



# THE BUILD SMART DIFFERENCE



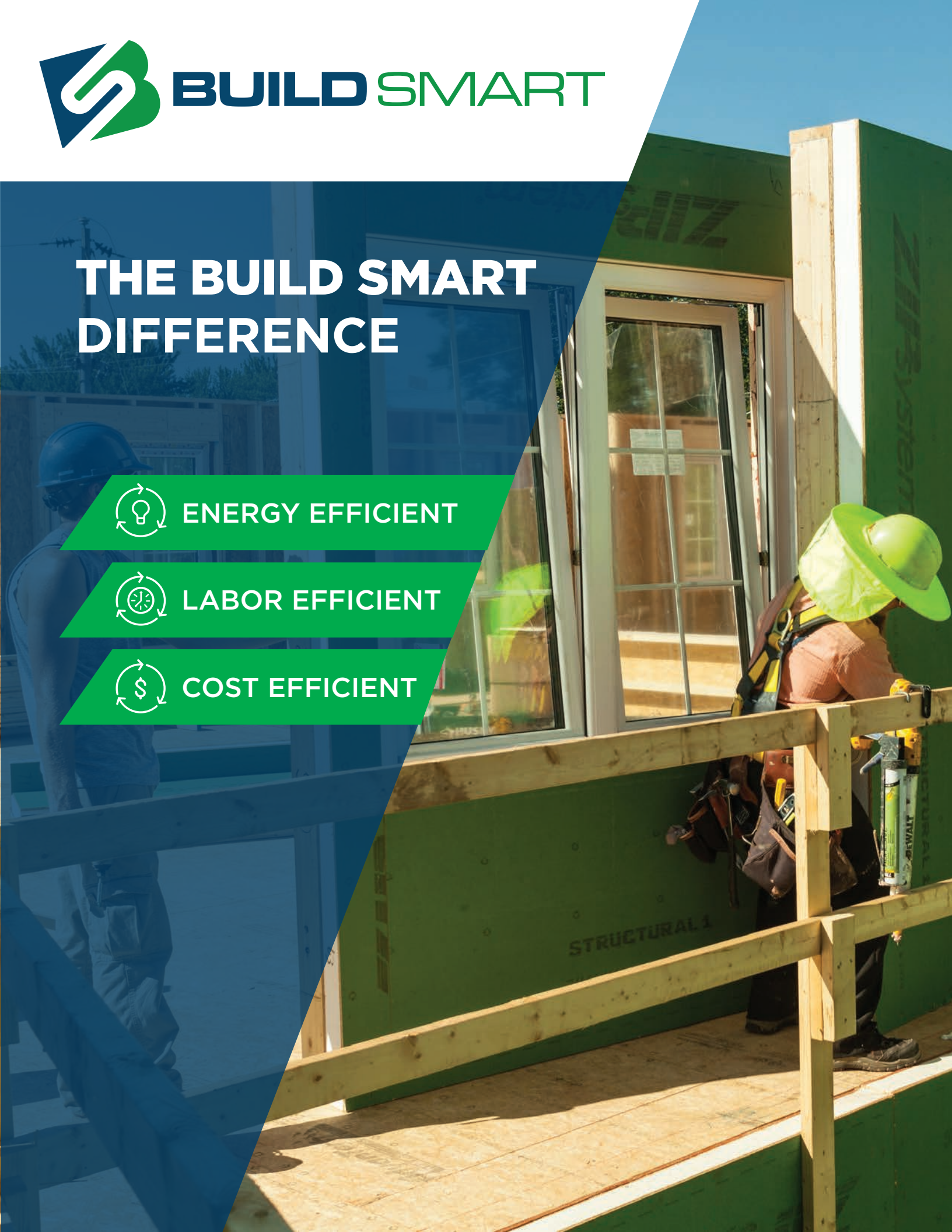
ENERGY EFFICIENT



LABOR EFFICIENT



COST EFFICIENT









# The Build SMART Value Proposition

Standing in the middle of a job site, I gather my tool bag for the task ahead. Looking around, the multi-family development of cottages and townhomes is the perfect snapshot of a residential building site. Several structures are in different stages of completion; the project is behind schedule.

A flapping noise to my right gets my attention. I turn and see a piece of house wrap fluttering in the cold winter wind. A large section is detached leaving the OSB sheathing exposed. Closer inspection reveals that the weather-resistive air barrier is slap-stapled to the face of the sheathing. This piece lifted at the corner and a high plains gale did the rest. The house wrap was just a couple of staples shy of being ripped off completely.



The rest of the jobsite is in various stages of disorder. The 4-plex I came to inspect is surrounded by piles of scrap. Dimensional lumber is scattered haphazardly, various building components, expensive windows and doors are stacked in the mud.

