

WALLS & CEILINGS

April 2013 | Volume 76, Issue 4 | The Voice of the Industry Since 1938™ | www.wconline.com

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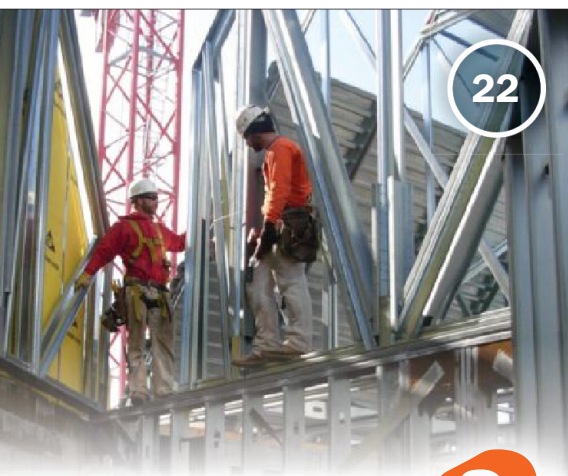
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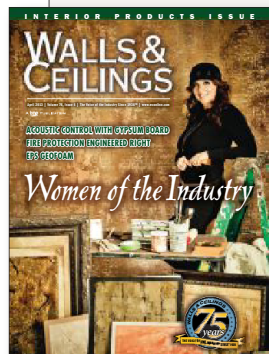
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Sandra Lassley of FeFiFaux Studios is an Omaha, Neb.-based faux finisher. Photo courtesy of Megan Marie Photography

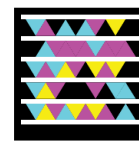
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BY MARK FOWLER



Reputation

Reputation is defined as “the estimation in which a person or thing is held, especially by the community or the public generally,” according to Dictionary.com. We work hard to build a reputation for ourselves, the companies and/or

organizations with which we work. In some cases, others try to destroy that same reputation. The water gets very murky when the issue is one of social values, and the civil discord between Republicans and Democrats seems to be about destroying each other’s reputation. This inherent conflict for social justice has led to some poor behavior from each side. The end result is not one side winning—as each had hoped—but a loss of reputation, credibility and character for both.

For proof, I submit a recent poll that reveals only 5 percent of the public feels Congress is doing a good job. This translates to the overall big picture that both sides have failed. The construction industry is not immune from suffering a similar fate of public disdain. Some public opinion of construction workers is not flattering and this is not limited to just the on-site worker. Similar to individual members of Congress, we may want to believe that we are immune and above that negative perception. But in reality, we are tethered to this perception and trying to alter that reputation takes work, a lot of work.

HARD TO BUILD, EASY TO TEAR DOWN

Reputation takes a long time to build and only a short time to tarnish. I believe the greater or more entrenched the reputation, the longer “free pass” you get, but we can all fall. No one has probably fallen more than Lance Armstrong. An argument could be made that he created his current reputation over a long practice of behind-the-scenes intimidation and coercion. Manti Te’o, the Notre Dame football player, has also damaged his reputation with publicly claiming his online girlfriend had died of cancer, only to find out it was a hoax. His explanation of being duped was plausible but he took the road, “What would you have done in my shoes when it was discovered it was a hoax?” He basically said he had no choice but to continue with the hoax and to keep the lie going, rather than admit he was more gullible than we consider appropriate for a college graduate.

I see this in our world, too. I was involved with an architect who was reviewing a cladding system for a building he was designing. As we dis-

cussed the various assemblies, pros and cons alike, I asked why he wasn’t using stucco, as he was always a fan of lath and plaster. He explained that the sample submitted by the contractor was badly cracked. He was told that was what he could expect.

I proceeded to seek out the contractor and find out more. It turns out, he wanted to steer the architect to a system he favored, so he intentionally cracked the sample and then suggested his favored system. The problem was the architect was never going to use that particular system submitted, so he went to other claddings. This is a form of deception designed to ruin a reputation.

The worst part was when the contractor and the supplier tried to solicit my help in the deception. I was having no part of it. I have a reputation, and while I respect a difference of opinion and understand variations on moisture management principles or detail preferences, I have a reputation and I look after it.

DON’T TRY TO “COVER-UP”

I was able to keep peace with my contractor and my dealer by not exposing their plan of deception but I did refuse to partake in the plan. This is what I would refer to as a “cover-up” and in my experience they rarely work out well in the long run. This is something I think is put to the ultimate test in tough times: when project budgets are tight, everyone looks for an angle to cut costs, make a few pennies or even salvage a lost cause.

I am sympathetic to any contractor or dealer trying to make it in today’s tough bid climate but you have a reputation to keep intact. So, what decision will it be? My architect friend got his lath and plaster wall, we made some modifications and the project had typical minimal cracking that the architect could live with and all our reputations were preserved. Reputation is what will carry you on for the next decade. Treasure it. **W&C**

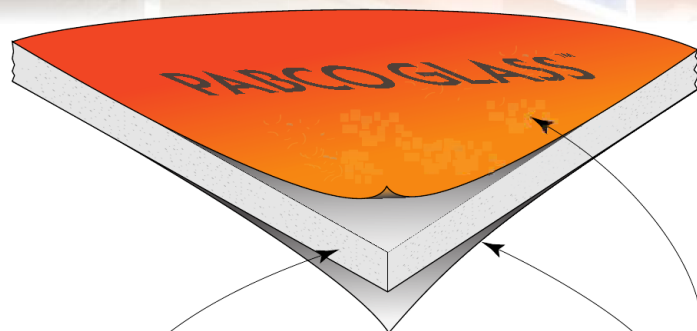


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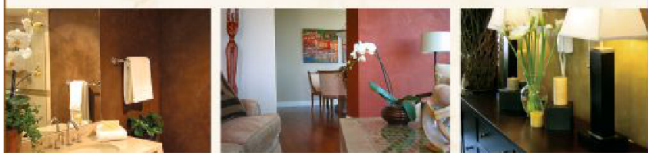
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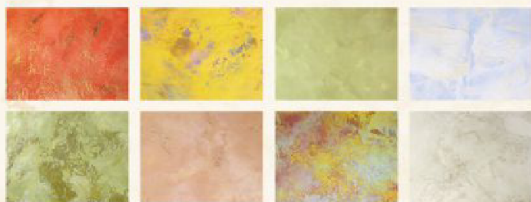
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4-6
Tucson, Ariz.
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EIMA HONORS W&C COLUMNIST FOR ARTICLE

The EIFS Industry Members Association honored *Walls & Ceilings'* Straight Green columnist Chris Dixon the Mike Sweeney Award for his piece "EIFS: The Greenest of Cladding Systems." The column appeared in *W&C* February 2013.



Dixon

The award was announced during this year's EIMA 2013 Annual Meeting in San Antonio, on March 20.

The Mike Sweeney Award was founded by the association in memory of Sto's Mike Sweeney, who passed in 2011. Sweeney worked as the media relations manager at Sto for 10 years, until his death. While at the company, Sweeney was responsible for public relations and advertising, thanks in large part to his relationships with vendors and the media.

During his time with Sto, he was a dedicated and enthusiastic participant on EIMA's Communications Committee.

Email Scott Robinson for more information on this award at srobinson@eima.com.

ACI RELEASES 2013 CONCRETE MANUAL

The American Concrete Institute has released its 2013 edition of one of its best-selling publications, the *Manual of Concrete Practice*.

Containing more than 220 documents, the manual is the most comprehensive and largest single source of concrete practice information available in one set of books. The *MCP* is a must-have for concrete professionals in any facet of the industry and contains all of the ACI documents needed to answer any questions about code requirements, specifications, tolerances, concrete proportions, construction methods, evaluation of test results, and many more topics. The manual also includes the 2011 version of ACI 318, *Building*

Code Requirements for Structural Concrete and Commentary.

The manual is available in a traditional hard copy version, which contains a set of six books and a separate index, an easy-to-use CD-ROM version, a USB drive version, or an online version. To order, visit www.concrete.org.



CLARKDIETRICH MOBILE TOOL FOR CONTRACTORS, ARCHITECTS

ClarkDietrich Building Systems announced the launch of its new mobile application, ClarkDietrich iTools, which gives contractors and architects access to a broad range of data, including cost-saving calculators, design tools, ClipExpress Navigation, LEED request forms and product literature directly from their mobile devices.

The cost-saving calculators use applicable project data to give contractors and architects an instant comparative pricing model for both materials and labor for many of the company's steel framing products. iTools also provides direct links to product pages, instructional videos and SubmittalPro, where contractors can view technical data sheets and generate submittals.

The new app includes access to the ClarkDietrich iProSTUD.com interior walls and ceilings design tool. Developed for contractors using the ProSTUD Drywall Framing System, it allows building professionals to view ProSTUD data, calculate ProSTUD limiting heights and email final submittal documents directly from their mobile device. ClarkDietrich iTools is now available in both desktop and mobile formats at iTools.clarkdietrich.com.

IPAF INTRODUCES MODULE FOR OPERATORS

IPAF has successfully trialed a new eLearning module as part of its

PEOPLE



Ladely

The American Concrete Institute has named **Tricia G. Ladely** as its director.



Griffin

The National One Coat Stucco Association recently named The QUIKRETE Companies' **Mike Griffin** to its board of directors as president.



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established AWPT training program for U.S. operators of aerial work

platforms. The eLearning module has been developed and tested with IPAF member NES Rentals, which has now trained most of its 1,040 staff to PAL Card level.

Trainees who complete the online session must still pass a supervised theory test at an AWPT-approved training center and must successfully complete a half-day of practical training and testing before being issued with a PAL Card (Powered Access Licensed-Registration)

as proof of successfully completed AWPT operator training.

The AWPT operator training program meets or exceeds all ANSI standards and OSHA requirements.



TRIM-TEX HOSTS ARCHITECTURAL AND DESIGN EVENT

Trim-Tex hosted an Architectural & Design event in February at its Design



SSMASM

SSMA RECEIVES ICC-ES REPORT

The Steel Stud Manufacturers Association announced that its structural and nonstructural products received evaluation report ESR-3064P from ICC Evaluation Service (ICC-ES). Receiving the ICC-ES evaluation report, coupled with an ongoing SSMA independent third-party certification program, offers the confidence to architects, engineers, contractors, specifiers, building officials and others that SSMA products are manufactured to the highest quality standards and I-Code requirements.

"SSMA has a long history of maintaining evaluation reports for its products," said SSMA Technical Director Rahim Zadeh, P.E. "We are proud that SSMA is the first to receive an ICC-ES evaluation report that complies with the 2012 International Building Code for both structural and nonstructural products."

In addition to 2012 IBC compliance, the new ESR-3064P report complies with 2010 California and Florida Building Codes. This report replaces the existing legacy report ER-4943P. ICC-ES requires that all legacy reports be converted to ESR reports when technical changes are introduced. The ESR-3064P report is available for download on the SSMA website at www.ssma.com.

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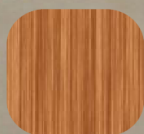
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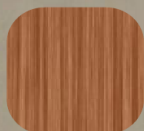
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Center in Lincolnwood, Ill., to showcase new products tailored towards architects. Many people from

Chicago and the surrounding areas attended the event to learn more about the products and network with fellow architects, specifiers and contractors.

Trim-Tex's Design Center is a large space with many different areas made to look like a different room. Each room showcases a different product line and how it can be used in a creative setting.

Architect attendees had the opportunity to earn 1 credit hour with AIA accredited speaker, Terry Murphy, who presented "Vinyl in Design."

FWCCA ROUNDTABLE EVENT FOR W&C FEATURE

The Florida Wall & Ceiling Contractors Association and *Walls & Ceilings* will be partnering on a feature



comprised of contractors from the state at its annual convention. The magazine is asking for 10 members to devote two hours to talk about business, contracting issues, new products and technologies, and more. The 90-minute event will happen at the Southeastern Wall & Ceiling Trade Show and Annual

Convention. The show takes place at the Omni ChampionsGate, in ChampionsGate, Fla., July 12-13.

