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Organization *Insights*

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Trading Spaces

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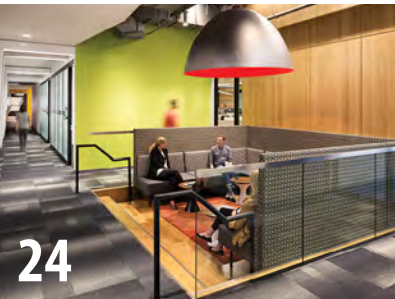
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On the cover: Viol, ©Kevin Bowers. Second row, left: ©Aker Imaging. Second row, right: ©Mike Verzella. Third row, left: ©Justin Wallace Photography. Third row, right: ©Mike Verzella. Fourth row, left: ©Chris Cooper. Fourth row, right: ©Kevin Bowers Photography.



Structure Tone's new global headquarters adjacent to Hudson Yards in NYC.

A Message from Jim and Bob

Remember the monologue William Shatner gave at the beginning of each episode of Star Trek? For those of you old enough to have watched that show, it began with the now-famous phrase: "Space: the final frontier."

While those words have certainly become iconic, the equally famous closing line may actually have more relevance to the kind of "space" we in the building industry focus on every day: "... to boldly go where no man has gone before."

Between designers, engineers, builders and building owners themselves, we are, as an industry, constantly pushing the boundaries of what it means to create an innovative, modern and functional space. This issue of *Insights* showcases some of those amazing spaces, from commercial offices with complicated data needs and product showrooms that create the ultimate customer experience, to sophisticated research labs and the complex chiller plants that support a campus.

New building design concepts and technologies are also revolutionizing the way we work. Building information modeling and virtual construction have made project coordination more efficient than ever before. Programs like the WELL Building Standard™ are changing the relationship we make between buildings and their occupants' health and wellness. And, of course, we can all see, hear and learn all about these developments through the immediacy of

the internet and online "space." We recently refreshed our website to share what makes our clients' spaces exceptional in a more engaging way, and we've more actively joined the online conversations of our industry and our communities, thanks to social media.

It's an exciting time to be in the building industry. We hope to see you soon and continue those conversations in person, on social media or in the very spaces we're creating together. Live long and prosper. ◀

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The Future of Office Design: What's Next?

In the competitive financial industry, attracting and retaining talented employees is a constant effort. For asset management firm Carlson Capital, the look, feel and efficiency of the work environment are critical to setting a high bar and keeping team members happy and engaged. We spoke with *Carlson Capital partner Nancy Carlson* for her views on what makes a workplace special and where office design is headed next.



Above ▲
Nancy Carlson, Carlson Capital partner.

What are the key drivers in designing Carlson Capital's workspaces?

1. To continue to provide working spaces that minimize visual distraction and allow our team members to concentrate.
2. To provide our teams opportunities to connect and to collaborate.
3. To convey our brand effectively so that it resonates with our clients and our employees.
4. To continue to make our offices comfortable, well-designed and supportive of our business needs.

How has having a consistent project team helped you reach those goals?

We believe in partnering for results, which is why we've continued to work with Staffelbach and Structure Tone for nearly ten years. Staffelbach has helped us develop standards for our workspaces that support our functional objectives. Our Staffelbach design team consistently guards our standards and, while applying them globally, pays great attention to the details. They research what's happening in workplace strategy and keep us informed so we can continue to make our offices relevant and engaging. They've really helped us define our brand for ongoing success.

Structure Tone's ability to work in various cities with us has helped us maintain a consistent level of quality. This level of quality is very important to us; it's part of our brand. We've now worked together on projects in Dallas and Houston, Texas,

Greenwich, Connecticut and London, UK, which has created a strong team approach that makes implementation even easier and more effective.

You recently renovated your space in London's Knightsbridge district. What was your vision?

We had multiple issues to consider:

- ◆ The cost of doing business in a given location
- ◆ The employees' commute
- ◆ Efficiency of the workplace
- ◆ The environmental design and our brand

Given all these, we decided it made the most sense to keep the office in its present location, and we would add a second floor to allow for our planned expansion. This resolved a commute issue as we are immediately across the street from the Knightsbridge Underground Station. With a new floor to design as our own, we also got the opportunity to emphasize our brand and culture.

Our vision was to create an efficient layout of offices and open work spaces combined with "tea points" that take advantage of the abundant natural light from the expansive exterior windows. We also needed ample wall space for art, which is an important part of our culture, and plenty of space for collaboration.

What are some of the unique features of the space?

The refurbished ceiling, glass partitions, flooring, custom lighting and furnishings, while not unique, per se, created a harmonious and well-appointed



When your staff is proud of their office, they feel better about their opportunities and their careers.

space. The generous terrace on the second floor also added a special feature we didn't have before, providing a beautiful space for collaboration and interaction. The space truly represents the Carlson culture and brand in London.

Staff often work extremely long hours. What role does emerging technology and design play in providing the best office environment?

Unfortunately, technology is inundating our lives. Even the World Health Organization has projected that "techno stress," the stress of being constantly "on," is one of the biggest health issues of the future. We have an obligation to our team to integrate technology effectively within the workspace and offer opportunities for concentration by creating quiet zones within working spaces. Attention to acoustical sound control is very important within the working zones.

How have wellness and flexible workspaces affected Carlson Capital's success?

When a company demonstrates that it cares about the working conditions of its staff and pays attention to their physical needs, it increases the employees' levels of engagement and job satisfaction. When they enjoy coming to work and experience a quality work environment, they produce better results.

One of the ways we try to help with that is by adding adjustable-height desks to our work environments. We believe that when we create environments that fulfill the basic needs of people and allow for a healthy balance of heads-down work and collaboration, we offer them more choices. If choosing adjustability at their desks makes them more comfortable, we want to support that.

How have Carlson Capital's real estate needs evolved?

We are constantly looking to position our firm well in the marketplace at cost-effective lease rates. As we all know, this is challeng-

ing. We have reduced the allotment of square footage per person, but in so doing have become more creative with the amenities provided within and near our space. Because the human resource cost is our greatest expense and our greatest asset, we continue to explore how to make real estate work harder for us.

What does your workplace of tomorrow look like?

The Carlson Workplace of Tomorrow will continue to focus on being efficient and effective. Technology will continue to be highly integrated and user-friendly. And I see us focusing on providing more individual choices—like combining open office areas with areas for collaboration and interaction.

It's so important to allow our team members to make choices about how and where they work so they have opportunities to experience different work venues. Those choices have a real impact on their health, safety and well-being, so we take them seriously.

It's all about our people. The future office will be more human-centric, focused on creating spaces that not only look good, but feel good, too. And consistent in our offices is a focus on quality. When your staff is proud of their office, they feel better about their opportunities and their careers. ◀



Above ▲
Adjustable-height desks are one way to support healthy balance at work. Fall 2016 | 5

A specially commissioned sculpture by Brazilian artist Henrique Oliveria was designed to be created on site around one of the existing concrete columns.



The trading floor is the heart of Vitol's operations, so its functionality was their highest priority.

Trading Spaces: A New Look for a Houston Energy Giant

As one of the world's largest independent energy trading companies, Vitol needed its Houston, Texas office to reflect that impressive reputation. With its one-of-a-kind artwork and design features, its new space delivers.

But creating such a special space meant taking some special measures, says Structure Tone Southwest project manager, Neel Watts. "Virtually every feature of this office was specific to this job," he says. "There was nothing cookie-cutter about it, so we had to get creative in our approach to nearly every portion of it."

Complexity and creativity were, indeed, running themes throughout the project. "Offices with huge trading floors like this one have a lot of inherent requirements," Watts says. "The sheer amount of electrical and data infrastructure involved in creating a functional trading floor is one thing, but accommodating that in a sophisticated, sleek design like this added another challenge."

