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**BUILD HIGH**  
PERFORMANCE HOMES.  
**BUILD BUSINESS.**

PROGRAM DOCUMENTS



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# TABLE OF CONTENTS

---

 2 **LETTER TO THE BUILDER**

---

 4 **PROGRAM REQUIREMENTS**

---

 12 ***ENVIRONMENTS FOR LIVING*<sup>®</sup> BEYOND PROGRAM**

---

 17 ***ENVIRONMENTS FOR LIVING*<sup>®</sup> *CERTIFIED GREEN* PROGRAM**

---

 19 **FEE STRUCTURE**

---

 22 **FREQUENTLY ASKED QUESTIONS**

---

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Dear Builder,

Thank you for your interest in the *Environments For Living*<sup>®</sup> program offered by TopBuild Home Services, Inc. Working closely with selected builders, we at TopBuild Home Services believe that the *Environments For Living* program has great potential to promote the principles of building science. The program's energy usage and comfort guarantees have the capability to generate builder marketing and sales benefits that we believe will help you in delivering value and satisfaction to your customers.

The materials in this booklet explain the *Environments For Living* program, how it operates and your responsibilities if you decide to participate in the program. This booklet, together with this cover letter and enclosures, constitutes the Program Documents. Your *Environments For Living* representative can answer any questions you might have and help you complete all documents.

Although more fully explained in the Program Documents, here is a brief overview of what you can expect from the *Environments For Living* program.

First, you will need to have your building plans and specifications reviewed for comparison with the Program Requirements. This *Ecovaluation*<sup>SM</sup> *Plan Review* is not a review or approval of your underlying plan design; however, the results of the comparison will be communicated to you. Any changes necessary to conform with the Program Requirements will be identified. In addition, the *Ecovaluation*<sup>SM</sup> *Plan Review* will provide an estimate of the energy usage to heat and cool the home (assuming conformance with the Program Requirements and your submitted plan) and, as appropriate, will provide an applicable energy rating for all submitted plans. You should carefully evaluate the *Ecovaluation Plan Review* since your participation in the program may require you to incur additional costs.

You then must sign a Project Agreement for each subdivision and/or each custom home you would like to include in the program. You will be responsible for designing and constructing each home to satisfy the Program Requirements, as well as to comply with all applicable laws and codes. This means that you will need to understand and clearly communicate the enclosed Program Requirements to your subcontractors and ensure that you and your subcontractors satisfy them.

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During the construction phase, we will provide you with training on the program, and make our representatives reasonably available. The program also includes performance testing and inspections, which will vary depending on your level of participation. You will need to notify us with your weekly job schedule, so we can arrange for the required testing and inspections.

All program fees for the respective homes participating in the program must be paid within thirty days of issuance of the respective invoice in order to receive an *Environments For Living*® limited guarantee.

Please note that the liability of TopBuild Home Services is expressly limited to the energy usage and comfort provisions as described in the *Environments For Living* program limited guarantee. Since the liability of TopBuild Home Services is limited, it is extremely important that you review the Program Requirements and validate them based upon your own best practices and expertise in the building industry. For a complete description of other provisions of the program, please review all of the enclosed Program Documents very carefully. The Program Documents express and control our entire agreement concerning your participation in the program for the specified subdivisions and/or homes, and supersede any other agreement or understanding, including any provisions in any agreement to which the Project Agreement may be attached.

From time to time, it may be necessary for the *Environments For Living* program to modify the Program Documents. Notice of any changes will be sent to you.

As a participant in the program, we may provide you with promotional support, including point of purchase signs and consumer brochures, as we believe appropriate. The Program Documents describe, in detail, how you can use the *Environments For Living* mark in your own promotional materials. Your promotional materials must conform to any advertising or other policies that the program may establish from time to time.

If, at any time, you decide to end your participation in the program, simply send me written notice by certified mail 60 days prior. TopBuild Home Services will notify you in the same manner if, at any time, you are no longer eligible to participate.

I look forward to welcoming you to the *Environments For Living* program!

Sincerely,

Dave Bell  
Vice President of Building Science  
TopBuild Home Services

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**ENCLOSURES:**

- ▶ Sample Certificate of Compliance
- ▶ Sample Project Agreement
- ▶ Sample Limited Guarantee
- ▶ Sample Limited Certified Green Guarantee
- ▶ Sample Home Energy Rating
- ▶ Homeowners Brochure(s)

## PROGRAM REQUIREMENTS

You, the builder, play a key role in managing and customizing the *Environments For Living*® program to suit your homes, your local market, and your business needs.

The *Environments For Living* program is performance based and not product based. This means that you are free to use any manufacturer whose products meet the Program Requirements. The program is designed to provide you with maximum flexibility; however, with that flexibility comes responsibility.



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## BUILDER'S RESPONSIBILITIES

As the builder, you shall:

- Design and construct your homes to include the Program Requirements.
- Remain solely responsible for the design and construction of your homes.
- Ensure that your subcontractors understand their responsibilities in meeting the Program Requirements. This shall include ensuring that your subcontractors have completed the *Environments For Living*<sup>®</sup> field training. It may also include amending your current agreements with subcontractors to reflect new responsibilities.
- Make any adjustments in the sequencing of trades needed to ensure that the Program Requirements are followed.
- Ensure that all applicable building codes are satisfied.
- Contact the *Environments For Living* headquarters if you believe there is a Program Requirement that conflicts with a building code requirement in your location.
- Comply with the requirements of the current International Energy Conservation Code (IECC) for all items not addressed in the Program Requirements if you build in an area with no building code in effect.
- Comply with the "Identity & Usage Guide" published by the program.
- Design Alternatives: Builder may propose to the Program for review and approval in the Program's sole discretion specifications that provide equal or greater performance than the Program Requirements.

Working together, it is our goal to provide your customers with a more comfortable and more energy-efficient home. The *Environments For Living* program provides homes with benefits beyond the energy and comfort guarantees that are available.