Contractors interested in being a part of this should contact Casey Nesterowich at nesterowichc@bnpmedia.com. Information

about this year's event can be found at www.fwcca.org. **W&C**



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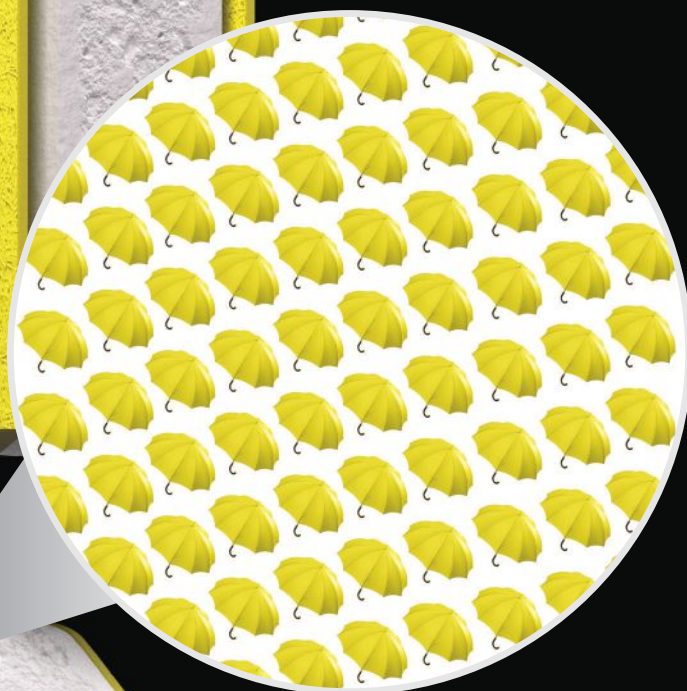
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Drywall finishing product

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The company has launched its newest drywall finishing product, Edge-Tape. Designed to replace traditional tear away bead, the product installs twice as fast and uses half the compound of tear away bead. It is 2 inches wide and comes in a 100-foot roll so it eliminates waste and is easily transported and stored at job sites. The product has a pre-finished (paintable and

sandable) paper-face that allows a skim coat to finish, saving you time and money. The PVC backing provides a rigid surface that can span gaps in drywall for a strong, straight finish. The product is used to finish drywall edges to suspended ceilings and for commercial "top out" applications where the drywall meets the concrete ceiling/deck. Unlike tear away bead, Edge-Tape can be installed by the finisher—not the carpenter—using standard compound. No adhesives or mechanical fasteners are needed. Its outer edge features a diamond punch pattern for a superior bond and faster drying with no rippling or blistering.

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- Stucco mesh to block stone and steel
- Backer board & tackless carpet strips to concrete



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Drywall jab saw

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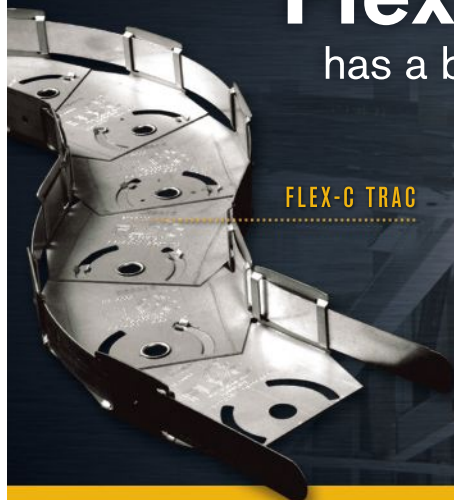
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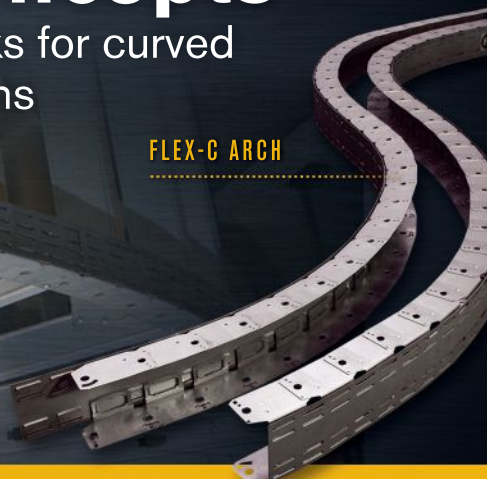
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THE FANTASTIC FIVE

Walls & Ceilings speaks to several important women in the industry about their experiences in the trades.

By John Wyatt

As of December 2011, an average of 828,000 women were employed in various occupation sectors of the construction industry, according to statistics by the National Association of Women in Construction. Women now make up about 9 percent of the construction industry in the United States.

Statistics for these numbers and percents become a little more complicated when categorized through the trades but make no mistake that the wall and ceiling industry has its share of women. Whether in the field, office or running a company, the following women have made a good and important contribution to our industry and deserve our recognition.

FeFiFaux Studios designs and installs a variety of faux finishes, faux plasters and natural plasters in the Omaha, Neb., area. The company works with waxes, glazes, mica powders, metallic plasters and many other mediums, creating classic wall finishes as unique, contemporary looks. The company celebrates its 24 year anniversary this year, working in both residential and commercial settings.

Its owner, founder and artisan Sandra Lassley is a member of the International Decorative Artisans League, an international non-profit organization dedicated to the promotion and preservation of the art of stenciling and related decorative painting.

"Customer service is something I especially pride myself in and is the hallmark of our business," says Lassley, whose business partner is Jeff Lassley, who runs the crew as project foreman. "The top priority is representing our customer's personalities in their own home, so I specialize in specific color coordination, implementing what the client already owns along with their goals for the new space. Additionally, we are happy to travel to other states to complete our client's vacation homes."

This last claim is no exaggeration. The company will travel anywhere its clients have asked and have even worked abroad.

In addition to working as a contractor, Lassley provides a niche service as a design consultant in color schemes

SANDRA LASSLEY

OWNER AND FOUNDER
FEFIFAUX STUDIOS
OMAHA, NEB.



**feFi
FAUX**

and a full line of custom Santambrogio Italian sofas and chairs. She moonlights as the national sales director for Bestitalian Sofas. She also serves as a spokesmodel for Fauxy Painter, a ladies paint wear clothing line company. Quite the busy schedule. But wait, there's more. She also writes a column Ask Sass for various online

publications, specifically for artists.

Lassley says she is seeing business finally turn, even to suggest it's growing.

"After a down year in 2009 and 2010, we have seen marked increases each year," she says.



AMANDA MONTFORD

PRESIDENT
SAVANNAH DRYWALL SUPPLY
SAVANNAH, GA.

Located in one of Georgia's most cultural and historic cities, Savannah Drywall Co. is an independent, family-owned drywall supply yard. It supplies residential and commercial projects in south-east Georgia and South Carolina. Savannah Drywall Supply carries a full line of gypsum wallboard products, cornerbead, fasteners, joint treatment, and hand tools. The company also stocks metal studs and track for commercial and residential construction.

**Savannah
DRYWALL**

Its President Amanda Montford is third generation, with her grandfather the founder of the business and her father the present owner. Montford is an active member of the National Association of Women in Construction and serves on the Board of Directors of the AMAROK Drywall Division of Affiliated Distributors.

"I am so proud to be able to carry on the business that my family has worked so hard to build," Montford says.

Now in her seventh year with the business, Montford has learned how to work around some people talking down to her.

"It used to bother me, but I have learned to let it roll off my back," she reports. "I have worked hard to learn this business and to prove I can do this job just as well as my father and grandfather. I actually enjoy getting the opportunity to prove people wrong."

THE FANTASTIC FIVE

Now entering its third generation, Brittnei Daley-Grishaeva is the CFO of this residential drywall, ceilings and plastering company. Daley's Drywall was founded by Gary and Sally Daley in 1963. Joined by their sons Craig and Chris in the mid 1970s, the company has grown into a very successful commercial and residential drywall contractor in Northern California.

"My mom and dad worked together in the business and I grew up around it, hanging out at 'the shop' every day after school when I was young," says Daley-Grishaeva. Needless to say, she has been around the business her whole life (she is 27). Obviously, growing into the trades has given her a great understanding of the company, its services and how to conduct business.

Holding a Bachelors degree in Business Management Economics with an emphasis in accounting and legal studies, she is also a construction bookkeeping technician. Daley-Grishaeva has led the company into the 21st century with her passion for technology. She says to maintain and continually improve the company's



**BRITTNEI
DALEY-GRISHAEVA**

CHIEF FINANCIAL OFFICER
DALEY'S DRYWALL & TAPING INC.
CAMPBELL, CALIF.

service and to track costs more accurately, Daley's Drywall & Taping has implemented digital production tracking systems, BIM, new accounting software and remote time card entry.

"Being a part of an evolving company and dynamic team that makes a dif-



ference in the physical world everyday gets me up in the morning and makes me excited for the new challenges that come with the territory," she says.

She says that she has never been told that women shouldn't be in the construction industry.

"I'm sure someone out there still thinks that but they either haven't crossed my path or haven't had the guts to say it in front of me," Daley-Grishaeva says.

"Luckily I've always gotten along great with men, even the rowdy construction-type," she continues. "Being a part of NAWIC has also empowered me as a woman in the construction industry. Even though I get along with men, it's great to discuss things with fellow women who have gone through it before and can always offer advice and wisdom."



**CAROL
KIMMEL SCHARY**

PRESIDENT/OWNER
NATHAN KIMMEL COMPANY, LLC
LOS ANGELES

Nathan Kimmel Co. LLC is a supplier of equipment, tarps and accessories for the wall and ceiling industry. The company has been in business 57 years and Carol Schary has been the sole owner for 17 years.

Schary also grew up in the business. When she became a mother, she did not want to

work full-time as a teacher (her profession at the time), so she went to work at the family business where the hours were more flexible.

"My father, Nathan Kimmel, died at 83 and my mother and I kept going to work to continue the business," Schary says. "When we were going over my father's estate taxes, the attorney said that I had doubled the business and that I should buy out my siblings, which I did. In 1996, I became the sole owner."



Through osmosis, Schary's business training came mostly from being around the family business, taking notes from her parents. And it's worked.

Today, the distributor sells to companies all over the world, making Nathan Kimmel Co. LLC a truly international operation. And it's clear that Schary does it because she loves it and the people in the industry.

One can find her and the company at several trade shows and meetings. She is a member of the Western Wall and Ceiling Contractors Association as well as AWCI, where she has been on its board of directors, served as chairman of the Supplies Committee and board member of the Foundation of Walls and Ceilings, which she'll be president of in two years. This will be the foundation's first woman to serve in that title.

Beyond the industry, the company and Schary have been listed on the *Los Angeles Business Journal's* "Top Women-Owned Businesses" for 12 years in a row, was named an "Enterprising Woman of the Year" by *Enterprising Women* magazine, and is a member of the National Association of Women Business Owners. Additionally, the company is a Certified Women Business Enterprise, which enables contractors with the company's WBE status to get points when sending in bids.

Schary says sometimes she sees a little of the old mentality from men dealing with women in the trades.

"The construction industry is still male-dominated but getting better with the younger generation coming into the business," she says.



GEORGIA MORROW LONG

OWNER
PLASTERS BY GEORGIA INC.
LAGUNA BEACH, CALIF.

Plasters by Georgia is located in Orange County, Calif., where according to Georgia Morrow Long, the company transforms ordinary walls, ceilings and other surfaces into “beautiful

and harmonious works of art.” The company has extensive experience in both commercial and high-end residential surface design and applications.

Morrow Long’s background as an artist allows her to see the interaction of colors and textures which she fuses with her skill set of plasters and application techniques. She says for plaster and Venetian product lines, she enjoys using Vella Venetian Plaster Systems. She also enjoys Vero Plaster’s Marmorino for lime-based applications and Modern Masters’ Platinum Line of metallic plaster.

More than two decades ago, she bought a fixer-upper house, took a few workshops and became enamored with working with plaster. As she began working with the material more, requests came in for her to do plaster jobs. Later on, she formed a corporation, got licensed and joined the trades. To this day, she still takes workshops to keep fresh on her skills.

When asked what separates her from other Venetian plasterers, she says art.

