

Construction

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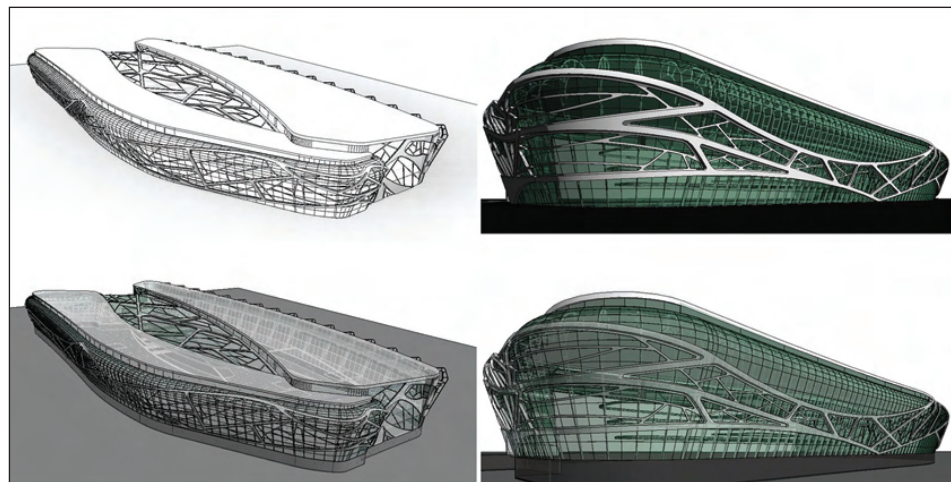
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Building information modeling threatens firms that can't keep up



BIM allows architects and engineers to design computer models of complex structures much more easily than previous technologies.

By Andrew Haley

The Enterprise

State-of-the-art computer modeling technology is making construction more efficient, while threatening to make those who can't keep up obsolete, according to several industry experts.

The modeling technology, called building information modeling, or BIM, was developed by AutoCAD maker Autodesk, and allows architects and engineers to design computer models of complex buildings much more easily than previous technologies, and then to layer multiple plans into a single file foremen can access on the job. But because BIM is so new, companies that have invested in it face significant hurdles interfacing with companies that have not.

Jeremy Blanck, an executive at Okland Construction, said the technology has shifted the burden of problem solving onto the pre-construction phase, since the modeling is so detailed it allowed wrinkles to be ironed out conceptually rather than on a work site.

"It's making us a lot more efficient when we get to the field," Blanck said. "We spend more time up front, resolving those challenges before we get to the field. When you get to the field you're implementing a 3D-model. Before BIM there were lots of conflicts."

He said the biggest hurdle to the technology was the learning curve, which he said had shrunk noticeably over the last few years. While the big four general contractors in Utah — Jacobsen, Okland, Big-D and Layton — have all invested in the technology to varying degrees, many subcontractors have not. Blanck reckoned 30 to 40 percent of subcontractors have an in-house BIM design department using Autodesk's software Revit to create their building plans. Of the various fields, some subcontractors are better than others, he said.

"Electrical needs to catch up," he said.

Blanck said the technology had become such a standard that Okland had begun avoiding subcontractors who farm

out their BIM work to outside specialists working as private contractors.

"On certain jobs, we'll definitely choose somebody who does it in-house. It's of value to us," he said.

Of the big four, Layton Construction leads the pack in BIM investment. The company hired Damon Socha to spearhead the creation of a separate BIM division within the company in 2008. In 2009, Brian Dilley joined the division. His official title is project manager, virtual construction.

"I was an estimator who had a knack for the technology," Dilley said.

He said BIM represented a paradigm shift over AutoCAD, not merely an improved technology.

"BIM is essentially the creation of data-rich 3D objects that represent the objects of a building. AutoCAD uses dot-line work. You have to draw each individual line. You draw where a stud would be. But in BIM you draw components," he said.

Dilley said the software for BIM had existed for sometime, but that it took years for the hardware to catch up. Layton's BIM division mostly uses two programs — Revit, which is used to design buildings, or their component electrical, mechanical, structural, electrical and other systems, and Navisworks, also by Autodesk, which crunches all of the layered plans into a single plan, identifies conflicts and reduces the file size enough that it can be stored on a personal computer or tablet. On the job, Layton's field superintendents carry iPads to access the 3D models of the building under construction, while big-screen TVs in trailers at the construction site are linked to computers so foremen can pull up large format 3D project models if the need arises.

Dilley said when Layton's BIM division first started they were outfitted with inadequate laptop computers and computer crashes and enormous time lags waiting for processors to compute the vast amounts of information in the 3D models hobbled operations. Since last summer, when the

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Five keys to building in a bad economy

During the five-year period that ended sometime in 2007, the costs of construction escalated exponentially as demand drove prices up and strained resources, including labor and materials supplies. During this time, owners turned to construction professionals to assist in their efforts to control costs, while providing the best value to construction projects. To this end, two forms of project delivery — "design-build" and "CM (construction manager) at risk" — also dramatically rose in popularity.

Basics of Construction Project Delivery

In years gone by, construction services were most frequently delivered under a project delivery system known as "design-bid-build." Under this method of project delivery, an owner hired a design professional, which designed the entire facility to be constructed, and, after the plans and specifications for the facility were completed, the owner delivered them to a number of contractors, which bid for the work. Typically, the owner simply awarded the project to the contractor that submitted the lowest bid for the work.

Over the years, two alternative forms of project delivery emerged, among others: design-build and CM at risk. Under the first, the owner typically selects the contractor which, in turn, contracts with an architect for the procurement of the design services for the project. With the construction and design services under a single contract, the owner gains both the benefit of a single point of contact for both services, and the expertise of the construction professional and the design professional, working as a team to provide a better facility for the owner. Under the second, CM at risk, the owner likewise engages the construction and design professionals early in the project, with both working as a team to, again, produce a project that provides the best facility within the owner's budget. Under this form of project delivery, however, the owner enters into separate contracts with the design and construction professionals.

In both scenarios, the owner pays the contractor a flat or percentage fee and determination of the overall cost of the project is an iterative process that clarifies pricing as the design for the facility is finalized. Both design and construction professionals work together to evaluate various alternative materials, systems and designs in an effort to provide the highest value facility for the cost. As construction costs soared during the early 2000s, these alternative project delivery methods gained popularity.

Construction Goes on Sale

The dramatic and rapid change in the economy during 2007-08 hit the construction industry harder than possibly any other industry. As a result, the industry went from boom to bust. As the economy remains sluggish, construction has, in effect, gone "on sale." Contractors throughout the Intermountain region report that

pricing for construction services has never been this low. This, however, does not signal that the time has come to abandon the lessons of the construction boom, when procuring construction services moved owners to design-build and CM at risk project delivery. Indeed, for the reasons explained below, the opposite is true. There are five keys to procuring construction services in the current buyers' market.

Key No. 1: Weighing Price vs. Value

Everyone is aware of the simple principle that "you get what you pay for" and readily concedes its relevance in purchasing decisions they make every day. Yet, news that "construction is on sale" seems to have ushered in the desire of some owners to purchase construction on a design-bid-build basis, seeking to obtain the lowest possible price for construction

by seeking competitive bids on a lump sum basis. This sentiment reflects a false notion that will frequently yield poor results.

Because a significant portion of the cost of construction comes from subcontract work, efforts to look only at the price of the work can lead to adverse consequences to the owner, from poor quality subcontractor work, unrealistic subcontractor price estimates and subcontractor plans to earn a profit on change orders. Certainly, a subcontractor providing poorer quality work is willing to provide services, materials and equipment at a lower price. However, poor quality subcontract work leads to an inferior product and a disappointed owner. Unrealistic estimates likewise lead to the unsavory results of subcontractor failure or project abandonment. And, at last, a scheming subcontractor may provide pricing that it understands is unrealistic, with an intent to win a bid and turn around and make the job profitable in change orders. This scenario either produces different pricing than anticipated or results in costly disputes. Neither is good for the owner or the project.