Homes that meet the *Environments For Living* requirements have increased durability, enhanced indoor air quality, and manage excess internal moisture better than conventionally designed and constructed homes that fail to meet the program's performance criteria and fail to incorporate the Program Requirements.

### Framing

There shall be an air barrier\* enclosing the conditioned space.\*\* Air barrier continuity is required throughout the structure, including at features such as knee walls, soffits, garage interfaces, intersecting walls, tubs and showers, and dropped ceilings. All exterior sheathings must be a rigid material capable of stopping airflow. It is recommended that roof sheathings include a reflective barrier except when cathedralized insulation strategies are implemented. (Note: radiant barrier side must face the air space.)

Special attention should be paid to the Capillary Break between foundations and masonry to wood transitions.

\*Air barriers define the location of the pressure boundary. The pressure boundary is defined as that location where 50% or more of the air pressure drop across an assembly occurs.

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*\*\* The conditioned space is that area within a building provided with heating and/or cooling systems capable of maintaining a minimum of 50 degrees F during the heating season and a maximum of 85 degrees F during the cooling season, or communicates directly with a conditioned space. (Reference: International Residential Building Code for One- and Two-Family Dwellings, 2000.)*

## Air Tightness

The air barrier separating the conditioned space from non-conditioned space shall be continuous. Depending on the program level, homes shall meet the following performance criteria for air tightness:

**Gold** = The lesser of .30 cfm or less per square foot of envelope area at 50 pascals or  $\leq$  2012 IECC ACH50 target in jurisdictions that have adopted the 2012 IECC code.

**Certified Green, Platinum and Diamond** = The lesser of .25 cfm or less per square foot of envelope area at 50 pascals or  $\leq$  2012 IECC ACH50 target in jurisdictions that have adopted the 2012 IECC code.

*cfm = cubic feet per minute*

All homes shall be measured using a blower door, following the test protocol described in the *Environments For Living*® program's Testing Protocol.

### Pre Drywall

- Holes shall be sealed with a material capable of stopping airflow. Fibrous insulation shall not be used as an air barrier in any application.
- All penetrations in the top and bottom plates shall be sealed, including bottom plates to concrete slabs.
- All soffits, chases, drop ceilings, stairways on exterior walls, fireplaces, double walls, and tub and shower surrounds shall be capped with a rigid material capable of stopping airflow and be air sealed.
- All vertical walls shall receive a 6-sided assembly.
- The insulation in knee walls shall be fastened in such a way that it will be in physical contact with the drywall/air barrier.

### Post Drywall

- Penetrations through drywall shall be sealed with a material capable of stopping airflow.

## Thermal Envelope

- Insulation shall be installed according to manufacturer's specifications, which include attention paid to gaps, voids, compression and wind intrusion.
- Insulation and the air barrier shall be installed in physical contact with each other.
- When state and local code allows, crawl spaces shall be constructed as a tempered space
- Separate from the outside and sub-soil atmospheres.
- Where vented crawl spaces are required, the thermal, air and vapor control shall be in the floor between the crawlspace and the conditioned area.
- Windows shall have a solar heat gain coefficient (SHGC) of 0.40 or lower in Zones 4-8 and 0.25 or lower in Zones 1, 2 and 3.

- Windows shall have an overall U-value as certified by the National Fenestration Ratings Council (NFRC) of .32 or lower in Zones 4-8 and .40 or lower in Zones 2 and 3 and .55 or lower in Zone 1. Climate regions shall be defined in the Department of Energy Climate Map.

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## MECHANICALS

### Heating and Cooling System Design and Performance

- Mechanical systems shall be sized according to the ACCA Manual J<sup>®</sup>. Room-by-room load calculations using the ACCA Manual J shall be submitted to TopBuild Home Services for each plan at time of submittal of plans for plan review to verify sizing.
- Furnaces, water heaters and boilers within the conditioned spaces (including basements) shall be sealed combustion or power vented units. All other combustion appliances shall be vented to the outside. Ventless fireplaces or space heaters are not allowed.
- Airflow to each room shall match designed airflow calculations from the ACCA Manual J to within +/- 10% of either:
  1. The average requirements for that room based on the average of four orientations of that specific home/floor plan, or
  2. The requirements for that specific home and orientation.
- Airflow across the indoor coil and/or heat exchanger shall conform to the manufacturer's specifications.
- Refrigerant charge shall be installed per the manufacturer's specifications.
- Inert gas (nitrogen) shall be used during any brazing/soldering of refrigerant lines.
- Indoor and outdoor HVAC system components shall be "matched" according to the ARI Directory.
  - Featured Product - Lennox<sup>®</sup> ENERGY STAR<sup>®</sup> qualified products†

### Ducts

- Air supply and distribution ducts located in non-conditioned spaces shall be insulated with a minimum of R-6.
- All duct connections shall be sealed with an Underwriters Laboratories (UL)-listed mastic product.
- All supply and return boot-to-house connections shall be sealed with a UL-listed Class 1 pliable sealant such as mastic or caulk.
- Homes shall be measured with a duct test rig using the test protocol described in the *Environments For Living<sup>®</sup>* program's Testing Protocol.
- Depending on the program level, homes shall meet the following performance criteria for duct tightness:

#### Duct Leakage to Outside

- All program levels refer to Gold, Certified Green, Platinum and Diamond.
- All program levels shall have 3% of the conditioned floor space in cubic feet per minute or less at 50 pascals

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### **Total Duct Leakage**

- All program levels shall not exceed 4% of the conditioned floor space in cubic feet per minute at 25 pascals.
- Exception: If ducts and mechanical systems are 100% within conditioned space, total leakage shall be 7% or less of the conditioned floor space in cubic feet per minute at 25 pascals.