Function First

The trading floor is the heart of Vitol's operations, so its functionality was their highest priority. To accommodate the complex data and electrical network necessary for worldwide trading, the project involved installing a raised floor system. What's

more, incorporating a raised floor trims two feet from the ceiling height, making typical ceiling HVAC ductwork a no-go. That meant the air system and duct highway must also fit within the raised floor space. The construction team worked closely with the engineers to judiciously review and verify the specs to ensure those systems could fit together—and function smoothly—within those tight quarters.

The floor itself also required careful installation given its many layers. Because a raised floor allows much more movement than a concrete one—a potentially scary proposition given all of the infrastructure housed within the floor—its installation involved topping 1 1/8" plywood with a combination of crack-suppression membrane, an ECOsilence membrane and porcelain tile for added stability.

Another complication with the flooring was that the raised floor was limited to the trading floor only. So, according to Watts, the transition from that area to others was tricky. "The servery, fitness center, restrooms and other areas on the 10th

floor didn't involve raised flooring, so the traditional flooring had to match. It was tough to ensure it all lined up."

The construction team solved the problem by building 4-inch foam lifts for a total of 20 inches, on which another 4 inches of lightweight concrete topping was poured. The team then carefully aligned the transitions from that floor surface to the materials on different sections of the raised floor—those topped with tile and those with an additional layer of carpet.

Form Meets Function

While the functionality of the space was, of course, critical, it didn't mean the design sacrificed style. Led by Houston architecture firm PDR, the design is refined and modern, with a number of distinctly creative elements, some of which are one-of-a-kind installations.

The Arktura Ceiling: The custom nature of this striking feature meant a long lead time before installation: 23 weeks. This posed a construction

challenge as the schedule had to be perfectly timed to delivery so that the raised floor, drywall construction and suspension system would be at the proper stage for accommodating the prefabricated 80" x 80" panels. For the raised floor, enough progress had to have been made there to support the 10,000sf of scaffolding needed to install the panels. That progress was, in turn, dependent on how far the team would be able to get with the IT and air system infrastructure. To accommodate the suspension system, the drywall soffits had to not only be constructed ahead of time but built meticulously to the shop drawings since the panels would arrive on site prefabricated, leaving no room for on-the-fly adjustments.

The Exclusive Artwork: One of the senior leaders of Vitol's Houston office is an avid art collector, a passion reflected throughout the office. The central piece of this collection is a specially commissioned sculpture by Brazilian artist Henrique Oliveria. Oliveria designed his piece to be created on site around one of the existing concrete columns, meaning the construction team needed to factor this process into the

overall schedule—including the custom enclosure Oliveria needed to complete the piece on an active construction site.

"We met with Mr. Oliveria and his team beforehand and they explained to us what he needed," says Watts. "With his demanding schedule, he had a small two-week window to get this done, so we had to make sure everything around him was ready."

The Support Structures: In that same artistic spirit, many of the space's support features were designed with added flair. The concrete support columns on the trade floor, for example, are flared at the top and embellished with LED lighting, neither of which is typical for structural columns. The open, "floating" staircase is unconventional as well. With its post-free cantilevered design, the construction team had to coordinate very closely with the structural engineers to ensure proper support.

The Office Fronts: PDR's vision for the new office was one of elegance and sophistication. To help make sure that design translated to construction, the design team brought Struc-

ture Tone into the selection process for office fronts to help determine which systems would work best.

"We looked at a number of office front products," says Watts. "We agreed with the recommended DIRT system as, based on our experiences, it met those constructability and sustainability needs and really complemented the design vision. At the time of construction, there wasn't another system like it in Houston."

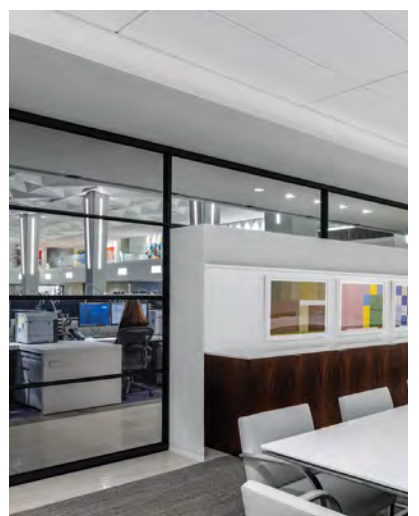
A Hub of Activity

With its full kitchen and servery, showers and fitness facilities and a sweeping view of downtown Houston, Vitol's new office has certainly become the talk of the town. The brand new building—which was still under construction as the office construction began—has become the anchor of a new "urban activity center" along Levy Park in Houston's Upper Kirby neighborhood.

"While the many unique features and amazing amenities of this project could be challenging, we were so proud and excited to be a part of it," Watts says. "There's really nothing like it in Houston." ◀

Project Details

- Size**
60,000sf
- Architect**
PDR Architects
- Completion**
January 2016
- Sector**
Commercial
- Services**
Construction Management
- Owners Rep**
Cushman & Wakefield
- Engineer**
IA Naman & Associates



Well Spaces

By Jennifer Taranto,
Structure Tone Director of Sustainability



The WELL Building Standard™ is a relatively new building rating system that measures the performance of a building as it relates to the occupant's health and well-being. In short, where LEED® cares about the health of the planet, WELL™ cares about the health of the people in the built environment.

As LEED made strides to transform the market, sustainability practitioners often talked about the perceived improved productivity of employees and the reduced absenteeism. These outcomes, which were secondary to carbon reduction, were, at best, observations discerned from clients, but without any formidable proof until now. Harvard recently released a study finding that carbon dioxide (CO₂) has a direct negative impact on cognitive ability, thus proving that productivity really is better in green buildings with better indoor air quality.

Here is where WELL enters the picture. The WELL Building Standard dovetails neatly where LEED leaves off by including features that specifically address the occupants and are backed up by science and medical evidence. It addresses the quality of the air, water, food and light within a space while at the same time guiding companies on policies related to fitness, comfort and mental well-being.

A company's largest expense is its staff, which can come close to nearly 90% of the costs of any service provider business. Because of this, as noted in a 2013 World Green Building Council study, any improvements made in indoor air quality have a far greater return on investment than cuts to energy usage. Those improvements to indoor air quality improve the productivity of your employees, reduce absenteeism and—more importantly—increase presenteeism. Those improvements to your employee's performance will far outweigh the improvements in energy performance, which account for a 1–3% savings. Make no mistake; this is not a call to ignore energy efficiency and replace it with wellness initiatives, but rather a call to action to supplement your carbon reduction goals with improvements to your employees' health.

In this market, there is a war on talent. Employers want the best and brightest workforce to push research forward on new pharmaceuticals, the best coders to create new software and the brightest attorneys to help people and businesses do the right thing. The question they'll ask is, "Why should I work for your firm?" The WELL Building Standard

allows companies to site specific, tangible examples to help answer that question.

Through our discussions with clients about the WELL Building Standard, we have heard that the rating system has allowed them to put their arms around disjointed efforts and budget allocations among various departments to speak with a unified, clear voice about the benefits these efforts offer to existing and new talent. WELL has brought multiple departments, previously working in silos, to the table to improve the potential health outcomes for everyone.



WELL has brought multiple departments, previously working in silos, to the table to improve the potential health outcomes for everyone.

Achieving WELL Certification for your project will create an integrated project team. There are features that require alterations to the built environment, those that require alterations in facilities maintenance and those that will require organizational policy changes as well as added incentives for employees. Furthermore, the features are field tested and verified so that you can point to third-party scientific test results showing the quality of the air, water, light and acoustics in your space.

We are experiencing this collaborative effect firsthand as we seek WELL Certification for our own new Manhattan office. Stay tuned for more on that process in the next issue of *Insights*.

