A Comparative Overview of the ICC/ASHRAE 700 2015 National Green Building Standard & Enterprise Green Communities 2015 Criteria

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# A ComparativeOverviewof the ICC/ASHRA760 2015National GreenBuildingStandard& EnterpriseGreenCommunities

Thisdocumentis intended to provide a review of the features, elements and keyfactors of two nationally recognized sustainability and greenbuilding systems ICC/ASHRATEO r 2015NationalGreenBuildingStandard and EnterpriseGreenCommunities("Enterprise"). It reviews the similarities and differences of the two systems as well as provides information for parties interested in integrating above code, voluntary sustainabled esign and construction practices and programs into residential single family and multifamily buildings.

phase,prior to the start of

## Categoriesof GreenPractices

NGBS and Enterpriseboth have practices in six similar topic areas:

- x Water Efficiency
- x EnergyEfficiency
- x Locationand SiteDevelopment
- x Material and Resource Efficiency
- x Indoor EnvironmentaQuality
- x Operationsand Maintenance

Enterprise has an additional category for "Integrative Design," which contains mandatory and optional practices related to identifying green development goals, potential resident health factors, and possible resiliency issues. The NGBS awards integrated design when it design

# CertificationLevels

### ICC/ASHRAZ00 2015NGBSCertification Levels

UnderNGBS\$inglefamily homesand multifamily buildingscanattain one of four potential certification levels:Bronze,Silver,Goldor Emerald,by earninga minimum number of points at each certification level, ascan be seen in Table2 below. There are 1,100 points available in the rating system. In addition to earned points, every building certified under the standard must comply with all of the relevant mandatory provisions.

Thestandardwasspecificallydesignedso that a

multifamily certification, the verifier must perform a rough inspection before the drywall is installed to observe the wall cavities in every apartment, and a final inspection of every apartment once the project is complete. There quired verification helps ensure a high level of rigor, continuity and quality assurance to the system and to the project shat are certified.

## HomeInnovation ResearchLabs

HomeInnovationResearch absis a 53 yearold, internationally recognized and accredited product testing and certification laboratory. Its work is solely focused on the residential construction industry and its mission is to improve the affordability, quality, performance and durability of housing by helping overcome barriers to innovation. Its core competency is as an independent, third party product testing and certification lab, as well as administering the NGB spreencertification system for residential buildings.

HomeInnovationqualifies,trains and accreditsbuildingprofessionals provide independent verifications ervices for builders participating in the NGBS Green Certificationsystem. Verifiers must first demonstrate they posses experience in residential construction and green building before they are eligible to take the verifier training. Many verifiers are also HER staters, LEED Homes Green Raters, or LEED Accredited Professionals Potential verifiers must complete thorough training on exactly how to verify every NGB practice. After completing the training, verifiers must passa written exambefore earning HomeInnovation accreditation, and accreditation must be renewed annually. Pobential

## Enterprise

EnterpriseCommunityPartnersis a non profit that supportsownersof existingmulti r family buildingsin keymarketswith capitalpurchases that reduceenergyand water consumptionor will lead to a more healthy living environment. They provide funds to help build, rehabilitate and operate efficient and affordable housing. They work with state and local governments o ensure the development of sustainable housing and economic development policies. All projects certified to meet Enterprise Green Communities Criteria are reviewed and approved in house by Enterprise staff.

# **Registration& Certification Fees**

Theregistrationand certification fees for the NGBS are depicted in the table below. At the time this report was written, Enterprisedoes not have any registration or certification fees. This does not include any fees charged by possible third party consultant susefulor necessary for project certification (which is not required), such as Green Verifiers or Energy Raters. These individuals and organizations set their own rates based on market prices.

	NGBS2015	Enterp	oriseGreenCommunities
	Registration \$0		<u>Registratio</u> n \$0
Single <b>F</b> amily	<u>Certification</u> \$200/Home	SingleFamily	<u>Certification</u> \$0
Multifomily	<u>Registratio</u> n \$0	Multifamily	<u>Registratio</u> n \$0
Multianity	Certification <ul> <li>1 ß Stories\$200base + \$30/unit</li> <li>#Stories\$600base + \$30/unit</li> </ul>		<u>Certificatio</u> n \$0
Additional	<u>Appeal</u> s \$0	Additional	<u>Appeal</u> s \$0
Fees	Inquiries \$0	Fees	Inquiries \$0

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# Legislativeand RegulatoryInclusion

Both Enterpriseand NGBS avebeen considered within a number of state and federal incentive programs. The following system and municipalities recognize Enterpriseand/or the NGBS:

x HUD& USDAEnergyEfficiencyStandardsNGB&andEnterprisearearecognized alternativecompliancepath for demonstratingthat HUDror USDAhousingmeets the agenciesenergyefficiencystandardsHUDalsorecentlyadoptedsignificant mortgageinsurancepremium reductionsfor greencertified buildingsEnterpriseand/orconsidered



# GreenPracticeCategories

Thissectionincludes an overview of the greenpractice categories featured in Enterprise GreenCommunities and the NGBS including mandatory practices, minimum point requirements, and green practices featured within the category.