The cottages downhill are also in different stages of construction. The final building's exterior walls are framed and braced, waiting for crews to return to complete the job. A storm is coming.

I enter the building I'd been hired to inspect and am greeted by more construction debris.

As I begin my inspection of the building envelope – the portion that incorporates any buildings' most important, energy-saving features - my shoulders slump. I'm confronted with insulation batts cut too large for the cavities, visible gaps and zero evidence of any effort at air sealing.

**“THERE HAS  
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This energy inspection had been postponed twice! For this? There has to be a better way to build.

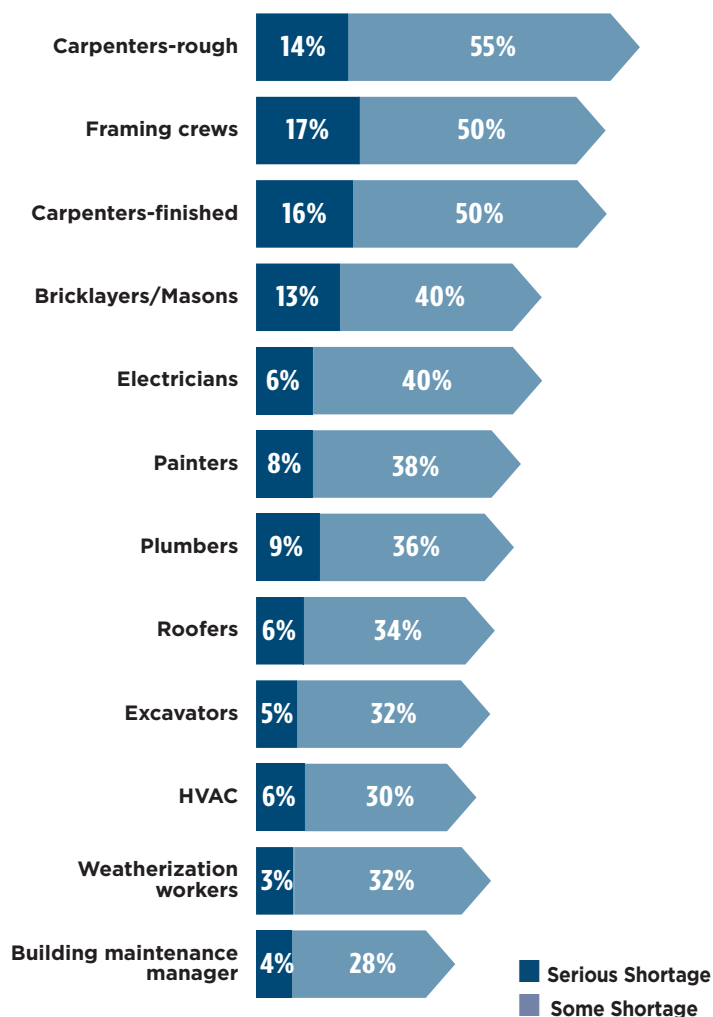
Today, multi-family housing accounts for 21% percent of new housing starts in the US. Though multi-family permits slowed in 2016, demand is increasing as Millennials prefer renting to home ownership, and Baby Boomers downsize. Couple this with a growing shortage of skilled construction labor, and today's home building market is in the middle of the perfect storm. Many have told me, point blank, that the “coming” construction labor shortage is “already here.”

For fun, I Googled “Labor shortage in construction” and was rewarded with 3.9 million links. A quick read through the first few pages shows an industry in the midst of a forced transition. An industry that is very worried.

As the labor pool fails to supply enough hands to swing hammers, enough trades to complete the still-growing demand for housing, it's worth exploring non-traditional building options. And it's essential that those options be considered in the context of current material and labor costs.

In the United States, traditional, low rise, "stick-built" construction means buildings that are framed on-site, using a team of carpenters to build to specifications. With this process, what happens daily on the job site is largely out of the general contractor's control. As housing continues its robust recovery from the collapse a decade ago, supply and demand for workers that make up the labor pool has shifted power away from the GC/Builder to the sub-contractor. Or as one superintendent commented as he and I waited for an insulation sub-contractor to show up one day, "We have a saying around here – a.m. means "after morning."

But what if builders could flip this relationship with their subcontractors by introducing new technology? What if builders could change the odds; reduce the weeks or months needed for traditional site-built construction to days with fewer workers?



Source: NAHB

***Build SMART's modular wall panels address the labor shortage, weather delays and compromised construction scheduling head-on.***

Improved building methods are slowly being introduced as alternatives to traditional onsite framing. One of these is a Kansas company's manufactured building envelope system, called Build SMART. It assembles exterior wall systems in a dedicated factory and ships them to the jobsite. Modular, structural panels, ready to be lifted into place with continuous external insulation, and exceptionally high-performing windows and doors already installed and air sealed.

