

Advanced Framing

What is it and why is it in CAL Green?

By Blair Seibert, AIA, LEED AP

The first time I heard about the Advanced Framing—or Optimum Value Engineering as it's called in the northeast, I was intrigued. This system exploits the abilities of 2 x framing to the point of eliminating members from the typical wood framing practices. The system is a credit in the GreenPoint Rated and LEED for Homes rating systems. CAL Green has recognized it as a valuable tool as well. Advanced Framing is one of the Tier 1 measures.

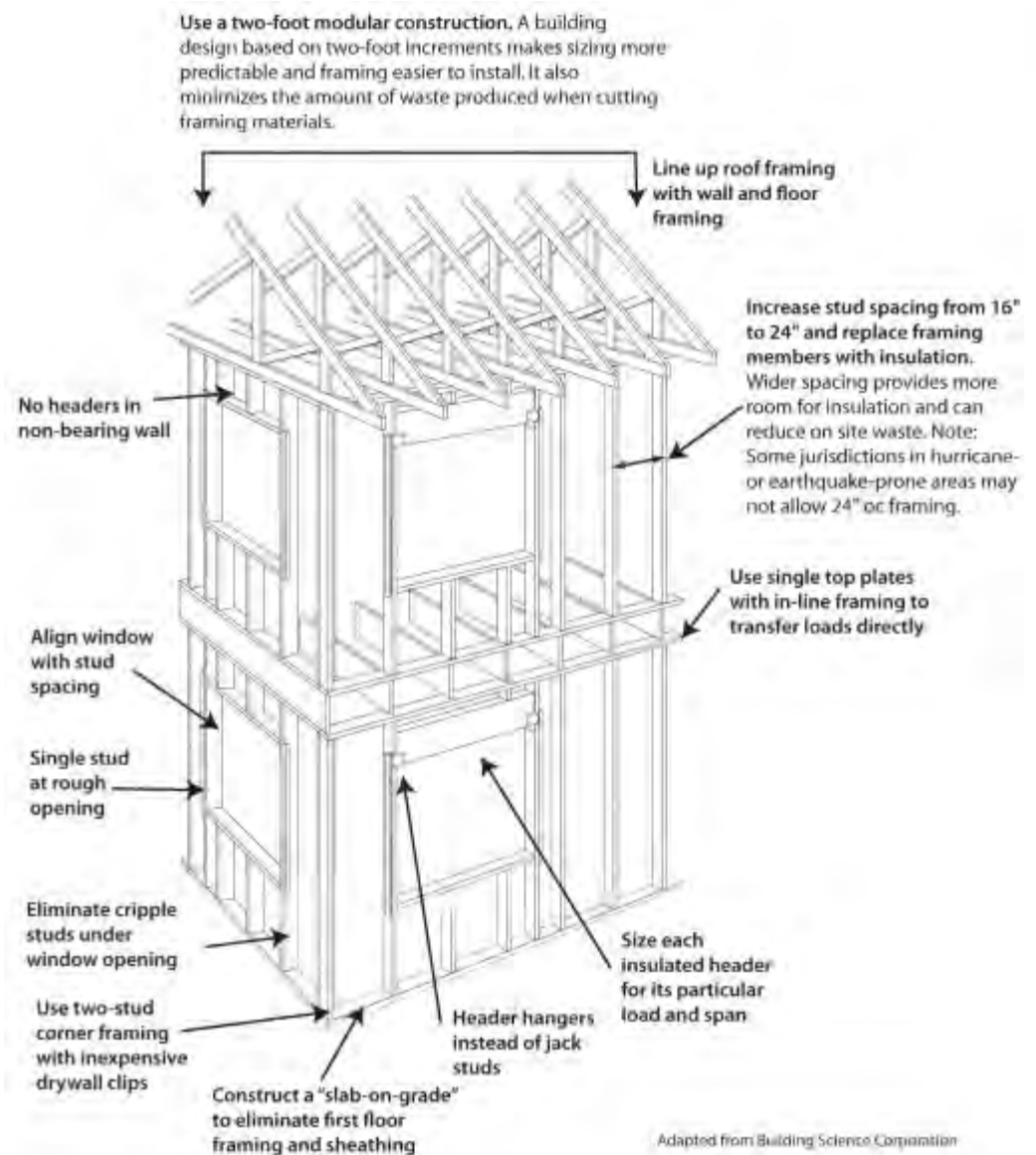
While the system has been around for many years it has been much more popular in the northern part of the U.S. due to the colder weather and high energy bills. With fewer wood components there is more room for insulation.

Real Life Experience

I was recently introduced to Scott Nyborg, a transplanted general contractor from New Hampshire. With six years of Advanced Framing experience, he offered some real life examples and lessons. While construction industries and green rating systems advertise its material reduction and dollar savings, Mr. Nyborg said the material cost savings are not substantial. The labor costs, however, are enough to get excited about.