Thetables

points for integrated design when it comes to the site development under the site "Lot

# Figure 5: Integrative Design Practices

#### Points Possible

4

#### Project Team, Mission Statement, and Goals

502.1 A team is established with roles identified specifically for green lot design, preparation, and development. A mission statement is developed with green goal's and objective.

#### Documentation

102.3 Verification of conformance to green building practices shall be the appropriate documents, architectural plans, site plans, specifications, builder certification and sign-off, inspection report or other data that demonstrates conformance.

		Points Possible
1.1a	<u>Goal Setting</u> Develop an integrative design process that works best for your project team and intentions. A minimum, document: ! A statement of the overall green development goals of the project and the expected intende outcomes from addressing those goals. ! A summary of the integrative process that was used to select the green building strategies, systems and materials that will be incorporated into the project. ! A description of how progress and success against these goals will be measured throughor completion of design, construction and operation to ensure that the green features are include and correctly installed.	Mandatory
1.1b	<u>Criteria Documentation</u>	

# Locationand Site Development

ICC/ASHRAZ00 2015NGBS Lot Design, Preparation and Development

The "Lot Design, Preparation, and Development" green practice category pertains to key site related green aspects such as stormwater



Points Possible

6

 Bicycle Parking

 Dedicated bicycle parking and racks are provided for mixed-use and multifamily buildings:

 501.2 (6) Path 1:Minimum of 1 bike space per 3 residential units (2 pts)

 Path 2:Minimum of 1 bike space per 2 residential units (4 pts)

 Path 3:Minimum of 1 bike space per 1 residential units (6 pts)



Points

Possible

Improving Connectivity to the Community

Improve access to community amenities through at least one of the transit, auto or biking mobility measures listed. For example, Provide outdoor bicycle racks that are accessible for

2.9 visitors and residents. [1 point]. Provide secure, lockable, sheltered and accessible bicycle



Points Possible



## Materials & Resourcefficiency

## ICC/ASHRAZ00 2015NGBS ResourceEfficiency

The "Resource fficiency" greenpractice category is focused on minimizing the environmental impact of buildings by incorporating environmentally efficient building systems and materials, and reducing wastegenerated during construction and after the home is occupied. Practices include using products and systems with enhanced durability and reduced maintenance as well as reused, recycled, regional or salvaged materials. It was encourages projects to develops maller dwelling units, recognizing he inherent impact on the environment of larger homes.

### MandatoryPractices:

x Fordwelling

products and materials within the home, as well as mitigating materials that could have a potential impact

water barriers, foundation drainage, capillary breaks, and tile backing materials, among others. Similar practices for a number of NGBS naterials practices can be found in the Enterprise (Healthy Living Environment" category of Enterprise (See Figure 10).

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901.9	Interior Architectural Coatings 85% or more of Architectural Coatings meet on of the following: ! Low VOC, no VOC, or GreenSeal GS-11. (6 pts) -OR- ! Emission levels in accordance with California Department of Public Health Standard Method v1.1 (8pts)	8		6.1
901.10	Interior Adhesives and Sealants 85% or more of interior adhesives and sealants meet one of the following: 1 Emission are in accordance with California Department of Public Health Standard Method v1.1 (8pts) 1 GreenSeal GS-36 (5 pts) 2 SCAQMD Rule 1168 (5 pts)	8		6.2
604.1	Recycled Content Building materials with recycled content are used for two minor and/or two major components of the building. Point are based on the percentage of recycled content, with a minimum of 25%.	9		6.3
609.1	Regional Materials Regional materials (within 500 miles of site) are used for major and/or minor components of the building. For component to comply with this practice, a minimum of 75% of all products in that component category must t sourced regionally. Two points per each major component and 1 point per each minor component.	10		6.4
603.2	Salvaged Materials			

