2016 Single Family Rating

Guidebook

TABLE OF CONTENTS

INTRODUCTION

The Green Building Process

Great homes don't just happen - They are planned green from the start. Establishing sustainability goals during the design process ensures that you will be able to optimize the use of our services as a valuable resource. Congratulations on your commitment to build a green home. We look forward to working with you!

The Single Family Rating

The Austin Energy Green Building Single Family rating is made up of a series of Basic Requirements required for all rated projects and seven additional categories containing measures that can be achieved to attain points for a higher rating: Education, Site, Energy, Water, Indoor Environmental Quality, Materials and Resources, and Innovations.

Basic Requirements

All required measures must be fulfilled for a home to qualify for a rating. Compliance with all of these measures satisfies the requirement for a 1-Star rating (without any additional points needed from the other categories).

Measures for Points and Special Requirements

Once the required measures have been fulfilled, points can be earned for green measures implemented. No negative points are assigned for failing to implement a given measure. It is not possible for all of the recommended green building measures to be implemented in a given house; in fact, many are mutually exclusive. A minimum number of points is required for each star level beyond 1 Star, and specific measures, called Special Requirements, are required for each star level as well. These are indicated throughout the rating document next to the point totals (see key below).

1 Star Basic Requirements

2 Star 25- 49 Points plus all  requirements

3 Star 50 – 49 Points plus all  requirements

4 Star 75 - 99 Points plus all  requirements

5 Star 100 - Higher Points plus all  requirements

Innovations

Innovations address sustainable building measures not already covered in the other categories. You, the green building professional, may have your own suggestions you'd like to propose for consideration. AEGB welcomes ideas for further measures that may qualify for bonus points. List them in the Innovations section at the bottom of the worksheet and discuss their potential point value with your AEGB representative/rater.

This guidebook is a supporting document to the AEGB rating on the Online Rating System (ORS). It is intended to assist the project team in understanding the purpose or intent of each sustainable building measure and the requirements and documentation needed for compliance to earn points.

Verification and Documentation

Each measure in the guidebook has a Required Verification section that will indicate any required documentation for that measure. At a minimum, the following verification and documentation is required:

- Complete Manual J and Manual D report
- Rough inspection conducted by rater post-insulation and rough-in mechanical and pre-drywall

- Final inspection conducted by rater upon substantial completion
- Home performance testing by approved 3rd party inspector (also required by City of Austin) with documentation submitted to rater upon substantial completion

Getting Started

First:
Register for a single family orientation – once or twice monthly on demand. Contact the AEGB representative listed under your Team tab for dates.

Second:
Before attending the seminar:

- Log on to the AEGB Rating System at: https://www.greenbuildingsystem.austinenergy.com
- Create a User Profile for your Company: If you are not already registered, we need to know more about the services that you provide as well as contact information for the project professionals. You can update this information as needed, and we encourage you to do so regularly. (Should you elect to be part of our professional directory, this is the information that will be used.)

Last:
During or after the orientation:

- Start a New Project: The information that you provide about your project will enable us to verify that your project is eligible for a rating within our program, and assign the appropriate Rating and AEGB staff to the project.
- Accept the Terms and Conditions: Once AEGB has accepted the project and assigned AEGB representatives to your project, we will send you an e-mail requesting you log-on to the system and accept the Terms and Conditions for participation.
- Now that you have accepted the Terms and Conditions, you will find new tabs are available on the web page.
- "Worksheet" Tab: This is where you will find all of the specific information about the requirements for achieving and documenting points in the rating.
- "Team" Tab: Invite the other professionals working on the project to participate in the online AEGB Rating System. Click on "Add Team Member" In the "Select Organization" field begin typing the name of the organization you wish to add. The organization you are adding may already have a profile- it is important to select their name from the drop down menu, if it is available. Failure to do so will result in multiple profiles for an organization and confusion. If the team member you wish to add does not have a user profile, add them and include an e-mail address so that we can contact them.

DISCLAIMER

AEGB does not make any warranty (expressed or implied) or assume any liability or responsibility, to you or any third parties for the accuracy, completeness or use of, or reliance on, any information contained in the AEGB Single Family Guidebook. Any discrepancies between the AEGB Single Family Guidebook and online rating system are unintended and will be resolved by AEGB. Due to the dynamic nature of websites, please bring to the attention of AEGB any referenced websites that are non-functioning. Implementation of specific measures must be made in compliance with all current building codes and local, state, and federal regulations. Health and safety measures are not intended as medical advice.

BASIC REQUIREMENTS

1. Codes and Energy Performance

Intent
To build a green building rated home, which must comply, at a minimum to meet all current codes and laws associated with the built environment. These codes are in place to assure energy-efficient quality buildings and protect the health and safety of building occupants, our community, and the natural environment.

Requirements
All new construction residential buildings, as defined by the 2015 IECC as amended by the City of Austin, shall meet all current City of Austin Codes as amended, regardless of project location.

- City of Austin Energy Code compliance can be met by one of the following methods:
  - Minimum percentage above code required shall be 0% using International Code Compliance Calculator (IC3),

    OR
  - Maximum Energy Rating Index (ERI) value of 59.
- Comply with other City of Austin codes and ordinances, including but not limited to the following:
  - IRC with Austin amendments
  - Mechanical Code with Austin amendments
  - Plumbing Code with Austin amendments, including Austin Irrigation Design Criteria
  - Austin Visitability/Accessibility Ordinance, Ordinance No 20140130-21
  - Austin Tree Ordinance, Land Development Code (Chapter 25-8, Subchapter B)

Renovated Home:

- If ductwork is replaced or changed, it must meet requirements for new construction, including testing.

Required Verification

- Submit Austin-specific IC3 Energy Code compliance report
- Submit Residential Testing Report Form completed by the 3rd party testing contractor

References
City of Austin - Building Technical Codes, Amendments, & Interpretations
City of Austin - Tree Ordinance Development and Permitting
City of Austin - Visitability Ordinance
International Code Compliance Calculator (IC3)
Contractors for Energy Code Required Testing

2. HVAC Efficiency and Design

Intent
To reduce energy use and increase occupant comfort through energy-efficient and climate-appropriate design and appropriate sizing of mechanical cooling systems

Requirements

Meet all of the following:

- Cooling and heating equipment and duct sizing based on complete and accurate manual J and manual D calculations.
- Design home such that 600 sq. ft. of living space per ton of cooling is met. Homes smaller than 900 sq. ft. must be equipped with a mini-split or other appropriate system
- Cooling equipment minimum efficiency for split systems 15 SEER / 12 EER
    - Gas furnace rated at 80 AFUE or greater
    - Heat Pump rated at 8.2 HSPF or greater
- Ductwork is masked/sealed at supplies and returns during construction
- Ceiling registers: curved blade-type--fixed or adjustable

Required Verification

- Correct Manual J submitted
- Correct Manual D submitted
- Submit Air-Conditioning, Heating and Refrigeration Institute (AHRI) certificate for split systems. For mini-split or alternative system, submit website printout.

