ground May 10 on Petzl’s new North American sales, marketing, training, and distribution headquarters. Designed by Salt Lake-based ajc architects and located in West Valley City, the new building will be LEED-certified, with 24,000 SF of office space, a 4,000 SF warehouse, and a 3,600 SF training area. The state-of-the-art training facility will contain a 60-foot high indoor climbing structure for product testing and training climbers and rope-access professionals. Work-life-friendly aspects of the new building will include a bicycle storage and maintenance room, employee climbing wall, and a workout facility, among other things. Petzl America plans to move from its current location in Clearfield, Utah, which it has occupied for more than 24 years, to the new facility in early 2014.

For over 40 years, Petzl has been developing innovative tools and techniques used by those who work and play in vertical environments. Petzl headlamps, helmets, harnesses, carabiners, and other products are among the finest in the world, trusted by professionals in the most challenging environments. Today, the Petzl brand is closely associated with adventure, exploration, rescue, and many notable exploits in the worlds of rock climbing, caving, and alpinism.

Hunt Electric Recognized for Workplace Safety Efforts
Hunt Electric of Salt Lake City recently earned recognition for its safety program, earning awards from the Utah Manufacturer’s Association and the Associated General Contractors of Utah. Hunt Safety Director Nathan Clark said the awards illustrate employees’ close adherence to safety procedures. Clark said the firm is approaching its goal of 3 million hours worked without a lost-time injury.

R&O Construction opens Salt Lake office
Ogden-based R&O Construction has opened an additional office at 635 South 500 West in Salt Lake City. The office was opened to better serve R&O’s Salt Lake area clients, and for easier access to R&O employees who live in the area. The Salt Lake office is headed by Vice President Mike Phillips and is fully-staffed with estimators, project managers, business development and an executive assistant. A plan room adds to the convenience for subcontractors. R&O also has a southwest regional office in Las Vegas.
In the world of glazing, curtain wall systems and steel joist and deck, Steel Encounters, Inc. of Salt Lake City has been a major player in Utah’s construction industry for nearly three decades. The firm, which was founded in 1985 and employs more than 170 people, has provided its services on many of Utah’s most important and prominent buildings, including Adobe’s Headquarters in Lehi, City Creek Center in Salt Lake, eBay’s Headquarters in Draper, the USTAR building at the University of Utah, and the NuSkin Innovation Center in Provo.

Utah Construction & Design had an opportunity to sit down with Tom Jackson, Vice President and Manager of the firm’s Architectural Division, to discuss the general state of the curtain wall/glazing industry.

UC&D: What are some new innovations that are occurring within the curtain wall industry?

Jackson: There is a real science behind curtain wall systems and building exterior facades. In the glass and curtain wall industry, the development of building exterior façade science has been required to meet the new energy code requirements that were developed to mitigate building energy usage and moisture infiltration. These changes began in the cold and wet climates of the Pacific Northwest and Canada. The latest changes have been the development of rain screen technology where the building exterior air and vapor barriers have been moved into the wall cavity behind the building’s exterior elements.

UC&D: What is your opinion of building commissioning?

Jackson: Building commissioners are verifying that the new codes and design intent for thermal, air, and moisture control is met in building facades. Testing of the building envelope early in the construction process protects the design integrity of the building envelope through early detection of problems. One of the problems we’ve seen is companies supplying materials that don’t meet the specification for the project and the owner or architect don’t know any better. People will put in cheap, inferior products. That’s why I like building commissioning, and we are seeing a lot more. There was a lot of testing performed on the City Creek Center.

UC&D: Your firm has worked on many high-profile, state-of-the-art projects in Utah. What project stands out as one of your favorites?

Jackson: All of City Creek Center was pretty amazing. The monumental size of that project and the sheer number of projects was incredible. We worked on the 33-story tower one, tower two, tower five, towers six and seven, building H, The Gym, and The Cheesecake Factory. The highlight was probably the Main Street Bridge and the retractable (Retail Promenade Operable Skylight), and the three arched glass walls facing the bridge. The arched glass walls facing the bridge feature high-strung stainless steel cable compression, clamping the glass to the cables. These products all required intense design and engineering to meet the stringent seismic drift criteria in Salt Lake City. This was a once-in-a-lifetime project in many respects and we take great pride in our work over the entire project.

UC&D: How do you get new people into the curtain wall/glazing industry?

Jackson: We start by hiring quality oriented people and train new workers in house. Steel Encounters has developed a detailed, copyrighted quality assurance program for our shop and field employees, which is the basis for our internal training programs. We employ a full-time Quality Assurance Manager to inspect the installation of our materials and ensure that our field employees completely understand and are following our shop drawings and installation instructions. We believe the economy is recovering and we are implementing these practices to ensure that our future workforce has the required skills to meet our high expectations.

Q&A with Tom Jackson

Vice President, Architectural Division Manager Steel Encounters, Inc.
Parson Took Torch from His Father and Passed it to His Sons

By Brad Fullmer

As the second generation of the Parson family to run the company started by his father and namesake, Jack B. Parson, Jr., learned early on that the key to running a profitable business meant empowering others and allowing them to work through challenging decisions on their own.

“One thing I learned from my dad and tried to pass down: There’s a goal you want to meet, but he didn’t call every play to meet that goal,” said Parson. “He knew he had to rely on the minds and abilities of other people to build an organization. To solve a problem, it’s better to work through other people to build an organization. To get the job done, you have to be able to hire a fellow named Ace Parker, who was an excellent employee, and when he did whatever was needed, Dad was able to hire a fellow named Ace Parker, who worked side-by-side with his father, running the business, which had expanded to provide heavy-highway contracting services, ready-mix, and aggregate supplies.

The company would have its ups and downs over the next 30-plus years, and in 1996 it was purchased by Oldcastle and merged with Staker Parson (acquired in 1995 by the same parent company) to create Staker Parson Companies. Jack Jr. at that point had enough faith in his sons to essentially step back from working full-time and hand over the reins. The lessons of hard work, honesty, and empowerment, handed down from generation to generation, have allowed the firm to grow exponentially in the past 17 years.

“Dad was always a patient teacher and willing to let you try your own way,” said John, 55, President of Oldcastle Materials West Sector and the top executive over 9,000 employees in three company divisions west of the Mississippi River. “One thing that stands out is he had a lot of confidence and trust in us, and even though times change, he was very good not to interfere, yet played a great supportive role.”

John said he also started working for the family business at age 14, and worked his way onto a paving crew after graduating high school. He learned to enjoy working hard and the fruits of diligent labor.

“I remember doing different things dad needed to get done,” said Jack Jr. “Back then you did whatever was needed. Dad was able to hire a fellow named Ace Parker, who ended up being the controller, and it was a blessing because he was so meticulous. I learned that you don’t build a company from the top down, but you build it from the base up.”

“Dad was good at empowering employees, letting them understand their responsibilities and supporting – not micro-managing – them. We resist the temptation of micro-managing. It’s in our DNA. It helps strip the ego out of the business to a large extent.” – Scott Parson

Jack Jr. ultimately worked his way up the company ladder, working with family and friends along the way. By the early 60’s he was working side-by-side with his father running the business, which had expanded to provide heavy-highway contracting services, ready-mix, and aggregate supplies.

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A CASE FOR PERVERSIOUS CONCRETE

Advocates say there are major advantages to using pervious concrete on certain projects; use of material can contribute LEED points.

By Brad Fullmer

A person who takes a casual glance at Chris Bedford’s driveway will see that it’s far from ordinary, with an array of Southwestern-style colors highlighted with forest green swirls.

Beyond the color, the driveway is also unique in that it is made of pervious concrete – concrete that has the appearance of a giant Rice Krispie treat, but is considered an up-and-coming ‘green’ concrete technology for its ability to reduce stormwater runoff by allowing water to pass directly through its surface.

A self-admitted advocate of pervious concrete, Bedford’s purpose for having his old driveway torn out and replaced with pervious concrete was two-fold. He wanted to 1) mitigate the amount of stormwater discharged from his property into the local storm drain system and 2) show the general public that pervious concrete should be a technology that is more widely considered by building owners in both commercial and residential applications.