		Points Possible
6.1	Low / No VOC Paints, Coatings and Primers All interior paints and primers must have VOC levels, in grams per liter, less than or equal to the thresholds established by South Coast Air Quality Management District (SCAQMD) Rule 1113.	Mandatory
6.2	Low / No VOC Adhesives and Sealants All adhesives and sealants (including caulks) must have VOC levels, in grams per liter, less than or e the thresholds established by the South Coast Air Quality Management District Rule 1168.	Mandatory
6.3	Recycled Content Material Incorporate building materials that are composed of at least 25% post-consumer recycled content or least 50% post-industrial recycled content. [1 point] Building materials that make up at least 75% of t project component each receive 1 point.	3
6.4	Insequent analysis of the project for a minimum of 50%, based on cost, of the building materialsÖ value. Select any or all of these options i material can qualify for 1 point): # Framing materials # Exterior materials (e.g., siding, masonry, roofing) # Flooring materials # Concrete/cement and aggregate material # Drywall/interior sheathing materials	4

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#### Other NGBS Resource Efficiency Practices (cont'd)

		ICC/ASHRAE 700-2015 NGBS	Points Possible
	602.1.5	Termite Barrier For areas of moderate to heavy termite infestation potential: Install no or low-toxicity treatment measures (4 pts) For areas of very heavy termite infestation potential: Install above measures, as well as implement low toxicity bait and kill treatment plan. (4 pts)	4
	602.1.6	Termite-resistant materials. Slight to moderate termite infestation probability: Install termite resistive materials for foundation, structural walls, floors, exterior decks, and exterior claddings feet above top of foundation. (2 pts) Moderate to heavy termite infestation probability: Install termite resistive materials in all above areas as well as exterior claddings 4 feet above top of foundation pts) Very heavy termite infestation probability: Install termite resistive materials in all above areas as well as all exterior claddings. (6 pts)	6
	602.1.7	Moisture Control Measures 1 Mandatory: Insulation in cavities is dry in accordance with manufacturerÕs instructions when enclosed (2 ; 1 Mandatory: Noisture content of subfloor, substrate, or concrete slabs is in accordance with the appropriate industry standard for the finish flooring to be applied. 1 Building materials with visible mold are not installed or are cleaned or encapsulated prior to concealment a closing. (2 pts) 1 The moisture content of lumber is sampled to ensure it does not exceed 19 percent prior to the surface and/or cavity enclosure. (4 pts) 1 Building envelope assemblies are designed for moisture control based on documented hygrothermal simul or field study analysis. (4 pts)	Mandatory + 14 Points
cy	602.1.8	Water-Resistive Barrier Where required by the ICC, IRC, or IBC, a water-resistive barrier and/or drainage plane system is installed b exterior veneer and/or siding.	Mandatory
Resource Efficien	602.1.9	Flashing         ! Mandatory: Flashing is installed at all of the following locations, as applicable:         (a) around exterior fenestrations, skylights, and doors         (b) at root valleys         (c) at at loviding to-deck, balcony, -porch, and -stair intersections         (d) at root-k-wall intersections, at roof-to-chimney intersections, at wall-to-chimney         intersections, and at parapets         (e) at ent building to-deck, balcony, -porch, and -stair intersections, at wall-to-chimney         (e) at ent so and under masonry, wood, or metal copings and sills         (f) above projecting wood trim         (g) at built in ord gutters, and         (h) drip edge is installed at eave and rake edges.         1. All window and door head and jamb flashing is either self-adhered flashing complying with AAMA 711-13 of izerid applied lashing complying with AAMA 714-15 and installed in accordance with fenestration or flashing manufacturerOs installation instructions. (2 pts)         1. Pan flashing is installed at sills of all exterior windows and doors. (3 pts)         1. Seamless, preformed kickout flashing or prefabricated metal with soldered seams is provided at all roof-to-intersections. (3 pts)         1. A rainscreen wall design is used for exterior wall assemblies. (4 pts)         1. Through-wall flashing is installed at transitions between wall cladding materials or wall construction types. pts)         1. Flashing is installed at expansion joints in stuccowalls. (2 pts)	Mandatory + 16 Points
	602.1.10	Exterior Doors Entries at exterior door assemblies, inclusive of side lights, are covered by installing a porch roof or awning, extending the roof overhang, recessing the exterior door, or installing a storm door. (2 pts per door, 6 pts ma	6
	602.1.12	Roof Overhangs Roof overhangs are provided over at least 90% of exterior walls to protect the envelope.	4
	602.1.13	Ice Barrier In applicable climates, an ice barrier is installed in accordance with the ICC IRC or IBC at roof eaves of pitch roofs and extends at least 24 inches inside the exterior wall line.	Mandatory
	602.1.14	Architectural Features 1 Mandatory: All horizontal ledgers are sloped away to provide gravity drainage. (1 pt) 1 No roof configurations create horizontal valleys in roof design. (2 pts) 1 No recessed windows and architectural features trap water on horizontal surfaces. (2 pts)	Mandatory + 5 Points