- Guidelines:
    SF Manual J Guidelines – Austin Energy Green Building
    - Select “Single-Family” in the Program Type dropdown box
    - Select “Manual J Inputs”

References

Air Conditioning Contractors or America
ACCA Approved Manual J Software
Air-Conditioning, Heating and Refrigeration Institute

3. Insulation Installation

Intent

To reduce energy use and increase occupant comfort through energy efficient and climate appropriate design

Requirements

Meet all of the following:

- Insulation installation meets 2015 IECC criteria and ENERGY STAR Grade I requirements, including insulated headers, 2-stud corners, and ladder blocking
- Insulation contains no added urea formaldehyde

Required Verification

- Site visit by AEGB staff

- Guidelines:
    Insulation Installation

- Proper installation requires that the building enclosure be insulated and air-sealed at walls and ceiling (and floors other than slab foundations in most cases) with continuous and contiguous application. One should be able to visually follow around and up and down the exterior walls, ceiling (or roof line, as may be the case), and most non-slab floors and see uninterrupted coverage.
- This includes kneewalls in attics, all of the wall area underneath staircases, exterior walls at tubs and showers, and the outside walls of exterior chases for fireplace flues or duct chases (not at the interior walls). Special care must be taken in regard to the floors of living spaces above garages (notorious for being neglected and therefore uncomfortable). Even though the joist/truss may be much larger/wider than the insulation installed, the insulation must touch the under-surface of the sub-floor above for it to be effective. Another frequently ignored area that must be insulated is the space between joist ends at the rim joist of a two-story home.
- The definition of ENERGY STAR "Grade I" must be met, which limits gaps, voids, and compressions to less than 2% overall. This is especially difficult when there are plumbing pipes, electrical wire, switch and outlet boxes, blocking, and other obstacles within the building cavities of the enclosure plane, that need to be insulated. It is extremely difficult to install batt insulation without compressing it or to make the cuts around those obstacles while trying to keep the insulation in contact with the air barriers and fill the cavities to provide a good thermal blanket.
- Insulation installed on the attic floor (blown, loose-filled) is not encased on its top side, so the depth of application must meet the required installation depth for the type of product being used to achieve the desired R-value. Air movement through loose-fill insulation is a problem in very cold climates (especially with fiberglass, which is lighter than cellulose), causing some loss of R-value, but is not considered a serious problem in Central Texas.
- Spray or "total fill" insulation systems automatically comply with the Grade I requirement if they fill the cavity of a 2x4-depth wall. These include systems such as damp-blown cellulose and fiberglass blown-in blanket, as well as all spray foam applications. Damp-applied cellulose installations must be allowed to dry completely prior to encasing them with air barriers.
- Of the two types of polyurethane foam, "open-cell" is most common in residential construction. This type of foam allows water to pass through so that roof leaks can be easily identified if they occur. "Closed-cell" foam is more common in commercial construction but is also used in homes. This type of foam does not allow water to pass through it. Polyurethane spray-foam insulation installed at the walls and/or the roof acts as its own air barrier, so no supplemental materials are required to encase it. If foam is left exposed in an attic, it may require an ignition barrier or special coating, especially if an air handler and/or water heater is present or if the space is to be used for storage. Check the installation requirements for the foam that you anticipate using.
- Rigid foam-board sheathing with an R-value of at least R-2 may be added to the exterior of the wall to reduce thermal bridging. This is required if metal framing is used.
- Air barriers must be stapled to the framing members at the outside perimeter and taped at all seams.

4. Skylights

Intent

To reduce heat gain and heat loss associated with skylights

Requirements

Meet one of the following:

- No skylights in the conditioned space

  OR

- Any skylights installed meet current ENERGY STAR criteria for SHGC and U-Factor

Strategies:

- Consider light tubes or windows placed high on vertical walls, well protected by overhangs to bring in light instead of skylights.
- Avoid placing a skylight on a west facing plane of a pitched roof

Required Verification

- Product Information if installing skylights
- Site visit by AEGB staff

References

ENERGY STAR Windows Doors Skylights

5. Indoor Environmental Quality

Intent

To reduce air contaminants that are odorous or potentially irritating and unhealthy for both installers and occupants

Requirements

Meet all of the following:

- Exhaust fans for bathrooms with a tub or shower:
  - Must vent to the outside
  - Must be connected to timer or humidistat
- Range hood exhaust vents to outside
- Low-VOC (volatile organic compound) interior wall and ceiling paint:
  - Max VOC level of 50 grams per liter
  - City of Austin recycled paint

Required Verification

- Site visit by AEGB staff

6. Electrical

Intent

To install ENERGY STAR appliances, which incorporate advanced technologies that use 10–50% less energy and water than standard models. The money saved on utility bills can make up for the cost of a more expensive but very efficient ENERGY STAR model.

Requirements

Meet all of the following:

- Incorporate a minimum of 4 ENERGY STAR rated appliances and fixtures; no more than 2 of any item type in this measure or combined with Energy 6.
- Install a minimum of two ceiling fans within the conditioned space

Required Verification

- Product information for 4 ENERGY STAR rated appliances and fixtures
- Site visit by AEGB staff

References

ENERGY STAR
American Council for an Energy-Efficient Economy

7. Landscaping

Intent

To reduce water use through appropriate plant choices and landscape installation

Requirements

Meet all of the following:

- All installed turf grass must have a minimum depth of 6" of soil containing 25% compost
- Planting Beds have at least 6” of soil containing 25% compost (e.g. Dillo DirtTM)
- Planting Beds have a minimum depth of 2” organic mulch
  AND meet one of the following:
- A minimum of 90% of new plants from current Grow Green plant list
- No landscaping is planned
- Existing landscaping is retained and properly maintained through construction

Required Verification

- Site visit by AEGB staff

References

City of Austin Water Conservation Department
Landscaping for water quality protection - Grow Green City of Austin
Grow Green Plant Guide – Grow Green City of Austin

8. Construction Waste Management

Intent

Construction waste management includes recycling or salvaging construction, demolition/deconstruction, and land clearing waste to reduce the amount of waste destined for the landfill. Construction Waste Management programs extend the life of the landfill and save energy, resources, and material costs.

Requirements

Meet one of the following:

- Minimum 50% by weight of waste is recycled or reused
  OR
- Maximum 2.5 lbs./sf is landfilled. Include all construction area, including conditioned spaces, porches, and garages.
  OR
- Remodel and new construction projects under 5,000 sf may provide a CWM plan to be approved by AEGB prior to commencement of project.