### **Ventilation**

- Outside air shall be provided and measured in every home at a minimum rate of 5.0 cfm per person plus .01 cfm per square foot of conditioned floor area. Persons per home shall be calculated using the sum of the number of bedrooms plus one. Outside air requirements shall not exceed the minimum rate requirement by more than 10% unless accounted for in the designed load calculations.
- Outside air supplied by supply-only or balanced ventilation systems shall be filtered and shall include a manual damper or other means of control.
  1. Outside air should have the ability to serve every room and occupant. Outside air should also have the ability to mix with inside air and have controls for intermittent cycling to homogenize (mix) the temperature throughout the structure appropriate for homeowner and climate zone.
  2. Controls to turn the ventilation system off in the event of unsatisfactory outdoor conditions (i.e. - areas subject to forest fires) should be made available to the homeowner.
- All kitchens shall have a spot ventilation system located at the cooking station(s) capable of exhausting 100 cfm to the outside.
- All bathrooms shall have a ventilation system capable of exhausting 20 cfm continuously or 50 cfm intermittently to the outside.

### **Pressure Balancing**

All rooms within the conditioned space - except baths and laundry - shall not exceed +/- three pascals pressure differential with respect to the outside when interior doors are closed and the air handler is operating. Additional returns, transfer grilles, or jump ducts may be needed to balance each room.

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## CARBON MONOXIDE DETECTORS

Hardwired and/or removable (plug-in type) carbon monoxide (CO) detectors shall be installed as follows in houses having attached garages, fireplaces, wood stoves or combustion appliances:

- Removable detectors shall be installed within one foot of the ceiling (manufacturer must approve this location). A minimum of one detector per house level or story is required.
  - Alarms shall be placed near or outside each sleeping area (one alarm can serve the typical three bedrooms at the end of a hall).
  - In homes with two or more sleeping areas, one alarm for each area is required.
  - Any bedroom having a fireplace shall have one alarm in the room in addition to the alarm outside that room.
  - Homes with elevators that open to a garage must have one alarm near each elevator door opening to the interior of the residence.
  - Detectors shall be installed in accordance with manufacturer's recommendations
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## INTERNAL WATER MANAGEMENT

The following is the general list of the required plumbing products and appliances to comply with the Program Requirements:

- Low-flow Shower Heads- 2.0 gallons per minute (gpm) at 80 psi.\*
- Low-flow Faucets- Bath 1.5 gpm and kitchen 2.2 gpm at 60 psi (ANSI/ASME A112.18.1)
- High-Efficiency Toilets- 1.28 gallons per flush and a minimum 350 gram media clearing. [http://www.epa.gov/watersense/docs/spec\\_het508.pdf](http://www.epa.gov/watersense/docs/spec_het508.pdf)
- High-Performance Clothes Washers (if installed by builder)- must be ENERGY STAR<sup>®</sup> qualified and must have a water factor no greater than 6.0.
- Energy-Efficient Dishwashers (if installed by builder) must be ENERGY STAR qualified.

*\*The total flow rate is tested at 80 psi per ASME A112.18.1/CSA B125.1; and showers are equipped with an automatic compensating valve that complies with ASE 1016 or ASME A112.18.1/CSA B125.1 and is specifically designed to provide thermal shock and scald protection at the flow rate of the showerhead being used.*

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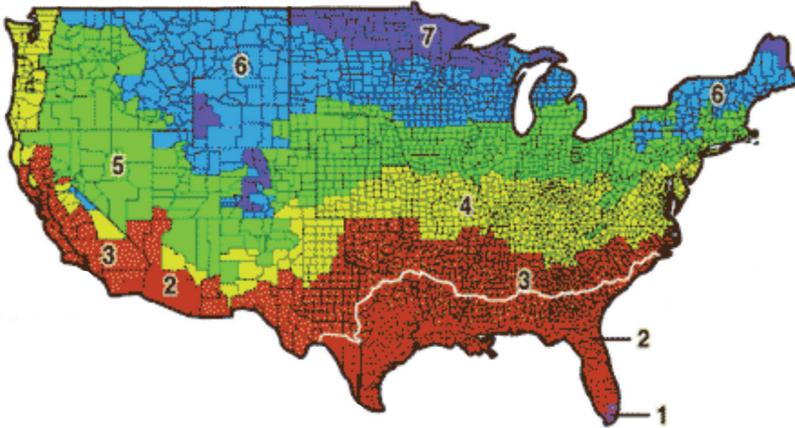
## MOISTURE MANAGEMENT

- Water management shall be provided as specified in the EEBA Water Management Guide.
- Moisture that enters building assemblies shall be allowed to dry either to the interior, exterior or both sides.
- Low permeance paints (less than one perm, ASTM E96), vinyl wallpaper, sheet polyethylene, foil-backed gypsum board, or any other low permeance material (less than one perm, ASTM E96) shall not be used on the interior of walls and ceilings in Zones 1-3. Very low permeance materials (less than 0.1 perm, ASTM E96), such as

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polyethylene, shall not be used on the interior of walls and ceilings in Zones 4-5.

- Climate regions shall be defined by the Department of Energy Climate Map:



For more information regarding the above, contact us at 1-866-912-7233, or visit [environmentsforliving.com](http://environmentsforliving.com).

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## TESTING PROTOCOL

Homes will be tested for duct tightness, air tightness and pressure balancing. Visual inspections shall be done for framing, thermal envelope, ventilation and carbon monoxide detectors for the Program Requirements.

Duct tightness shall be measured using a duct test rig and meet the Program Requirements for the level of participation. Air tightness and pressure balancing shall be measured using a blower door test rig and meet the Program Requirements for the level of participation. All tests and inspections will be performed by a party authorized by the *Environments For Living*® program.

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## TESTING FREQUENCY

### Gold and Platinum Production Homes

The first two production homes of each plan within a subdivision will be tested and inspected for compliance with the Program Requirements.

### Custom and “Plus” Homes

All homes shall be tested and inspected for compliance with the Program Requirements.