Key No. 2: Project Delivery Matters

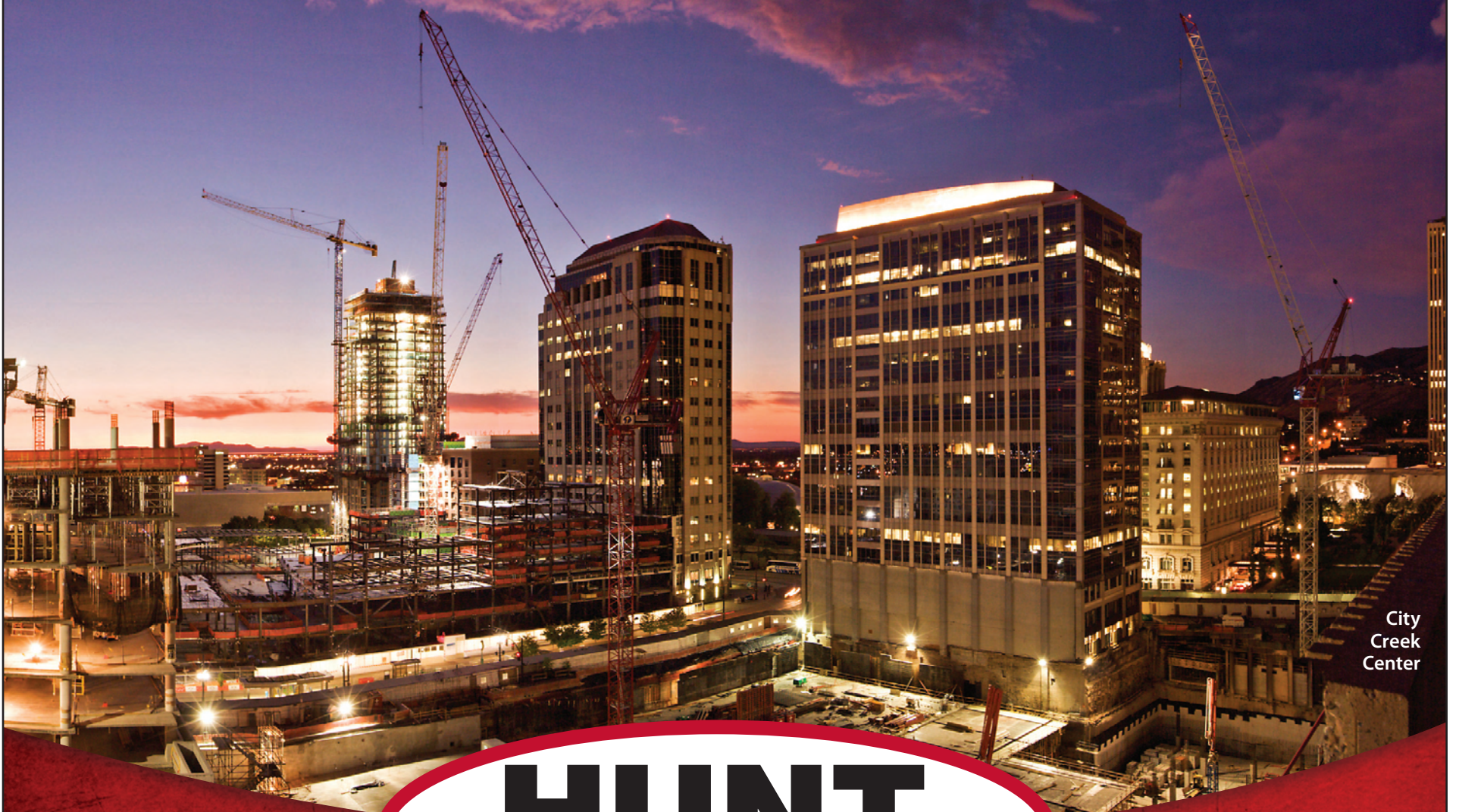
Design-bid-build has proven to be a poor project delivery method because it represents lost opportunity to increase the value of a facility at any given price by leaving the construction professional off the project team until materials, systems and design have been finalized. While some changes may certainly be made, little of the value that the construction team brings to the table can be realized once the design reaches the construction document stage, at which point the project may be bid on a lump sum basis. Design-bid-build is also inferior because it focuses the owner on the lowest price to obtain what appears to be the singular result reflected on the plans. Focus on the lowest price may result in the adverse subcontractor behavior described above. When the con-

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David Zimmerman

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Big-D Construction Corp 404 W 400 S Salt Lake City	801-415-6000 801-415-6900 big-d.com	\$575.72 million	DND	810	Natural History Museum of Utah, Thanksgiving Park Phase II, BYU Heritage Housing, SUU Science Center, Brigham City Temple	Rob Moore
Okland Construction Company, Inc 1978 S West Temple Salt Lake City	801-486-0144 801-486-7570 okland.com	\$396.69 million	\$17.5 million	540	Huntsman Cancer Hospital Expansion Phase IIB, Goldman Sachs TI 222, Harmons Downtown, City Creek Center Multiple Projects, University of Utah Eccles	J. Randy Okland
Jacobsen Construction Company, Inc 3131 W 221 S Salt Lake City	801-973-0500 801-973-7496 jacobsenconstruction.com	\$363 million	\$5.19 million	405	The Regent and City Creek, City Creek Retail Development, Utah State University College of Agriculture, DABC Warehouse Expansion & Remodel, Springville City Library, Logan Regional Hospital Renovation, Century Link Building Renovation	Douglas C. Welling
R&O Construction 933 Wall Ave. Ogden	801-627-1403 801-399-1480 randoco.com randogreen.com	\$230 million	\$278,000	165	Falcon Hill at Hill Air Force Base Utah, Joaquin Student Housing in Provo, Utah, Fashion Place Mall remodel and addition of Crate and Barrel and North Face	Dale C. Campbell
Ralph L. Wadsworth Construction Company, LLC 166 E. 14000 S. Suite 200 Draper	801-553-1661 801-553-1696 wadscoco.com	\$195.8 million	\$25.8 million	442	I-15 CORE, SR-154 Bangerter Highway at 7800 South, UTA Parking Structure, South Layton Interchange, FrontRunner South, I-215 On-Ramp, I-80 Summit Park Bridge, Dixie Drive Interchange	Sterling Construction Company, Inc.
Wadman Corporation 2920 S 925 W Salt Lake City	801-621-4185 801-621-7232 DND	\$90 million	\$2 million	100	Davis County Administrative Office/Library/Children's Justice Court West Valley Promenade & Plaza, Davis School District Special Education Building	David Wadman
Rimrock Construction, LLC 11635 S 700 E Ste 100 Draper	801-676-7625 801-676-0208 rimrock.us	\$65 million	DND	35	HGTV Dream Home 2012 Give Away, Home 2 Suites-Layton & West Valley, Wasatch Commons Apartments, Gods Express-Draper (first in the west)	Mark Hampton
Sahara, Inc 801 N 500 W Ste 300 Bountiful	801-298-7724 801-951-3190 sahara1.com	\$50 million	DND	30	Tooele Country Detention Center, Larry H. Miller Toyota Dealership, Providence Hall Jr. High School	Thomas C. Mabey
Cameron Construction 573 W. 3560 S. Suite 1 Salt Lake City	801-268-3584 801-268-3678 cameronconstruction.com	\$21.3 million	DND	25	Maple Springs Senior Care & Assisted Living, LDS Hospital 1st Floor Clinic Remodel, variety of Sportsman's Warehouse locations, multiple Maverik locations, IHC Health Care projects	Kevin Cameron & David Hill
Eckman & Mitchell Construction 3032 S 1030 W Salt Lake City	801-908-0604 801-908-0205 emconstruction.com	\$20 million	DND	25	Pacific Landing 3, Pheasant Hollow Business Park, Hoyt Artery	Gary Eckman, Eric Eckman, & Curtis Padjen
Stacey Enterprises, Inc 3768 Pacific Ave Ogden	801-621-6210 801-621-7329 staceyc.com	\$20 million	\$1.5 million	18	Fresenius New Product Development Building, Farmington Cinemark 14, Ogden Housing Authority Offices, KOBE Japanese Steak House	Scott R. Dixon
Pentalon Construction 132 E. 13065 S. Draper	801-619-1900 801-619-1901 pentalon.net	\$12 million	\$103,208	24	Seinna Villas Apartments, Elmbridge Apartments, Rendon Terrace Senior Housing	Carl Tippetts
Bonneville Builders 4885 S 900 E Ste 208 Salt Lake City	801-263-1406 801-261-8380 bonnevillebuilders.com	DND	\$100,000	20	Delta Professional Plaza, Durham Brands, HAI Corporate Offices, Beatty & Wozniak Law Offices	John Tebbs

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Pervious concrete has benefits for owners, contractors and the environment

By Andrew Haley

The Enterprise

A special type of concrete is saving contractors and developers from building expensive stormwater retention basins while scrubbing pollutants from urban runoff and recharging local groundwater levels.

Pervious concrete has been used in Europe for decades but has only recently caught on in this country. Essentially a type of porous cement, pervious concrete allows precipitation and irrigation water to filter down through it into the earth below rather than sloughing off into storm drains.

The new state-of-the-art Utah Museum of Natural History (UMNH) features pervious concrete in its 60,000 square foot, 150-stall parking lot, which only bolsters the museum's overall green building specs. The pervious concrete cleans trace oil, transmission fluid and other pollutants



Pervious concrete allows precipitation to filter through into the earth rather than runoff into storm drains.

from the runoff, capturing pollutants and recharging local groundwater levels. In addition to its environmental contribution, by turning the parking lot into what is in essence a water-capture system, UMNH avoided the costly addition of a stormwater retention basin on nearby, high-priced land.

Sarah George, UMNH's executive director, said minimizing the museum's environmental impact has been important to the design and development of the facility from the get-go.

"We are working very hard to minimize impact on this site and keep our footprint as minimal as possible," she said. "It's a hilly site. We know there will be runoff. One of the solutions was to use pervious paving, which would mean we wouldn't have to build a stormwater retention pond. The building next to us has a big stormwater retention pond. We didn't want a big hole. It is a great, elegant solution."

In addition to the museum's rain-capturing parking lot, the facility has a partial green roof that channels runoff into two 10,000-gallon cisterns while increasing thermal retention values, George said. The part of the roof that isn't covered in soil

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BIM

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company invested in new, liquid-cooled \$6,000 computers custom-built by Origin, Dilley said the division had drastically improved its efficiency. To ensure complex plans are not lost to sudden power failures, the computers have full battery back-up systems and are plugged into emergency power generators.

According to Dilley, Layton does no BIM design in-house. Rather, the Layton BIM department spends the majority of its time uploading Revit files created by project architects and engineers working for various subcontractors and making sure those files do not clash. Clash detection is one of the BIM department's chief tasks, Dilley said.

Because subcontractors working with Layton must provide building plans using BIM technology, BIM is forcing subcontractors throughout the western states to adapt or risk losing Layton's business. Dilley said Layton was at the forefront of the technology among the big four general contractors and that many subcontractors are currently forced to hire outside specialists to design plans using BIM. Though the technology is now fairly common in California and Arizona, and is catching on in Utah, Dilley said many contractors and subcontractors in Utah and Wyoming have yet to adopt BIM.

Troy Gregory, president of Hunt Electric, said his electrical contracting company recognized several years ago the paradigm shift BIM represented and invested heavily in the technology so that it would not be left reliant on obsolete programs.

"We jumped in feet first," Gregory said.

He said the company's leadership did extensive research on BIM and made a strategic decision that not investing the technology would lead to a competitive disadvantage when bidding on projects.

"That's why we embraced it early, earlier than any other electrical contractor in Utah. It's one more thing that can help pick a job for us," Gregory said.

