



**INDOOR
ENVIRONMENTAL
QUALITY**

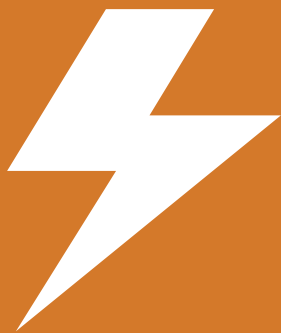
Spot Ventilation

Spot ventilation in kitchens and bathrooms moves moisture from showering and cooking out of the home.

All levels of the *Environments For Living* program require fresh air ventilation throughout the home, and spot ventilation in the kitchen and bathrooms. Kitchen and bathroom ventilation must be capable of exhausting to the outside a specific volume of air at a specific rate.

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Builders should review program requirements for complete details.



**ENERGY
EFFICIENCY**

Low-E Windows

The “E” stands for “emissivity” but low-E really means energy efficient.

The *Environments For Living* program requires low-E windows that have a solar heat gain coefficient (SHGC) of 0.53 or lower in cold climates, and 0.40 or lower in other climates.

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Combustion Safety

Avoiding the build-up of carbon monoxide (CO)—a colorless, odorless gas—is important for occupant safety.

At all program levels, the *Environments For Living* program requires hardwired and removable CO detectors in all homes. The program has requirements for the location and number of CO detectors based on the specifics of each home, such as number of stories and sleeping areas.

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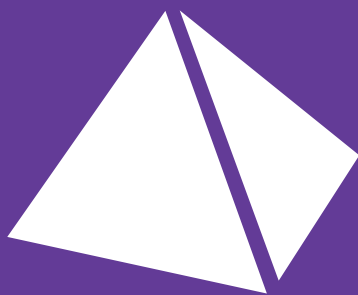
Internal Moisture Management

Vents, pressure balancing, fresh air ventilation and “right-sized” HVAC equipment work to reduce moisture from daily activities like cooking and showering.

At all levels, the *Environments For Living* program includes a number of requirements that help manage moisture inside the home. Builders must follow the Energy and Environmental Building Association™ (EEBA) Water Management Guide so that moisture entering building assemblies has a way to dry—either to the interior, exterior, or both. Tub and shower surrounds must be backed with specific water resistant materials. And, in hot-humid climates, additional requirements apply, such as not using vinyl wallpaper in kitchens and bathrooms.

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DURABILITY

Internal Moisture Management

Moisture is one of the three primary physical forces which adversely affect the durability of building materials—with air and heat being the other two.

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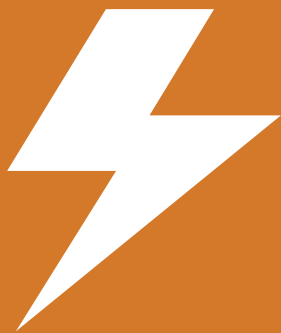
Air Pressure Balancing

Balanced air pressure throughout the home results in more-even temperatures and reduces the potential for condensation build-up.

At all levels, the *Environments For Living* program requires all rooms (except bath and laundry rooms) in the conditioned space not exceed a pressure differential of +/- 3 pascals with respect to the outside when interior doors are closed and the air handler is operating. Returns, transfer grills, or jump ducts may be needed to balance each room.

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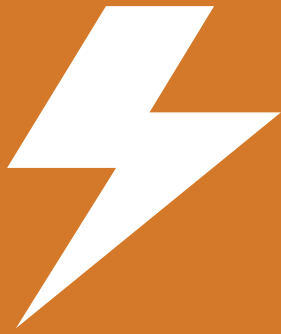
ENERGY
EFFICIENCY

Tight Construction

Air barriers are important in minimizing air leakage because they impede the flow of air through building cavities.

All levels of the *Environments For Living* program require special framing techniques, such as a continuous air barrier, to help reduce leaks and drafts. Framing sets the stage for meeting many of the program’s requirements. It’s important that the air barrier is continuous, including areas such as knee walls and soffits, and that holes are sealed.





ENERGY
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Improved Thermal Systems

Enhanced insulation techniques help to minimize voids and gaps, and higher thermal properties (R-value) add to energy efficiency.

All levels of the *Environments For Living* program require enhanced insulation techniques with special attention paid to gaps, voids and compression. In addition, the program requires insulation to be in physical contact with the air barrier, as a primary means of preventing air movement between conditioned and unconditioned space, which can diminish the insulating power.

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ENERGY
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Framing and Sheathing

Framing and sheathing details work together to create a tight building envelope and, ultimately, an energy-efficient home.

