

ASK THE INSPECTOR COLUMN FOR MAY 11, 2016
HEADLINE: ECO-HOME FRAMING

At a recent inspection, the client asked about adding an addition and wanted to make it as sustainable a building as possible. He told me he spoke to a couple of renovation contractors and they were adverse to anything other than conventional frame work. For some reason, a high percentage of the home building community are adverse to change, unless it is darn near mandated upon them. The most common answer from builders is, "The Municipal Building Inspector won't pass it" and, in some cases he is right, unfortunately. That said, the sheer volume of lumber used in a home can be reduced and, given our knowledge of manufactured lumber like floor trusses, composition bearing beams and roof trusses, there is no reason it can't be done.

Some time ago a system called optimum value engineering or OVE was developed, using conventional platform framing as a base. It is also called advanced framing techniques or AFT. Platform framing makes up the majority of today's wood home construction. Any skilled carpenter should be able to grasp the differences in OVE/AFT and standard framing very quickly. When I built our "Spa" last year, we used this method and, yes, it took some thought, but once the layout was done, it was quickly grasped by the crew. The secret is paying attention to what is known as "inline framing," where the floor, walls and roof framework are all in line with one another. Done properly, this can reduce the amount of dimensioned lumber used in a home by anywhere up to 30%. Another consideration is to use the two foot rule for designing the home. This makes best use of standard sizes of many materials, thereby reducing waste.

The AFT system starts with using manufactured floor trusses or MFT's, as they are called, as the first step. These are generally spaced at 24" on centre. These trusses are engineered for load and will span considerably wider spaces than conventional sawn lumber. Once your subfloor is properly glued down and then secured with screws the frame walls are installed. The AFT system recommends 2x6 wall frame on 24 inch centres, which brings the bearing load in line with the MFT floor framework. The most obvious areas where AFT is used are around windows and outside corners. In the corners they use a two stud system and drywall clips instead of three studs or blocking. The window areas are the most obvious. Header hangers are used instead of jack studs. The headers are insulated, rather than being spaced. In order to convey the in-line frame system, blocking is used between the top of the header and the next level or top plate. On non-bearing walls, for example the gable end of a home, the entire window opening is single studded and no cripples are used at the stud walls. The top plate is a single plate, not doubled up like used today. The plates are joined over a wall stud and a galvanized connector plate is used on top of the plate to secure them together. A company called Simpson makes an amazing line of metal hangers and attachment brackets. We have used roof trusses in

residential construction since the late 60's and they are usually spaced at 24 inches on centre. This allows for the full load transfer to the foundation.

On top of reducing the amount of lumber, AFT also allows for greater insulation values and reduces the thermal bridge effect that is common in most wood frame homes. I have lost count of the number of homes I have been in during the winter where the cold, and sometimes frost, is forming on the inside corners of the outside walls and/or where the interior walls butt against the outside framework. This cold is a dead giveaway that there is no insulation in these cavities. I can't understand why the AFT method of framing is not fully utilized. One study I have showed where the cost savings were nearly 15% on materials alone.

Our client also queried the use of metal framework for a home. Steel framework is growing in popularity in some areas, especially for nonbearing partitions and in basement renovations. It is often said that metal studding won't absorb water and will not rot or contribute to mould. In these examples they are correct. Steel studding has a number of plusses. They are stronger than wood, many contain recycled metal and they are consistent in size. If you have an issue where a fire rating is necessary, steel studding should be looked at. When we renovated our church (www.alltechgreenchurch.ca) we used steel studding and it was ideal for this job.

That said, there are a number of minuses that are not commonly known. If used as a complete framework for a home, metal transfers considerable heat and cold. One study I have on file showed where metal studding expanded and contracted nearly ½ an inch over a 24 hour period. I would be very hesitant recommending exterior frame steel studding in our northern climate. Wiring and plumbing takes special care in installation and if you go the metal route, make sure your electrician or plumber is aware you are using metal studding; it is likely their price quote will be affected.

I have seen a couple of metal studded walls taken down and I was surprised how rusted the screws and fasteners were. The contractor did not make the extra effort to use the correctly coated or galvanized screws. Steel studding has its place, but you must compare where it will be used and the costs, including labour, for installing this material.

We are now seeing a dramatic rise in alternate building systems, straw bale, insulated concrete foundations and structural insulated panels. It is time that conventional framework got onboard of the drive to reduce and recycle. The AFT system can and does work; we have a Spa building to prove it.

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