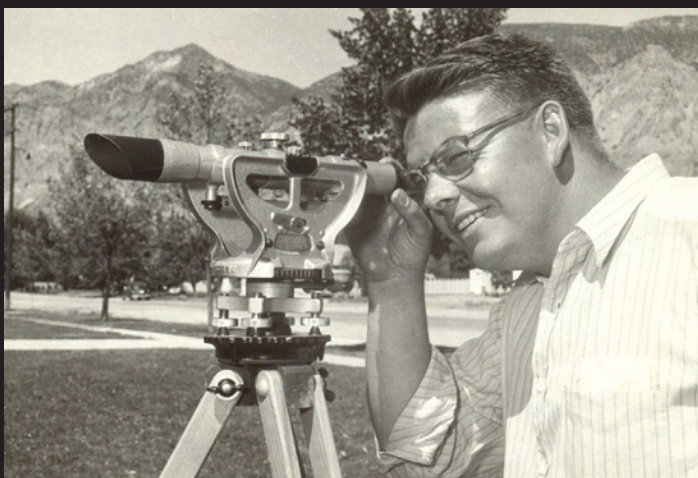
He said investing in BIM was easier for Hunt than it might be for other electrical contractors. Hunt has long had an in-house design/build division, meaning adapting to BIM required the company to invest in training and equipping employees who not only were on the payroll, but were the right kind of employees to learn a new design software. Gregory said other electrical contractors without an in-house design component will have to add new faces to their payrolls as well as invest in the necessary technology to outfit an entirely new division.

Gregory said that BIM is primarily of benefit to the clients hiring contractors using the new technology.

"If done properly, if used properly, it's beneficial to the owners," he said. "The challenge is getting everyone on that level. It doesn't benefit you unless everyone's on board and knows how to use it."

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KEYS

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struction professional is engaged as part of the project team at the outset of a design-build or CM at risk project delivery system, the contractor also selects subcontractors early in the project that thrive in a team environment, and seek the best interests of the owner alongside the contractor. The value gained by competition is not lost because the subcontractors know that the contractor may engage multiple subcontractors and will likely engage a different subcontractor if the other subcontractor regularly provides better value to the owner. By selecting the subcontractors early in the project as part of the project team based on this competitive model, the project avoids the pitfalls of poor subcontractor quality, unrealistic bids and efforts to make up low pricing on change orders. Hence, it can be readily seen how project delivery improves the project for the benefit of the owner.

Key No. 3: Selecting the Right Team

While this may seem obvious, this concept seems to be overlooked frequently during efforts to obtain extremely low pricing while "construction is on sale" and owners are tempted to obtain the lowest price through lump sum bidding. Simply put, the owner's best use of time is by selecting, up front, a general contractor and design team that it feels it can work well with and that it can trust to protect its interests in providing the best value for the project. The owner gains the benefits of competition by meeting with, and obtaining pricing from, multiple contractors. However, once the contractor is selected, the owner and the contractor must be on the same team, firmly committed to providing the best value for the owner's budget. Construction professionals have years of experience and have the ability to provide value through the value engineering process, subcontractor selection and input into the other aspects of the project that affect its value to the owner.

Key No. 4: There is no Substitution for Hard Work

It is extremely common for owners to believe that they do not have time or knowledge sufficient to devote to a construction project. Frequently, the owner will seek to delegate its responsibility to a third party construction manager or owner's representative. This system almost always fails if the owner tries to walk away from the project until it is completed. The problem with this action is that the hired construction manager or owner's representative simply cannot know all of the aspects of the owner's business or operations sufficiently to make the best decisions affecting the value of a construction project.

In other instances, owners may simply believe that once the contract is signed, they have no further obligations with respect to the project because everything they need is reflected on the plans and they need only show up to approve the project near substantial or final completion. This simply will not work. Notwithstanding completed plans, there will always be a host of decisions required from the owner.

Timeliness of owner decisions will also affect project completion. Therefore, the owner must be engaged and be willing to devote time and energy throughout the design and construction process to answer questions, to seek to understand the efforts by the design and construction team to provide a quality product, and to understand and make decisions regarding the owner's needs, in terms of quality of the facility, future maintenance and facility longevity.

Key No. 5: Focus on Teamwork and Not Penalties

Finally, another flaw is the notion that the owner's best interests are served by a construction contract that establishes high standards for contractor performance and strict penalties for failure to achieve those standards. Liquidated damages clauses are one example. Experience suggests that penalties are rarely a meaningful tool to drive a project to timely completion. Rather, the most successful projects begin

on a basis of mutual trust and risk allocation, with an emphasis on a team effort.

In sum, construction is, in fact, on sale. But when the wise owner seeks to build in poor economic times, it will hold fast to the same principles of successful project delivery systems that brought value in booming economic times.

David Zimmerman practices construction law in the Salt Lake City office of the law firm Holland & Hart LLP.

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Cache Valley Electric 875 N 1000 W Salt Lake City	435-752-6405 435-752-9111 cve.com	\$125.71 million	\$300 million	646	Electrical Construction, voice and Data Cabling, Fiber Optics, Signal & Utility LTG, Service Substation & Transmission, Network Integration, Security Integration, Wireless, Industrial, Commercial Mission Critical, Health care	Jim Laub
Wasatch Electric, a Division of Dynalectric Co. 2455 W 1500 S Ste A Salt Lake City	801-487-4511 801-487-5032 wasatchelectric.com	\$94 million	Unlimited	440	Full service. All high, medium and low voltage capabilities, specializing in design-build, design-assist and mission critical projects, 24 hour emergency service	Tim Homer
Taylor Electric, Inc. 2650 S 1030 W Salt Lake City	801-413-1300 801-413-1301 taylor-electric.com	\$44.52 million	\$80 million	229	Full range of services in commercial and industrial construction which include design-build, 24/7/365 service, medium voltage, low voltage and preventive maintenance	Ryan J. Taylor
GSL Electric 8540 S Sandy Pkwy Sandy	801-565-0088 801-565-0099 gslelectric.com	\$35.5 million	\$60 million	265	Commercial and industrial construction, design-build engineering services, low voltage systems, service	Lance Capell
Rydalch Electric, Inc. 250 W Plymouth Avenue Salt Lake City	801-265-1813 801-265-2166 DND	\$19 million	\$30 million	100	Electrical construction and service	Frank Rydalch, & Mark Rydalch
Eagle Electric, Inc. 7000 S Commerce Park Dr Midvale	801-255-8089 801-255-8108 eagle-electric-inc.com	\$4 million	\$5 million	28	Commercial, residential, low voltage, design-build, site lighting, pole bases 24 hour emergency service	Kurt Brooks
Hunt Electric, Inc. 1863 W Alexander St. Salt Lake City	801-975-8844 801-975-0511 hunteelectric.com	DND	\$90 million	240	Traditional electrical contracting, commercial, industrial and high-end resort, design-build construction, renewable energy, infrastructure and traffic, I.T.S.-fiber optic installation	Richard Hunt

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Enterprise
UTAH'S BUSINESS JOURNAL

Utah steel firm integral to new Disneyland "Cars" attraction

SME Steel Contractors Inc., West Jordan, which has provided structural steel for high-profile projects such as City Creek in downtown Salt Lake City, including the skybridge recently highlighted on National Geographic's program "World's Toughest Fixes," created the structural steel foundation for the latest attraction at Disneyland Resorts in California.

Slated to open this summer, Disney Cars Land re-creates the fictional town of Radiator Springs from the Pixar films "Cars" and "Cars 2." Elements from both films have been incorporated into the project, which is the largest portion of Disney's \$1 billion expansion and marks the second largest expansion for Disneyland Resorts.

Walt Disney Imagineering is the design team behind Disney Cars Land. The 12-acre theme park is backed by the Cadillac Mountain Range, which is 1,090 feet in length and is an intricately detailed design featuring tube steel and channel construction reaching 125 feet at its highest point. This 280,000 square foot structure is a familiar looking mountain range reminiscent of Utah mountains near Moab. It was created using a primary steel structure supporting a secondary steel structure



The "Cars" attraction in Anaheim contains a 280,000 square foot structure and is the largest portion of a \$1 billion expansion.

and crowned with rock chips. The steel resembles a giant pile of pixie sticks; however, every piece of steel was pinpointed in several locations utilizing satellite precision. This enormous rock structure is the largest of its kind in Disneyland or

Disneyworld — exceeding the Matterhorn and Splash Mountain.

The highest peaks stretching skyward resemble tail fins of 1957-62 Cadillac cars. Due to the complicated detailing, the proj-

ect was design-build utilizing 100 percent Building Information Modeling (BIM) capabilities, which create a 3D image of the entire project. The highest piece of
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and plants is covered in solar panels helping to generate electricity for the museum.

“There is an ethical and a practical reason to be sustainable,” George said. “This up-front investment will be a long-term payback in operating cost. The ethical reason is the museum has a sustainability statement. We use the definition of sustainability on our website: meeting the needs of the present without compromising the ability of future generations to meet their needs.”

For a museum, the decision to avoid building a large adjacent stormwater retention basin may seem esthetical, but there are practical ramifications as well. A developer building a subdivided lot must dedicate a portion of those subdivisions to accommodate a stormwater basin, and lose a sizable percentage of potential sales. Pervious concrete enables existing infrastructure such as roads, sidewalks, driveways and parking lots to function as de facto stormwater reservoirs, enabling the full use of developable acreage.

Pervious concrete has not been a uni-



Both the parking structure and the non-landscaped portions of the roof at the new Utah Museum of Natural History make use of pervious concrete provided by Staker Parson.

form success. In June 2008, the Urban Drainage and Flood Control District (UDFCD,) which assists local governments in the Denver metropolitan area with flood control problems, called for a

temporary moratorium on pervious concrete in the Denver area after experiencing surface raveling problems. UDFCD eventually determined those problems had been caused by improper installation and lifted

the ban.

The major difference between regular concrete and pervious concrete is that upwards of 25 percent of the volume of pervious concrete is made up of voids. To achieve those voids, concrete mixers create a paste from very precise amounts of water and cementitious material they then use to coat the surface of aggregate particles. Industrial products like fly ash and silica fume help ensure the pervious concrete contains enough voids that water can filter through properly, without compromising the strength and integrity of the concrete.