#### Other NGBS Resource Efficiency Practices (cont'd)

		Points Possible
602.3	Roof Water Discharge A gutter and downspout system or splash blocks and effective grading are provided to carry water a minimur feet away from perimeter foundation walls.	4
602.4	<u>Finished Grade</u> ! Mandatory: Finished grade at all sides of a building is sloped to provide a minimum of 6 inches of fall withi feet of the edge of the building. Where there is not 10 feet available, the final grade is sloped away from the of of the building at 2% or greater. ! Final grade is sloped away from the edge of the building at a minimum slope of 5%. (1 pt) ! Water is directed to drains or swales to ensure drainage away from the structure. (1 pt) Reuse of Existing Building	Mandatory + 2 Points
603.1		

#### Other NGBS Resource Efficiency Practices (cont'd)

		ICC/ASHRAE 700-2015 NGBS	Points Possible
Resource Efficiency	611.3	Universal Design Elements Dwelling incorporates one or more of the following universal design elements. (12 pts max): I Any no-step entrance into the dwelling which is accessible from a substantially level parking or drop-off are more than 2%) via an accessible path which has no individual change in elevation or other obstruction of more than 1-1/2 inches in height with the pitch not exceeding 1 in 12, and provides a minimum 32-inch wide clearance into the dwelling. (3 pts) I Minimum 36-inch wide accessible route from the no-step entrance into at least one visiting room in the dwe and into at least one full or half bathroom which has a minimum 32-inch clear door width and a 30-inch by 48 clear area inside the bathroom outside the door swing. (3 pts) I Minimum 36-inch vide accessible route from the no-step entrance into at least one bedroom which has a minimum 32-inch clear door width. (3 pts) I Minimum 36-inch wide accessible route from the no-step entrance into at least one bedroom which has a minimum 32-inch clear door width. (3 pts) I Bioching or equivalent installed in the accessible bathroom walls for future installation of grab bars at wate closet and bathing fixture, if applicable. (1 pt) I All interior and exterior door handles are levers rather than knobs. (1 pt) I All interior and exterior door handles are levers rather than knobs. (1 pt) I All interior and exterior door handles are lever stather than knobs. (1 pt) I All interior and exterior door handles or tother similar switches stare splaced between 15 480 above the finished floor. Additional switches to control devices and switches are placed between 15 480 above the finished floor. Additional switches to control devices on tops in stalled as desired. (1 pt) I All light switches are nocker-type switches or other similar switches that can be operated by pressing them assistive devices). Toggle-type switches may not be used. (1 pt) Any of the following can be controlled with a (wireless) mobile device such as a smartphone, tablet or laptc computer_	12
	611.4	<u>Product Declarations</u> A minimum of 10 different installed products have either industry-wide or product specific Environmental Product Declarations (EPDs). Product-specific EPD's are weighted 2x higher than industry-wide EPDs.	5

# EnergyEfficiency

### ICC/ASHRAZ00 2015NGBS- EnergyEfficiency

ThisNGBS: ategory focuses on design and construction practices that help increase the energy efficiency of a project while encouraging the use of renewable energies. There are multiple paths for a project to comply, providing builders and project teams the flexibility to choose the best means of demonstrating increase denergy efficiency based on their local conditions and market. Regardles of the path selected, this category includes multiple mandatory practices to ensure a solid base of energy efficiency regardles of project type and location.

Table10 below shows the pathways available to demonstrate compliance with this category. Also listed are the corresponding evels of certification a project can achieve by selecting the various pathways. For example, a project selecting an Energy Sta8.0 Certified Homelabel as the compliance method can only achieve Bronze Certification, while only a project pursuing the Performance Pathcan achieve the higt egs (c13.6 / TT1 1 Tf 1.4319126 TD 0 T

# MandatoryPractices:

- x One of the available compliance pathways from Table1 must be selected.
- x All installation of insulation must meet Grade1 standards.
- x Buildingenvelopetightnessmust be tested

EnterpriseGreenCommunities-EnergyEfficiency

The "EnergyEfficiency" category of Enterprises focused on practices that help increase the energyefficiency of a project while encouraging the use of renewables. To comply, singlefamily homes and low rise multifamily projects must meet the requirements of ENERGSTARNew Homes. Formid rise and high rise buildings, the project must be certified through the ENERGSTAR Multifamily High Riseprogram, or use the multir faceted approach described in Figure 8 below. The project must also install ENERGY STAR abeled appliances high efficacy lighting, and submeters for each unit.

