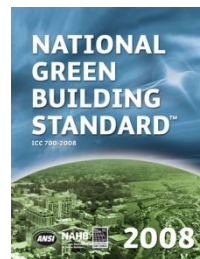


Understanding the Green Programs

Dave Bone

MaGrann Associates

Moorestown, NJ



We Help You Build a Better *Green* Home

AGENDA

1. What is Green Building?
2. National Programs
3. Benefits of Programs
4. Steps to Compliance
5. Comparison: Energy Star, LEED for Homes, NAHB, ANSI/ICC
6. Additional Information Sources

What is Green Building?

CONTROL

Site Choices

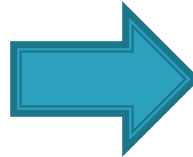
Materials

Building Design

Size

Landscape Design

Occupant Training



ACHIEVE

Energy Efficient

Water Efficient

Healthy & Safe

Comfortable

Durable

Resource Efficient

What is Green Building?

LESS IS MORE:

All buildings have a negative environmental impact

GOAL = Minimize Impact

SMALLER BUILDINGS use Less:

Materials

Initial Energy

Long-Term Energy & Water

Maintenance Resources

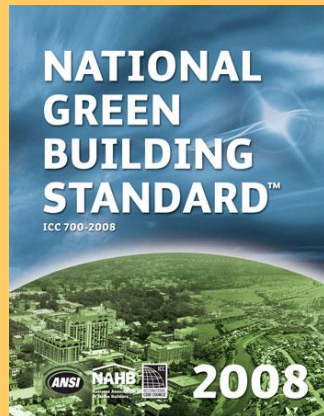
Regional Green Building Programs

- ▶ 80-100 existing green building programs nationally
- ▶ Builders are & have been sampling a variety of local and regional green certifications for a decade or more



National Green Building Programs

- ▶ Time for a single national consensus or room for two programs??



The Core: Energy Efficiency

- ▶ Energy Star Homes: since 1995
- ▶ Joint Development of US EPA & DOE
- ▶ Can be utilized alone or in conjunction with a full green building program



What is Energy Star Homes?

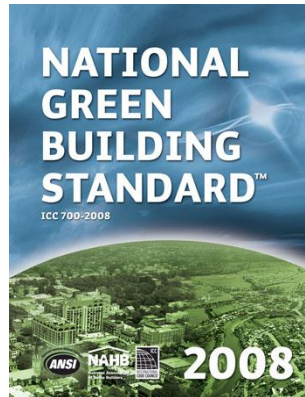


1. Certified by a 3rd Party HERS Rater
2. HERS Index: 85 or lower
 - Uses 15% less energy than: house of same dimensions built to minimum requirements of IECC 2004
 - Includes 1) envelope, 2) mechanical equipment, 3) lights/appliances, 4) solar, and 5) measured duct leakage and infiltration.
3. Low Duct Leakage: less than 6 cfm/100 square feet to outside
4. Complies with EPA Thermal Bypass Checklist
 - Addresses important consumption and comfort issues.
 - Helps ensure low air infiltration.
5. A/C properly sized per ACCA Manual J
 - Optimal running efficiency (minimal short cycling).
 - Adequate dehumidification.
6. Some Energy Star lights and/or appliances.
7. Incentives available through New Jersey Clean Energy Program.



- ▶ Developed by National Association of Home Builders Research Center in conjunction with regional & local HBAs
- ▶ Two public comment periods.
- ▶ Released for use in early 2008.
- ▶ Formed the basis for the National Green Building Standard, which will replaced it.
- ▶ Both programs will coexist for about 1 year.





- ▶ Based on the NAHB Model Green Home Building Guidelines.
- ▶ Evaluated using the ANSI review process as Standard ICC 700–2008.
- ▶ Approved on 1 /29/09.
- ▶ Certifications will be offered to complying projects under the NAHB Green Building Program.
- ▶ Other programs can also adopt this standard and add to it.





- LEED (Leadership in Energy and Environmental Design): Voluntary, consensus-based national rating system for developing high-performance, sustainable buildings.
- Developed by the U.S. Green Building Council (USGBC),
 - Non-profit organization – not affiliated with US Government
 - Committee structure consisting of expert volunteers
 - Member ballot of new rating systems
 - Deliberate goal of scientific consistency and rigor
- Pilot program initiated in 2005, fully-chartered program released in early 2008.