The product may tempt those in the field to draw comparisons to Structural Insulated Panels (or SIPs) and more conventional panelized construction - both methods that have been around for years and are gaining market share. But both come with their own issues.

SIPs are often installed by contractors that lack sufficient training, or altered by subsequent trades that compromise the integrity of the thermal envelope while installing mechanical, electrical and plumbing runs. And as for final, effective air sealing? It's rarely done in the region that I operate in.

More conventional panelized construction addresses the onsite carpenter shortage, but does little to address the growing demand for improved quality and energy savings. Something the SIPs manufacturers originally set out to do.

Build SMART's modular wall panels address the labor shortage, weather delays and compromised construction scheduling head-on with a building envelope system that is quickly erected on site with limited crews. Six trips or more around a traditional site-built structure are combined into one. Build SMART professionals train field crews in the how and why of proper installation and air sealing techniques, further ensuring that the promise of high performance is delivered in the final product.

***In a fraction of the time needed for traditional stick built construction, the perimeter Build SMART envelope is erected, dried-in and ready to clad.***

The panel design protects the integrity of the building's weather resistive, thermal and air barrier envelope while providing open interior stud bays for open access by mechanical, electrical and plumbing subcontractors. This reduces a traditional builder's risk while delivering a higher quality, energy saving building in less time. The benefits of Build SMART are most obvious in the highly competitive multi-family building markets. The average time to construct a 3 – 4 story multi-family building is 12.5 months<sup>1</sup>. (Time varies greatly between project scope and size.) Most experts allow two to three months to reach dry-in stage for traditional stick-built structures.

These time frames can be substantially shortened by using panelized construction. As Kansas City's construction professional Ian Leftwich says "For your average 12' building section, I can frame that in 30 minutes traditionally; or with pre-assembled panels – 6 minutes." But even that comparison doesn't reflect further savings related to additional components included with Build SMART.

When asked to compare conventional site-built construction costs to a Build SMART envelope, Rob Leonard Jr., the Field Technical Manager

at Build SMART, often uses a spreadsheet to help builders understand the true cost comparisons.

"We're finding that the gains from shortening the production schedule more than makes up for the added cost per square foot for Build SMART products.

"Once you start looking at true costs needed to replicate the energy saving improvements that are part of the Build SMART system – using multiple trades and conventional site-built practices – the Build SMART difference is obvious. The traditional builds that I used "to do for a living took far, far longer," Leonard said.

"Additionally when looking at the big picture on the labor pool, we were pleased when a developer on a recent project arrived on site, day 1 with the nine carpenters he felt he'd need to assemble our envelope system. By the end of that day, he realized he could have done the same work with just three."

Leonard's comments point to the broader issue that was alluded to earlier: how do different construction methods compare when it comes to quality?

In all this discussion of time frame and labor shortage, the question of finished building quality can get lost. Consistent quality control on a jobsite can be challenging. And the focus on quality often varies across jurisdictions, trades, and work crews. Not so with Build SMART.

<b>Build SMART Building Envelope System VS. Completed Construction Costs</b>				
<b>Exterior Building Envelope Description</b>	<b>Insulated Exterior Walls with Windows and Doors</b>	<b>Total Project Cost — Ground Break to Completion</b>	<b>% Cost Difference vs. Build SMART</b>	<b>Total Cost Per Square Foot</b>
Field constructed per 2012 IECC - stick frame/Tyvek WRB Air Barrier/ R-20 insulation	<b>\$440,284</b>	<b>\$7,889,341</b>	<b>-2.3%</b>	<b>\$149.47</b>
Build SMART 2x6 Wall/3.5" Continuous Exterior Insulation / Zip Wall with integral WRB / Factory-Installed Passive House Institute Certified windows / Air sealing / R 19 cavity bay batt insulation	<b>\$626,436</b>	<b>\$8,075,493</b>	<b>0</b>	<b>\$153.00</b>
Field constructed Passive House 2x6 wood frame / 3.5" EPS Nailbase / PH windows, R20 insulation	<b>\$823,624</b>	<b>\$8,272,681</b>	<b>+2.4%</b>	<b>-\$156.74</b>

***"We're finding that the gains from shortening the production schedule more than makes up for the added cost per square foot for Build SMART products."***





According to David Boyer, CEO and President of Build SMART, “... ***the design and execution of this system makes it easily adaptable to almost any floorplan and any climate zone in North America.***

And the quality that's built in focuses on details that take more time and are often the source of failure in a traditional site-built envelope.