In the meantime, learn more about becoming WELL Certified at wellcertified.com. ◀

© Courtesy: DELOS and Genster



Small Space, Big Challenges

If “isotope geochemistry” sounds complicated, that’s because it is—which means its researchers and students have very specific needs when it comes to a laboratory space.

“Professor Baxter treats this facility like his temple. He’s very proud of it, and we are, too.”—Sean Hanley, Structure Tone superintendent

At Boston College, the Earth & Environmental Sciences Department wanted a new lab to house this kind of geochemistry work, including what’s called a “TIMS” instrument, or Thermal Ionization Mass Spectrometry unit. In basic terms, this research studies the ages, rates and timescales of past Earth processes and helps trace how material moved within them.

Building a space that properly accommodates such complex scientific pursuits was, not surprisingly, equally complicated. Between fitting together the necessary equipment and ensuring the lab met stringent standards for a controlled environment, the construction team met challenges from day one—and had a very short window to figure them out.

Free and Clear

To start, due to the nature of the corrosive acids used to break down the rocks, the lab had to be free of all metals—even down to screw heads and door hardware. Otherwise, the acid could eat right through the metal and begin contaminating the air particles, which would render the samples useless (not to mention repeatedly ruin lab fixtures). Everything had to be coated in epoxy which, according to Structure Tone superintendent Sean Hanley, had a major bearing on the construction schedule.

“Usually you build all the walls first and then the ceiling, but we had to build everything in layers from the top down,” he says. The team sprayed existing conditions with the epoxy first, then the hangers for the sprinkler and mechanical systems, then ductwork, then the ceiling

grid, and so on. Each phase meant a separate mobilization, sometimes weeks apart, to avoid recirculating air in the space.

“We’d have to move everyone out for the epoxy coating, then let everyone back in for another section, then back out for coating,” Hanley says. “It was tricky since this wasn’t the initial plan but rather something we caught during scheduling.”

The lab is also a Class 1,000 clean room, which means the space must essentially be free from even the smallest, most minute air particles. The construction team built three separate “balloons” to contain all air flow in the space. “We had to make sure everything—from the ductwork, to the filters, to the ceiling panels—was air tight,” Hanley says.

Solving a Space Puzzle

Part of the lab upgrade included replacing two of the three air handler units on the roof. The penthouse that housed the two units was extremely tight, and the steel beams above did not allow a unit to be taken out or dropped in through the roof as a whole. Instead, the team had to orchestrate a plan to carefully demo, shift, remove and replace, while leaving two of the three units on at all times. “It was like a game of Tetris,” says Hanley. “We built two separate roof openings and a temporary curb and covering, which allowed the team to open the roof and seal it back after the two crane days.”

Installing the ductwork for the HVAC system was equally challenging. Given the extremely corrosive chemical exhaust produced in the lab, the team installed PSP ductwork, a stainless steel corrosive fume exhaust duct with PermaShield fluoropolymer barrier coating, on the interior of the duct. The anti-corrosion nature of this system involved fabricating each piece in the shop based on measurements, which adds four to five weeks to the typical two or three days of the fabricate-

All images these pages: © Robert Benson Photography

in-the-field approach. The team had to carefully map out the exact route installation of the prefabricated duct would take, from the third floor through the fourth, through the penthouse and out the roof—all within 1/16 of an inch of accuracy.

Rolling with the Punches

On-the-spot problem-solving like this seemed to be a daily course of business for the project team. For a facility with such specialized uses, some of the features that seemed fine in the drawings began to pose an operational problem for the lab owners as they came to fruition.

So, the team often came together to make changes on the fly. For example, after the construction crew installed the flooring, the head of the lab noticed that the floor specified and installed was not chemically resistant enough to hold up to the chemicals used in their research. So, out it went. In another instance, the fume hoods atop the research cubbies weren’t large enough to accommodate some of the equipment the researchers use. Together the project team decided to cut the existing hoods in half and raise them 8

inches to meet the clearances. “That could have been a show-stopper,” says Boston College construction project manager, Paul Scarnici.

Another construction challenge was dealing with an occupied building and campus with limited sidewalks and walking paths for students and faculty. To minimize noise and vibration during class times, the crew had materials delivered before classes began and used only a selected amount of hand tools. “The client joked that they kept throwing hand grenades at us,” recalls Hanley. “They were shocked that we were able to make so many changes and recommendations right on site. It was almost like a design-build project.”

As clichéd as it may sound, it was truly committed teamwork that made the project move along smoothly. “The team stuck to it,” says Scarnici. “We all stayed tight and put our heads together to solve each problem as it came without pointing fingers or getting rattled.”

Through this careful planning, teamwork and flexibility, the new lab was ready for students by the next semester. And the faculty couldn’t

be happier. Professor Ethan Baxter, in particular, followed progress throughout construction, posting photos to his own website. “Professor Baxter treats this facility like his temple,” says Hanley. “He’s very proud of it, and we are, too.” ◀

Project Details

- Size**
2,000sf
- Architect**
Dimella Shaffer
- Completion**
January 2016
- Sector**
Education
- Services**
Construction Management
- Engineer**
Thompson Consultants, Inc.

The Secret to Building Success

Building Information Modeling (BIM) processes, in some form or another, have been around for nearly 20 years. However, in 2007 the UK government issued a country-wide mandate that set out four levels of BIM ranging from 0 to 3, stating that all centrally-funded government projects should achieve Level 2 by 2016. Structure Tone's UK team embraced the change, making it a central focus area for the practice and its project partners.



Above ▲ Using BIM and virtual construction tools in the earliest stages of the process ensured that the project team was coordinated well before construction began.

When the group became engaged in building the European headquarters for the Canadian pension plan OMERS, led by architect HLW International Ltd and engineer ChapmanBDSP, they quickly identified the project as a perfect candidate for their enhanced BIM/virtual construction strategy. With all project team members on board, making BIM/VC a pivotal tool proved to be essential to its success. Here's how:

1. Making a complex design a reality

Located in the iconic Leadenhall Building in Central London, the design for the new OMERS office featured a bespoke staircase that traverses—and connects—the two floors. Given the building's unique three-axis movement, making that design work horizontally, vertically and laterally was a potential construction challenge. Using BIM, the team created a sophisticated model that showcased how the staircase could be sequenced and built, even piloting their first use of 3D printing to create a tangible representation of how such a complex structure would come together.

HLW's innovative design for the boardroom also presented an ideal opportunity to apply a coordinated BIM strategy. The multifaceted, folding ceiling was angled in all directions, meaning integrating services like grilles, AV speakers, sprinklers, fire alarms and lighting would be tricky. Working hand-in-hand with the engineers at ChapmanBDSP, the construction team modelled the ceiling to highlight key pinch points and the dimensions