Required Verification

- Review of construction waste management plan or summary by AEGB staff

References

Construction & Demolition Info - City of Austin

9. Homeowner Education

Intent

To provide homeowners with information about their homes so that they may more efficiently operate and maintain them

Requirements

Provide the following to the homeowner:

- Copy of Green Building rating certificate
- Warranty information for home systems, appliances, and coatings
- Walk-through review of home system and appliance operations and maintenance

  Cover at a minimum:
  - Heating and air conditioning and ventilation system – filter types and changes, annual maintenance, and condensate overflow
  - Water heater operation and annual maintenance, plumbing system temperature and other settings, shut-off valve location, and freeze prevention
  - Kitchen appliance operation
  - Vent fan and timer and/or humidistat operation
  - Irrigation system operation and maintenance
  - Landscape plant establishment and maintenance information
  - Gutter maintenance
  - Exterior cladding maintenance
  - Decking maintenance
  - Flooring and/or floor coating maintenance
  - Pest control
  - Fire and CO2 alarm system warnings and maintenance
  - Electrical panel location and basic electrical safety information
  - Gas system safety related to appliance operation
  - Location of all operations and maintenance manuals

- List of home's green features; complete ABOR Energy, Environment, and Sustainability list or provide other list of green features approved by rater

Required Verification

- Copy of Walk-through checklist

References

ABOR Energy, Environment, and Sustainability Checklist

EDUCATION

Environmental Awareness

1. Green Building Education 3 - 21 points

Intent

To provide people with a good understanding of what green building is all about before purchasing a lot, planning a new home, or remodeling an existing one so that they make smarter choices and get better results—greater comfort and convenience, lower utility bills, better durability and less maintenance, better health, higher resale value, and reduced environmental impact

Requirements

Meet any or all of the following:

- Project has participated in AEGB "Materials Efficiency, Performance Enhancement, and Cost Savings" (MEPECS) review and met all reporting and disclosure requirements** listed in the Rating Guide **(10 points)**
  - Provide complete plan set, including site plan, detailed foundation, framing, roof truss, and floor plans, and mechanical (HVAC, plumbing, electrical and lighting) for each home plan, and site work/landscaping plans for each site, including all necessary authorizations for AEGB to use plan details for educational purposes
  - Provide complete detailed building specifications of materials and methods used in construction of project
  - Provide complete cost budget for analysis by AEGB, including all necessary authorizations allowing AEGB to use cost information for educational purposes.
  - Project team members with purchasing and plan change authority must acknowledge review of AEGB recommendations on cost-saving, materials efficiency, and performance enhancements based on plan and budget information provided.
  - Participant agrees to acknowledge improvements made in Material Efficiency, Performance Enhancements, and Cost Savings (MEPECS) in marketing materials for public education.
- Green Building Professional Education: Applicant is an accredited green building professional or is a Green Boots graduate * **(5 points)**
- Green By Design attended by professional: AEGB Green by Design workshop attended by member of current design +/or builder staff* **(3 points)**
- Green by Design attended by homeowner* **(3points)**

Required Verification

- *Attendance Date(s)
- **Consent and Release Form (MEPECS)

References

For information on Green by Design, visit www.greenbuilding.austinenergy.com or call 512.482.5300

2. Documented Design Team Meeting 2 points

Intent

To provide a team approach to the design and construction of a green home. Through the sharing of expertise, better decisions are made, costs are reduced, the design and building process goes more smoothly, and the result is more successful. This concept is the basis of green building.

Requirements

- Documented design team meeting, including, at a minimum, owner, architect/designer, builder, and mechanical contractor, held in design stage **(2 points)**

Required Verification

- Meeting minutes and summary from pre-design and design phases or AEGB representative present

References

Integrated Design – Green Building Advisor

3. Homeowner Manual 5 points

Intent

To provide address-specific reference material for the homeowner so that this information is maintained and conveyed, as properties change occupants over time. To assure that the rated home meets its intended durability and efficiency, it is necessary to provide homeowner education and training on operations and maintenance.

Homeowner choices and behaviors can significantly affect the overall life expectancy, efficient operation, and cost of maintaining the home, as well as have a major impact on its systems and components.

Requirements

Provide an address-specific homeowner manual that includes **all** of the following:

- Hardbound binder with street address label (in large font) on front cover and spline. An example would be “Homeowner Manual for 123 Green Avenue.”
- Copy of the rating certificate
- Copy of the final rating worksheet for the home, OR A list of all the green features included in the home (including both the Basic Requirements met and the list of selected measures awarded from the a la carte selections of the rating worksheet), AND Information from the rating guide on each of the green features included in the home (for educational purposes and to communicate benefits, compliance requirements, and related information important to the continued value those measures represent)
- Information on specific design aspects of the home intended to improve performance (durability and efficiency) and how each functions and what is required to realize benefits (e.g., passive solar negated by window treatments, shading devices, planting evergreen or deciduous trees). Include information on specific design, building methods, or materials used to mitigate damages from moderate-to-high risk scenarios applicable to the site (floods, tornados, termites, storms, etc.)
- List of detailed building specifications for home, including materials, methods, and selected options above base building specifications (e.g. framing details, insulation type and ratings.)

- List of manufacturer brand, model numbers, and descriptions (including efficiency ratings, if available) for HVAC system, water heating, and other mechanical equipment (ERV, kitchen vent, bath exhausts, appliances), as well as related warranty and care manuals
- Homeowner DVD or CD recording or written detail of walk-through specific operations and maintenance for future reference
- Copy of the site plan (plat) with topography, natural site features, vegetation and landscape features, designated wildlife habitats, solar access, prevailing breeze, etc.
- Information regarding any development-specific green features, including public park or green space, recycling services or facilities, amenities center, mixed-use retail and community service center locations, schools, alternative transportation features (pedestrian and/or bicycle routes, car share, etc.), dog parks, recreational facilities, or other common amenities, as well as improvements for energy, water, or natural resource conservation (drought tolerant landscaping, dark sky lighting, protected natural areas, etc.)
- Provide a detailed maintenance checklist and twelve-month calendar schedule on all major building components and systems (exterior façade, roof, foundation, mechanical systems, etc.), including how-to maintenance dialogs for homeowner responsibilities (HVAC filter replacement, programmable thermostat settings, clearing of HVAC condensate lines, etc.), as well as guidelines for managing the maintenance schedule
- Information on all home warranty coverage terms, conditions, and contact information for the warranty claims processing

In addition, the Address-Specific Homeowner Manual **must contain** at least **eight** of the following:

- Soils and site development: Information on soils found on site and soil analysis, recommended soil amendments, detailed drainage features/plan included in site development, grading away from foundation, onsite infiltration and capture features, permanent erosion control features, foundation maintenance recommendations, etc.
- Project plan set: a copy of the home plans, including floor plans, elevations, electrical, roofing, etc.
- Pre-insulation photos: consists of home electrical wiring, specialty wiring, gas line locations, framing features, and plumbing installations, clearly labeled
- Electrical panel box: clearly labeled electrical panel box and written schedule in homeowner manual that details circuit runs and any control features available currently or for future reference
- Schematics: information and diagrams for manifold plumbing and structure wiring schematics, electrical load management system schematics, Manual D diagram (including duct sizes and airflows), etc. (all that apply to project)
- HVAC calculations: approved Manual J for sizing HVAC and Manual D for airflows, with explanation of design temperatures, occupants, appliance loads, and air balancing specific to the home
- Home energy modeling: a report providing detailed breakdown of energy consumption by type (heating and cooling of air, water heating, lighting, etc.), including expected production by onsite generation sources (solar PV, wind, etc.)
- Plumbing details: a diagram showing the location of safety controls and valves for any systems, location of drainage for HVAC condensate, water heater overflow, laundry room drains, etc.
- Pest control: information on the specific type(s) of pest control measures included in project (landscaping 36” from foundation, borate treatments, mesh or sand barriers, etc.)
- Lighting fixture details: list of lighting fixtures and recommended bulb types and wattage for energy efficiency.
- Contractor list: list of all major contractors with contact info for all serviceable systems and finishes (HVAC, plumbing, electrical, roofing, flooring, countertops, etc.)
- Service provider/maintenance list: list of local service providers for maintenance of installed products and systems (painters, HVAC commissioning and service agents, organic pest control, organic landscape maintenance, etc.), including description of service offerings for each company listed

- Interior finish care: information on care and maintenance of all installed interior finishes (specific low-VOC finishes, non-toxic cleaner recommendations, etc.)
- Hazardous materials: list of any common hazardous materials identified on project (especially remodels) and any common building materials used in construction that may require special handling and disposal methods (stains, varnishes, paints, etc.)
- Tree protections: details of all onsite tree protection features installed and professional arborist's recommendations for tree maintenance, as available
- Soil amendments: details of soil amendments provided, organic soil amendment and fertilizing recommendations and schedule for landscape, mulch maintenance, etc.
- Landscape design: clearly labeled with list and location of each installed landscaping plant and watering requirements (after establishment period)
- Hydro-zoning: information on hydro-zoning of landscape plantings, detailing recommended watering schedules for each zone to establish landscape and to maintain established landscape (for turf, shrubs/plantings, and trees)
- Irrigation system design: layout and information on irrigation controllers and control settings, as well as the types of irrigation heads installed at each zone, efficiency ratings, coverage area, and flow rates for each area of the landscape serviced (turf heads, low landscape plantings, shrubs, or trees).

Required Verification

Address-specific homeowner manual

SITE

Sustainability Through Responsible Site Selection and Development

1. Density 3-7 points

Intent

To reduce sprawl and the need for utility and transportation infrastructure expansion by designing livable, walkable, and bikeable communities that encourage efficient transportation and a mix of community-oriented businesses

Requirements

Meet any or all of the following:

- Lot has more than one dwelling unit **(4 points)**
- Lot size is less than 5,750 square feet **(3 points)**

References

Travis Central Appraisal District

2. Community 2 - 9 points

Intent

To reduce sprawl and the need for utility and transportation infrastructure expansion by designing livable, walkable, and bikeable communities that encourage efficient transportation and a mix of community-oriented businesses

Requirements

Meet any or all of the following:

- Street, electricity, water, and wastewater have been in place for a minimum of 25 years **(3 points)**
- Public transit stop is within a 1/4 mile walk **(2 points)**
- Food store is within a 1/2 mile walk **(2 points)**
- Four or more community resources are within a 1/2 mile walk **(2 points)**
  e.g. public park, trail, school, post office, community center, daycare facility, community garden, restaurants. There shall be no more than two of any one type of community resource allowed.

Required Verification

List four community resources

References

Austin Capital Metro Transit
Walk Score®

3. Rain Gutters 3 points

Intent

To direct rainwater away from the structure to prevent erosion and to protect the structure itself, and/or for rainwater capture

Requirements

- Complete gutter and downspout system directs stormwater away from foundation to landscaping or catchment system
  OR
- Alternative rain water management system to direct water off of the roof and away from the building onto a non-splatter pervious surface
  AND
- In order to be eligible for a FOUR Star rating, you must achieve this measure.

Required Verification

- Site visit by AEGB staff

References

www.rain-gutter-guide.com

4. Site Work and Landscape 2 – 8 points

Intent

To design a project site which minimizes negative impacts on surrounding properties and watersheds, including storm water runoff, flooding, erosion, and reduced water quality

Requirements

Meet any or all of the following:

- Site work diverts water to onsite infiltration. Include permanent erosion and storm-water control measures **(3 points)**
  - retaining walls
  - piped drainage system
  - berms and swales
  - french drain
  - rain garden
- Wildlife Habitat **(3 points)**
  - Landscape provides a quantifiable source of water for birds, butterflies, and small wildlife drinking and bathing needs

- A minimum of 25% of all landscape plants provide:
  - A sustainable habitat for wildlife, with are useful sources of food
  - Permanent shelter and source of cover from weather and predators
  - Safe place to raise young
- Uses non-rotary irrigation and water conserving practices (compost and mulch
- Landscape requires minimal maintenance and uses only non-toxic fertilizer and pest control products

- Permeable surfaces are used for a minimum of 25% of driveways, parking areas, walkways, and patios; not installed over impermeable base - excluding decomposed granite **(2 points)**

Required Verification

- Site visit by AEGB staff

References

City of Austin Water Conservation Division
Grow Green Rain Garden Plants
Lady Bird Johnson Wildflower Center– Green Roof
Environmental Protection Agency – Green Roofs and the Heat Island Effect
Green Roofs: Working Expertise, Regional Solutions (GRoWERS)
National Wildlife Federation Garden for Wildlife

5. Wildfire Mitigation 5 points

Intent
To implement precautionary measures to reduce risk of damage to the building structure from a wildfire

Requirements
Select one of the following, as it applies to the project:

- Unvented attic assembly (no soffit, ridge or gable vents, or air hawks)
  OR
- All attic vents (air hawks, soffits, and gable and ridge vents) have installed non-combustible screening with 1/8” or smaller openings (perforated fiber-cement materials with 1/8” or smaller openings accepted at soffits)

  AND

Select three of the following that apply to the project:

- Wood fencing is not attached to building; may be separated by stone or metal barriers
- Any attached wood decking, railing, and pergola materials must be fire-resistant or noncombustible material and/or use metal angle flashing at intersections
- All windows and doors adjacent to exterior decks must be tempered glass
- Exterior siding and skirting is non-combustible
- Roof gutters have fine mesh screen guards or other methods that prevent accumulation of flammable debris

- Class A fire-rated roof covering, all roof intersections have metal flashings
- No planting beds within five feet of home's foundation unless adjacent to noncombustible material such as masonry, cement, or stucco; all landscape plants are drought-tolerant (low water needs) species or landscape is irrigated
- Create a "defensible space zone" around perimeter of all structures, cleared of underbrush and deadwood to 6'-10' from the ground. Perimeter must be a minimum of 30 feet or to lot line.
  AND
- In order to be eligible for a TWO Star rating, you must achieve this measure.