“Anyone can slap plaster on a wall but the trick is in making it look good,” Morrow Long says. “The color and texture has to be just right in order to pull in all the other colors and textures in the room into a harmonious union. The plaster should be the backdrop, the palette—not the focal point in a room.”

Morrow Long is used to being the only woman in the room on the job site, and typically she says that the majority of tradesmen that she deals with are very professional and respectful. But occasionally she does run into the odd person who is rude or hostile. But she knows not to take it personally and to focus on the work.

“I bring a woman’s perspective with regard to color, placement and feel,” she says. “Men and women are wired differently and they think and look at the world in a different manner. It’s as the French say, ‘Vive la difference.’”

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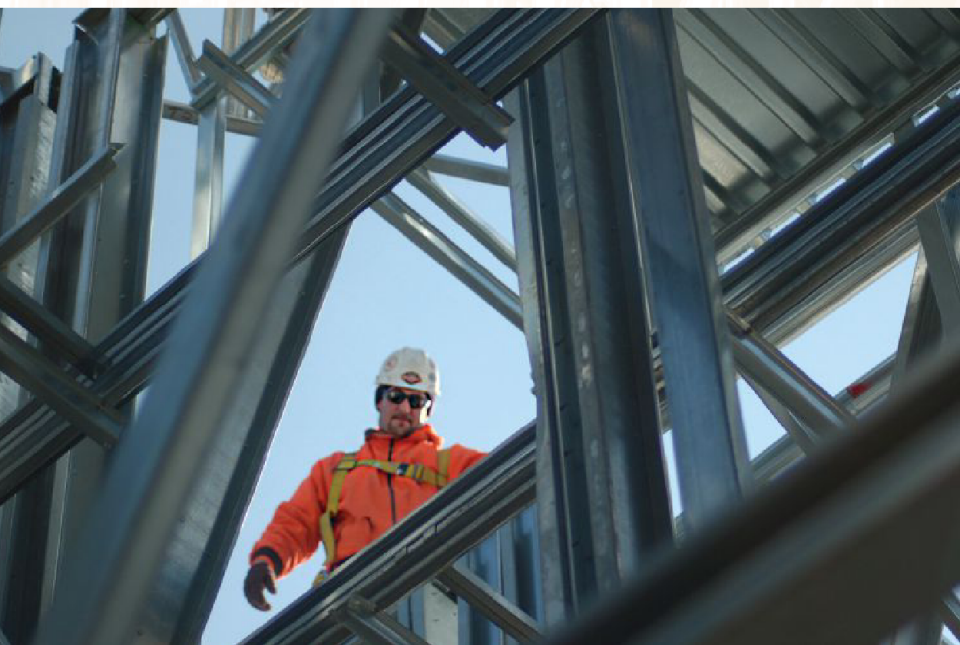
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WASHINGTON HEIGHTS



Cold formed steel framing used for higher education.

By Tom Valvo

College students face many challenges throughout their four, or five, or even eight years of higher education. They develop as adults, as individuals, as a community of students with similar goals during their time in school. Much can be said for the cold formed steel trusses that have become a regular part of new construction projects on Washington University in St. Louis' Danforth campus in St. Louis. The latest project, the Thomas Eliot B Dormitory, sports a complex and intricate roof system consisting of 350 unique cold formed steel truss designs. Ultra-Span fabricator/partner Engineered Steel Products teamed with St. Charles, Mo., based panelizer and framing

contractor Gateway Panels to deliver yet another successful cold formed project to the St. Louis region.

Washington University, founded in 1853, maintains an elite reputation as an institution of higher learning in many academic fields, including medicine, engineering, research, and law. As its website states, "*To promote learning, the University encourages independence, boldness, and originality of thought.*"

The same can be said for the buildings, both old and new, that dot the 169-acre Danforth campus. Several older campus buildings, in fact, have even been listed on the National Register of Historic Places. Suffice it to say, expectations are always

high when new structures are added to this historic and regal campus.

PRECEDENT DAY

The Eliot B Dormitory (part of the University's South 40 Redevelopment Project) is no exception and is a real show-piece in many respects. The "infill" structure is the fourth in a series of new residence halls that comprise the new, European streetscape-styled South 40 residential area. Due to the extremely tight job site, Gateway Panel has had a year-long challenge of staging, delivering, hoisting and installing factory-built wall panels and roof trusses with minimal interruption to everyday campus life taking place literally a few feet away. Gateway attributes much of its success to their steel truss supplier, Engineered Steel Products, based in Wright City, Mo. Engineered Steel was required to sequence delivery of the trusses on a very specific schedule, so that Gateway could pre-assemble sections of the roof at their facility and deliver to the job-site, ready to lift right into place.

According to Bruce Schierding, estimator and project manager with Gateway Panel, "This has to be a record. I've never seen a project go up so fast. We asked ESP to deliver certain roof sections on an extremely rigid schedule, and they came through without a hitch—something previous truss suppliers have been unable to do."

Without the skill and reliability of Engineered Steel and cold-formed steel trusses there could have been significant challenges and delays. In fact, even with the production schedule squeezed from 16 weeks down to 12 weeks, Engineered Steel met every demand.



PROJECT NOTES

Project:
Thomas Eliot B. Dormitory
(South 40 Residential Redevelopment)
Washington University, St. Louis
<http://reslife.wustl.edu/>

Contractor:
Ultra-Span Fabricator:
Engineered Steel Products
Wright City, Mo.

General Contractor:
Clayco, St. Louis
<http://claycorp.com/>

Architect:
Mackey Mitchell Architects, St. Louis
<http://mackeymitchell.com>

Engineer:
ASDG LLC, Fairview Heights, Ill.
<http://asdglc.com>

Truss Installer:
Gateway Panel, St. Charles, Mo.
<http://www.gatewaypanel.com>



NOT LINCOLN LOGS

Cold-formed steel was the best choice for this structure for many reasons. First, given the life expectancy of this structure, the materials used needed to stand the test of time. Using organic materials such

as wood framing would immediately introduce temperance to the structural framing. Cold-formed steel is an inorganic and stable product. It does not twist, warp, split and crack as it ages and transitions through climate cycles. In addition,



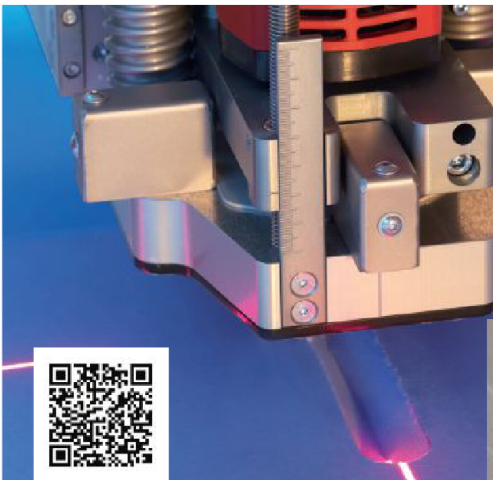
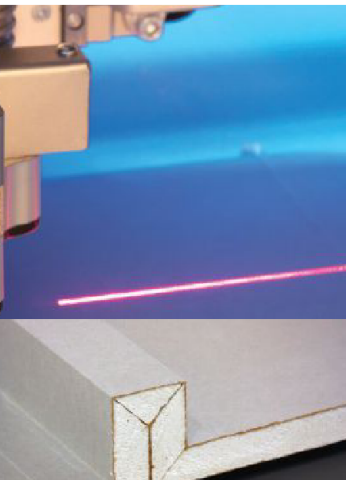
cold-formed steel is 100 percent non-combustible. The first step in reducing the chance of fire damage in a structure is to remove the fuel (wood) from the structural elements.

Cold-formed steel also contains a high recycled content. According to the Steel Recycling Institute (www.recycle-steel.org), 83.3 percent of new steel used comes from recycled steel. And, by taking full advantage of cold-formed steel and reducing the amount of heavy structural steel, the weight of structures can often be significantly reduced. All of these elements added together can greatly reduce the impact of new construction on our environment. This is reflected in the U.S. Green Building Council's LEED program. The LEED rating systems offers credits within its Materials and Resources sections, 4.1 and 4.2. Because material credits are awarded based on the percentage of the entire structure, increased use of cold-formed steel, with its high recycled content, will improve the likelihood of a structure qualifying for these points.

Architects Mackey Mitchell considered the positive contributions of cold formed steel trusses and walls when selecting the framing materials. The students living in the newly constructed Eliot B. Dormitories will likely give little thought to the framing materials used to make up their home for the school year. However, Washington University and everyone involved in the construction of these dorms will know that the materials used were chosen with great consideration for sustainability. **W&C**

Tom Valvo is a group president for MiTek Industries, the parent company of Aegis Metal Framing.





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FIRE PROTECTION ENGINEERING

Throughout the history of deadly catastrophic building fires, combustible wall and ceiling finishes have often played a significant role in the unfortunate number of fire deaths. In many of these fires, the wall and ceiling finishes contributed to a very fast moving fire. In fact, these fires moved so quickly that conditions in the building became deadly in a matter of minutes. As a result, the fire protection engineering community has worked tirelessly to develop better testing methodologies, and stricter fire and building code requirements for wall and ceiling finishes.

When designing buildings to make them safer from fire, it is the fire protection engineer's goal to ensure that during a fire, it takes less time for the building occupants to evacuate to a safe place before conditions in the building become untenable. Fire protection engineers do this by ana-

Understanding how combustible wall and ceiling finishes impact occupant safety. **By Chris Jelenewicz P.E.**

lyzing how buildings are used, how fires start, how fires grow, and how fire and smoke affect people, buildings and property. Additionally, they use the latest technologies to design systems that control fires, alert people to danger and provide means for escape. This includes ensuring that the proper interior finishes are installed for the appropriate occupancy and location in a building.

FIRE DEVELOPMENT

There are several reasons why combustible finishes play a critical role in fire development. First, combustible finishes provide additional fuel loading in the building. At the same time, these finishes provide a pathway for fire to spread throughout

a building. Additionally, during a fire, finishes can produce smoke and deadly fire gases that can obstruct visibility during evacuation or have physiological effects that can result in disorientation or death.

EARLY HISTORY

During the 1940s, there were several deadly fires where combustible finishes contributed to a high death toll. The most deadly was at Boston's Cocoanut Grove Nightclub in 1942 that left 492 dead. In this fire, the cloth-covered walls and ceilings provided a means for the fire to move quickly throughout the building. Combustible finishes also played a significant role in three other deadly fires in 1946: LaSalle Hotel, Chi-

cago, (61 fatalities), Canfield Hotel, Dubuque, Iowa (19 fatalities), and the Winecoff Hotel, Atlanta (119 fatalities). These fires focused the fire protection community's attention on the need to install safer wall and ceiling finishes in buildings.

STEINER TUNNEL TEST

Although developed in the early 1900s, the Steiner Tunnel Test (ASTM E-84/NFPA 255) is still the most widely used fire testing apparatus for determining surface flammability for wall and ceiling finishes. In this test, a 2.5-foot long test specimen is placed in the horizontal position in a test chamber. At the start of the test, gas burners ignite the underside of the test specimen. The flame spread across the sample is documented. At the conclusion of the test, the material is assigned a flame spread index that accesses the speed that fire spreads across the material. Finishes that are assigned a higher FSI are expected to exhibit a faster surface flame spread than ones with a lower rating.

Additionally, the reduction of light inside the test apparatus from smoke is documented. This test data is used to establish a smoke developed index. The purpose of the SDI is to access the visual obscuration that results from smoke when the sample is burning. A low rating would indicate greater visibility when compared to a sample with a higher SDI.

FIRE AND BUILDING CODES

The fire and building codes assign a classification for a finish based on the FSI and SDI established during the Steiner Tunnel Test. Each tested material is assigned one of the following classifications:

- Class A – FSI, 0-25 and SDI, 0-450
- Class B – FSI, 26-75 and SDI, 0-450
- Class C – FSI, 76-200 and SDI, 0-450
- No Classification – FSI >200 or SDI >450

The basic assumption behind these classifications is that a Class A finish will provide a less severe fire hazard than a Class B finish; and a Class B finish is less severe than Class C finish. The building and fire codes allow different classifications of finishes to be installed in a building

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FIRE PROTECTION ENGINEERING

based on the occupancy classification of the building and the location of the finish in the building.