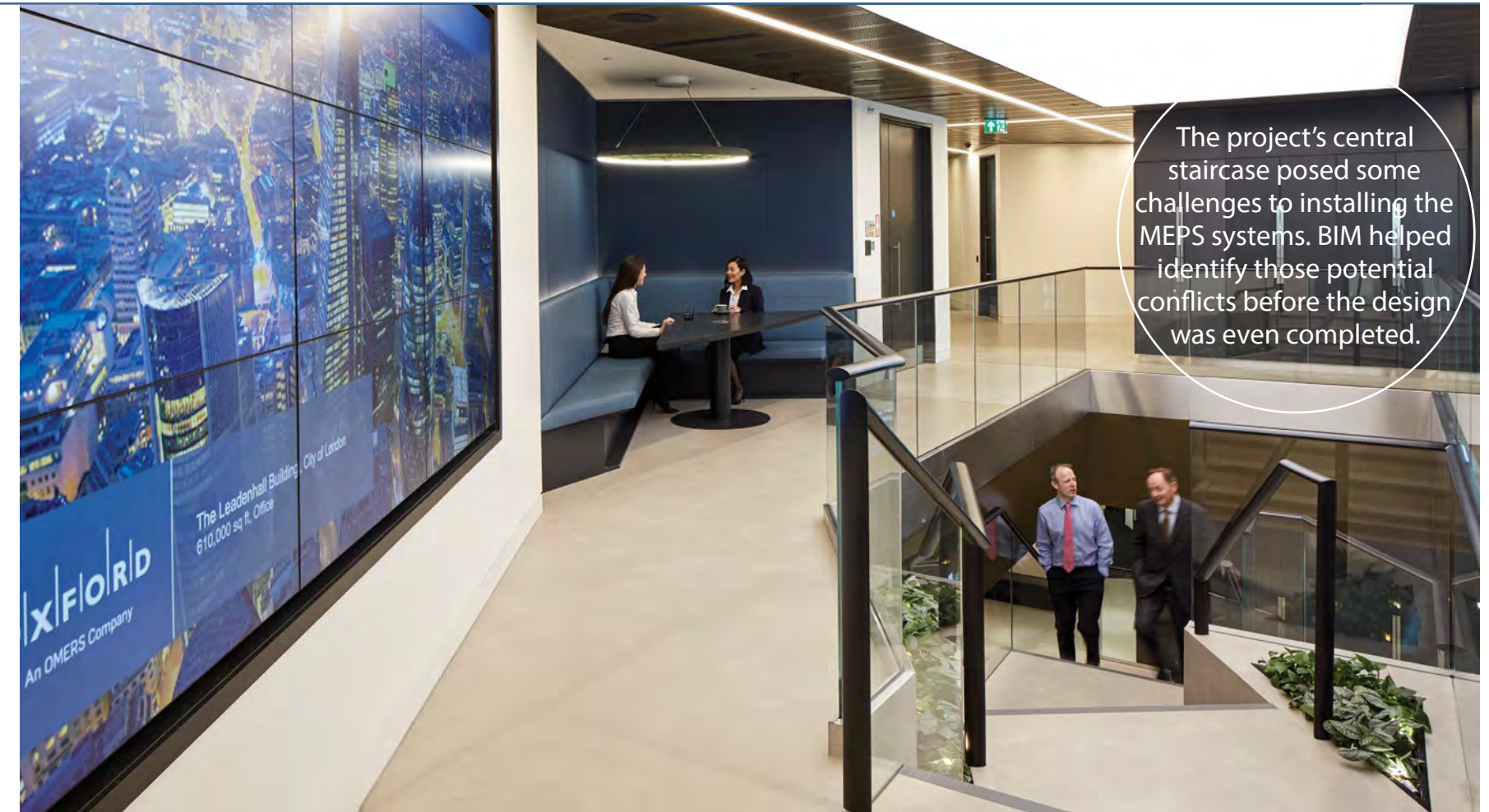
needed to coordinate the space. Through rigorous coordination workshops and adjustments to the models, the project team introduced service spines on either side of the room, which provided the space to incorporate those services.

2. Resolving conflicts

Clash detection is a well-known benefit of BIM. For the OMERS project, the team took it to another level by starting early. Before the project had even been awarded to the company, Structure Tone developed a federated model that included not only the MEPS elements coordinated with the base build steelwork, but also an accurate 3D model of the staircase. This model identified a main duct penetrating the top three treads of the design's proposed staircase. After flagging the issue with the design team, Structure Tone's BIM/VC team worked with them to reroute the main duct 45 degrees to avoid the staircase and allow them to continue finalizing the mechanical design.

When the project was fully under way, Structure Tone's BIM/VC team went to work performing an in-house 3D point cloud survey. From this scan data, the team developed a survey model, making an exact parametric replica of the onsite installation. Once again, the model helped identify—early on—some conflicts in the base build as-built drawings. The team was able to use this information to immediately identify missing beams and incorrect service hole sizes and positions.

Oxford Properties



The project's central staircase posed some challenges to installing the MEPS systems. BIM helped identify those potential conflicts before the design was even completed.

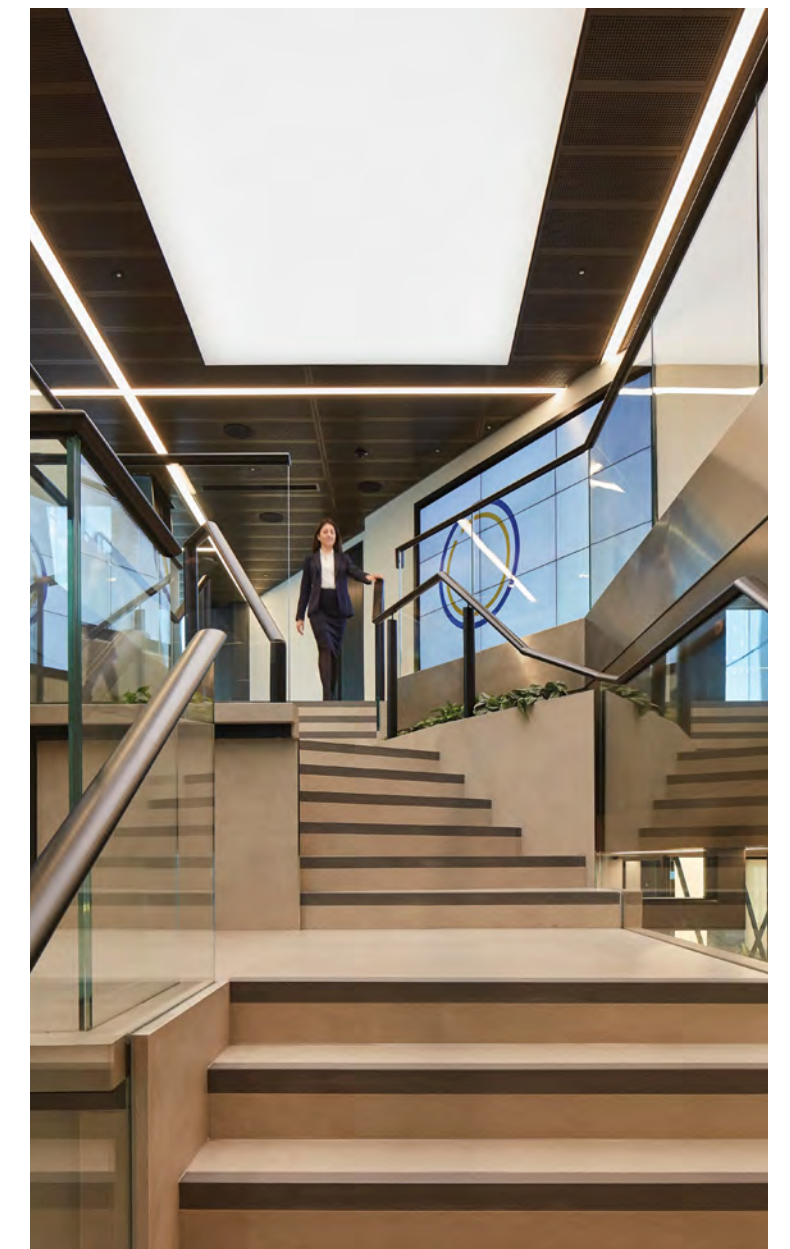
3. Creating an efficient, coordinated team

With a number of potential conflicts revealed before drawings had even been finalized, the project had a head start before construction began. Drawing approvals went through more quickly, and the team undoubtedly prevented unforeseen challenges. What's more, nipping these challenges in the bud early on significantly reduced the risk for both the construction team and its supply chain.