Mix in too much water, or not enough, in temperatures too hot or too cold, at humidity levels too arid or too moist, and instead of a stormwater-filtering sponge hard enough to drive a truck on, you get an unintended gravel lot, which is what happened in Denver. Local concrete and paving giant Staker Parson knows the pitfalls of pervious concrete installation. It not only installed the UMNH parking lot, but also designed the specific concrete mix it is made of.

Lonnie Gray is a research and development manager at Staker Parson. He speaks about pervious concrete the way alchemists speak of gold. Gray had his road-to-Damascus moment with pervious concrete in the parking lot at Brasher's Auto Auction, which installed one of the country's first pervious concrete parking lots in the late 1980s.

“The thing that sold me on pervious was this parking lot,” Gray said. “It had a road base underneath it. They did not cure it properly and put a bad base underneath it. It lasted 18 years with zero maintenance on a 20-acre parking lot. Three years ago it started to ravel, so they cleaned it off and covered it with seal coat.

“We took some core samples. It took close to an hour and 15 minutes to get a four-and-a-half-inch core sample. It was tough as could be. We took it up to the U of U. There was no sign of freeze-thaw damage whatsoever. For 18 years it had no recharge bed. When it was placed it did not have the seven-day plastic cure. That was a worst case scenario, but they accidentally hit [the proper mix] dead on.”

Bill Brooks, operations manager at of



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Brasher's, praised the pervious concrete car lot for its durability and for the practical solution it presented to the company's acreage problem. A 20-acre car lot captures a lot of a rain and would have necessitated an enormous stormwater retention basin.

"Up until the time it started to come apart it was fantastic. It did everything we needed it to," he said. "It made runoff easier so we didn't need drains. With the size of our lot it seemed like it would work out for us."

Pervious concrete has other alchemists. Chris Bedford, regional sales manager at Headwaters Resources in South Jordan, has pioneered the use of colored silica fume and colored bean oil to create naturally colored pervious concrete. According to Bedford, a driveway he recently installed was the first pervious concrete project with integral color and colored grouted edges.

He said a proper balance of ingredients was crucial to a good pervious mix.

"Fly ash helps make the mix move and mix better. With fly ash, it seems to

slide off the fins [in the mixing truck] so they can get more of the paste out of the truck. It benefits with fly ash in the mix," he said. "When it goes through the chemical reaction it's picking up calcium hydroxide and giving it added punch you can't get from cement alone. Using fly ash and silica fume, besides being a recycled material, also cuts down on the usage of cement and therefore cuts down on the amount of CO2 emitted into the environment, since every ton of cement produces a ton of CO2."

Because of its 20 percent voids, integral white color and material composition, Bedford's driveway also absorbs less solar radiation. That reduces heat buildup, lessening the heat island effect above the driveway. The porous, white cement also reflects more light than traditional concrete, enabling pedestrians to see better at night and reducing the need for street lights.

If pervious concrete has an Achilles' hill, it is that the voids within the concrete gradually fill with waterborne grime, as any filter would. One of the insights Staker Parson has brought to the pervious con-

crete market is that achieving the proper ratio of void to material not only ensures flow, but also eases maintenance.

"You want 20 percent voids on pervious concrete," Gray said. "The bigger the voids, the easier it is to re-open it and be able to clean it. When you're down to a 14 percent void system, it plugs up faster and is twice as hard to open back up. Maintenance is the issue on pervious concrete."

That critical maintenance issue led Salt Lake City-based Bunyan Industries to develop its Bunyan Infiltration Restoration Device, or B.I.R.D. vacuum. The B.I.R.D. is a 42-inch wide hooded vacuum on a triangular wheelbase attached via tubes to a truck-mounted vacuum pump. It directs a high-pressure blast of water against the pervious concrete and sucks air through the porous slab, cleaning the voids of grime and restoring the permeability of the material.

"A typical vacuum relies on a lot of air flowing over the surface and gathering up debris," said Bunyan's founder David

Mitchell. "Ours differs in that our unit attaches to the surface with rubber lips, and sucks down and fastens to as tight a seal as we can make, and forces air to come through the void to burp those contaminants out."

As elegant a solution as the machine is, the B.I.R.D. can only restore pervious concrete to the permeability it originally had when first installed. That is why Bunyan launched a campaign to insure the proper installation of pervious concrete in the first place, not only to guarantee the mix sets up properly and lasts its intended lifecycle, but to prevent premature clogging and contamination as well.

"If you design the surface an inch above any neighboring surface that might spill dirt onto the surface, you might never have to do this kind of intensive maintenance over the life of the pavement," Mitchell said.

"Our agenda is to get on top of bad practices that have caused failures for pervious. That's where pervious has hit the wall."

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Staker Parson Companies 2350 S 1900 W Ogden	801-731-1111 801-731-8800 stakerparson.com	1,815	156 9 244	DND DND DND	Sand, rock, landscape products, ready-mixed concrete, asphalt, paving and construction services	Scott Parson
Geneva Rock Products 1565 W 400 N Orem	801-765-7800 801-281-0076 genevarock.com	1,000	114 26 265	7,225,302 802,729 985,973	Asphalt, concrete, aggregate, sand, gravel, construction services, rock, micro-surfacing, landscape products, paving services	Jim Golding
Granite Construction Company 1000 N Warm Springs Rd Salt Lake City	801-526-6000 801-526-6049 graniteconstruction.com	700	15 DND 0	1,500,000 0 NA	Engineered fill, hot and warm mix asphalt, state spec road base, type 1,2 & 3 slurry aggregates, washed sand and gravel roofing rock	Brad Sweet
Kilgore Contracting 7057 W 2100 S Salt Lake City	801-250-0132 801-250-0671 kilgorecontraction.com	580	75 30 NA	DND DND DND	Rock, sand, gravel, asphalt, paving site work, underground, earthwork & asphalt maintenance	Jason T. Kilgore
Sunroc Corporation 180 N 300 E St George	435-634-2200 435-634-0561 sunroc.com	300	60 21 95	2,559,123 DND 256,158	Concrete, masonry products, sand, gravel, aggregate, rock, stone, landscape products, construction services	Rhys Weaver
Altaview Concrete 7057 W 2100 S Salt Lake City	801-250-0132 801-250-0671 altaviewconcrete.com	150	NA 5 120	DND DND DND	Concrete and concrete pumping	Scott Reynolds
Westroc, Inc 670 W 220 S Pleasant Grove	801-785-5600 801-785-7408 westrocinc.com	84	6 6 43	690,000 0 156,000	REady-mixed concrete, aggregates	Cy Spurlino

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Enterprise
UTAH'S BUSINESS JOURNAL

SME

from page 9

steel is a 43-foot beam that was erected during a "topping out" ceremony on Oct. 28, 2011. The culminating steel beam was painted white and ceremoniously signed by those who participated on the construction team in addition to the many VIPs who made the project possible.

Willy's Butte and an enormous radiator cap are two separate rock formations that were also created using the same steel support design. Seven venue structures were added to complete the park attraction along a strip of Route 66: Radiator Springs Racers Queue Building complete with an interior night scene, Courthouse, Luigi's Flying Tires, Ramone's House of Body Art, Flo's V8 Café, Radiator Springs Curios, and Cozy Cone Motel.

Despite the tight work area and limited lay-down space, SME said there were no interruptions to park entertainments. It was completed right on schedule with a



The total steel for the "Cars" project is 3,770 tons, comprising 23,503 individual pieces.

high focus on safety.

Ryan Allgood, SME Project Executive, said, "This was a challenging and interesting project focusing on several elements of intricate design, fabrication and erection," said Ryan Allgood, SME project execu-

tive. "Without the pride and professionalism of our shop and field ironworkers, this job could not be completed on time and on budget."

The total steel for the project is 3,770 tons comprising 23,503 individual pieces

of steel. SME also provided the miscellaneous metals package for each of the several venues. Miscellaneous metals include items such as railings and stair systems that are used in commercial building construction.

Top Wasatch Front Home Builders*

Ranked by Value of Residential Permits Issued in 2011**

Company Name Address	Phone Web	Value of Residential Permits Issued	# of Units	Average Value of Unit	# of Permits Issued	Average Value of Permit
Ivory Homes 970 Woodoak Ln Salt Lake City	801-268-0700 ivoryhomes.com	\$104,727,969	534	\$196,120	431	\$242,988
Edge Homes PO Box 764 Spanish Fork	801-794-0030 edgohomes.com	\$45,129,062	219	\$206,069	219	\$206,069
DR Horton 12351 Gateway Park Pl Ste Draper	801-571-7101 drhorton.com	\$37,277,443	183	\$203,702	163	\$228,696
Richmond American Homes 849 Levoy Dr Ste 100 Taylorsville	801-743-7440 richmondamerican.com	\$34,981,811	154	\$227,155	154	\$227,155
Garbett Construction 273 N East Capital St Salt Lake City	801-456-2430 garbetchomes.com	\$31,027,627	228	\$136,086	228	\$136,086
Castle Creek Homes 1798 W 5150 S Roy	801-525-0681 castlecreekhomes.com	\$27,474,851	130	\$211,345	127	\$216,337
Salisbury Development 494 W 1300 N Springville	801-491-9091 alwaysaffordablehomes.com	\$25,122,158	106	\$237,001	107	\$234,787
Henry Walker Homes 500 N Marketplace Dr Ste 201 Centerville	801-677-1600 henrywalkerhomes.com	\$24,399,089	96	\$254,157	96	\$254,157
Fieldstone Homes 1265 E Fort Union Blvd Ste 350 Cottonwood	801-233-8300 fieldstone-homes.com	\$24,265,017	112	\$216,652	112	\$216,652
Destination Homes 67 S Main St Ste 300 Layton	801-593-9993 destinationhomes.com	\$22,880,122	102	\$224,315	99	\$231,112
Candlelight Homes 1099 W South Jordan Pkwy South Jordan	801-495-3414 candlelighthomes.com	\$19,368,489	82	\$326,201	82	\$326,201
Holmes Homes 126 W Seago Lily Dr Ste 250 Sandy	801-572-6363 holmeshomes.com	\$17,487,299	93	\$188,035	89	\$196,487
Nilson Homes 5617 S 1475 E Ogden	801-392-8100 nilsonhomes.com	\$15,116,446	54	\$279,934	54	\$279,934
McArthur Homes 9962 S Redwood Rd South Jordan	801-253-9910 mcarthurhomes.com	\$13,786,658	66	\$208,889	55	\$250,667
Magleby Company PO Box 990 Pleasant Grove	801-785-9998 paulmagleby.com	\$11,602,110	3	\$3,867,370	3	\$3,867,370
Perry Homes 17 E Winchester St Ste 20 Murray	801-264-8800 perryhomesutah.com	\$11,292,277	54	\$209,116	54	\$209,116
Wasatch Regional Builders LLC 175 E 400 S Ste 160 Salt Lake City	801-961-1002 DND	\$9,949,982	78	\$127,564	78	\$127,564
Rainey Homes 520 N Kays Dr Kaysville	801-444-9400 raineyhomes.com	\$9,714,201	34	\$285,712	34	\$285,712
Symphony Homes 526 N 400 W North Salt Lake	801-298-8555 symphonyhomes.com	\$9,112,561	35	\$260,359	35	\$260,359
Home Center Construction 2264 Williamsburg Cir West Jordan	801-569-2346 homecenterconstruction.com	\$9,031,539	34	\$265,634	34	\$265,634
Woodside Homes 39 E Eagle Ridge Dr North Salt Lake	801-299-6700 woodsidegroupinc.com	\$9,005,141	49	\$183,778	49	\$183,778
Brighton Homes 320 W 500 S Ste 210 Bountiful	801-397-9755 brightonhomes-utah.com	\$8,071,876	31	\$260,383	31	\$260,383
Brad Reynolds Construction PO Box 17958 Salt Lake City	801-281-2200 bradreynoldsconstruction.com	\$7,897,027	51	\$154,844	23	\$343,349
Cadence Homes 3400 Ashton Blvd Ste 180 Lehi	801-768-0503 cadencehomes.com	\$7,645,461	30	\$254,849	30	\$254,849
Patterson Construction 11038 Highland Blvd Highland	801-756-7303 pattersonconstruction.com	\$7,557,814	39	\$193,790	39	\$193,790