“Pervious concrete is not being effectively utilized to its capacity in the Utah construction market,” said Bedford, who is a technical sales representative with fly ash magnate Headwaters Resources Inc. of South Jordan, and has been working in the concrete industry for more than 30 years. “Owners and developers don’t fully understand the potential benefits pervious concrete offers. With any new technology there is an education process and I want the industry to realize pervious should be more widely used.”

Bedford’s driveway was placed during the first week of June 2012 by ACME Construction of West Jordan. The concrete mix was designed by Lonnie Gray, research and development manager for Staker Parson Companies of North Salt Lake, and included 20 percent fly ash and 4 percent white silica fume.

The driveway was placed on two separate days, then covered with 6 mm plastic poly sheets and cured for 11 days. After a month, Bedford sprayed on pigmented soybean oil and then carefully placed a top coating of acrylic sealer on the surface with a half-inch nap roller so as to not compromise the concrete’s void system.

“That gave it a high-gloss sheen and added a layer of protection to the concrete,” said Bedford. After two full years, he says the pavement has exceeded expectations. “I couldn’t be happier with it,” he said. “I will have to re-apply the soybean oil in some areas every couple of years, but it’s held up better than I expected.”

Pervious concrete has been used on a handful of commercial projects in Utah in recent years, including parking lots at the Utah Museum of Natural History near the University of Utah, the Associated General Contractors of Utah’s headquarters, Wasatch Touring in Salt Lake City, Taylorsville City Hall, and the Sutton Geology Building at the U. The Swaner Eco Center in Park City, the first building in Utah to earn LEED Platinum certification, also incorporated pervious concrete for parking areas and sidewalks.

“Our pervious parking lot has been a stellar performer,” said Rich Thorn, President/CEO of AGC of Utah. “It has been very little maintenance on it – we vacuum it once a year – and it has not had any cracks or fractures. From an environmental standpoint it’s also been good.”

But the use and acceptance of pervious concrete is still in its infancy. Part of the reason is that cities and municipal owners simply haven’t required it in development projects. In addition, land is still relatively cheap compared to other major metropolitan areas and the mentality ‘if it ain’t broke don’t fix it’ still exists in regards to stormwater prevention.

“No cities have pervious concrete as a standard, so it’s not an option for us right now,” said Brad Mackay, a civil engineer and senior project manager for Ivory Homes. “We’ll have to explore the cost to see if it makes sense.” According to Mackay, an average storm drain detention system costs approximately $150,000 to $250,000 per development, which includes the $100,000 cost for the land itself (one-third to one-half acre).

“Pervious concrete will still exist in regards to stormwater prevention.” According to Mackay, an average storm drain detention system costs approximately $150,000 to $250,000 per development, which includes the $100,000 cost for the land itself (one-third to one-half acre).

“These are not enough examples in the industry to warrant the use of pervious concrete yet,” Mackay adds. “You have to see if it’s cost prohibitive, and also the longevity of it, how it holds up over time versus asphalt (or regular) concrete. For commercial developments I can see it being more of an application because you need to utilize every square foot for parking or drive aisles.”

Even though municipalities haven’t fully embraced the concept of pervious concrete, it is regarded as something that can easily improve general water quality in communities. “It’s a matter of educating people at this point. If developers would really look at pervious concrete and the inherent benefits they’d realize it makes sense…on certain projects. It hasn’t been used much in this state, and people tend to stick with what they know works rather than try something new.”

– Chris Bedford
“Any sort of pollutant or garbage on a street or gutter that ends up downstream lowers water quality,” said Bob Thompson, watershed scientist with Salt Lake County. “Pervious (concrete) helps act as a stopgap by allowing water to drain through it while catching some pollutants.” Thompson said pervious concrete isn’t applicable for every development, but certainly makes sense for some.

“It depends on location,” he said. “In the Salt Lake valley you have very sandy, porous soils. Any hardscape allows water to run down to the lower part of the valley. If it were allowed to permeate the ground where there are porous soils, it would help recharge the aquifer. It’s not a great application for every project but in some situations it does make sense.”

Scott Rocke, a civil engineer with Psomas in Salt Lake City, believes pervious concrete aids in diminishing stormwater runoff volumes.

“Pervious concrete drastically reduces the amount of runoff from a parking lot or site and helps reintroduce water naturally into the aquifer as opposed to running off and into a concentrated storm drain facility,” said Rocke. “We’ve used it in some drainage swells in low-flow situations to help keep water from ponding at the bottom. It’s successful if designed properly.”

Installation of pervious concrete is a little more challenging than regular concrete for the contractor, but proper training and protocol alleviates any real concerns.

“Conventional concrete can be temperamental and that’s magnified with pervious,” said Paul Franzen, project manager for ACME Construction of West Jordan, who placed Bedford’s driveway. “It takes more experience with how it works. You can overwork it, it’s a fast-moving product.”

Franzen said it’s important for contractors wanting to get into it to get certified through the American Concrete Institute (ACI), which is not difficult.

“We had to place 10,000 SF to get certified; during that process we learned about how long to work it and making sure to get Visqueen (polyethylene plastic) on in time. Certification is key. It works well in applications where water buildup is an issue. There are a lot of benefits.”

Jerry Hall, director of operations for Geneva Rock Products in Salt Lake City, believes it’s just a matter of time before pervious concrete is utilized on more projects.

“You’ll see more of it as people want to be greener and as land space becomes more of an issue,” said Hall. “It’s a way to conserve space. The LDS Church has shown a huge interest in it and big corporations are interested in it. Owners are still hesitant. I think we’ll see in the future (residential) developments that don’t have curb and gutter – they’ll have pervious roadways and sidewalks. Think about how much money a developer could save not having to build storm drains and curb and gutter (systems).”

“It’s a matter of educating people at this point,” Bedford added. “If developers would really look at pervious concrete and the inherent benefits they’d realize it makes sense and would use it on certain projects. It makes sense financially and environmentally. The only reason it’s not utilized more is because it hasn’t been used much in this state, and people tend to stick with what they know works rather than try something new.”

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Let the water flow.

Water from the Logan River will again be flowing to the fields of Cache Valley this summer with the completion of the $20 million Cache Water Restoration Project, which reached substantial completion in April. The project to reconstruct and improve the approximately six miles of mostly open, unlined channels that make up the Logan and Northern, as well as the Hyde Park and Smithfield canals, has been underway since 2009.

That year, a landslide tore out a nearly 20 ft. section of the Logan and Northern (known as the Crockett canal) that ran along Canyon Road in Logan sending mud and water crashing into a home below and killing three people.

Jim Huppi, a board member and shareholder representative for both canal companies, said after the slide the operators began earnestly looking for a solution to deliver water more safely and efficiently to the nearly 1,000 shareholders that include a range of individual, agricultural and institutional users.

Canal operators were able to get the project classified as an emergency and secured funding from the Natural Resources Conservation Service’s (NRCS) Emergency Watershed Protection Program. The NRCS supplied nearly 75% of the funding with the remainder paid by canal shareholders.

Zan Murray, from the Logan office of project manager J-U-B Engineering, said an early cost/risk analysis of the project showed a CM/GC method would best deliver the project in the desired time frame.

“Given the risks of the project, which included difficult working conditions and working during the winter, it was determined that (CM/GC) was the way to go,” said Murray. “We could work on design while construction was underway in other areas. We wanted to involve the public with the design and also meet our budget, our construction schedule and restore water to the shareholders.”

Following the completion of an Environmental Impact Study in 2011, a CM/GC contract was issued in early 2012 to J-U-B Engineers for program management, Montgomery Watson Harza (MWH) of Salt Lake for design and Whitaker Construction of Brigham City as general contractor.

Previously the water flowed in open channels, some lined and some unlined. Today, water is carried in a combination of pipelines, box culverts and open, lined channels, reducing water loss to seepage and evaporation. The project also added a section of pressurized pipe, metering systems, new turn-outs and head gates and improved access for maintenance. The system can handle a peak flow of 130 cfs but will average about 90 cfs according to project engineers.

Murray said the project was essentially broken down into five parts with construction being carried out in stages. Among the most significant was a new intake diversion in the Logan River about 1.6 miles up Logan Canyon. The new diversion includes a screened intake designed to allow water to flow through, but prevent fish and debris from entering. Screens required by the U.S. Forest Service are designed to keep fish from becoming trapped against the screen and move them along downstream.