Once Structure Tone's BIM/VC team had created its model and shared it with the project team, ChapmanBDSP was able to model their systems around it, ensuring everyone was working from the same playbook. With this shared foundation, Structure Tone's Jamie Greig and Ashley Heel coordinated reflected ceiling plan workshops for the entire project team, aiming to finalize the ceiling plan earlier in the process so that the other trades would not be delayed on-site. The team led an on-screen, detailed review of each area using AutoCAD software to make HLW and ChapmanBDSP's changes to the ceiling layout then and there.

With the entire project team clearly coordinated and working together right from the start, using BIM/VC technology helped create a team with a shared mindset—a winning scenario for all. ◀

Right ▶ The project team used BIM and 3D printing to demonstrate how the complex two-level staircase would be sequenced and built.





The chiller plant provides 40,000 tons of cooling to help keep buildings comfortable.

Keeping the University of Pennsylvania Cool

As every homeowner knows, turning on the air conditioning means a huge spike in the electric bill—particularly through the dog days of summer. Now imagine what an urban college campus must generate to keep its buildings comfortable. Efficiency is critical.

As the University of Pennsylvania has grown in enrollment, it's expanded its West Philadelphia campus to more than 200 buildings over 300 acres. Its necessary infrastructure has followed suit, including a recent expansion of the Module 7 chilled water plant, which now provides 40,000 tons of cooling to air condition nearly 180 university buildings.

“Many buildings have a small chiller plant within the building itself,” says Ken Innella, LF Driscoll vice president. “But having a centralized, stand-alone facility like this to support such a wide network of buildings is much more efficient. The sheer size of this massive Penn facility is impressive.”

The new chillers and expanded building not only increase the plant's cooling capacity by 25%, but also help the university meet another important objective: reducing its reliance on electricity. The two new 5,000-ton chillers run on steam, meaning air conditioning won't overtax the campus' electrical demand, particularly during peak summer months. PECO Energy also gave Penn large grants for installing non-electric equipment as incentives to avoid adding to the electrical infrastructure and to install optimization software in the existing plant.

To add steam to the traditionally electrically-powered plant, our LF Driscoll team had to install 1,225lf of piping to connect the chillers to the campus' existing Veolia steam lines. To make matters more complicated, this installation involved coordinating around Penn's heavily used baseball field—plus under a Center City railroad. Since the railroad wasn't going to stop running, our team had to install the piping under the tracks without disturbing the surface, using a method called “jack and bore.” The team essentially dug a hole, or pit, on each side of the track and then used a boring machine and auger to push through the ground horizontally, from one pit to the other. Each time a train approached, flag men alerted the crew to halt boring until the train passed.

The building was designed by Leers Weinzapfel Associates, and engineer Trefz Engineering led the system design efforts. In 2006, this same LF Driscoll/Trefz project team worked with Penn to add two variable frequency drive (VFD), 5,000-ton chillers to the plant which, at the time, were the most efficient and base-loaded chillers in the facility.

With its added chilling capacity and fully automated and optimized plant controls up and running, the university expects to save significantly on utility costs. And they're not done yet—there's room for two more chillers to continue supporting the Penn community. ◀

© Mike Verzelio

Amazing Spaces



Cannondale Headquarters, Wilton, CT.

Take a look at some of the notable—and inspiring—projects we recently completed. #STOamazingspaces



Above ▲ Cannondale, Wilton, CT. Architect: CPG Architects.

Above ▲ NY Plumbers Union, New York, NY. Architect: Environetics.

Above ▲ Sabre Executive Suites, Southlake, TX. Architect: HKS, Inc.

Above ▲ 100 East 53rd Street, New York, NY. Architect: Foster + Partners, SLCE.

Left and previous page: Cannondale. ©David Sundberg/Esto. Right: Plumbers Union. ©Eric Laliguel

Left: Sabre. ©Kevin Bowers. Right and following page: Alcon Experience Center. ©DVdesign Group, Inc.



#STOamazingspaces
100 East 53rd Street,
New York, NY



Our Pavarini McGovern team recently hosted a Cranes & Derricks workshop in New York City to help industry partners understand crane safety and the regulatory environment.

Safety Corner: Cracking Down on Crane Safety

By Gary Di Paolo, senior vice president, corporate safety, Structure Tone

Crane accidents have been in the news often over the last few years, and some cities are responding with increased regulations and oversight on operators. In New York City, where stringent site safety regulations and management have been the norm for decades, the Department of Buildings recently unveiled a batch of updated policies and regulations to put an even finer point on the best practices for crane safety.

Appointed by Mayor de Blasio after last February's crane collapse in Tribeca, members of a new Crane Safety Technical Working Group proposed 23 regulations, several of which went into effect on June 30, 2016. The new regulations:

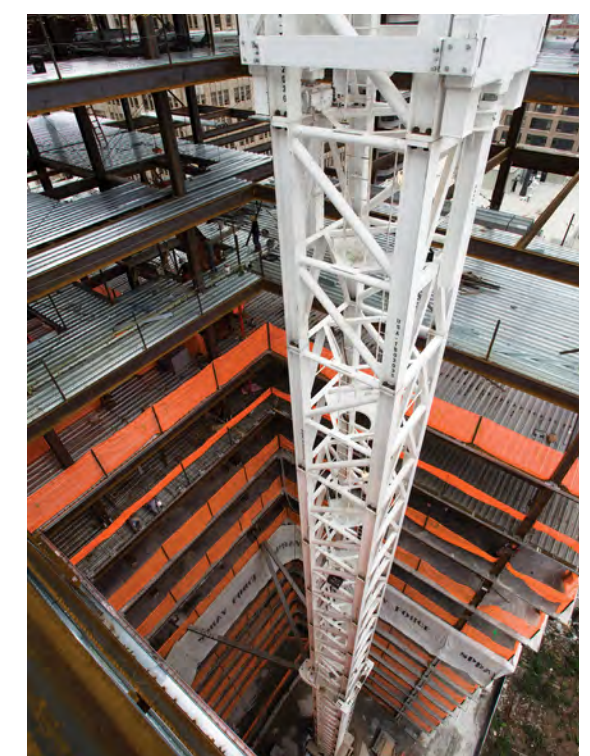
- ◆ Ban any crawler crane configuration that must cease operation in winds of 20 miles per hour or less from being on city streets.
- ◆ Require anemometers be affixed to cranes to monitor wind speeds and other weather conditions in real time.
- ◆ Mandate that contractors using crawler cranes must have an on-site lift director to monitor conditions and organize pre-shift meetings and inspections.
- ◆ Restrict crawler crane operations when winds exceed 30mph, as measured on site.

It's safe to say that other cities will soon follow New York's lead when it comes to regulating crane

safety. Philadelphia, for example, has been looking closely at New York's requirements and considering the same level of oversight and site safety management that New York has established.

Regulations like these are certainly helpful for enforcing proper implementation and more clearly guiding when, where and in what conditions cranes can operate. But they really should not significantly alter the practices and behavior of those of us who live and breathe construction safety, day in and day out, on every site. It's the job of construction managers to ensure—no, to demand—that everyone involved in a project, from the subcontractor crews to the engineers, understand the construction environment and what's happening around them.

Safety goes beyond what's required by law. A culture of safety shared throughout a project team is the critical difference-maker. ◀





Showroom Spaces



Above ▲ Data center design may look simple, but a complicated network of infrastructure and equipment lies beneath the surface.

The Need for Speed

In the fast-paced world of data, speed matters. Data center developers like CyrusOne are making speed-to-market a hallmark of their business, and efficient construction can make all the difference.

With now over 30 data centers across the globe, CyrusOne knows what it takes to design, build and operate these mission critical facilities. They frame their philosophy around three main principles: lowering capital and operating expenses for their clients, reducing risk through redundancy and building scalable facilities that allow clients room to grow.