In addition, the codes recognize the role automatic fire sprinkler systems have in controlling fires. As such, a reduction in the classification is usually permitted if the entire building is protected by a fire sprinkler system. For example in an area where only Class A is permitted, Class A or B would be permitted if a fire sprinkler system is installed.

ROOM CORNER TEST

Because the Steiner Test only tests a material in the horizontal position, the results observed during the test may not always replicate the conditions that are found in an actual building fire. An alternate test to the Steiner Test is the Room Corner Test (NFPA Standard 286—Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth).

In the Room Corner Test, the finish material is applied to three walls and the ceiling in a 768-cubic-foot test room. A gas burner that is placed on the floor at one of the room corners is ignited for 15 minutes. At the conclusion of the test, the tested finish passes or fails. Failure is established if one of the following occurs:

- Flame spreads to the ceiling during the first five minutes of the test
- Flashover occurs
- The peak heat release rate exceeds 800 kw
- Smoke released does not exceed 1,000 square meters

If a material passes the Room Corner Test, the materials are permitted to be used where interior wall and ceiling finish is required to be Class A.

TODAY

Despite all the advancements over the last 100 years, we still see fires where combustible finishes are a contributing factor to the high

number of deaths today. In 2003, indoor pyrotechnics used during a band's performance ignited polyurethane foam that lined parts of a nightclub's walls and ceilings at the Station Nightclub in West Warwick, R.I., resulted in 100 deaths. And on January 27, 2013, a nightclub fire in Santa Maria, Brazil, left more than 230 dead. Similar circumstances such as pyrotechnics mixed with flammable wall finish were responsible for the high number of deaths.

These fires still remind us of the consequences that can occur if the proper finishes are not installed and the importance on why the design, construction and enforcement communities should focus on installing safer finishes in buildings. **W&C**

Chris Jelenewicz P.E. is engineering program manager at the Society of Fire Protection Engineers.



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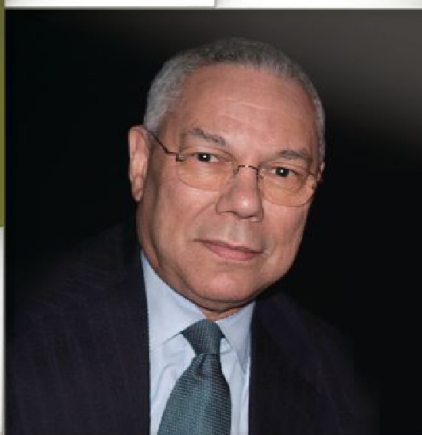
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There is a growing set of priorities observed by project design teams for energy efficient building design. “Envelope First Energy Efficiency” is a design philosophy, which considers the building’s exterior first, as the key to sustainability and the platform to build on for performance and aesthetics. Energy conservation measures are designed on the foundation of an optimized envelope design, with use of renewables to achieve Net Zero Energy.

High performance envelopes are critical to a building’s overall thermal efficiency, with energy code and “green” building standards raising the bar for exterior systems and assemblies. Insulated metal wall and roof panels are a factory built assembly well suited to achieve high standards for building envelope thermal performance. IMPs have gained wide acceptance in Europe and are beginning to see increasing design opportunities in North America.

Building envelope design decisions are driven by a multitude of factors. Aesthetics play a key role, but is always weighed with other factors such as material cost, construction cost, life cycle, cost of ownership etc. Thanks to energy performance standards like ASHRAE 90.1 and “green” rating systems like LEED, building energy efficiency and thermal performance are now an increased focus for most project systems and assemblies material decisions.

Code is the primary driver for insulation decisions in both new construction and retrofit projects. Regardless of environmental design initiatives, the code requirements, which determine the minimum R-values to be specified, are the principal influencers on the IMP configuration used in a given design. Whether insulation enhancements go beyond code minimums depend on other design related issues as well as what’s available in the budget.

The achievement of net-zero energy (a building that produces as much energy as it consumes and produces zero annual carbon emissions) has become the next opportunity for many new construction projects. As the retrofit market grows exponentially as part of the aging American



What

The IMP edge for construction efficiency and envelope performance. **By Paul Bertram**

infrastructure landscape, energy performance has become critical. Insulated metal panels present practical opportunities in both markets for wall and for roof applications.

The growing use of IMPs allows project design teams to create integrated building exteriors with stunning appearances, which also perform to the highest standards. These versatile exterior solutions are relatively easy to install and deliver

many practical advantages for commercial walls and roofs.

WHAT ARE INSULATED METAL PANELS?

The CSI Master Format describes roofing and siding IMPs as “a wall or roof assembly composed of an insulated polyisocyanurate core material sandwiched between two cold rolled pre-coated steel skins, utilizing an interlocking joint for



a weather tight vapor barrier and insulating system.” The definition broadens slightly as IMP manufacturers offer options such as rock wool, puf, or polyurethane cores, with enhanced fire retardant properties and other unique applications.

The majority of insulated metal panels are made with polyisocyanurate (polyiso) cores due to the superior insulating properties of polyiso and its ease to manufacture. Polyiso is one of the most energy efficient insulating materials used in commercial building due to its dense closed cell composition. With the high-

est R-value per inch of any common insulation material, it’s ideal to create a rigid board product.

Some of the most familiar applications for IMPs include cold storage buildings, office and convention centers in extreme climates, sports complexes, food processing plants, new manufacturing facilities and utility buildings.

IMP MANUFACTURING

IMP’s are manufactured using either of two processes: “lamination” or “foamed in place.” The foamed in place process injects foam between

the two sheets of metal and bonds to the metal skins via a chemical reaction as it fills up the interior portion of the panel. The foamed in place process is preferred for higher volume projects requiring many consistent width panels and less factory customization. In this process the core is curing while it’s between the panels, which may create tiny air spaces. Even though these are minute they can have some influence on solar heat gain in certain applications contexts.

The lamination process bonds a “pre-cured” and shaped polyiso panel board between two steel or aluminum panels. This allows some of the de-gassing to take place prior to bonding and permits pre-lamination inspection of the boards prior to the bonding process, so the quality and consistency of the foam core is much more likely, especially in more customized designs.

Regardless of the process used in manufacturing, it’s the manufacture itself that becomes one of the leading benefits of IMPs. Since they’re assembled in the factory, the quality and consistency of each product is assured. The customization takes place prior to arriving at the job site and is figured into the cost. Factory built IMPs are durable and long lasting because finishes are applied in the factory under optimum conditions. Environmentally friendly weather resistant coatings, textures and finishes are designed for maximum long term performance.

SIMPLIFIED INSTALLATION

Construction cost is a key factor in both new construction and retrofit. Cost savings during the construction process make IMPs attractive. Because the IMP is a single component, installation on site is simplified. Installation takes place more quickly, due to fewer process steps. Because IMPs combine the elements of a multi-component system into one installation, the IMP installation process requires fewer passes around the building.

The erector works with a lightweight component, so handling and manipulation is uncomplicated. Because of the light weight of these modular components there are also

What an IMP

framing and foundation requirements which are simplified. For example, support girt spacing of 8 to 12 feet can be used on many projects because of the relatively high panel strength and structural integrity of the systems. This creates other project economies and benefits.

A mounting system using concealed fasteners eliminates the need for multiple fastener types such as those required when multi-components are used, and also contributes to structural integrity and stability. Additionally, installation isn't limited by temperature and weather conditions which can sometimes impact individual components in multi-component interior-exterior wall systems.

According to the Metal Construction Association, insulated metal panels can be erected by a four-man crew at a rate ranging from 1,100 square feet per hour on a architectural project, to 5,000 square feet per hour on an industrial project.

From a standpoint of building speed and economy, IMPs also provide benefits for the interior of the building. In some industrial installations such as warehouses, the interior metal skin of the IMP becomes the finished wall system.

Framing can be added to the interior skin and finished with drywall or another kind of interior finish can be added. Additional layers of insu-



lation or radiant barrier material may be added in applications such as cold storage of in extreme climates.

These factors and others find IMPs reducing construction costs significantly for the exterior portion of the building. In a construction climate where every effort is made to reconcile overall cost, maximize job efficiency

and building performance, the productive build speed of insulated metal panels positions them competitively in North America.

ENHANCED BUILDING PERFORMANCE

One of the principle reasons to favor a thermal continuity solution such as insulated metal panel is thermal performance. There are considerable long term benefits which make using IMPs an important building performance product choice.

Insulated metal panels combine a fully functional thermal continuity system with an exterior finish. Thermal breaks are created naturally since the metal on the interior side is completely separated from the exterior sur-

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face by the foam core. This is ideal to prevent thermal bridging and assist in containment for heating and cooling.

The high performance finishes applied in production to IMPs require significantly less maintenance than many exterior finishes or claddings applied in the field over thermal continuity. Most manufacturers offer technical finish options with reflective properties, which also increase performance.

Additionally, moisture and air infiltration are reduced or eliminated due to the tightly fitting joints. IMPs add a weather resistant, moisture resistant barrier system without having to add additional components.

In most applications IMPs are weighted heavily for their insulation values. Those panels with polyiso cores generally have no lower R-value than 6.5, and can range as high as 42, depending on material thickness and composition. The R-value of 6 inch thick panel can exceed 40, exceeding most LEED requirements and ASHRAE 90.1 future standards.

THE FUTURE

IMPs are a technology solution for sustainability consideration with practical advantages. As project designers look to specify efficient, cost effective materials which perform to the continually evolving building standards, IMPs will continue to evolve in design and performance with new attractive features.

In a building design, which requires long term performance, a premium product investment offset by efficient installation cost and perpetual improved performance levels will make IMPs worthy of strong consideration. **W&C**

Paul R. Bertram Jr., FCSI, CDT, LEED AP is director of Environment & Sustainability Kingspan Insulated Panels. He is responsible for the company's environmental and energy-efficiency strategies. In addition to oversight of the company's EnvelopeFirst design strategy, Paul coordinates Kingspan's life-cycle analysis and sustainability reporting efforts for five North American manufacturing locations and offices. He has completed an ISO-compliant, cradle-to-grave LCA for the company's product line of insulated metal panels for building walls and roofs.



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A GREATER ACOUSTICAL CONTROL

New products and design strategies increase options for acoustic control with gypsum board. **By Ashwin Himat**

Over the years, building and design professionals have employed a variety of wall assembly design techniques to meet the acoustic control requirements of projects. Some of these traditional methods have earned a reputation for being expensive or too problematic, as even minor installation errors can compromise the acoustical performance of the entire wall assembly. With the advent of new technology and innovation, however, building product manufacturers are developing newer, more practical solutions for acoustic control. In addition, they are working to educate customers on the fundamentals of acoustic science to help guide them toward the best material choices for an acoustical wall assembly.

ACOUSTIC SCIENCE FUNDAMENTALS FOR WALLS

To solve acoustical problems, building and design professionals must first consider three elements: the sound source, the path that sound travels and the sound receiver at the end of the path. Sound originates from various sources outside the building or adjacent spaces inside the building. Sound transmission paths are building elements, such as wall assemblies, through which noise from the sound source travels. And, the receiver is a person or group of people who occupy the space.

All background noise found in an interior environment is generally referred to as ambient noise. Though it's certainly common for interior



environments to have at least minimal levels of ambient noise, excessive noise can seriously hinder building occupant communication and concentration. In spaces with excessive ambient noise, it is generally accepted that most people would need to speak at least 15 decibels (dB) louder than the ambient noise level in order to be heard at all. So, what might otherwise result in a moderate sound level for conversation (40 – 60 dB), can encroach into the loud sound range (60 to 80 dB). Therefore, it is generally preferred for ambient noise to be less than 40 dB in a space where conversation or speaking is taking place.

After acceptable ambient noise levels are established, the project focus turns to finding the best ways for restricting unwanted sound from entering the spaces of the design. A very important part of this process is the specification of wall assembly components that block the transmission of ambient noise through them. The measurement used to gauge the ability of wall assemblies to contain this noise is the sound transmission class rating. A higher STC rating means that more airborne



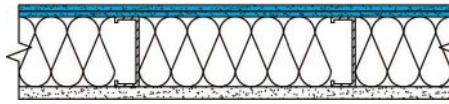
noise is blocked by the component or assembly. Conversely, components or assemblies with lower STC ratings permit more sound to pass through them, raising the ambient noise level of the space.