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*Northern Utah is defined by the following counties: Carbon, Davis, Duchesne, Juab, Morgan, Salt Lake, Summit, Tooele, Uintah, Utah, Wasatch and Weber counties

**List information provided by Construction Monitor and found at constructionmonitor.com



Top Northern Utah Home Builders*

Ranked by Value of Residential Permits Issued in 2011**

Company Name Address	Phone Web	Value of Residential Permits Issued	# of Units	Average Value of Unit	# of Permits Issued	Average Value of Permit
Sierra Homes Construction 470 N 2450 W Tremonton	435-257-4963 sierrahomes.com	\$7,530,188	46	\$163,700	46	\$163,700
Horizon Development and Management 1433 N 11075 W Ste. 104 Farmington	801-231-5318 DND	\$5,988,474	27	\$221,795	2	\$2,994,237
Kartchner Homes 601 W 1700 S Ste A Logan	435-755-7080 kartchnerhomes.com	\$5,906,300	32	\$184,572	30	\$196,877
Visonary Homes 925 W 200 N Ste A5 Logan	435-792-6000 buildwithvisionary.com	\$3,555,670	21	\$169,318	21	\$169,318
Immaculate Construction 2 N Main St Ste 1 Logan	435-213-3758 DND	\$3,039,314	14	\$217,094	14	\$217,094
Neighborhood Nonprofit Housing Corporation 95 Golf Course Rd Ste 104 Logan	435-753-1112 nnhc.net	\$1,994,400	14	\$142,457	14	\$142,457
Lifestyle Homes 41 E 400N Ste 134 Logan	435-760-1700 buildwithlifestyle.com	\$1,757,705	12	\$146,475	12	\$146,475
Westates Construction 95 River Bend Way North Salt Lake	801-383-3252 DND	\$1,672,543	9	\$185,838	9	\$185,838
Immaculate Construction Inc PO Box 674 Logan	435-787-4915 DND	\$1,645,800	12	\$137,150	12	\$137,150
Highmark Construction 399 N Main St Logan	435-752-4775 highmarknow.com	\$1,157,147	8	\$144,643	8	\$144,643
Smart Construction PO Box 548 Garden City	435-770-2084 smartconstruction-bearlake.com	\$1,128,000	3	\$376,000	3	\$376,000
DRD Property Development 1332 Orchard Heights Dr Logan	435-213-5322 drdpropertydevelopment.com	\$1,000,000	10	\$100,000	10	\$100,000
Target Homes 3055 S 1250 W Brigham City	435-730-3778 DND	\$955,625	4	\$238,906	4	\$238,906
Westates Construction Company 95 River Bend Way Ste A North Salt Lake	801-383-3252 DND	\$864,500	5	\$172,900	5	\$172,900
Mt Sterling Construction 925 W 200 N Ste A5 Logan	435-757-4603 mtsch.com	\$825,716	3	\$275,239	3	\$275,239
Champlin Development 40 W Cache Valley Blvd Ste 1 Logan	435-512-9127 champlindevelopment.com	\$760,591	5	\$152,118	5	\$152,118
JM Reed Construction 265 N Main St Smithfield	435-757-7557 DND	\$647,331	3	\$215,777	3	\$215,777
Sorensen & Gnehm Construction 743 Stewart Hill Dr Logan	435-994-0098 DND	\$585,735	2	\$292,868	2	\$292,868
B&J Custom Building 708 W 1800 N Ste 3A Logan	435-755-8796 bandjcustom.com	\$585,640	3	\$195,213	3	\$195,213
Mike Schultz Construction 1798 W 5150 S Ste 103 Roy	801-525-0681 DND	\$565,034	2	\$282,517	2	\$282,517
J&M Contractors 2508 E 8240 S Ogden	801-737-0284 DND	\$540,299	3	\$180,100	3	\$180,100
Precision Construction PO Box 387 Morgan	801-330-5855 DND	\$539,214	8	\$67,402	8	\$67,402
Cache Valley Mech 160 S 400 E Hyde Park	435-994-1574 DND	\$486,120	2	\$243,060	2	\$243,060
HH&R 9355 N 4400 W Tremonton	435-230-0041 DND	\$479,517	1	\$479,517	1	\$479,517
Dan Hunsaker Construction PO Box 82 Wellsville	435-764-1457 DND	\$479,413	3	\$159,804	3	\$159,804

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Construction by LDS Church helped buoy the building industry during the Great Recession

By Andrew Haley

The Enterprise

Spending by The Church of Jesus Christ of Latter-day Saints has helped buoy Utah's construction industry during the Great Recession.

According to building permit figures compiled by *Construction Monitor*, a Cedar City-based trade publication that compiles construction data, the church obtained permits for \$140 million in new Utah construction and building rehabilitation projects in 2011. Of that, approximately \$40 million went toward construction of new chapels and other religious buildings, while the remaining \$100 million went toward rehab, remodel and renovation projects ranging in scope from an \$8,000 remodel of the 500 South Deseret Industries to the \$52 million remodel of the Ogden Temple.

"It doesn't surprise me. They're constantly doing work," said Jim Wood of the University of Utah's Bureau of Economic and Business Research (BEBR).

BEBR, which maintains a separate database of statewide construction activity on its Utah Construction Information Database, listed \$60 million in building permits issued for new construction of "churches and other religious buildings" between January and October 2011. Wood estimated that "90 percent" of that was for LDS Church activity and that half of that 90 percent was for construction in Salt



Artist's rendering of the Ogden Temple once its \$52 million remodel is complete. The remodel will include a complete redesign of the building's spire.

Lake County. The publicly funded BEBR does not differentiate between religious denominations in the presentation of its data.

The \$140 million in permits listed by *Construction Monitor* was separate from the church's colossal City Creek development in downtown Salt Lake City. Wood said City Creek amounted to between \$500 million and \$750 million in total construc-

tion expenditures, not the \$1.5 billion previously reported. He said BEBR had arrived at those figures based on its evaluations of building permits issued by the city.

"The major project really is City Creek," Wood said. "There's been a number out there for five years of \$1.5 billion. It's not an official number. As far as I know the church has never issued that number.

It's one of those numbers that just appears."

David Mineer, president of *Construction Monitor*, said it is an unspoken rule of thumb in the construction industry that building permit valuations are about half of market valuation. He said that might account for the \$1.5 billion sum, since it was exactly twice Wood's more conservative estimation of \$750 million. The church has imposed an ironclad silence about costs of the City Creek project.

"Building permit value is usually half the valuation. Say you have a project permitted at \$100 a square foot when in reality it's \$200 a square foot. [The building permit valuation] is generally about half of what the fair market value is. It's kind of how it is," Mineer said.