“Some of that quality is imparted by replacing builder grade sticks, OSB, house-wrap, windows and doors with better materials. By maintaining high quality standards, keeping our materials and processes dry, and focusing on a seamless process in the factory, we check several quality control concerns off the list.” Boyer continued.

#### **Included in the list of building material quality upgrades that Build SMART incorporates are:**

- ◆ Engineered finger jointed lumber.
- ◆ High Quality OSB.
- ◆ Fluid-applied detailing and air sealing products that stand up to the toughest weather.
- ◆ Continuously adhered external insulation with no thermal bridge.
- ◆ Zip Sheathing with integrated weather resistive barrier.
- ◆ Passive House certified windows.
- ◆ Passive House certified doors.

***“We’re delivering a higher standard of quality at a price that’s competitive with – sometimes less than – site-built.***

In addition, we’re reducing the time, exposure and labor required to deliver a well-designed, energy saving building envelope.” Boyer stated.

The higher performing windows and doors, pre-installed in the factory appear to a big deal, especially when builders consider the real costs and liability associated with onsite installation. When I stressed this feature in a recent conversation, the general contractor I was speaking with acted like he just found free money lying on the sidewalk.

This can be felt in both the short and long term for builders trying to compete in the new-normal of high demand home building during a skilled labor shortage.

On a single project, Build SMART enables builders to deliver a higher quality, better performing building in less time than traditional site-built construction. On multiple projects, Build SMART reduces risk while delivering a greater number of more profitable projects with no increase to your company’s fixed overhead.

“With Build Smart I saved time, money, and call backs,” says architect Tim McDonald. McDonald just topped out his second multi-family project using Build SMART panels in Philadelphia.

In a career focused on all building types and materials, today McDonald wears several hats including architect, Certified Passive House Consultant and builder/developer. His passion is designing and delivering affordable, energy-efficient multi-family structures.

Regardless of which energy efficient design principles an architect may be shooting for, McDonald points out that the most important characteristic of the building envelope is air tightness. A tight house enhances the comfort and health of building occupants, while reducing their ongoing cost of living.

***“WITH BUILD SMART I SAVED TIME, MONEY, AND CALL BACKS.”***

For long term property owners, however, the reliable savings in monthly heating and cooling costs can be overshadowed by the reduction in annual maintenance, repair or replacement costs arising from damages caused by moisture that condenses and accumulates within wall assemblies that are not air-tight.

In light of the loose house wrap seen on so many jobsites in my region, this is welcome news.

McDonald's mention of limiting callbacks reminds me of the home building industry I work in. Many large builders have teams of personnel devoted solely to managing call-backs. As someone often hired to accompany those teams armed with a blower door and infrared camera, I can assure you, the reason for that pipe freezing; or the draft in the baby's room was usually poor air sealing.

### Other things to keep in mind include:

- ◆ U.S. consumers generate 251 million tons of solid waste each year. 40 percent of that waste comes from construction projects. Those piles of cut lumber that get hauled away, buried on the jobsite or consumed in your neighbor's bonfire? Much smaller.
- ◆ Additional waste caused by weather related damage or theft can be mitigated.
- ◆ Fluctuating lumber rates. Build SMART negotiates competitive pricing on all components used in the wall systems.
- ◆ Safety hazards. Those multi-story window installs that are a superintendent's OSHA nightmare? Nothing to worry about with Build SMART. The windows are pre-installed. So are the doors.
- ◆ As far as the perimeter building envelope is concerned, design time, energy modeling, material vetting, material sourcing, material lead times all done.



So the fact that “there simply is not enough skilled labor to build what is being sold in many markets” according to George Casey<sup>2</sup> shouldn't matter as builders look to technology like Build SMART. The value of this approach appears evident as tradition meets reality.

Indeed I am reminded of other industries that failed to address technology changes at their own peril. When I hear responses like “we've always done it this way...” I point out that stubborn resistance to change usually leads to extinction. Ask Blockbuster.

It seems clear: residential construction will have to accommodate the ongoing surge in demand by making this change in the way they do things, especially in light of the labor crunch. Those that feel such new technologies and performance expectations are a passing trend, may be in for a rude awakening. Recent cost evaluations prove that the future of expedited quality may be the only viable path to delivering high performing construction in the “new normal” that we face today.

The future of expedited quality made easy is finally here.

***Change is the law of life and those who look only to the past or present are certain to miss the future – John F. Kennedy***

#### Footnotes:

<sup>1</sup> - <http://eyeonhousing.org/2013/11/how-long-does-it-take-to-build-multifamily-housing/>

<sup>2</sup> - [http://www.builderonline.com/builder-100/strategy/home-buildings-elephant-in-the-room\\_o](http://www.builderonline.com/builder-100/strategy/home-buildings-elephant-in-the-room_o)

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