Water from the diversion is channeled into a box culvert that flows under U.S. Highway 89 and proceeds along the north wall of Logan canyon. Prior to the reconstruction the water flowed in an open channel popular with the public for recreation like tubing, but posing a risk for the canal company and making maintenance difficult.
Cache Water Restoration Project

“...the canal operators used to have to drive a truck in the channel to do maintenance like removing rocks. The box culvert eliminates that problem. We’ve built an access road on top of the box culvert with openings for access,” said Murray. Placing the box culvert along the narrow right-of-way was one of the greatest challenges for contractors, said Judd Hamson of Whitaker Construction, which specializes in underground and trenched utility lines.

“We were working on that section during the winter when the flow from the river was the lowest and we had some terrible weather to deal with,” he said. The pre-cast box culvert sections had to be placed on concrete said Hamson. Placing the concrete in the cold weather and in an operating corridor as narrow as 9 ft. in some sections along the canyon wall was also difficult, Hamson said.

“We could pump the concrete in hoses along the canyon only so far,” he said. “There was about 4,000 ft. we couldn’t reach with hoses and had to move it with small dumpers and smaller pumps. It was definitely challenging, but we enjoy those kinds of projects.”

Murray said some areas along the steep wall of the canyon were identified as areas where the soil under the channel could slide causing another breach. Those areas were “bridged” using reinforced sections of box culvert. The top of the box culvert is now gated at both ends and can be used for maintenance as well as access by the U.S. Forest Service.

After emerging from Logan Canyon the water is transferred from the box culvert to a 66 in. concrete pipeline that heads north, traversing the eastern edge of the Logan Country Club golf course. At that same point, a section of 18 in. HDPE pipe splits southwest to service users of the Crockett Canal along Canyon Road where the 2009 breach occurred.

The project was not without controversy. Many home owners along the eastern bench enjoyed the open canal as a landscaping feature and were resistant to plans that originally had the pipe partially buried.

Murray said meetings with home owners resulted in a redesign using a combination of buried pipe and open channel with landscaping features. Water is now flowing in the canal but some landscaping will not be completed until later this year. Part of the construction process also resulted in improvements to the right-of-way which had become inaccessible due to overgrowth by trees and vegetation.

In addition to property owners, the project involved coordination with a host of agencies including Logan City, Cache County, the U.S. Forest Service, NRCS and unincorporated cities with users north of Logan.

Huppi, Murray and Hamson all said the CM/GC process helped facilitate changes and keep the project on schedule.

“Between the project management team and the CM/GC process we are well under budget and the project has turned out as good, if not better, than we expected,” said Huppi.
60 years later, still building Utah.

The success of the company has not come from any brilliance on my part but rather, employing wonderful, dedicated, loyal people who are allowed to get involved making major decisions, to grow and develop their abilities.

-Ron W. Layton, Founder (1917-2014)

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60 years of building the toughest projects around.
Craig Fabrizio of Ogden-based Staker Parsons Companies said getting the disparate – and often competing – interests of Utah’s asphalt paving industry to come together as an association with common goals was something that had been talked about as long as he could remember.

“I’ve been in this industry 20 years; people recognized the need for an asphalt paving association of some kind for a long time,” said Fabrizio. “The idea got brought up once in a while but no one wanted to take the lead. About five years ago we started seeing some things happen as far as technology changes and market share and realized the time was just right.”

Fabrizio served as the first President for the Utah Asphalt Paving Association (UAPA), formally organized in 2011 when 10 members signed a charter to launch the long-talked about organization. Today there are 47 members representing companies from across the asphalt paving industry.

Current president Joe Johnson, who works as Materials Vice President at Kilgore Contracting of Salt Lake City, said being able to bring so many voices together on issues affecting the industry has been a great benefit for everyone.

“Since we began we’ve been able to demonstrate the benefits of having this unified voice,” he said. “I’ve been surprised at how fast we’ve been able to see changes and bring more members on board. We have great support from our members.”

Fabrizio said support and awareness has also grown in the wider community of end-users since UAPA began a series of ‘Lunch and Learn’ seminars.

“We’ve had participation from lots of cities and towns and also from engineers; I think we’re developing a good brand,” said Fabrizio. “If we can educate those users about new applications and best practices, that is good for our whole industry.”

President-elect Brandon LeFevre of Staker Parsons said education has been one of the main goals of the association.

“We believe asphalt is the best material for road building,” said LeFevre. “But to make that possible we have to make sure it is designed right for the application, done with the highest quality, best technology and that it is tested well by the entities that use it.”

Reed Ryan, Executive Director of UAPA, said providing a single source of information and opinions has benefits for end-users and providers of material and services. UAPA has created committees to review and create industry standards for placement, design and specifications for pavements in the state. Through its affiliation with other asphalt paving organizations, UAPA can solicit input and provide information from across the country.

“We want to be a resource for something like a city who wants information on a paving project, and instead of hiring someone to tell them or having an individual contractor with their own interests advise them, we can give them a straight answer from one place,” said Ryan. “We can provide education and speak with a unified voice.”

LeFevre said with tightened budgets in many cities and towns UAPA is anxious to provide “a full range of asphalt options and applications.”

LeFevre also noted that as many municipalities and developers continue to make sustainability and “green” materials a priority in projects, the association wants to highlight the recyclable qualities of asphalt.

“It is one of the most recycled building materials in the industry,” said LeFevre. “Compared with other paving options there are far fewer gasses and particulates released into the environment.”

Ryan said Utah is unique in the region in having established an asphalt paving association. Of the 35 asphalt paving associations nationally, almost all are east of the Rocky Mountains, with the exceptions of Colorado, Washington and California.

“The industry here was taking a chance when they came together to form UAPA,” said Ryan. “It think we’ve grown from infancy and are now reaching a level of maturity. We’ve been able to draw on such high caliber expertise that we know what we are talking about and what we want to do. When we do things with a unified voice that makes a big difference for the overall industry.”

Spotlight: Utah Asphalt Paving Association

After overcoming industry hesitation, UAPA leaders are pleased with three years of solid progress.

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Building the Brand

Granite Construction workers roll out a new section of asphalt pavement at the Salt Lake International Airport in March. (photo courtesy Granite)

Workers from Staker Parsons Co. place a new asphalt road in Southern Utah. (photo courtesy Staker Parsons)
Structural Roundtable: Building and Highway Engineers Discuss Key Issues in Their Respective Industries

Topics include BIM, Sustainability, ABC, Project Delivery and Meeting Needs of Owners.

Participants
Ron Dunn; Dunn Associates
Dorian Adams; Reaveley Engineers + Associates
Dallin Pedersen; HDR Inc.
Richard Hansen; Michael Baker Jr.
Curt McDonald, HDR Inc.
Michael Goodman, Parsons Brinckerhoff

Utah Construction & Design hosted its second roundtable event May 16 at the Associated General Contractors of Utah. Representatives from three structural engineering firms and three civil engineering firms met to discuss important issues they face in their respective industries. Bringing together structural engineers from both the building and highway side was unique, yet educational. We alternated questions to structural engineers from both the respective industries. Bringing together important issues they face in their civil engineering firms met to discuss structural engineering firms and three of Utah. Representatives from three Michael Goodman, Parsons Brinckerhoff

UC&D Structural Engineering Roundtable

Baker Jr.; Ron Dunn, Dunn Associates; Michael Goodman, PB; Dallin Pedersen, BHB Engineers. Left to right: Curt McDonald, HDR; Dorian Adams, Reaveley Engineers + Associates; Richard Hansen, Michael Baker Jr.

UC&D: (SE) What is the general consensus of where BIM (Building Integrated Modelling) is in the market in terms of the structural side? In an ideal world someday we might start seeing more IPD (Integrated Project Delivery) and BIM working together, if it’s implemented at the right level and deep enough into the process. Is that happening in the market?

Dunn: Most all structural engineering firms are heavily involved in BIM modeling as well as project deliverables that are generated from BIM modeling. We spend 30%-40% of our time on our BIM model that doesn’t further our deliverables, we’re simply updating models. Question BIM’s ability in a fast-tracking process because of the inability to manipulate the model between all of the different parties. Contractors simply recreate their own BIM model so wonder why we aren’t trying to make it a more uniform model for the owner’s benefit. It’s difficult structurally to make changes downstream in the BIM model at the pace you can make other changes.

