HANG EM’ HIGH

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A/E/C TECHNOLOGY
2017 LEGISLATIVE RECAP
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On the Cover: Crane operators lift one of many panels that are over 60 feet in length as part of Entrata’s new office building in Lehi, Utah (photo courtesy AE Urbia).
Making Progress

Hard to believe we’re more than one quarter through 2017! Lots of good things are happening throughout Utah this year - in fact, it’s hard to drive anywhere without seeing some kind of construction activity. Doesn’t matter if it’s vertical or horizontal - progress is being made on numerous fronts.

This issue of UC&D includes unique project features (the new Entrada HQ in Lehi, a look at the thriving K-12 market) and a host of guest columns from various A/E/C professionals. We appreciate all those who contributed their expertise within these pages.

Our A/E/C People section is also something we’re proud to include on a regular basis. In this issue we profile a host of individuals who are making their way up the corporate ladder. It’s refreshing to see the variety of people making positive contributions within their firms and to the industry as a whole.

When driving south on I-15, as you enter Utah County, it is hard to miss Entrata’s new corporate headquarters rising to the east. As it overlooks part of Utah’s silicon slopes what many people don’t realize is that this landmark four-story building is a tilt-up concrete structure. This same practice which is typically used in class C industrial space was designed and built on a fast track schedule and showcases class A finishes and amenities. Check it out on page 28. Its official ribbon cutting and open house on March 17th represent another local Utah company making substantial progress and impacting its respective marketplace. Kudos to the design team and contractors who made their vision a reality.

The Living Zenith project at approximately 11th South and 4th East in Salt Lake City is an innovative approach by Redfish Builders and its collaborative partners to create the first net zero community in Utah. Catalyzed by a trip to the Mekong River husband and wife duo Mitch Spence and Tiffany Ivins set out to create the healthiest homes in Utah utilizing renewable finishes and solar energy production among a list of strategies to achieve net zero status. This article (pg. 42) as well as guest columns from Daniel Pacheco (pg. 12), Utah USGBC director, and Matthew Garlick, (pg. 50), with Total Building Commissioning, help each of us strive to make progress on lessoning our environmental impact in our work and personal life.

As always, we appreciate your interest in our publication and encourage you to reach out to us with news about your firm and the people who make it happen.

Regards,

Bradley Fullmer
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Herriman, UT

This 42-acre plot includes a 208,000 sq. ft. solar-powered indoor soccer training facility that is the largest pre-engineered free span building in North America.
It’s a race to produce the first standardized autonomous vehicle. In the heat of the pack, Google and Uber are caught up in a legal battle over LIDAR—an acronym for Light Detection, And Ranging technology—a vital component of self-driving cars. While these tech companies fight to own a custom version of this digital measuring tool, the state of Utah is utilizing LIDAR to change the way we build roads, bridges, and other infrastructure projects.

LIDAR is a surveying method that measures distance to a target by illuminating that target with a laser. The machine—available in static, mobile and aerial applications—collects very dense and highly accurate points, which allows precise identification of objects.

In just 90 seconds, LIDAR can capture everything in every direction for 300 meters, collecting 1.4 million points per second. To put that in perspective, the LIDAR technology can capture more data in two minutes than my surveyor grandfather captured in his 50-year career.

To make the data meaningful, measurements are taken at various set points and then automatically pieced together to create a computer-generated 3D-model of any project site. The result is an almost precise replica, viewable from any angle with an eighth of an inch degree of accuracy.

When combined with video and photography footage captured through small unmanned aerial systems (sUAS), these 3D models provide the project owner, engineer and contractor with the most accurate depiction of existing conditions the industry has ever seen.

Capitalizing on this technology, UDOT has initiated a series of projects called Intelligent Design Construction (IDC), where paper production plans are reduced or eliminated from the project. Instead, the entire contract is based on a pre-construction 3D-model and a post-construction 3D-model. Essentially, the industry is moving from marking plans with a red pen to identify final changes, to actually giving the owner back a 3D-model at project finish to prove the work is complete, to specifications, and fulfills the design intent.

In October, UDOT completed its first IDC project and the country’s first state-funded road project built around a 3D computer-generated model.

SR-20, Passing Lane MP 10 to MP 12 was awarded to W.W. Clyde & Co. in April of last year. The project required creating an additional lane for two miles of winding road on a state highway in Iron County. The entire project was constructed using LIDAR-generated models. The job was completed early and under budget, receiving a Project of the Year Award and an Innovation Award from UDOT.

With the success of the SR-20 project, UDOT has classified multiple 2017 projects as IDC jobs.

UDOT’s vision to eliminate the substantial amount of money and time spent on plan production is not the only benefit resulting from LIDAR technology and high accuracy 3D-modeling. We are seeing favorable outcomes throughout the entire construction process for multiple involved parties.

**PRECONSTRUCTION**

At the get-go, having the 3D-model gives the project team an amazingly accurate as-built to start preconstruction planning and engineering. Instead of relying on potentially outdated survey data, same-day LIDAR scans make it possible to verify the design plans—and shorten the overall design schedule.

LIDAR picks up even the smallest details. We’re talking everything: paint markings, cracks in a structure, bumps, rutting in the asphalt, roadway markers, powerline interferences, utilities and manholes, etc. This benefits the contractor in two ways. One, potential problems are identified before construction begins. Two, the pre-construction model can be used as proof of initial condition if concerns are raised by citizens or other impacted parties throughout the construction process.

**CONSTRUCTION**

As the physical work begins, subsequent models provide as-built progress surveys for the project team. The LIDAR and sUAS technologies allow the contractor to produce progress photos and quantity surveys to simplifying the billing process.
With the availability of current, accurate data, engineering modifications or changes to the design can be made quickly and effectively, without the burden of reprinting various plans and specifications that were affected by the change.

**POST CONSTRUCTION**

Another huge benefit to the project owner and future contractors is the final model. As-built data is collected for features installed underground and updated in the 3D-model, allowing for easy location in the future and for clash detection software to find potential conflicts in the computer before the work starts, not during construction when these conflicts can cause major delays and impact costs.

Access to the final as-constructed 3D-model helps UDOT and other agencies with maintenance of roads, including striping, mile-markers, and placement of rail posts.

**MOVING FORWARD**

Every part of this technology is improving the way engineers and contractors work. It’s safer, faster and providing more accurate surveying to improve design and reduce the cost of rework.

You can either help make the rules and be part of the conversation early, or you’ve got to live by someone else’s after the fact – like it or not. We’re happy to share our experience on what works and what doesn’t to make sure the expectations are re-written in a way that makes sense for the work in our industry. It’s exciting that Utah is taking the lead on making 3D models the standard for transportation construction.

---

*Lance Greer is a third-generation surveyor and a 3D-modeling expert representing contractors in the Federal Highway Administration’s Every Day Counts initiative. He currently works for W.W. Clyde & Co. as area manager of the company’s survey and automated machine guidance division. You can contact him at lgreer@wwclyde.net*
Alphabet Soup

Beyond acronyms USGBC raises awareness of green building principles and practices.

By Daniel Pacheco

Will you join me and my MLAB for a “cup of alphabet soup”?

I am Daniel Pacheco and I started my career in 1985 at United Way working with Utah’s Architects, Engineers and construction companies. Today I am a Director for USGBC. Over my career I have seen how every industry is challenged with unique jargon and then when the people part of a project comes together we see Gold and even more!

What does this have to do with you? Lots! USGBC is the U.S. Green Building Council. I work with the local volunteer board known as a Market Leadership Advisory Board (MLAB) engaging and supporting the Utah Community that includes architects, designers, builders, owners, building managers and occupants of commercial, retail, educational, religious and residential buildings – people that LIVE, LEARN, LABOR or WORSHIP in Utah.

Our primary purpose is to raise awareness of green building principles and practices among the green building community and general public as well as provide a forum for communication, networking and recognition for the green building community.

Partners and members include local green building enthusiasts, spanning the industry from real estate professionals to designers, owners, engineers and product representatives. We strive to engage a broad green building community to help progress our vision and mission and work toward a sustainable and regenerative built environment within a generation.

The mission of USGBC Utah is to create an environmentally, socially, and economically sustainable way of life by transforming how neighborhoods and buildings are designed, built, and operated. We hope to achieve this mission through education and outreach to our community and transformation of our built environment.

Like in all sectors, our ‘alphabet soup’ may sound foreign as new terms are introduced. Often when I introduce myself people hear “USGBC – green building – sustainability” and quickly respond “OH the LEED’S People?”. I have to respond “Actually it’s LEED” (Leadership in Energy and Environmental Design) the most widely used green building rating system in the world. LEED is available for virtually all building project types, from new construction to interior fit-outs and operation & maintenance. LEED provides a framework that project teams can apply to create healthy, highly efficient, and cost-saving green buildings. LEED certification is a globally recognized symbol of sustainability achievement.

Today there is LEED, LEED GA, LEED AP, LEED EB and on and on. USGBC is changing and adjusting to the marketplace. USGBC Utah is now part of the national organization with enhanced services for the local market. What are those services? In plain terms, it is education, networking, advocacy and service. In technical terms it is access to the worldwide LEED rating system and building standards that have stretched the thinking in green building and sustainability.

USGBC is changing! Now is the time for you to learn more. I’d love to tell it all here but must refer back to the invitation to join us for a cup of “alphabet soup”. You can learn of the partnership of USGBC and GBCI (Green Building Certification Institute). USGBC is partnering with many organizations to push our mission of green building transformation further than ever before. GBCI has expanded beyond administering LEED to include a suite of complementary certifications and professional credentials. GBCI now exclusively administers certifications for PEER standard for power systems, the WELL building standard, Parksmart, the Sustainable Sites Initiative (SITES®), Zero Waste Facility Certification and the GRESB benchmark, which is used by institutional investors to improve the sustainability performance of the global property sector. Additionally, GBCI just announced the formation of a new technology organization to support the missions of USGBC and GBCI. Arc is a state of the art platform that will allow any building to participate and immediately start measuring performance, make improvements and benchmark against itself.

Bottom line – schedule time for a “cup of alphabet soup”. Learn what’s new. Call me at 801-987-0891.