Sound generated on one side of a wall will energize the wall structure and set it in motion, much like a diaphragm. The wall then transmits the sound energy, which can be heard on the opposite side of the wall. The ASTM test methods used to determine STC use this direct transmission process and derive the STC number from sound attenuation values tested at 16 standard frequencies from 125 Hz to 4000 Hz. These transmission-loss values are then plotted on a sound pressure level graph, and the resulting curve is compared to a standard reference contour. Acoustical engineers fit these values to the appropriate Transmission Loss (TL) curve to determine a final STC rating.

Acoustic control has increasingly gained recognition in recent years as a key component of sustainable design, due to its role in creating positive indoor environmental quality. Its growing importance is evidenced by its inclusion in the requirements of prominent green building programs and codes, such as LEED for Schools, the Green Guide for Health Care and the International Green Construction Code (IgCC). Let's look at the two construction market drivers that stand to benefit most from acoustical wall assemblies—schools and healthcare facilities.

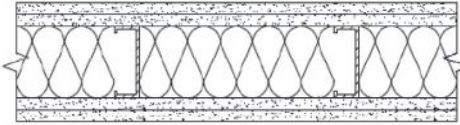
ACOUSTIC CONTROL IN SCHOOLS AND HEALTHCARE

In schools, it's imperative to create an effective learning environment, which requires clear communication between teachers and students. Ambient noise in schools, such as conversations in hallways, sound systems, students in neighboring classrooms and mechanical equipment, can easily distract students and interfere with teacher-student communication. Ambient noise also leads teachers to raise their voices, which often results in vocal strain over time. Concerns like these have led to more stringent school acoustical requirements for both new construction and remodels



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A wall constructed with a single layer of laminated SilentFX wallboard.



Wall construction with a double layer of gypsum wallboard.

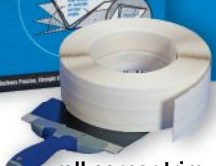


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A Greater Acoustical Control

from leading building standards, such as ANSI Standard S12.60-2002: *Acoustical Performance Criteria, Design Requirements and Guidelines for Schools* and LEED for Schools.

It is crucial for all healthcare facilities to provide a very comforting, low-noise interior environment that is conducive to healing. In hospitals designed and constructed with close attention to acoustic control, patient satisfaction is higher and their sleep quality is improved. The construction and remodeling of healthcare facilities is guided by a variety of contemporary building standards, all designed to make sure patients receive the best environment for healing. Again, acoustical requirements play an important role, especially in the Health Insurance Portability and Accountability Act (HIPAA), IgCC Acoustics Section 807, LEED for Healthcare and *Sound and Vibration Design Guidelines for Health Care Facilities*, an ANSI standard currently in the developmental stages.

Now, let's look at a growing trend in gypsum board products that provide building and design professionals an easier route to desired STC ratings for wall assemblies—laminated noise-reducing gypsum board.

LAMINATED NOISE-REDUCING GYPSUM BOARD

Designing wall assemblies with a variety of strategically placed layers and materials has been a common method for achieving desired STC ratings over the years—one that, unfortunately, hasn't come without its share of drawbacks. For instance, strategies like adding multiple layers of gypsum board, installing noise-dampening resilient furring chan-

nels or isolation clips and building double-stud walls, can be quite effective but are often costly and time consuming. Incorrect placement of the boards or improper installation of the resilient furring channels and isolation clips can compromise the sound containment abilities of the wall assembly. One contemporary solution to these problems is laminated noise-reducing gypsum boards.

Laminated noise-reducing gypsum boards are a high-performance, more easily installed alternative to most traditional acoustic control methods used on interior walls in residential, commercial or institutional applications. A factory-made version of a sandwich-style field fabrication sometimes used by drywall contractors, the boards consist of a layer of viscoelastic polymer applied between two specially formulated thin layers of gypsum board. The final product ends up being 1/2 to 5/8 inch thick, or the same as traditional gypsum board. The boards have the ability to impede sound transmission by using the inner poly-

mer layer as somewhat of a shock absorber. The polymer converts the acoustic energy into thermal energy that is dissipated across polymer sound transmission. This type of “constrained layer damping” board product performs well acoustically over an extended range of frequencies and significantly increases STC ratings for the assembly.

Wall assemblies that use a single layer of noise-reducing gypsum board have been tested and shown to meet or exceed the acoustic performance of assemblies that use double layers of traditional gypsum board. In fact, these

boards have been shown to increase the wall assembly's STC rating by 10 or more points, while adding an extra layer of traditional gypsum board increased STC by two to three points. Laminated acoustical gypsum board is therefore an excellent acoustic solution for meeting STC requirements, such as isolation clips or resilient channels. Directly applied to framing, they provide more consistent and predictable acoustic performance. The laminated boards can still, however, be used in conjunction with resilient channels or clips in wall assemblies to achieve extra sound transmission control. In these cases, the material would also help reduce the negative effect of any short circuits.

Using single-layer noise reducing gypsum board can also help reduce material usage, versus traditional multi-layered gypsum wall. The high acoustic performance of the product makes it possible to build effective noise-reducing walls with less material, conserving valuable square footage, and saving both construc-

SOURCE ROOM	RECEIVING ROOM	MIN. STC*
SCHOOL		
Classroom	Adjacent Classroom	STC 42
	Speech use only	STC 48
	Speech + Audiovisual	STC 42
	Corridor, public area	STC 52+
	Recreational area	
DOCTOR'S SUITE		
Office	Adjacent offices	STC 52
	Corridor, lobby	STC 52
	Mechanical	STC 52+
HOTEL		
Bedroom	Adjacent bedroom	STC 48+
	Corridor, lobby, public area	STC 48+
	Mechanical	STC 52+
MULTI-FAMILY HOME		
Bedroom	Adjacent Bedroom	STC 48-55
	Living room, separate occupancy	STC 50-57
	Corridor, lobby, public area	STC 48-55
	Exterior of building	STC 42-60

* Recommended minimum STC



tion time and material cost. Less material used also means a more sustainable structure.

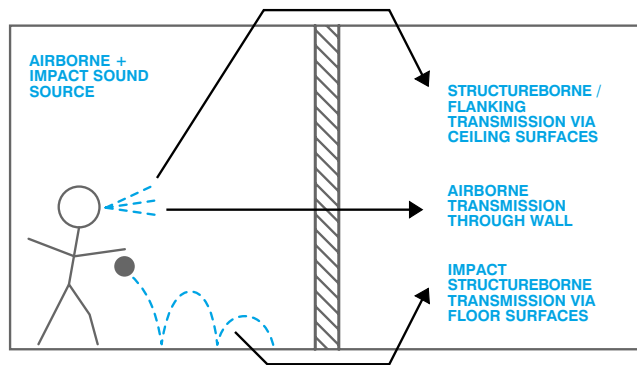
EDUCATE THE CUSTOMER

Some gypsum board manufacturers are now taking a broader approach to bring noise-reducing gypsum and other high-STC wall assembly options to a wider variety of construction markets, as the need for sound attenuation is ubiquitous. With their superior sound attenuation properties, noise-reducing gypsum boards are certainly gaining popularity among architects and designers working on acoustically sensitive commercial construction projects. And, it's not unreasonable to foresee these products moving into the residential market, as well, as a media room acoustic control option in single-family homes.

CertainTeed Gypsum, for instance, recently launched dBStation, an industry-first interactive tool, which simulates the acoustical performance of a variety of wall assemblies. Designed for use on the Apple iPad or Motorola Android mobile devices, dBStation allows architects, builders, and homeowners to actually hear the acoustical differences of wall systems in real-world applications and share these results with their clients. Tools like this and more concise information from manufacturers can only help them guide clients toward the best product and design decisions for their specific acoustical needs.

AN EXCELLENT FIT

In addition to superior acoustic control properties, most of today's noise-reducing gypsum boards have moisture- and mold-resistant face and back papers and offer an economical single-layer alternative to multi-layer gypsum board configurations in wall and ceiling assemblies. The result of this combination is improved sound attenuation for high-STC assemblies in various building settings, distinct contributions to green building design, and an important role in meeting the emerging acoustical standards needed to ensure optimal IEQ. Noise-reducing gypsum boards are a wise all-around choice for a wide breadth of projects. **W&C**

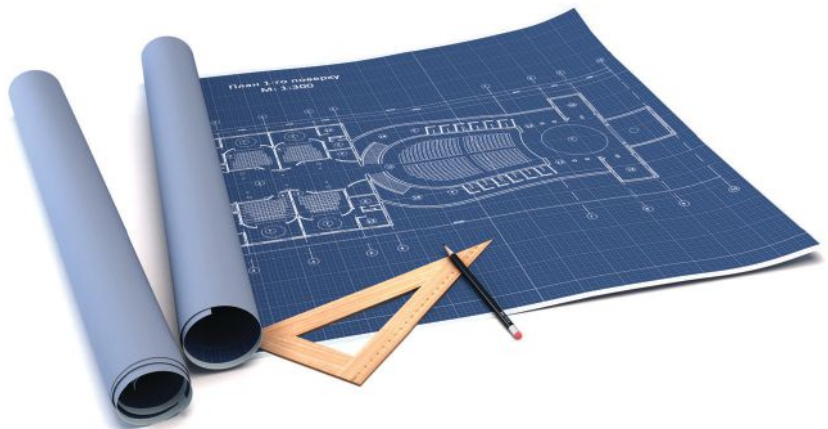


As director of marketing for CertainTeed Gypsum since 2007, Ashwin L. Himat is involved with launching new gypsum products, managing the product portfolio, and offering marketing programs. He has 17 years experience working

for Saint-Gobain Corp. and its subsidiaries and can be reached at ashwin.l.himat@saint-gobain.com.



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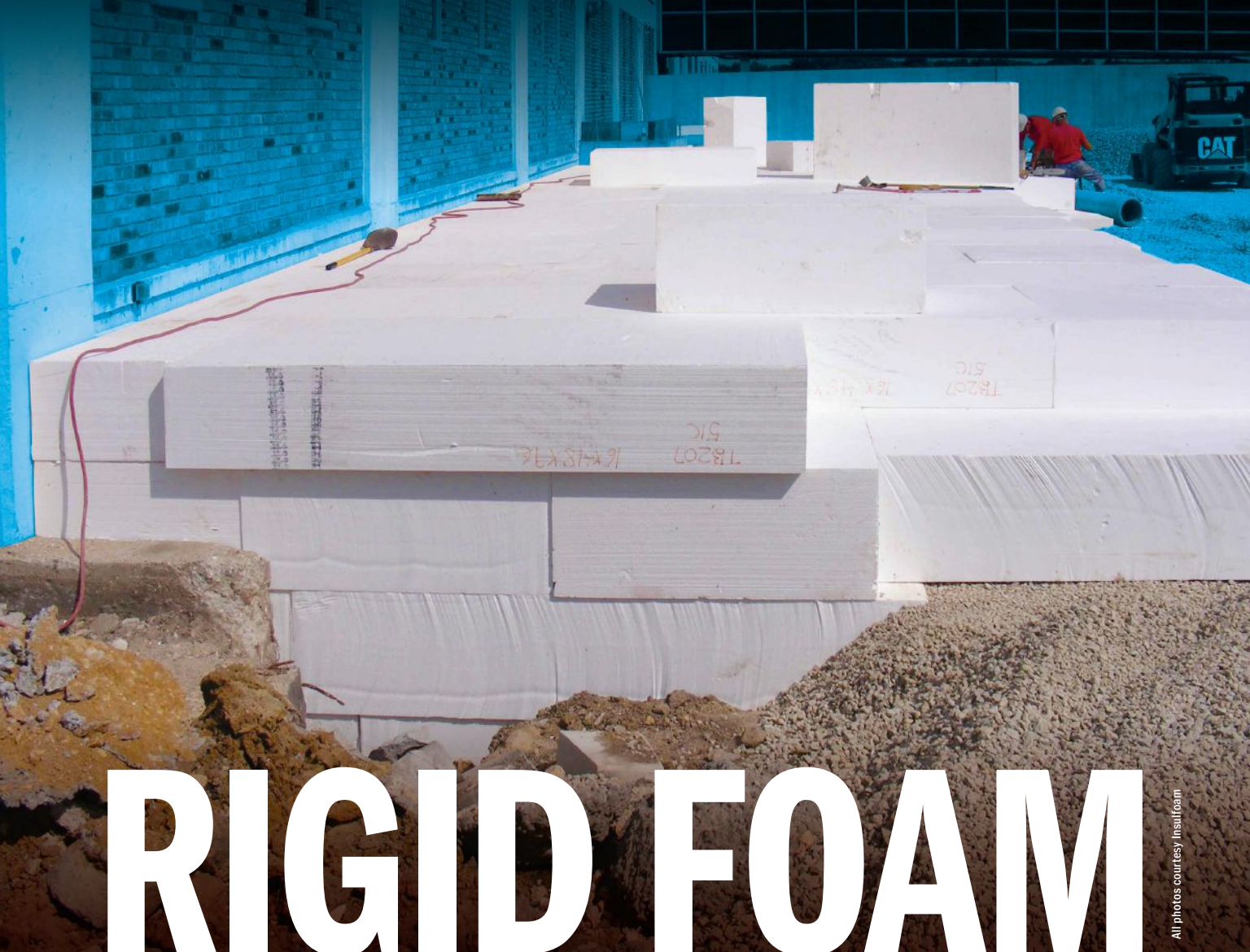
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RIGID FOAM NOT JUST FOR INSULATION