Adams: Given the choice between doing Revit or AutoCAD on a project we would choose Revit unless it was a smaller project or remodel. Our CAD operators and Revit modelers are the same folks and they’ve said it takes more time to do a project in Revit and that has a lot to do with the requirements that the model is coordinated with the architecture, mechanical and electrical. It’s not necessarily an improvement in the quality of the 2D product. (BIM) is not going away. The future is integrated Project Delivery and I see a time, when given the right circumstances on a project and having the right owner, architect and contractor, that there will be a real integration of the design in the construction process. Sharing models during design with the contractors, shop drawing production and all that. The atmosphere has to be right. You have to have a reason to do it. It’s not going to be a design-bid-build type of situation.

Pedersen: It takes 30%-40% more time to create (BIM) models and typically the expectation is there is no additional compensation for creating the same product as a two-dimensional sheet of paper. Some things just can’t be done in the structural REVIT software in its current state such as placing rebar in concrete. We’ve attempted at times to put rebars in, and usually it takes an exorbitant amount of time for not much gain. On a concrete tilt up panel for example, we find it more effective to do simple detail lines in an elevation than model the rebar. It seems like the work is being done multiple times in creating these three-dimensional models. We’re trying to coordinate with the architect, and the contractors and subs will create something else. The model itself is not the contract documents, the sheets of paper are. In dealing with coordination, I can see advantages and disadvantages. It’s the same idea as an engineer relying too heavily on structural software in helping them with calculation rather than understanding analysis modes better and keeping that in their mind. Some things are lost in the ability to coordinate a set of drawings. If architects and engineers are relying on the 3D model too much, the inherent abilities to do it in your head can be lost.

UC&D: (CE) Accelerated Bridge Construction is a hot topic in Utah. What are your thoughts on the concept? Which of your firms have designed ABC bridges?

McDonald: HDR has designed ABC bridges on the CORE project – Baker designed two, HDR designed one. ABC has a really bright future. It has obvious advantages, it lessens disruption to the traveling public but also has high public approval, not only in Utah but throughout the country. It improves the safety of construction workers and has environmental advantages. UDOT talks about the cost of moving a bridge and how that cost keeps coming down. It’s a great innovation and personally I have a real interest in it.

Hansen: We were involved with the first ABC bridge move on 45th South, and we’ve also been involved with two bridges on I-15 CORE and several bridge slides. The bridges on I-15 CORE were the 200 South Bridge and the Sam White Bridge, which were the first two-span bridges to be moved into place using SPMTs. ABC provides a lot of value to the public. UDOT has changed their thought process on how they approach ABC to some degree. They’re looking at specific projects to utilize (ABC methods) rather than trying to implement it at every possible instance. There is a great deal of interest in the country in what Utah has been doing. Other DOTs look at UDOT as an example for what they’ve done with the Accelerated Bridge Construction process.

Goodman: I worked for Jacobs at the time of the I-15 CORE project and Jacobs had one bridge move, a two-span concrete girder bridge. I really like the concept and where it’s going, but there is a cost to it – everything from additional materials and construction costs to additional design activities for the engineers. It’s not being pushed on some smaller projects because the difference in cost is too big. I-15 CORE was a good opportunity to find out which bridges were good to move (via SPMTs).

UC&D: (SE) This year is the 15th anniversary since the U.S. Green Building Council implemented the LEED process. Some owners are for it, some are against it. From a structural engineering standpoint, what challenges do you have with LEED or how applicable is LEED in what you do? Is LEED a good thing?

Dunn: The very definition of sustainability is that a building will be there a long time. Perhaps the biggest
A building may or may not be leased depending on whether it is LEED certified, and certain government institutions require a certain minimum (LEED) standard. There is no vehicle in place right now for a developer to charge more rent for a building that is going to be there tomorrow. The cost of an earthquake has nothing to do with the damage a building sustains and what it’s going to take to fix that building. The cost of an earthquake is the displacement of people. If you own a business and the building you’re in is destroyed, sure the developer incurs financial burdens, but if you’re displaced you can’t operate your business. Doesn’t it seem logical that a building that is better protected against that should be able to charge a higher per square foot lease? Until a developer or building owner can sell that to the general public, I don’t see it happening.

Adams: There might be some misunderstanding among the public. They may think that if a building was designed to meet the building code that it’s going to last through an earthquake and they’ll be able to get back in their building and life’s good. That’s simply not the case. The minimum requirement of the building code is life safety. It protects people from bodily injury and death in an earthquake, but it is likely there will be so much damage to a building they won’t be able to run their business. Part of business continuity planning should be making sure they’re in a building that will allow them to stay in operation, and there ought to be a premium for that.

Peden: There is that perception that you can get into a building right away or there won’t be much damage or that a building is “earthquake-proof” because it follows the code and that’s just not the case. LEED is specifically geared toward energy savings and impact to the environment and that doesn’t have as much of an impact from a structural engineer’s control over a project. A steel supplier or an aggregate supplier has much more sway than a structural engineer does in terms of impact to the environment on those few LEED points that are geared to the structure in general. Owners are spending an exorbitant amount of money on these sophisticated mechanical and electrical systems for energy savings, and not as much considering the fact that buildings designed to the code will receive a reasonable amount of non-structural damage in an earthquake. It ought to be more about sustainability rather than just LEED is a good thing I think so. But LEED is not all-inclusive.

Dunn: For electrical and mechanical engineers an earthquake happens everyday. There’s no way of playing those odds, and quite frankly unless there is a return on that investment, I don’t know that I’d make that table bet, and I’m a structural engineer.

Peden: A building owner can see on their monthly bill if they have a good mechanical system. Until an earthquake happens – a considerable one that is expected (in this area) – the building owner doesn’t know how their structural system is going to perform until that happens.

“LEED seems to be centered around how fast the meter spins, how much light is in a building or how nice the air is. Sustainability in my mind is that the building will have longevity. We have that ability to make the building have greater longevity at probably smaller costs than some of the costs spent to buy points on the mechanical and electrical side.” – Ron Dunn

Dorian Adams of Reavely Engineers + Associates (left) and Ron Dunn of Dunn Associates.

frustration to a structural engineer is we have the ability to design structures to last longer than a typical code structure would do. Yet there is a (LEED) scoring system that offers no direct benefit for designing a building under more stringent (structural) requirements. There are more (LEED) points for putting in a bike rack than to make a building last longer. In our opinion there is going to be a lot of very expensive mechanical and electrical equipment that will not be usable if a structure is damaged during a (seismic) event beyond repair. There are very easily identified milestones that can be used to generate points that a building can benefit from using a higher category or different lateral system of redundancy. All of these things are already in place in the codes we design to, but are not recognized, or no value is placed on those in the (LEED) process. LEED seems to be centered around how fast the meter spins, how much light is in a building or how nice the air is, which are all very good things. But sustainability in my mind is that the building will have longevity. We have that ability to make the building have greater longevity at probably smaller costs than some of the costs spent to buy points on the mechanical and electrical side.” – Ron Dunn
As you get a tighter design and explore those risks more thoroughly then you can tighten the number associated with each of the risks, so you can really bring down the cost of a project. The advantage of design-build is the schedule can be reduced and the agency/owner knows exactly what they’re paying for the project. With design-bid-build, the owner gets exactly what they want, with the other two they can’t be as specific.

Hansen: UDOT in general does a really good job of looking at different projects and implementing different methods for procuring jobs. From a project delivery standpoint, it’s on a project-by-project basis. How large is it? What is the dollar amount? What are the goals? Do we have money for design now? Do we need to spend the money in the next number of months? Some of the advantages of design-build are you get to work with the contractor. You can see what works best for them and implement that into your design. The schedule is the biggest driver. We’re working on the Payson design-build project right now. We got our notice to proceed March 1 and substantial completion is October 15. It’s six miles of Interstate 15 widening from Spanish Fork through Payson and we’re nearly completed our design. As soon as we get plans to the contractor they start building, it’s an accelerated project.