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## BEYOND Homes

All homes (100%) will be tested for duct tightness and pressure balancing. Visual inspections shall be done for framing factor, air barrier integrity, thermal envelope integrity, flashing details, ventilation, carbon monoxide detectors, internal efficient water use details, efficient lighting and ENERGY STAR® qualified appliances.

## Certified Green Homes

All homes (100%) will be tested for duct tightness, air tightness and pressure balancing. Visual inspections shall be done for framing efficiencies, air barrier integrity, thermal envelope integrity, flashing details, ventilation, carbon monoxide detectors, internal efficient water use details, efficient lighting and ENERGY STAR® qualified appliances.

Builder must allow an *Environments For Living* program approved tester to perform 100% of the testing and inspections above as required by the program.

Quality Management Process approved by the *Environments For Living* program — For any such Quality Management Process, the builder will be solely responsible for testing and inspecting 100% of all homes by a tester approved by the program for compliance with the *Environments For Living® Certified Green* Program Requirements. In addition, 15% of all homes in a subdivision must be tested by the program. The Quality Management Process is only available for subdivisions committing over 100 homes to the *Environments For Living Certified Green* program.

The *Environments For Living* program reserves the right to amend the testing frequency as may be necessary to assure compliance with these program requirements, in which case additional fees may be required.

# ***ENVIRONMENTS FOR LIVING*<sup>®</sup> BEYOND PROGRAM**

The *Environments For Living*<sup>®</sup> BEYOND program is designed to help you with today's challenging construction landscape. New code requirements along with growing homeowner expectations for more sustainable durable, energy efficient homes adds pressure to your construction practices. The Program offers an integrated approach to residential construction that combines innovative systems-centric solutions and superior support services to help you reach an extraordinary level of energy efficiency and sustainable construction.



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## COMPLY WITH THE ENVIRONMENTS FOR LIVING PROGRAM REQUIREMENTS

In addition you must comply with the following:

### Achieve a Home Energy Rating System (HERS) Index score:

Achieve a Home Energy Rating System (HERS) Index score:							
Climate Zone	1	2	3	4	5	6	7
Energy Rating Index score	52	52	51	54	55	54	53

Or Achieve 15% above 2015 International Energy Conservation Code

### Framing

Framing factor\* not to exceed 16% of the total wall area occupied. Prescriptively, use/integrate the following construction methods: Single plate, Studs 24" on center, Slip California or 3 stud corners, reduced cripple and jack studs

\*Framing factor expresses a percent of the total wall area occupied by framing members

### Air Tightness

- Homes shall have infiltration rates  $\leq 3$  ACH 50 target.

## Thermal Envelope

The insulation requirements are in the table below:

Climate Zone	1-2	3	4	5	6-7
Crawl & Basement Walls	None	R-5ci** or R-13 cavity	R-10ci** or R-13 cavity	R-15ci** or R-19 cavity	
Flat Ceiling	R-30	R-38	R-49		
Floors	R-19			R-30	
Roof Deck	R-21	R-30		R-49	
Slab Insulation	None	R-5	R-10, 2ft		R-10, 4ft
Walls	R-13 cavity + R-2ci** or R-5 CMU	R-13 cavity + R-5ci**		R-20 cavity + R-5ci or	

\*\*ci - continuous insulation

- Windows shall have an overall U-value as certified by the National Fenestration Ratings Council (NFRC) of .34 or lower in Zones 5-7 and .35 or lower in Zones 3 and 4 and .40 or lower in Zone 1 and 2. Climate regions shall be defined in the Department of Energy Climate Map.
- Homes with a total window-to-floor area greater than 18% shall have an efficiency offset from the building envelope.
  - Featured product- Neopor® graphite-enhanced rigid thermal foam insulation, WALLTITE®- HP closed-cell, spray-applied polyurethane foam system

## Mechanicals

- All filters must have a Minimum Efficiency Reporting Value (MERV) of eight.
- Air ducts and mechanical systems must be located within conditioned space.

## Internal Water Management

- Incorporate a Structured Plumbing Design or Demand Circulation Loop in the plumbing plan see [http://www.epa.gov/watersense/docs/newhome\\_builder\\_resource\\_manual508.pdf](http://www.epa.gov/watersense/docs/newhome_builder_resource_manual508.pdf) for more information.

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## Moisture Management

- Moisture that enters building assemblies shall be allowed to dry either to the interior, exterior or both sides.
- Drying strategy must be identified.

## Control Layers

- Four primary control layers water, air, vapor and heat work together as a continuous integrated system to offer enhanced building performance relating to comfort, health and durability.
- Control layers must be identified.

## Lighting and Electrical

- At least 90% of hard-wired lights must be compact fluorescent or LED
- At least one labeled electrical outlet in all bedrooms, and two outlets in common areas, must be operated by individual miscellaneous electric load designated switches, in order to allow homeowner to manage electric loads (e.g., TVs, computers, battery chargers, entertainment systems).
- Home(s) must be designed for easy incorporation of alternative energy systems at a later date and be wired as solar-ready.

## ***ENVIRONMENTS FOR LIVING***<sup>®</sup> ***CERTIFIED GREEN PROGRAM***

The *Environments For Living Certified Green* program is designed to have homes built in accordance with the program achieve an energy-efficiency level equal to a reduction of carbon dioxide (CO<sub>2</sub>) emissions and a reduction in internal water usage of 20%, and the home must achieve a Home Energy Rating System Index of 68 or less (20% more energy efficient than the 2009 International Energy Conservation Code).



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## COMPLY WITH GOLD LEVEL PERFORMANCE

In addition you must comply with the following:

### Framing

Optimum Value Engineering\*\*\* techniques should be applied whenever possible to reduce the amount of wood used for framing. Also, whenever possible, certified wood and wood-based materials from a sustainable forest should be used (see attachment A for approved certification programs). Remember that special attention should be given to details that have an environmental impact.