Wood said the \$500 million to \$750 million in issued permits accounts only for the construction value of City Creek's "sticks and bricks" — the buildings' basic cost that excludes the price tags of land, sidewalks and other infrastructure, landscaping, furniture, interior design and other expenditures such as architecture and engineering fees. The more luxurious a building, the more one could count on amenities other than "sticks and bricks" driving up the total market price, he said. Luxury condos in City Creek's 30-story Promontory residential tower, offer "floor-to-ceiling

see LDS page 20

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Top Structural Steel Companies in Utah

Ranked by Gross Utah Sales in 2011

Company Name Address	Phone Fax Web	Gross Utah Sales Average Size of Project (\$)	Notable 2011 Projects	Specialities	Services Offered	Top Local Executive
SME Steel Contractors, Inc 5801 W Wells Park Rd West Jordan	801-280-0711 801-280-3460 smesteel.com	\$170 million \$7.5 million	Salt Lake City Federal District Courthouse, Newport Beach Civic Center, Questar Office Building, Salt Lake Public Safety Building, Smith Center for the Performing Arts	Structural steel fabrication and erection for hotels, casinos, convention centers, retail centers, office buildings, hospital and medical office buildings and government buildings	Structural steel fabrication and erection, turnkey steel construction services, design assist service consultation, detailing, shop fabrication, field erection, ornamental metals	Wayne Searle
Petersen Incorporated 1527 N 2000 W Ogden	801-732-2000 801-732-2098 peterseninc.com	\$90 million \$200,000	Nuclear Waste Vitrafacation Melters	Plate Fabrication, mining equipment, process equipment	Engineering, fabrication, machining, field erection, ware housing & distribution	Rob Despain
GEM Building 1025 N Water Lane Brigham City	435-723-5000 435-723-2353 gembuildings.com	\$30 million \$750,000	Utah Museum of Natural History, U of U Daybreak Specialty Care Center, Kennecott Truck Shops, USU Regional Distance Learning, Bishop's Storehouse, Brigham City Temple, Adobe Omniture Office	Full Design Services including engineering, drafting, and detailing for projects anywhere in the country and world. State of the art fabrication facility for projects anywhere in the intermountain west area.	Same as Specialities	Dave Isaacson
Mark Steel Corporation 1230 W 200 S Salt Lake City	801-521-0670 801-303-2040 marksteel.net	\$20 million \$300,000	DND	ASME VIII Div 1, heavy plate fabrication, sophisticated paint endorsement, AISC certified, modules, large complex structural and mechanical assemblies	Stress relieving, paint mechanical assembly	James R. Vemich
Tech-Steel, Inc Bldg D2 Freeport Center Clearfield	801-328-2543 801-546-6320 tech-steel.com	\$13 million DND	Climax Molybdenum, Merit Medical Production, NuSkin Innovation Center	Structural steel and misc. metals fabrication, steel joists, metal decking and erection for commercial and industrial projects	Full service turnkey steel contractor services	Tad Rasmussen
S&S Steel Fabrication 2292 W 500 N Hurricane	435-635-9801 435-635-9804 sssteelfab.com	\$12.5 million \$1 million	Transformers Ride for Universal Studios in Singapore and Universal City California, Intrepid Potash Expansion in Wendover Utah	Structural steel fabrication in industrial markets and complex/unique structures	Structural/Platwork/Misc	E.M. (Mike) Staples
Sanpete Steel 685 E Main St Moroni	435-436-8310 435-436-8340 sanpetesteel.com	\$8 million \$2 million	Herriman Middle School	Structural steel beam framing	Detailing, erection, design-build	Jeff Richards
MetalForce, Inc 5037 S 2700 W Roy	801-776-5700 801-776-5800 metalforceinc.com	\$2 million \$27,000	Shale Bins, Bridge Railings, Skids	Frames, bins, structural fabrication tanks, mezzanine	Fabrication	DND
Blue Star Steel 3692 W 500 S Salt Lake City	801-908-8302 801-908-8307 bluestarsteel.com	DND DND	Dinosaur National Monument, Anadarko Skids, Utah Data Center	Structural, vessels, tanks, skids and piping	Detailing, fabrication, design-build on skids	Jeff Wright
Rocky Mountain Fabrication 1125 W 2300 N Salt Lake City	801-596-2400 801-322-2702 rmf-slc.com	DND \$1.2 million	Colt Oil Hub-Epping, ND	API/AWWA/NFPA/ASME-storage tanks, spheres, silos, shacks, hoppers, ducts, alloy lining, thickeners/clarifiers, scrubbers/absorbers, and more	Full-service plate steel construction-design, fabrication, field erection	Randy Guest

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LDS
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windows, hardwood flooring, exquisite cabinetry and designer lighting,” according to the building’s website.

Wood said he has studied the ratio of building permit valuation to market valuation, especially in residential construction, and found the discrepancy closer to 60 percent. He said there is a continuum in the permit/market valuation ratio, with warehouses at the bottom end and hospitals at the top end. Wood begrudgingly agreed that the market value of new chapel and temple construction could be drastically undervalued in building permits, but said that cost assessments of rehab and remodel projects were likely closer to their permit valuations.

“If you’re doing any rehab, it should be very close to the building permit,” Wood said.

Despite repeated entreaties, the LDS Church declined to comment. Doug Andersen, a spokesperson for the church, said he had sought information from high-

er-ups on recent multimillion dollar projects in Utah County not yet listed in *Construction Monitor’s* database, but had struggled “getting them to budge on anything.” Those projects include two temples and a new life sciences building on the campus of Brigham Young University.

“Their inclination is not to say anything,” Andersen said.

Last fall, the church selected three Utah general contractors to lead the construction of those three projects. Okland Construction was chosen to build a new 265,000 square foot life sciences building at BYU, Wadman Corp. to build the new 97,000 square foot Payson Temple, and Jacobsen Construction to stabilize the burned-out Provo Tabernacle, which the church has decided to rebuild as a second Provo temple. Those three projects are scheduled to take between two-and-a-half and three years each to complete, providing Okland, Wadman and Jacobsen highly lucrative contracts through the projected remainder of the economic recovery.

Although the LDS Church is extremely secretive about its expenditures and finances, the church has long telegraphed

to the general public that it finances its construction activities with cash. Statements from church presidents about the perils of debt and debt spending date back at least to the Great Depression. Debt-free spending and \$140 million in building permit valuations mean at least that amount, if not far more, as Mineer suggests, was injected directly, industry wide, into the state’s general contracting companies last year. That is a tremendous boon to an industry that has struggled since the 2008 downturn with the collapse of the housing sector and a dearth of construction activity caused by slushy credit markets.

“We’re pretty fortunate to have that kind of activity going on,” Mineer said.

Because it undertakes so many construction projects statewide, the LDS Church is able to diversify its spending among a variety of companies, pumping much needed money into Utah construction coffers at a time when private sector contracts have dropped off sharply. In the last year, for the 34 issued building permits worth more than \$1 million that list the LDS Church as developer/tenant, the

church hired 22 different general contractors. In dollar terms, Big-D won the lion’s share of those dollar contracts, with over \$52 million; followed by Okland, with over \$13 million; Stallings, with over \$8 million; and Philipoom, with over \$7 million as measured by permit valuation.

Many smaller contractors, like M&D

Because it undertakes so many construction projects statewide, the LDS Church is able to diversify its spending among a variety of companies.

Sons Construction, were hired on for much smaller jobs that nevertheless proved critical to avoiding layoffs that would have swelled the pools of the unemployed and driven up Utah’s jobless figures. M&D Sons, a Tremonton-based company, is listed online as a homebuilder specializing in building single-family homes in the Tremonton area, despite the fact that the sole building permits issued in 2011 listing M&D as general contractor were two LDS Church projects — a \$52,000 pavilion at the Brigham City North Stake and \$12,000 in tenant improvements at the Logan University 2nd Stake. Sixty-four thousand dollars is a far cry from what the company made during the salad days of the housing bubble, but it is far more than the homebuilders would have been capable of earning in a housing market characterized by an oversupply of vacant homes and banks unwilling to lend to prospective buyers.

By far the most expensive of its 2011 projects, apart from City Creek, is the ongoing \$52 million renovation of the Ogden Temple. According to the church’s website, the temple, dedicated in 1972, will undergo a massive external modification, including a complete redesign of the building’s spire, and will meet more stringent energy efficiency standards and seismic requirements, for a total building cost assessed at \$43 million. Big-D Construction is general contractor on the temple renovation, as well on a new underground parking structure that received a separate building permit with a \$9.4 million valuation.

Other big-ticket items receiving building permits in 2011 include the \$13.2 million remodel of the Missionary Training Center in Provo. That figure is the tallied valuation of four permits worth \$4.4 million, \$2.5 million, \$3.1 million, and \$3.2 million issued respectively in May, August, September and December of last year. Okland Construction is the general contractor on all four permits.

For Okland, the MTC remodel has been laying golden eggs for some time. In January 2009, the LDS Church obtained a building permit valued at \$2.2 million for the project, and in March 2010 a private company called MTC Partners obtained a building permit for \$9.5 million worth of construction on the Provo site where LDS missionaries undergo language and other training before departing on LDS missions.



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Residential construction in Utah may, at last, be slowly improving, according to three company execs

By Andrew Haley

The Enterprise

Executives at three Utah residential construction companies told *The Enterprise* that business is slowly improving after catastrophic losses in 2009.

Bill Perry, CEO of Perry Homes, said January sales at his homebuilding company are up considerably, year to date, and have been steadily improving. Perry Homes has been building single-family homes along the Wasatch Front for more than 30 years. But despite improved sales, homebuyers remained skittish, Perry said. "I think the market in the Wasatch Front area has improved. It's not substantial. [But] it's improved in the four months since August. The low point was August, when the government couldn't get its stuff together. August was terrible," he said, referring to Congress' showdown over the debt ceiling.

"In July we sold 10 houses. In August we sold one. In September we sold three. In October we sold seven. In November we sold seven and in December we sold six," Perry said. "Typically November and December are slow anyhow and typically August is a busy month. I don't think it so much killed the market as people didn't know what to do."

With sales this month up significantly YTD, Perry remained cautious about the

coming year.

"We had four sales in the first two weeks of January. Last year we had four sales for the entire month. Now I don't believe this year will be twice as good, but I think we'll see a 15 to 20 percent increase. It won't even get us to halfway of 2006. We dropped 74 percent."

Perry said 2009 was by far the worst year in memory for his company sales-wise. Though the crisis hit much of the industry in 2008, for Perry Homes that year was buoyed by sales carried over from 2007. After plummeting sales finally bottomed out, Perry said they improved 5 percent in 2010 and between 10 and 15 percent in 2011, though growth was still spotty.

"Some areas are better than others. I see the hub of the recovery is going to be southern Salt Lake County and northern Utah County," he said.

Leading the rise in sales are what Perry called move-up buyers, or current homeowners looking to buy a larger or improved home. The first-time buyer market is still stagnant, he said. Perry gave credit for the increased sales among move-up buyers to homeowners taking advantage of low interest rates and low housing prices and those families who have outgrown their homes, noting that average sales prices reflect the shift in the market.

"The average sales prices of our homes have gone up 15 percent. The prices of our homes have not increased. People are moving into nicer houses," he said.

According to Perry, increased sales among move-up buyers are not going to solve the housing crisis. Government restrictions on lending and downward market pressure caused by the continuing abundance of foreclosures are hobbling recovery, he said.

