Construction begins on a mini "hot box" structure for a 6th Grade Science & Learning Fair project.

Construction Industry Labor Shortages: Teach Your Children Well

PASSING DOWN KNOWLEDGE OF CONSTRUCTION PRACTICES FROM GENERATION TO GENERATION IS A STRONG WAY TO BOND FAMILIES TO THE TRADES. By Jason Wigboldy

My favorite show on television is Dirty Jobs with Mike Rowe. This guy isn't afraid to get his hands dirty. He appreciates those hard-working individuals who work the necessary jobs in our society that, if left unfilled, would bring this country to its knees. Those "dirty" jobs often provide comfortable wages and satisfaction from a job well done. Yet, it is still a challenge to fill those unwanted jobs. I'm reminded of a quote from Ann Landers: "Opportunities are usually disguised as hard work, so most people don't recognize them."

The construction industry—including our walls and ceilings sector—is seeing an alarming shortage of qualified skilled labor. Current labor shortages in our industry are a result of many different and complicated factors, but Mike Rowe himself identifies the core problem saying, "The flaw in our character is our insistence on separating blue-collar jobs from white-collar jobs, and encouraging one form of education over another."

Simply put, young adults entering the workforce have been programed by society to value a white-collar cubicle job higher than a blue-collar skilled craftsman job. Here is an example.

Apple's Core

The new Apple Park campus in Cupertino, Calif., is a temple to technology and higher education. But isn't it ironic that even with all the technology in the world, with all their college educated employees, that campus would not have been possible without the thousands of hard working and highly skilled tradesmen and women who worked tirelessly to complete it.

A recent Tradesmen International blog stated correctly: "The problem is that when the recession hit, many skilled workers who were unable to find jobs dropped out of the industry, and have never returned. Compounding this problem, a whole generation of younger workers are no longer even considering construction as a viable career option. Many high schools have phased out shop classes, and parents increasingly have steered graduates to four-year colleges and white-collar careers. Now, as older workers are retiring, there simply isn't anyone ready to take their spots."

Parents have an enormous responsibility to raise their children well. What we instill in our children will be the foundation upon which they build their future. I am not advocating for children to be present on construction jobsites—far too dangerous. I am advocating for parents within our industry to encourage their children to consider a rewarding career in the construction industry before they enter the workforce or head off to college. This can begin at a young age. I'd like to share two specific examples of how I have engaged with my own children and have, hopefully, sparked an interest in them to consider a career in the construction industry.

"Junior Marketing Intern" Caelen Wigboldy handing out his Rodenhouse Thermal-Grip Frisbees at the AWCI Intex Expo.

Getting Involved

My career involves the development and marketing of fasteners for the exterior building envelope, specifically to attach continuous insulation, lath for stucco, building wrap attachment, etc. I am privileged to attend and exhibit at several industry trade shows each year, and I am always on the hunt to nab a souvenir trinket for my children from the many trade show booths. After returning from a tradeshow in early 2017 my 9-year-old son said, "Dad, I know what you need to hand out in your booth. You know the little black washers you sell for attaching rigid insulation? They look like Frisbees. You should order some black Frisbees that have your company logo and hand them out to customers." Brilliant idea.

Steel stud construction for the mini "hot box".

Cutting fiberglass insulation to fit between the wood and steel studs of the mini "hot box".

Teach Your Children Well

Attaching continuous insulation to wood and steel studs using thermally efficient Thermal-Grip washers and screws.

Cutting the roof panels to cap the mini "hot box". Almost ready for testing.

We designed and ordered a few hundred Frisbees, and luckily the INTEX Expo convention was right around the corner and happened to coincide with my children's spring break. My son jumped at the opportunity to join me in the booth to hand out his Frisbees. I was so proud of our newest Junior Marketing Intern and he has been interested in fasteners and our construction industry ever since that trade show.

Another example: This spring, my sixth-grade daughter was required to prepare a project for the school Science & Learning Fair. She asked me for ideas, and to my surprise, when I mentioned that she should research something about construction she gladly accepted the challenge.

