

NGBS 2020 vs. GreenPoint Rated Existing Buildings



SUMMARY

A comparative analysis of NGBS Green building certification and GreenPoint Rated (GPR) certification for existing buildings shows that NGBS Green is more rigorous and its practices more aligned with the International Code Council (ICC) I-code requirements. NGBS Green is solely based on the ICC-700 *National Green Building Standard™* (NGBS) that was developed through an open and formal consensus development process and is approved by the American National Standards Institute (ANSI). GPR did not follow an open and formal consensus development process, is not ANSI-approved, and certification is based on an assortment of practices from a variety of sources, some of them copied from the NGBS.

For NGBS Green certification for existing buildings, mandatory practices are only applicable to renovated, altered, or added portions of the building, focusing on better renovation practices. In contrast, GPR's required practices for certification of existing buildings are vague and required for the entire building. NGBS Green also provides more options for green certification with its large list of practices that can be selected to achieve minimum points towards a desired level. Overall, NGBS Green offers a more comprehensive sustainable building option at a lower cost than GPR.

PROGRAM OVERVIEW

Development Process

NGBS Green: The NGBS is an ANSI-approved standard developed by a consensus committee, written in code language, and aligned with the ICC code requirements. It is subject to regular review and updates to incorporate new technologies and building practices and keep it aligned with the most recent suite of national building codes. There have been four NGBS versions to date: 2008, 2012, 2015, and 2020. The 2024 NGBS is currently under development. The NGBS provides a blueprint for architects and builders to follow for the design and construction of residential-use green buildings. Since 2009, Home Innovation Research Labs (Home Innovation) has served as the national certification agency for the NGBS, and NGBS Green is the certification program based on the NGBS.

GPR: GPR allows green certification of existing buildings based on a checklist consisting of cherry-picked green practices. It was developed in 2005 by a diverse set of residential building stakeholders. While there have been some updates through the years, the current checklist is barely comparable to the outdated 2012 NGBS with its limited scope and list of green practices.

Certification Bodies

NGBS Green: Home Innovation serves as national certification agency for NGBS Green which is based in the NGBS **as written and unaltered in any way** to respect the ANSI development process and approval.

Home Innovation is a 58-year-old company dedicated to improving the performance, affordability, and durability of homes by reducing barriers to innovation. NGBS Green is recognized by federal, state, and local agencies; Fannie Mae and Freddie Mac; and institutional and international investors. NGBS Green

offers timely certification of residential buildings. The verification and certification processes are regularly improved through user analysis and quality control.

GPR: Build it Green, a nonprofit organization administers certification of the GPR. Build it Green started as a regional green program providing certification only in California and while the program recently expanded nationally it remains focused in California.

OVERALL STRUCTURE

The overall structure of NGBS Green and GPR are shown in Table 1.

Table 1. Comparison of NGBS Green and GPR Overall Structure

NGBS Green		GreenPoint Rated	
Develop a Strategy	Develop a strategy for incorporating green features in the construction using resources like NGBS scoring spreadsheet and <i>Builder's Resource Guide</i> .	Hire a Rater	Find a certified GreenPoint Rater from the Certified Professionals Directory and bring them in early in the design process.
Hire a Verifier	Hire accredited Verifiers from the list of Verifiers in the area.	Identify Measures	Work with the Rater to review the GreenPoint Rated checklist and create a customized list of design features and construction practices for your project.
Registration	Register project with Home Innovation and pay certification fee.	Submit Initial Application	The Rater should submit a project planning score sheet to Build It Green and assist project team through the design process.
Design	Review certification requirements, incorporate high-performance, green amenities and products in the project, and provide preliminary scoring spreadsheet to the Verifier.	Verify Measures	The Rater should coordinate with the construction team to provide third-party documentation and site verification of measures and construction practices achieved.
Construction	Document all green construction practices, schedule a rough inspection with the Verifier before drywall installation, and schedule final inspection when construction is complete.	Apply for Final Certification	The Rater should compile documentation, calculate scores, and submit all necessary documentation to Build It Green for certification review processing when the project is built and documentation completed.
Certification	Verifiers must submit the verification reports for both rough and final inspection within 30 days and expect certification within one business day.	Get Your Certificate	Build It Green mails the GreenPoint Rated certificate as instructed by the Rater.

A comparison case study of the NGBS Green and GPR for new construction multifamily buildings is [available Home Innovation’s website](#). A summary of comparison of two programs is shown in Table 2.