Scott is the owner of Nyborg Sustainable Construction, Inc., a Los Angeles-based home performance company. While building in New Hampshire (a state with less restrictive building codes than California) he became known as a builder who created homes that were less expensive to operate. Advanced Framing allowed the owner to get closer to a net-zero nest. Can you imagine what a great marketing and sales tool that was in such a cold climate?

So what is this environmentally friendly system and what are its other advantages? The system consists of many components which can be used together or separately. The more of the system incorporated, the less wood materials required. The overarching component of Advanced Framing is building to the wood stud's full capacity. That can be achieved by placing a 2x wood studs at 24" or 19.2" on center. 19.2" spacing would be used when 4'x8' sheathing and interior finish materials are installed horizontally. note that you can only use 24" centers in 2-story construction if you use a 2x6 stud (per CBC table 2308.9.1, 2x4 studs can only support a ceiling and roof at 24" centers, not a second story). A happy side effect of using 2x6s is you get extra depth for insulation (more insulation than you need by code in Southern California, but there's nothing wrong with exceeding code J).



When the vertical members align with the roof rafters, ceiling and floor joists, there is no weight placed on the top plate of the wall. Thus a second top plate is unnecessary. To fully exploit the system the structure should be designed on the module you choose to use. "Stacked framing" is CRITICAL.

Three stud corners and two stud 'T' intersections are used to reduce the bulk of wood (thermal bridges) in corners and intersections. [Maybe a technicality: thermal bridges are created by wood members that go "all the way through" the wall – that is, they are in contact with both the outer and inner surfaces of the wall and create a bridge of material with a relatively low R value that transfers heat easily from one surface to the other. So, while 3 stud corners and 2 stud T intersections do reduce the total amount of wood, they are really targeted (at least in my mind) at reducing the number of studs that can act as bridges. It's a nuance...] Further material reductions occur when headers are sized to carry the actual load. Headers over doors and smaller openings in non-bearing walls are typically eliminated.

With less wood there's more room for insulation. Laminated dimensional lumber for headers allows room for foam insulation between the two wood pieces. Whether you're trying to keep the cold or hot air out, more insulation is always a good option.

Although not specifically a part of the Advanced Framing system, Mr. Nyborg often uses TJI joists. They are a perfect match with Advanced Framing techniques not only because they provide a wider flange in which to nail but they are not limited to the 10' spans of the typical 2x6s at 16" o.c. wood. Longer joist spans mean big labor savings as a result of reduced numbers of piers, posts, girders, and joist laps. [TJIs tend to yield flatter, stronger floors that are less likely to squeak too.]

Once a crew understands the system there are labor savings. One of the details that Scott said the subcontractors do not like is the gypsum board clips at interior corners. Once you see it I think you'll understand. I can imagine it would be very challenging getting the screws through the gypsum board perfectly aligned with the clips.

Drawbacks

There are drawbacks of course, the least of which is retraining framers. The second challenge is retraining architects to design to a module. I remember hearing about that in school, don't you? If you think modules are boring, think about Frank Lloyd Wright. While I grant you his modules varied, his work always involved modules and I wouldn't think anyone would call his work boring.

Because the ceiling and floor joists are more widely spaced, they may have to be beefier to accommodate the increased load. That's where the TJIs and composite wood joists come in. Composite products made from smaller pieces of wood (often post industrial or fully recycled) along with super strong resins use less virgin materials and actually perform better than natural wood.

Wider spaced ceiling joists need to have 1x3s installed at 16" o.c. in order to hang ½" gypsum board. That adds labor. To find a wealth of information, pictures, axons and CADD details go to the National Association of Home Builders Toolbase website <http://www.toolbase.org/Construction-Methods/Wood-Framing/advance-framing-techniques> It is an incredible resource. To reach Mr. Nyborg with questions please go to <http://www.nyborgconstruction.com/>

Blair Seibert, AIA, LEED AP, Green Point Rater, Certified Sustainable Building Advisor is the principal of Verde Concepts, In. Verde provides a broad spectrum of support to architects and owners that want to reduce the environmental impacts of their projects and buildings. Her 25 year background as an architect gives her a unique vantage point. She can be reached at blair@verdearchitects.com or 310-203-0896.



Schedule of Events



Sat	September 17, 9:00 am—4:00 pm "Toolbox Series" Seminar AIA SFV Chapter Office
Wed	September 28, 2011, 6:30 pm Monthly Evening Program TBA
Wed	September 28, 2011 Design Awards Program Entry Form DUE
Sat	October 1, 9:00 am—4:00 pm "Toolbox Series" Seminar AIA SFV Chapter Office
Mon	October 24, 2011 16th Annual AIA SFV Golf Tournament Woodland Hills Country Club
Wed	October 26 2011 Design Awards Program Submissions DUE

SAVE THE DATE!

Sat	January 21, 2012, 6:00 pm 25th Annual Design Awards Banquet Castaways, Burbank
-----	---