Green Future Guidelines

- Developed by NJ Housing and Mortgage Finance Agency.
- Referenced by and developed for:
 - Low-Income Housing Tax Credit Green Point
 - Balanced Housing and Home Express Green Requirements
 - Single Family CHOICE Program
 - Special Needs Housing Trust Fund
- LEED for Homes is acceptable alternate in some cases.

Benefits of Programs

- Structured & Comprehensive Approach
- Minimize Shortcuts, Last Minute Changes, and Forgotten Details
- Third Party Verification = Consumer Confidence
- Marketable Certification
- Meet Affordable Funding Requirements

Comparison of Programs

1. Applicability to Housing Types
2. Design/Decision Process
3. Verification Methods
4. Categories of Measures
5. Prerequisites and Credits

APPLICABILITY



Single Family
 Gut Rehab
 Renovation
 Multi-Family Low
 Rise (1 to 3 stories)
 Multi-Family Mid-rise
 (4+ Stories)

	NAHB NATIONAL GREEN BUILDING PROGRAM™	NATIONAL GREEN BUILDING STANDARD 2008	LEED™ FOR HOMES	ENERGY STAR
Single Family	Yes	Yes	Yes	Yes
Gut Rehab	Yes	Yes	Yes	Yes
Renovation	No	Yes	No	No
Multi-Family Low Rise (1 to 3 stories)	No	Yes	Yes	Yes
Multi-Family Mid-rise (4+ Stories)	No	Yes	Yes	Pilot

Energy Star for Multi-Family



1. 3 Stories or Less

- Follows same methodology as Single-Family Homes

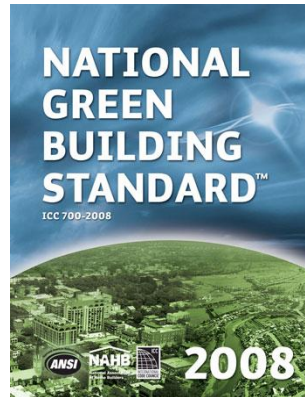
2. 4+ Stories

- Pilot Program – Available in NJ, not in PA yet.
- Energy Modeling - ASHRAE Std. 90.1 used instead of HERS Rating.
- Must reach 20% improvement over baseline building.
- Cost estimating required for improvement measures.



Mid-Rise Pilot

- Detailed in Mid-Rise Pilot Guidance, 8/20/08
- Applies to 4-6 story buildings
- Separate Checklist
- Differs from Single Family program in 16 credits
- Largest changes in:
 - Energy Performance
 - Ventilation



304.1 Multi-unit buildings. For multi-unit buildings, points for the green building practices that apply to multiple units shall be credit once for the entire building. Where points are credited, practices shall be implemented in all units, as applicable. Where application of a prescribed practice allows for a different number of points for different units in a multi-unit building, the fewer number of points shall be awarded.




Design/Decision Process



Provider MUST participate in “Preliminary Rating” with project team:

- Explain Mandatory Measures
- Help team understand measures and verification methods
- Develop initial project checklist



LEED for Homes Simplified Project Checklist

Builder Name: _____

Project Team Leader (if different): _____

Home Address (Street/City/State): _____

Project Description:

Building type: *Single detached* Project type: *Custom*

of bedrooms: *0* Floor area: *0*

Adjusted Certification Thresholds

Certified: *45.0* Gold: *75.0*

Silver: *60.0* Platinum: *90.0*

Project Point Total		Final Credit Category Total Points			
Prelim: <i>0 + 0 maybe pts</i>	Final: <i>0</i>	ID: <i>0</i>	SS: <i>0</i>	EA: <i>0</i>	EQ: <i>0</i>
Certification Level		LL: <i>0</i>	WE: <i>0</i>	MR: <i>0</i>	AE: <i>0</i>
Prelim: <i>Not Certified</i>	Final: <i>Not Certified</i>	<i>Min. Point Thresholds Not Met for Prelim. OR Final Rating</i>			