\*\*\* *Optimum Value Engineering (OVE) is a logical framing design that reduces the lumber requirements without sacrificing structural integrity.*

### Thermal Envelope

Use insulation products that are GREENGUARD® Indoor Air Quality Certified ([www.greenguard.org](http://www.greenguard.org)), or the builder must demonstrate through third-party verification its alternative insulation product (a) meets the emissions standards of GREENGUARD or (b) has been manufactured from at least 75% recycled content.

- Featured Product- Qualified Owens Corning® insulation products†

### Mechanicals

#### Heating and Cooling System Design and Performance

In Climate Zones 1-3, minimum efficiency for air conditioning or heat pumps shall be 14 SEER; minimum efficiency for heating equipment shall be 80% AFUE for furnaces. In Climate Zones 4-8, minimum efficiency for air conditioning or heat pumps shall be 13 SEER; minimum efficiency for heating equipment shall be 90% AFUE for furnaces. Heat pumps shall have a minimum efficiency of 8.2 HSPF.

- Featured Product- Lennox® ENERGY STAR® qualified products†

#### Ventilation

Outside air shall be filtered and include a manual damper or other means of control. All filters must have a Minimum Efficiency Reporting Value (MERV) of eight or greater or an approved electronic air cleaner.

### Internal Water Management

In addition to the water management requirements as shown in the general Program Requirements, the following list of plumbing products and appliances are required as part of the *Environments For Living® Certified Green* program:

- High-Performance Clothes Washers — Must be ENERGY STAR® qualified and must have a water factor no greater than 6.0.
- Energy-Efficient Dishwashers — Must have a capacity greater than or equal to eight settings and six serving pieces. Compact dishwashers are not eligible.

*Note: Builders may submit alternative water strategies to reduce internal water use by at least 20% to the Environments For Living® Certified Green program's Ecoevaluation™ Plan Review process for review and approval.*

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## Appliances

Appliances must be ENERGY STAR® qualified. The appliance package must include energy-efficient refrigerators, dishwashers and clothes dryers.

- Featured Product- GE ENERGY STAR® qualified appliances†

## Water Heating

Water heaters shall have a minimum overall Energy Efficiency Rating Factor (EF) as determined by the Department of Energy greater than or equal to:

GAS		ELECTRIC	
Size (Gallons)	Energy Factor	Size (Gallons)	Energy Factor
30	0.64	30	0.95
40	0.62	40	0.91
50	0.60	50	0.91
Whole Home Tankless	0.82		

Water heaters in the conditioned space or in a basement shall be sealed combustion or power vented units.

### Tankless Water Heaters

- Shall provide a minimum of 3.5 gpm with a 77°F rise.
- Shall be able to provide a continuous supply of hot water at a minimum 0.5 gpm; or
- When tankless water heaters are used, the builder/plumber must consult with the manufacturer about proper design to pass the following tests, provide copies of the manufacturer's recommendations at plan review, and provide a certification that these tests have been run and successfully passed at closing:
  - "Cold sandwich" - Run a lavatory faucet until hot water arrives at the sink, then turn off the faucet. After one minute, run the adjacent tub/shower valve for five minutes. The system shall deliver continuous 105°F mixed shower water, with no "cold sandwich."
- Continuous Shower supply-The plumbing system design shall supply 95°F water to each shower for five minutes.
- If the water heater you wish to use is not listed above, please call the *Environments For Living® Certified Green* program's Customer Service Department at 1-866-912-7233.

## Indoor Environmental Quality (IEQ)

- Homes where carpet exceeds 70% of the conditioned floor area shall have an approved central vacuum system.

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- Carpet products shall carry the Carpet and Rug Institute (CRI) Green Label Plus for indoor air quality.
  - Carpet must be type 6 Recyclable Continuous Filament Nylon. (This program requirement does not relate to Indoor Environmental Quality.)
  - Carpet must be certified by the Federal Housing Administration (FHA) and meet specific FHA construction guidelines with a minimum 25 oz. per sq. yd. face weight.
  - Carpet must have a durability rating of 3.25 points or higher on the CRI approved Contract Walker Accelerated Wear test. Based on a 1-5 rating scale.
  - Tack strips or factory supplied non-wet, low-Volatile Organic Compound (VOC) adhesives shall be used to install carpet.
  - Urea-formaldehyde wood products shall not be used under carpets.
  - Interior paints must contain low levels of VOCs, be durable, have good hiding properties and conform to the following:
    - Interior paint limits shall be 50g/L for flats and non-flats, un-tinted.
    - Primers shall not exceed 100g/L VOC (All VOC levels determined on a product minus water basis).
    - Interior paints shall exhibit a minimum of 400 scrubs before failure by ASTM D2486-89.
    - Paints must have a contrast ratio of 0.95 at 400 ft<sup>2</sup>/gal as determined by ASTM D2805-88, using a white paint with a reflectance of at least 80%.
  - Composite products located inside the conditioned space must meet HUD's formaldehyde emission standard or be sealed with laminates or sealers.
  - If sealing is impractical, composite materials that use phenol-formaldehyde glues shall be used.
  - Cabinets must be constructed of composite panels that meet the standards of the Kitchen Cabinet Manufacturers Association Environmental Stewardship Program ([www.kcma.org](http://www.kcma.org)), and the Composite Panel Association Environmentally Preferable Product Specification (CPA 03-08) ([www.pbmdf.com](http://www.pbmdf.com)). Although not related to Indoor Environmental Quality, cabinets also must be constructed from wood that is certified from a sustainable forest or they must be manufactured in a facility compliant with the ISO 14001 Environmental Management System.

## Lighting

- At least 60% of hard-wired lights must be compact fluorescent or LED.
- Recommend use of dimmer switches for all non-fluorescent fixtures, allowing the homeowner to reduce watt usage.

## Photovoltaic/PV Installations

Homes that include a photovoltaic (PV) system must meet the following additional requirements:

- At least 75% of hard-wired lights must be compact fluorescent or LED. Homes must achieve a Home Energy Rating System (HERS) Index of 75 or less (25% more energy efficient than a home built to the 2006 IECC).