All levels of the *Environments For Living* program require a continuous air barrier enclosing the conditioned space. In addition, rigid exterior sheathing capable of stopping airflow are required and it is recommended as a “best practice” that roof sheathings include a reflective barrier, except when insulation is applied to the underside of the roof deck.

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Fresh Air Ventilation

Fresh air ventilation means that filtered outside air is brought into the home through the HVAC system.

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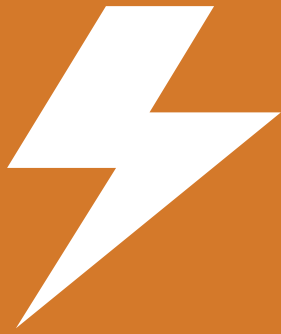
Optional Advanced IEQ System

With so many consumers increasingly concerned about indoor environmental quality, builders and homebuyers may want to consider adding an advanced IEQ system.

As an option under the *Environments For Living* program, builders may choose to offer an advanced IEQ equipment package, which is based on four pillars of improving indoor air quality—source elimination, ventilation, cleaning/purification, and monitoring. Equipment for this option includes a purification system, advanced HEPA filtration, germicidal lamp and other components that vary according to climate.

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Right-Sized HVAC

“Right-Sized” heating and cooling systems and sealed air ducts help equipment work efficiently. (“Right-Sized” refers to the process of determining which HVAC system should be used in any particular structure.)

At all levels, the *Environments For Living* program requires the builder to provide sizing of the heating and cooling systems using the ACCA (Air Conditioning Contractors of America) Manual J[®] for room-by-room load calculations which are submitted with each plan review.

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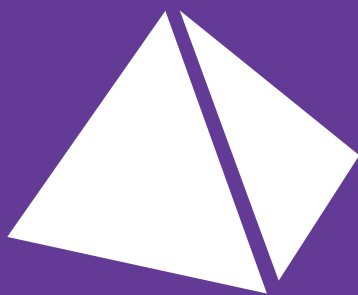
Tight Construction

This sealing technique, combined with specific duct tightness prescribed by the program, helps keep attic dust and other contaminants out of the home's ventilation system.

The *Environments For Living* program requires that duct connections are sealed with a UL-listed mastic product, and all supply and return boot-to-house connections are sealed with UL-listed class 1 pliable sealant such as mastic or caulk.

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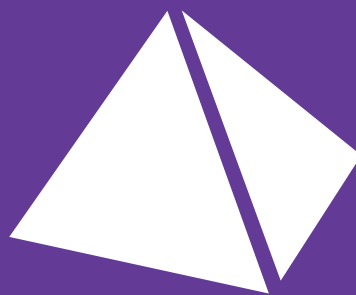
Optimum Value Framing

Spacing studs at 24 inches on center—instead of the traditional 16 inches—reduces the amount of lumber needed for framing and increases the available space for insulation.

At all levels of the *Environments For Living* program, builders are encouraged to apply Optimum Value Engineering (OVE) techniques, also known as advanced framing, to reduce lumber requirements while maintaining structural integrity.

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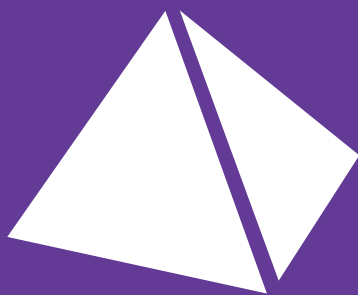
Air Barrier

The air barrier inhibits air from entering and exiting the building envelope, and plays an important role not only in energy efficiency but also in durability.

At all levels, the *Environments For Living* program requires a continuous air barrier and sealing of penetrations. Components and finished surface materials such as drywall and sheathing act as air barriers, but regardless of the material, it's important that the air barrier is continuous and that holes are sealed.

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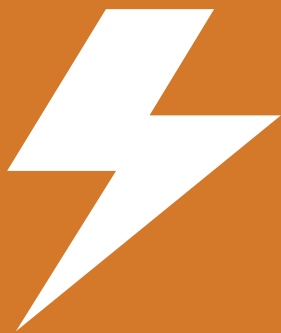
Thermal Envelope

Fiberglass, cellulose, and foam insulation materials are all effective at creating thermal envelopes, but regardless of the material, it's important that the thermal envelope is in physical contact with the air barrier.

At all levels, the *Environments For Living* program requires the thermal envelope, or insulation, to be applied in direct physical contact with the continuous air barrier, in order to minimize air flow that can reduce the insulating power of the insulation.

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Recommended Crawl Treatment

For improved energy and moisture management, the program recommends a ventless, conditioned crawl strategy except where local codes require otherwise

When state and local code allows, crawl spaces shall be constructed as a tempered space separate from the outside and sub-soil atmospheres.

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