# MandatoryPractices:

- x <u>Singlefamily and Low rise Multifamily</u>: Certifyeachdwellingunit through the ENRG STAR New Homesprogram
- x <u>Mid riseandHighriseMultifamily</u>: Certifythe project through the ENERGY STARMultifamily HighriseProgram,or use the multi faceted approach in Figure7
- x Sizeheatingand coolingequipmentin accordance with the Air Conditioning Contractors f America (ACCA) Manuals Jand Sor ASHRAE and books
- x InstallENERGSTAR:lotheswasher,dishwashersandrefrigerators.lf appliancesnot installed,specifyENERGSTAR:nodelsmust be usedif installedlater
- x Permanentlightingmust comply with high efficacy and other guidelines stated in Figure8
- x Individualelectric meters or submeters must be installed for all dwelling units.

### Minimum Point Requirements:

Enterprisedoesnot require projects to obtain a minimum number of points per category.

# Analysis

TheNGB\$providesmultiple pathwaysfor demonstrating the baselinecompliance with this category, asseen in Table 10 above. This includes energy modeling, utilizing the ENERG\$TARHomeEnergyRatingSystem(HERS) ndex Target, and/or certifying the project through ENERG\$TARH also includes a number of additional mandatory practices, such as HVAC and duct sizing requirements, to ensure a baseline of energy efficiency. Notably, the NGB\$ equires all insulation to be installed to Grade1 standards, for one of the second secon

rise and higher buildings can either choose the ENERGSTAR Multifamily Highrise Program, or use the multi faceted approach

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# !"#\$%&'()'\*+&%#,'\*--"."&+.,'/%0.1".&2'

		Points Possible
701.4.4	<u>High-Efficacy Lighting</u> Dwelling unit(s) must either have a minimum of 75% of total hard-wired lighting fixtures or bulbs qualify as h efficacy, or the lighting power density be 1.1 watts/square foot or less.	Mandatory
701.4.3.5	<u>Recessed Lighting</u> Recessed luminaries installed in the thermal envelope must be sealed to limit air leakage, must be IC-rated labeled as meeting ASTM E283, and sealed with a gasket or caulk.	Mandatory
703.6.1	<u>Hard-wired Lighting</u> 1 95% percent of the total hard-wired interior luminaires or lamps qualify as ENERGY STAR or equivalent. (2-3 pts based on climate zone) 1 A minimum of 80 percent of the exterior lighting wattage has a minimum efficacy of 40 lumens per watt or is solar-powered. (1 pt) 1 In multifamily buildings, common area lighting power density (LPD) is less than 0.51 Watts per square foot. (7 pts)	11
705.2.1	Lighting Controls Points can be earned for providing dimming controls and/or occupancy or photo sensors for interior and/or exterior lighting fixtures of dwelling units. Multifamily projects can earn points for having dimmers or occupa sensors in common areas, and for providing automatic light reduction for unoccupied interior corridors, stairwells, garages, and parking areas.	ı 15
705.2.1.2	Exterior Lighting Photo or motion sensors are installed on 75 percent of outdoor lighting fixtures to control lighting.	1

Points Possible

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#### Other NGBS Energy Efficiency Practices