Goodman: I have the same feeling about UDOT in general; they’re willing to try new things and make it a priority and that’s a good thing. You need to find out what works best. I like CM/GC – like design-build you get to work with the contractor and ask them how they prefer to do things or what their methods are so you can provide an efficient design. It provides the ability to change, since the project is underway. If a better idea comes up you can change the way you design or build something. With design-build you’re committing to a lot of things and it’s a condensed process. With CM/GC there is more discussion and decision-making going on with the project.

UC&D (SE): What are the challenges for structural engineers designing in Utah, given that the seismic conditions? It’s something you just do, in terms of accounting for the ‘Big One’ (earthquake)?

Adams: The code has a maximum considered earthquake and the chances of exceeding that maximum earthquake. We automatically – based on the codes we have – take two-thirds of that acceleration force into consideration. That is inherent in terms of life safety and immediate occupancy and collapse prevention. We design a building so people can get out and lives won’t be lost. I still think there is a wrong perception that buildings will be completely unscathed if they’re designed to current building codes, but the codes have changed and have gotten more complex and I do believe it has improved the type of buildings that are built today.

Dunn: Codes change every three years and the cities we live in are our big test labs, and the genesis for changes in the codes are how buildings have performed in the past. After each successive earthquake or calamity it imposes changes in the code. Sometimes the difficult part for us as engineers is we’re kind of guilty until proven innocent as it relates to our systems that we’ve produced. Sometimes it’s difficult to explain to an owner and to a contractor that this week we have to design it different than last week. We’re faced with the notion of trying to value engineer the earthquake out of a building. The structural system is a fairly significant cost and is one of the first places looked at when (owners) try to save money. When you figure that a significant portion of the structural elements in our buildings are just sitting there dormant until an earthquake happens, one can start to question those elements and their safety and destructive capabilities of an earthquake are as high as anywhere else in the country; it’s just we don’t have a recurrence interval to remind us. During my career in San Francisco, it was much easier to convince owners and architects and contractors of the subtle changes and importance of the codes. They lived it every day. I’ve sometimes thought if we had an earthquake here it would probably change perceptions, but it probably wouldn’t be until owners would say ‘well, this happened, we don’t have to worry about that for another 2,500 years.’

UC&D (CE): What other issues do civil engineers consider when designing bridges and other related structures?

Goodman: Using concrete is cheaper right now than steel so our designs use as much concrete as possible. We’re using precast components on certain things like partial-depth precast deck panels which acts as the form work for the wet pour on top. You’ve got a better performing deck is what has been observed. It also reduces construction activity because they’re not building and striping as much form work. There have been changes in seismic design. A lot of our design effort is seismic design, perhaps 30-40% of the effort in designing a bridge, performing analysis and calculations.

Hansen: We have to account for designing larger projects that have a fast-paced schedule. You need to bring a lot of people in quickly for these projects. We’re either hiring more people or you bring in people from other offices. On I-15 CORE we had other offices helping us, as did HDR and Jacobs, but each state has their own requirements for bridges on top of the standard AASHTO requirements. Every state does things different so it takes more coordination and time to keep everybody on the same page.

McDonald: We consider sustainability. Mountain View Corridor was a ‘greenfield’ project but most of the time we’re replacing a structure that already exists. One of the biggest challenges we have is doing that with the least amount of impact to the traveling public and environment. That is one of the reasons ABC is so popular. On bridge slides there is a new method for reinforcing the earth by using a spread footing, like a geogrid system. That way you can place the new footing while the existing bridge is still in place, then you can build the new bridge adjacent to it, tear out the existing bridge, slide the new bridge in and set it on top of that new footing.

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UC&D Structural Engineering Roundtable
It’s been more than 5½ years—October 27–28, 2007 to be exact—since the first bridge for the Utah Department of Transportation (UDOT) was rolled into place using self-propelled modular transporters (SPMTs), a project that heralded the arrival of UDOT’s Accelerated Bridge Construction (ABC) movement.

Since the time of that I-215 45th South Bridge move, UDOT has forged a reputation nationwide as the leader in ABC technology, and has moved more bridges into place via ABC methods than all other states combined, according to former UDOT Executive Director John Njord, who retired in early 2013 from the Department after more than 25 years, including 12 years as the top executive.

“It’s been a little perspective in the month I’ve worked as a consultant with other states across the country and their hesitance with ABC,” said Njord. “UDOT has done more ABC bridges than all other states combined. We learned of the technology from Florida, but have taken it to a whole new level. UDOT is committed to reducing traffic impacts. ABC is a tremendous method in doing just that. It’s striking to see how reluctant other states are in embracing the concept.”

According to Carmen Swanwick, Chief Structural Engineer for UDOT, the by the end of August 2013, 42 total bridges in Utah will have been moved using ABC techniques, including 25 via SPMTs, 16 by lateral slide (using rollers and hydraulic jacks), and one (Layton I-15 Interchange) that was “launched” into place.

There are myriad reasons for utilizing ABC, including increased safety for the contractor and public, reduced onsite construction time, reduced environmental impact, and increased constructability. Perhaps the main reason, though, is a significant reduction in mobility impacts and traffic delays.

“We consider user costs when performing our analyses,” said Swanwick. “The contractor has an incentive to get (the project) done faster.”

“ABC is a part of what we’re trying to accomplish—it’s not the end goal,” added Carlos Braceras, a 27-year UDOT veteran who was named Executive Director in June. “The end goal is to deliver projects as quickly as possible within budget, with the least impact to the public.”

The Genesis of ABC for UDOT

While the I-215 45th South bridge is often alluded to as the beginning of the ABC movement in Utah, the reality is ABC techniques have been implemented since 2002. The program began slowly, with the utilization of precast concrete elements such as deck panels, approach slabs and abutments. After visiting the Florida DOT in 2005 about ABC, UDOT officials were ready to embark on the Department’s ‘bridge move’ phase.

UDOT hired consulting engineering firm Michael Baker Jr. (Baker), a national firm with an office in Midvale, in November 2006 about ABC. UDOT officials were ready to embark on the Department’s ‘bridge move’ phase.

For UDOT, Building Bridges is as Simple as A-B-C

Accelerated Bridge Construction methods continue to be refined, garner attraction nationwide.

By Brad Fullmer
Baker took a scanning tour to New York City in January 2007 to witness SPMTs move a bridge off barges and onto abutments over the Harlem River. The experience was invaluable. “Even though it wasn’t the exact same type of project, it was valuable to meet with the contractor and talk about challenges they encountered and different tricks they found out during their process,” said Arens. “In addition we did a lot of research on (existing) data.”

Baker started design in March 2007, and shortly thereafter UDOT brought in Draper-based Ralph L. Wadsworth Construction (RLW) as the contractor in a CM/GC process, which was a unique project delivery method at the time. According to a September 2011 report prepared by WCEC Engineers, Inc. of Salt Lake City, the original programmed budget for the project was $6.6 million, but construction costs came in at just under $7.3 million. The savings in costs to the traveling public, however, were significant. The bridge was able to be moved into place in approximately 58 hours, requiring I-215 to be closed for less than 2 ½ days. Using UDOT’s daily traffic volumes on I-215 and 45th South from 2007, assuming a user cost of $15 per hour, the savings from ABC via SPMTs was estimated at $4 million.

“The cost savings to the public of utilizing ABC is the driving factor,” said Swanwick.

The fastest ABC bridge moves to date for UDOT were done by Wadsworth Brothers Construction (WBC) of Draper in August 2008 on four bridges on I-80 at Mountain Dell and Lamb’s Canyon up Parley’s Canyon near Salt Lake City. WBC replaced the four bridges in 37 hours over two weekends. The bridges were built adjacent to the existing structures in the median of I-80 over an approximate four-month period and were moved into place via SPMTs. According to the Federal Highway Administration, it was the first project in the nation to demolish, move and replace two bridge superstructures in 16 hours, and was the first total closure of a major interstate trucking route for bridge replacement. By using off-site construction and SPMTs, UDOT estimated that motorist delay was decreased by 180,000 hours, with a user savings of more than $5.1 million. In addition, WBC’s bid of $9 million was $1.5 million less than the lowest traditional construction bid.