The same material that many contractors use to insulate walls and roofs—expanded polystyrene (EPS)—can help reduce lateral loads on building foundations and retaining walls. EPS geofoam is a lightweight fill that allows for the use of thinner walls, with less material, as well as a reduction in labor needed for concrete forming or the installation of segmented retaining wall blocks.

EPS geofoam has the same composition as EPS insulation, but is formed into blocks, rather than sheets. As a fill material, a key advantage of EPS is its ultra low weight—approximately 100 times lighter than soil (one to three pounds per cubic foot compared to 110 to 120 pounds for soil). EPS geofoam enables contractors to

EPS geofoam can reduce lateral loads on building foundations and retaining walls.

By Nico Suttmoller

backfill against walls and foundations, replacing the heavy soil wedge customary with traditional fill materials.

Substantially lighter fill can mean a reduction in the amount of excavated soils, simpler wall designs including less structural steel and concrete because of the thinner wall thickness and reduced footing size. EPS geofoam can also reduce or eliminate the need for geogrids or mechanical tie-backs typically used with segmented retaining walls. As a result of using geofoam as a lightweight fill, contractors can build

using much less costly fascias that act more like a fence than a retaining wall.

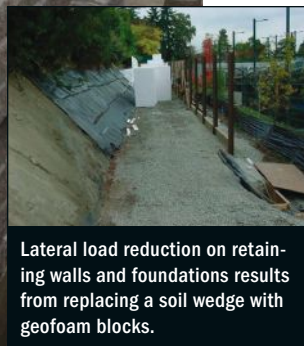
In addition to allowing for more cost-effective walls, EPS geofoam is easy for crews to install by hand. This can simplify construction staging and reduce equipment costs, especially on tight job sites.

ENGINEERS ENABLE

Engineers often specify EPS geofoam where underlying soils have low bearing capacity, which would cause unacceptable soil settlement and potentially damage nearby structures.



Contractors can make retaining walls thinner when using geofoam blocks for fill in place of soil.



Lateral load reduction on retaining walls and foundations results from replacing a soil wedge with geofoam blocks.



Because of its high compressive resistance, EPS geofoam works well for back fills that must support the weight of roads and sidewalks.

Some examples of projects that used EPS geofoam as a backfill on foundation walls or retaining walls include:

- McDonalds Restaurant, Fairmont, W. Va.
- KBS Hospital, Dixon, Ill.
- West Virginia University student housing, Morgantown, W. Va
- Numerous highway embankments

At the Fairmont McDonalds, a retaining wall was needed that could accommodate the change in grade, as well as reduce the load over extremely soft soils. Typical soil fill would have caused unacceptable settlement of the retaining wall. The use of EPS geofoam allowed the owner to incorporate the traditional keystone retaining wall while eliminating the need to use the typical geogrid material to reinforce the retaining wall.

To determine if EPS geofoam is suitable for your project, consult a qualified civil or structural engineer or a geofoam manufacturer. A range of background information also is available from the Syracuse University Geofoam Research Center (<http://geofoam.syr.edu>) and the EPS Industry Alliance (<http://epsindustry.org/other-applications/geofoam>). **W&C**



Nico Sutmoller is a Geofoam Specialist for Insulfoam, a division of Carlisle Construction Materials. He can be reached at geofoam@insulfoam.com.

EPS geofoam is durable, does not decompose and is not adversely affected by freeze-thaw cycles. These attributes mean EPS geofoam works well in climates all across North America. Depending on the density of geofoam used, water absorption limits range from 2 percent to 4 percent by volume making it suitable for below-grade applica-

tions. Compressive resistance values range from 316 to 2,678 psf at 1 percent deformation. Contractors have used the material in numerous load-bearing applications, including as a sub-base under pavements supporting locomotives and jet aircraft. The loads on most backfills adjacent to buildings and retaining walls are substantially less.

OTHER USES FOR GEOFOAM

EPS geofoam has been used for a wide range of architectural and infrastructure applications given its lightweight, durable nature. Applications include structural void fill, garden roofs and concrete forming.

Common architectural void fills using geofoam include stadium seating in theaters and sports arenas, stairways, podiums, loading docks and pool decks. Manufacturers can provide custom-cut blocks in various shapes and sizes to enable contractors to quickly build up these and other similar features.

EPS geofoam also works well for forming concrete walls of various types. For example, the contractors for a new water treatment plant in California used geofoam fill in place of tra-

ditional fills within three 7-foot by 7-foot by 50-foot concrete walls used to channel water. Typical construction of such walls entails two-sided forming, then filling the void with soil, sand or concrete slurry and completing a second concrete pour for a topping slab. With geofoam, blocks made-up half of the form, which served as a void fill and support for a concrete topping slab. This method enabled crews to pour the topping slab and channel walls at the same time, which significantly reduced pouring labor, material costs and accelerated the concrete forming schedule.

In garden roofs, geofoam provides a lightweight, water-resistant, supportive base for liners, soil, irrigation systems and plants.



Repair of Fire-Rated Gypsum Panel Product Systems

Fire-rated gypsum panel product systems may be damaged during the life cycle of a building. To maintain the required fire-rated separation between occupancies or areas, damaged systems must be repaired so that they are restored

to their original fire-resistive condition. The repair must follow procedures dictated by the severity of the damage.

Small holes (such as those caused by a door knob) can be repaired by patching. An example of a damaged gypsum panel is shown in **Figure 1**.

To maintain the integrity of the surface membrane, the gypsum panel patch must be mechanically secured in the layer or layers of board that have been damaged; attachment with joint compound only is not acceptable. The patching material should be cut from type X or proprietary type X gypsum board of a thickness and type equal to that of the original materials.

REPAIRS

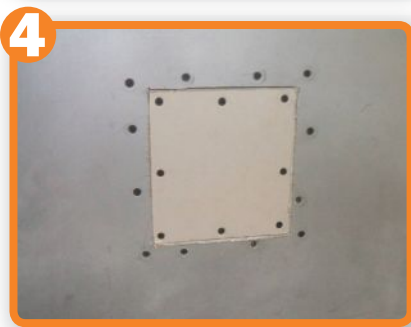
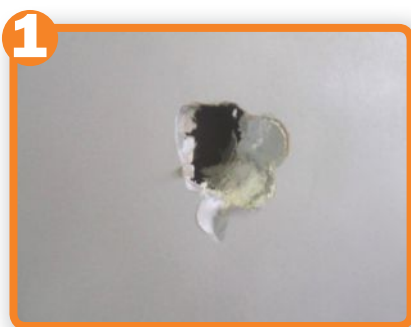
To repair the hole, cut a square or rectangular patch that is slightly larger than the damaged area from a panel. Using the patch as a template, place it against the damaged surface so that it completely covers the hole and cut around its edges to enlarge the damaged area to match exactly the size of the patching piece. You can also lightly trace around the edges of the patch with a pencil to outline the area to be cut. Use caution when cutting into the stud cavity to avoid electrical shock or creating water leaks (see **Figure 2**) Remove and replace any damaged insulation or other material that is in the cavity.

Then, as shown in **Figure 3**, install metal runner track around all four sides of the damaged area (note that the existing studs may be used on one or more sides of the patch if the damaged area has been cut back to a stud). Using fasteners spaced no more than eight inches on center, secure the patching material to the exposed face of the runner tracks or studs (see **Figure 4**). Fasteners should be the same length and have the same head diameter and shank diameter as those prescribed in the original fire test system.

Several proprietary clip products are available which provide mechanical support for patching small holes. Manufacturers of these products should be contacted for information.

DAMAGED AREAS

If the damaged area covers more than 100 square inches in 100 square feet of gypsum surface area, all materials in the damaged area



must be removed back to the original framing to make the repair. Framing in the area to be repaired must be inspected and replaced, if necessary. Maximum framing spacing requirements of the original fire-rated system description must be strictly followed; additional framing members should be added as needed to facilitate the repair.

Once the framing is repaired, replacement gypsum panels or panel pieces should be installed in the opening. The gypsum panel products must be fastened to the framing using fastener spacing not greater than that required by the original fire-rated system description. Ends and edges of the gypsum board that are not backed by framing materials should be supported with metal runner track.

Multiple-layer systems typically require that joints be staggered between layers. Proper repair of multiple-layer systems may require that face layers of panels be removed beyond the base layer joint so as to retain the staggered joint feature.

To restore the system's fire-resistive integrity, a patched or repaired area generally must be treated with joint treatment material. At a minimum, the edges of the patched area must be treated with joint tape and joint compound in a manner consistent with the requirements for joint treatment application established by the original fire-rated system description or applicable building code. For example, systems derived from GA-600, *Gypsum Association Fire Resistance Design Manual* are required to have the joints in all face layers taped (minimum Level 1 as specified in GA-214, *Recommended Levels of Gypsum Board Finish*) and fastener heads treated. Systems derived from other sources may have different requirements. **Figures 5 and 6** show a taped and finished patched area.

The appearance of the repair should also be evaluated with particular emphasis given to damaged areas that are visible to building or facility occupants. A poorly installed

patch on a wall in a hotel ballroom, for example, could affect the appearance of the entire wall and might detract from the overall aesthetic quality of the facility.

APPEARANCE CONCERNS

Finishing the damaged wall or ceiling area using a Level 5 finish as described in GA-214, *Recommended Levels of Gypsum Board Finish* is one method for addressing appearance concerns that arise from a patched surface. The Level 5 finish should be applied to the entire repaired area, so that the total planar wall or ceiling area between two break points has been resurfaced. Treatment of only the immediate area around the repair should be avoided as it may cause the repair to become more obvious.

To improve the appearance of large, repaired areas that are structurally sound, but aesthetically unacceptable, a new layer of gypsum board may be attached to the existing, repaired surface with adhesive or fasteners. Assuming that the partition or ceiling has been correctly repaired, the new layer of gypsum board may be of any thickness or core type and can be added without adversely affecting the fire resistance rating or acoustical performance of the repaired system.

Repair of a fire-rated wall or ceiling must be accomplished with care, as retaining the integrity of the system must be one of the paramount principles of the repair plan. However, when planned and accomplished correctly, fire-rated gypsum board systems can be repaired reasonably quickly and with minimal disruption to building occupants. It is the ease of repair that, among other positive attributes, makes gypsum board an appealing choice for fire-rated systems. **W&C**

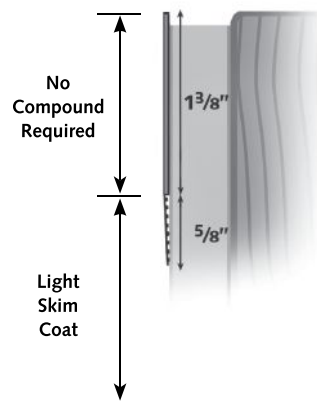
Michael Gardner is the executive director of the Gypsum Association, an international trade association representing gypsum board manufacturers in the United States and Canada.