	ICC/ASHRAE 700-2015 NGBS	Points Possible
701.4.1.2	Radiant and Hydronic Space Heating System is designed, installed, and documented using industry-approved guidelines and standards.	Mandatory
701.4.2.1	Duct Air Sealing All duct sealing is in conformance with UL 181A or UL 181B	Mandatory
701.4.2.2	Ducts and Plenums Building cavities are not used as ducts or plenums.	Mandatory
701.4.2.3	Duct system Sizing Duct systems are sized and designed in accordance with ACCA Manual D (or equal).	Mandatory
701.4.3.1	Building themal envelope in durably sealed to limit infiltration. All openings, penetrations, joints, seams, connections, common walls, and other sources of infiltration are caulked, gasketed, weather-stripped, or otherwise sealed with an air barrier material, suitable film, or solid material.	Mandatory
701.4.3.2.1	Insulation must be installed to Grade 1 standards and visually inspected by Green Verifier before installation drywall.	Mandatory
701.4.3.2.2	Air Sealing & Insulation Testing 2 Building envelope tightness must be tested with blower door per ASTM E-779. 1 Air barrier and insulation must be field verified by Green Verifier pre-drywall and post-construction. Fenestration Air Leakage	Mandatory
701.4.3.4	Fenestrations, such as windows, must not have an infiltration rate of 0.3 cfm per square foot, while swinging doors must not exceed 0.5 cfm per square foot.	Mandatory
701.4.5	Boiler Supply Piping Any boiler supply piping in unconditioned space must be insulated Maximum IIA	Mandatory
703.1.1.1	The total building UA is less than or equal to the total maximum UA as computed by 2015 IECC. The total U proposed and baseline calculations are documented. REScheck or COMcheck is deemed to provide UA calculation documentation.	Mandatory
703.1.1.2	Prescriptive R-values and Fenestration Requirements The building thermal envelope is in accordance with the insulation and fenestration requirements of 2015 IE	Mandatory
703.1.2	Building Envelope Leakage Building thermal envelope must be in accordance with 2015 IECC R402.4.1.2 or C402.5	Mandatory (Prescriptive Path)
703.1.3	<u>Duct Testing</u> The duct system is in accordance with 2015 IECC R403.3.2 through R403.3.5 as applicable.	Mandatory
703.2.5.1	Efficient Fenestration NFRC-certified U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (T do not exceed the values in NGBS Table 703.2.5.1. Enhanced Encertration	Mandatory (Prescriptive Path)
703.2.5.2	NRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) meet the values in NGBS Table 703.2.5.2.	6
703.3	HVAL Equipment Encodery Design and install HVAC equipment that is meets efficiency standards stated in NGBS Section 703.3 Tables are dependent on equipment type and Climate Zone.	1-52
703.4	Duct systems Install ductless heating and/or cooling systems, install all ducts in the conditioned space, and/or have the en HVAC duct system tested by a third party for total leakage at a pressure differential of 25 Pa and max air lea no more than 6% of design flow rate, or 4.0 cfm at 25 Pascals per 100 square feet. Points are dependent or climate zone.	15
703.5	Water Heating System Water heating system meets the necessary Energy Factor or Solar Energy Factor required to earn points. P are dependent on water heater type (gas, heat pump, desuperheater, solar, etc.) and climate zone.	25
703.7.1	<u>Passive souar uesign</u> The building is designed for passive solar, including but not limited to, the long side of the building facing wii 20 degrees of true south, overhangs or adjustable canopies or awnings or trellises provide shading on south facing glass for the appropriate climate zone, and the south face windows have a SHGC of 0.40 or higher.	4
705.2.2	TDD's and Skylights A tubular daylight device or skylight is installed in rooms without windows.	2
705.2.3	Lighting Outlets Occupancy sensors are installed for 80% or more hard-wired lighting outlets in living spaces.	1
705.2.4	Recessed Luminaires	1

705.2.4 Recessed luminaires penetrating the thermal envelope is less than 1 per 400 square feet.

#### Other Enterprise Energy Efficiency Practices

	Enterprise Green Communities	Points	Possible
5.8a	Resilient Energy Systems: Floodproofing Conduct floodproofing, including perimeter floodproofing (barriers /shields), of lower floors. Design and install building systems as specified by the full criterion so that the operation of th systems will not be grossly affected in case of a flood.	1	8
	Resilient Energy Systems: Islandable Power Provide emergency power through an islandable photovoltaic (PV) system or an efficient and portable generator that will offer at least limited electricity for critical circuits during power outages per one of the three options listed.	I	
	Option 1[8 points]           With PV systems, install inverters that provide limited access to solar-generated power during outages when the sun is shining.           -OR-           Option <u>2</u> 6 points]           Provide a PV system with battery storage and a system to switch to battery backup 18 18. 18	1	8

705.5.2 Performance of system is verified by HVAC contractor, including start-up procedure refrigerant charge handler 888.02884f [ (BuildinQ q (Rtur) m2 10 (e r) 10 sc q 0.1008000 0 2ulo)ra(e molnso Effg., ) s. 0 030.1

705.5.1 HVAC Contractor and service technician are certified by nationally/regionally recognized program (e Building Performance Institute). (1 Pt) 705.5

705.3 An induction cooktop is installed. Return Ducts/Transfer Grilles 705.4 Return ducts or transfer grilles installed in every room with a door (except bathrooms, kitchens, closets, pan and laundry rooms). HVAC Design and Installation

Other NGBS Energy Efficiency Practices (cont'd)

Induction Cooktop

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Points Possible

1

2

### Water Efficiency

## ICC/ASHRAE00 2015NGBS-Water Efficiency

The "Water Efficiency" practice category is focused on conserving and efficiently using one of the world's most important resources water. From rainwater harvesting to wastewater treatment systems this category provides a broad selection of water efficiency strategies specifically targeted towards residential design, construction and operation.