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## ADDITIONAL RECOMMENDED PRACTICES:

### Engineered Plumbing System Design

We highly recommend applying one of the plumbing system designs below to achieve further water savings in minimizing the water wasted waiting for hot water, which will also benefit homeowner convenience. (These system descriptions are used in NAHB Green Building Standard, USGBC's LEED for Homes, and other Green Building documents. The criteria for cups of water volumes are converted to feet of pipe for different materials in the chart on the next page.)

#### Central Core System

- The water heater shall be centrally located.
- The water volume contained between the water heater outlet and in any pipe run to a fixture fitting outlet shall be no more than 0.375 gallons (six cups = 87 cubic inches).
- Hot water pipe shall be insulated with at least a rating of R=4.

#### Manifold or "Home Run" System

- The pipe run length from the water heater to the manifold shall not be more than five feet.
- The water volume contained in any pipe run from the manifold to any fixture fitting outlet shall be no more than 0.375 gallons (six cups = 87 cubic inches).
- Hot water pipe shall be insulated with at least a rating of R=3.

#### Remote or "Sub-manifold" System

- The water volume contained between the water heater outlet and in any pipe run to a fixture fitting outlet (including the remote or sub-manifold) shall be no more than 0.375 gallons (six cups = 87 cubic inches); or,
- If the trunk or branch line running to the sub-manifold causes the volume to exceed three cups, a demand-controlled hot water recirculation system must be used between the water heater and the manifold and the water volume contained in any pipe run from the manifold to any fixture fitting outlet shall be no more than 0.25 gallons (four cups = 58 cubic inches).

#### Standard Trunk, Branch, Twig System

If the water heater location and size of home do not allow for a central core design, and neither the Home Run Manifold or Remote Sub-manifold systems are used, a standard trunk, branch and twig system shall be used with the following requirements:

- A demand-controlled hot water recirculation loop shall be installed on the trunk line and/or branch leading to the fixture fitting outlet farthest from the water heater, such that no fixture fitting outlet pipe run from the trunk or branch to the outlet has a volume larger than 0.25 gallons (4 cups = 58 cubic inches).
- Hot water pipe shall be insulated with at least a rating of R=3.

## Definitions:

Demand Controlled Hot Water Recirculation – a pump located either at the water heater or end of the system to prime the hot water piping, which is triggered on-demand by either manually (push button or switch) or by sensing presence of a person at the location where hot water will be needed for bathing, cooking or hand washing.

### CUPS OF WATER VOLUME PER FOOT OF PIPE

Nominal Pipe Diameter	3/8	1/2	3/4	1
Copper	8	5	2.5	1.5
PEX	12	6.6	3.3	2
CPVC	n/a	6.4	3	1.8

*Standard setting bodies, references and government agencies referenced in this document are not affiliated with or sponsors of the Environments For Living® Certified Green program.*

## Attachment A:

### Approved Certified Wood Sources

- A. The Sustainable Forestry Initiative® Program
- B. The American Tree Farm System®
- C. The Canadian Standards Association's Sustainable Forest Management System Standards (CAN/CSA Z809)
- D. Forest Stewardship Council (FSC)
- E. Program for the Endorsement of Forest Certification Systems (PEFC)

## OPTIONAL PROGRAMS

### ecomagination<sup>sm</sup> Homebuilder Program®

In addition, the *Environments For Living Certified Green* program requires builders who choose to participate in the GE ecomagination Homebuilder Program will need to incorporate the following into their homes:

- Advanced Lighting — At least 60% of each home's lighting fixtures must be ENERGY STAR® qualified GE compact fluorescent lamps (CFLs).
- All appliances must be qualified GE ENERGY STAR® appliances that deliver significant energy and water savings.

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## Indoor Environmental Quality (IEQ)

As an option, builders may also 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. IEQ equipment requirements include the following Lennox® equipment:

- Variable Speed Furnace (G61V or G60V)
- Healthy Climate® ERV/HRV—ERV for warm/humid climates; HRV for cooler climates (ERV1–150/HRV1-150)
- Healthy Climate® Pure Air™ Purification system (PCO-20C)
- Healthy Climate® HEPA Bypass (HEPA-40/60) True HEPA — 99.97% efficient
- Healthy Climate® Germicidal Lamp UV-2000 — 2000 microwatts
- Evaporator coil with foil faced insulation and a composite drain pan incorporating MicroBan®, or blower coil with a composite drain pan incorporating MicroBan® option
- Healthy Climate® Power Humidifier for cold/dry climates (WP2–18)

For additional information, visit [www.lennox.com](http://www.lennox.com).

## Optional Acoustic Comfort Package

- As an option, builders can elect to install an Acoustic Comfort Package. In the event a builder elects to install this package, there shall be an acoustical insulation product and acoustical sealant in the walls, ceilings and floors of the master bedroom, bathrooms and laundry rooms of the home. The acoustical sealant shall be applied around all electrical outlets and switch boxes in the walls and at the bottom plate. In addition, the doors on each of the rooms must be a solid core door. These building practices will raise the Sound Transmission Coefficient performance of the room to within 37–39. For additional information, visit [www.owenscorning.com/quietzone/quietzone.asp](http://www.owenscorning.com/quietzone/quietzone.asp).

# FEE STRUCTURE

## 1. THE ECOVALUATION<sup>SM</sup> PLAN REVIEW

All *Environments For Living*<sup>®</sup> program homes require an “*Ecovaluation Plan Review*,” a process of evaluating the energy use of the new home, the carbon emissions and the cost to the builder participating in the Program. Each model will undergo an *Ecovaluation Plan Review* to determine the guaranteed heating and cooling energy use as well as where the home qualify for federal, state, local and utility incentives which will be factored into a cost analysis.