Making all of this work means finding partners that understand those principles, data center infrastructure needs and the necessity of high-quality but highly efficient construction.

"We've been building mission critical facilities for over 25 years, so we've developed a really keen understanding of how to move the obstacles that can slow it down," says Structure Tone vice president of mission critical, Lane Anderson. "We're able to anticipate challenges and creatively plan around them, which works well for a firm like CyrusOne."

Cable plant infrastructure, equipment availability and racking, IT integration, hot and cold aisle containment systems... those are just some of the challenges unique to mission critical buildings. While experience with these elements is a major advan-

tage, experience alone doesn't equate to speed. Solid project management and a working knowledge of technology are crucial.

"Virtual design and construction and BIM make a world of difference to efficiency," says Anderson. "They help us identify and resolve potential and existing conflicts on the spot, in real-time."

Cloud-based collaboration has also boosted the project team's ability to move quickly. While cloud-based tools aren't brand new, they're still unconventional in the construction industry.

"These tools have been game-changers," Anderson says. "They allow us to resolve issues together onsite or remotely since project team members can access and review documents from anywhere with an internet connection."

Now with eight projects in Texas under their collective belts, CyrusOne and Structure Tone continue to hone their process. "We do a lessons learned after every project," Anderson says. "We have a database of all of those lessons and how best to approach them the next time." ◀

Justin Wallace Photography

John Hardy Showroom
New York City.



UGG Showroom,
New York City.



Flexibility. Technology. Distinction. All hallmarks of today's retail showroom space or—as many industry professionals now call them—experience centers. “These spaces are all about the experience,” says Scott Davies, marketing strategy manager for appliance company Fisher & Paykel. “It provides a platform for our customers to interact with our appliances in a unique and memorable way through both physical and digital elements.”

“An everlasting trend is creating a unique environment that is memorable, is inspiring and shows the true soul of a brand.” —Inga Kruliene, principal at Design Republic, designers of John Hardy's New York showroom



Above ▲ Digital features work hand-in-hand with the physical design (by Fearon Hay) of Fisher & Paykel's NYC showroom.

Previous page and this page, top: “Mike Verzelia.

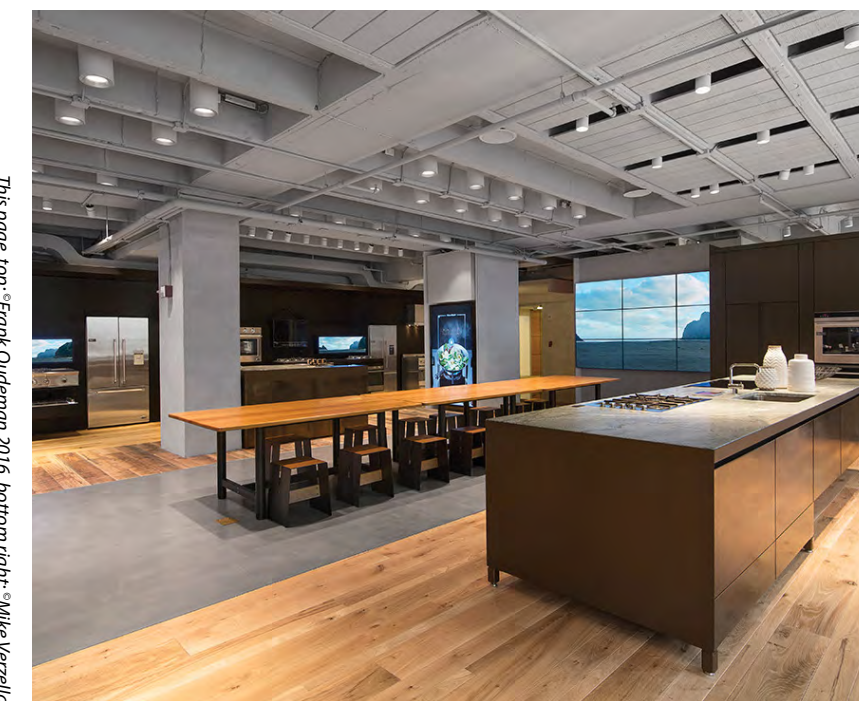
That idea of the brand experience—and the flexibility to adapt the space to it—has become the central driver for companies whose products range from appliances, to Ugg footwear, to John Hardy jewelry.

“In addition to housing our showroom, our new space at 330 Hudson Street in New York serves as our corporate headquarters and an

environment where we not only do business but also entertain,” says John Hardy CEO, Robert Hanson. “The unique showroom environment we've created is the window to our brand.”

For the project team, translating the brand into an experience means truly understanding what the brand represents.

Below ▼ The Fisher & Paykel showroom is designed to be an inspirational space to explore, choose, plan and cook.



This page, top: “Frank Oudeman 2016, bottom right: “Mike Verzelia

“We are very interested in the big-picture vision,” says Dan Finnegan, senior vice president at Structure Tone. “We like to learn where the company comes from, their values, their culture. All of that helps us fine-tune the details to meet the experience level they're looking for.”

For John Hardy, for instance, the team studied the company's Balinese history to ensure the final product reflected it appropriately. “Instead of bringing Bali into the showroom in a literal way, we introduced subtle cues through texture, color, contrasting elements of light and dark, silver and gold, wood and glass into the space,” says Hanson. “These luxury design elements create an art gallery feel allowing our powerful, dramatic and inspiring artisan-crafted jewelry to shine.” An art gallery. A creative office. A sleek, urban home. Whatever the experience, today's showrooms are delivering, with the tone of the brand embedded throughout. ◀

Above ▲ John Hardy's New York City showroom was designed to be a warm, inviting space that speaks to the company's Balinese heritage.

Below ▼ Ugg's New York City Showroom, designed by Checkland Kindleysides, is both sleek and cozy.



Contemporary Spaces

Planning Makes Perfect

Three-and-a-half months. That's how quickly financial services firm Brown Brothers Harriman & Co. needed to fit out and move into its new office in an existing high-rise in Jersey City, New Jersey. With a lot of communication and strategic planning, the project team worked through a speedy preconstruction process to make sure the firm's 550 employees moved into their new home on time.

Brown Brothers Harriman has a robust software development team with some intense IT infrastructure needs. To fast-track the 95,000sf, multi-floor project with facilities that meet those standards, the project team strategized to pre-purchase the lighting package, computer room air conditioning (CRAC) units, FP boxes, structural steel and the UPS so that both move-in and commissioning could proceed quickly. Introducing new points of entry and carriers, along with generator upgrades, also helped provide redundant IT and main frame rooms.

Prepurchasing wasn't limited to IT infrastructure alone. Procuring the structural steel ahead of time also allowed the monument stairs to be prefabricated and the finish metals and glazing to be purchased, after heavy coordination, from CAD drawings. As these materials and finishings arrived, the project team developed a precise phasing plan in which multiple trades worked on multiple shifts to help the team work as efficiently as possible in the given time constraints.

The new space offers BBH employees a number of upgrades and amenities, from improved restrooms and wellness suites to a 6,000sf "grab-and-go" café and servery area—truly a place to call home, sweet home. ◀

Project Details

Size

95,000sf

Architect

HLW International

Completion

November 2015

Sector

Commercial

Services

Construction Management

Owner's Rep

Gardiner & Theobald Inc.

Engineer

Jaros Baum & Bolles, Inc.

Photographer: Chris Cooper

Building on



How the fit-out industry uses BIM today

BIM is a powerful process, through which companies from across the built environment sector can design better buildings more quickly and deliver structured data.



But building professionals must learn to both use it “selfishly” to improve their own processes and to share its data with clients if BIM’s true potential can be unleashed.