date last updated: _____ last updated by: _____

		Max Points	Project Points				
			Preliminary	Maybe	No	Final	
Innovation and Design Process (ID) (No Minimum Points Required)		Max	Y/Pts	Maybe	No	Y/Pts	
1. Integrated Project Planning	1.1 Preliminary Rating	Preq	1	0	0	0	
	1.2 Integrated Project Team		1	0	0	0	
	1.3 Professional Credentialed with Respect to LEED for Homes		1	0	0	0	
	1.4 Design Charrette		1	0	0	0	
	1.5 Building Orientation for Solar Design		1	0	0	0	
2. Durability Management Process	2.1 Durability Planning	Preq	1	0	0	0	
	2.2 Durability Management		1	0	0	0	
	2.3 Third-Party Durability Management Verification		3	0	0	0	
3. Innovative or Regional Design	a. 3.1 Innovation #1 _____		1	0	0	0	
	a. 3.2 Innovation #2 _____		1	0	0	0	
	a. 3.3 Innovation #3 _____		1	0	0	0	
	a. 3.4 Innovation #4 _____		1	0	0	0	
<i>Sub-Total for ID Category:</i>			11	0	0	0	
Location and Linkages (LL) (No Minimum Points Required)		OR	Max	Y/Pts	Maybe	No	Y/Pts
1. LEED ND	1 LEED for Neighborhood Development	LL2-6	10	0	0	0	
2. Site Selection	a. 2 Site Selection		2	0	0	0	
3. Preferred Locations	3.1 Edge Development	LL 3.2	1	0	0	0	
	3.2 Infill		2	0	0	0	
	3.3 Previously Developed		1	0	0	0	
4. Infrastructure	4 Existing Infrastructure		1	0	0	0	
5. Community Resources/ Transit	5.1 Basic Community Resources / Transit	LL 5.2, 5.3	1	0	0	0	
	5.2 Extensive Community Resources / Transit	LL 5.3	2	0	0	0	
	5.3 Outstanding Community Resources / Transit		3	0	0	0	
6. Access to Open Space	6 Access to Open Space		1	0	0	0	
<i>Sub-Total for LL Category:</i>			10	0	0	0	
Sustainable Sites (SS) (Minimum of 5 SS Points Required)		OR	Max	Y/Pts	Maybe	No	Y/Pts
1. Site Stewardship	1.1 Erosion Controls During Construction		Preq	1	0	0	
	1.2 Minimize Disturbed Area of Site			1	0	0	
2. Landscaping	a. 2.1 No Invasive Plants		Preq	2	0	0	
	a. 2.2 Basic Landscape Design	SS 2.5		2	0	0	
	a. 2.3 Limit Conventional Turf	SS 2.5		3	0	0	
	a. 2.4 Drought Tolerant Plants	SS 2.5		2	0	0	
	a. 2.5 Reduce Overall Irrigation Demand by at Least 20%			6	0	0	
3. Local Heat Island Effects	a. 3 Reduce Local Heat Island Effects			1	0	0	

Design/Decision Process



- Builder determines measures to pursue using online “**Green Scoring Tool**”
- Verifier involvement is not required.

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:: Home : Green Scoring Tool Greening the American Dream

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Habitat Atlantic City **Scoring Tool** | [Scoring Summary](#) | [Reports](#) | [Projects](#)

Lot Design	Resource Efficiency	Energy Efficiency	Water Efficiency	IEQ	Homeowner Education	Global Impact
------------	---------------------	-------------------	------------------	-----	---------------------	---------------

Section Page 1 of 26

Section Score: ?

86

0 37 62 100
Bronze Silver Gold

Project Status: ?

[Lot Design](#) 15
[Resource Efficiency](#) 64
[Energy Efficiency](#) 86
[Water Efficiency](#) 24
[Indoor Environmental Quality](#) 53
[Homeowner Education](#) 9
[Global Impact](#) 11

Project Score >> 262

0 237 311 395
Bronze Silver Gold

Don't forget your 100 additional points! ?

[Scoring Details](#)

Quick References: ?

- [REScheck™](#)
- [IECC 2003](#)
- [ANSI/ACCA Manual J 8th Edition](#)

Required Conditions - Energy Efficiency

Implement an integrated and comprehensive approach to energy-efficient design of building site, building envelope, and mechanical space conditioning systems

! REQUIREMENTS - The home must meet the three conditions listed below to be considered for certification.

