CREATING A FUTURE WHERE SIPS ARE THE PREFERRED BUILDING SYSTEM.

Select SIPs
The official publication of the Structural Insulated Panel Association
Premier Issue, Fall 2017

A SIP-Specific Code for the IBC
Architects and Builders Who Take this Training Have a Clear Advantage
Online Calculator to Generate Design Specs

A Better Way to Build

A Washington builder Scott Homes improves quality and profitability with SIP construction

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SIPA Project Highlight

Native American Center
University of Montana

Location: Missoula, Montana
Building type: Institutional/Educational
Square feet: 30,000
Completed: 2011
Thickness of SIP wall panels: 6 in.
Thickness of SIP roof panels: 12 in.
Designer: A&E Architects/Glen & Glenn Architects
Builder: Jackson Contractor Group, Inc.
SIP manufacturer: Big Sky R-Control
SIP benefits:
- LEED Certified
- Energy efficiency
- Time/labor savings
- Cost savings

A Better Way to Build

SIPA Project Highlight

Park Row Apartments
St. Peter, Minnesota

Location: St. Peter, Minnesota
Building type: Multifamily
Square feet: 26,352 per building
Completed: August 2014
Thickness of SIP wall panels: 6 in.
Thickness of SIP roof panels: N/A
Designer: Energy Panel Structures
Builder: Southwest Minnesota Housing Specialists
SIP manufacturer: Energy Panel Structures
SIP benefits:
- Speed of SIP construction compensated for winter construction delays
- Affordable utility cost for low income tenants
- Durability

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A Message from the President of SIPA

SIPs: Increase Your Value, Decrease Your Costs

Welcome to the premier issue of Select SIPs – the industry’s first and only magazine dedicated to structural insulated panels (SIPs). Whether walls, roofing, or flooring, SIPs are critical for a robust energy envelope needed to meet today’s – and most importantly – tomorrow’s demands.

The construction market is ripe for durable and resilient construction as seen both by recent hurricanes Harvey, Irma, and Maria, and also by more demanding energy performance codes, tighter air leakage requirements, and sustainability desires. SIP construction contributes solutions to each of these needs.

Why SIPs? SIPs cost less. SIPs create a better structure. SIPs fit with the market demand for less air leakage (often lower than one air change per hour ACH50) and faster install times using less available, lower skilled labor. All this with factory controlled, precision quality and exact tolerances for even complicated designs delivered to the jobsite, cutting days to weeks off framing and roofing schedules for a rapid “dry-in” time.

Many times, the reductions come just from the cumulative savings allowed during integrative design and installation.

How can a value-added product like SIPs really cost less? Many times, the reductions come just from the cumulative savings allowed during integrative design and installation. SIPs minimize wall layers, joints, and thermal bridging to achieve the high insulation and leakage performance mandated by today’s most demanding IECC 2012 and 2015 codes. Trimming HVAC costs with smaller systems, shorter duct runs placed in conditioned spaces, and faster electrical install due to pre-cut cable chases, receptacles and switches save more time and money.

Reductions from almost no jobsite waste to haul to the landfill combined with fast erecting jumbo wall and roof panels lengths up to 8 ft x 24 ft using lower cost labor add up. But wait – all of these savings are before the decades of building occupants enjoying significantly lower HVAC operating costs with superior indoor environmental quality.

If you are new to SIPs, let our members answer your questions. If you use SIPs already, please share your stories with us at info@sips.org or www.sips.org.
A Message from the Executive Director & COO of SIPA

Building SIPA's Vision

Ideally, this new Select SIPs twice yearly (Fall and Spring) magazine will peak, revive, or confirm your interest. Look online (www.sips.org/projects) to the new catalog of projects mapped across North America. There are currently over 200 projects in the database, but hundreds more are being added.

Are you already using SIPs in your projects? Consider submitting your project to the Building Excellence Awards Competition conducted annually across all building types (www.sips.org/building-excellence-awards). If not, look back at over 16 years of winning projects or view others in the project gallery at www.sips.org/gallery. Be sure to read this magazine’s “Project Profile” section for case studies on the two 2016 winning SIP projects. One is the world’s largest Passive Certified Building and the other is a residential restoration of a late 1800s home! Winners of the SIPA 2017 Building Excellence Awards will be featured in the Spring 2018 edition of Select SIPs.

Today, a network of almost 200 SIPA member companies provide over 80 percent of all the structural insulated panels in North America.