Daniel Pacheco is the Director of the Utah US Green Building Council. He can be reached via email at dpacheco@usgbc.org.
**Marketing Strategies**

**Question and Answer Sessions**

The Q&A period is your opportunity to prove you can be trusted with their money, their job, their business, and their dream.

By Frances Pruyn, CPSM

“*We won it in the Q&A.*”

Yep, you can score big with a selection committee during the question and answer period and be awarded a project. You can also go down in flames when one team member appears arrogant, demonstrates how little s/he knows about the client’s project, or has lousy chemistry with the rest of the team.

So, yes, we rehearse and rehearse and rehearse a presentation only to mess it up in the Q&A. Remember to rehearse the Q&A, and be mindful that:

- **People ask questions that they already have the answers to.** It is a test. The challenge is not just answering the question intelligently, but also providing the answer the questioner wants to hear. That means doing some homework about the project and the committee members.

  EXAMPLE: Is there enough money in the budget? Actually probably not, or they wouldn’t be asking the question, but what are they really asking? Do they just want you to say yes, so they can hold you to it? Do they think that you might want to “design the Taj Mahal” and you don’t understand their need to be frugal? Or do they know there isn’t enough money in the budget and want to get validation in front of his or her colleagues? The best answer is specific, “the Utah average cost for this building type is $____. Your budget is $____. That makes it tight, and we will have to set priorities (or we will have to be creative)”

- **Try not to over-answer questions.** Start with a brief, clear and direct response. After that, you can explain yourself, but get to the point, don’t show off. Sometimes the answer is yes or no. Say that first. This does mean you have to have thought of an answer in advance. Try not to think and talk at the same time.

  EXAMPLE: What is the biggest risk in this project? Again, what does the person asking the question think is the biggest risk in the project? Is it budget, schedule, or lack of communication? It is typically one of those three things, or things like bad soils or shortage of labor or a huge steering committee, that will impact the budget, schedule, or communication. Have a plan you can explain in one sentence how to mitigate that risk.

- **Assign questions to be answered by one person!** Then let that person answer the question, don’t pile on. The exception is if you are sure that the person answering the question misunderstood it. Then redirect the question back to the selection committee member, “Mr. Client, did you want to know if the budget is realistic or how we are going to keep within the budget?” Once the question has been clarified, let the guy assigned to answer the question answer.

- **Stay on point.** It is easy to go down dirt roads when you start talking about subjects that are complex, or about which you know a lot. Answer the question, don’t school the client.

- **Even if the question seems stupid, respect it with an intelligent answer.** If you want a selection committee member to vote for you, best not to embarrass them in front of their colleagues.

There is no foolproof way to be prepared for every question that a prospective client can throw at you. Still, you need to be prepared with a short answer to every question you can imagine.

The Q&A period is the time you can show real enthusiasm for a project and demonstrate your creativity, your ability to listen and your team’s compatibility. The Q&A period is your opportunity to prove you can be trusted with their money, their job, their business, and their dream. Be direct, be sincere, be honest, and be disciplined, disciplined, disciplined.

Frances Pruyn, Senior Principal of Marketing and Business Development for CRSA and served as the 2016-2017 Utah Chapter Society of Marketing Professional Services (SMPS) President. She earned her Certified Professional Services Marketer (CPSM) designation in 2015, a certification by SMPS which advocates for, educates, and connects leaders in the design and building industry. To learn more about SMPS and the certification program, contact Marketing Manager Michele Santiago at 800.292.7677, x245, or michele@smps.org, or Certification Manager Kevin Doyle, x232, kevin@smps.org. Information also is available at www.smps.org.
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ENGINEERING
So another 45 day session of the Utah State Legislature is now in the rear view mirror. In many ways, it was an uneventful year, in other ways, it was extraordinarily busy. How can that be, one might ask? Well, when you look at or count the number of bill files opened, it’s a staggering number…. well over 1,000, in fact, there were nearly 1,400 with 535 of those being passed.

It was a very busy year, yet in the same breath, I recall several committee meetings that were cancelled well into the session. So, I guess from that standpoint, uneventful may be a good word.

From the Associated General Contractors standpoint, our legislative committee met weekly to review new legislation, assist with drafting legislation, amending current bills being considered and developing positions to share with our elected leaders. For AGC we were tracking approximately 30-40 bills and actively working 10-15. And in our look back at the 2017 Utah State Legislative Session, we believe the construction industry overall had a pretty good year. Few bills passed that had a negative impact on contractors, specialty contractors or service suppliers. On the other hand, several bills passed that we believe will help make our industry better.

This would be a good time to express our industry thanks to members of the House & Senate, along with the Executive Branch for their leadership. Utah is a great state, with great leaders, who really care about the citizens that call Utah home. They work hard to balance the never ending needs that constituents bring forth each year. Education, infrastructure, taxes, social needs and demands, and health care are but a few of the items that fill our elected leaders’ calendars. AGC says great job for all you do and accept our thanks for keeping Utah number one in so many ways.

OK, let’s look at a few of the construction related bills. (in no order)

- HB 313 S2 License Changes (passed), Rep. Schultz. Bill addresses electrical contractors; licensing of contractors in various trades and license classifications and addressed contractor experience.
- HB 327 Nighttime Highway Construction Noise Amendments (held), Rep. Christofferson. Bill modified the definition of nighttime construction activity, to allow material to be delivered to an active jobsite.
- SB 276 S1 Transportation Funding Amendments (passed), Sen Van Tassell. Bill changes the collection of taxes in determining the motor & special fuel tax.
- HB 357 S3 Homeowners Association Revisions (passed), Rep. Knotwell. Bill addresses how HOA comply with certain provisions prior to being able to bring a legal action.
- HB398 S2 Procurement Code Amendments (passed), Rep. Froerer. Bill addressed, among other things how or when a Best and Final Offer (BAFO) form of state purchasing can take place.
- HB 460 Capitol Development Projects Bonding Amendments (passed), Sen. Bramble. Bill increases the authorization of bonds ($100 Million) for the new state prison.
- SB 92 Workers Compensation Fund Revisions (passed), Sen. Bramble. Bill addressed changes in the WCF as they transition to a mutual insurance company.

Rich Thorn is the President/CEO of the Associated General Contractors of Utah. He has four decades of experience working in the construction industry, including nearly 35 years at the AGC. He can be reached at rthorn@agc-utah.org or (801) 363-2753.
Ray’s company buys more than 120 Fords every year.

Ray Gammell is the Vice President over Equipment and Facilities at Clyde Companies, Inc., assuring over 750 Fords keep working as hard as the people who drive them. He had worked with Ford Fleet Care, but the bills quickly became too hefty. Eventually, Ray met Jared Robinson of Ken Garff Ford’s Fleet Services, who was able to negotiate better repair rates for everything from oil changes to engine replacements. When asked what his thoughts were on Jared, Ray said, "it doesn’t get any better than this guy."

To have a fleet experience like Ray’s, start by calling 877.621.2563 or visiting KenGarffFord.com.
Salt Lake-based Midwest D-Vision Solutions (MWDS), a leading supplier of glass and glazing, commercial flooring and construction specialty products and services, announced the asset acquisition of Daw Construction’s Door and Hardware Division on March 15.

Daw Construction of Draper is a long-standing, well-respected provider of construction services in the Intermountain West with services including drywall, doors and hardware, insulation and interior construction services. Daw Construction and MWDS have a successful history of working together, and a great mutual respect for the services and expertise that each company brings to the construction market.

Greg Letey, General Manager of Daw Construction Group said, “Daw Construction is excited to see MWDS acquire our door and hardware division. MWDS takes great pride in delivering professional services and best in class construction products with a personal touch. We are thrilled that our door division employees will be joining Midwest and we know that our customers will be well taken care of.”

Midwest D-Vision Solutions and its parent company Midwest Commercial Interiors, have not acquired any business interest in Daw Construction Group. The acquisition covers only assets (inventory, raw materials and fabrication equipment) associated with the fabrication of commercial door assemblies and door hardware. Current employees of Daw’s door division have been successfully transitioned to the MWDS team.

“The acquisition of Daw Construction’s door division is a great fit for the Midwest Commercial Interiors family of companies. Our goal is to imprint the commercial door and hardware market with our signature “EZ2 Work With” business model and improve the overall value proposition and service level delivered to general contractors throughout Utah,” said Marshall Tate, President and CEO of Midwest D-Vision Solutions.

This acquisition dramatically increases MWDS’s capacity and capabilities in the sale and distribution of commercial hardware packages and access controls. MWDS is now capable of providing comprehensive scope coverage for CSI Division 8 including interior and exterior glass and glazing systems, as well as doors, hardware and access controls.

“The combination of glass and door systems under one roof is really unique. Currently these scope areas are covered by separate subcontractors. MWDS now has the ability to provide a full bandwidth of glass systems as well as door and hardware packages. This translates to numerous benefits for architects, designers, general contractors and building owners. The market has told us clearly that there is great value in having these two scope areas under one company,” said Sean Wright, Vice President of MWDS.

FFKR Architects work on the Philadelphia LDS Temple earned the Trumbauer Award, which recognizes excellence in contemporary classicism by the Philadelphia Chapter of the Institute of Classical Architecture & Art. (photo courtesy FFKR)

FFKR Garners Recognition on Two LDS Temple Projects

FFKR Architects of Salt Lake City has earned awards for two LDS Temple projects located in the Eastern U.S. The temple in Philadelphia – completed last July – is a winner in the inaugural Trumbauer Awards which recognizes excellence in contemporary...
classicism by the Philadelphia Chapter of the Institute of Classical Architecture & Art.

FFKR served as the design architect of record for the 60,000 SF temple in association with Perkins + Will who provided interior design and landscape architecture. The Philadelphia LDS Temple has received glowing local accolades. The owner is the Church of Jesus Christ of Latter-day Saints.

The design is detailed in the Neoclassical revival style of American Georgian architecture. Bold lines are capped by majestic spires, the East topped by a gold leafed statue of the angel Moroni. The Temple's design conforms to the demands of overlapping historic districts, its massing responds to the adjacent Renaissance Revival icons of the Philadelphia Free Library and the Family Courts Building.

