

Good Bones

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If you enjoy watching any of the many home improvement shows where the hosts pick an older home to renovate you notice they always talk about the “bones” of the house. In their opinion this is one of the most important features of any potential renovation job.

Typically they will say “the kitchen is a complete gut job”, or the bathroom has to be “blown out”. Of course all the finishes will not do. The carpet, the window coverings, the siding, the roofing, etc. all has to be replaced or updated. Yet this house is still a good candidate to renovate because it has “good bones”.

It makes me wonder if the “bones” or structure of the house is so important why when the house was built was it the part of the budget that the builder tried to save money on. Coming from the industry that supplies the “bones”, the trusses and the floors, how come there is so much pressure on the pricing of

these elements when they are so critical and will remain for the entire life of the home.



In a recent survey of 25 single family homes in Alberta it was determined that the roof truss system averaged 5/8 of one percent of the price of the house.

Yet, for some reason the behavior of home builders suggest that this is just too high, and they need to save another 10% and get

multiple quotes to ensure that they are keeping costs down.

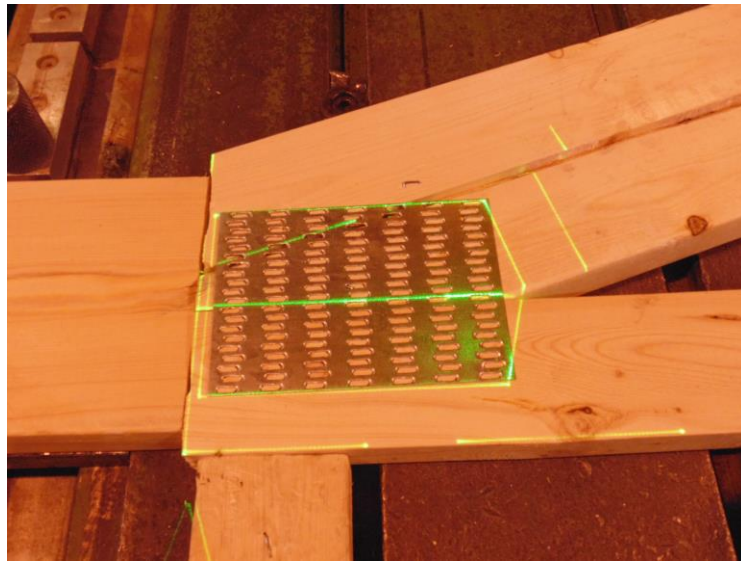
In fact, **the cost of the roof trusses are about the same as they were 17 years ago**, although the price of a single-detached home has increased from \$200,720 in 2001 to \$574,060 in 2017 according to CMHC. This is despite that fact that labor has increased by more than 60%, and raw materials increased by 50%.

Remember that in 20-30 years all the finishing materials that are currently the style will no doubt be ripped out of the house and the structure will remain. A friend of ours that is currently buying a new house was told that they should expect to spend 10 percent of the price of the house on window coverings, which would be about \$40,000. I informed him that he should know that the same builder probably investing about \$2400 in the entire roof truss system for his home and most likely went with the lowest bid. The window coverings would probably be completely changed 3-4 times in the life of the home, but the trusses would still be expected to be doing their job keeping the outside out.

So how have truss companies been able to keep the relative cost of trusses so low over the past 17 years? The answer lies in the investment in technology. Most modern truss plants now have computerized

sawing and automation that has enabled them to increase productivity despite their input costs increasing. They have invested in saws that are highly efficient and layout tables with automated jiggging and even laser systems to place the metal connector plates.

The software to design trusses has become extremely efficient in the design of the trusses. It could be said in the past that there was always a large safety factor in the design of trusses, but now software lets the designer design the members and connectors to their maximum capacity in order to minimize the cost. The design of the truss will work for the loads imposed on it and not much more. The lumber is maximized so that the lowest grade and size can be used for each member and the plates are usually off-set in order to utilize the smallest and lightest gauge plate for the job. It used to be that a fabricator may have 20 different plate sizes, but now they may have to carry 150 types to ensure that they are keeping their metal costs down.



Laser placement of a metal connector plate

It appears though that technology has about reached the limit in increasing productivity and as fabricators are continued to be under pricing pressure, the reduced cost has to come from somewhere. The old saying goes **“you get what you pay for”**.



Allowable wane on a #2 bottom chord

If price is all that matters to the customer a fabricator may have to use that piece of lumber that still meets grade, but looks pretty ugly in a truss. In the past the truss company may have only used MSR lumber, because it has fewer defects, but now has to use the lowest cost #2 lumber they can find. The panel points or distance between joints gets a little bit longer, or the configuration changes from a Howe to a Fink configuration in order to reduce the price. They may have to design a truss system that requires more bracing from the contractor, adding additional labor that the builder has to take into account, but is not a line item on the truss quote.

Getting back to the renovation shows, one of the design elements that they always seem to want to change is the removal of the popcorn ceiling in order to have a flat ceiling.

That popcorn ceiling served a purpose to hide imperfections, movement, and shrinkage in the structural members. As the design of these trusses and members become more minimal, more deformations are likely to be noticed on a flat painted ceiling or with ever increasing complex designs. When looking at multi-million dollar homes under construction I often wonder if the builder considered the problems they may have because they were trying to save 10% of 5/8 of one percent of the price of their trusses.

Another issue that is starting to arise is that people want to install solar panels on their roofs. Well, unless they were designed for the additional load you had better think about this decision, because the trusses were most likely designed to the minimal climatic conditions at the time.

I firmly believe that when a builder is choosing their truss or material supplier that they should dig a little bit deeper than getting 3 different quotes and work with their supplier to ensure that they are getting value and quality for their money. Instead of e-mailing 50 plans for pricing, go visit the manufacturer and see what their shop is like, how they manufacture the quality of their materials and the training of their people. Most importantly what does their Quality Management System look like and can they explain how it works.

It may surprise builders, but there is currently no requirement, building code or otherwise, to have any sort of quality control in a truss plant. There are requirements for the design of trusses and published acceptable tolerances for manufacturing, but no requirement to have any quality control system in place, and no requirement to have any third party inspection of their quality control.

In the long run it is more important to have a good mutual working relationship with your truss supplier, get your expectations met, and when the 3rd or 4th owner of the house is buying it they can say that this house was built with "good bones".