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Field Supervision

Ever considered the number of actual hours a field supervisor spends managing a change from inception to completion? What does a field supervisor actually do to complete a change? Does a \$1,000 change cost less to

supervise than a \$4,000 change? On average, how often is your supervision budget met or exceeded?

Subcontractors commonly complain that their field supervision costs regularly exceed budget with or without changes. Consider there was a time of higher margins and lower production rates when subcontractors didn't care if their supervision budget was exceeded because the overall job made money. Today, subcontractors bid jobs at lower margins and higher production rates, and a percentage of labor to

determine field supervision hours. Hence, most jobs are bid with less than enough field supervision hours.

Since most subcontractors are starting jobs with low margins, high production rates and not enough money in their field supervision budget, it is more critical than ever to have more than enough supervision time in each change priced.

HOW MANY HOURS?

Those who normally price changes don't often consider the variables that should be considered when

determining the number of supervision hours that should be included in each change. For example: 1) Quality of plans and specifications, 2) Level of cooperation from GC, and 3) Availability of information. These are just a few general variables that may increase or decrease supervision hours since every job is different and the people on every job vary.

In addition, the person(s) pricing a change should consider what a field supervisor actually does when a change occurs. In other words, what does a field supervisor actually do to complete a change? (Consider creating your own supervision check list or use the following list and apply hours to each task.) In this case, we are considering a change involving drywall and framing:

A. Field Supervisors Role and Responsibility

1. Review and understand change
2. Coordinate with GC/ other trades
3. Procure layout information
4. Schedules work
5. Procures received material
6. Procures received tools/ equipment
7. Procures framing labor
8. Procures drywall hanging labor
9. Procures taping labor
10. Procures schedules, multiple cleanups
11. Coordinates multiple inspections
12. EWA or time card management

Some subcontractors have project managers order material for changes that could be charged for if included in the field supervisor's role. In any case, the twelve tasks listed above happen in some way, shape or form. A very important consideration is the fact that for every hour a supervisor manages a change, he is not managing the original base contract.

When you consider what a field supervisor actually does from inception to completion of a change and then add a difficulty factor as a result of poor plans, lack of information or a general contractor who doesn't want to be involved, you can be sure your supervision hours for

any change will be higher. To be clear, “every job develops a unique positive or negative culture” that should be considered when pricing a change.

PROJECT MANAGERS THINK AND THINK CRITICALLY

A phenomenon occurs when you take a person from the field that has run work for a long time and then promote him to a project manager. They will forget how much time it actually takes to supervise a change. Their counterparts (the project manager) who have never worked in the field continues to do what they were taught when they started and this is usually to apply a percentage for supervision based on labor hours.

In either case, consider for a moment the possibility that project managers have lost sight of the goal or have forgotten why they are managing a project. What have they become, what are their goals and why are they managing a job? In the case of pricing changes, their goal, their reason for managing a job, is to price changes properly, accurately and profitably, and have the ability to sell any change that is disputed.

All jobs are different and all changes are different. Project managers should be trained to look at each individual change based on the job they are on and the complexity of the change to accurately determine the number of field supervision hours each change will require.

Is it possible to have a \$1,000 change and \$400 of it attributed to field supervision? Of course it is when complexity and variables are considered. Am I saying that 10, 15 or 20 percent of labor is not enough money for field supervision? Well, let me ask you, on average are you meeting or exceeding your field supervision budget?

OWNERS DON'T KNOW

Consider whether or not it is important for you to know how much



Pete and his wife Karen in Italy.

money you spent on supervision for \$300,000 worth of change order work? Now consider whether or not it's important to know how much money you spent on labor, material, tools and equipment for that same \$300,000 in change order work?

In most situations, owners/subcontractors don't know because changes are not accounted for; meaning they have no idea how much was spent and neither do project managers.

Most interesting is when a general contractor disputes a change because it appears to be priced too high and the subcontractor and general then begin a negotiation, which ends with the subcontractor lowering their price without knowing how much the change actually cost. This is called “negotiating against thyself” and it's done more often than not due to a lack of information. I have no doubt that if subcontractors knew what their costs were to perform a change, it would be unlikely they would lower their price unless they had the room to do so.

An owner/subcontractor and project manager should be able to look at a job cost and see how well or how badly the supervision budget is on the original base contract or how well or badly the supervision budget is doing on change order work.

AVERAGING

Let's take a \$1 million job with \$300,000 in added work for a total

contract amount of \$1.3 million. Labor was 65 percent of the total contract amount or \$845,000. Of the \$845,000, the field supervision budget was 10 percent or \$84,500. This math would tell us that about \$20,000 was spent on change order field supervision and \$64,500 was spent on original base contract field supervision.

Everything sounds logical until you consider that the field supervisor spent roughly 30 percent of his time managing changes rather than managing the original base contract and if accurately calculated, you might find that the field supervisor spent 40 to 50 percent of his time managing changes, meaning it's likely the supervision budget was exceeded by 10 to 20 percent. Plus the fact that each hour a field supervisor spends on a change is an hour he is not managing the base contract.

Always using a percentage of labor to determine field supervision hours for changes has become a convenient time saving habit that is almost laughable. However, field supervisors aren't laughing because they go into every job these days with not enough or barely enough field supervision hours. Let me ask again: Are you meeting or exceeding your supervision budget?

I'm writing this article while on a trip to Europe and am currently in Sicily, Italy, in the small beach town of Cefalu. I have to say that the Sicilian people have mastered the art of managing chaos on construction projects and chaos in general by yelling, pointing, honking or stomping their feet until they get what they want. Maybe field supervisors should try those things in an effort to get an adequate number of supervision hours? Now for another Cappuccino or maybe a Bellini. **W&C**

Pete Battisti has been in the commercial drywall business for 20 years.



Winning More Claims

with Strategic Project Management (Part 2)

[Editor's Note: Part 1 ran in Walls & Ceilings November 2012 issue.]

The chance of losing a claim is a lot higher than any contractor in the construction business wants to admit. Contractors convince themselves of any number of things in hopes that “it” won’t happen to them. Periodic and regular

checkpoints across the lifecycle of a project help to identify issues while there is still time for them to be addressed. This review process provides a solid offense for winning claims. Access to information from across the project is critical. There are five essentials to strategic project management: scope, resource, time, money and documentation. If the job shifts from perfect to imperfect, these five critical components will determine whether the contractor makes money on the job or if there is enough information to win a claim. Part one in this series covered scope and resource.

Time is something typically “given” to the contractors by the GC and the

subs live and die by this time schedule. Whether the schedule of tasks outlined matches the sequence in which the crews need to work is something that needs to be considered.

The next step is identifying vertically stacked activities to indicate potential conflicts or areas of concern where contractors may be stepping all over one another on a project. Proactively resource loading the schedule must be addressed. This is accomplished by taking the budgeted hours and calculating how many men will be needed to complete each line item in the schedule. When a resource loaded schedule is mapped onto a chart, it should look

like a modified/gradual bell curve. If it does not, then there are unbalanced resources which could take the project off course (time and budget). If a problem arises, be certain to communicate the problems to the GC early and regularly and ask for relief. If the contractor doesn’t make the GC aware of a potential situation or ask for assistance when he is aware there is a problem it will be harder to be granted that relief later in the project.

JOB COST ACCOUNTING SOLUTION

In order to manage the Money, contractors need a solid job cost accounting system. Estimated quantities must be identified from the thorough and complete takeoff performed by the project manager before beginning the build. In addition, the installed data quantities should be gathered from the job site using automation tools that will be instantly communicated back to the office. The next step is to align that information to the weighted average value of those areas otherwise there will be erroneous results.

The next information needed is the estimated time from the PM’s estimate and the actual time from the payroll time cards. This information will allow the calculation of the percent complete of the job. Projections for final costs will show potential claims based upon the information the numbers expose. Now this following point is critical: don’t ignore the analytics—the numbers don’t lie. If contractors don’t pay attention to these projections they will have a problem at the end of the project and it will be too late to correct the issue.

SOLID DOCUMENTATION

Documentation is arguably the most important of the five essentials. Documentation must be started from the beginning—not when the situation dictates its need. The crew simply won’t remember the details. Without good documentation it will be a war of “your word against theirs” when it comes to supporting (or defending) a claim. A delay letter should not be confrontational but rather be infor-

mational to avoid a claim before it happens. Make this communication very clear and include details such as activity, area, delay start time, delay end time, and elapsed time (net work days minus any holidays in that window) when known. This provides a lot of credibility when having a conversation related to the delay.

The best time to pull together this information is the day before the regular job status meeting. Share this information with the superintendent before the meeting allowing him to discuss this situation with each of the appropriate contractors at the status meeting.

The other important aspect of documentation is tracking the measured mile. It is a legal premise where contractors measure off effected work. Identification of the estimated time to complete is compared to the actual time spent. Analyzing the factors that caused the

cost overrun is most effective when using automation tools because the work is time stamped and easily reflects the work status. Photograph and take videos of the situation and store the support data within the automation tool then carry the tablet into the meetings. Creating solid documentation takes away the "your word against theirs" weak-link in a claim.

A claim isn't a strategy to make money. Rather filing a claim is a way to avoid losing money or to recover money. Start from a position of strength. Focus on the five essentials: scope, resource, time, money and

documentation. If the claim is well documented, the other parties may not push back once the information is shared. Strategic and proactive project management is the argument winning tool for a claim. **W&C**

Cecilia Padilla, president of On Center Software Inc. is an internationally known expert in the construction industry. Padilla's expertise spans 25 years in drywall, light- and heavy-gauge framing, lath and plaster, EIFS, fireproofing-themed facades, and acoustical ceilings. Prior to joining On Center, she worked for Marek Brothers Systems in Houston and for Raymond Interior Systems in Las Vegas and Orange County, Calif.

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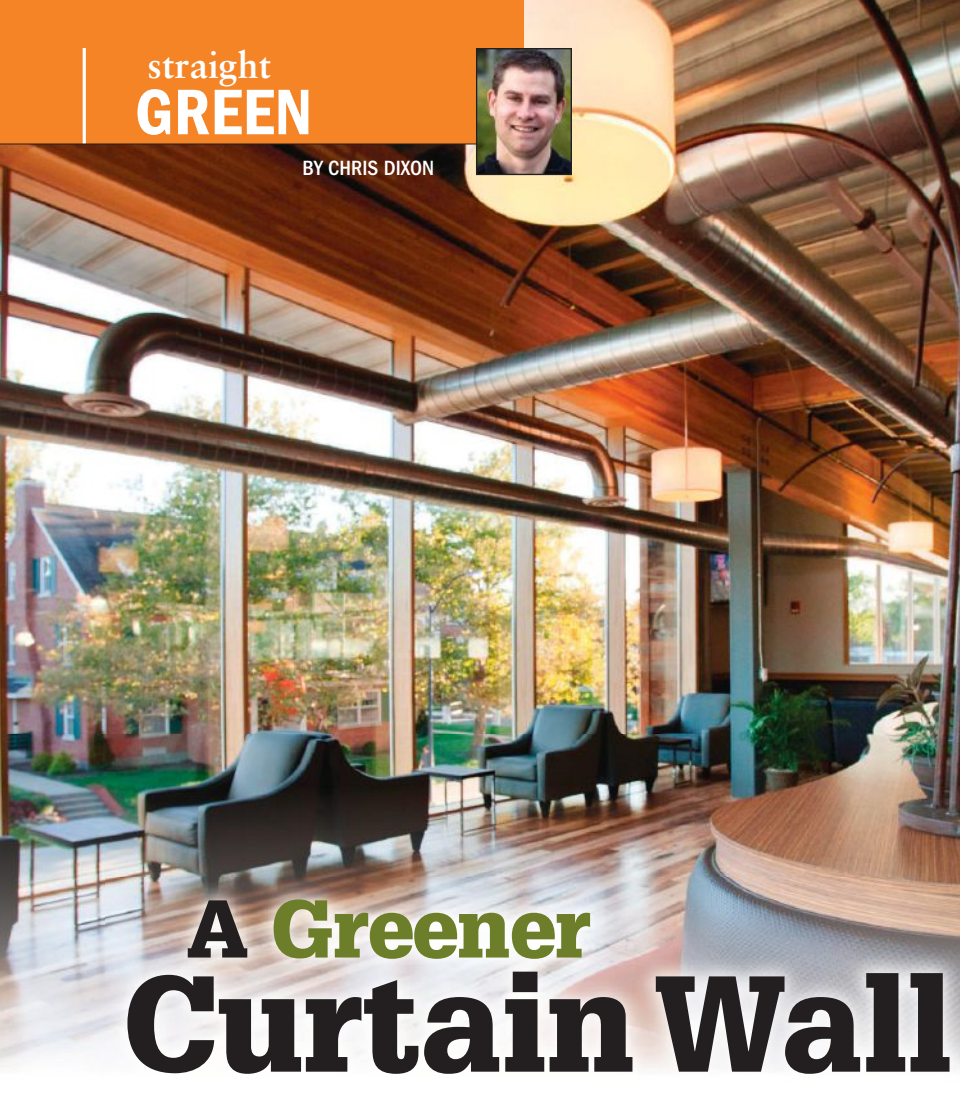
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A Greener Curtain Wall