The design suggests an American interpretation of Late-Georgian style that reflected notions of democracy and religious freedom. Simple materials, with the enduring forms of ancient temples symbolized all that was great about our new nation.

In addition, FFKR won the Ecclesiastical category for the Seventh Bulfinch Awards for its design of the Hartford Connecticut LDS Temple. The 32,246 SF temple is a single-story building clad in cut stone and highly detailed in the Neo-Classical revival style of American Georgian architecture, with a Federal influence. The temple features carefully proportioned and detailed Ionic pilasters with richly carved capitals and a full entablature and cornice.

The design is based on in-depth research of historic New England and traditional American architecture. Details in the temple's trim and moldings are inspired by nature. Interior spaces are detailed to reflect New England Architecture and ceilings have simple moldings and coffers. The design ranges from simple to large compositions and includes carved wood moldings inspired by the old Connecticut State House.
As a long-time member of Utah’s local construction industry – my father started Salt Lake-based Mountain States Fence in 1963 and I’ve been with the firm much of my professional career after graduating from law school and practicing law in Salt Lake for nine years.

In 2006 I served as Chairman of the Utah Chapter of the Associated Builders and Contractors (ABC). I am also the incoming chair for 2018 (a second chance to get it right!) I also serve as a Trustee on the National ABC Political Action Committee. We collect thousands of dollars in contributions and distribute them to selected political candidates around the country. Mountain States Fence has also been an active member of the Associated General Contractors of Utah since the mid-1960’s.

Some would suggest that my age (66) and experience provide some credence to my observations (others would dispute such an arcane notion). Drawing on the arrogance that comes with age and with the compliment implicit in the invitation to do this article, I have decided to opine and muse about a personal quest. Admittedly, it might be a “Quixotic” quest because the world seems to be moving in a different direction. But, like “tilting at windmills” it is important to me and there may be some aspiring knights or ladies out there who share my feelings.

Humans first began creating rules and laws because as they began to socialize and associate in groups, peaceful co-existence...
became an imperative. After all, they came together because it was too dangerous “out there” by themselves and others could provide many things that the individual could not. Originally, these rules were not too onerous – simply aimed at preventing people from hurting one another. Obviously, somewhere along the way we created politicians to meddle in the political affairs and they greatly expanded the definition of the rules or laws intended to keep us from “hurting” each other.

Similarly, good manners and courtesy were notions that evolved to facilitate we animals living together in, hopefully, polite society. The origins of some of our actions that are traditionally thought to be “good manners” demonstrate the practical reasons for good manners. Almost always, good manners and courtesy helped us to live together in some version of peace and harmony. (Maybe the recent election nastiness and rancor in our society is the result of us denigrating good manners and courtesy. An aside: I supported Trump.)

Take for example, the etiquette dictating that a man should remove his hat indoors. This, like most courtesies and good manners was a demonstration of respect. Warrior headdresses such as knights’ helmets were removed to demonstrate trust and respect as the wearers became vulnerable without their “hats”.

Opening doors for women probably came about because the fashions of the period prevented a woman from reaching the doorknob. Likewise, helping a woman from the coach (or car) was necessitated from the fashions preventing them from seeing the steps.

Essentially, good manners are the best example of “The Golden Rule” – if you are nice to me and show me respect, I will be nice to you and show you respect. It is pretty obvious that this ancient rule had a huge role in helping people of all cultures to get along together.

So, if you have been reading attentively, you realize that RUDENESS is the opposite of good manners and courtesy. Indeed, it is even defined as “unmannerly and discourteous”. For some reason many hold good manners and courtesy in disdain. It is somehow not cool to be polite. A gentleman is an anachronous concept to be disparaged.

Somewhere along the line in the not so distant past in the construction industry, a decision was apparently made to often abandon simple good manners and courtesy in favor of rudeness and bullying as a way to “persuade” cooperation and collaboration on the jobsite. This sort of behavior too often reflects the culture of the company involved. It is interesting to watch because it demonstrates ignorance of the simple fact that “The Golden Rule” works in reverse too.

Thus, this is my quest. Let us teach our employees about tact, which is “adroitness and sensitivity in dealing with others or with difficult issues”. Teach them to be gracious which is “well-mannered, pleasantly kind, benevolent and courteous”. Teach them to show respect in all of their dealings on the jobsite. We should teach them that subcontractors and their employees really are partners and not subhuman bottom dwellers. And general contractors and their employees are not ignorant – but sometimes arrogant bullies. We should accomplish this teaching first by example.

I believe that these things can be taught. Although, I was once told that you cannot really teach good customer service to one who has never experienced it. Everyone has experienced the effect of “The Golden Rule” and we will simply be reminding our folks of how good it felt to be treated with good manners, courtesy and respect.

I respectfully urge all of you to join me in my quest. However, if you choose not to, I will demonstrate good manners and courtesy as a gentleman and not call you foul names, vilify your mother, nor curse you and your progeny.

Rick Higgins is President of Mountain States Fence of Salt Lake City, and a long-time advocate and executive of the Associated Builders and Contractors of Utah (ABC Utah). He can be reached at (801) 261-4224.
The Utah Chapter of the Society for Marketing Professional Services (SMPS) recently announced major award winners.

**Matt Rich**, VP of Business Development at Jacobsen Construction of Salt Lake City, was honored as the 2016 'Marketer of the Year' at the group’s annual Marketing Awards Gala. Top business and industry leaders selected Rich because of his extraordinary marketing achievements in Utah’s A/E/C industry.

“It’s thrilling to be recognized with this prestigious award from SMPS Utah,” said Rich. “The Utah Chapter is an outstanding organization of exemplary industry professionals, and it’s a great honor to be celebrated by them.”

**Rachelle West**, a Business Development Executive at Siemens Industry Inc. of Sandy, was honored as the 2016 ‘Rising Star’ recipient. She has a successful role in the building technology division of her company. A regular day for West may consist of multiple executive tasks including contract negotiations and relationship management. She hopes to learn more from SMPS and continue to further her company’s goals to promote renewable energy and technology.

“We have some amazing people in this business who work together to improve business ethics and streamline processes,” said West.

“Matt has been a long-time member and supporter of our chapter and represents us well, both locally and regionally. He’s a class act and well deserving of the award. Rachelle has proven to showcase her many talents within the A/E/C industry,” said Travis Wilson of Sandy-based Layton Construction, current President of SMPS Utah.

2017 SMPS Utah Board members include a wide range of A/E/C professionals. The board consists of the following: Top row (left to right): Cali Centurion, MGB+A The Grassli Group; Emily Hymas, Jacobsen Construction; Kimberly Johnson, Design West Architects; Stephanie Ray, Baker Int’l; Julee Attig, Reaveley Engineers + Assoc.; Lori Haglund, Van Boerum & Frank Assoc.; Vicky Golie, Babcock Design Group. Bottom row (left to right): Heidi Nielsen, FFKR Architects; Fran Pruyn, CRSA Architects; Amber Craighill, BHB Engineers; Travis Wilson, Layton Construction. Not pictured: Linda Hansen, Ensign Eng. and Design; Keri Hammond, MarketLink.

Salt Lake-based FFKR Architects announced a slew of recent promotions within the firm, including two new Senior Associates (**Larry Curtis; Christina Haas**) and six Associates.

Curtis started at FFKR in 2005. Some of his notable projects include the Provo City Center Temple, City Creek Development, and Daybreak Corporate Center. He’s currently working on Milagro Apartment Tower and Riverwoods Apartments.

Haas is a six-year veteran of FFKR, working on a variety of healthcare projects, including Utah State Hospital, Midvalley Health Center, BioFire Diagnostics, U of U Health Sciences Transformation, and The Center to House the David W. Bernolfo Global Outreach Program. The Moran Surgery Expansion and the U’s Rehab Hospital currently occupy a lot of her time.

Recently promoted to Associate are **Monica Chandler, Chris Bachorowski, Brian Mecham, Jodi Geroux, Tyler Smith** and **Rob Merrick**.

Chandler has been with FFKR since 2012 and has worked on notable projects such as the Hartford Temple, Philadelphia Temple, Tucson Temple, and the Kaysville Library. More recently, she has been involved in the Shoshone-Bannock Casino and the Gateway Condos Lobby Remodel.

Bachorowski started in May 2015 at FFKR. His most involved project is BioFire
Diagnostics Construction Administration. Currently, he’s working on BioFire Diagnostics, Clinical Innovations Medical Device Manufacturing Expansion, and PRA Health Sciences Medical Office Building.

Mecham also started in May 2015 and has worked on Regent Street Garage and the 40 East Building Renovations, First Security Building Entry Remodel, and programming work for a number of LDS Temple Projects. His current lineup includes Regent Street Garage and the 40 East Building Renovations, First Security Building Entry Remodel, HSC Ambulatory Care Complex, and the LDS Manti Temple Renovations.

Geroux and Smith started with FFKR in October 2015. Geroux has worked on the Doubletree Hilton Paradise Valley Remodel and the Hilton Tucson East Remodel. Some of her current projects include InterContinental Kansas City Remodel, and miscellaneous Hospitality and Higher Education projects. Smith has focused the majority of his time at the firm working on projects for Maverik.

Merrick has been with the firm for just over a year and has played a role in the BYU CoGen Facility, and Winger’s Restaurant and Alehouse.

FFKR also recently announced that Intern Architect Pierre Fagerlund has succeeded in passing the rigorous Architect Registration Exams (ARE). A native of Michigan, Fagerlund holds a Master of Architecture from the University of Utah, where he was an Honors Award recipient for his graduate thesis.

He began working at FFKR in 2011 and hopes to be licensed by June, once paperwork requirements are satisfied. Fagerlund has architectural design experience in multifamily housing, healthcare, K-12 education, and graphic design.

Salt Lake-based Van Boerum & Frank Associates (VBFA) has promoted two engineers to Associate Principals. Ryan Van Voast is an electrical engineer based in VBFA’s Salt Lake City office. He has experience in the design and engineering of airport, education, multi-family housing and commercial projects. In this capacity, he assumes responsibility for the growth and success of VBFA’s electrical division, and plays a key role in VBFA’s Commissioning Team.