Helping you achieve all aspects of support, SIPA members include professional engineers, architects, builders (including SIPA Registered Master Builders with proven SIP expertise), dealer/distributors, SIP manufacturers, and suppliers. Some of the world’s largest, most innovative material building science companies, like Ashland, BASF, and Dow-DuPont, are not only active supplier members but serve on the association’s Board of Directors. You can reach out to them all or the ones nearest you by visiting www.sips.org.

The time has come! Learn more about using SIPs in your next project.

Want to dive deeply into education about SIPs? Two free one-hour online AIA Continuing Education courses with credit are available for architects. For builders, 10 free one-hour video courses step through every aspect of SIPs, from fabrication, logistics, and framing to electrical and plumbing. After completion and testing, builders can receive a Master Builder designation and discounted SIPA membership. All this and more is available at www.sips.org. Sign-up there for the bi-weekly SIPs Update newsletter.

Since 2007, code compliance with SIPs has been facilitated by inclusion in the International Residential Building Code. International ISO standards for both roofing and walls with SIPs are available. Through extensive testing with both APA – The Engineered Wood Association and the Forest Products Laboratory, SIPs are aiming for inclusion soon into the International Building Code via reference to the American Wood Council’s National Design Specification for Wood Construction.

Launching in Summer 2018, the new SIP Engineering Design Guide and companion calculation software will greatly aid structural engineers designing commercial projects. Read more about it in this magazine’s article Engineers in the Know.

As you can see, there is a lot going on at SIPA! You’ll read and hear more about SIPs with many of our partners, like the US Department of Energy’s Solar Decathlon and Race to Zero university competitions in Denver, Colorado, or their Zero Energy Ready Home Awards presented at the Energy & Environmental Building Alliance Conference in Atlanta. The New Building Institute and Net Zero Energy Coalition are annually cataloging numerous SIP structures. But don’t think SIPs are only for “specialty” projects. Each year scores of hotels, schools, restaurants, and multifamily structures are constructed using SIP advantages.

Come see SIPA in Orlando at the International Builders’ Show, January 9-11, 2018, or at the SIPA Annual Meeting in Jacksonville, Florida, February 26-28, 2018.
Although structural insulated panels (SIPs) have been around for over half-a-century, they do not currently have a single set of engineering calculation approaches governing their use. This means design professionals are left with questions and no unified place to find answers, aside from code reports supplied to them by the manufacturers. These reports provide information about the product but not the calculation basis to incorporate them into a building system design.

This leaves designers in the unfavorable position of having to rely on their judgment on how to best use engineering practices as they relate to SIPs.

The Structural Insulated Panel Association’s (SIPA) Structural Insulated Panel Engineering Design Guide is about to change this. Once complete, the guide will become the go-to tool for the uniform, single-source guidelines that are required for SIPs to gain more widespread acceptance throughout the construction industry.

“It was just a confusing situation for engineers, especially when you compared SIPs to other materials that have ready-design references available,” says Tom Williamson, Chair of SIPA’s Technical Advisory Committee. “It was a major roadblock that was keeping this industry from advancing so we decided that if we really wanted to expand the market for SIPs, we needed to provide engineers and architects with a solid design guide that could be on hand, where they could just plug in their design information and obtain the answers they required.”

The launch of the SIPA Structural Insulated Panel Engineering Design Guide project was predated by a decade of work done by SIPA member NTA, Inc., a building product evaluation and testing company. The company took on the work as an in-house project to better help its engineers design with SIPs. While the scope of this initial project was limited, it did enable NTA to better assist their clients.

Eric Tompos, Vice President/Director of Compliance at NTA, Inc., has been working on the manual since 2007, when NTA, Inc. was approached by a company to start over and take a fresh approach with their SIP panels. “For us, this was an interesting opportunity to start from scratch. What we are seeing now in the more recent SIPA design guide is the culmination of that early work and what we have been collecting since 2014.”

SIPA approached NTA, Inc. in 2014 about the possibility of creating a document with a larger scope; one which all engineers could use. Work began in May 2014 and the goal has been to complete the manual in four years. Completion is just around the corner; a draft of the full guide and commentary was provided to SIPA this past March and the completed SIPA Structural Insulated Panel Engineering Design Guide and companion design software is slated for release in July 2018.

Throughout the development process, members from industry have remained closely involved, providing direction for scope and determining the content for the guide. Williamson says, “We’ve been fortunate to have a really
good team at NTA that has kept us in the loop.”