She decided to focus on applications that I deal with in my career, and specifically chose to research the effects of energy loss through thermal-bridging of steel studs, and how we as a nation can reduce energy consumption through the use of continuous insulation. I won't lie and say that I didn't coach her along the way, but I was thoroughly impressed with her desire to learn about a subject that most sixth graders would find boring. I think she was competing with her Junior Marketing Intern brother. With my oversight she built a miniature "hot box" building for thermal-bridging tests and wrote a report on her studies. The following report, written by a sixth grader, offers a simple and relevant summary of the importance of continuous insulation within our building envelope industry:

Insulation

Energy consumption and how to make buildings more energy efficient.

When I get ready for school on a cold Michigan winter's morning, the last thing I do before leaving home is put on a warm winter coat. This protective outside layer keeps my body heat in and the cold out. Without a winter coat I would not stay warm enough on the playground to function properly. In the same way, at night time I cover my bed with warm blankets to keep the heat in and the cold out. These are all examples of the importance of insulation. My dad's business serves the insulation industry and knows a lot about different types and methods of insulation. I wanted to learn more about it as insulation plays an important role in our everyday lives.

According to the U.S. Energy Information Administration (www.eia.gov)

Getting children interested in the construction industry through 6th Grade Science & Learning Fair.

A small heater is placed inside the mini "hot box" structure. FLIR infrared thermal-imaging camera clearly shows the temperature gradient and thermal-bridging of the steel studs, compared to the lower section of the wall covered with continuous insulation.

a significant amount of energy in the country is consumed by heating and cooling our homes and buildings. In fact, around 40 percent of the country's total energy was consumed on heating and cooling residential and commercial buildings in 2016. That is lot of energy just to keep us feeling comfortable. We can reduce this energy consumption and waste by using higher R-value rated insulation materials as well as better insulating techniques. R-value is a measure of resistance to heat flow through a given thickness of material. The higher the R-value the greater the resistance against heat transfer.

Some of the most common sources of energy to heat or cool our buildings are produced by fossil fuels, such as coal, oil and gas, as well as nuclear energy. All of these are bad for the environment. Coal, oil, and gas are all non-renewable resources, meaning we cannot make more of it and, eventually, it will run out. Fossil fuels are also bad because they create carbon emissions which pollute our air, contaminate our waters, and can destroy beautiful nature. Nuclear energy, though initially clean if managed properly, produces long-lasting nuclear waste and also has the potential to create hazardous nuclear contamination or a disaster like the world has seen at Chernobyl or Fukushima in Japan.

We as a country can reduce our addiction to dirty energy by better insulating our homes and buildings. From the attic to the basement, insulation protects your house like a coat keeps you warm in the winter, and like a Koozie around your cold-drink, keeps buildings cool in the summer. Insulation reduces the exchange of heat from one area to another. The outer shell or envelope of your home or building is the barrier that prevents the temperatures of both the inside and outside air from equalizing. Therefore, the better we insulate our buildings the less energy our heating and cooling systems have to consume to keep occupants comfortable.

There are many great types of commonly used insulation materials. They include fiberglass batts, mineral wool, denim, spray foam, and extruded foam plastics including polyisocyanurate, extruded polystyrene, and expanded polystyrene. Because of its inexpensive cost, fiberglass batt insulation installed between studs has traditionally been the most popular choice for insulating our buildings for many decades. However, fiberglass batts alone are not the best method of reducing the transfer of energy.

A THERMAL BRIDGE IS AN AREA OR COMPONENT OF AN OBJECT WHICH HAS HIGHER THERMAL CONDUCTIVITY THAN THE SURROUNDING MATERIALS.

Starting around 2010, the U.S. Department of Energy began to adopt and implement stricter policies and energy codes that focused on how we insulate the exterior building envelope. That agency's research found that a significant amount of energy was being lost due to thermal-bridging of the structural framing members and studs. This was due to the fact that the walls were only insulated in between the studs, and not in a continuous layer over the studs.