He has provided electrical engineering and commissioning services to clients including Salt Lake International Airport, Arizona State University, Davis School District, Ogden School District, and
Van Voast holds a Bachelor of Science in Electrical Engineering from Montana State University. He is currently registered as a licensed professional engineer in the states of Utah, Nevada and California.

**Scot Muir** is a LEED Accredited Professional and a mechanical engineer based in VBFA’s Logan office. He is a recognized expert in the design of complex HVAC systems, and sought by clients in education, healthcare, and the arts.

Scot provides mechanical engineering services to clients, including Utah State University, Intermountain Healthcare and Utah’s DFCM.

Muir holds a B.S. in Mechanical Engineering from Utah State University. He is currently registered as a licensed professional engineer in the State of Utah.

**Spectrum Engineers** of Salt Lake City announced that **Spencer Little** has been promoted to Principal Electrical Engineer. Little attended the University of Utah and graduated with a B.S. in Electrical Engineering in 2008. Shortly after graduation, he was hired at Spectrum as a project engineer. His design experience includes multi-housing development, government aircraft hangars, and corporate office space. He has architectural licenses in both Utah and Arizona.

**Darren Smith**, Senior Concrete Engineer for Geneva Rock Products, is the current President ACI’s Intermountain Chapter. He has previously served as Vice-President, Treasurer, and as a member of the Certification Committee. At Geneva Rock Products Smith is responsible for management of engineering, quality control, technical services, and product research and development for ready-mixed concrete products. He holds a B.S. in Civil Engineering from Brigham Young University and a Master of Business Administration from the University of Utah.

**Bryan Lee** is the Concrete and Steel Engineer for the Utah Department of Transportation and current ACI Vice President. He has been in his current position at UDOT for 10 years; prior to that he served as a Quality Assurance Engineer for UDOT. He also serves as a member of the National Precast Concrete Association quality assurance committee and as a member of the executive board of the National Concrete Consortium.

**Aaron Whitaker** is a Quality Manager for Ralph L. Wadsworth Construction and the current Treasurer for ACI. Whitaker has 15 years experience in design and construction management. He earned a B.S. in Civil Engineering and a Master in Structural Engineering.

**Amanda Bordelon**, who teaches Civil Engineering-related classes at the University of Utah, specializing in concrete materials for pavements and thin overlay/inlay designs. She ultimately earned a Ph.D in Civil and Environmental Engineering from the University of Illinois at Urbana.

**Andy Solt** is a 10-year veteran of BASF, currently serving as Sales Leader for Admixture Systems. He specializes in technical support for Ready Mix, Precast and Underground Construction. He also serves as golf committee chair for ACI.

**Brett Lincoln** is the Salt Lake City Branch Manager for Intertek-PSI. He has over 17 years in the construction professional services industry, including environmental, geotechnical, materials testing, special inspection and non-destructive examination and holds numerous certifications from ICC, AWS, ACI and NICET. He is a past-president for ACI and the awards committee chair.

**Chris Bedford** is a Technical Sales Representative in the Intermountain Region for Boral (formerly Headwaters Resources, Inc.). Bedford graduated in Construction Technology at New York State University at Canton Technical College and has 39 total years of experience in the concrete materials industry in Quality Control/Quality Assurance, including high performance concrete mix designs for Precast and Pre-stress concrete.
operations. His work load includes sales, marketing, operations and new product applications research, and the non-conventional use of fly ash in thermoplastics, paints and engineered lumber.

**Ed Rufener** is a Senior Engineering Inspector/Safety Manager for the City of South Salt Lake and has worked closely with A/E/C professionals for more than 30 years. He is a member of the Utah Chapter of APWA and has been instrumental in writing the APWA Standards and Specifications Manual.

**Jeffrey Tanabe** has been the Marketing/Technical Services Manager for CMT Engineering Laboratories/PEPG Consulting for the past 12 years. Previously, he was an Analytical Chemist for Utah Portland Cement/Lone Star Cement in SLC, and QA/QC Manager for MONROC-Utah Aggregate, Asphalt, Ready Mix and Precast Operations. He is a past President of the Chapter and was instrumental in having the 2018 ACI Spring Convention come to Salt Lake City.

**Jerry Foster** is a Regional Materials Manager at Kleinfelder, Inc. with responsibility for the Nevada and Utah materials testing operations. He began his career with Kleinfelder 17 years ago. Prior to that he worked in management positions at similar companies.

**Mark Sweat** is recently retired from his role as Quality Assurance and Technical Services Manager at Altaview Concrete, a Kilgore Company and previously Westroc Inc. He has worked in almost every aspect of the ready-mix industry for 40-plus years including Mixer Driver, Plant Operations Manager, and Dispatch Manager. He is a Past President of ACI Intermountain and also certified by the NRMCA (National Ready Mix Concrete Association) as a Production Control Technologist and Pervious Concrete Technician.

**Mitzi McIntyre** is the Executive Director of the Utah Chapter of the American Concrete Pavement Association (ACPA). Since 2001, she has provided technical assistance to cities, counties, UDOT, airport commissions, and consultants regarding concrete pavement design and construction.

She is a member of the American Society of Civil Engineers, International Society for Concrete Pavements, the Utah Chapter of the American Public Works Association, and the Intermountain Chapter of the American Concrete Institute. McIntyre was the 2014 recipient of the International Grooving and Grinding Association’s Concrete Pavement Rehabilitation Promoter of the Year.

**Scott Strader** is a Concrete Inspection Manager for UDOT Central Materials and is responsible for the Department’s Precast Concrete Inspection program statewide. His work history includes being a Precast Inspection Manager, a certified ICC Special Inspector and a certified Quality Auditor. Scott has been the Certification Chair for the Chapter for 10-plus years. ➔
AEC People

Tim Biel, is President of CME Transportation Engineering Group and has worked in the construction and materials industry for over 25 years. He has a Bachelor of Civil Engineering from University of Illinois and a Master in Civil Engineering from the University of Utah. Biel’s areas of expertise include pavement design, materials design and investigation. He spent 14 years with UDOT, holding positions as Region Two Pavement Management Engineer, Region Two Materials Engineer and State Engineer for Materials.

Todd Laker is a Senior Technical Service Engineer for Holcim (US) Inc.’s Mountain Sales Group with 15 years experience with the firm. He holds a Bachelor of Construction Management from Weber State University, where he is now an adjunct professor of concrete technology. He is an Associate Contractor and LEED Accredited Professional. He is currently the National Convention Co-Chair and a voting member of the PCI Concrete Materials Technology committee.

Tammy Meldrum has served as Executive Director of the ACI Intermountain Chapter since June 2010. She began her career in the cement/concrete industry in 1984 with Ideal Basic Industries, which was later acquired by Holnam, currently LafargeHolcim. In addition, she served as the Executive Assistant of the Rocky Mountain Concrete Promotion Council.

Val Hale, executive director of the Governor’s Office of Economic Development (GOED), has appointed Benjamin Hart as Deputy Director.

Hart previously served two years as Managing Director of Urban and Rural Business Services at GOED. With this new appointment, he will oversee corporate recruitment and international trade, along with several additional programs.

“Ben has done a remarkable job overseeing our urban and rural business services at GOED,” Hale said. “His leadership in workforce development has garnered national attention and is considered a best practice. His strong economic development background, combined with his trademark enthusiasm and energy, will make a seamless transition to his new role as deputy director.”

Hart has extensive knowledge in economic and workforce development. His leadership at the Department of Workforce Services led to the creation of programs such as the Utah Cluster Acceleration Partnership and Small Business Bridge, which assisted approximately 700 businesses and created roughly 2,000 jobs. While working at Layton City, Hart led out in several economic wins for the community, including the development of East Gate Business Park, the growth of the Layton Hills Mall business area and the revitalization of downtown Layton. An especially notable win in his service to Layton City was the recruitment of Janicki Industries, a world-leading aerospace manufacturing company.
Utilizing the newest construction technology, we’re capturing 1.4 million data points per second to create computer-generated 3D models that save time, money, and produce a better end-result. As an industry leader in light detection and ranging technology, W.W. Clyde & Co. produced the country’s first state-funded paperless road project, receiving the UDOT Project of the Year award and the UDOT Innovation Award in 2016.

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HANG EM’ HIGH

Entrata’s New Four Story Class A Office Space In Lehi Sets A New Standard In Utah For Tilt-Up Office Space.

By Doug Fox
he new Entrata corporate headquarters in Lehi not only sits in a prominent Traverse Heights location – majestically overlooking I-15 at the north end of Utah County – but it also broke new ground by becoming the first true four-story tilt-up concrete office project in the state.

The building, which held its grand opening ceremonies on March 17, features 106,000 square feet of Class A office space. Located just north of the Adobe building and Cabela’s, the new Entrata offices are truly a beacon on a hill, and fit in perfectly with other Silicon Slopes projects populating the burgeoning Lehi tech corridor.

“We are proud of this building and its location,” said Pat Moffat, director of construction for owners The Boyer Company. “Over the past few years, we have constructed over 1 million square feet in the Draper/Sandy/Lehi area, and we feel this building is a key part of our south valley portfolio.”

Entrata -- the nation’s largest provider of website portals and payment processing to the multifamily home industry and a leading developer of property management software tools -- currently employs more than 1,400 people globally. According to Chief Operating Officer Chase Harrington, around 400 employees are expected to initially populate the new headquarters, but the building also will accommodate the company’s expected expansion to 750 workers by the year 2020.

“The economic climate and booming I.T. infrastructure of Silicon Slopes has been integral to the growth and development of our company since Day 1,” Harrington said. “The location of the new building – set on the top of the hill, overlooking the rest of the slope on the east side of I-15 – was chosen to improve visibility of our brand and accessibility for our employees.”

The project turned out to be a true team effort between more than a handful of companies as Tom Stuart Construction and designers AE URBIA partnered on the core and shell of the building while Layton Construction’s Interior Construction Specialists and designers Method Studio handled the tenant improvement side of things. The aggressive construction time frame for the project, especially with all teams involved, made things a bit hectic at times. »
According to Marbe H. Agee, principal, Method Studio, the entire project was designed and documented within a two-month period and constructed within six months.