Steel, concrete, aluminum and glass have been the pre-dominate materials used in large commercial buildings for more than a century. The first steel-framed skyscraper was the Home Insurance Building built in Chicago in 1885. The

use of these materials has allowed buildings of today to be tall, lightweight, fire-resistant, and incredibly efficient.

Until very recently, there has not been much of a reason to challenge the use of these materials in buildings. Our ever-growing understanding of the negative impacts our species has had on the environment is forcing a rethinking of everything we do, including the materials we use to build with. Steel, concrete, aluminum, and glass all require a huge amount of energy to produce. And they are used in great quantity in buildings as structure and skin. According to the paper “Life-Cycle Energy Use in Office Buildings,” by Raymond J. Cole and Paul C. Kernan, structure and envelope represent the single larg-

est component of a building’s total embodied energy. As a result, these four materials represent the largest contribution to green house gas emissions in buildings. And this is a big deal. So much so that the current version of CALGreen—the State of California’s Green Building Code—includes provisions for calculating a building’s contribution to climate change (GHG), using either whole building analysis or materials analysis. For the materials analysis path, the code states:

“A5.409.3 MATERIALS AND SYSTEM ASSEMBLIES. IF WHOLE BUILDING ANALYSIS OF THE PROJECT IS NOT ELECTED, SELECT A MINIMUM OF 50 PERCENT OF MATERIALS OR ASSEMBLIES BASED ON LIFE CYCLE

ASSESSMENT OF AT LEAST THREE FOR THE IMPACTS LISTED IN SECTION A5.409.2.3, ONE OF WHICH SHALL BE CLIMATE CHANGE.”

Note: Software for calculating life cycle assessments for assemblies and materials may be found at the Athena Institute website and the NIST BEES website.

Swapping out steel, concrete, glass, and aluminum for most materials and systems is not easy to do. For large commercial buildings, there are few available, or even feasible, alternatives. There is one, however, that shows promise.

A NEW KIND OF CURTAIN WALL

Nearly every large commercial building in the US is clad, in part or in whole, with glazed aluminum curtain wall. A curtain wall system is a lightweight exterior cladding made of framing members (typically aluminum and/or steel) that support glass and metal panels. Curtain wall is hung from the building and supported by the edge of each floor slab. It does not support floors or roof. Aluminum framed curtain wall has been used in the U.S. since the 1930s.

As technological advances in curtain wall have progressed, manufacturers have been offering systems with a wide range of materials and configurations, including the framing, without compromising performance or cost. Framing members are typically made of rectangular extruded aluminum sections, with steel reinforcement added where required. Steel, fiberglass, and PVC curtain wall framing is an option today, with timber and bamboo recently added to the growing list. You read that correctly—bamboo!

Since its formation in 1992, the German company Raico has been redefining how curtain wall works and is incorporated into buildings. It has developed several systems that can be attached to any type of framing without changing performance characteristics. Framing can be of aluminum, steel, wood or—

yes, even bamboo. In every case, water penetration, air infiltration, and thermal performance remain the same. This has opened the door of opportunity for innovative companies looking to capitalize on this exciting new alternative.

United States companies CT Windows, IC2 Technologies, and Lamboo now offer Raico curtain wall systems coupled to laminated timber and bamboo framing systems. Replacing aluminum framing members with timber or bamboo can help reduce a building's total GHG emissions. In the paper "A Comparative Study on Environmental Life Cycle Impacts of Curtain Walls," by Rahman Azari and Yong-Woo Kim, the authors conduct a Life Cycle Analysis that shows aluminum curtain wall systems have more than seven times more global warming potential than a timber framed curtain wall. The same is true for acidification and eutrophication.

WHERE CAN I GET ONE?

A sample of a timber framed curtain wall was recently dropped off at my firm, and was displayed in the "new and interesting materials" display shelf. The sample generated quite a bit of interest among architects. The manufacturers I spoke with on the telephone are actively and aggressively working to get these systems to market. At the moment, few, if any, systems have been used in the U.S. There are a small handful of examples in Europe (where else?) but none of note in the United States. Why? The reasons are many but the main one has to do with U.S. building codes.

The international Building Code allows the use of wood in all types of buildings, even in non-combustible assemblies. But the code is very prescriptive, and very strict in what it allows—and what it does not. Wood framed curtain wall, while not expressly prohibited in the code, is not expressly allowed either. Getting wood (or bamboo) framed curtain wall on a



commercial building in the U.S. is possible, but owners and designers must be prepared to jump through several hoops to achieve the goal. The best contemporary example of a team that was successful in this quest is represented in the exquisitely designed Arena Stage at the Mead Center for American Theater in Washington D.C., designed by Bing Thom Architects. The building uses laminated wood columns 45 to 63 feet tall which support a laminated wood framed glazed curtain wall. To convince skeptical building code officials, the design team used computer modeling to show that effects of a fire on the structure would be minimal, and there would be plenty of time for safe building evacuation. A char analysis was also done, showing how char that develops on the exterior of the exposed wood members actually protects the interior of the wood during the fire event. Calculations were provided showing that the integrity of the wood members would not be compromised.

CONCLUSION

Wood use in buildings is being given a second life, thanks to building code revisions and the desire to minimize buildings' environmental footprint. New technologies such as timber and bamboo-framed curtain wall allow designers to use these materials in place of traditional materials such as aluminum and steel, without any adverse impact on the system's ability to perform structurally, thermally, and environmentally (water penetration and air infiltration). If manufacturers of these systems can pave the way for designers to convince owners and code officials that these systems are completely viable alternatives, they might start showing up on a building near you! **W&C**

Chris Dixon is a registered architect, Certified Construction Specifier, and LEED AP. He serves on GBI's Green Globes Technical Committee and is a former USGBC Materials and Resources Technical Advisory Group member.

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ALLIED BUILDING PRODUCTS' CONTRACTOR OF THE MONTH: MARTIN INTEGRATED SYSTEMS

One could argue that Martin Integrated Systems is one of the most respected ceiling contractors in California. Now celebrating its 25-year anniversary, the company is still burning all engines to full throttle.

Martin Integrated prides itself as being one of the go-to specialty ceiling contractors, based in Orange, Calif., since 1989. The company's CEO, superintendent and estimators collectively have more than 100 years of experience in the commercial construction industry. The company focuses on insulation, acoustical, specialty metal, security and wood ceilings, as well as acoustical wall treatments and wood wall panels.

Because of this scale of services, Martin Integrated has extensive experience in theaters, airports, prisons,

hospitals—you name it. The company's President and Owner Marty Hovivian says that through hard work and reputation, he is able to be in a position to not just take any project that comes along.

And now, two-and-a-half decades later, Martin Integrated operates all over California, with a satellite office in San Francisco. He is grooming his son Tyler, who currently serves as a project manager, to be the successor when Hovivian decides to retire.

GREAT COLLEAGUES

As a specialty ceilings contractor, the company has been awarded many interesting yet

◀ Curved wood ceilings at a commercial project in Southern California.

complex jobs such as extensive work for the film industry, having worked for Warner Bros., Sony Pictures, University of Southern California and Chapman College film schools.

The company is also pre-qualified to do work for the government and has done a considerable amount of hospital projects (one of which is the USC Medical Center, which is more than 1.5 million square feet).

However confident Hovivian may be as one of California's premier ceiling contractors, he is never at loss for praise of his staff. Currently employing around 50 employees, he is more than happy to share the credit.

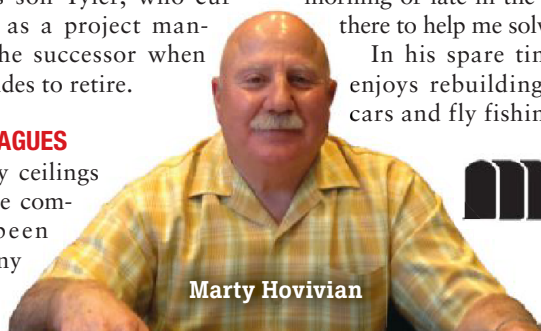
"I'd like to recognize my staff now," he says. "Without all these people here, I just can't make it happen alone."

Presently, the company has 40 jobs at all phases of the job site schedule and according to Hovivian, the rest of the year has a backlog of work.

Spreading the thanks around, Hovivian is equally impressed with Allied Building Products and its staff, singling out one particular name.

"Bettie Donate has lots of passion for what she does," he says. "She goes the extra mile. If I call her early in the morning or late in the evening, she's there to help me solve problems."

In his spare time, Hovivian enjoys rebuilding old English cars and fly fishing. **W&C**



Marty Hovivian



JOHN WAYNE AIRPORT

Terminal C at John Wayne Airport is a new 282,000 square-foot-extension to the terminal. Martin Integrated installed acoustical and metal ceilings for the project, which is located in Santa Ana, Calif. The company installed 80,000 square feet of Armstrong's MetalWorks Torsion Spring Custom Curved Ceiling System and approximately 35,000 square feet of the manufacturer's Ultima and Optima acoustical ceilings.

For the MetalWorks product, preparation was very difficult. The panels are manufactured in Armstrong's plant in China. The company had to fly in QC from North America to oversee the production. From there, the 35 containers of the product had to be packaged and labeled cor-

rectly, escorted through customs once stateside, loaded specifically for Martin Integrated and delivered on time. Armstrong oversaw all of this.

It is because of service such as this that Hovivian is a big supporter of Armstrong.

"I like the Armstrong product lines; they do a great job," he says, citing the company's Steve Bresnahan, vice president of its Architectural Specialties Division. "I can't say enough nice things about them."

The feelings must be mutual as Armstrong has named Martin Integrated to its roster of Architectural Specialties Certified Contractor Program.

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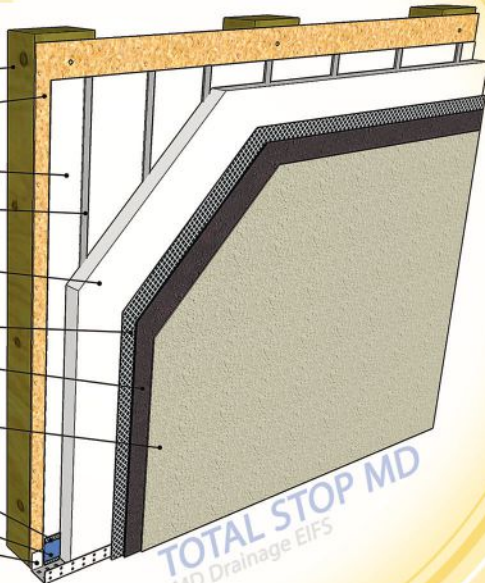
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