A thermal bridge is an area or component of an object which has higher ther-

mal conductivity than the surrounding materials. Thermal bridges result in heat transfer into or out of conditioned space. Thermal bridges in buildings may impact the amount of energy required to heat and cool a space. There are strategies to reduce or prevent thermal bridging, such as limiting the amount of building members that span from unconditioned to conditioned space and applying continuous insulation materials to create thermal breaks.

Our industry needs to support and encourage the younger generation to see value in a hard day's work ...

Continuous insulation is defined by ASHRAE as, "insulation that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior, exterior, or is integral to any opaque surface of the building envelope."

When researching for this project, I myself was curious to see how great the importance of continuous insulation was on building envelope energy efficiency. I researched and tested this by building a miniature building with the help of my father.

The building has four walls, all of which are insulated differently. The first wall was built with wood studs, plywood sheathing, and fiberglass insulation placed between the wood studs. The second wall was built with wood studs, plywood sheathing, fiberglass insulation between the studs, and a layer of continuous insulation installed over the plywood sheathing. The wood stud wall specimens represent typical residential home construction. I also wanted to research and test typical commercial construction methods. The third wall was built with steel studs, exterior gypsum sheathing, and fiberglass insulation placed between the steel studs. The fourth and final wall was built with steel studs, exterior gypsum sheathing, fiberglass insulation between the studs, and a layer of continuous insulation was installed over the exterior gypsum sheathing.

I then placed a small electric heater in the miniature test "building" and waited for the inside to be warmer than the outside of the "building" simulating winter. I then observed the energy efficiency of each insulating method by testing for thermal bridging with an infrared heat sensing gun. The thermal-imaging gun shows surface temperatures in different colors on the screen. Darker areas on the screen are cool surface temperatures, and warm or hot areas show up on the screen in bright red, yellow, or white colors.

During the test, the ambient room temperature around me was 62 degrees Fahrenheit. After placing a small electric heater in the "building," I let the room inside heat up for approximately one hour. I then took the heat sensing gun and determined the different surface temperatures of the various layers of the building envelope. I found that the outside surface temperature of the steel studs had warmed up to 89.3 degrees, which indicated a significant thermal bridge through the fiberglass insulation. The gypsum sheathing over the steel studs warmed to 74 degrees and the outside surface of the continuous insulation was still only 63 degrees, or just 1 degree warmer than the outside ambient air temperature. When I tested the wood framed walls, the wood studs were 63 degrees and the plywood sheathing over the wood studs was also 63 degrees. The outside surface of the continuous insulation, was still 62 degrees. You can easily tell that the wood studs transferred far less heat than the steel studs. It was also very apparent that continuous insulation significantly reduced thermal-bridging and heat transfer, especially on steel stud framed buildings.

I used to think that insulation somehow created heat. I now know that is wrong. Insulation does not create heat. It does however, keep heat in and cold out in the winter, or cold in and warm out in the hot summer. Continuous insulation is a cost effective method to make our buildings more energy efficient.

In conclusion, the best way to reduce the energy consumption of our homes and buildings is to use not only the best insulation material, but also the best insulating method. The use of continuous insulation greatly reduces the transfer of heat and energy by virtually eliminating thermal bridging. Insulation plays an important role in our everyday lives and keeps us comfortable during all seasons of the year.
– Madeline Wigboldy, Sixth Grader

The Rewards of Construction

Construction is rewarding work, whether you are an architect designing the building, a building material manufacturer or distributor, or on the jobsite pouring your blood, sweat and tears into the project. Even children can appreciate construction at a young age, and I hope that I have created a spark of interest in my own children to consider a future rewarding career in the industry.

Our industry needs to support and encourage the younger generation to see value in a hard day's work, in using their hands to earn a living, to perfect a skilled craft. Modern day society absolutely needs doctors, attorneys, and computer engineers, but we also need hard working skilled laborers to construct our hospitals and corporate campuses. Parents have the primary responsibility to raise children who recognize the value of honest work. A closing quote from American businessman Joseph B. Wirthlin: "Teach your young children to work, and teach them that honest labor develops dignity and self-respect. Help them to find pleasure in work and to feel the satisfaction that comes from a job well done." W&C

— Jason Wigboldy —

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