"Our biggest problem right now is appraisals. Foreclosures are setting the

price points," he said. "We can't compete with foreclosures."

Perry said government interference, and not overly cautious lenders, are to blame.

"I wouldn't give any credit at all to the government for helping the market," he said. "Regulations were too loose four years ago and now their too tight and way too controlled by government restrictions on loans and so forth. They're overdone."

see *RESIDENTIAL* next page

Magleby Construction to enter commercial market

Luxury-home builder Magleby Construction has hired former Big-D Construction vice president Greg Fix and launched a new commercial construction division.

Fix launched Big-D's Utah Valley office and turned the branch into a \$100 million-a-year operation, said Magleby president Chad Magleby. Magleby said Fix's "entrepreneurial spirit and the possibility to effect change" as well as "intangible lifestyle aspects" led him to join Magleby's new commercial division as a vice president.

Magleby said his company is well suited to commercial construction because its high-end residential estates and other Magleby-built projects such as the Riverside Country Club and Thanksgiving Point were already more complicated than most commercial construction projects. He also called commercial projects "less demanding customer-wise." According to Magleby, Magleby Construction already had its systems side ready to go and its financial and administrative operations in place to begin commercial work immediately.

"[Commercial] projects have always just come to us. The idea now is to go out after commercial projects instead of waiting around for them to come to us," Magleby said.



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While new home sales in the south end of the Salt Lake Valley and in northern Utah County led Perry Homes' increased sales, Magleby Construction saw sales of its luxury homes in Summit, Salt Lake, Utah and Davis counties follow the lead of the Dow Jones Industrial Average, said Magleby president and CEO Chad Magleby. According to building permit information compiled by *Construction Monitor*, last year Perry Homes received building permits for 54 homes with a total permit valuation of \$11.3 million. Magleby received permits for three houses with a total permit valuation of \$11.6 million.

"We've been in the high-end luxury home market for 37 years," Magleby said.

"Our customers are far less tied to the mortgage market than the stock market. For the last year-and-a-half the market's been pretty stable," he said. "The Dow has been up around 10,000 and 11,000. That's been good for us. A few years ago when the sky was falling and the Dow was down around 6,000 people got worried."

With markets more stable, Magleby said his company consistently is working on six to eight projects, with as many "in the queue." Those projects, all luxury homes, range from several thousand square feet up to 15,000 square feet. The company recently rebuilt the Riverside Country Club in Utah County, a cash cow for the firm.

Magleby described it as a "16-month, 50,000 square foot project with significant

"If you have good credit, and a little bit down — 3.5 percent down — and you have a job, you can get a house. Prices have not increased. Volume has increased. I think we're at the bottom."

cash flow."

Because his customers are generally self-funded and pay cash, they are less constrained by the whims of the mortgage markets. Though they are unfettered by restrictions on credit, sales have yet to return to the heights of several years ago, something Magleby credited to savvy customers taking advantage of the buyer's market.

"Buyers are fewer and farther between. They're looking for good value. These are businesspeople. They're successful because they know how to manage their money," he said.

But Magleby suggested his cash-rich clientele are just as skittish as Perry's move-up buyers in Draper.

"We're going to be OK in 2012 because we're in an election year. Everyone's going to hold tight. Then, depending on the election results, we'll see what people do. If the White House doesn't change over, the people I do business with will go into hiding for three or four years," he said.

Bryson Garbett is president and CEO of Garbett Homes, which he founded in 1988. He gave the government slightly more credit, calling Utah's 2009 New Home Purchase Grant "the most effective thing I've seen. The tax credit helped a little."

Garbett said his company has also seen strong sales since August, with double-digit sales in December and January.

"The first 10 days of January we sold

a house a day," he said.

According to *Construction Monitor*, in 2011 Garbett Homes received 229 building permits with a combined permit valuation of \$31.2 million.

Garbett said sales first started picking up at the end of summer, but were still well below the high water mark set in the middle of the last decade.

"Our sales increases have been huge, over 100 percent if you go on a monthly basis. One month we had almost a 200 percent increase in sales. But that's percent, not homes sold," he said.

Garbett said market forces have aligned to create a terrific buyer's market. He said three factors have made new home purchases irresistible to prospective buyers — low interest rates, low housing prices and the prevalence of cost-saving, energy-efficient technologies.

"I've been in the industry for 40 years and I've never seen such a good time to buy a home," Garbett said.

"We have homes now that are selling in the \$150s that are energy-efficient. We're selling houses with geothermal heating in the \$150s. It's a great time to get an energy efficient home," he said.

Garbett dismissed the perception that banks aren't lending to potential homebuyers.

"If you have good credit, and a little bit down — 3.5 percent down — and you have a job, you can get a house. Prices have not increased," he said. "Volume has increased. I think we're at the bottom."

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Good project management must include good risk management, according to downloadable report

The complexity of construction projects creates greater risks for inefficiencies than those faced by other industries, thus, good project management must include good risk management, according to McGraw-Hill Construction's latest SmartMarket Report, "Mitigation of Risk in Construction."

Mitigating risk can yield significant cost benefits, yet risk assessment procedures are more widely adopted than risk mitigation, with 43 percent of owners, architectural and engineering firms and contractors reporting that one quarter or less of firms use formal mitigation procedures. The report, sponsored by Navigant and Pepper Hamilton LLP, was released Dec. 15, 2011 at the 26th annual Construction SuperConference in San Francisco.

"Investing in risk mitigation represents a great opportunity for firms in the construction industry to improve their bottom-line and increase productivity," said Harvey Bernstein, vice president, industry insights and alliances, McGraw-Hill Construction. "The results reveal that the industry understands the key risks and the strategies, like BIM [building information modeling] and integrated teams, that help address risks. The firms that will have an edge in this difficult construction market are the ones that understand the value of

Construction professionals estimate that 11 percent of their projects get embroiled in disputes, and the average claim totals over \$3 million.

risk mitigation and recognize they can no longer continue business as usual."

The in-depth report identifies the risks the industry is most concerned about today: schedule and scope creep (24 percent of projects are delayed), budget and cost overruns (19 percent go over budget), project process approvals, safety, and site conditions. Bottom-line and performance risks are regarded as the most serious. However, these factors are under a firm's control, so effective mitigation strategies can directly have a positive impact.

"Construction professionals estimate that 11 percent of their projects get embroiled in disputes, and the average claim totals over \$3 million," said Bruce Ficken, Pepper Hamilton partner and head

of the firm's construction practice. "While we can help with litigation if it goes that far, we would rather advise clients on how to avoid legal claims through risk mitigation. There is a lot you can do throughout the project lifecycle that will significantly reduce risk and unnecessary costs."

Addressing risk early helps firms reap the full benefits of risk mitigation and is one of the chief recommendations in the report. The report also suggests strategies such as building a strong project team, communicating clearly, embedding risk management into firm culture, implementing a rigorous risk assessment and mitigation process, engaging in activities that reduce the likelihood of litigation, and utilizing technologies such as BIM. Over

70 percent of respondents report that using integrated teams and BIM software reduces project risk.

The most complex projects in the construction industry are often those in the infrastructure sector, and the report takes an in-depth look at this sector, while also detailing risks related to the energy sector, health care, insurance considerations and sustainability, as well as insights into how design-build and integrated project delivery can reduce risk. Expert interviews and case studies offer insights from around the U.S. and world, such as the Pentagon Renovation Wedges 2-5, Utah's I-15 Corridor Reconstruction, and New York's World Trade Center 2, 3 and 4.

McGraw-Hill Construction conducted the 2011 Risk Mitigation Study in October 2011 to assess the level of impact caused by risks, the scope of use of risk assessment and mitigation procedures, and the frequency and causes of litigation, particularly for firms that work on infrastructure projects worth \$100 million or more. In addition to the primary study and dozens of interviews, an online survey focusing on risk mitigation in the energy sector was also carried out among Construction Users Roundtable (CURT) members. For more information or to download the report, visit <http://bit.ly/s2auFZ>.



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Nonresidential construction spending increased 0.9 percent in November

Total nonresidential construction spending increased 0.9 percent in November to a seasonally adjusted annual rate of \$555.7 billion, according to a Jan. 3 report by the U.S. Commerce Department. However, total nonresidential spending is down 0.1 percent from one year ago. (see graph).

Private nonresidential construction spending was unchanged for the month, but is 4.5 percent higher than November 2010. Public nonresidential construction jumped 1.8 percent in November, but is still down 4.4 percent year-over-year.

Nine of the 16 nonresidential construction subsectors posted increases in spending for the month, including power, up 5.1 percent; sewage and waste disposal, 3 percent higher; public safety, up 2 percent; health care, 1.9 percent higher; and highway and street construction, up 1.9 percent. Four subsectors experienced increases in spending from one year ago, including manufacturing construction, up 13.3 percent; commercial construction, 11.4 percent higher; power construction, up 6.5 percent; and education-related construction, 3.9 percent higher.

Seven nonresidential construction subsectors had decreases in spending for the month, including conservation and development, down 11.6 percent; communication, 4.9 percent lower; water supply, down 4.3 percent; religious, 4.3 percent lower; and amusement and recreation-related construction, down 3.5 percent. Twelve subsectors are down from November 2010, including conservation



and development construction, down 23.3 percent; religious construction, 23.1 percent lower; lodging construction, down 19 percent; water supply construction, 10.6 percent lower; and communication-related construction, down 9.4 percent.

Residential construction spending increased 1.8 percent in November, and rose 2 percent during the last 12 months. Overall, total construction spending — which includes both nonresidential and residential — rose 1.2 percent in for the month, and is 0.5 percent higher than November 2010.

“November’s nonresidential construction performance was solid,” said Associated Builders and Contractors chief economist Anirban Basu. “The increase in spending was broad-based and encom-

passed both private and public construction.

“While privately purchased nonresidential construction has been rebounding for quite some time and is up 4.5 percent year over year, publicly-purchased construction has been in general decline. That changed in November, with public construction up nearly 2 percent, led by increased purchases in the power, health care, office and sewage and waste disposal categories.