Table 2. Summary of Comparison Between GreenPoint Rated and National Green Building Standard

	GreenPoint Rated	NGBS Green
<i>Certifying Organization</i>	Build It Green	Home Innovation
<i>Geographic focus</i>	California (some certifications are also available for non-California states)	United States (including its Puerto Rico and U.S. Virgin Islands) and the Caribbean
<i>Versions</i>	Version 6.1, 7, 8	NGBS 2008, 2012, 2015, 2020
<i>Baseline Code</i>	CALGreen for California; Some pre-requisites including mandatory measures of 2012 NGBS for non-California states.	IBC, IRC, IECC
<i>ANSI Approved</i>	No	Yes
<i>Scope</i>	Single-Family Residential and Multifamily Residential (New Construction and Existing Building)	Single-Family Residential, Multifamily Residential, Mixed-Use Building (New Construction and Existing Building), Conversion of commercial space into residential and Site Development
<i>Certification Levels</i>	Platinum Gold Silver Certified	Emerald Gold Silver Bronze Certified (only for commercial space of mixed-use building and single-family homes and duplexes)
<i>Development process</i>	List of green practices compiled by residential building stakeholders	ANSI-approved consensus committee
<i>Supporting Organizations</i>	N/A	International Code Council (ICC), National Association of Home Builders (NAHB)
<i>Categories</i>	Energy Efficiency, Water Conservation, Indoor Air Quality, Resource Conservation and Livable Communities	Lot Design, Preparation, & Development, Resource Efficiency, Energy Efficiency, Water Efficiency, Indoor Environmental Quality, and Operation, Maintenance, and Building Owner Education
<i>Verification</i>	Third-party Green Raters	Third-party Verifiers
<i>Raters/Verifiers Training</i>	In-person training for Raters	Virtual training for Verifiers

Analysis

NGBS Green and GPR are both voluntary, green certification programs that offer a framework for assessing health, performance, and sustainability of new and renovated residential buildings. The overall

structures of the two programs are similar at first glance but diverge significantly regarding their comprehensiveness and rigor.

ANSI approval of the NGBS is a third-party confirmation of the standard's openness, representation, and due process in the standard development. ANSI approved the NGBS as a comprehensive green building rating system for residential buildings to be used in its entirety.

NGBS Green certification is based on the **ICC-700 National Green Building Standard** in its entirety, and unamended. To earn an NGBS Green certificate, the building must be 100% compliant without exceptions. Should there be any deviations in compliance the NGBS Green certificate would be required to include a note as to what the deviation was from the Standard.

GPR is also based on the **ICC-700 National Green Building Standard**, however, GPR certifies buildings based on an abridged "lite" version amended outside of the ANSI development process and without public input. Furthermore, GPR uses an out-of-date version, **ICC-700 2012 National Green Building Standard**, which for most locations in the U.S. is **below code**.

As a result, NGBS Green is more comprehensive, more rigorous, and far more likely to result in an above-code building.

A couple of updated features in the 2020 NGBS make it even more flexible than the GPR. The 2020 NGBS allows a three-year look back on remodeling activities that count towards green certification. It also includes important exemptions for buildings in the Tropical Zone.

NGBS Green+ certifications provide a streamlined, supplementary, third-party recognition for NGBS Green Certified homes based on their exceptional performance in one or more categories of green practices including, Net Zero Energy, Resilience, Smart Home, Universal Design, Wellness, and Zero Water. Nearly all NGBS Green+ certifications are available for both new construction and existing buildings. The GreenPoint Rated Low Carbon Home is the only special designation provided by GPR.

NGBS GREEN VS. GPR FOR EXISTING BUILDINGS

Building Eligibility

NGBS Green: To qualify for whole-building certification under the **remodel path**, in addition to the foundation, at least 50% of existing building's structural systems must remain in place after remodel. If more than 50% is renovated, new construction path can be selected. Recent new construction projects are not eligible for verification under the remodel path. Buildings with **additions** less than 75% of original above-grade conditioned area can also follow remodel path. This path can also be used for converting commercial/office space into residential.

Practices for remodel path are same as new construction, modified to reflect renovation. Building attributes that comply before remodel and remain in compliance can earn points. Partial compliance is not allowed, and practices must be implemented across the entire building to earn points.

GPR: Both the Single-Family Existing Home and Multifamily Existing Building can earn either **Elemental Level** or **Whole House/Building Label** depending on the minimum thresholds and points earned for each category. Certain practices must be met to earn these labels listed as 'required measures.' Partial Credits are available for meeting a practice to some extent.

