

GREEN

A brief overview of the GREEN Building Program
developed by the National Association of Home Builders

This is the second in a series of technical white papers designed
to improve understanding of issues facing purchasers
of top-quality custom wood doors.

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The National Green Building Standard

In 2007, the National Association of Home Builders (NAHB) in cooperation with the International Code Council (ICC) established a code that would help them to define the goals for green buildings and create a scoring system that offers some consistency in rating buildings and building sites.

The guidelines were written by builders, researchers, environmental experts and designers, people who know and understand the concepts of sound environmental conservation and also have hands-on working experience in the construction trades.

This standard sets four different levels at which living space can be rated green. They are Bronze, Silver, Gold and Emerald. The Emerald rating may at first seem like an odd designation for the highest level ... until you stop to think about it. These ratings can be awarded to single-family homes and multi-family homes, remodeling projects and building sites.

This scoring system has become the first residential rating system to receive the American National Standards Institute approval.

It's a voluntary program, so builders can conform to it as much or as little as they and their customers wish. They will often find out that many of their current processes and materials will already earn them points toward their GREEN rating. But significantly, they will learn that very minor modifications can dramatically increase their rating at the same time that they reduce any negative impact on the environment.

Site Planning

Long before ground breaking begins, proper site planning can determine ways to situate houses in such a way that they minimize impact on the environment. Working with the natural landscape, it's possible to minimize problems like ground water runoff and retention, passive solar heating and cooling and the heat-island effect. In the long run, this means that the house will cost less to maintain.

This phase of GREEN scoring takes into consideration the following areas:

- The Lot
- Mass Transportation
- Project Team, Mission Statement And Goals
- Natural Resources
- Slope Disturbance
- Soil Disturbance And Erosion
- Storm Water Management
- Landscape Plan
- Wildlife Habitat
- Mixed-Use Development
- Environmentally Sensitive Areas
- Density
- On-Site Supervision and Coordination
- Trees and Vegetation
- Driveways And Parking Areas
- Heat Island Mitigation

Resource Efficiency

The GREEN scoring method also takes into consideration the use of natural resources in every phase of construction. The more efficiently resources are conserved, the higher the score. For example, using engineered wood products wherever possible optimizes forests by using 50% more of the log than conventional lumber. Resource efficiency also takes into account the reduction of jobsite waste.

The following areas are all considered:

- Conditioned floor area
- Material usage
- Building dimensions and layouts
- Framing and structural plans
- Prefabricated components
- Stacked stories
- Site applied finishing materials
- Foundations
- Above grade wall systems
- Exterior Doors
- Roof overhangs
- Foundation drainage
- Drip edge
- Roof water discharge
- Finished grade
- Termite barrier
- Termite-resistant materials
- Water-resistive barrier
- Ice barrier

- Foundation waterproofing
- Flashing
- Roof surfaces
- Recycling
- Reuse of existing building
- Salvaged materials
- Scrap materials
- Recycled content
- Construction waste management plan
- On-site recycling
- Recycled construction materials
- Biobased products
- Wood-based products
- Manufacturing energy
- Resource-efficient materials
- Indigenous materials
- Life cycle analysis
- Manufacturer's environmental management system concepts

Energy Efficiency

Energy efficiency is an important factor in GREEN. It involves areas such as air infiltration, duct leakage, HVAC air flow and efficiency. As you can see from the list of covered items that follows, this part of the GREEN rating is exhaustive.

- Building envelope: Total UA
- Building envelope: Installation insulation grading
- Building envelope: Exterior mass walls
- Insulation and air sealing: Third party verification
- Fenestration: U-factor & SHGC
- HVAC: Combination space heating & water heating system
- HVAC: Furnace and/or boiler efficiency
- HVAC: Boiler controls
- HVAC: Heat pump heating efficiency
- HVAC: Cooling Efficiency
- HVAC: Ground source heat pump
- HVAC: Ceiling fans
- HVAC: Whole unit fans
- HVAC: Programmable thermostats
- Water heating: Energy factor
- Water heating: Desuperheater
- Water heating: Insulating hot water pipes
- Water heating: Indirect fired water heater storage tanks
- Lighting & appliances: Hard-wired lighting
- Lighting & appliances: Recessed light fixtures
- Lighting & appliances: Occupancy & motion sensors
- Lighting & appliances: Skylights

