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WORDSMITH

Below is the text of a few of the articles and columns I wrote for BuilderNews Magazine. Unfortunately, the complete articles are no longer available at their website, so I cannot post links.

Product Technical Focus (PTF) Columns: short columns that focus on technical aspects of new products and building practices.

PTF: Deck Fasteners

Nothing ruins a sunny summer day for a barefoot homeowner like a nasty gouge from a protruding deck fastener or loose plank. And nothing ruins a contractor's day like a call-back from a customer whose deck is sprouting screws and big black stains like mushrooms in a Washington rain forest. The key to keeping the day happy for everyone? Using the right fastener for the right lumber. A little over a year ago there were big changes in the treated lumber industry, changes which had major ramifications for the fasteners used to work with that lumber. Specifically, responding to EPA and public concerns about arsenic, in January 2004, manufacturers stopped making CCA (copper chromated arsenic) pressure-treated wood products. Since then, builders have become familiar with new, arsenic-free treatments such ACQ (ammoniacal copper quat), SBX (borate oxide) and CA (copper azole). As Albert Mickadeit of Swan Secure points out, these new treatments use "four to six times more copper" to make the wood "biostatic" (incapable of sustaining biological growth).

The now well-known problem is that lumber made with these new, arsenic-free treatments is far more corrosive than its CCA predecessors. We'll spare you a visit back to high-school chemistry class; suffice to say that the new, copper rich formulas create far more galvanic corrosion. To deal with this, builders must use specially designed fasteners. Fortunately, enough time has passed that manufacturers and regulatory agencies have been able to perform tests and develop guidelines for usage along with new lines of fasteners and new types of coating and galvanizing.

In general these fasteners are either made from stainless steel or specially formulated hot-dipped galvanized steel or coatings. Typically, the newer coatings are multi-layer or thicker than previous types. Although by and large building codes are still being re-written, manufacturers have had enough time to conduct tests on fasteners in a variety of environmental conditions. At this time, most manufacturers and agencies are recommending fasteners that meet the ASTM Standard A153 (for connectors, the applicable standard is A653/Class G-185). The result of all this research has been the development of a number of products with greater corrosion resistance and holding power. For example, Simpson (maker of the popular StrongTie line of connectors) has developed several lines of fasteners (e.g. ZMAX) in both galvanized and stainless. They offer a handy on-line chart (http://www.strongtie.com/productuse/selection-guide.html) to help you select the right combination of lumber and fastener product. Similarly, USP now offers their most popular fasteners and connectors in a "Triple Zinc" galvanized version that is suitable for use with most of the new lumber treatments. Swan Secure has expanded the selection of their "Swaneze" screws in 316 stainless for the most demanding outdoor applications.

Some industry experts speculate that the new treated lumbers will have a shorter lifespan than CCA due to the increasing popularity of composites and shrinking

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wood supplies. Whatever the future brings, there's no doubt that the materials used for outdoor building are in a period of transition, but fastener companies have been able to expand their product lines to include a much larger array of choices suitable for use with the new treatments. And that helps to make everybody's day a sunny one.

PTF: Pre-manufactured Garage Doors

Well, the bad news is that top-secret, bat-cave grade technology is not yet available to non-super-heroes. The good news is, it's getting closer. Today's garage doors can be as invisible or as spectacular as you like. And while you may not yet be able to swoosh your jet car into the bay at full throttle, new materials make doors lighter, safer and easier to operate than ever. At the same time, manufacturers are using these materials in new, innovative ways to create unique and visually arresting doors. Buyers are paying more attention to the aesthetics of garage doors and the way they can build curb appeal, so this year manufacturers are offering more design choices than ever.

For example, Clopay's new line of doors, Avante, use glass and aluminum to create doors that look more like Japanese screens than garage doors. Available with clear, frosted, tinted or mirrored glass, people inside can see out while passersby outside can't necessarily see in. At night, lights in the garage can make the doors glow like paper lanterns. In the desert southwest, where there's often a view from every room, these doors seem particularly appropriate and appealing. At the same time, the aluminum frame yields an almost maintenance free door that will stand up to the elements.

For those who prefer a more traditional look, Southern California's Anaheim Door Company (www.anaheimdoor.com) has gone back to the old world and now offers real leaded-glass windows as an option on two lines of their composite garage doors. The windows are made with real etched and beveled glass with true brass filleting. As Anaheim says, "there's no substitute for the real thing." Amen to that.

On the other hand, sometimes something that only looks like the real thing can actually be superior. Following up a very successful product launch in 2004, Warner Industries has expanded its award winning line of Transformadoor products. Described as the " ultimate face-lift" for garage doors, Transformadoor consists of 1/8th inch thick composite panels that look and feel like aged wood. Other than adding curb appeal, however, Transformadoor panels are virtually maintenance free and also provide increased insulation and longevity.