“We planned every aspect of the job in great detail. Everything had to go as planned or chaos would have unfolded and traffic would have been backed up for 20 miles. We also learned from the first weekend closure and implemented our lessons learned to replace the second set of bridges in six hours less than the first set.” – Con Wadsworth, President of RLW

UDOT’s first-ever bridge move via SPMTs was October 27-28 at the I-215 45th South bridge in Salt Lake City. Below: The I-80 Reconstruction project in 2008 featured seven bridges built simultaneously in a ‘Bridge Farm’ staging area. (photos courtesy Baker; RLW Construction)
Other DOTs Following Suit

UDOT’s most recent high-profile SPMT bridge moves occurred on the I-15 Utah County Corridor (CORE) project (completed December 2012), where four bridges were moved into place using SPMTs, including the first-ever two-span bridges – the 200 South Bridge and the Sam White Bridge – in Spring 2011. Arens said the bridges were 330 ft. and 354 ft. in length, respectively and required four lines of SPMTs. DOT officials from other states were on hand to witness the Sam White Bridge move – the largest two-span superstructure ever moved into place via SPMTs in the Western Hemisphere, adding to UDOT’s ABC lore.

The most recent bridge slide in Utah occurred at the end of May on the $5.57 million I-15; Manderfield Bridge project north of Beaver.

“It’s been very good,” Arens said of his firm’s involvement with UDOT’s ABC process. “A lot of state DOTs are interested. It’s awesome how other states are seeing UDOT as a trailblazer in figuring this out.” Arens said he recently helped the Wisconsin DOT write the ABC portion of its bridge manual and is going to Milwaukee to provide quality assurance/oversight for WISDOT’s first ABC bridge move on June 14. In addition, Baker is under contract with the Iowa DOT to provide oversight and detail review with its first bridge move this fall.

“It’s definitely something that is growing outside of Utah,” Arens said. “Transportation officials recognize the value of it in reducing the impact on the traveling public.”

“Accelerated Bridge Construction has its uses, although it’s too expensive to implement on every bridge,” added Guy Wadsworth. “For those high-volume interchanges where long-term bridge construction would result in extensive highway user costs and delays, it pays for itself. Having a core group of experienced contractors in Utah who can perform this type of work is useful to UDOT.”

“I think it’s in the future of every state, it’s just a matter of time,” said Njord. “Here is the state of Utah, representing less than 2% of the U.S. population, yet we’ve delivered more ABC projects than all states combined. It’s a remarkable achievement.”

ABC Advantages
- Minimizes traffic congestion during construction
- Accelerates delivery of design and construction
- Reduces road user costs associated with traffic delays
- Encourages innovation
- Incites competitive pricing
- Improves work-zone safety for both contractor and traveling public

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After 12 years of being in the white hot spotlight that accompanies serving as the Executive Director of the Utah Department of Transportation (UDOT), John Njord is looking forward to the next phase of his career, one that promises considerably less scrutiny and day-to-day pressure.

“I will not miss the second guessing that occurs on decisions made on behalf of the community,” said Njord, 52, who spent more than 25 total years at UDOT and is now working as a consultant for a firm founded by former mentor and past UDOT Executive Director Tom Warne. “When you launch into an environment with public services, there is a lot of scrutiny on decisions you make, including from the news media. Everyone has an opinion on transportation. Not seeing my name in the newspaper is something I am looking forward to.”

Njord certainly went out with a bang. The end of 2012 marked the conclusion of a record three-year, $3 billion program for UDOT, including the completion of two landmark projects: the $1.1 billion I-15 Utah County Corridor (I-15 CORE) expansion and the $245 million Mountain View Corridor (construction costs on both). I-15 CORE was the fastest billion-dollar-plus public highway project ever completed in U.S. history, as it was completed start-to-finish in less than three years.

Njord said he’ll mainly miss the day-to-day interactions and associations he had with so many great people.

“Clearly I’ll miss more than anything the people I worked with, both within UDOT and outside agency partners,” he said. “I developed a lot of friendships within the engineering, consulting, and contracting world. I’m proud of what has been accomplished with our transportation system.”

“John’s leadership at UDOT is unparalleled, not just in Utah, but nationwide,” said Rich Thorn, President/CEO of the Associated General Contractors (AGC) of Utah. “The fact he served as Executive Director for 12 years is in and of itself extraordinary. It says a lot about his vision and his ability to be flexible. Under his watch UDOT set itself apart on a regional and national level.”

“John positioned the Utah Department of Transportation as a stand-out leader for innovation through a variety of cutting-edge projects and programs,” said Utah Governor Gary Herbert. “During John’s tenure Utah’s roads became smoother and more structurally sound, mobility increased, and fatalities decreased by 41 percent. The State of Utah is truly grateful for John’s 25 years of exceptional service.”

Stepping into the role as UDOT’s top dog is Carlos Braceras, 54, who was appointed as Executive Director May 6 by Herbert. Tabbing Braceras was almost a no-brainer, given that he served as Njord’s Deputy Director for all 12 years, has more than a quarter-century worth of experience at UDOT, and has forged hundreds of long-term relationships with government officials, contractors, consultants, legislators, and other key agency and municipality decision-makers who comprise Utah’s transportation industry.

Braceras is now in charge of 1,800 UDOT employees, and a complex 6,000-mile system of roads, highways and bridges, for which he feels well-prepared for.

“From a technical perspective, yes I feel prepared,” said Braceras. “I know the issues we have around our state, and...”
I understand the budget. The biggest change I’ve already noticed is that for 12 years I had John right behind me. Now, the buck stops here. I’m not intimidated by that, but it is a noticeable difference.”

Njord has little doubt the Department is in good hands.

“Carlos is a work sponge, if any work comes close to him he sucks it up and takes it,” Njord said. “As Executive Director, Carlos is the face of the agency and he’ll have to learn to delegate. One of the most important things he will do is to continue to build relationships with local governments, legislators, and others involved with transportation, as well as developing and maintaining trust.”

Carrying on UDOT’s Mission

Braceras’ initial plans for the remainder of 2013, and looking ahead to 2014, are to continue emphasizing UDOT’s four strategic goals, including:

Preserve Infrastructure
Improve Mobility
Strengthen Economy
Zero Fatalities

Beyond those goals, Braceras believes there are myriad ways to improve UDOT. “We need to expand how we do our work in ways that are more collaborative with communities and help them be successful with their goals,” he said. “We also want to do everything we can to improve the transparency of the Department. It’s the public’s money, we want to provide the public with the means to follow their money and see how it is being used on the design and construction of new projects.”

Braceras is also committed to maintaining and enhancing UDOT’s image as a leader in transportation innovation. Under Njord’s watch UDOT established itself as the preeminent DOT nationally in Accelerated Bridge Construction (ABC) techniques, in addition to implementing new design technologies such as diverging diamond interchanges (DDI) and continuous flow intersections (CFI).

Transportation funding is also a perennially key topic. Although 2013 is a slow year for the Department, with roughly 180 projects on the docket consisting of mostly preservation and rehabilitation jobs, there should be significantly more new projects let out from 2014-2017. “We are interested in finding ways to improve our system to where it provides businesses with a competitive advantage,” said Braceras.

People in the industry are confident Braceras will keep UDOT’s momentum moving forward. “I’ve been around the country and UDOT has one of the best run departments in the United States,” said Con Wadsworth, President of Ralph L. Wadsworth Construction of Draper. “Our guys have their s--- together. Both John and Carlos are bright guys. You’re not losing a heck of a lot with Carlos. I’m more concerned with who replaces Carlos (as Deputy Director). The department has come a long ways.”

“Carlos made John great in many ways, John made Carlos great in many ways,” said Thorn. “Most of the people I’ve talked to are happy with Carlos as Executive Director. He’s an amazing leader, he’s respected, and he has the ability to be a good listener. He knows the political process and how to work with legislative agencies. We’re confident that UDOT will not miss a beat.”

“Carlos Braceras is a man of outstanding capability and extraordinary expertise,” added Governor Herbert. “His well-articulated vision for Utah’s future transportation system focuses on our economy, optimal mobility, maximum value for tax dollars and our unique quality of life.”
Welcome to UC&D’s first-ever rankings of Utah’s Top General Contractors, based on revenues generated in 2012. We have published two lists: a combined list of all GC’s, irrespective of classification, and a list that separates general builders, heavy/highway/civil, and municipal/utility general contractors. Firms are ranked according to revenues generated by Utah-based offices. Readers should note that we have also included company-wide revenues for firms with offices outside Utah (listed below Utah revenues). Every effort was made to contact respective GC firms and encourage their participation. Only one firm who submitted a survey did not disclose revenues.