NTA, Inc. and SIPA’s Technical Advisory Committee set up an industry task group that reviews progress through a series of regular, hour-long webinars. The task group looks at what NTA is doing, where they are at, and provides suggestions for change.

“The whole process has been as smooth as possible for us because NTA has been willing to have this group provide guidance and – in the end – it’s going to result in a really good design guideline for SIPs,” adds Williamson.

There were a few challenges in the creation of the SIPA Structural Insulated Panel Engineering Design Guide, starting from the point of even establishing a firm definition of what constitutes a structural insulated panel. Another challenge stemmed from the need for additional data on the ways designers wished to use SIPs, which requires additional research and testing in order to determine how the SIP product might respond in real-world applications. Most of the testing that had been done previously had been the general, standardized tests dictated by certification agencies and were not necessarily well suited for coming up with the information NTA, Inc. required.

“Some of this challenge was mitigated by NTA side-programs and studies,” says Tompos. “Any time we had extra panels from qualification testing, we would perform ad hoc tests to fill in some of those information blanks. So, while some of the provisions found in the guide may be lacking in terms of firm supporting data, if nothing else, the provisions of the guide will serve as something that could be tested further in a laboratory and refined down the road.”

Initially, drafts of the design guide were only made available to members of the industry-based task group. Recently, however, the decision was made to open up the draft to a wider audience in order to gather additional feedback and perhaps catch problem areas the initial task group might have missed.

“So far, response to the draft has been positive,” says Corey Nigh, Test Engineer at NTA, Inc. “We’re now receiving feedback from industry engineers to help further improve the guide, and those who have used it have told us how appreciative they are to now have a SIP-specific design guide in their design toolbox.”

Going forward, SIPA and its members will continue to provide feedback over the months to come and any updates to the guide will be made before its final publication, scheduled for July 1, 2018. Nigh says that there are still holes in some of the information, so future versions are likely as additional data on SIPs is produced and more design applications are explored over time. This could result in future updates to the guide. In terms of this first edition though, Nigh says, “it has been very exciting to work on something that is so needed and desired by the SIPs industry.”

For further information on this guide, visit www.SIPs.org.
Every three years the International Building Code (IBC) is updated, with the next scheduled for release in 2018. While structural insulated panels (SIPs) are already included in the International Residential Code (IRC), the Structural Insulated Panel Association (SIPA) is currently working with industry representatives to help ensure that SIP-specific references will be included in future IBC updates, with a desired 2024 target date. This is because the current SIP testing reports won’t be ready by this January 2018’s deadline for inclusion for the next 2021 update cycle.

“Here we have a product that has been around for 50 years and has never been recognized by the IBC simply because there had not been a coordinated industry push to do it,” says Tom Williamson, Chair of SIPA’s Technical Advisory Committee. “SIPA has been leading that push to be part of a future IBC update and we’re certainly looking forward to seeing it happen.”

At present, the IBC does not directly include references to a wide range of specific products. Instead, the Code references products through industry design standards such as the National Design Specification for Wood (NDS) or the Special Design Provision for Wind and Seismic (SDPWS) that are supported by the American Wood Council. One of the main issues facing SIPs is that, although they are considered a wood product, they are not currently referenced in the NDS or SDPWS, so therefore are not referenced in the IBC.

Todd Bergstrom, Chief Operating Officer at SIPA member company AFM Corporation, explains, “to get into the IBC, you actually typically don’t get into the Code directly – you go into one of the reference codes that is within the IBC. It’s not that SIPs couldn’t go in the Code, it’s just that there is a lack of complete reference documentation for SIPs right now, which makes it a challenge to be included.”

The primary difference with the IBC and the IRC is that SIPs are listed prescriptively within the IRC as a product relative to a design standard. As an example, there is a current SIP standard ANSI PRS 610: Standard for Performance-Rated Structural Insulated Panels in Wall Applications that was developed to provide a basis for code acceptance of SIPs back in 2007. However, this standard that recognizes SIPs used in walls has not been referenced by the IBC and, in order for SIPs to be referenced within
Creating a future where Sips are the preferred building system.

The slow drive to inclusion in the IBC is not only a technical issue for SIPS, it is also an issue of time and funding. Testing is time intensive and costs money while an association, such as SIPA, only has so many resources to spend on the development of supporting data. Also, SIPA does not currently employ any permanent technical staff whose job it is to go out and solely dedicate themselves to advancing the goal of SIPS being included within the Code. This lack of resources is one of the main reasons that 2021 is a stretch for any IBC inclusion for SIPS. Instead, SIPA is looking further ahead to 2024, and beyond, to see its products referenced in the Code.