The home must also achieve at least 37 Points (Bronze Level) from the optional guidelines in the Performance Path or the Prescriptive Path.

The home is equivalent to the [IECC 2003](#) or local energy code whichever is more stringent. Conformance to this threshold shall be based on plan analysis using software such as [ResCheck](#) or other as approved by green building program administrator.

Check here if you claim compliance

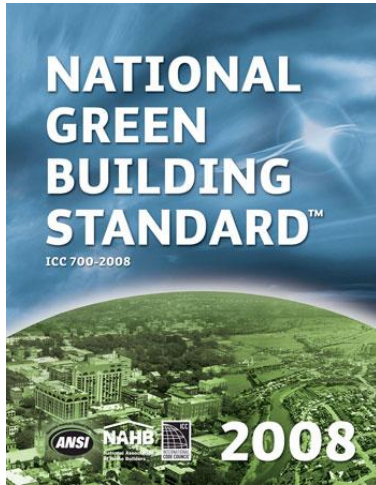
Energy Star - Will Qualify

[Guidelines Reference 3.1.1](#)
[How To Verify Intent](#)
[How To Implement Resources](#)

Size space heating and cooling system/equipment according to building heating and cooling loads calculated using [ANSI/ACCA Manual J 8th Edition](#) or equivalent. [Computerized software recognized by ACCA](#) as being in compliance with Manual J 8th Edition may be used.

Internet | Protected Mode: C

Design/Decision Process



- Builder determines measures to pursue using online “**Green Scoring Tool**”
- Verifier involvement is not required.

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Green Scoring Tool for the National Green Building Standard

Scoring Tool Navigation

- [My Projects](#)
- [Create New Project](#)
- [My Account](#)
- [Scoring Tool Help](#)
- [Certification Information](#)
- [Brochures](#)
- [View Guidelines Projects](#)
- [Sign Out](#)

Scoring Tool Checklist

Project Name: Sample Project
Project Description: NJ Green Home
Scoring Path: Single-Family New Construction
Green Level Achieved: None
This project is 2500 square feet, requiring 50 additional points for Bronze and 100 additional points for Silver, Gold, and Emerald.

Chapter 5, Step 2 of 19

Chapter 5: Lot Design, Preparation, and Development

Section 501 Lot Selection

501.1 Lot

The lot is selected to minimize environmental impact by one or more of the following:

501.1(1)
An infill lot is selected.

	Points Possible	Points Claimed
Conditions met	4	<input type="checkbox"/>

[How to Verify](#) | [Intent](#) | [How to Implement](#) | [Resources](#) | [Green Approved Products](#)

[Show Your Comments](#)

Chapter Status **Project Status**

Chapter 5 Score: [How do I reach a green level?](#)

Chapter Minimums: 39 66 93 119

Mandatory Status: [Don't forget your Additional Points!](#)
[Chapter Summary](#) | [Project Scoring Analysis](#) | [Project Reports](#)

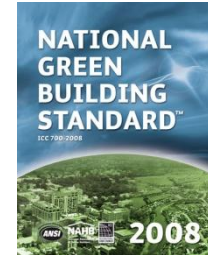
Verification Methods



GREEN RATER

(Overseen By Provider)

1. Visual Inspection & Testing
2. Accountability Forms
3. Backup Documents
 - Invoices
 - Letters
 - Spec Sheets
 - Drawings & Calcs
 - Photos
 - Submitted by fax/email
or viewed at site

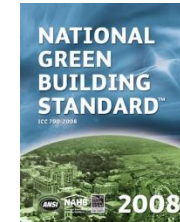


VERIFIER

(Certified By NAHB-RC)

1. Visual Inspection & Testing
2. Backup Documents
 - Invoices
 - Letters
 - Spec Sheets
 - Drawings & Calcs
 - Photos
 - All viewed at site

Points & Levels



Level	Points
Certified	45
Silver	60
Gold	75
Platinum	90
Total Possible	136
Total Measures	~ 86-105
Home Size Adj.	-10 to +30

Level	Points
Bronze	237
Silver	311
Gold	395
Total Possible	600-900
Total Measures	~ 86-154
Home Size Credit	0 to 9

Level	Points
Bronze	222
Silver	406
Gold	558
Emerald	697
Total Possible	1270+
Total Measures	~ 237-259
Home Size Credit	0 to 15