“The undertaking of completing a ground up project and interior buildout in the allotted time frame was daunting,” Agee said. “For all parties to be successful, it was necessary to work right behind – and sometimes on top of – each other. Method Studio, AE URBIA, Tom Stuart Construction and Layton ICS all worked in a collaborative approach. We understood that for one of us to succeed, we all had to. We shared drawing files, design capital, labor and a willing attitude.”

“The Entrata building has true four-story, tilt-up wall panels that were cast on grade and then lifted into place,” said James M. Williams, president of AE URBIA. “The panels support gravity and lateral loads, thus eliminating the need for perimeter steel beams and columns. In addition to supporting structural loads, the panels also provide the building envelope, while eliminating the need for expensive waterproofing and architectural finishes.”

Williams said that, historically, due to their durability and economy, tilt-up buildings have been used for class C warehouse buildings. It’s only been in recent years that the tilt-up approach has been elevated to class A buildings for office and retail use, as well as religious and school buildings.

According to Williams, several other factors have prevented the tilt-up approach for multi-story buildings in Utah – including the limited availability of larger cranes required to lift the heavier concrete panels, and bracing systems that are tall enough and strong enough.

“There has also been a misconception that a tilt-up concrete building can’t provide a high-enough glazing ration for realtors,” Williams said. “(But) all of these challenges and misconceptions have been overcome.”

One of the main construction challenges in relation to the sheer size of the concrete panels was creating them at the location itself.

“Being on the side of the hill, it was difficult to create a flat waste lab area where the panels could be poured, and then easily tilted into place,” Boyer’s Moffat said.

“There was a lot of earthwork that had to be done, including the installation of soil-reinforced retaining walls,” Williams said. Still, he noted, it only took eight to 10 days to lift and brace the wall panels.”

We were determined to create a space that aligned with our culture, branding and business philosophy. In a traditionally buttoned-up industry, we are a company that stands out as vivacious, quirky, smart and focused on disruptive innovation bringing much needed change and function to the technology being used by our clients.

- Chase Harrington
a little down time waiting for some of the panels to reach lifting strengths.”

With concrete panels that are over 60 feet in length, Williams said that to help eliminate congestion, the panels were braced to the exterior of the building using helical anchors at each brace location.

“We also had concerns about the bracing of the panels in such a high-wind area,” Williams said. “The bracing worked well even during some very windy times.”

One of the biggest advantages to the tilt-up building approach vs. traditional steel beam construction is cost reduction.

“Tilt-up construction has been shown to save as much as 20 percent over conventionally constructed office buildings,” Williams said. “Tilt-up construction eliminates the need for perimeter columns and beams, has excellent sound characteristics, provides durability, eliminates waterproofing, eliminates expensive architectural finishes, minimizes future maintenance, has excellent thermal properties, is not subject to mold, withstands both gravity and lateral loads and is a safer method of construction since most of the work takes place on the ground prior to lifting. The construction schedule can also be reduced over conventional construction.”

One of the supposed downsides to the tilt-up approach is the apparent lack of windows. Not so with the Entrata building, Moffat said.

“I think that there is a stigma in place with the tilt-up that you don’t get as many windows … as you do with typical steel-frame construction,” Moffat said. “However, our building has over 45 percent glass. I do think that given the right set of circumstances, we would build another similar-type building.”

With the success of the Entrata build now in the books, Williams said he expects to see an increase of tilt-up construction for class A office buildings of up to six and even seven stories high.

“It has already been embraced in the Texas and California markets,” Williams said of the larger stories builds using the tilt-up approach. “We have received a lot of compliments on the (Entrata) building’s design. Now that the building is up, most people have no idea that it is a tilt-up —

Concrete panels over 60 feet in length were braced with helical anchors and performed well even in such a high-wind area (photo courtesy AE Urbia). Inside the building has many amenities for its employees (left) including a multi-purpose café, gym, mothers room, and game room just to name a few. (photo by Sohm Photografx).
concrete building. In their minds, it’s just a great-looking class A office building.”

On the tenant improvement side of things, the interior makes an immediate statement with a grand lobby featuring a two-story LED video wall behind the front desk, a main staircase, an employee retail store and gym area off to the right, and views into a state-of-the-art Network Operations Center.

“The lobby has a two-story atrium with a 16-foot wide by 24-foot tall digital screen,” said Agee. “The monumental open stair playfully hints at surprises yet to come by adding a touch of ‘Entrata red’ to the underside of the treads.”

Some of those “surprises yet to come,” include employee amenities such as Entrata’s double-decker red bus, a multi-purpose café, outdoor basketball court with stadium seating, an outdoor amphitheater, a game room, a mothers’ room, rooftop patio, huddle rooms, ping pong and pool tables, and a massage room where employees can receive monthly 15-minute massages.

“It was important for Entrata to create a space that would attract and retain employees,” Agee said.

Dave Knorr, project manager for Layton ICS said another cool aspect to the offices inside the building is that they eschew the typical box or rectangular spaces.

“They really wanted to have something a little bit kind of edgy” he said, “and so the designer came in and there isn’t a straight wall in the place. So every wall in every conference room is on an angle within the space. They have some really unique conference rooms. You can walk on all four sides of the conference room, but none of the walls are 90-degree walls – they’re all on an angle, so it makes the space feel bigger because there’s not just straight walls down the side or down the middle. Everything is on an angle except for the main core of the building.”

Agee said that as successful as Entrata is in its market sector, the company still doesn’t take itself too seriously, an attitude which shows up in various design elements.

“Their internal tagline is ‘Business in the front and party in the back,’” Agee said. “It is only natural that they would name their meeting rooms after famous mullets – yes you read that right – hair styles. Visitors are treated to a larger-than-life image of Hulk Hogan’s famous blonde mullet in the ‘Hogan’ meeting room.” There are also the MacGyver, and Swayze (after Patrick Swayze) conference rooms.

“We were determined to create a space that aligned with our culture, branding and business philosophy,” Harrington said. “In a traditionally buttoned-up industry, we are a company that stands out as vivacious, quirky, smart and focused on disruptive innovation bringing much needed change and function to the technology being used by our clients.”

In that sense, Entrata would appear to be a perfect match for its new corporate headquarters.

“I have to compliment the Entrata team,” Moffat said. “They had a vision of what the building could be.”
Growth Spurt

Utah’s booming population is spurring construction in all sectors, especially the K-12 market.

By Rebecca Burton

Last year, Utah topped the charts as the nation’s fastest growing state. “Utah’s ascendency in 2016 was only partially fueled by migration, the typical driver of population growth for the rest of the country. The lion’s share of growth came from something Utahans have always been good at, and the rest of America, rather bad: They’re making more babies,” reported The Atlantic in December 2016.

As the state’s youngest demographic continues to grow, there is no sign of slowing in Utah’s K-12 construction market. Part of this growth is manifest in a robust housing market. “Even though [home value] appreciation is expected to slow in 2017, according to analysts’, factors such as first-time millennial home buyers will
keep Utah’s housing market strong and the need for K-12 educational facilities at a premium. This continuing trend will drive the K-12 educational construction market well into 2020 and beyond,” said Jeff Haderlie, Marketing Director for Orem based Westland Construction. “More and more young families are choosing to stay here, move here, and start a family full of future K-12 students.”

“Utah is one of the fastest growing states in the country, so there is a continuing demand for new schools,” said Jeanne Jackson, Principal at VCBO Architecture. “Utah is ahead of the curve in this aspect. I have heard from colleagues in Arizona and New Mexico that they still haven’t recovered [from the recession].”

“Just about every school district is growing,” said Kendall Smith, Project Executive at Hughes General Contractors in North Salt Lake. “I continue seeing them bond to pay for the work.”

Alpine School District, the state’s largest district with 87 schools, is one such example. The district passed a $387 million bond last November. “By 2021, we’ll have nine new schools,” said David Stephenson, Administrator of Public Relations. “This is by far the biggest bond we’ve ever gone out for and it had the highest percentage of voter approval.”

Along with Alpine, Jordan passed a bond for $245 million last year which will include the construction of six new schools.

“The market is strong and probably strengthening,” said Brian Parker, Vice President at MHTN Architects in Salt Lake. “2016 broke the ice. I think in 2017 and 2018 you’ll see a lot more districts going out for bonding.”

“We are in the preparation stages for going out for another bond this November,” said Ken Crawford, Director of Athletics and Support Services at Ogden School District. “We have hired an architectural firm along with some research firms to help us develop our scope for the bond.”

Canyons School District is also considering a bond for 2017. “We passed a bond in 2010. It included 13 projects [two were new schools] and we’re on our last three,” explained Rick Conger, Director of Facilities Services. “There are a lot of people who want to continue the momentum and want to go out with a bond in November.” That said, the district may also elect to wait a few years.

To keep up with such a rapid pace of construction, many districts are using prototypes, especially for elementary schools.

“It’s a good move because it saves in design costs,” said Christopher Hogan, President at Hogan & Associates Construction, Inc., Centerville. “The disadvantage is they all look the same. For every school — particularly the high schools — it’s important for them to be part of that community.”

Springside Elementary School in Saratoga Springs is an example of the K-12 population outgrowing the available facilities. This caused Alpine School District to step up the construction timeline and the entire construction team came together and Westland Construction developed a new 7-month schedule to deliver an 80,000 sf school facility that was delivered on-time and within budget.
Jackson agreed. “If you’re building in a field where there is nothing for context, there is nothing wrong with a prototype. When you’re talking about replacing a school, it has to be designed to fit the neighborhood."

In cities where prototypes do make sense, each new school allows an opportunity for improvement and adjustment to ensure the new facility meets educators’ needs.

“If a district doesn’t update their prototype as teaching methodologies change, certain aspects of the prototype don’t function as well,” said Smith.

“The repeat plans are a great exercise in showing how you can be better,” said Parker.

“We do use prototypes, but we always review it before we ever build it again,” said Frank Pulley Jr., Director of Physical Facilities at Alpine School District. “The outside looks similar, but we’re constantly reviewing the classroom.”