Required Verification

- Visual site verification by rater
- Documentation and receipts of related material purchases

References

City of Austin Wildfire Protection Plan
NFPA Firewise Communities Program Information
Texas A&M Forestry Service Wildfire Preparedness Program Information
Insurance Institute for Business & Home Safety Wildfire Safety Tips
Federal Alliance for Safe Homes (FLASH) Wildfire Wizard Tool

6. Outdoor Living 1 – 18 points

Intent

To reduce sources of indoor heat and humidity and associated energy costs by encouraging occupants to take advantage of outdoor living

Requirements

Meet any or all of the following:

- Built-in outdoor kitchen **(4 points)**
- Built-in outdoor fireplace (no indoor fireplace installed) **(3 points)**
- Plumbed outdoor shower **(3 points)**
- Covered, usable front porch protecting entry door **(3 points)**
  Minimum depth: 6'; minimum area: 100 sq. ft.
- Covered, usable porch other than front porch **(2 points)**
  Minimum side dimension: 6'; minimum area 100 sq. ft.
- One of the above porches fully screened **(2points)**
- Uncovered patio **(1 point)**
  Minimum side dimension: 6'; minimum area: 100 sq. ft.

Required Verification

- Site visit by AEGB staff

7. Exterior Lighting 1 – 4 points

Intent

To design a project site to minimize light pollution on neighboring properties and into the night sky and to conserve energy

Requirements

Meet any or all of the following:

- All exterior light fixtures are designed to reduce up-lighting/light pollution; or fixture locations are shielded from above **(2 points)**
- In addition to measure above, all exterior fixtures are full cutoff (emitting no light above horizontal) or are at least 5' from porch ceiling or overhang at same floor as light fixture **(1 point)**
- All exterior lighting has motion detectors with photocell controllers **(1point)**
  AND
- In order to be eligible for a FIVE Star rating, you must achieve this measure.

Required Verification

- Site visit by AEGB staff

References

International Dark-Sky Association Lighting Basics

ENERGY

Saving Energy, Reducing Emissions, Using Clean Energy

1. Energy Performance 5-44 points

Intent

To build an energy-efficient home which uses performance-related provisions and current minimum energy code requirements. The 2015 International Energy Conservation Code with City of Austin Amendments establishes minimum regulations and is founded on broad-based principles that make the use of new materials and innovative techniques to conserve energy. Utilizing an energy modeling program as a design tool enables effective analysis of design decisions aimed at improving performance, reduces operating costs, improves occupant comfort, and lowers carbon dioxide emissions.

Requirements

Meet the following:

- Design and build a home whose modeled *energy use* achieves a percentage improvement above currently adopted City of Austin Energy Code with local amendments. Use the International Code Compliance Calculator (IC3) software to demonstrate the home exceeds the applicable Austin Energy code with local amendments. If home utilizes natural gas for space heating, the home shall be considered as mixed fuel. If home utilizes an electric heat pump for heating, the home shall be considered as electric. Points are awarded per Table 1 and 2 below depending on site fuel type(s).

Table 1: Points Available for Electric Only Homes

Percent Savings	4%	6%	8%	10%	12%	14%	16%	18%	20%	22%	24%	26%
Points Available	5	10	15	20	23	26	29	32	35	38	41	44

Table 2: Points Available for Mixed Fuel Homes

Percent Savings	7%	9%	11%	13%	15%	17%	19%	21%	23%	25%	27%	29%
Points Available	5	10	15	20	23	26	29	32	35	38	41	44

Notes to Consider:

Since the 2015 IECC with City of Austin amendments is more stringent than the published energy code, an Austin version of the IC3 software is being developed to reflect these local amendments. A link to the IC3 software as well as various documents to help understand the software and the inputs needed are provided below in the References section of this measure.

Points are awarded for percent above code without the reduction achieved through onsite energy production (solar photovoltaic systems). Points for onsite energy production are awarded separately under Photovoltaic Systems (Energy 7).

Required Verification

Submit the following:

- All pages of IC3-Austin Energy Report
- If entered inputs in the 'Testing' section of the IC3 software deviate from Austin Energy Green Building's Recommended IC3 inputs, required City of Austin performance testing results will need to be provided to verify initial inputs are in accordance with actual testing result values.

References

2015 City of Austin Energy Code with Amendments
SPEER: 2015 Energy Code Training and Resources for Compliance
International Code Compliance Calculator (IC3) v4.0
IC3 User Manual
IC3-Austin Testing Input Guide

2. High Performance Systems 1-14 points

Intent

To reduce energy demand and consumption through the use of high performance heating and cooling equipment

Requirements

Meet one of the following:

- Whole-house mini- or multi-split heating and cooling system **(5 Points)**
- Variable-capacity compressor; minimum 4 speeds **(4 points)**
- Variable-speed air handler; minimum 600 sq. ft./ton of cooling **(2 points)**
- Ground/water-source heat pump **(2 Points)**
- Dual capacity compressor; minimum 600 sq. ft./ton of cooling **(1 Point)**

Required Verification

- Site visit by AEGB staff

3. Water Heater Efficiency 0-5 points

Intent

To reduce energy use by improving the efficiency of water heating equipment

Requirements

Meet one of the following:

- Water heater is solar thermal; meets Austin Energy requirements **(5 points)**
- Water heater is integral heat pump; minimum efficiency 2.0 EF **(4 points)**
- Water heater is ENERGY STAR® gas tankless/on-demand **(2 points)**
- Water heater is gas tankless/on-demand **(1 point)**
- Water heater is ENERGY STAR® gas storage tank **(1 point)**
- Where no gas service available – electric storage tank meeting program requirements; consult rater **(0 points)**
- Building is a remodel. Project is exempt if water heater is less than 5 years old and is not changed out during remodel. Per AEGB rep authorization **(0 points)**
  AND
- In order to be eligible for a THREE Star rating, you must achieve this measure.

Required Verification

- Water heater product specifications
- Site visit by AEGB staff

References

Austin Energy Rebates
ENERGY STAR – Federal Tax Credits
DSIRE – US. Department of Energy
ENERGY.GOV - Selecting a new Water Heater

4. Controls and Monitoring 0-5 points

Intent

To allow homeowners to better understand, monitor, and .control their energy usage, and to assist in peak-load management

Requirements

Meet one of the following:

- Complete energy management monitoring and control system **(5 points)**

- Plug and play monitoring system **(3 points)**
- Power Partner internet connected approved thermostat **(1 point)**
- Thermostat has integral hygrometer or humidistat **(0 points)**
  AND
- In order to be eligible for a FIVE Star rating, you must achieve this measure.