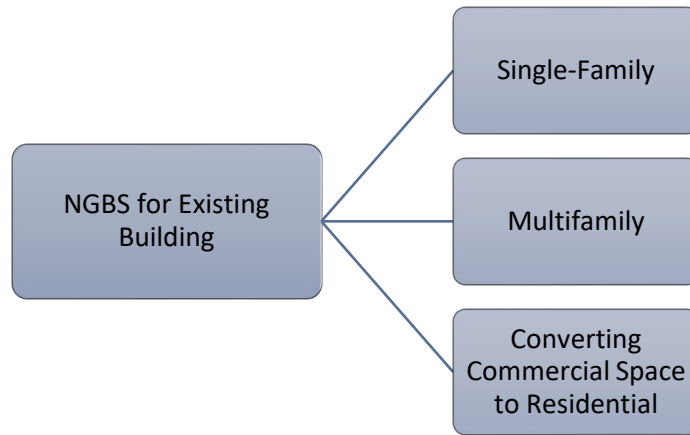


Figure 1. NGBS Green Provisions for Existing Buildings

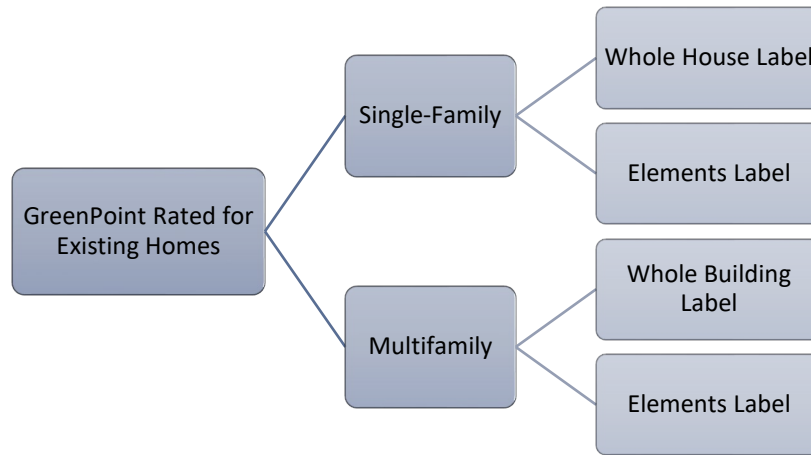


Figure 2. GPR Provisions for Existing Buildings

Mandatory Requirements

NGBS Green: NGBS mandatory practices for existing buildings are the same as those for new construction. NGBS for Existing Buildings requires the building, including additions and common areas, to be compliant with relevant mandatory items while unaltered portions of building are exempt from mandatory requirements, unless safety or moisture issues are present.

GPR: GPR for Existing Building has a list of required practices that are mandatory for each label of certification (elements and whole building) and is applicable to the whole building. The list of required practices for GPR Existing Building Certification are listed in Table 3.

Table 3. Required Practices from GPR Checklist and Comparable Mandatory Practices from NGBS for Existing Buildings

Required Practices for GPR Elements Label	Comparable Mandatory Practices for NGBS Existing Pathway
Divert All Cardboard, Concrete, and Metals (only projects currently doing renovation work)	Hazardous waste: The construction waste management plan shall include information on the proper handling and disposal of hazardous waste. All hazardous waste is properly handled and disposed of.
Plumbing Survey and Correction	
HVAC Survey	HVAC system sizing: Newly installed or modified space heating and cooling system is sized according to heating and cooling loads calculated using ACCA Manual J, or equivalent. New equipment is selected using ACCA Manual S or equivalent.
Combustion Safety Backdraft Test	
Energy Survey or Meet Energy Budget for Building Based on Year	Minimum energy efficiency requirements: Additions, alterations, or renovations to an existing building, building system or portion thereof shall comply with the provisions of the ICC IECC as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with the ICC IECC. An addition complies with the IECC if the addition complies or if the existing building and addition comply with the ICC IECC as a single building.
For Newly Installed Products, Reduce Formaldehyde in Interior Finish – Meet Current CARB Airborne Toxic Control Measure (ATCM) for Composite Wood Formaldehyde Limits by Mandatory Compliance Dates.	Optional practice for points.
Incorporate GreenPoint Rated Checklist in Blueprints.	Building construction manual: A local green building program certificate as well as a copy of ICC-700 National Green Building Standard , as adopted by the Adopting Entity, and the individual measures achieved by the building is included in the building construction manual.