General contractors were asked to submit revenues from the past three years, so we could gauge how firms have fared since the ‘Great Recession’ of 2008-09. Some firms have shown incremental growth, some are down a bit from 2011 and 2012, and others have simply maintained consistent numbers, with the hope that the remainder and 2013 and 2014 will offer modest economic improvement.

Cautious Optimism

Rich Thorn, President/CEO of the Associated General Contractors of Utah, said his members – which include most of the major general contractors in the state – remain “cautiously optimistic” about the general state of Utah’s various construction markets, despite the fact that there are less big jobs on the horizon now than behemoth projects like City Creek, the NSA building, I-15 CORE and Mountain View Corridor have been completed.

“I think companies are a little more optimistic than they have been,” said Thorn. “There seems to be more opportunities to bid work, even though there are not many big projects right now. Our highway program is down this year in terms of pure volume, but there is still optimism on the highway side that the next three years will be good.”

Thorn said the market remains highly competitive, given the fact that there are so many competent, qualified, and reputable GC’s within the state. Bids are typically full, and companies submitting bids realize profitability isn’t near what it was six or seven years ago, although it is improving slightly.

“Some generals and subs have been able to establish a backlog, which means firms are going to hopefully be a little more profitable,” said Thorn. “Now is a great time for owners and developers to build projects if they can get requisite funding. Contractors are submitting competitive bids and continuing to perform high quality work.”

Thorn said key issues general contractors are paying close attention to include immigration reform, project delivery methods, environmental regulations and compliance, and greater work opportunities in the private sector.

By the Numbers

A quick glance at the numbers show that Utah’s ‘Big Four’ general builders – Okland Construction, Big D Construction, Layton Construction, Jacobsen Construction – continued to earn the most revenues of any local general contractor. Okland’s Utah office pulled in $955 million, more than $100 million more than Big D’s Utah office ($844). Layton’s Utah office reported $520 million, while Jacobsen came in at $532 million. R&D Construction’s Utah office was fifth with $245 million.

Three heavy/highway/civil firms captured the next three spots, with each having performed significant work on the I-15 CORE project. Ames Construction reported $293 million from its Utah office, Ralph L. Wadsworth Construction (RLW) tallied $502 million, and Staker Parsons Companies disclosed $581 million.

Interestingly, of these top five general builders and the three heavy/highway firms, only R&D and RLW showed modest revenue increases from 2011. The next six firms are all general builders, led by Hogan & Associates at $172 million. R.Moore Construction was next with $113 million, followed by Hughes General Contractors ($96 million), Wadman Corporation ($88 million), Bodell Corporation ($26 million) and Kier Construction ($158 million). Wadman has shown remarkable consistency the past three years ($83 million in 2010, $88 million in 2011, $89 million last year).

Among firms at the bottom of the rankings, Pentalon made a significant leap in revenues from the previous year, more than doubling from $11 million in 2011 to $26 million in 2012. Garff Construction ($59 million in 2012) has also been consistent the past three years, with a $100,000 increase in consecutive years.

Three municipal/utility firms participated, including Whittaker Construction ($40 million), COP Construction ($28.7 million) and Alder Construction ($20.9 million).

Top Utah General Contractors

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<th>Address (HQ)</th>
<th>Phone</th>
<th>Year Est.</th>
<th># of Employees (Utah/Overall)</th>
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<td>1971 W. Weber St. SLC, UT 84115 (801) 486-0144 <a href="http://www.okland.com">www.okland.com</a></td>
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<td>Douglas C. Welting President/CEO</td>
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Utah Construction & Design is pleased to publish a list of the Top General Contractors in Utah based on revenues generated in 2012 by firms with headquarters and/or offices in Utah. In the initial list, firms are ranked by revenues generated from their Utah OFFICES. Overall company revenues (all U.S. offices) are also listed. Firms who chose not to disclose revenues (DND) are ranked after revenue-disclosing firms in order based on number of employees. Every effort was made to contact respective GC firms and encourage their participation.

Top Utah General Contractors (Combined; All Disciplines)

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<td>Staker Parsons Companies</td>
<td>2350 S. 1900 W. Ogden, UT 84401 (801) 731-9111 <a href="http://www.stakerparson.com">www.stakerparson.com</a></td>
<td>1952</td>
<td>162923</td>
<td>9</td>
<td></td>
<td>Scott Parsons President/CEO</td>
<td>29</td>
<td>I-15 CORE Kennesaw Copper Tailings Dam</td>
<td>$258</td>
<td>$306</td>
<td>$263</td>
<td>Highway</td>
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</table>

UC&D’s 2013 Top Utah General Contractors
<table>
<thead>
<tr>
<th>Firm Name</th>
<th>Address (HQ)</th>
<th>Phone</th>
<th>Website</th>
<th>Top Executive</th>
<th>Title</th>
<th>Largest Project from 2012 (Utah offices)</th>
<th>Top Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hogans &amp; Associates Const.</td>
<td>1440 N. 1250 W. Centerville, UT 84041</td>
<td>(801) 951-7700</td>
<td><a href="http://www.hogansconstruction.com">www.hogansconstruction.com</a></td>
<td>Mike Hogan</td>
<td>CEO</td>
<td>DND</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$172 (Same)</td>
<td>DND DND DND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$118 (Same)</td>
<td>$98 $76 Comm/Retail Office DND</td>
</tr>
<tr>
<td>Hughes General Contract</td>
<td>900 N. Redwood Road North Salt Lake, UT 84054 15</td>
<td>(801) 250-1411</td>
<td><a href="http://www.huguesg.com">www.huguesg.com</a></td>
<td>Todd Hughes</td>
<td>President</td>
<td>Ogden High School Restoration Hillcrest Junior High School</td>
<td>Healthcare Multi-Family</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$96.1 (Same)</td>
<td>$88.7 $83.8 K-12 Civic/Inst. DND DND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Higher Ed DND</td>
</tr>
<tr>
<td>Waidman Corporation</td>
<td>2692 S. 825 W. Ogden, UT 84401</td>
<td>(801) 621-4188</td>
<td><a href="http://www.waidman.com">www.waidman.com</a></td>
<td>Dave Hogan</td>
<td>President</td>
<td>West Valley Promenade Jackson Hole Airport, Ph. III</td>
<td>Office</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Industrial 100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$76.7 (Same)</td>
</tr>
<tr>
<td>Kier Construction</td>
<td>3710 Quincy Avenue Ogden, UT 84403</td>
<td>(801) 261-4141</td>
<td><a href="http://www.kierconstruction.com">www.kierconstruction.com</a></td>
<td>Stephen J. Kier</td>
<td>President</td>
<td>Liberty Peak Apartments</td>
<td>Multi-Family</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$58 (Same)</td>
</tr>
<tr>
<td>Flattum Contractors</td>
<td>195 E. 900 S. American Fork, UT 84003</td>
<td>(801) 756-5040</td>
<td><a href="http://www.flattumcontractors.com">www.flattumcontractors.com</a></td>
<td>Paul Martinez</td>
<td>Vice President</td>
<td>Timpanogos Highway D/B H-15 Manderfield Bridge</td>
<td>Highway Bridge</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>$50.3 (Same)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$53.3 (Same)</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>$48.6 (Same)</td>
</tr>
<tr>
<td>Whitaker Construction Co.</td>
<td>P.O. Box 430 Brigham City, UT 84302 (435) 723-7255</td>
<td><a href="http://www.whitaker.com">www.whitaker.com</a></td>
<td></td>
<td>Richard Whitaker</td>
<td>President</td>
<td>South Jordan Force Main Cache Water Restoration</td>
<td>Water</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$40 (Same)</td>
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</table>
### Utah General Contractors - General Builders

