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# Q&A with Architect A. David Gibson, AIA



## Question:

What does value engineering mean and how can it be incorporated without sacrificing design quality?

## Answer:

Value engineering is simply applying practical design by minimizing material waste and incorporating standardization of building components. As the past "in house" regional architect for Pulte Homes, I was asked to value engineer the plans I was designing, specifically for the first time buyer product. The cost frugality is actually a smart idea for any cost range of structures. Value is a very important goal for any home builder, be it production or custom. There are several ways of being value conscious without sacrificing design aesthetics.

The first task is to be aware of standard building material sizes and to accommodate the full size of that building component, so as to minimize waste. Whether it's sheathing (4' x 8'), drywall (4' x 8'), foundation form boards (two-foot increments), or framing lumber (two-foot increments), most materials have a common denominator of two feet. Every structure, whether it is residential or commercial, should be laid out on a two-foot grid during the schematic design process, so as to save on material and labor costs from the foundation all the way through to the roof. Foundation form boards, framing, trusses, sheathing and drywall can all be utilized more efficiently.

Both the span lengths and spacing of trusses are governed by two-foot increments. For example, a 22'-3" span of a roof truss would require 24-foot long bottom chords (wasting 1'-9" of board per truss), whereas if the room were reduced to 22 feet overall, or increased to 24 feet, there would be no wasted materials. Oftentimes, a room size or combination of rooms can be adjusted

either up or down in length to accommodate a two-foot increment. As for the spacing of the trusses, an area to be covered by trusses off the two-foot grid, even by an inch, would require one additional truss. Multiply that by every unit built in a subdivision, and you're talking serious wasted money.

A quick note on the savings issue: don't forget to point out the cost-savings with the subcontractor trades as to how the material waste may be reduced by approximately 10 percent. This savings should go into your pocket, not theirs. When I first started re-vamping the product for Pulte, I was able to create better details and improved elevations with the money saved through value engineering. However, the framing, drywall and concrete bids were actually higher than

before. The trades were used to giving bids on a cost per square foot basis, including a generous contingency for waste. After they were convinced that the waste would be minimized, the bids went down accordingly.

Try to minimize the variety of different truss lengths and configurations to avoid "jig" setup charges from the truss manufacturer. This is especially critical when building several houses within a subdivision. One project I worked on had 20 different floor plans, with four different width "series." They ranged from 40' - 60' in width. Initially, we were not concerned with the various truss lengths and had a total of more than 60 various truss lengths and types. The truss manufacturer suggested that we make

*Continued on Page 18*

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*Continued from 5*

some minor adjustments to the plans, which reduced the number of varying truss lengths by about 40. The result was a substantial cost-savings as related to the reduction of setup time for the truss jigs and simpler truss installation on-site.

Designing with the two-foot grid can tip you off to potential conflicts between framing, mechanical chases and plumbing lines. For instance, avoid placing a second-story toilet directly over a two-foot grid line due to a truss below. Be conscious of bearing points for trusses, and if possible, align them with bearing walls rather than costly girder trusses.

Minimize unnecessary building offsets that affect foundations, framing and roofing. Design consistent footprints for all elevation variations of the same plan, so as to standardize the foundations and alleviate confusion in the field.

Modular dimensioning of columns, framing members, soffits and pop-outs will save money and waste on sheathing and drywall if designed with the material panel size in mind. Design soffits and columns so that usage of four-foot-wide boards can be cut in half, thirds or fourths without waste.

Another cost-savings trick is to standardize building materials to include windows, doors, shelving, countertops, cabinets, appliances, etc. Obviously, the greater number of one item being ordered and shipped will yield greater savings. Don't get charged for shipping a nearly empty truck. Large builders that build thousands of homes across the country negotiate national contracts with manufacturers of building products and possess great bulk buying power.

Well-placed groupings of standardized windows will save money over multiple sized windows, and will give you a more organized, attractive house. Don't vary the size of the secondary bathrooms. Utilize the same cabinets, countertops and mirrors for greater savings and better value.

Careful orchestration of the massing elements will result in an aesthetically pleasing structure without the expense involved in unwanted clutter. Some of the most aesthetically pleasing elevation styles are those that express simplicity in form. Simplify the structure where possible, and you will be able to afford the fine details that the customer will truly value.

*A. David Gibson, AIA is president of Collaborative Group Architects, Inc. Mesa, AZ. They specialize in residential production housing and custom homes. He can be reached at (480) 330-7192. For more information, visit their Web site at: [www.collaborativegrouparchitects.com](http://www.collaborativegrouparchitects.com).* ■

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|   |    |
|---|----|
| Building Industry Conference & Expo ..... | 2  |
| Chas Roberts Air Conditioning Co. ....    | 17 |
| Desert Moon Graphics .....                | 16 |
| Jerry Portelli Photography, Inc. ....     | 20 |
| Lighten Up .....                          | 15 |
| Paramount Windows .....                   | 5  |
| Sexton Pest Control .....                 | 18 |
| Solid Earth Landscaping .....             | 11 |
| Superior Drywall Co., Inc. ....           | 11 |