"SIPA has limited staff but members volunteer their time to help push the mission of the association forward,” says Bergstrom. “The technical committee within SIPA is constantly working, albeit on a volunteer basis, to advance the mission of building a greater overall awareness of the performance of SIPS.”

As an example of these efforts, SIPA is working on the recognition of SIPS in both walls in seismic risk areas and as diaphragms in floors and roofs through research being conducted at the United States Department of Agriculture’s Forest Products Laboratory (FPL) and by APA – The Engineered Wood Association. These research efforts are continuing to evaluate some of the basic science issues around SIPS and is building a base for the engineering community by developing the design information they require.

The project to establish the performance characteristics related to the use of SIPS in seismic regions has been completed and will soon be published by the FPL. Another project, also completed last year, helps in determining the creep performance characteristics for SIPS.

"These studies put arrows in our quiver that will allow us to respond to questions from design professionals by saying, ‘hey, now we know how to do that with SIPS’.”

Should a product – such as SIPS – not be in the IBC, it will need to show equivalence and meet the intent of the IBC without actually being in the Code, typically through ICC-ES or other agency code reports, before its acceptance within industry grows.

“House wraps are a product not in the IBC but they are used in virtually every single building today,” notes Bergstrom. “This is because someone has gone out, done the work, and received evaluation reports to say that they are equal to what’s already in the Code, which just happens to be building paper. This is an example of a product that has gained mass acceptance without actually being in the IBC even though building paper versus house wraps is a simple substitution.”

The future drive to inclusion in the IBC is worth the effort; there are direct benefits to having your product referenced. Once a product’s standard is included, its acceptance by industry only accelerates, as its inclusion makes the process of adopting it easier for design professionals.

“When an engineer or architect goes to use a product in a building, the first thing they do is go to the governing code, usually the IBC, to see what it says about what they can do with that product,” says Williamson. “If they go to the IBC and there’s no mention of structural insulated panels, they may question where to get relevant design information and they may simply move on to use something else that is referenced.”

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The resulting industry data collected by this testing and evaluation will eventually lead to standard development for SIPS, and to demonstrating the equivalency to other products in the Code. It will also help to usher eventual acceptance into a future standard reference.

“Ultimately, the process for getting things in the IBC is actually pretty easy,” says Bergstrom. “Anyone can have something included in the Code; it just needs to have technical justification that the ICC Code Committee, which updates the Codes, can evaluate. It’s just a matter of getting your proposal well-crafted and such that it’s suitable to be peer-reviewed by a group of building officials. That’s the tough part.”
WHAT DO YOU WANT YOUR BRAND TO SAY?

Your brand is more than a logo. It’s what customers say to other consumers about your product when you aren’t there to hear. It’s the feelings and associations people have when they hear your name.

LET AN NTA SIP PANEL CERTIFICATION SAY IT FOR YOU

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Each SIP panel certified by NTA receives our Certification Mark that verifies compliance to all applicable codes to code officials and regulators.

QUALITY
An NTA Listing Report provides evidence that your product was produced under a quality system monitored by an accredited, third-party agency.

REPUTATION
NTA’s thorough testing process provides detailed reports that support your marketing claims.

AUTHORITY
The experts at NTA wrote “Engineered Design of SIP Panels”, which provides design methods for Structural Insulated Panels.

THE NTA MARK: A SYMBOL OF CODE COMPLIANCE

Once a product has completed its evaluation, and its quality system has been verified, it receives a code report, along with our Certification Mark. Each mark issued contains a unique number that can be used by consumers, code officials and regulators to locate your code report in our online database.
Creating a future where SIPS are the preferred building system.
Education Outreach

Architects and builders who take training specific to SIP design and installation have an advantage.

The Structural Insulated Panel Association (SIPA) currently sponsors two AIA Continuing Education courses intended for construction professionals to learn more about structural insulated panels (SIPs). Each of the courses are delivered via two different formats that are tailored for the specific need. Participants can opt for a face-to-face presentation that is facilitated by an area SIPA member – a SIP manufacturer rep will come to the architect’s office and speak to a group. The exact same courses can also be taken by watching online video versions available from various SIPA member websites, the SIPs.org site or through the education provider site, TheContinuingArchitect.com.

Each course runs approximately one hour in length and participants can earn one HSW Learning Unit.