Prerequisites and Category Minimums



Credit category	Prerequisites (mandatory) measures	Minimum point requirements	Maximum points available
Innovation & Design Process (ID)	3	0	11
Location & Linkages (LL)	0	0	10
Sustainable Sites (SS)	2	5	22
Water Efficiency (WE)	0	3	15
Energy & Atmosphere (EA)	2	0	38
Materials & Resources (MR)	3	2	16
Indoor Environmental Quality (EQ)	7	6	21
Awareness & Education (AE)	1	0	3
Total	18	16	136

Prerequisites and Category Minimums

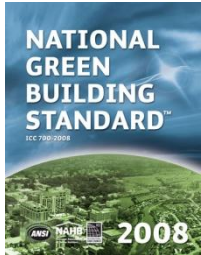


Points Required for the Three Different Levels of Green Building

Prereq:

	Bronze	Silver	Gold
0 Lot Design, Preparation, and Development	8	10	12
0 Resource Efficiency	44	60	77
3 Energy Efficiency	37	62	100
0 Water Efficiency	6	13	19
0 Indoor Environmental Quality	32	54	72
0 Operation, Maintenance, and Homeowner Education	7	7	9
0 Global Impact	3	5	6
Additional Points From Sections of Your Choice	100	100	100

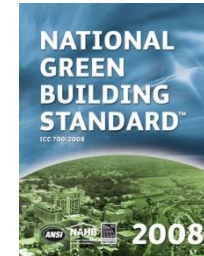
Prerequisites and Category Minimums



Points Required for the Four Different Levels of Green Building

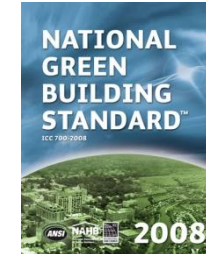
Category	Prereqs	Bronze	Silver	Gold	Emerald	Max Avail. (Approx.)
Lot Design, Preparation, and Development	0	39	66	93	119	226
Water Efficiency	0	45	79	113	146	200
Resource Efficiency	5	30	60	100	120	259
Energy Efficiency	16	14	26	41	60	355
Indoor Environmental Quality	12	36	65	100	140	307
Operation, Maintenance and Building Owner Education	1	8	10	11	12	29
Additional Points from any category		50	100	100	100	

Mandatory Measures: Innovation/Design



Conduct <u>Preliminary Rating</u>	--	--
Prepare <u>Durability Plan</u> (builder defines, verifies measures)	--	--
<p><u>Durability Measures:</u></p> <ul style="list-style-type: none"> •Water Resistant Flooring (Kitch/Bath/Laundry/Entry) •No paper-faced walls around tubs •Drain/Pan for washers, water heaters, and condensing dryers •Dryer vented to outdoors 	<p>--</p> <p>Points awarded for various measures</p>	<p><u>Durability Measures:</u></p> <ul style="list-style-type: none"> •Ext. Drain Tile – Fin. Bsmt. •Water Resistive Barrier •1:20 Slope from House •Ice Barrier per IRC/IBC •No carpet adjacent to toilets •Dryer vented to outdoors •No paper-faced backer behind tile •Vapor retarder under slabs •Damp proof below grade walls •R6 on ducts in uncond. space <p>Points awarded for various other measures</p>

Mandatory Measures: Energy



<p>Meet <u>Energy Star Homes</u> performance requirements</p> <p><i>(via performance path or prescriptive equivalent)</i></p>	<p>Size HVAC per <u>ACCA Manual J</u></p> <p>Points awarded for various other measures</p>	<p>Size HVAC per <u>ACCA Manual J</u></p> <p><u>Sealed Ductwork</u></p> <p><u>No Panned Supplies</u></p> <p><u>Air Sealing</u> including majority of items on EPA Thermal Bypass Checklist</p> <p><u>Energy Star qualified windows</u></p> <p>Points awarded for various other measures</p>
<p>--</p>	<p><u>IECC 2003 Compliant</u> per REScheck Or equivalent</p> <p>3rd Party Review of Compliance</p>	<p><i>Note:</i> <i>Performance Path comparison is to latest version of IECC</i></p>
<p><u>Proper Refrigerant Charge</u></p>	<p>-- Points awarded</p>	<p>-- Points awarded</p>