“It should be noted that these data are seasonally adjusted, which means they attempt to account for seasonal weather conditions. Because November was unusually mild in much of the nation, the improvement in nonresidential construction spending may at least be partially

attributable to weather rather than economic factors.

“In addition, December was also unusually temperate, with the implication being that next month’s report may also be positive.

“Despite the recent momentum in nonresidential construction spending, there remain plenty of reasons for concern. Lending conditions continue to be disciplined and state and local government budgets remain stressed — not a good combination to push the nonresidential construction industry out of the doldrums.”

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FFKR Architects 730 Pacific Ave Salt Lake City	801-521-6186 801-539-1916 ffkr.com	36	9	\$18.3 million	Corporate, cultural, health and science, k-12, hospitality, higher education, historic, sports and recreation, institutional and interior design	Kenneth E. Louder
MHTN Architects, Inc. 420 E South Temple #100 Salt Lake City	801-595-6700 801-595-6717 mhtn.com	29	4	\$12.6 million	MHTN specializes in providing vision-focused planning and design services to higher education, k-12 education, civic, commercial, health care and cultural clients locally and around the world. Talented people working together to create great ideas every day.	Peggy McDonough
VCBO Architecture 524 S 600 E Salt Lake City	801-575-8800 801-531-9850 vcbo.com	20	9	\$15 million	K-12 education, higher education, health care, office, interiors, sports and recreation, justic, manufacturing, data centers, commercial, civic/government, housing	Niels Valentiner
CRSA (Cooper Roberts Simonsen Associates) 649 E South Temple Salt Lake City	801-355-5915 801-355-9885 crsa-us.com	16	3	\$514,000	Architectural design and construction, architectural renovation, restoration, and preservation, LEED/sustainable design, local and regional planning services, master planning, facility assessment, interior design, landscape architecture, public and institutional participation process assistance, visioning and illustrations	Allen D. Roberts
Naylor Wentworth Lund Architects 336 S 400 W Salt Lake City	801-355-5959 801-355-5960 nwlarchitects.com	14	6	\$9.3 million	NWL architects offers professional expertise in programming, master planning, architectural design, interior design and construction administration of education, governmental, religious, civic and commercial facilities	Ross L. Wentworth
EDA Architects, Inc. 9 Exchange Place, Ste 1100 Salt Lake City	801-531-7600 801-363-3149 edaarch.com	12	5	DND	Architecture, master planning, programing, architectural interior design and LEED services	Peter duP. Emerson, Burke Carwright, John Shuttleworth, Thomas Brennan, Greg Brooks
Design West Architects 795 N 400 W Salt Lake City	801-539-8221 801-539-8224 designwestarchitects.com	11	1	\$3.5 million	Education, health care, housing municipal, hospitality, interior design, landscape architecture	Blake Wright
ASWN+ (Allred Soffe Wilkinson & Nichols, Inc.) 515 S 900 E Ste 200 Salt Lake City	801-269-0055 801-269-1425 aswn.com	5	1	\$3.5 million	Architecture, interior design, landscape architecture, land planning, civil engineering, surveying, construction management	James F. Allred
Archiplex Group, LLC 255 Crossroad Square Salt Lake City	801-961-7070 801-961-7373 archiplexgroup.com	2	1	DND	Commercial, institutional, government, residential-focusing on sustainable design.	Ralph Stanislaw

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Top Engineering Firms in Utah

Ranked by Number of Professional Engineers in 2011

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Company Name Address	Phone Fax Web	# of Professional Engineers	# of Graduate Engineers # of Utah Employees	Engineering Services	Notable Utah Projects	Owner/Managing Principal
MWH Americas, Inc 10619 South Jordan Gateway, Ste 100 South Jordan	801-619-3200 801-619-4200 mwhglobal.com	45	60 90	Water, wastewater, environmental engineering	Central Weber Sewer Improvement District Plant Upgrade & Expansion	Stan Postma
Van Boerum & Frank Associates, Inc 330 S 300 E Salt Lake City	801-530-3148 801-530-3150 vbfa.com	28	44 87	Mechanical, electrical, plumbing, fire protection, commissioning, energy	Galliran Center, LDS Temples throughout the world, Vernal Municipal, J.L. Sorensen Rec Center	Kim P. Harri
Spectrum Engineers 324 S State Street Ste 400 Salt Lake City	801-328-5151 801-328-5155 spectrum-engineers. com	25	5 66	Mechanical, electrical, technology, acoustical and fire protection engineering and lighting and theatre design	Salt Lake City public Safety Complex, Adobe Utah Technology Campus, Nu Skin Innovation Center, Natural History Museum of Utah at Rio Tinto Center, Utah Valley University Life Center Complex, University of Utah Thatcher Building for Biological & Biophysical Chemistry	Stewart E. Greene & David E. Wesemann
Ensign Engineering and Land Surveying, Inc 45 W 10000 S Ste 500 Sandy	801-255-0529 DND ensignutah.com	21	26 50	Civil engineering, structural engineering	Hill AFB Military Housing Project, Desert Chemical Depot, Cedar City Aquatic Center, Legacy Crossing Theaters, LDS Church Graite Mt. Records Vault.	David Jenkins
Reaveley Engineers & Associates 675 E 500 S Ste 400 Salt Lake City	801-486-3883 801-485-0911 reaveley.com	15	21 35	Structural design, seismic analysis, seismic retrofit / existing structures, analytical Studies of structures, concrete restoration, master planning, feasibility studies, programming, schematic design, design Development, contract documents, construction phase services, value engineering & peer reviews	University of Utah College of Nursing, Jordan Valley Water Treatment Plant Filter Gallery & Chlorine Room, Ogden-Weber Applied Technology Center, Ogden High School Seismic Retrofit, Ph. III, University of Utah USTAR, Leonardo Seismic Upgrade, Huntsman Cancer Hospital, Ph. 2B	Parry Brown
CLC Associates, Inc 231 W 800 S Ste A Salt Lake City	801-363-5605 801-363-5604 clcassoc.com	14	14 18	Land development, site civil, erosion control, infrastructure, entitlement processing	Draper Station-Frontrunner- Anchored Transit Oriented Development, Scheels-114th S. I-15 Intersection- Sporting Goods Super Center, Ogden Wal-Mart	Matthew D. Idema
Stantec Consultation Services, Inc 3995 S 700 E Ste 300 Salt Lake City	801-260-0090 801-266-1671 stantec.com	14	1 55	Water resources, hydrogeology, water and wastewater planning and engineering, structural engineering, site engineering, environmental remediation and monitoring, wetland delineations, floodplain mapping, FEMA studies, avian and bat monitoring and mitigation	Eagle Mountain City WWTP, North Jordan canal system, 60-mile raw water supply for energy development near Vernal, wastewater treatment plan for Mesa Verde National Park, UST remediation and monitoring in Grand Teton National Park	John Wainwright
Carollo Engineers 1265 E Fort Union Blvd Ste Cottonwood Heights	801-233-2500 801-233-2501 carollo.com	11	8 17	Study, design and construction management of water and wastewater treatment and infrastructure	Central Utah WCD Utah Valley Water Treatment Plant	Rick D. Wheadon
Dunn Associates, Inc 380 W 800 S Ste 100 Salt Lake City	801-575-8877 801-575-8875 dunn-se.com	11	11 19	Structural Engineering	Utah Museum of Natural History, U of U Spencer Fox Eccles School of Business, Holland Centennial Commons at Dixie State	Ronald H. Dunn
BHB Consulting Engineers 2766 S Main St Salt Lake City	801-355-5656 801-355-5950 bhbenigneers.com	10	16 26	Full service structural engineering	U of U Medical Office Building in South Jordan, Building 6 at the Gateway, Granger H.S. Replacement, Hurricane H.S. Replacement, IHC Distribution Center	Don Barder & Chris Hofheins
Envision Engineering 244 W 300 N Ste 100 Salt Lake City	801-534-1130 801-534-1080 envisioneng.com	5	4 22	Envision Engineering is a full service electrical engineering firm specializing in power distribution, lighting design, low voltage systems, studies, programming, and sustainable design for educational, religious, municipal, health care, commercial, and industrial facilities.	WSU Davis Campus Classroom Building & Central Plant; BYU Life Science Museum Expansion; LDS Temple - Ft. Lauderdale, FL; LDS Temple - Ft. Collins, CO; LDS Temple - Provo Tabernacle; SLCC Herriman Campus Master Plan; Gateway 6 Office Building	Jeff Owen & Dave Whitton

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Top Engineering Firms in Utah

Ranked by Number of Professional Engineers in 2011

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Company Name Address	Phone Fax Web	# of Professional Engineers	# of Graduate Engineers # of Utah Employees	Engineering Services	Notable Utah Projects	Owner/Managing Principal
Mid-State Consultants, Inc 1475 N 200 W Nephi	435-623-8601 435-623-8610 mscon.com	5	2 70	Mid-State is a Nationwide Engineering Firm with its corporate office in Nephi, Utah and multiple offices across the country. We provide telecommunications engineering services for inside and out side plant, design, CAD, records conversion, right-of-way acquisition, GPS field verification and mapping.	Mid-State continues to provide assistance to independent telephone companies in Utah with various projects. We also recently assisted a higher learning institution with engineering services for a fiber optic facilities connecting multiple sites throughout Salt Lake City and between its campus and a data center.	Steve Kidd
Dominion Engineering 5684 S Green St. Murray	801-713-3000 801-713-3030 dominioneng.net	4	DND 18	Civil Engineering, land planning, and survey	McDonalds, Harriman Town Center, Freeport #7, The Point Building #6	DND
J.M. Williams & Associates/ AE URBIA 2875 S Decker Lake Dr Ste 275 Salt Lake City	801-575-6455 801-575-6456 aaurbia.com	2	2 10	Structural engineering for all building types, seismic reports and upgrades, property reports, architecture, design-build, integrates delivery, commercial and residential.	LDS Motion Picture Studio Jerusalem Set, Quality Bicycle Products, Thanksgiving Point Wellness Center, Gardener Mountain home, Independence Student Housing	James M Williams

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