Indeed, it is within school walls where innovation and new materials can best support learning.

“Some progressive districts are migrating from auto shops and wood shops to things like makers’ spaces where students are engaged in solving real world problems,” said Parker. “Across the board—elementary to high school—we’re seeing robotics labs integrated into the curriculum.”

In Davis School District, VCBO Architects is designing a composites lab for the new high school. “It is a different kind of a shop and a totally different design,” said Jackson. To create these labs—which prepare students for careers in the automotive and aerospace industries—VCBO toured several composites labs at schools in Seattle where Boeing was involved in the design.

Outside of the lab, simple changes to the classroom—such as a multitude of writeable surfaces—support a fluid learning environment.

At New Bridge Elementary in Ogden (see
below sidebar), “there is writable space on all four sides of the classroom,” said Crawford.

“We’ve given moveable furniture and desks with whiteboard tops to a number of elementary schools in Davis,” said Jackson. “Everybody loves it.”

Even changes to flooring can improve a school’s aesthetic and functionality. “Luxury vinyl tile is really nice” said Hogan, in speaking of innovation in construction materials. “It’s a thicker tile that has a more durable base. It has texture on it, so it can look like a wood floor or a concrete floor. Polished concrete also continues to gain popularity. It’s very durable.”

Less visible construction materials are also improving schools’ performance, particularly in energy efficiency.

“We’re seeing more air barrier systems come out,” said Smith. “We’re trying to make the most energy efficient envelope that we can.”

“Spray foam has been a good solution to meet required energy ratings,” said Hogan. “It seals up the building so air is not leaking.”

“We’re always looking at the equipment and the lighting to be as conscious as we can be about the energy we’re consuming,” said Pulley.

Odyssey Elementary in Davis is at the forefront of energy efficient design and produces more energy than it needs through solar arrays. It is one of two buildings in Utah listed on the New Buildings Institute’s list of Zero Net Energy Emerging Buildings. (The other is Salt Lake City Public Safety Building, and Utah does not currently have any certified Zero Net Energy Buildings.)

“Davis School District has a huge commitment to using less energy because it saves their taxpayers money,” said Jackson.

Schools can also recognize cost savings in the earliest stages of construction. “Districts have come to understand that if you bid a school at the right time of year, you get a better deal,” said Jackson.

Those using a Construction Manager/General Contractor (CM/GC) method also see cost savings. “On our last few large construction projects we have implemented CM/GC,” said Crawford. “Having an additional resource from the >>
beginning has been useful to make good, accurate decisions that are the best use of time and financial resources.”

Early collaboration on scheduling and resource management are important for efficiency, and will be even more important when construction begins on the airport and new prison.

“Utah is one of the hottest economies in the nation for construction right now. This has its challenges as well,” said Hogan.

“Today, because of the bubble in the market, it isn’t just the school work that is out there,” said Parker. “The subcontractor market and the labor pool is still pretty stretched. We’re seeing shortages still, in areas like masonry. In a year or so from now, I wonder and worry a little bit because when the airport and prison are in full swing—and I worry more about the prison—it will take a lot of subcontractors when that happens.”

“The construction market is very, very robust right now. If anything, I worry about if there are enough subcontractors to go around,” agreed Conger.

For now, at least, these worries are not playing out. “In the first two months of this year, there was at least $400-500 million worth of work that was bid [for schools],” said Jackson. “We were very worried about labor shortage and bids have indicated we don’t have one at this time. We got very good bids from contractors and subcontractors. We were delighted, actually. Contractors and subcontractors like to work for school districts because they are good clients.”

Pulley agreed. “We’ve been very fortunate to work with people who specialize in education construction and building schools. We have a lot of established relationships with subcontractors to do other work in district, not just new schools.”

This symbiotic relationship between districts, designers, and contractors is especially effective in serving Utah’s robust K-12 market.

“Utah—with its unique culture—has a lot of kids, so there is always a demand for schools,” said Hogan. “There are good contractors that have been able to specialize in schools. There is a benefit there for quality, schedule and cost.”

New School Rock

New Bridge Elementary is creating good vibrations as the first STEM school in Ogden School District.

In the heart of Ogden’s downtown, a new elementary school is pulsing with life.

After opening its doors last year, New Bridge—the district’s only STEM (Science Technology, Engineering, and Math) elementary school—saw enrollment nearly double from 361 to over 630. The magnet school has drawn students from throughout the district, as well as Weber and Davis counties.

“STEM is a trend that is continuing to gain a lot of traction for many reasons,” said Brian Parker, Vice President at MHTN Architects, whose firm designed the school. “It is a way for educators to wrap their heads around project-based learning and work with students in multidisciplinary ways. Parents understand that it will be very important for their children’s futures, and also leadership sees that it is very important for our future workforce.”

“The intent of New Bridge was to make it the best elementary school in the state where the learning environment, technology, curriculum, staff and administration all combined to create the perfect combination for a successful STEM education,” explained Ken Crawford, Director of Athletics and Support Services at Ogden School District. “The idea was to provide teachers with flexibility to teach however their students would learn best without being constrained by the furniture or the room.”

The school’s flexibility was achieved through a blend of innovative design and use of nontraditional materials.
“The teaching wall is going away. The desks are reconfigurable. Instead of putting white boards or chalkboards attached to the wall, the wall has a skin on it that turns it into a white board. It is a lot more flexible teaching space,” said Cristopher Hogan, President at Hogan & Associates Construction, Inc., Centerville, whose firm built the school. “One of the unique features are the doors into the classroom areas. They are glass sliding doors and the hallways are open, extra classrooms.”

“The boundaries of the classroom become blurred and they can spill into whatever space they need to support learning,” said Parker. “New Bridge is organized around a learning community, which consists of four learning studios.” Each studio houses one of the grade’s four classes, and teachers can bring their students together in a collaboration space where a traditional hallway would once have been.

“In designing the school, we used a footprint that had been used by us and neighboring districts, but we blew it up and made it better,” explained Crawford. “New Bridge is a very successful story on taking a prototype school and customizing it,” said Parker. “It is still very unique.”

Another unique aspect of the school is its foundation. “The soil didn’t have the bearing capacity for a commercial building because it was in a blighted area of downtown,” explained Hogan. “The soils were poor, so we had to come in and put Geopiers in.” Geopier, a commercial product, is an aggregate pier used to improve clay, silt and soil to support shallow foundations. “They go 10-15 feet deep,” explained Hogan. “There was something like 900 to make the ground more stable.”

Above ground, other unique features set the school apart while also setting the students up for success.

“The school boasts three dedicated STEM labs, a 3D printing lab paired with 3D scanners, a science lab equipped with a vented hood and chemical resistant tables, and a robotics lab used for coding and robot building,” said Crawford. “We want to introduce concepts and practical tools to our students at a young age so they already have the knowledge that many adults are just now obtaining.”

“Even kindergartners are in there and programming [in the robotics lab]. It is a real hands-on learning activity,” said Parker. “The science, math and technology is part of the DNA of how they’re running the school.”

Indeed, it is those running the school who shaped the vision of what it could be.

“Supporting that paradigm shift in education takes so much more than just the facility,” said Parker. “They have the right captain in charge of the ship right now to steer it in a slightly different direction than most elementary schools are used to.”

Additionally, to make the school the best it could be, the district and architects sought buy-in and perspectives from those who would use the facility day to day early on in the design process.

“We included as many stakeholders as feasibly possible, everyone from maintenance, technology and custodial departments, to teachers and district STEM and curriculum specialists,” said Crawford. “Then adding design elements from MHTN with their vision of what 21st century schools could look like, along with input from Hogan Construction of how that vision could be made a reality, we were able to build this magnificent school,” said Crawford.

“It turned into a fabulous facility for that district,” agreed Hogan.

New Bridge Elementary School
Owner: Ogden School District
Architect: MHTN Architects
General Contractor: Hogan & Associates Construction
Electrical Engineer: Ken Garner Engineering
Mechanical Engineer: Van Boerum & Frank Associates
Structural Engineer: ARW Engineers
Civil Engineer: Great Basin Engineering
Redfish Builders may currently be riding the crest of the energy efficiency wave in Utah, but the husband-and-wife team behind the innovative company trace inspiration for the Beehive State’s first net zero community to a float down the Mekong River in Laos.

Living Zenith, a $2.5 million housing project near Salt Lake City’s Liberty Park, held its model home ribbon-cutting on Jan. 24. While the planned five-home community may be relatively small in number, it is large in potential and possibility.

As Utah’s first net zero community – meaning each home when completed will generate as much renewable energy as it consumes over the course of a year – Living Zenith is a proving ground zero for environment-friendly housing innovation going forward.

“We’re gleaning as much information as we can to build the tightest and healthiest homes in Utah,” said Mitch Spence, who runs Redfish Builders with his wife, Tiffany Ivins. “It all hinges on a tight envelope with renewable finishes and solar energy production.”

Spence and Ivins were already environmentally conscious, having seen their share of pollution while consulting in developing countries over the past 20 years, but it was a trip down the Mekong River last year that really crystallized their commitment and dedication to making a difference with their projects.

“We had an awakening on the Mekong River,” Ivins said. “Mitch and I had both visited the headwaters of the Mekong in Tibet where it’s crystal blue glacier run-off. So we were looking forward to seeing the river downstream.”

What they found instead – after the river had passed through China, Myanmar, Thailand, Laos, Cambodia and Vietnam – was a river rife with pollution, flowing in a thick brown sludge.
“What really hit home is the fact that our demand for products in the USA is directly impacting production and pollution in Asia,” Spence said. “We came home sobered. We committed to defy the norm. We committed to greener building for better living.”

Living Zenith was approved by the Salt Lake Planning Commission in June of 2016, with a groundbreaking of Sept. 30. The planned homes range from 2,400-2,900 square feet with four bedrooms and three baths. Sales prices start in the high $500,000’s – but it is estimated that the average homeowner in Utah would save $152,000 in utility bills over the course of a 30-year loan.