Those were some of the main conclusions of a roundtable discussion organized to debate the application of BIM in the private sector, as well as its mandatory use at Level 2 for centrally-funded public sector schemes in the UK.

Hosted by Structure Tone’s London office, the open and honest discussion among professionals with varying degrees of BIM experience shed new light on what the industry is doing now—and can do in the future—with BIM.

Model behaviour

Casey Rutland, associate director and BIM specialist at ARUP, began the discussion by showing how, three years ago, his firm produced ProjectOVE, an educational snapshot of possibilities, resulting in a 35-storey, 170m tall building model designed to look and function like a human body.

“The pump systems and HVAC systems are the heart and lungs, and the data centre is the brain,” said Rutland. But the important thing to take from this, he continued, was that it wasn’t simply geometry. Specific calculations run through all of the modelled elements (structural, electrical, HVAC) to demonstrate how one affects the other, as they do in the human body. For instance, changes made to, say, MEP at any stage can, in real time, immediately recalculate flow rates, pressure drops and so on.

“So when we say we do BIM, this is real, proper BIM,” he said. “It’s not just things that take up space in the model but rather a true, working model that showcases how one source of truth can be relied on for engineering calculations and coordination reassurance.”

Arup passed their model to Turner & Townsend who costed it at £440 million! The dataset is shared as a case study to enthuse and educate building professionals about BIM and its capabilities as a useful way to make complex processes easier to understand.

BIM in practise

Turner & Townsend’s associate director and BIM specialist, Dave Monswhite, said the money-saving aspect of ProjectOVE is powerful, especially concerning the optimization around the frame.

Out in the real world, said Monswhite, the most important thing is to share good, useful data with clients, something which came fully into perspective on a recent luxury leisure project.

“As we were analysing the model on a weekly basis, we could actually see the front-to-back ratios changing and the business case altering, live on our dashboards, which was quite entertaining for the client,” he said. The result was a smaller internal function room than the interior designer had thought appropriate—but which almost certainly would have sunk the business case if targeted at the outset.

BIM at large

HLW International’s managing director, Bronte Turner, reported they have globally embraced BIM to utilise the huge opportunities it offers them and their clients.

“The rise has been steep since BIM came to the forefront,” she noted. “In a short period of time we’ve transitioned beyond 2D drawings—which were fine—but compared to where the BIM process can take us, they now seem quite archaic.”

The biggest change BIM has brought to HLW is the shift in decision making. As Turner explained, the BIM process naturally improves design communication, coordination and quality. This enables cli-

ents to make more informed decisions earlier in the project process, at a time when there is greater ability to control costs, reduce risk and potentially reduce programmes.

Another key benefit specific to the fit-out market is the BIM data related to people and occupation. Turner says we are now able to test our designs in a virtual environment from the test-fit stage, significantly improving workplace strategy, space utilisation and head count information. "This continues right through to facilities management opportunities," she said. "By 2025, the UK government aims to lower costs by 33% across the lifecycle of the project, of which operation and maintenance make up approximately 75%."

While the industry has certainly heavily promoted the benefits of BIM, it is still a daunting proposition and big investment for a practice. "I still have to promote the concept of BIM to some clients. HLW now only works in Revit, and not all buildings are modelled, so that's a cost we have to bear," Turner said.

But continuous education and on-the-job success is helping make the conversion easier. Monswite reported that an experienced property director he worked with on a refit project was inspired by BIM after seeing the building fully laser scanned and modelled. "He actually said to us: 'This is the first time I've understood what I am buying in 20 years,'" Monswite recalled. "For them it was a safety issue that was the key driver, actually being able to understand the asset in some detail and plan the fit-out in a safe and sequenced manner."

Filling the gaps

Michael Burke, Structure Tone International's director of preconstruction services and BIM, says the industry is far away from the finished product.

"We're not there yet with all elements of BIM," he said. "But what we're selling is an innovative approach, taking lessons learnt from our US cousins and previous jobs, but also going to conferences and learning how we can take specifics of BIM into our everyday working practices."

Burke also questions how much of the supply chain is embracing the technology. M&E contractors are applying it for certain elements, as are some of the larger ceiling and joinery contractors. But the tier-two and tier-three contractors are often not quite there yet. "If we're going to push the BIM specifics, we need them on board," he said.

And what about the next wave of technology? "The future will also be about augmented and virtual reality, so clients can actually stand in the middle of their reception, say, based on drawings and see what it will look like," Burke added. Drones, too, will become more commonplace as a tool across the industry.

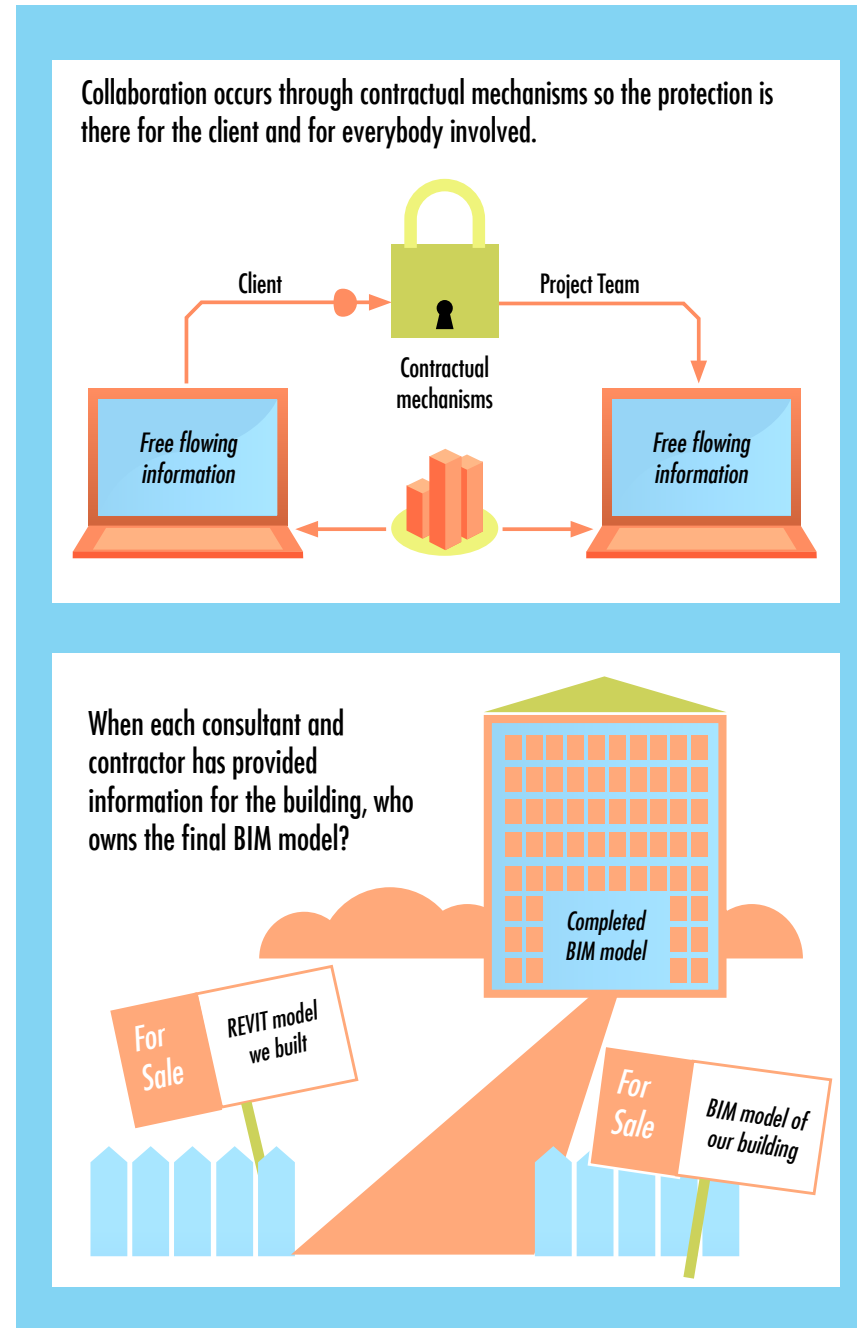
Who owns what?