Analysis

NGBS Green has a longer list of mandatory practices than GPR’s abridged checklist because it requires compliance with all mandatory practices in the **ICC-700 National Green Building Standard**. Moisture management and building envelope tightness practices like water resistive barrier, flashing, and testing and verification of building air tightness and insulation, are listed as mandatory practices in the NGBS. These are important construction practices that help avoid long-term moisture damage to the building envelope. The required practices of the GPR checklist for existing buildings do not address these crucial practices.

The NGBS mandatory practices (Appendix A) are aligned with the ICC building codes and are more stringent than GPR’s abridged list, resulting in the building earning NGBS Green certification to be higher

performing and more efficient. In contrast, GPR’s required practices are vague and use the rater’s judgement rather than requiring a streamlined set of standard practices. This raises a red flag because any building (even those not complying with minimum building codes) can earn a GPR certification. The GPR required practices also miss important measures like moisture management and air sealing. Similarly, requiring mandatory practices for the entire building, in cases of remodeling, loses focus from the most important construction activities that could be made more sustainable. The **ICC-700 National Green Building Standard** and NGBS Green address this by exempting the unaltered portions of the building from mandatory requirements, unless safety and moisture issues are present. A new home that is not constructed to meet the minimum code for new construction can select the existing path and be green certified through GPR.

MINIMUM POINTS THRESHOLD

NGBS Green: The minimum points required to earn various levels of NGBS Green certification, as indicated in ICC-700 National Green Building Standard, for existing building is shown in Table 4.

Table 4. NGBS Minimum Point Threshold for Existing Building¹

Certification Levels	Bronze	Silver	Gold	Emerald
Minimum Point Threshold	88	125	181	225

Points earned from the energy and water efficiency categories do not count towards the minimum points threshold shown in the figure. In addition to the minimum points in the prescriptive practice, a minimum rating level of Bronze is also required in Energy Efficiency and Water Efficiency to earn a NGBS Green certification for existing buildings. There are two pathways for the energy and water efficiency ratings: (1) Prescriptive Path; and (2) Energy or Water Consumption Reduction Path.

The Prescriptive Path for both energy and water efficiency are earned by meeting various practices included within the NGBS energy and water efficiency chapters. The minimum points threshold required for various levels of energy and water efficiency ratings are given in the tables below.

Table 5. NGBS Minimum Point Threshold for Energy Prescriptive Path for Existing Buildings¹

Energy Prescriptive Point Thresholds				
	Rating Level			
	BRONZE	SILVER	GOLD	EMERALD
Section 11.703 prescriptive thresholds	30	45	60	70
<i>Points from § 11.703. and § 11.706 shall not count towards the total points for § 305.2.7.</i>				

Table 6. NGBS Minimum Point Threshold for Water Prescriptive Path for Existing Buildings¹

Water Prescriptive Point Thresholds				
	Rating Level			
	BRONZE	SILVER	GOLD	EMERALD
Section 11.800 prescriptive thresholds	25	39	67	92
<i>Points from § 11.801 through § 11.803 shall not count toward the total points for § 305.2.7.</i>				

¹ ICC 700-2020 National Green Building Standard

The Energy Consumption Reduction Path is based on the estimated annual energy cost savings or source energy savings after remodel, as determined by a third-party energy audit and analysis or utility. The reduction is the percentage difference between the consumption per square foot before and after the remodel. For multifamily buildings, the energy consumption is based on the entire building, including all dwelling/sleeping units and common areas.

The minimum percentage reduction in energy consumption required to earn various levels of energy efficiency ratings are given Table 7.

Table 7. NGBS Minimum Point Threshold for Energy Reduction Level for Existing²

	Energy Reduction Level Thresholds			
	Rating Level			
	BRONZE	SILVER	GOLD	EMERALD
Reduction in energy consumption	15%	25%	35%	45%

Water consumption for determining water efficiency rating level through the Water Consumption Reduction Path is based on the estimated annual use as determined by a third-party audit and analysis or use of utility consumption data. The reduction is the percentage difference between the consumption before and after the remodel.

The minimum percentage reduction in water consumption required for various levels of water efficiency ratings is given in Table 8:

Table 8. NGBS Minimum Point Threshold for Water Reduction Level for Existing Buildings²

	Water Reduction Level Thresholds			
	Rating Level			
	BRONZE	SILVER	GOLD	EMERALD
Reduction in water consumption	20%	30%	40%	50%

GPR: The minimum points required to earn various levels of GPR certification for existing buildings are shown in Table 9, and the point distribution is shown in the charts following.