Continuing in the "old look, new material" vein, Jeld-Wen has added a new line of Old World styled doors, the "Estate Collection." According to Darcie Meihoff of Jeld-Wen, the popularity of carriage style doors has continued unabated. The Estate series expands the line of Jeld-Wens metal doors that look like swing-type doors but work just like an ordinary lift type garage door. Featuring Old World and Mediterranean hardware options like clavos, straps and knockers, that used to only be available on wooden doors, the Estate Collection lets homeowners enjoy the look of wood without the weight, cost or maintenance headaches.

Like so much in the building trade, garage doors have taken on at least a green tint. Anaheim Door has an innovative program to recycle virtually everything associated with garage door replacement: old steel or wood doors, hardware, cardboard packaging, almost everything is kept out of the landfill. Surprisingly, however, no manufacturers are yet claiming to use environmentally friendly materials or manufacturing techniques.

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Feature Article: THE VALUE OF VALUE ENGINEERING

OVERVIEW: Knowing what you don't know

"Value Engineering", (aka, "Value Management", "Value Methodology" or "Value Analysis"), isn't a new concept. Contractors, engineers and architects are all familiar with the terms and, if asked, will readily volunteer definitions. Problem is, you'll get a different definition depending on who you talk to and what their experience has been. So let's start by trying to untangle the mess a little. Outside the circle of Value Engineering (VE) professionals, most people see VE largely as a way of saving money on a building design. For example, at the behest of sticker-shocked buyers, many contractors will substitute cheaper materials or systems than those the architects originally spec'ed and call that a "value engineering" change. Contractors can see this as cutting the "fluff" that pie-in-the-sky architects use to dress up their designs. Doing this kind of "VE" makes the contractor happy by increasing his profit margin and speeding his turnover and makes the homeowner happy by making the house more affordable. The problem is, if the changes aren't done carefully they can negatively effect the building either in terms of increased maintenance and operational costs or reduced comfort and functionality. For this reason, engineers, architects and designers can have a negative view of VE. They see it as a way for greedy contractors to boost their profits at the expense of their designs and, ultimately, reputations.

If you talk to VE professionals, however, you get a very different picture of what it is and what it does. According to SAVE International, the major professional organization for value engineering, "The value methodology (also called value engineering, value analysis or value management) is a powerful problem-solving tool that can reduce costs while maintaining or improving performance and quality requirements. It is a function-oriented, systematic team approach to providing value in a product or service." In plain English, that means that VE, done correctly, is a consensual approach that uses input from all the members of a construction project—architects, builders and owners – to analyze the project and find ways to not only build it cheaper, but build it better. Better how? VE uses Functional Analysis to look at a number of factors beyond initial cost. A Functional Analysis looks at how people use the designed spaces in order to develop a design that is more comfortable, more efficient, easier to maintain and, yes, cheaper to build and to own. Because correctly done VE looks at costs beyond initial materials and construction, it can sometimes suggest design changes that are initially more expensive, but will save money over the life of the building.

This is one of the reasons that VE has seen slow adoption in the residential market as compared to commercial or government construction. According to Sean McGinnis of Milstead & Associates, a Portland, Ore. construction management firm, VE is harder to do for residential construction for several reasons:

- Existing building codes can be a roadblock. You have to re-educate city and county building officials in your area to use the new methods, designs and materials that a VE analysis can recommend.
- Another problem, especially for smaller builders, is that the costs of changing methods and materials can be prohibitive. McGiniss gives the example of using SIPS, which can be very time and energy efficient. Crews and subs from framing to electrical have to be re-trained and expensive new equipment, like cranes, has to be purchased and manned.
- There's also the "hassle factor", as McGiniss puts it. Developers have to find new suppliers, find new fasteners to match new materials, learn new terms and generally re-tool big chunks of how they do business. For many builders, changing how they do "business as usual" is just too daunting.
- Finally, McGiniss points out, there's the simple fact that residential construction has been so thoroughly analyzed and picked apart that there just aren't that many opportunities for substantial, worthwhile, VE generated changes.

All of that can be too daunting for the busy contractor, which is one reason why VE hasn't penetrated very far into the residential market, according to McGiniss.

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Another big reason McGiniss doesn't mention is cost. Although many people see VE as a way of reducing a building's price tag, when it is properly done using Functional Analysis, VE can result in a design that costs the same but works better, or even costs more but works so much better and more efficiently that the costs will be re-couped by reduced maintenance and other cost-of-ownership factors. In other words, it's possible that not only will the developer have to pay for the VE analysis, he may end of with recommendations that don't make the project any cheaper.

Despite all that, McGiniss points to several ways in which residential construction design could benefit from VE. For example, HVAC and plumbing systems could benefit from technologies like hydronic heating and on-demand hot water heaters, both of which are more efficient and can result in functional improvements (faster, quieter, cleaner, dust-less, higher capacity, etc.) that create a home that is cheaper to own and maintain and more comfortable to live in. From a more purely cost effective point of view, careful engineering and site analysis can result in slab/basement designs that use less concrete and so are cheaper and faster to build.