***Ecovaluation Plan Review fees are:***

- \$350 per production\* plan
- \$550 per custom plan

If you have any questions concerning appropriate fee amounts or need to know where to send plans for *Ecovaluation Plan Review*, please call the *Environments For Living* program’s Customer Service Department at 1-866-912-7233 or email [eflplaneview@topbuild.com](mailto:eflplaneview@topbuild.com).

*\*Minimum of 100 homes per year to qualify for the production price.*

## 2. THE GUARANTEE PACKAGE AND ENERGY STAR<sup>®</sup>

Pricing varies by type and number of homes dedicated to the program. Contact the *Environments For Living* program’s Customer Service Department at 1-866-912-7233 or visit [environmentsforliving.com](http://environmentsforliving.com).

### Each guarantee package includes the following:

	PROGRAM LEVELS				
	Gold	Platinum	Certified Green	Diamond	Beyond
Limited Heating & Cooling Energy Use	✓	✓	✓	✓	✓
Guarantee	✓	✓	✓	✓	✓
Limited Comfort Guarantee	✓	✓	✓	✓	✓
Performance Testing (Framing, Insulation, Blower Door/Duct Blaster)	✓	✓	✓	✓	✓
Home Energy Rating <sup>3</sup> (HERS)	75	70	68	65	55*

*\*See page (INSERT) for additional information for your climate zone*

## ENERGY STAR® Testing and Guarantee Package

	Production <sup>1</sup> 15% Sampling <sup>2</sup>	Production <sup>1</sup> 100% Testing	Custom Builders	Beyond
ENERGY STAR® Performance Testing	✓	✓	✓	✓
Limited Heating & Cooling Energy Use Guarantee	2 years	3 years	3 years	3 years w/ 10 year option
Limited Comfort Guarantee	2 years	3 years	3 years	3 years w/ 10 year option
	\$300/home	\$600/home	\$700/home	\$700- 990/home

## Limited Guarantee Package ONLY

	Production <sup>1</sup> 15% Sampling <sup>2</sup>	Production <sup>1</sup> 100% Testing	Custom Builders	Beyond
Performance Testing	✓	✓	✓	✓
Limited Heating & Cooling Energy Use Guarantee	2 years	3 years	3 years	3 years w/ 10 year option
Limited Comfort Guarantee	2 years	3 years	3 years	3 years w/ 10 year option
	\$250/home	\$565/home	\$650/home	\$650-\$905/ home

<sup>1</sup> Minimum of 100 homes per year to qualify for the production price.

<sup>2</sup> Residential Energy Services Network (RESNET) national standards for sampled ratings will be followed. For details see chapter 6 of the RESNET Mortgage Industry National HERS Standards document found at: [www.resnet.us/standards](http://www.resnet.us/standards).

<sup>3</sup> The HERS Index is a scoring system established by Residential Energy Services Network (RESNET), a third party, in which a score of 100 is what a standard new home built to 2006 IECC would score, while a score of 0 is a new home that has netzero energy use. The HERS Index score shown is calculated for the home plan as designed, not as built, using software approved by RESNET. The software assumes certain conditions and requires inputs specified by RESNET. The actual energy efficiency of your home as built, and your energy use, will vary depending on, among other things, occupancy, location, orientation, and specific as built features and characteristics, and may be higher or lower than the HERS Index score shown above. TopBuild Home Services, Inc. does not guarantee the actual HERS Index score for the home as built. The HERS® Index is a registered trademark of RESNET.

<sup>4</sup> If you build in California or Florida, please contact us for pricing, as we do not offer ENERGY STAR® certificates or labels in those states.

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## Each guarantee package includes the following:

- Limited Heating & Cooling Energy Use Guarantee  
Each home will receive a limited heating and cooling energy use guarantee. See guarantee for further details and limitations.
- Limited Comfort Guarantee  
Each home will receive a limited comfort guarantee. "Comfort" means that the temperature at the location of the thermostat will not vary more than 3 degrees from the center of any conditioned room within that thermostat zone. See guarantee for further details and limitations.
- Homeowner Manual (pdf)
- Emissions Statement & Certificate of Compliance (Certified Green Program only)
- Sales Training – As offered by the program
- Field Training – As offered by the program

## Marketing

Builders will receive five coroplast signs with stakes, 100 consumer brochures and a video for each subdivision. Customized signs and additional collateral materials may be purchased from Environments For Living®. ENERGY STAR® marketing materials are available to builders participating at the Gold, Platinum and Certified Green levels. Become an ENERGY STAR® partner and take advantage of marketing materials online at [www.energystar.gov](http://www.energystar.gov).

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## 3. INCREMENTAL CONSTRUCTION COST

As bid. See Program Requirements and Plan Review.

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# FREQUENTLY ASKED QUESTIONS



## **Q: WHO IS BEHIND THE *ENVIRONMENTS FOR LIVING*® PROGRAM?**

A: TopBuild Home Services, Inc., a TopBuild Company offers the *Environments For Living* program and the *Environments For Living*® *Certified Green* program to builders. Participating builders must meet the program requirements in order to qualify their homes.

## **Q: DOES THE *ENVIRONMENTS FOR LIVING* PROGRAM REQUIRE THE USE OF TOPBUILD PRODUCTS, OR ANY OTHER MANUFACTURERS PRODUCTS?**

A: No. The *Environments For Living* program is performance based, not product based. Builders are free to use any products that meet the program requirements except if the builder decides to participate in the ecomagination<sup>SM</sup> Homebuilder Program®.

## **Q: WHAT IS THE DIFFERENCE BETWEEN THE *ENVIRONMENTS FOR LIVING* PROGRAM AND THE *ENVIRONMENTS FOR LIVING* CERTIFIED GREEN PROGRAM?**

A: All *Environments For Living* programs and levels require greater energy efficiency than conventional code-built homes, and all have building science-based requirements that result in enhanced durability, and indoor water efficiency and environmental quality. However, the *Environments For Living Certified Green* program adds additional indoor water efficiency, and appliance and lighting efficiency to achieve even more homeowner and environmental benefits.