The homes will rely on an array of strategies to achieve net zero status. A central feature is an airtight envelope that uses energy-efficient, eco-friendly architectural material and styles. These include a foundation of 14-inch foam (instead of concrete), solar photovoltaic arrays, thermal windows, high-density blow-in insulation, low-flow water fixtures and toilets, high-efficiency LED lighting, Energy Star appliances, HRV and split systems, steel garage with rigid insulation and a home-energy manager that provides something akin to a central nervous system which monitors energy use.

Utah’s Office of Energy Development learned about the project during the groundbreaking stage of development and reached out to Redfish directly.

“When we first reached out to Living Zenith, we realized the best way to help them accomplish their goals was to serve as a facilitator of sorts,” said Shawna Cuan, Managing Director of Energy Efficiency and Energy Education in Utah.

Cuan’s office helped Spence and Ivins evaluate their home designs and put them in touch with local and national architects that specialized in net zero and who were willing to mentor and guide them in the process.

“Our office views affordable, reliable energy as critical to Utah’s long-term success and a net zero community can help us meet that objective,” Cuan said, noting that Utah is expecting to double its population in the next few decades. “Not only does net zero benefit the individual, ...”
Renewable energy is a market that is here to stay, and beyond PV, micro-grids incorporating energy storage are the next logical and technologically feasible step. - Meghan Dutton

but it also benefits the wider community. A homeowner gets an extremely low power bill and demands less from the electrical grid that serves the whole community. Net zero means reduced emissions that improve air quality inside and out. The air in your home is better, which means you feel better, your overall health is better, and you put less into the air outside, which improves Utah's air quality.”

Wheeler Machinery Co. in Salt Lake City partnered with Redfish in designing the photovoltaic systems and providing the systems' componentry. Wheeler Cat views participation in the Living Zenith project as a way to expand its energy offerings beyond traditional resources, such as mining, oil and gas.

“Renewable energy is a market that is here to stay, and beyond PV, microgrids incorporating energy storage are the next logical and technologically feasible step,” said Meghan Dutton, the Renewable Energy Segment manager for Wheeler Machinery Co. "Wheeler Power Systems is thrilled to be part of this pioneering, cutting-edge project. Projects like this, that challenge those involved to scratch their heads and consider whether there may be better ways of doing things -- and that end in the real deployment of the innovative solution -- are unbelievably exciting.”

Dutton said Wheeler Cat is now pushing beyond the initial milestone to explore additional ways that Living Zenith can benefit the surrounding community – such as using its PV systems to charge a central battery bank that would provide emergency preparedness and resiliency benefits to the neighborhood.

“It really is a project that continues to evolve and surpass conventional thinking and the status quo,” Dutton said. “Working with Redfish Builders on this project has been truly inspiring. They possess a remarkable ability to dream big and think way outside the box. They are not deterred by challenges that arise from being the first to do something. They find the right partners, they find a solution and they push ahead.”

In addition to Wheeler and Utah’s Office of Energy Development, other collaborative partners include Salt Lake City’s Sustainability Department, Portland Energy Conservation, Inc., Utah Clean Energy, the University of Utah, and others.

Naturally, not everyone has been immediately onboard with the overall process. Spence said that many large
developers lobbied the state legislature this year to reject greener building codes. “It’s not popular for builders to build this way,” he said, “since it’s more expensive up front. I’ll take a hit in profits with these first few subdivisions. But we hope it’s the beginning of buyers demanding better options with greener buildings.”

“Net zero building involves a steep learning curve,” Ivins said. “As the developers, we’re doing a ton of research and learning with experts from all over the world. We’re teaching our sub-contractors to use new methods and try different strategies. There’s sometimes pushback. We had to teach our designers, architects and neighbors what we’re doing. It’s an intense education for everybody involved. But it’s exciting to see it happen.”

At present, Ivins said that three of the planned five homes are under contract. Redfish is currently working with the buyers to customize designs and construct their homes. “It’s exciting to see their interest in these homes,” Ivins said of the buyers. “It feels like we’re all part of this big family who is creating something like Noah’s Ark. Most people don’t understand what we’re doing, but everyone stops to check out the ark.”

**Living Zenith**

*What:* Utah’s first net zero community  
*Project cost:* $2.5 million  
*Scope:* Five net zero homes  
*Developer:* Redfish Builders  
*Collaborative partners:* Wheeler Machinery Co., Utah Office of Energy Development, Salt Lake City Sustainability Department, Portland Energy Conservation, Inc., Utah Clean Energy, the University of Utah, and others
The Utah Engineers Council (UEC) – a group comprised of several Utah-based engineering associations – held its 2017 Awards Banquet February 25 at Rio Tinto Stadium’s Interform Club Real room.

Justin Don Naser, a Principal at Ogden-based ARW Engineers, was presented with the ‘2017 Engineer of the Year’ award, UEC’s highest individual honor. Naser is currently serving as Chair of the Utah Uniform Building Codes Commission and regularly meets with state legislators to encourage adoption of appropriate building codes for the state. Naser earned a Master of Science from Utah State University and has taught steel building design courses to USU students. He has helped design several key higher education buildings including the USU Engineering Building, the Wayne Estes Center at USU, and WSU’s Tracy Hall Science Center. Other notable projects on his resume include the LDS Church History Library and the LDS Brigham City Temple.

“It’s a huge honor to receive this from peers you work with,” said Naser, who has spent his entire 19-year career at ARW. “As I read through the resumes (of other nominees) I felt like I was inferior. There are a lot of talented engineers in Utah.”

He said one of his favorite project was a residence between Snowbird and Alta that was designed to withstand an avalanche.

Other individual awards handed out included: Educator of the Year – Paul J. Barr; Fresh Face in Engineering – Jake Merrell; MESA Teacher of the Year – Tami Pandoff.

In addition, UEC presented $1,500 scholarships to 13 students studying engineering at a Utah-based university.

UEC’s annual banquet coincides with Engineers Week, celebrated in the U.S. during the week of the anniversary of George Washington’s birthday. In addition to being the first President of the U.S., Washington is also recognized as one of our nation’s first engineers.

The event’s keynote speaker was Martin Frey, a BYU Mechanical Engineering graduate who spent more than a dozen years as a senior director for Cisco in Silicon Valley. Beyond his technological expertise, Frey recently entered the Guinness Book of World Records as the first person to climb the highest summits on all seven continents, and to sail the seven seas, circumnavigating the world. His message consists of challenging individuals and organizations to ‘step outside’ of their comfort zones.

Frey told stories of crossing the shifting ice blocks of the Khumbu Ice Fall below Everest, and sailing turbulent seas.
across the North Pacific ocean aboard the 70-foot racing yacht ‘Visit Seattle’. He talked about his career arc working initially in the defense industry, and then pivoting to work for Cisco when it was a small start-up company in the mid-80’s. He admitted that catching the next wave was due in part to a little luck.

UEC noted that more than 200 people attended the awards banquet and expressed gratitude to the many sponsors and companies who contributed to its cause.

UEC 2017 Award Winners

**Engineer of the Year** – Justin Don Naser, ARW Engineers

Other Nominees: Richard Reeder, VBFA; Lee Cammack, J-U-B Engineers; Rob Fabian, BAE Systems; Ryan Cole, Gerhart Cole, Inc.; Scott Beckwith, Beckwith Technology Group

**Educator of the Year** – Dr. Paul J. Barr, Utah State University

Other nominees: Trent Hunt, BYU Adjunct Professor; Douglas Hunsaker, USU Assistant Professor; Forrest Brown, Park University; Tadd Truscott, USU Assistant Professor; Andy George, BYU Assistant Professor; Fernando Fonseca, BYU Associate Professor.

**Fresh Face of Engineering** – Jake Merrell, Nano Composite Products

Other nominees: Ashley MacMillan, Geocomp Corporation; David Griffin II, Arch/Nexus Company; David Bassett, Avenue Consultants; Paul Dyreng, Reaveley Composites, Marc Bodson, U of U Dept. of Electrical Engineering; Gary Horton, Summit Co. Engineer; Mark Holt, U.S. Air Force Engineer (HAFB).

**MESA Teacher of the Year** – Tami Pandoff, E.G. King Elementary School, Davis School District.

**UEC 2017 Scholarship Winners**

Sharon Dansie – Weber State University; Landon Foust – Weber State University; Rafael Chanut – University of Utah; Shalauna Thompson – University of Utah; Mitch Shepherd – University of Utah; Joshua Pratt – University of Utah; Jeffrey Smith – Brigham Young University; Craig Maughan – Brigham Young University; Joshua McClellan – Brigham Young University; Christian Morrill – Utah State University; J. Jackson Matsen – Utah State University; Seth Thompson – Utah State University; Daniel Ulrich – SUU

It’s a huge honor to receive this (‘Engineer of the Year’ award) from peers you work with. As I read through the resumes (of other nominees) I felt like I was inferior. There are a lot of talented engineers in Utah. - Justin Naser

Dr. Paul J. Barr, a USU Professor, was named ‘Educator of the Year’.

Jake Merrell of Nano Composite Products is UEC’s ‘Fresh Face of the Engineering’.

Tami Pandoff of E.G. King Elementary (Davis Co. School District) earned the ‘MESA Teacher of the Year’.
Solar Flair

Vivint rooftop solar system includes more than 2,700 panels covering a staggering 80,000 SF.

By Nikki Anderson | photos courtesy Hunt Electric

Vivint Smart Home Arena, the home of the Utah Jazz and the premier sports and entertainment venue in the Intermountain West, now boasts one of the nation’s largest rooftop solar systems at an indoor arena, with an array of over 2,700 panels covering 80,000 square feet.

Hunt Electric Inc. led the design, engineering, and installation of the solar array for the Larry H. Miller Group of Companies. The project was completed in a short six weeks (including engineering!), leading up to the ribbon cutting on October 26, 2016. Proof of the favorable opinion Utah residents have for solar was the list of speakers: Gary Herbert; Utah Governor; Ben McAdams, Salt Lake County Mayor; David Bywater, CEO at Vivint Solar; Richard Hunt, CEO of Hunt Electric; Stan Penfold, SLC Council vice chair; Steve Starks, president of the Utah Jazz; and Jim Olson, president of Vivint Smart Home Arena.