### MandatoryPractices:

- x If a project is seekingGoldor EmeraldCertification,all water closetsand urinals must have a maximumflow rate of 1.28gpm, regardlessof dual flush capabilities.
- x If a landscapingsystem is installed, an irrigation plan must be executed by a qualified professionabertified by a WaterSense abeled system (or equal).

### Minimum Point Requirements:

CroonBuildingCotogorion	Minimum PointsRequired				
GreenbuildingCalegones	BRONZE	SILVER	GOLD	EMERALD	
WaterEfficiency	25	39	69	97	

#### Table12: Water Efficiency Minimum Point Requirements

EnterpriseGreenCommunities-Water Conversation

The "Water Conservation" category is focused on reducing the use of water in the home through conservation measures and encouraging the use of alternative water sources Like other categories Enterprise also encourages the project team to consider resiliency during design, and how the residents will have access to potable water during emergencies.

### MandatoryPractices:

- x Installwater conservingixtures in all units and any common facilities:
  - o <u>Toilets</u>:WaterSensetabeledand1.28gpfmax
  - o <u>Urinals</u>:WaterSensetabeledand0.5gpfmax
  - o <u>Showerheads</u>WaterSensetabeledand2.0gpmmax
  - o <u>KitchenFaucets</u>2.0gpmmax
  - o <u>LavatoryFaucets</u>WaterSenseabeledand1.5gpmmax
- x For all single family homes and all dwelling units in buildings three stories or

fewer, the static service pressure must not exceed 60 psi

### Minimum Point Requirements:

Enterprisedoesnot require projects to obtain a minimum number of points per category.

Analysis

Both the NGBS and Enterprise focuson reducing water use of the home through increase deficiency and conservation as well as encouraging the use of alternative water sources Enterprise has a straightforward mandatory requirement of meeting the maximum flush and flow rates for indoor fixtures, as well as Water Sense abeling. Additional points can be earned for selecting fixtures with even more increased efficiencies.

TheNGBSJoesnot mandatefixture flush and flow rates, with the exception of water closets for projects seeking Goldor Emerald Certification. The one stand alone mandatory requirement for water in the NGBS that if irrigation is installed, it must be homæ!o\$ ñ Ses 34 0. Pross (water of the NGBS that if irrigation is installed, it must be designed in dexecuted by a qualified profession acertified by a Water Sense 11, 12, 11, 17, 12, 224, 0 TD .0003 Tc (water for contents of the sense 10, 224, 0 TD .0003 Tc (water profession acertified by a content of the sense 10, 2000 to the sense 10, 2000 t

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		Points Possible	Points Poss	ible
801.3	<u>Showerheads</u> ! Showerheads are less than 2.5 gpm. (4 pts for 1st shower, 1 pt for each added shower, 7 max) ! All showerheads are less than 2.5 gpm (6 added pts), less than 2.0 gpm (10 added pts), i than 1.6 gpm (14 added pts).	24		
801.4	Showers can shut off flow without affecting temperature. (1 pt each, 3 pts max) <u>Lavatory Faucets</u> Bathroom faucets are 1.5 gpm or less. (1 pt each, 3 pts max)     All bathroom faucets are 1.5 gpm or less. (6 added pts)     Self-closing valve, motion sensor, metered, or petal-activated faucet installed. (1 pt each, max)	12		
801.5	Water Closets and Urinals         ! Water closet have a flush volume of 1.28 gal or less. (2 pts per fixture, 6 pts max)         ! All water closets have a flush volume of 1.28 gal or less. (11 pts/Mamdatory for Gold or Emerald Certification)         ! Water closets have flush volume of 1.2 gal or less. (1 added pt per toilet, 3 pts max)         ! One or more urinals have flush volume of 0.5 gal or less. (1 added pt)         ! One or more toilets and/or urinals are compositing or waterless. (6 added pts)	19		
801.3	<u>Showerheads</u> See details above.	See above		
801.4	Lavatory Faucets See details above.	See above		
801.5	Water Closets and Urinals See details above.	See above		
801.1	Indoor Hot Water Usage Max volume from water heater to furthest fixture is 1 gallons [11 pts], 0.5 gallons [17 pts], c 0.25 gallons [29 pts] Rainwater Collection and Distribution (Irrigation)	29	Efficient Plumbing Layout and Design         4.4       The hot water delivery system shall store no more than 0.5 gallons of water in any piping/mani between the hot water source and any hot water fixture.       4	
801.7.1	i			

