VISION HOUSE® LA TESTS A NEW SYSTEM

Improved Wood Framing 04

Boise Cascade's new framing concept saves energy for the homeowner, has a green story you can sell, and reduces job site waste.

BY JULIE KNUDSON

Artist's rendering of VISION House® Los Angeles.

Running ductwork and trunk lines through the web brings the entire system into conditioned airspace.

With this system, ducts and other mechanicals are protected during construction, and leave a clean finish at the end of the project.

What do you get when you put a new spin on a traditional concept? If you're talking about the world of framing, then one answer is Boise Cascade's Conditioned Airspace HVAC Framing System. It's a long name, but it accurately describes the company's answer to an age-old dilemma.

In conventional framing systems, most HVAC ductwork is run through crawlspaces and attics, while the air handler or furnace itself sits in the garage. That means the intake air often contains whatever odors and pollutants that might be lingering nearby—gas cans for the lawnmower, half-used paint cans, bottles of weed killer—and pumping it straight into the living area. It also means the incoming air is usually the wrong temperature; stifling in the summer when you're trying to cool things down and frigid in the winter when occupants most want to be warm. The traditional pathways for ductwork also translate into wasted energy costs in the form of leaks of expensive conditioned air into unoccupied spaces.

Enter Boise Cascade's new framing system. It addresses the energy-gobbling drawbacks of conventional framing methods that run ductwork in unconditioned space, while simultaneously offering builders an option with more sustainable manufacturing methods and innovative design practices that cut down on waste and lessen environmental impact.

Testing Ground: VISION House® LA

One home taking advantage of Boise's new framing concept is Green Builder's own VISION House® Los Angeles, a demonstration home created to serve as a research and training ground offering information to builders, architects and consumers.

Los Angeles-based Structure Home is the project's builder, and Mark Sapiro, Structure's co-founder, says he chose Boise Cascade's engineered wood products because they're certified green-engineered, a good match for this project. "I know that the products are manufactured with sustainability in mind," he says.

Sapiro evaluated the product's stability and potential to decrease callbacks, along with the system's efficiency and waste reduction features. Result: He's become a believer. "We really love the product and we hope to incorporate it, not just in this one VISION Home," Sapiro says. "We're hoping that Boise Cascade will be

Boise Cascade's laminated veneer lumber (right) offers consistent quality when compared to traditional dimensional lumber.

one of those manufacturers that we'll continue to use and incorporate into future projects."

Sourcing, Tracking and Planning

The sustainability of Boise's system starts with the raw materials. "Boise Cascade demands full forest certification of all wood fiber used," says Denny Huston, general sales manager of Boise Cascade Engineered Wood Products. "The company doesn't own forests, but buys wood fiber in compliance with forest certification standards, such as the Sustainable Forestry Initiative (SFI) and Forest Stewardship Council (FSC)." Huston says that Boise Cascade utilizes a chain-of-custody tracking system that documents the sourcing of all wood fiber purchased, which ensures that only material from acceptable sources makes its way into Boise's inventory. Through the use of this comprehensive, documented system, Boise Cascade engineered wood products are eligible for credits toward either LEED or National Green Building Standard certification.

Once the trees have been turned into EWP, Boise takes another opportunity to reduce waste. Instead of shipping standard-length lumber out to each job site, the designers at Boise use a suite of software applications, including BC Calc, to precisely plan out the location of each framing component, along with HVAC duct and trunk lines. The BC Framer software creates a floorplan identifying every I-joist, beam and rim board, along with locations for all necessary duct penetrations.

"It tells you the length and size of the joists and where everything is placed," says Mike Carver, area manager of the engineered wood products division at Boise Cascade, "and you can see the whole duct schematic laid out with the I-joist schematic–it's all been rolled into one."

Carver explains that the plan is then evaluated in BC Calc, to ensure the floor joists will perform to the builder's expectation. "BC Calc calculates and makes determinations on a couple different things: Are the joists going to be structurally sound? Are they properly sized for the job? And then how are they going to perform?" Because floor performance is of critical importance, Carver says, "The whole geometry of it creates a lot more waste." So instead of cutting conventional boards out of each tree, Boise Cascade instead peels their logs. This shaves veneers off each log, and the plies are then glued together to create Versa-Lam beams and Versa-Stud framing lumber. These laminated products offer the right moisture content for fewer post-construction problems, and they're stronger and straighter than dimensional lumber. The more efficient use of raw materials adds to the sustainability of Boise Cascade's engineered framing products.

TREE SCIENCE

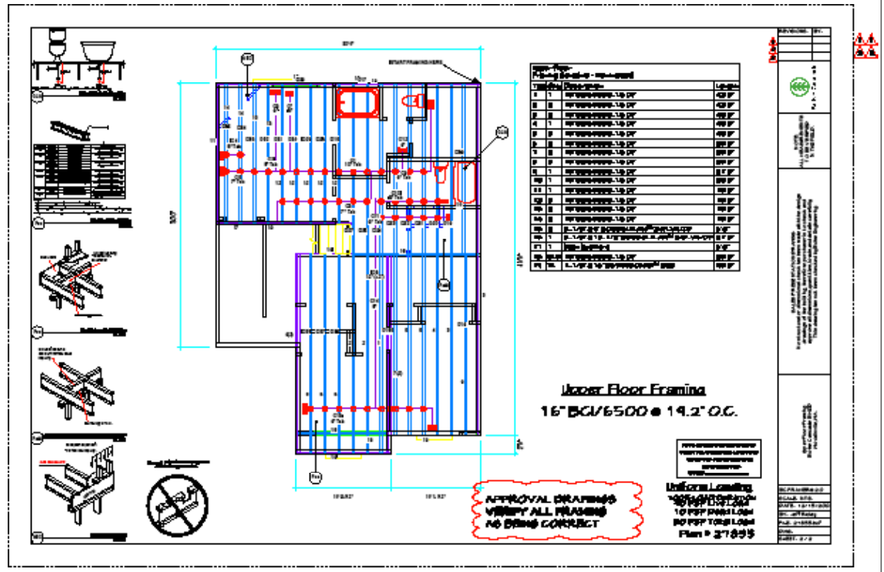
PEELING VS. CUTTING

Finding new ways to reduce waste throughout the manufacturing process is one task Boise Cascade has mastered with its engineered wood products. "When you look at traditional dimensional lumber, you're taking a round log and you're trying to cut rectangular pieces out