CASE STUDY: Stick Framing

Perhaps the best way to understand what VE can do for a project is to take a look at it in action. So let's examine VE as it is applied to something every contractor knows about: stick framing. Get ready to happy about something your tax dollars did. Value Engineering studies by the US Dept. of Energy's Office of Energy Efficiency and Renewable Energy (EERE) have identified a number of ways that standard framing methods can be modified to not only save money on materials but also provide other benefits while retaining, or even increasing, structural integrity.

First, let's cut right to the heart of the matter: the money. According to one study cited by the EERE, using Optimum Value Engineering (OVE, the government has to have a their own word for everything) allows material costs on a 1,200 square foot home to be reduced by as much as $500, or $1000 for homes twice as large. "Additionally, labor savings are estimated at around three to five percent" according to EERE studies.

Another advantage to "optimizing the amount of labor used to frame homes" is that open wall space is maximized, the EERE says. This gives more room for insulation and reduces condensation prone cold spots that can lead to mold (and the subsequent legal headaches builders have became all too familiar with).

How is it done? With a combination of different techniques and building methods. According to the EERE, builders are experimenting with the following:

• Framing corners using only two studs and inexpensive drywall clips

• Increasing floor joist and rafter spacing to 24 inches

• Eliminating headers in partition and other non-loadbearing walls

• Increasing stud spacing from 16 inches to 24 inches

• Using single top plates combined with in-line framing to transfer loads directly

Obviously, these new techniques take some getting used to and the consequences of doing them wrong can have structural implications. Contractors have to be very clear in explaining them to their crews or subs and in providing ample training and examples. For this reason, the EERE points out, most builders choose an incremental approach, adding one new technique at a time.

Putting Theory Into Practice

So we've heard from the experts, but how does VE really work out in the field? BuilderNews spoke with Mike Carver, a manager with Boise Building Solution's Build-Rite Process engineering service, who works directly with builders from the Pacific Northwest. A one time light construction worker and re-modeler,Mike has been working in the construction materials market for almost two decades before joining Boise in 2002.

The Build-Rite Program was developed for large regional and national builders who build multiple units from a single set of plans. According to Carver, after an inspection of a target home being built, the home-plan is modeled using custom software into a 3-D model. This model then allows Build-Rite engineers to do a full structural analysis of the plan as an entire unit, rather than single component by component,

truss by joist. This “system-based” design allows Boise’s value engineers to find ways to create framing packages that can reduce material costs and/or increase structural integrity. After the revised designs are discussed with the builder, detailed, materials lists are created that correspond precisely to the plans.

Overall, then, the program creates greater efficiency throughout the process by implementing standardization of cost-effective designs. You don’t have to be Henry Ford to know that standardization minimizes costs by reducing errors, training time and materials estimating.

In fact, according to Carver, the efficiencies realized through the standardization of value analysis, provides benefits to all involved in the process, from builder to supplier to homeowner, to the environment. Builders benefit because the consistency of the building, even with multiple framing crews, makes for easier management and tighter material control. “Now, if a framer needs 30 more studs for the first floor pack you can directly see why,” says Carver. Management headaches are also eased because the Build-Rite plans, consisting mostly of diagrams and numbers, are very easy for non-English speakers to understand, “easier than a blueprint”, Carver maintains. Suppliers benefit because the precise, standardized material lists mean fewer call-backs and re-deliveries. Because the system is so precise, framers need to carefully audit each delivery, and this reduces time and money wasting errors for both supplier and builder. Homeowners benefit because they get homes that are as structurally sound, or more so, Finally, the environment benefits because there is less lumber waste and fewer trucks making deliveries. This green angle can also make an excellent selling point for many Northwestern home-buyers, so there’s even something in it for Real Estate agents.

Things like the need to check deliveries against orders are one reason why some builders “push back” when they first begin to explore value engineering programs like Build-Rite, Carver points out. “Builders are a very traditional group,” Carver says, so value engineering is, “though it’s an over-used term, a ‘paradigm shift’ for builders.” When builders first see that building using the Build-Rite process will take some time to implement they can balk, but once they see that on average they are saving 8-12% on framing packages and their framing crews are saving two to three days per house, they usually tend to buy in to the program.

Conclusions

If you take only one thing away from this article, it should be the notion that VE is much, much more than just building a house more cheaply. Builders need to shed their negative stereotypes of VE and look at it as a holistic process. In fact, VE works best when it is done collaboratively, building consensus between all the stakeholders—builders, architects, engineers and buyers—and makes use of carefully applied Functional Analysis. It vital to use VE engineers or programs who are certified in the field or at least have had some special training. When it’s done in this way, VE can not only reduce costs but result in better, more efficient and functional designs where everybody is a winner.

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