- Lighting & appliances: ENERGY STAR® appliances
- Lighting & appliances: Induction cooktop
- Lighting & appliances: Occupancy sensors – hard-wired lighting outlets
- Solar space heating and cooling
- Solar water heater
- Additional renewable energy options: Photovoltaic panels
- Other on-site renewable energy sources
- Ducts
- HVAC design and installation
- Installation and performance verification
- Third-party testing to verify performance
- Energy consumption control
- Renewable energy service plan

Water Efficiency

Fresh water is becoming a more and more precious commodity in today's world. In the United States, the average home will use more than 64 gallons of water every day. But through a few common-sense conservation efforts, this can be reduced to less than 45 gallons per day.

A green home conserves water both indoors and out. As part of the GREEN rating, even details such as the choice of landscaping materials is reviewed. Normally, native species of grasses and shrubs have thrived because they are hardy and well-suited to regional rainfall patterns. Selecting these for landscaping around a home site will often mean less artificial irrigation is required.

Consider all of the things that are part of the water efficiency section of the GREEN scoring process.

- Indoor hot water usage
- Water conserving appliances
- Food waste disposers
- Showerheads
- Faucets
- Toilets & urinals
- Low-volume irrigation system
- Irrigation systems
- Rainwater collection & distribution
- Water filters
- Gray water
- Automatic shutoff water devices

Indoor Environmental Quality

It wouldn't be any good if so much focus on energy usage and resource conservation resulted in a building that was unhealthy or unpleasant to live in. So the GREEN building initiative also gives high marks to those things that make a home a comfortable and safe place to live and raise a family. For example, it would be energy efficient to build a home that allowed no fresh air in and prevented the exhausting of inside air. But you wouldn't want to live in such a dwelling.

The GREEN program awards points not only for air quality but also for consideration given to allergies and respiratory ailments. The following list contains all of the elements used in the indoor environmental quality section of the GREEN scoring system at the time this paper was written:

- Space and water heating options
- Fireplaces and fuel burning appliances
- Wood burning fireplaces
- Garages
- Structural plywood & OSB
- Wood materials
- Carpets
- Hard-surface flooring
- Wall coverings
- Architectural coatings
- Adhesives and sealants
- Cabinets
- Insulation
- Carbon monoxide (CO) alarms

- Building entrance pollutants control
- Spot ventilation
- ENERGY STAR® exhaust fans
- Building ventilation systems
- Radon control
- HVAC system protection
- Central vacuum systems
- Living space contaminants
- Tile backing materials
- Capillary breaks
- Crawlspace
- Moisture control measures
- Plumbing
- Duct insulation
- Relative humidity
- Humidity monitoring system
- Kitchen exhaust

Operation, Maintenance and Building Owner Education

All of the hard work and effort that is put into the design and construction of a GREEN building can be quickly nullified if the occupants don't know how to properly maintain and service the systems installed. For that reason, a very smart and necessary part of the program asks builders to take appropriate steps to educate the building owners.

How often should filters be replaced? What cleaning fluids, chemicals and pesticides should be used? Which ones should be avoided? What simple practices should be adopted to conserve water? Lower heating bills? These and other questions are covered in the following two scoring modules:

- Building owners' manual for one- and two-family dwellings
- Operation & maintenance training for owners of one- and two-family dwellings & multi-unit buildings

Scoring Chart

Each of the areas discussed above are scored and points awarded appropriately. To achieve a bronze, silver, gold or emerald rating, the builder must reach the levels for each section shown in the chart below:

Point System for Green Buildings				
Category	Point Levels			
	BRONZE	SILVER	GOLD	EMERALD
Lot Design, Preparation and Development	39	66	93	119
Resource Efficiency	45	79	113	146
Energy Efficiency	30	60	100	120
Water Efficiency	14	26	41	60
Indoor Environmental Quality	36	65	100	140
Operation, Maintenance and Building Owner Education	8	10	11	12
Additional Points From Any Category	50	100	100	100
TOTAL	222	406	558	697

HolzKraft is happy to support the GREEN initiative and contribute to public awareness of the program through efforts like this white paper.

To learn more about the program, please contact the National Association of Home Builders or visit their website at:

www.nahb.org