<table>
<thead>
<tr>
<th>Firm Name</th>
<th>Year Est.</th>
<th>Top Executive Title</th>
<th>Largest Project from 2012</th>
<th>Annual Revenues (millions)</th>
<th>Top Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Okland Construction Co.</td>
<td>1918</td>
<td>William Okland</td>
<td>Adobe Corporate Campus</td>
<td>$593.6</td>
<td>DND 23.1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>President 22</td>
<td>Nu Skin Innovation Center</td>
<td>$814.3</td>
<td>DND 12.6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Healthcare 12.6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Civic/Inst. 11.2%</td>
</tr>
<tr>
<td>Big D Construction Corp.</td>
<td>1967</td>
<td>Rob Moore</td>
<td>LDS Brigham City Temple</td>
<td>$484.9</td>
<td>DND 28.7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>President 36</td>
<td>Club Air SLC Office</td>
<td>$593.6</td>
<td>DND 9.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Multi-Family 9.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Office 9.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Higher Ed 8.8%</td>
</tr>
<tr>
<td>Layton Construction Co.</td>
<td>1953</td>
<td>David S. Layton</td>
<td>USTAR at University of Utah</td>
<td>$420</td>
<td>Healthcare 44%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>President/CEO 27</td>
<td>San Mateo Jail</td>
<td>$618.5</td>
<td>Industrial 14%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Comm/Retail 13%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sports/Rec 8%</td>
</tr>
<tr>
<td>Jacobsen Construction Co.</td>
<td>1922</td>
<td>Douglas C. Wellsing</td>
<td>City Creek Center</td>
<td>$332</td>
<td>Higher Ed 30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>President/CEO 36</td>
<td>onterra Worldwide Corp.</td>
<td>(Same)</td>
<td>Religious 30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Campus</td>
<td>$396</td>
<td>Healthcare 12%</td>
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<td></td>
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<td></td>
<td></td>
<td>$403</td>
<td>Civic/Inst. 12%</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>K-12 11%</td>
</tr>
<tr>
<td>R&amp;D Construction</td>
<td>1980</td>
<td>Stade Ophelkens</td>
<td>The Village South Campus</td>
<td>$245</td>
<td>Comm/Retail 26%</td>
</tr>
<tr>
<td>Ogden, UT 84404</td>
<td></td>
<td>CDO 30</td>
<td>Station Park Phase II</td>
<td>$281</td>
<td>Multi-Family 26%</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Office 12%</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Civic/Inst. 10%</td>
</tr>
<tr>
<td>Hogan &amp; Associates Const.</td>
<td>1945</td>
<td>Mike Hogan</td>
<td>DND</td>
<td>$172</td>
<td>DND DND DND</td>
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<tr>
<td>Centerville, UT 84014</td>
<td></td>
<td>CEO 32</td>
<td>DND</td>
<td></td>
<td>DND DND DND</td>
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<tr>
<td>Rasmussen Construction Co.</td>
<td>1999</td>
<td>Richard White</td>
<td>DND</td>
<td>$18</td>
<td>DND DND DND</td>
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<tr>
<td>Draper, UT 84020</td>
<td></td>
<td>Managing Member 14</td>
<td>Dry Creek Holdings Nature's Way</td>
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<td>DND DND</td>
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<td></td>
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<td></td>
<td>DND</td>
<td></td>
<td>DND DND</td>
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<tr>
<td>Hughes General Contractors</td>
<td>1951</td>
<td>Todd Hughes</td>
<td>DND</td>
<td>$96.1</td>
<td>K-12 DND DND</td>
</tr>
<tr>
<td>North Salt Lake, UT 84054</td>
<td></td>
<td>President 30</td>
<td>Opteon High School Restoration</td>
<td>$88.7</td>
<td>Civic/Inst. DND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hilrose Junior High School</td>
<td>$83.8</td>
<td>K-12 DND DND</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Comm/Retail DND</td>
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<td></td>
<td></td>
<td>Higher Ed DND</td>
</tr>
<tr>
<td>Wadhams Corporation</td>
<td>1951</td>
<td>Dave Hogan</td>
<td>DND</td>
<td>$85.8</td>
<td>DND DND DND</td>
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<tr>
<td>Ogden, UT 84401</td>
<td></td>
<td>President 16</td>
<td>West Valley Promenade</td>
<td>(Same)</td>
<td>DND DND DND</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Jackson Hole Airport, Ph. 11</td>
<td>$84.8</td>
<td>DND DND DND</td>
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<td></td>
<td></td>
<td></td>
<td>DND DND DND</td>
</tr>
<tr>
<td>Firm Name</td>
<td>Year Est.  # of Employees (Utah/Overall) LEED AP</td>
<td>Top Executive Title Years at Firm</td>
<td>Largest Project from 2012 Largest Project in 2013</td>
<td>Annual Revenues (millions) 2012</td>
<td>2011</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------</td>
<td>-----------------------------------------------</td>
<td>-------------------------------</td>
<td>------</td>
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<tr>
<td>Bodell Construction</td>
<td>1972</td>
<td>Michael Bodell President 41</td>
<td>Molycorp Combined Heat Plant Abner Solar Power Plant Pipe</td>
<td>$76.7 (Same)</td>
<td>$68.6</td>
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<tr>
<td>Kier Construction</td>
<td>1986</td>
<td>Stephen J. Kier President 27</td>
<td>Liberty Peak Apartments Canyon Crossing at Riverview</td>
<td>$58 (Same)</td>
<td>$46</td>
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<td>Hadco Construction</td>
<td>1980</td>
<td>John Hadfield President 23</td>
<td>TDS eBAY Foothill Phases III</td>
<td>$48.6 (Same)</td>
<td>$44.9</td>
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<tr>
<td>Zwick Construction Co.</td>
<td>2007</td>
<td>Darin C. Zwick President/CEO 6</td>
<td>DND</td>
<td>$35</td>
<td>$36</td>
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<tr>
<td>Pentafin Construction</td>
<td>1959</td>
<td>Carl Tippets President 20</td>
<td>Rendon Terrace Apartments Wilmington Gardens</td>
<td>$26</td>
<td>$12</td>
</tr>
<tr>
<td>Stacey Enterprises</td>
<td>1962</td>
<td>Scott R. Dixon President 30</td>
<td>Fresenius Medical Care Wahrgst. Jr. School</td>
<td>$25</td>
<td>$24</td>
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<tr>
<td>Cameron Construction</td>
<td>1973</td>
<td>Kevin Cameron President 25</td>
<td>LDS Hospital Entry Renovation Cottonwood Club Rebuild</td>
<td>$18.5 (Same)</td>
<td>$20</td>
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<tr>
<td>Watts Construction</td>
<td>1968</td>
<td>Doug Watts CEO 28</td>
<td>The Retreat at SunRiver ALF Seasons Health &amp; Rehab</td>
<td>$6.9 (Same)</td>
<td>$5.2</td>
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<tr>
<td>Gaff Construction</td>
<td>1911</td>
<td>Bill Gaff Manager 40</td>
<td>DND</td>
<td>$5.9</td>
<td>$5.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Firm Name</th>
<th>Year Est.  # of Employees (Utah/Overall) LEED AP</th>
<th>Top Executive Title Years at Firm</th>
<th>Largest Project from 2012 Largest Project in 2013</th>
<th>Annual Revenues (millions) 2012</th>
<th>2011</th>
<th>2010</th>
<th>Top Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whitaker Construction Co.</td>
<td>1933</td>
<td>Richard Whitaker President 46</td>
<td>South Jordan Force Main Cache Water Restoration</td>
<td>$40</td>
<td>$47</td>
<td>$45</td>
<td>Water Wastewater 60% Natural Gas 10%</td>
</tr>
<tr>
<td>RCP Construction</td>
<td>1930</td>
<td>Edward Bedell President 16</td>
<td>By-Product Phase I By-Product Phase II</td>
<td>$28.7 $60.2 $42.7 $41.2 $67.7</td>
<td>$59.4</td>
<td>$34.3</td>
<td>Groundwater Refinery Water 60% Wastewater 10%</td>
</tr>
<tr>
<td>Alder Construction</td>
<td>1996</td>
<td>Bruce Alder President 40</td>
<td>Jordan Basin WRP (JV) Utah Valley WTP</td>
<td>$32.9 (Same)</td>
<td>$31.8</td>
<td>$34.3</td>
<td>Water Wastewater 50%</td>
</tr>
</tbody>
</table>

2013 Top Utah General Contractor Rankings

2013 Top Utah General Contractors - Heavy/Highway/Civil

2013 Top Utah General Contractors - Municipal/Utility
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- Comfort
- Tread Design for Traction
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- Heavy Ply Construction
- Good Tire for an Economy Price

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