Energy Star vs. REScheck

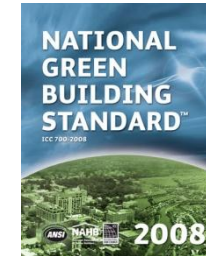


REScheck™

- Compares to 2004 IECC for rating
- Includes:
 1. Envelope: insulation/windows/etc.
 2. Mechanical Equipment: HVAC/DHW
 3. Infiltration
 4. Duct Leakage
 5. Lights and Appliances
 6. Solar
- Compares to any energy code (2003 IECC for NAHB/ICC)
- Includes:
 1. Envelope: insulation/windows/etc.
 2. Mechanical Equipment: HVAC/DHW

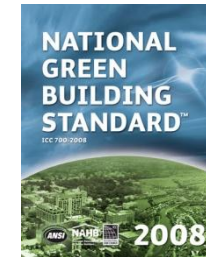
- It is possible for a home to pass Energy Star but NOT pass REScheck for IECC 2003.

Mandatory Measures: Site



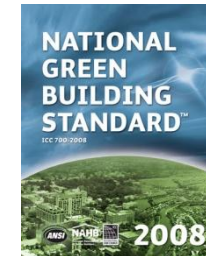
<u>Erosion Controls</u> during construction	-- Points awarded for various measures	-- Points awarded for various measures
No <u>Invasive Plants</u>	--	--

Mandatory Measures: Materials/Resources



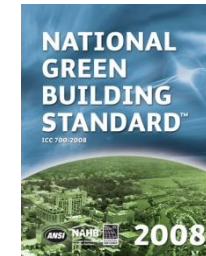
<u>Framing Waste Factor</u> < 10%	--	--
<u>Tropical Hardwoods</u> (if used) must be FSC certified	--	--
Identify <u>Waste Diversion</u> options and document rate of diversion	-- Points awarded for Waste Management Plan	-- Points awarded for Waste Management Plan
--	--	<u>Floor/Roof/Wall Sheathing:</u> PS1 for OSB PS1 / PS2 for Plywood Exposure 1 Adhesives

Mandatory Measures: Indoor Environmental Quality



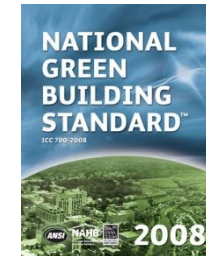
<u>Closed Combustion or Power Exhaust</u> Mechanical Equipment	-- Points awarded	<u>Natural Draft Appliances</u> installed to be code compliant and minimize spillage/backdrafting Points awarded for other measures
<u>CO Monitor</u> On each Floor	--	-- Points awarded for installation near bedrooms
<u>Doors on Fireplaces</u>	--	-- Points awarded
<u>Outdoor Air Ventilation</u> per ASHRAE Std. 62.2	-- Points awarded	-- Points awarded
<u>Local Exhaust</u> (kitchen/bath) per ASHRAE Std. 62.2	-- Points awarded	<u>Bath Exhaust</u> Per ASHRAE Std. 62.2 Points awarded for kitchen

Mandatory Measures: Indoor Environmental Quality



Duct Sizing per <u>ACCA Manual D</u>	-- Points awarded	-- Points awarded
<u>MERV 8 Filters</u> In Air Handlers	-- Points awarded for MERV 9	-- Points awarded
<u>Radon Resistant Construction</u> In EPA Zone 1	-- Points awarded	<u>Passive Radon System</u> In EPA Zone 1
<u>No HVAC in Garage</u>	--	<u>Air Sealing</u> between garage & home Points awarded for other measures

Mandatory Measures: Awareness/Education



<u>Homeowner's Manual and Training</u>	-- Points awarded	<u>Homeowner's Manual</u> Points awarded for training
--	--	<u>Building Manager's Manual</u>



NAHB Green Building Program



Point Evaluation of

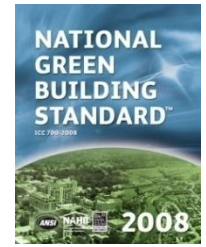
LEED for Homes Prerequisites (Not Certified)