Required Verification

- Site visit by AEGB staff

References

Austin Energy - Power Partner Thermostats and Rebate Information

5. Commissioning 3-6 points

Intent

To ensure the building envelope is functioning as designed. Air leakage can increase energy consumption and contribute to comfort, health, and safety issues

Requirements

Meet any or all of the following:

- **Blower door test (3 Points)**
  Performed results in envelope leakage no greater than 3 ACH 50; mechanical ventilation required
- **Fresh air commissioning / testing for exhaust fans (3 points)**
  + 20% 50 cfm for Bath and 100 CFM for kitchen exhaust.

Required Verification

- Testing report

References

ENERGY.GOV – Article on Blower Door Tests
Green Building Advisor

6. High Efficiency Fixtures and Appliances 1-8 points

Intent

To reduce energy use and peak energy demand

Requirements
Meet any or all of the following:

- Occupancy sensors control >50% of interior lighting **(4 points)**

- 100% LED Lighting **(3 points)**
- ENERGY STAR appliances/fixtures: ≥2 in addition to Basic Requirement 6 **(1 point)**

Required Verification

- Site visit(s) by AEGB staff

References
ENERGY STAR – Lighting & Fans
Consortium for Energy Efficiency (CEE)

7. Photovoltaic Systems 1-20 points

Intent

To provide a clean, renewable source of energy and reduce the need to generate fossil fuel-based power through the use of solar photovoltaic systems. By designing the home with solar power in mind, homeowners can more easily incorporate these systems at a later date.

Requirements

Meet one of the following:

- Solar capabilities provide 90-100% of modeled energy needs **(20 points)**
- Solar capabilities provide 70-89% of modeled energy needs **(15 points)**
- Solar capabilities provide 50-69% of modeled energy needs **(10 points)**
- Solar capabilities provide 30-49% of modeled energy needs **(5 points)**
- Solar capabilities provide 10-29% of modeled energy needs **(3 points)**

  OR
- Solar assessment of the property performed by a certified professional indicates installation potential meeting Austin Energy Solar Rebate criteria **(1 point)**

Required Verification

- Site visit(s) by AEGB staff

References

Austin Energy Solar PV Rebate Guidelines

8. Electric Vehicle Charging 1-2 points

Intent

Prepare to meet future needs by designing an electrical infrastructure necessary to support the additional load of plug-in electric vehicles (PEV). Compared to gasoline fueled vehicles, PEVs reduce air pollution and greenhouse gas emissions that affect human health and global warming.

Requirements

Meet one of the following:

- Austin Energy-approved electric vehicle charging station installed **(2 points)**
  OR
- Dedicated 240 volt outlet installed for future charging station **(1 points)**

Required Verification

- Site visit(s) by AEGB staff

References

Plug-In Partners (Austin Energy Electric Vehicle Programs and Incentives)

9. Roof and Shading Design 0-7 points

Intent

To reduce energy use by improving the thermal enclosure above code requirements through selection of higher performance roofing materials and strategic shading

Requirements

Meet one or more of the following:

- Projection factor of >0.5 for all windows facing southwest to northwest - 225 degrees through 315 degrees **(3 points)**
- All roof overhangs project a minimum of 24" horizontally **(2 points)**
- Meet roofing solar reflectance/SRI values for slope of roof **(2 points)**
  - Roof pitch is greater than 5/12 and reflectance/SRI is 0.20/16 or higher
  - Roof pitch is between 3/12 and 5/12 and reflectance/SRI is 0.30/30 or higher
  - Roof pitch is less than 3/12 and reflectance/SRI is 0.55/64 or higher
- Building is a remodel **(0 points)**
  AND
- In order to be eligible for a FIVE Star rating, you must achieve at least one of these measures.

Required Verification

- Site visit(s) by AEGB staff
- Roof product information showing solar reflectance and/or SRI value

References

ENERGY STAR Roof Products
Sustainable by Design - Design Tools

WATER

Water Conservation, Rainwater Harvesting, and Improved Water Quality

1. Water Heating Design 1-7 points

Intent

Reduce energy and water use through efficient design of hot water systems

Requirements

Meet any or all of the following:

- Hot-water Smart-technology operation and/or recirculation system OR recirculation system is push-button on-demand only; not continuously recirculating and not motion-activated **(3 points)**
- All water heaters in 1-story home are located within 20 piped feet of appliances and/or fixtures they serve; 30 piped feet for 2-story **(3 points)**
- >R-4 insulation of all hot water lines **(1 point)**
  AND
- In order to be eligible for a FOUR Star rating, you must achieve this measure.

Required Verification

- Site visit by AEGB staff

2. Indoor Water Conservation 2-7 points

Intent

To reduce water use and associated energy and infrastructure costs for pumping, treating, and heating water

Requirements

Meet any or all of the following:

- All shower heads have maximum flow of 1.5 gallons per minute; no more than one shower head per shower or tub **(3 Points)**
- All bathroom sink faucets have a maximum flow of 1.0 gallons per minute **(2 Points)**
- Toilet is an Ultra HET model using1 gallon per flush or less **(2 Points)**

NOTE: Many WaterSense faucets have a flow of 1.5 gallons per minute. Check the actual flow rate to meet the bathroom sink faucet measure.

Required Verification

- Site visit by AEGB staff

References

WaterSense products
Water Conservation for Residents
Austin Water - Free Showerheads and Faucet Aerators

3. Turfgrass and Irrigation 3 points

Intent

To minimize potable water use for landscape irrigation

Requirements

Meet all of the following:

- Any installed irrigation system must include the following water efficiency features:
  - System designed by a licensed irrigation professional
  - Hydrozoned with the appropriate type of irrigation delivery used for each planting area and plant type (planting and tree beds use only drip irrigation, bubblers, subsurface irrigation, and/or soaker hoses.)
  - Design layout must achieve a 65% distribution-uniformity (DU) on fixed rotary spray heads Use of 6" heads in turf areas
  - Use of pressure-compensating heads
  - Wifi-enabled controller with flow monitoring area of turfgrass installed or planned

  OR
- No irrigation system is installed or planned

- Area of turfgrass installed or planned
  - Does not exceed 2000 sq. ft.
  - OR turfgrass installed or planned does not exceed the area of the footprint of the house
  - OR complete irrigation system is WaterSense certified
  - OR no new turfgrass is installed or planned.

  AND
- In order to be eligible for a FOUR Star rating, you must achieve this measure.