“The two courses, whether taken online or through a presentation, are crafted to teach design professionals the basics of what SIPs are,” explains Tom Moore, Principal at Pinnacle Engineering Inc. and Chair of SIPA’s Education Committee. “Many who take the courses either don’t know much about the product or have never even heard of SIPs. In addition, if the participant is new to designing for energy efficiency or issues of sustainability, the courses will help familiarize them with some requirements needed to meet certain green building standards.”

There are two courses tailored to design professionals.

Residential Design with Structural Insulated Panels:
This course is focused on residential construction and provides information on what residential builders would be most interested in, laying out the many benefits of designing with SIPs for residential applications. Course takers gain a better understanding of how SIPs are made, the nuances between SIPs and other types of construction, and how to properly utilize SIPs for optimum energy efficiency and durability. The intent of this course is to instill a better understanding of designing for current industry standards with SIPs.

Commercial Design with Structural Insulated Panels:
Through case studies and design strategies, this course examines more advanced non-residential aspects and benefits of designing with SIPs. The designer gains more detail on issues such as fire and sound ratings, and walks away from this course with a better understanding of current industry standards with SIPs.

The success of the AIA Continuing Education courses to date has encouraged SIPA to consider taking the AIA course delivery model and tailoring it for structural engineers.

“A lot of SIP manufacturers have expressed to SIPA their difficulty educating the engineering community on what SIPs are and how to design with SIPs,” says Moore. “They’re asking for a more technical course, similar to the AIA presentations delivered by a SIP sales rep, directed at structural engineers. It’s a bit of a balancing act to make this happen, but it’s certainly on the horizon.”
THE BEST BUILDERS

SIPs have been steadily increasing in popularity as builders become more interested in designing with energy efficiency and sustainability in mind. To respond to the growing need for trained SIP installers, SIPA has been offering the BEST (Builder Education with SIP Training) Program since 2013. This 10-part series of online training courses provides the building community with everything they need to know about incorporating SIPs into their projects.

“With the BEST Program, builders receive a good foundation and understanding of SIPs within the industry, as well as information on best practices in design and installation,” says Al Cobb, Director of SIPschool and the host of the BEST online training videos. “They only call me an expert because I have made more mistakes than anybody and my goal is to help builders make fewer mistakes than I did. As such, the BEST courses are just filled with tricks, tips, and techniques that will help to shorten the builder’s learning curve, get up to speed quicker, and become more profitable sooner.”

The BEST Program has been designed for those builders with minimal SIP experience; its completion is the first step in becoming a fully qualified SIPs installer. Once participants have completed the online courses – and completed some version of a hands-on component – they can then be referred to as a Builder in Training, which shows the industry their demonstrated level of competency. Further training and proven proficiency in SIP installation and demonstrated performance of minimal air leakage by blower door testing allows builders to earn the prestigious Registered Master Builder status.

Benefits can also be found in the BEST Program for experienced SIP builders, as many installers are at a competitive disadvantage having only dealt with one manufacturer of SIPs or a single installation perspective. “We construct differently in different climatic regions because building science tells us that’s the right way to build durable structures,” says Cobb. “The BEST Program’s emphasis on the broad explanation of various panel types and sealing techniques gives even the experienced SIP installer a greater understanding of the entire industry. This allows them to approach different kinds of jobs with a better knowledge of what they should and should not do in a particular situation.”

Ultimately, SIPA embraces the BEST Program as a way to promote SIPs construction. Having a robust, well qualified installer workforce for SIPs is key to prevent a “black-eye” for the industry due to poor installation practices.

“So, by offering this training, it’s really a win-win-win situation for everyone. The homeowner gets a better package that’s more durable, the builder gets the recognition for their training, and the BEST Program helps improve the industry as a whole by ensuring that we get better overall SIP installation,” says Cobb.

Find out more details of the BEST program at www.sips.org/training/sipa-registered-builder-program.
Typically, building materials and products other than SIPs – such as trusses, steel beams, dimensional lumber and fasteners – already have valuable design tools that are catered specifically to their type of product. By having these design tools on hand, those products have been able to garner a greater acceptance by the design community which, in turn, led to more widespread use within the construction industry. By comparison, SIPs have so far lacked this important feature, which limits both the SIPs’ exposure to designers and also to the type of designers who may already feel comfortable working with the product.

That is, until now.