Category	Points for LEED Prerequisites
Lot Design, Preparation & Development	11
Resource Efficiency	68-80
Energy Efficiency	37-100 +
Water Efficiency	N/A
Indoor Environmental Quality	42
Operation, Maintenance & Homeowner Education	18
Global Impact	N/A
Total Points	176-251

Required for: Bronze: **237**



ANSI/ICC Standard Point Evaluation of LEED for Homes Prerequisites (Not Certified)



Category	LEED Prerequisites = ANSI/ICC Std. Points	LEED Prerequisites = ANSI/ICC Std. Mandatory
Lot Design, Preparation & Development	13	N/A
Resource Efficiency	23	Some Specific Durability Measures Not Met
Energy Efficiency	36 +	<ul style="list-style-type: none"> •Some Specific Air Sealing & Insulation Measures Not Met •Can be ES and not meet IECC2003 UA •ES Windows not req'd
Water Efficiency	N/A	N/A
Indoor Environmental Quality	48	All Met
Operation, Maint. & Homeowner Education	11	Building Manager's manual not required
Total Points	131+	

↓
222

Required for Bronze:

Program Fees



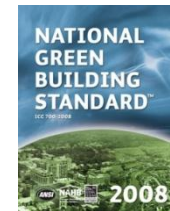
Preliminary Rating and Verification:

- Fees set by Verifier

LEED for Homes Pricing

	SINGLE-FAMILY HOUSING		MULTI-FAMILY HOUSING		VOLUME PRICING
	REGISTRATION	CERTIFICATION	REGISTRATION	CERTIFICATION	PROJECT SPECIFIC
USGBC MEMBER	\$150	\$225	\$450	\$0.035 PER SQUARE FOOT	CONTACT PROVIDER FOR INFO
NON-MEMBER	\$225	\$300	\$600	\$0.045 PER SQUARE FOOT	

Note: The LEED for Homes Rating System requires completion of on-site inspections prior to certification. Additional Provider and Green Rater verification costs apply and are based on market prices. Please consult the Provider of your choice for applicable rates and fees. All fees are subject to change. Sorry, no refunds.



Verification:

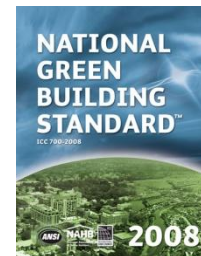
- Fees set by Verifier

Certification:

- \$200 per home (NAHB Members)
 - \$500 per home (non-members)
- + \$20/unit for MultiFamily

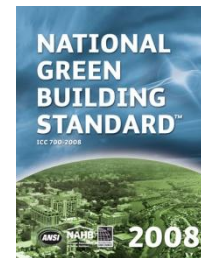
Program Similarities

- ▶ Development of program consensus based and builder participation is voluntary
- ▶ Third Party verified, though slightly different process
- ▶ Program requirements typical of general green building practices
 - Address Home Size, although slightly different
 - Two energy pathways
- ▶ Paperwork and amount of time & effort to certify is roughly equivalent



Program Differences

- ▶ Third Party Verification: NAHB Verifier vs. LEED H Providers/Raters
- ▶ Where rating process begins
- ▶ Applicability to Mid Rise Multi Family
- ▶ LEED Prerequisites are point categories for NAHB/ANSI
- ▶ Energy Star equivalent not required by NAHB/ANSI
- ▶ NAHB point categories for minimum bronze certification level are soft in terms of encouraging innovative green strategies. This is particularly true for non-Energy Star Builders.
- ▶ ANSI Standard is between LEED and NAHB Guidelines in rigor



Additional Information



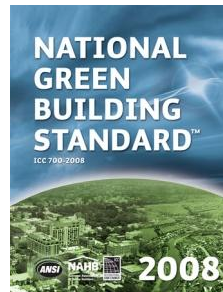
New Jersey Builders:
www.njcleanenergy.com
or *800-390-6090*

National Program Information:
www.energystar.gov

Additional Information

1. Online Courses
2. LEED for Homes AP Program: currently Beta Testing exam, release planned for late-2009

www.usgbc.org



www.nahb.org

www.nahbgreen.org

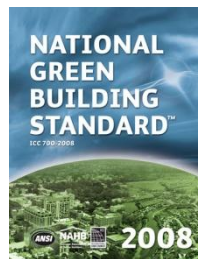
Understanding the Green Programs

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