Required Verification

- Irrigation and landscape plan(s)
- Site visit by AEGB staff

References
City of Austin Water Conservation Division
Dillo Dirt Compost

4. Auxiliary Water 1 – 10 points

Intent
To reduce potable water use and associated costs for treating and pumping

Requirements
Meet one of the following:

- Rainwater harvesting
  - Rainwater is sole source of potable water; 20,000 gallon minimum storage; back-up well allowed **(10 points)**
  - >5,001 gallons storage **(5 points)**
  - 1,001– 5,000 gallons **(4 points)**
  - 501-1,000 gallons storage **(3 points)**
  - 110-500 gallons storage **(1 point)**

Note: Preventing cross connections between auxiliary and drinking water systems is important to protect the health and safety of all entire public water system users. City, state, and federal regulations apply to auxiliary water sources used with drinking water service because they may not meet drinking water standards.

- Auxiliary water is any water, except drinking water or a mixture of water and anything else from any source, that is pressurized for use, treatment, or disposal on or available to a site served by Austin Water Utility. This includes, but is not limited to:
  - Lake or river water
  - Well water (find out more about the new Water Wells Program and Water Wells Ordinance...)
  - Harvested rain water
  - Reclaimed water
  - Gray water
  - Air conditioning condensate
  - Water from a neighboring public water supply

There is greater concern over possible cross connections now that auxiliary water systems increasingly involve pressurized plumbing systems that can contaminate large volumes of water.

- There are three primary methods of cross connection prevention:
  - Ensure that the auxiliary water system is not connected to the drinking water system from the start.
  - Make sure that the public water system is adequately protected by approved and regularly-maintained backflow prevention assembly(ies) at water service meter(s) to any site using an auxiliary water system.
  - Periodically verify that auxiliary and potable water systems remain segregated and all required safeguards are working properly.

Required Verification
Site visit by AEGB staff

References

Rainwater Harvesting Rebates
Auxiliary Water Sources
Texas A&M Rainwater Harvesting Information

MATERIALS & RESOURCES

Sustainable Material Choices, Use, and Disposal

1. Exemplary Construction Waste Management 3 points

Intent

Construction waste management includes recycling or salvaging construction, demolition/deconstruction, and land clearing waste to reduce the amount of waste destined for the landfill. Construction Waste Management programs extend the life of the landfill and save energy, resources, and material costs.

Requirements

Meet one of the following:

- Minimum 75% by weight of waste is recycled or reused **(3 points)**
  OR
- Maximum 1.25 lbs./sq. ft. is landfilled. Include all construction area, including conditioned spaces, porches, and garages **(3 points)**

Required Verification

- Review of construction waste management summary, e.g. haul summaries with haul tickets, by AEGB staff

References

List of City of Austin Approved Haulers

2. Durable Finished Floor 2 – 4 points

Intent

To install floors constructed of durable, long-lasting materials. This type of flooring system will not need replacement as often as non-durable products, thus reducing landfill materials and future costs and time associated with flooring repair and removal. Durable floors also help maintain good indoor air quality because they are easier to clean and do not harbor dust mites.

Requirements

Meet one of the following:

- Flooring is 100% durable material **(4 points)**
  OR
- Floor is durable material for a minimum 50% of all floor area **(2 points)**

Remaining floor material must be
- o Rapidly renewable
  OR
- o CRI Green Label

AND

- In order to be eligible for a FOUR Star rating, you must achieve this measure.

Flooring materials accepted as durable include concrete, stone, ceramic tile, strand bamboo, and wood.

NOTE: Although soft vinyl flooring (sheet vinyl) has some of these same benefits, it is does not qualify for these points due to our efforts to reduce the use of fossil-fuel and chlorine-based materials with their associated health and environmental risks. Superior substitutes such as true linoleum are readily available. Vinyl composition tile currently remains on the acceptable list because it does not contain plasticizers - chlorine-based compounds that increase health risks and environmental burdens.

Required Verification

- Site visit by AEGB staff

References

Green Label Plus approved products - Carpet & Rug Institute

3. Recycling and Reuse of Existing Buildings and Materials 3 - 5 points

Intent

Extend the life cycle of the existing building stock, conserve resources, reduce waste, and reduce environmental impacts of new buildings as they relate to materials, manufacturing, and transport

Requirements

Meet one of the following:

- Project is renovation of, and/or addition to existing home **(5 points)**
- Existing home removed from site is relocated for use at another site **(4 points)**
- Existing home removed from site is deconstructed, and materials are ≥75% reclaimed/reused **(3 points)**

Required Verification

- Deconstruction/relocation documentation

4. Durable, Locally Sourced, and Recycled Materials 2-10 points

Intent

To use products with environmentally preferable attributes in home construction

Requirements

Meet any or all of the following:

- Roofing: metal or tile **(2 points)**
- Significant use of reclaimed/reused materials, such as doors, hardware, flooring, trim **(2 points)**
- Use of recycled-content products **(2 points)**
- Decking material of raised porch/deck is recycled plastic/composite lumber **(2 points)**
- Use of local materials/products for major elements of the home; harvested or manufactured within 500 miles **(2 points)**

Required Verification

- Product information documenting preferable attributes

References

Building Materials Reuse Association
Re-Store Salvaged Building Materials Outlet – Austin Habitat for Humanity
Austin Resource Recovery - Recycled-Content Product Directory
Austin Material Marketplace

5. House Size 2-4 points

Intent

To build small compact homes, which require fewer materials to build, and less resources to maintain and operate than larger homes

Requirements

Meet one of the following:

- Home is less than 900 sq. ft. **(4 points)**
- Home is less than 1,200 sq. ft. **(3 points)**
- Home is less than 1,500 sq. ft. **(2 points)**

Required Verification

- Home Plans
- Site visit by AEGB staff

6. Framing 1 - 3 points

Intent

To reduce environmental impact by implementing Optimum Value Engineering (OVE), also known as advanced framing in the construction of quality structurally sound code-approved wood-frame homes

According to the US Department of Energy's Office of Building Technology, advanced framing techniques can save hundreds of dollars in material costs and shave 3 to 5 percent off labor costs. These techniques reduce annual heating and cooling costs up to 5 percent by maximizing the exterior wall cavity available for insulation installation, creating a more energy-efficient building enclosure.

Requirements

Meet any or all of the following:

- Exterior wall framing is 24" on center **(2 points)**
- Interior wall framing is 24" on center **(1 point)**

Required Verification

- Site visit by AEGB staff

References

Advanced Framing Details
PATH: Advanced Framing

7. Pest Control 2-5 points

Intent

To increase durability of a structure by controlling termites, while reducing environmental and health impacts for workers, occupants, soil, beneficial insects, pets, plants, and groundwater

Requirements

Meet one of the following:

- All wood framing is treated with borate to a minimum of 3 feet above the foundation, **and** a mechanical-barrier termite control system is used **(5 points)**
- Mechanical-barrier termite control system is used **(2 points)**
- All wood framing is treated with borate to a minimum of 3 feet above the foundation **(2 points)**

AND

- In order to be eligible for a TWO Star rating, you must achieve this measure.