On behalf of the Structural Insulated Panel Association (SIPA), web developers at NTA are currently working on a design calculator that is to be released alongside the final version of the SIPA Structural Insulated Panel Engineering Design Guide in mid-2018. This online tool will help the user store and organize the equations given to it by the upcoming SIP design guide, which will then allow them to translate those numbers into ready-made, adjustable examples that can be easily accessed and used. Ultimately, the goal of the online SIP calculator will be to reach more engineers and design professionals and, by extension, help narrow the knowledge gap that currently exists for designers working with SIPs.

“This is pretty consistent with a lot of different industries,” says Eric Tompos, Vice President/Director of Compliance at NTA, Inc. “If you go online now with any trade organization, you will find online calculators or apps for use. We’re trying to bring SIPA up to the same level as those groups and create some online, interactive design software that can be used to try out different scenarios and bring more familiarity to SIPs.”

The online tool will also help increase the speed in which design professionals learn how to design with SIPs, particularly for those who have not worked with the product previously. That being said, the design tool will provide flexibility so that design professionals working at an advanced level with SIPs are able to adjust the example templates – or build their own – if they choose.

At launch, the online design tool will be able to address some of the more common loading scenarios for SIPs, as well as be able to ingest advanced users’ personal templates to use on more complex jobs. To aid in this, the calculator will offer each user their own login and provide personal file storage. Once a design is finished, the user will be able to print a copy of the calculations as a PDF document and then export it from the system for their use elsewhere.

“The thought behind the design of the online design tool was that it should account for most ways designers want to use SIPs,” says Corey Nigh, Test Engineer at NTA, Inc. “But we are hoping that during beta testing, designers will provide feedback on the tool’s layout, ease of use, functionality and how useful the examples are for the ways they want to use it. We can use that feedback to improve the current examples and help SIPA understand where to prioritize future developments.”

The online tool will also help increase the speed in which design professionals learn how to design with SIPs, particularly for those who have not worked with the product previously. That being said, the design tool will provide flexibility so that design professionals working at an advanced level with SIPs are able to adjust the example templates – or build their own – if they choose.

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“The main benefit that this calculator will bring for design professionals will be in time-savings,” says Nigh. “Instead of reading the guide and building their own spreadsheets, users will be able to simply input data into this online tool and have it do the work for them.”

Building an online design tool such as the SIP calculator was a two-stage process, first requiring a design guide to establish the rules of design for that product and then needing to use those rules in order to build example calculations for various scenarios. This presented a challenge in the creation of the online tool, as the need for additional industry data on SIPs limited the ability of the design guide to be able to cover all SIP applications.

“The main benefit that this calculator will bring for design professionals will be in time-savings,” says Nigh. “Instead of reading the guide and building their own spreadsheets, users will be able to simply input data into this online tool and have it do the work for them.”

For more information on the SIPA Structural Insulated Panel Engineering Design Guide, go to www.sips.org/technical-information/engineered-design-guide.
Several years ago, Col. Paul Beineke and Col. Cheryl Beineke, both pilots in the U.S. Air Force, were looking for a place to retire and planned on moving with their children back to Marion, Ohio, where Cheryl's family comes from. The ancestral family homestead is a historic, 4,467 square-foot timber-framed house built in 1872 by Cheryl's great-grandfather.

Interested in energy efficiency, Paul searched the internet to seek out a builder familiar with SIPs and timber-framing, convinced that structural insulated panels were the answer to creating an optimally performing home from the standpoint of both energy efficiency and being structurally sound.

"With more than three decades of experience taking on these types of projects, I know that there is no better way to do it, other than with SIPs. It was a complete no-brainer."

Fortunately, Beineke came across GreenTech Construction and Dan Troth, a builder with more than 30 years of SIP experience, who has been building energy efficient homes in central Ohio since 1991. Now, with work being close to complete, GreenTech has recently received two SIPA 2016 Building Excellence Awards for the Beineke project, winning in the Renovation category as well as being the Overall Residential winner.

"I could have remodeled this home with 2x4 walls stuffed with fiberglass but that would have been a very inefficient way of insulating this house," says Dan Troth, President at GreenTech Construction and SIPA member. "With more than three decades of experience taking on these types of projects, I know that there is no better way to do it, other than with SIPs. It was a complete no-brainer."

GreenTech used SIPs from SIPA member MM&I for the project; eight-inch panels along the walls and 12-inch panels on the roof. GreenTech appreciated MM&I's use of thicker 5/8-inch OSB skins on its SIPs, as well as the company's "RTA" or Ready to Assemble package, with all doors and windows pre-cut at the factory, which made for a smoother installation.