The process of peeling the tree creates very little dust, instead using virtually all of the wood fiber to create laminated veneer lumber.

OPTIMIZED PLANNING

Boise Cascade's BC Framer software lets designers pre-visualize utility line placements through the joists when the plan is drawn, allowing the builder and HVAC and plumbing contractors to work together to plan ideal line locations. This helps to speed construction and avoid potential problems with contractors trying to figure out line placements mid-project. "They do some pretty extensive takeoffs and layouts of all the products that are being proposed for use," Sapiro says. "They provide plans that we can put out and submit to our structural engineer and our framing contractors." He says the process "helps make sure the project gets assembled as accurately as possible, speeds up the installation process, and does a really good job of minimizing the amount of waste because we're not cutting a lot of product out in the field."



Boise Cascade's suite of planning software creates detailed drawings showing the location of framing components and HVAC ductwork, along with calculations for floor performance.

With the help of Boise's advanced planning software, I-joists can be pre-cut to allow all mechanicals to run through conditioned spaces.

tance, especially in a high-end home, Boise's designers evaluate not only the structural integrity of the framing system but also how the floor will feel to the homeowner.

After the plan has been through a final analysis, the lumber is then cut to match the plan exactly and sent on to the contractor. Because there are no extra materials or too-long boards being shipped, transportation costs and environmental impact is minimized. Job site efficiency is improved, too.

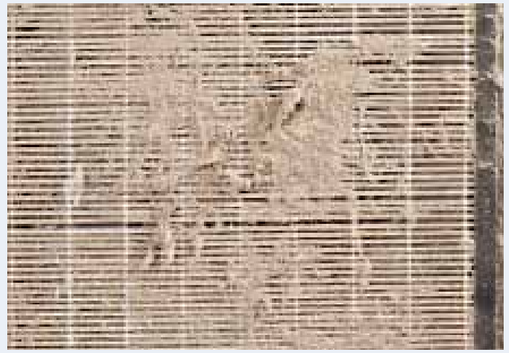
"When an I-joist package is delivered to a job site, it's already precut," Carver says. "There isn't extra weight being taken to the job site like dimensional lumber, and where you're typically cutting and pulling out bad boards, you don't have that with engineered wood products."

Contractor Advantages

Boise Cascade's system offers builders a range of benefits over traditional framing practices. Sapiro appreciates the product's stability, which helps to prevent squeaks and shrinkage.

"It's very easy to work with and very consistent in size and moisture content, which really does help prevent moving around, shrinking and expanding," he says. "It's also going to prevent a lot of damage to the ductwork that we'll typically see in attics, where ductwork can get kinked, tangled, and damaged. Ducts are typically not as well-protected as this when they are run in the joist bays, which is pretty common."

THE HOMEOWNER PITCH



Air and odor pollutants can be drawn into furnaces that are located in unconditioned space.

Along with adding sustainable materials and design to their lifestyle, the Boise System can be pitched as a way to save on monthly energy bills. "There are two sides to the green movement: 'Saving the planet' and, for homeowners, 'Saving my wallet,'" Huston says. "This program does both." He says that the U.S. Department of Energy estimates indicate the conditioned airspace framing system may reduce energy consumption by up to 40%, resulting in a nearly 40% savings for homeowners on their heating and cooling bills for the life of the home.

A third benefit is the system's contribution to good indoor air quality and comfort. "It's a much cleaner system," Carver says. "Moving the air handler into the house, you're drawing from inside the house where the air has already been filtered and conditioned. You're starting with a much cleaner space." This brings fewer odors and air contaminants into the living space.

He also appreciates the system's ability to support shorter duct runs, and says the shift to using conditioned space for ducting is a significant move forward. "I think one of the big points is that they have the ability to cut out large sections of the web and actually run heating and air conditioning ducts through the floor joists," Sapiro says. "We're able to run our air conditioning ducts in conditioned air space as opposed to unconditioned space.

Huston says that Boise's system "merges HVAC design and optimization with structural floor design and optimization for a solid, well-engineered solution that keeps the builder in charge of how homes are designed and built." And home designers can work closely with HVAC contractors to create highly detailed plans that provide "optimum performance and least waste."

He also says the improved design capabilities of the system offer builders the chance to reduce material and installation costs through more accurately specified ducting requirements and the potential to install only one H/C unit instead of two.

A well-engineered, sustainable product can also be a strong selling point when it's time to lure homeowners. "It is a competitive advantage for a builder to be able to produce homes capable of consuming up to 40% less energy than homes being produced by competitive builders," Huston says. "There aren't many places a contractor can go to find that kind of month-in, month-out savings for homeowners."

Carver agrees, and adds that Indoor Air Quality should also be a talking point with homeowners. "If the builder's able to say, 'We've got a system that's much cleaner and safer as far as air quality is concerned,' that's a pretty emotional appeal right there." He says that builders who understand the advantages of the system "have a really good story to tell that's going to differentiate them from other builders."