Required Verification:

- Site visit by AEGB staff

References

Integrated Pest Management information
Grow Green-Termite information

INDOOR ENVIRONMENTAL QUALITY

Enhance Occupant Comfort, Health, and Productivity

1. Mechanical Ventilation 3-5 points

Intent

To provide mechanical ventilation required to maintain indoor air quality due to improved building materials and construction techniques which produce tighter houses. The amount of mechanical ventilation required depends on a number of factors: size of the house, number of occupants, rate of natural infiltration (tightness), amount/types of indoor pollutants, and climatic conditions.

Requirements

Meet one of the following:

- ERV (enthalpy recovery ventilator) designed with dedicated duct system **(5 Points)**
  - Does not tie into bathroom or kitchen ventilation
- Mechanical ventilation with automatic damper controlled by a timer, humidistat, and temperature controller **(3 Points)**

Select all of the following

- Ducted into return-air plenum, must be filtered
- Air handler must be variable speed, ECM (electronically commutated motor)

AND

- In order to be eligible for a FOUR Star rating, you must achieve this measure.

Required Verification

- Site visit by AEGB staff

References

ASHRAE Standard 62.2-2013

2. Natural Ventilation and Daylighting 1–8 points

Intent

To provide fresh air and reduce the need for mechanical cooling, especially on days when the relative humidity is low. In Central Texas, natural ventilation plays an important role in maintaining comfort.

Requirements

Meet any or all of the following:

- Designed, effective stack ventilation: operable windows in cupola, clerestory, or at top of stairwell **(3 points)**
- Windows are designed for daylighting: placed high on walls, not requiring privacy treatment **(2 points)**
- Designed, effective cross-ventilation with operable windows in main living areas **(2 points)**
- Spaces lacking natural lighting have an Energy Star tubular daylighting device/solar tube **(1 point)**

Required Verification

- Site visit by AEGB staff

References

Whole Building Design Guide – Natural Ventilation
AUTODESK Sustainability Workshop: Passive Cooling and Natural Ventilation
Chuck Wright – Stack Effect

3. Improved Air Quality 1-10 points

Intent

To minimize indoor pollutants that affect the health and comfort of occupants. These include combustion products, auto exhaust fumes, engine oils and lubricants, gasoline-powered lawn equipment and fuels, paints, varnishes, adhesives, sealants, fertilizers, pest-control chemicals, cleaning materials, and other chemicals that off-gas toxic fumes.

Requirements

Meet any or all of the following:

- No fireplace is located within conditioned space **(3 points)**
- Garage exhaust options - Meet one of the following:
  - Garage is detached from the house or house has no garage **(3 points)**
    OR
  - Attached garage is exhausted using a vent fan with timer or passive vents installed 18" above floor **(1 point)**
- HVAC filter: > 4" pleated-media, or electronic (not electrostatic); easily accessed; HVAC system designed for filter type **(2 Points)**
- Interior wall and ceiling paint has maximum VOC level of 10 grams per liter **(2 points)**

Required Verification:

- Site visit by AEGB staff

4. Cabinet Materials and Adhesives 3 points

Intent

To minimize airborne chemical contaminants that can affect the health and comfort of occupants

Requirements

Meet any or all of the following:

- Cabinet materials + adhesives **(3 points)**
  - Meet E1 standard
  - Meet CARB Phase 1 Standard
  - Have no added urea-formaldehyde

  AND
- In order to be eligible for a FIVE Star rating, you must achieve this measure.

Required Verification

- Site visit(s) by AEGB staff

References

Composite Wood Products ATCM – California Environmental Protection Agency

5. Universal Design 1-10 points

Intent

A barrier-free home or one with universal design features incorporates principles and features that allow more comfortable and independent living for more people of all ages.

Requirements

Meet any or all of the following:

- Home incorporates barrier-free and universal design elements **(3 points)**
  Select at least 5 of the following:
  - 42” minimum-clearance access corridors (hallways) throughout home with ramped or beveled changes at door thresholds
  - Full length sidelight at public entry
  - Adjustable-height closet rods and shelves
  - View-windows with a sill height of 36" or less
  - Knee space under the sink and cooktop
  - Lever-type water controls
  - Variable-height work surfaces
  - Contrasting border treatment on counter tops
  - Pull-out shelves in base cabinets
  - Knee space under bath lavatory
  - Roll-in shower and/or tub
  - Bath lavatory mirrors extending to backsplash behind sinks

  - Offset controls in tubs and showers
  - Adjustable-height showerheads
  - Elevator

- All interior doors are 2'-6" or wider **(2 points)**
- Grab bar blocking installed in all tubs/showers **(1 point)**
- Grab bars installed in tub/shower in at least one bathroom **(1 point)**
- Toilets in at least one bath/powder room is WaterSense ADA model **(1 point)**
- All doors have lever handles **(1 point)**
- Dedicated kitchen recycling center; approved by rater **(1 point)**

Required Verification

- Site visit(s) by AEGB staff

References

NAHB Aging in Place Checklist

ADDITIONAL RESOURCES

Please note that web sites and references may change and/or material may become outdated.

Builder's Guide to Hot Humid Climates or *Builder's Guide to Mixed Humid Climates*
www.eeba.org
Indispensible handbooks of building science and construction details for architects, designers and builders; other excellent books are available from EEBA (Environmental and Energy Building Association). Be sure information applies to your conditions. Central Texas is generally in the hot, humid climate zone (Zone 2) but some parts are drier and cooler (Zone 3). Much of the published information available to us applies to a northern climate and is incorrect for most of Texas.

Environmental Building News
www.buildinggreen.com
www.buildinggreen.com/downloads
Monthly online magazine; takes no advertising; very strong on material evaluation

Home Energy
www.homeenergy.org

Green Builder
www.greenbuildermedia.com
Highly readable, monthly magazine covering a broad range of green building topics

Federal Government Websites
www.eere.energy.gov/buildings : US Department of Energy-Efficiency and Renewable Energy
www.energystarhomes.com
www.huduser.gov/portal/research/path.html : Partnership for Advancing Technology in Housing; resource for homeowners and homebuyers, the homebuilding industry and federal agencies; PATH catalogs the best resources on advanced building technologies and practices to emerge from the decade-long public-private partnership, which ended in 2008

Building Science Websites
www.fsec.ucf.edu : Florida Solar Energy Center—research institute of the State of Florida (hot, humid climate)
www.buildingscience.com : Private consulting company located in Massachusetts; top building scientists
www.eeba.org : education resource for building science

Other Helpful Websites
www.globalgreen.org : National environmental non-profit organization
www.usgbc.org : United States Green Building Council
www.nibs.org/?page=sbic : Sustainable Buildings Industry Council; Green Building Guidelines