BEYOND THE BASICS:
Advanced Framing

Written by Andy Pease, AIA, LEED AP, In Balance Green Consulting

6 Steps to Reduce Lumber Use and Maintain Structural Integrity

Advanced Framing is a collection of home construction framing techniques that go beyond standard framing practices. These techniques are designed to make the most efficient use of materials, minimize labor and material costs, maximize house quality, and reduce energy use.

Developed by the National Association of Home Builders (NAHB) Research Center in the early 1970s, Advanced Framing was originally called “Optimum Value Engineering” (OVE).

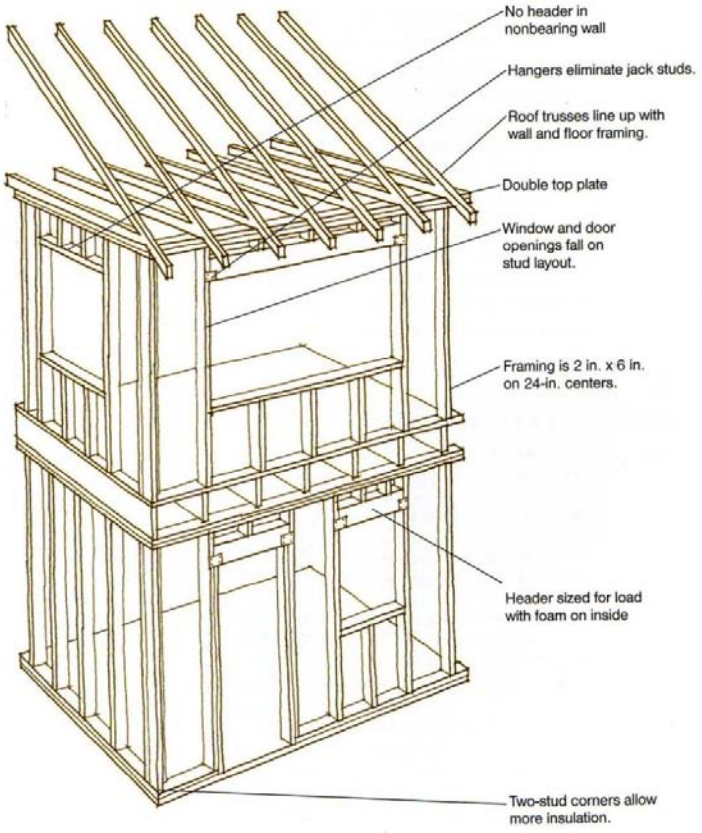
Advanced Framing started as a research study, in which a contractor built two homes, one with 2x4s at 16” on center (oc) and one with 2x6s at 24” oc. He reported lumber material costs for the 2x6 home decreased about 15% and framing labor dropped 5-6% (research shows that this cost should become lower still as framers learn the new techniques). The increase in insulation (R13 to R19) also increased the insulation cost by approximately 15%; however, this cost is linked to long-term savings for the owner.

Advanced Framing is comprised of six basic techniques:

1. Extended Spacing
Standard wall framing uses 2x4’s at 16” on center (oc). Advanced Framing’s highest impact strategy is extending stud spacing; it uses 2x6’s at 24” oc, which reduces wood use and provides for better insulation values; both the 6” thickness and the spacing between studs leave more room for insulation.

Locally, when builders extend stud spacing to 24”, they often use 5/8” sheetrock, for more rigidity as well as thermal mass.

Although Advanced Framing includes trusses and joists at 24” oc, this is already standard practice in California. In some areas of the country, builders use a single top plate, instead of a double top plate, but in California, code and panel dimensions do not support the single top plate, so that aspect of advanced framing is not used locally.



Advanced Framing Techniques

2. Two-Foot Modular Design
A two-foot modular design is a building plan that is laid out in 2’ multiples to make best use of floor, wall, and roof covering materials (see drawing below). Two-Foot Modular Design makes the best use of common panel sizes (4x8 plywood and OSB and 4x8 and 4x12 drywall).

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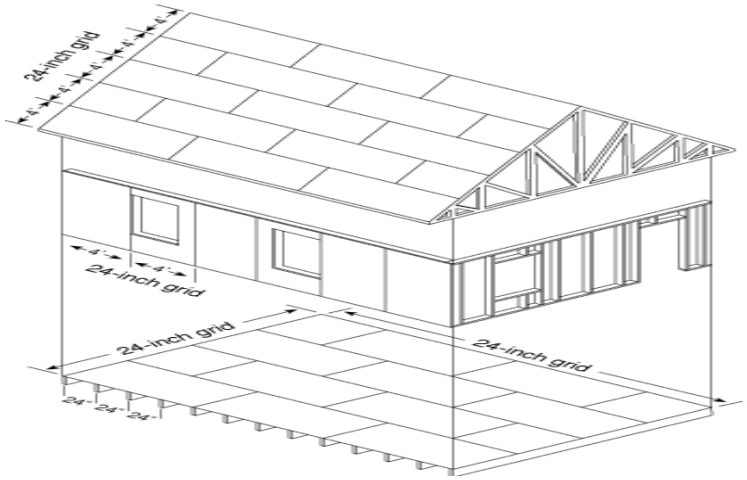

Two-Foot Modular Design

3. Modified Corner and Intersection Construction
"Standard" construction uses 4-stud or 3-stud plus block, but a 2-stud corner works as well when used with drywall clips. Drywall clips (drywall stops) are small pieces of hardware that function as backing to fasten drywall in a two-stud corner. Drywall clips are fitted onto the edge of the drywall before being attached to wood or steel studs, eliminating the need for an additional stud. Wall intersections can be framed with ladder blocking, rather than the typical 2-stud construction on each side of partition end-stud.

4. Header Sizing
Headers are often oversized in conventional framing, but headers may not be required in non-load bearing walls. For example, one can use a non-load bearing gable-end truss and eliminate headers in some of the walls.

In single headers or headers that are smaller than the wall thickness, space is allowed for rigid insulation to increase the overall insulation value of the wall. In addition, pre-manufactured insulated headers are available.

5. Elimination of Jack Studs
Jack studs (the 2nd stud on either side of a window) can be eliminated when structural headers in non-bearing walls are eliminated or when metal hangers are used to support structural headers.

6. Energy Heel
Roof framing above the top plate is extended 4" – 8" high so that the roof insulation is at least 80% of its full thickness at the roof perimeter.

Benefits of Advanced Framing
- Lower First Costs – Less labor and material
- Improved Energy Efficiency – Higher R-values and less thermal bridging
- Improved Resource Efficiency – Fewer trees cut; less transportation and processing
- Reduced Waste – Fewer studs, fewer cuts, so less hauling and waste
- Increased Comfort – Better insulation at walls, corners and headers equates to more consistent temperatures
- Reduced Drywall Cracking – Fewer attachments means fewer opportunities for cracking

This win-win solution for builders, buyers, and the community at large provides reduced cost and energy use, and conservation of natural resources. Although there is a learning curve–builder re-training, buyer acceptance and communication with code officials –it is well worth the effort to gain the full potential of this green building solution that is here to stay.

This article provides an overview of the Advanced Framing concepts. For a full explanation and important tips, please read "Advanced Framing – 10 Pages" at www.slogreenbuild.org.