## **Q: WHAT IS THE ECOMAGINATION<sup>SM</sup> HOMEBUILDER PROGRAM®, AND MUST I USE GE PRODUCTS IN ORDER TO PARTICIPATE IN THAT PROGRAM OR THE *ENVIRONMENTS FOR LIVING* CERTIFIED GREEN PROGRAM?**

A: The ecomagination Homebuilder Program is an option builders may use to leverage the brand power of GE and ecomagination. Under that option, GE products are required.

However, the *Environments For Living Certified Green* program does not require the use of GE products, or any particular manufacturer's products.

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**Q: WHAT IS THE DIFFERENCE BETWEEN THE *ENVIRONMENTS FOR LIVING*® *CERTIFIED GREEN* PROGRAM AND OTHER GREEN BUILDING PROGRAMS?**

A: In terms of structure, a key difference is that the *Environments For Living Certified Green* program is performance based, while other programs are typically “checklist” programs whereby builders earn points in various categories. The *Environments For Living Certified Green* program, as with most green building programs, includes requirements for energy efficiency, resource/ material efficiency, water efficiency, indoor environmental quality and homeowner education. The one area our program does not include is site planning, because this does not fit into our performance-based structure. Builders can look to any number of local and national green building guidelines to incorporate site planning in their building plans.

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**Q: CAN I PARTICIPATE IN THE *ENVIRONMENTS FOR LIVING CERTIFIED GREEN* PROGRAM IF I AM ALSO PARTICIPATING IN MY LOCAL HOME BUILDERS ASSOCIATION’S GREEN BUILDING PROGRAM?**

A: Yes! The *Environments For Living Certified Green* program is designed to be complementary with other programs because we know that builders often desire more than one certification when they are building to higher standards than codes typically require.

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**Q: HOW DO I GET STARTED?**

A: It all starts with a plan review of the home or homes you intend to build. For assistance filling out the input sheet for your plan review, you can contact us at 1-866-912-7233 or via e-mail at [environmentsforliving@topbuild.com](mailto:environmentsforliving@topbuild.com). We will either forward you to a regional manager or a certified contractor in your area who can help you fill out the plan input sheet. The input sheet and your house plan(s) are then sent to our plan review center.

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**Q: WHAT IS PROVIDED IN THE PLAN REVIEW?**

A: The plan review provides you with the following:

- An energy performance analysis of your home plan(s) under the *Environments For Living*® program requirements.
- A comparison of the way your home plan(s) will perform under the *Environments For Living*® program requirements and the identification of any changes necessary for your home plan(s) to conform to the program requirements.
- An estimate of the costs required to meet the program requirements.
- A heating and cooling energy usage estimate.

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- The estimated amount of carbon emissions that will be reduced under the *Environments For Living*® program.

Based on the plan review and the Environments for Living program requirements, you can then bid your project to your subcontractors, just as you do currently.

If you decide to participate in the program you will need to sign our standard Project Agreement.

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**Q: WHAT ARE LIMITED GUARANTEES FOR HOMEOWNERS?**

A: The limited guarantee on heating and cooling energy use guarantees the amount of energy needed to heat and cool the home. The guarantee is for energy “use,” not cost. (We cannot guarantee the cost since we do not have any control over utility rates.) The comfort guarantee promises that the temperature at the location of the thermostat will not vary more than three degrees from the center of any conditioned room within the thermostat’s zone.

Please see the guarantee for complete details and limitations.

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**Q: WHO ISSUES THE LIMITED GUARANTEES?**

A: TopBuild Home Services, Inc. issues and administers all guarantees associated with the *Environments For Living* program.

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**Q: WHEN ARE THE LIMITED GUARANTEES ISSUED?**

A: As a matter of convenience, we issue the guarantee when you submit your housing start to us. However, you can’t provide the guarantee to the homeowner until the house is completed and has passed all applicable tests and inspections.

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**Q: WHY IS THE INSULATION BID MORE EXPENSIVE TO MEET THE PROGRAM REQUIREMENTS?**

A: Your current insulation and installation methods may provide you with a reliable thermal envelope to meet conventional building codes, but under the *Environments For Living*® program, meeting conventional code requirements is not enough. The program exceeds most current requirements and conventional codes in order to enhance performance. The change in insulation techniques and application requires a higher degree of quality, skill and time. Additional attention is given to the interaction between the air barrier system and the thermal envelope so that these components work in harmony. Changes in framing may be required to support modifications to application methods.

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**Q: HOW CAN I ENSURE THAT THE COMPLETED HOMES MEET THE PROGRAM REQUIREMENTS?**

A: The *Environments For Living*® program is designed to provide builders with maximum flexibility; however, with that flexibility comes responsibility. For a list of your responsibilities, please review this document thoroughly. After your obligations have been met, the program requires testing and inspections to verify that your home meets certain program requirements. To ensure that testing and inspection procedures are in compliance with the program, we have quality control measures that monitor all test and inspection results.

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**Q: WHAT INFORMATION DO I NEED TO PROVIDE WITH THE WEEKLY JOB SCHEDULE?**

A: The tester will use your weekly job schedule to arrange for the required testing. The schedule report should provide:

- A complete listing of each participating home, including lot number, block, physical address and model.
  - The date on which construction began/begins.
  - When the home will be available for testing.
  - When the completed home will be available for testing prior to closing.
- .....

**Q: WHO CAN I CONTACT IF I HAVE QUESTIONS ABOUT THE ENVIRONMENTS FOR LIVING PROGRAM?**

**A: CALL US TOLL-FREE AT 1-866-912-7233, OR VIA E-MAIL AT ENVIRONMENTSFORLIVING@TOPBUILD.COM.**

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## Sponsors

The developers of the *Environments For Living*® program are proud to list the following organizations among our sponsors:



† Builders are not required to use these "Featured Products."

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