The renovations also included a geothermal heating-cooling system that supplies conditioned air from the finished basement to the rooftop cupola space, triple-pane windows with different coatings for each side of the house, LED lighting, a tankless water heater, and Energy Star appliances. In addition, GreenTech made every effort to repurpose the house's original materials; re-using all of the original walnut doors, refinishing the original oak floors, and reapplying the Beineke house's original slate roof.

"Two of my passions are building new super energy-efficient homes and preserving the last of our historic timber frame homes and barns," says Troth. "I didn't see this project as a challenge but rather as an opportunity to focus on both: marrying the past to 21st century technology. I'm very appreciative of the historical context in which the Beineke home was originally built, and it's a joy to be a small part of that history."

For more information on the project, please visit www.sips.org/building-excellence-awards/2016-building-excellence-awards-beineke-renovation.
First becoming interested about the issues surrounding energy conservation during the 1970s, scientist Amory Lovins helped co-found the Rocky Mountain Institute (RMI) in 1982 in Snowmass, Colorado, pioneering the soft energy path. In 2015, RMI moved from its Snowmass location into its new net-zero energy RMI Innovation Center in nearby Basalt with SIPs factoring large in helping RMI meet its lofty design and sustainability objectives.

The winner of the SIPA 2016 Building Excellence Award in the Commercial (over 10,000 square-feet) category, the RMI Innovation Center is a 15,610 square-foot office building and state-of-the-art convening center built to help demonstrate just how net-zero carbon buildings should be designed, contracted, constructed and occupied.

The RMI Innovation Center is the highest-performing building in the coldest climate (Zone 7) of the United States, producing more clean energy than it uses on an annual basis plus enough extra to power six electric vehicles. The Center uses 74 percent less energy than the average building in this climate zone and - as of 2016 - it is one of only 200 net-zero commercial buildings in the country, providing a leading example of buildings that can solve the climate crisis.

"From day one, RMI had high performance qualifications and goals in mind for this project," says Craig Schiller, Senior Associate at the Rocky Mountain Institute. “The Center was designed to replicate RMI’s core values around energy efficiency, and we wanted to show what a high-performance design can achieve using common technologies that could be duplicated anywhere.”

SIPs were an important element of the energy efficient design. Twelve-inch-thick SIPs help the Center achieve its net-zero energy status and maintain inside temperatures at comfortable levels. In addition, the tightness of the SIP building envelope helps better prevent unwanted air from gaining access in the building interior, leading to a controlled, airtight indoor environment that was both healthy and comfortable for occupants.

“Aside from one military building, the RMI Innovation Center is the most airtight commercial building in the United States,” says Schiller. “We have an airtightness value of 0.32 ACH at 50 pascals; almost twice as low as the passive standard. This was just a huge win for us, and we have no doubt that the SIPs played a part in that.”

In addition to winning a SIPA 2016 Building Excellence Award, the RMI Innovation Center has also been recognized as the largest office building in the country to be PassiveHouse Certified and exceeds Architecture 2030 Challenge Goals. The Center is also classified as a PHIUS+ Source Net Zero Project, having earned all 19 LEED energy points.
There are few places on Earth more inhospitable to sustaining human life than the South Pole. In 2008, the National Science Foundation (NSF) established a new research station in the heart of Antarctica, naming it after the two explorers who first stepped onto the mile-thick mass of ice and snow; Roald Amundsen and Robert F. Scott.

With the capacity to house up to 100 people, the National Science Station is a marvel of building innovation, aerodynamically designed, and positioned above the ice to allow blowing snow the space to drift underneath. In addition, the entire station can be hydraulically elevated to help extend the building’s lifespan.

South Dakota-based SIPA member company Enercept worked alongside the contractor in the manufacture of the SIPs for the project; providing the design greater R-value (R-50+ for the walls and R-70+ for the roof panels) and superior strength when compared to standard framing methods. Enercept also worked with the builder in the construction of its Degree Angular Scale Interferometer (DASI Satellite) at the Pole. For both the station and DASI, the use of SIPs gave the project a material that was system built, generated less waste, and – most importantly – offered the builder a greater speed of construction.

“The building season is limited in this climate due to lack of sunlight and temperatures where you just are not able to work,” says Neal Mack, Senior Regional Sales Manager at Enercept. “Summer temperatures might reach zero degrees Fahrenheit and the building site is located at over 10,000 feet elevation. This made carpentry work nearly impossible even on a good day because you’re struggling to breathe in the thin air and are simply trying not to freeze to death.”