Intellectual property is becoming much more prevalent in a BIM-led world, even in data structure. "I think when there's a problem, that's what makes clients nervous," said Burke. "They're probably thinking to themselves, 'It's hard enough in 2D to understand the demarcation between consultant/client responsibilities, never mind model data.'" But, in reality, BIM actually makes this difference easier to understand.

A potential solution? A common platform, suggested Monswite. "We allow everyone to freely collaborate through contractual mechanisms so the protection is there for the client, the protection is there for everybody involved, but they're able to behave in a different way, and that helps with the cultural issue."

The whole idea of BIM, after all, is to be collaborative and enjoy free-flowing information, said Rutland. Although people are often scared of liability issues, these don't change in a Level 2 BIM process.

"You all have liability for your own problems," said Monswite. "You're sharing information the same as you were before, just in a different medium."



The "light-bulb moment" for a lot of project managers is when they see a tool like Revit in action. "The designer is placing things in 2D, and the 3D is appearing in other boxes. They say, 'All of this is connected? You don't draw it?' No. That's when it happens," Monswite explained. "Once they realize it's good stuff, they'll come back for it again."

BIM adaptation or the Level 2 challenge?

The UK government has provided BIM recommendations and standards, such as the PAS1192, setting out guidance for delivering the ideal BIM project. But, explained Dan King, BIM manager at Structure Tone International, "delivering what is documented and delivering a useful and reliable, data-rich BIM model are two different challenges."

What concerns King the most is the misconception of fully achieving Level 2 BIM. "To say so-and-so has achieved it creates unrealistic targets for an industry struggling to deliver full Level 2," he said. "Contractual and legal misunderstanding, along with an inexperienced supply chain, makes a true Level 2 BIM project an unachievable goal without full subcontractor buy-in."

For BIM adoption to truly work, King explained, all members of a project team need an understanding of the BIM standards and processes required throughout the entire project timeline. "The practical adaptation of BIM on a project should be unique to each member of the team, with an understanding of how their deliverable will be used further down the BIM project line." ◀



Design on a Dime at a Texas Food Bank

The North Texas Food Bank knows how to do a lot with a little. As a nonprofit organization dedicated to fighting hunger, they work with volunteers and partners to stretch as little as one dollar into three (or more) meals for North Texas families.

So when it came time to move some of their administrative offices to a new location, they wanted to make the most of their limited renovation budget. "As a nonprofit, they don't have a lot of money for expenses like these," says David Horner, project manager at Structure Tone Southwest. "So we challenged ourselves to creatively repurpose the space they found into a really nice, inviting place to work."

That space was two stories of an underused, 12,000sf building in the burgeoning Dallas Farmers Market area in the southeast corner of town. While a complete renovation wasn't going to be feasible, the project team worked together with architect Corgan Associates to help the Food Bank maximize what the space had to offer, from updating existing infrastructure to adding creative touches.

For starters, the team was able to reconfigure interior walls to create an open office environment that brightened and modernized the space. Rather than demolishing and replacing the concrete walls, for instance, the team spruced them up with pops of color and repurposed salvaged wood paneling into accent walls.

To add more natural light, the team cut a new window into the first floor, which meant many, many reviews with the architect and structural engineer. Not only did the new window need to line up as closely as possible with those on the adjacent wall, but it also entailed some heavy structural reinforcement to fit within the existing concrete block infrastructure.

Now that the space is completed, the Food Bank team couldn't be happier. "The space has come such a long way from what we started with," David says. "And to know this group of people—who do so much for our community—now enjoy their workplace even more is truly rewarding." ◀

Below ▼
Brightly painted walls and lots of windows freshen the space.



Giving Back to Our Communities



“The hope is this beautiful memorial will bring peace to the families who have lost so dearly,” says Carol Neubaur, LF Driscoll’s Philadelphia-based project manager. “I am honored to be part of such a special project.”

June 5th Memorial, Philadelphia

On June 5th, 2013, the demolition of a vacant three-story building in Philadelphia collapsed a party wall, destroying a Salvation Army Thrift Store, killing six innocent people and injuring many others. The Philadelphia community quickly came together to reinvent the site as a memorial park, both to honor the memory of those who died and to serve as a constant reminder of the importance of construction safety and the value of human life.

Moved by the community response, LF Driscoll joined the effort in early 2015 as part of the pro bono team that has donated design and construction services and materials to make the memorial park a reality.

Construction of the June 5th Memorial Park began this summer and is expected to be completed by the end of the year. To donate to the effort, visit www.june5memorial.org.



Above ▲ Jim Donaghy with Joe Szabo, managing director and head of global operations at Tishman Speyer and this year’s honoree.

Racing for a Cause

“Together we are stronger.” That’s the motto of the National Multiple Sclerosis Society and certainly the driving motto behind the New York City—Southern Chapter’s annual Race Against MS at New York’s Belmont Park.

Structure Tone is a main sponsor of the Race Against MS, which marked its 34th year this summer. Brian, Jim and Raymond Donaghy have all been members of the event committee since 2004, when they were asked by the president of the MS Society to assist in turning around a struggling event.

Led by event emcee, NBC Sports anchor Bruce Beck, the over 500 attendees enjoyed an afternoon of thoroughbred racing, cocktails, lunch and live and silent auctions. As a result, this year’s event raised \$500,000 for critical research, support services and educational programs for the nearly 10,000 people living with MS in the five boroughs and Westchester, Putnam, Rockland, Orange and Sullivan Counties.

“Giving back to the communities where we work is a core philosophy at Structure Tone, and all employees are encouraged to seek opportunities to support local charitable causes,” Jim says. “The Structure Tone team who supports the MS Society for this event really goes above and beyond to make the event successful.”



Above ▲ Our Dallas team pauses for a group shot.

Putting Our Skills to Work

When it comes to helping out in our communities, there’s nothing like hands-on labor. And when that work falls directly within our area of expertise, even better! This spring, 25 members of our Dallas, Texas team pitched in to nearly complete the construction of a Habitat for Humanity home, shingling the roof, adding siding, window flashing, trim and fascia board and painting the finished

product. The build day was part of the quarterly meeting of employees in our Rotational Project Engineer program, which allows junior staff to try working in various departments of the company to determine where their interests and skills fit best. Through this challenge, the group learned to brainstorm, solve problems and work as a team. And, most importantly, they helped a Dallas family in need get one step closer to moving into a new home.



Above ▲ PennFirst team celebrating their sculpture.

Putting the “U” in CURE

Imagine the iconic “LOVE” sculpture in Philadelphia. Now imagine that sculpture made out of cans. That was the vision that inspired the PennFirst team’s creation for CANstruction, the annual design event held across the globe in which teams build sculptures out of cans of food. The food is then donated to local hunger relief organizations, helping raise both awareness and tangible donations to hunger causes.

The PennFirst team—made up of volunteers from LF Driscoll, Penn Medicine, Langan, HDR, Balfour Beatty, Southland Industries and Foster and Partners BR+A—played on the event’s “Decades” theme to create a sculpture that celebrated Philadelphia’s historic role as a national leader in healthcare. Exchanging the letters of LOVE for CURE, the team used its artwork to remind and inspire people to continue doing their part to help find a cure for cancer. Over 3,200 cans later, the team’s message was clear: when we work together, #weCANcure. ◀



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