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# Indoor EnvironmentalQuality

ICC/ASHRAT00 2015NGBS- Indoor EnvironmentalQuality

 $\label{eq:constraint} The ``Indoor Environmenta Quality'' practice category is focused on providing clean air and a$ 

Analysis

As



Points Possible		Points Possible
901.2.2	-	



Other NGBS Indoor Environmental Quality Practices		Other Enterprise Healthy Living Environment Practices		
	Points Possible		Points Possible	
Electric heat pump air handler 901.1.6 Path 1:Install the heat pump in an unconditioned space (2 pts) Path 2: Install the heat pump in a conditioned space (5 pts)	Points Possible	Nold Prevention: Water Heaters 7.7	Points Possible	

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# Operation, Maintenance, and Building Owner Education

ICC/ASHRAZ00 2015NGBS- Operation, Maintenance, and BuildingOwner Education

The "Operation, Maintenance and BuildingOwnerEducation" practice category is focused on providing information on the building 'suse, maintenance and green components to all necessary parties. This includes

operations and maintenance procedures

- x Providea guidefor homeownersand renters that explains the intent, benefits, use and maintenance of their home's green features and practices
- x Providea manualon emergencyoperationstargeted toward operations and maintenances taff and other building level personnel.
- x Forrental properties:Collectand monitor project energy and water performanced at a for 100% of owner paid utilities and 15% of tenant paid utilities for at least5 years.Provideto Enterprise.
- x Forowner occupiedunits: Collectand monitor energy and water performance data for easy access and review. Provideto Enterprise.

Minimum Point Requirements:

Enterprisedoesnot require projects

NGBSalsoawards

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ICC/ASHRAE 700-2015 NGBS	Points Possible		Points Possible
Single-Family Homeowner's manual to responsible parties, including the following: Mandatory 1 A National Green Building Standard certificate with a web link and completion document. 1 1001.1			
Training of Single-Family Homeowners         On-site training of initial homeowners of operation and maintenance and occupant actions for all of the following:         (1) HVAC filters         1001.2       (2) Thermostat operation and programming         (3) Lighting controls         (4) Appliances operation         (5) Water heater settings and hot water use         (6) Fan controls         (7) Recycling and composting practices	Mandatory	8.4 Resident and Property Staff Orientation. See above	Mandatory

Operation, Maintenance, and Building Owner Education

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Other NGBS Operation and Maintenance Practices

Points Possible

2

Public Education

One or more of the following is implemented. (2 pts max): 1 Signs showing the project is designed and built in accordance with the National Green Building Standard posted on the construction site. (1 pt)

1003.1 National Green Building Standard certification plaques with rating level attained are placed in a conspicuo location near the utility area of the home or, in a conspicuous location near the main entrance of a multifamil building. (1 pt)

! A URL for the National Green Building Standard is included on site signage, builder website (or property v for multifamily buildings), and marketing materials for homes certified under the National Green Building Standard. (1 pt)

#### Other Enterprise Operations and Maintenance Practices

#### Points Possible

#### Emergency Management Manual

Provide a manual on emergency operations targeted toward operations and maintenance sta and other building-level personnel. The manual should address responses to various types o emergencies, leading with those that have the greatest probability of negatively affecting the project.

8.2 project. The manual should provide guidance as to how to sustain the delivery of adequate housing

# Conclusion

Both EnterpriseGreenCommunitiesand the NationalGreenBuildingStandardare effective systems for the integration of greenbuildingstrategies into single family and multifamily homes.NGBS designed o accommodatell residential buildings, while Enterprises specifically designed for affordable housing.

Both Enterpriseand NGBS equire certain mandatory practices to be completed, and then offer a catalogof optional practices for a project to earn points. Both systems require a project to meet a minimum number of total points to earn certification. NGBS has increasing evels of certification based on the number of points earned, while Enterprise projects are either certified or not certified.

NGBS equires projects to earn a minimum number of points within each green building practice category, providing a wide variety of practices a project team can select based on site specific conditions while still helping ensure a balance dapproach to sustainable design and construction. Enterprise has a more a specific set of mandatory requirements, helping ensuring every project meets a certain sustainability baseline no matter where they may be located.

Both Enterprise and NGB  $\mathbf{S}$  ocuson the six main subject areas of sustainability in the residential industry: Water Efficiency Energy Efficiency Location