Understandably, there are many challenges to building in an environment this extreme and, prior to this project, no SIPs products had ever been tested against these kinds of harsh climate conditions. The largest challenge came in the design and fabrication of the materials for the chamfered upper and lower areas of the structures that were to allow air flow to continue past the structure and limit snow drifts from forming around the structure. Enercept also needed to collaborate closely with project stakeholders throughout the design and building process to help ensure success.

“Building materials do not have a ‘significant track record’ of use in these type of extreme exposures,” says Mack. “So, our SIPs were incorporated into the project through a combined effort of the client, builder, architects and engineers to ensure that the building met the needs of the client and would work given the extreme climate and the building location.”

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The Benefit of Membership
SIPA is making sure industry realizes that there is a better way to build!

The Structural Insulated Panel Association (SIPA) has a goal to significantly increase the SIP market beyond the current 18 million square feet in the next five years. We want you on board as our association leaders work to create a future where SIPs are the preferred building system. Learn more about SIPA’s mission at SIPS.org.

SIPA HAS ALREADY MADE HUGE STRIDES IN DOING THIS. A FEW OF OUR ACCOMPLISHMENTS TO DATE INCLUDE WINS IN THESE AREAS.

EDUCATION
✓ New residential and commercial AIA CEU courses. SIPA delivered 1,856 residential and 1,280 commercial CEU courses in 2016 via online and in person training.
✓ SIP educational sessions at the International Builders’ Shows (IBS) in Las Vegas and Orlando.
✓ Building Education with SIPS Training (BEST) loaded to YouTube. These 10 one-hour videos have been viewed over 8,950 times. Check them out by searching “Building Education with SIPS Training” on YouTube!

TECHNICAL
✓ Building a design calculator (to be released alongside the guide mentioned above), that will enable users to store and organize equations provided in the guide, allowing them to translate those numbers into ready-made, adjustable examples to easily be accessed and used.
✓ Working towards inclusion of SIPs in the 2024 International Building Code.

COMMUNICATIONS
✓ An internet campaign that delivered one million banner ads to pre-screened relevant builders/designers and stakeholders.
✓ A new mobile-friendly SIPS.org website that had 513,000 page views from 113,200 unique visitors in 2016.
✓ The launch of an interactive and easy to use directory and guide that enables the public and industry to easily locate our members across the United States.

NETWORKING / MARKETING
✓ Joined the Department on Energy’s Better Buildings Program and Race to Zero Competition as judges and sponsors. Five of the design projects used SIPs.
✓ Created national and local interest via the 2016 Building Excellence Award and subsequent case studies. SIPA will be presenting the 2017 awards at our 2018 Annual Meeting in February in Jacksonville, Florida.
✓ Represented SIPA at the White House Industry Summit on Sustainable Building.

Membership gives you access to all of this, and more. Open up this valuable network of industry contacts, colleagues and opportunities for your business; SIPA represents over 80 percent of the SIP industry volume!

HERE ARE JUST A FEW REASONS WHY BEING A SIPA MEMBER WILL BENEFIT YOUR ORGANIZATION.

✓ The SIPA website can be credited with brand exposure and bringing SIPA members thousands of leads from potential buyers and stakeholders that visit the SIPA website every year through its member directory and logo ads. Members even have the ability to screen leads based on their service area. Membership gets you a spot on the site.

✓ SIPA’s marketing plan includes the lofty goal of rapidly growing current market volume. How are we doing this? Our plan includes exhibiting at trade shows such as IBS and the modular building industry’s Off-Site Construction Expo, and promoting SIPs through the ENERGY STAR and the Zero Energy Ready program. We are also working with major industry stakeholders such as the National Association of Home Builders, the U.S. Green Building Council, APA – The Engineered Wood Association, and more. Membership gets your company a spot at the table.

✓ SIPA is heavily involved in technical research; the organization has sponsored numerous programs for testing and verifying the performance of

Continued on page 22
Advantage SIPA

panels as an industry, instead of individual companies. We are working towards inclusion in the IBC, an ASTM SIP standard is under development, and conversion of a recently finalized ISO standard for SIP roofing and walls, specific to North American ASTM/ANSI local standards, is underway. Membership ensures your voice is heard when these important guides and rules are being created.

Members of SIPA have access to a valuable resource that no one else has access to—networking with other members of the industry! The association provides a forum for interaction between members in different segments of the SIP industry, including the Annual Meeting and other regular industry events. Membership gives you easy access to seminars and workshops that make learning from industry experts easy.

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