The top-to-bottom, $125-million renovation of the arena (currently in progress) began on the roof by replacing the insulation to aid in energy conservation, before giving the interior a transformation that will result in an enhanced, energy-efficient, first-class customer experience.

By putting the roof to work, Vivint Smart Home Arena’s solar array will create energy equivalent to 31.7 million miles of vehicular traffic while supporting the commitment to reduce the impact on our air quality and encouraging other leaders in the community to do the same.

At 130 feet, in a busy area of Downtown SLC, the site posed unique challenges structurally due to the complicated wind-loading for buildings over 60 feet. The owner also had special
requirements for materials used during construction that added to the engineering challenges. Hunt’s extensive experience in the solar industry led to a highly-customized design, with some of the lightest loading on the roof in the industry. The orientation of the building, slopes of the roof, and existing communication equipment let Hunt Electric’s design team of engineers maximize the potential of the roof for energy performance while tying into the technological overhaul of the arena for monitoring and optimization by the arena’s facilities team.

In business since 1986 and with a warranty of up to 25 years, Hunt Electric Inc. has been serving the Utah commercial market, adding disciplines to our expertise by focusing on the needs of our customers, adding the renewables division to our portfolio in 2008. Named the #1 Commercial Solar Contractor in Utah and #2 in the United States by Solar Power World Magazine, Hunt Electric’s expertise allows us to continue to give customers like Vivint Smart Home Arena exceptional customer service with an ongoing relationship built on positive results.

Active in 14 states, Vivint Solar LLC, a sister company of Vivint Smart Home, provided the solar panels to build the project at Vivint Smart Home Arena and has become a leader in the solar industry. Arenas like VSHA compete across their region to offer the best facilities to their guests and attract world-class sports and entertainment events. The long-standing relationships with the Larry H. Miller Group, Vivint Solar, and Hunt Electric Inc. accelerated the project, allowing completion of the solar energy solution before the first home game of the season for the Utah Jazz.

The addition of solar panels plays an important role in helping businesses stay competitive. Solar power provides energy reliability, security, and fiscal independence for businesses. Additionally, every type of building can benefit from solar, even if it doesn’t cover your entire bill. According to EnergySage marketplace data, the average commercial property owner paid $1,950 in monthly electricity bills before going solar. After their installation, their electricity bill was reduced to approximately $500 – a 75% reduction, and typically paying off in 3-7 years. Businesses can also deduct 85 percent of the value of the solar asset from their taxes, providing another significant offset to the upfront cost of a system array.

The American solar workforce grew by 25 percent over 2015, the largest annual growth percentage since the foundation’s first solar jobs census was released in 2010. Utah gained 1,729 solar industry jobs in 2016, representing a 65 percent increase in the state’s solar workforce since 2015 and represents $300 million in economic activity.

Nikki Anderson works in Hunt Electric’s Solar Division.
Building owners designing new buildings are faced with making big investment decisions. In a perfect world, they would have unlimited budgets and would build buildings that would be cherished by future generations and have no impact on the environment. However, unlimited budgets are clearly not the reality, so building owners look to do the best they can while keeping costs low. Every project has a balance between budget and efficiency, finding that balance is a worthwhile process.

The Efficiency Tree: Start Low, Then Go High

When an energy engineer is hired to assist a design team in evaluating efficiency options, the first step is to start at the bottom of the efficiency tree, where low-cost/high savings strategies exist. In Utah, with its varying climate, typical low-cost/high saving strategies are roof insulation, LED lights and evaporative cooling strategies. Once the low-cost measures are identified and quantified, and if budget is available, the design team can move up to mid-tree measures. Things like energy recovery ventilators and condensing boilers are both examples of mid-tree measures. How good an investment these are depends on how the building uses energy. In my experience, only the bigger, more complex projects see high-efficiency equipment pay back well in a life-cycle cost analysis. In a 300,000-square-foot hospital, high-efficiency chillers and occupancy-based ventilation controls are likely to be a great investment. In a 20,000-square-foot office however, the utility cost savings achieved by upgrading from an air-cooled, variable refrigerant flow (VRF) to a more efficient, water-cooled unit is unlikely to pay back the additional first-cost in less than 10 years.

At the top of the tree, we start to consider renewables. Solar photovoltaics (PV) can be a great investment, depending on what you want. If you want to make a public statement on your commitment to the environment, there are few more publicly visible efficiency strategies. If you are looking to reduce your energy bill and get the most environmental benefit for your money, look lower on the tree first. Once you’ve implemented every strategy that has a better payback, then look to invest in renewables. An engineer from the National Renewable Energy Laboratory (NREL) gives us a good rule of thumb: Every $2 spent in building energy efficiency offsets $2 worth of PV. While PV is getting cheaper every year, there are still typically at least 10 strategies in any building that do more and cost less. Having an energy modeler on your team can help identify low, mid- and high-level fruit (i.e. efficiency options) which will help owners get the most for their money.

Will it work? Will it keep working?

An important goal in any project, however, isn’t to buy into flashy technology, but to simply make sure the things you buy work as intended. When building owners invest in efficiency, they do it with the idea that they’re saving money and/or reducing their environmental impact. The piece of the puzzle that’s often missed is that which converts good intention into a functional building. HVAC and electrical commissioning work from the design phase through building occupancy to review the design for constructability related issues and to provide quality-control sampling during installation of systems and construction close-out. This process helps owners achieve a facility that operates as they intended. Even on projects that aren’t highly complicated, the goal of commissioning is to start up a building functioning at its highest level of efficiency. The process has proven to be a service that quickly pays for itself. In the short and long term, commissioning’s goal is a building that costs less to operate.

Commissioning and Energy Modeling Work Together

Recently, I had an opportunity to do both commissioning and energy modeling on a new medical clinic project. Part of both jobs included a detailed design review. While combing over the architectural details looking for the as-designed roof insulation values for my energy model, I noticed a detail for the parapet wall where the thermal control layer was incomplete as it wrapped around the back side. This would result in a significant thermal break which can often lead to not only increased energy use, but condensation within the wall cavity. Though it was not in our mechanical commissioning scope, I brought it up at a commissioning meeting with the architect and design engineers. We reviewed the detail and developed a revised insulation strategy that both reduced the building load, improving the building energy use, and avoided the potential for condensation in the parapet. For this project, having the perspective of both an energy engineer and a commissioning agent, I was able to make a positive impact in the design that avoided a potential problem in the future.

Perfect is the Enemy of Good

Energy efficiency doesn’t have to come in the form of a net zero building. It also doesn’t need to be done only by wealthy, eco-philanthropists. Every building owner is looking for a return on their investment, and a dollar saved through energy efficiency is a dollar in your pocket. Energy-efficiency and commissioning are great ways to improve your bottom line whether you’re concerned with being green or saving it.

Matthew Garlick is an engineer for Salt Lake-based Total Building Commissioning (TBC).
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Michael Garlick is an engineer for Salt Lake-based Total Building Commissioning (TBC)
The Perfect VR Headset…
We’ll let you know when it’s here.

By Brent Bowen

There’s no question that Virtual Reality (VR) headsets are changing the way architects visualize and present their designs. The ability to instantly immerse yourself into a 3D environment provides an unmatched sense of scale and spatial awareness.

A few years ago, our office began testing various VR devices but we were rarely asked to construct a VR space. Today, we’ve dialed in the most effective process and as VR has become more accessible/main stream, the requests are coming in weekly.

However, each VR device carries advantages and drawbacks resulting in different experiences. Deciding on which system is best for your company can be difficult, especially when taking into account the additional hardware required in order to use these systems. The more expensive VR devices offer better experiences, but their cost, setup complexity, cables & bulky headsets create obstacles. Also, the quality of the image still has a ways to go before it’s as nice as the high-quality monitors that we now take for granted.

Breakdown of 2017’s best VR options:

OCULUS RIFT / vivid and smooth but tethered.
The Oculus Rift provides vivid graphics and smooth gameplay, but has its drawbacks. It needs to be tethered to a high-end PC, and the cables can get in the way. Furthermore, you cannot physically walk around thus requiring gaming controllers to handle your in-game movement.

HTC VIVE / tethered but you can walk around!
Although still tethered to a computer, the Vive benefits from two ‘base stations’ mounted on walls over the user’s area to track players’ movement, giving the user freedom to physically walk around a 15’x15’ area. Similar to the Rift, the Vive is powered by a high-end, expensive gaming PC to provide smooth graphics. The Vive is the most expensive and requires the most effort to set up.

SAMSUNG GEAR VR / not tethered! Portable and low cost.
Samsung’s Gear VR provides a less sophisticated, yet still solid VR experience (at a much more affordable price). While the Rift and Vive require expensive PCs, the Gear VR is powered by a Samsung phone. This makes setup more convenient—simply plug in a phone and it automatically starts running. The absence of tethered cables means users can look around without the hassle of getting tangled up, however it lacks the tracking sensors to physically walk around a space. To work around this, multiple views can be set up in a space. In summary, it’s a great entryway into VR because of convenience and price.

VIRTUAL WALKTHROUGH / using web browser, mobile or desktop
Virtual walkthrough is much less prohibitive as your client already owns the equipment necessary to engage in a space, no headset necessary. A phone, tablet, or computer is all anyone needs and the device utilizes it’s built in accelerometer as a ‘lens’ to view a sharp image. While less immersive, this mode offers added practicality as an infinite number of users can simultaneously tour the space online, and from any location. It’s easy to share walkthroughs with out of state clients, multiple clients simultaneously in face-to-face meetings, and becomes a powerful sales tool when owners want to show a prospective tenant.

CONCLUSION
There’s no doubt that VR has its place in the future of architectural design. For our clients, using VR has resulted in better design, less reworking, happier clients and the WOW factor to impress clients and win design competitions. However as with many first generation devices, each system has its flaws. The promising news is with all the competition, developers are feverishly working to improve and release a second generation of VR systems.

In 2002 Brent Bowen founded Bowen Studios, an architectural rendering and 3d digital animation firm based in Salt Lake City and serving domestic and international clients. He serves on the Board of Spy Hop, and is an adjunct professor at the U. of U. in the planning department. Brent is also a volunteer expedition leader for CHOICE Humanitarian.
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