Table 9 Minimum Point Threshold for GPR Existing Building Certification³

Category	Elements	Whole Building
Community	2	3
Energy Efficiency	8	20
Indoor Air Quality	2	5
Resource Conservation	2	6
Water Conservation	2	3
Additional Points	9	13
Total Points	25	50

² ICC 700-2020 National Green Building Standard

³ GreenPoint Rated Existing Home Multifamily Rating Manual, Version 1.0

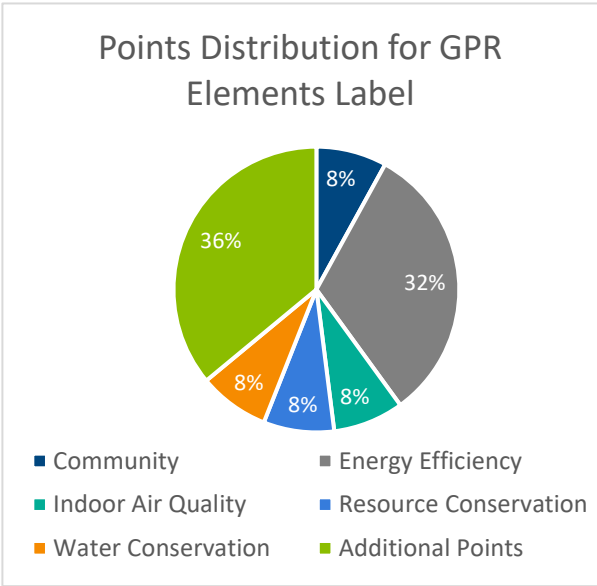


Figure 3. Minimum Points Distribution by Percentage Elements Label

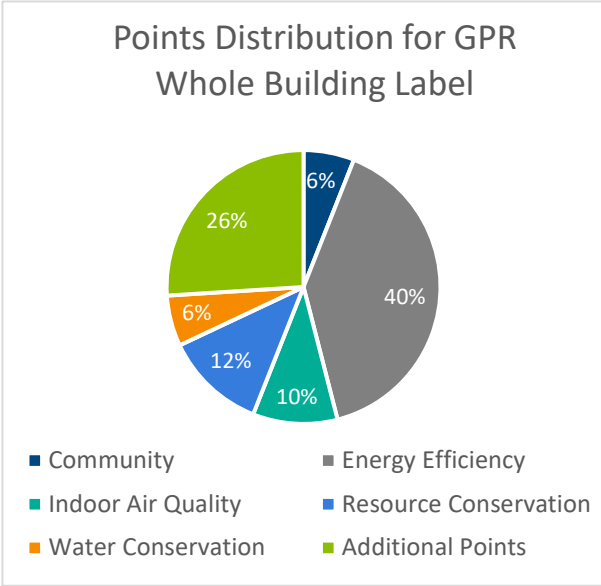


Figure 4. Minimum Points Distribution by Percentage for Whole Building Label

The required energy efficiency practices for GPR certification for existing buildings include HVAC survey and energy survey. As part of the HVAC survey, the Raters are recommended to conduct a survey of distributed systems of blower unit and ducts, all systems of furnaces, fans and exhaust units, air conditioning and utilities, and central systems of boiler. The energy survey includes visual evaluation of various components like lighting systems, domestic hot water systems, space cooling systems, appliances, mechanical ventilation systems and building envelopes. It also requires the rater to interview at least one key maintenance staff member to get additional feedback.

The required water efficiency practices for GPR certification for existing buildings includes plumbing survey and correction. The plumbing survey and correction requires the Green Rater to conduct a visual survey of overall plumbing integrity, backflow prevention valves for landscaping, distributed water heaters and central boilers/water heaters.

These GPR practices may require a judgement call on the part of the Rater and if corrections are needed, the Raters are required to complete additional field verifications of corrected measure or have documentation of corrections.

Analysis

GPR certification for existing buildings has a minimum point threshold requirement for each category. NGBS Green compliance for existing buildings does not have a minimum point threshold for categories like lot design, resource efficiency and indoor environmental quality. Therefore, the NGBS Green allows greater flexibility than the GPR for existing buildings since certification can be obtained from any type of renovation after saving in energy and water consumption and achieving minimum points from the rest of the categories. Consequently, achieving the 'elements level' for GPR certification is easier because of its lesser point threshold.

VERIFICATION PROCESS

The verification of GPR measures is done through non-intrusive site observations, interviews with the main client contact and other team members, and review of client-provided documents. The verification process for NGBS Green requires site observation and client-provided document reviews.

Both NGBS Green and GPR require the Verifier/Rater to verify the building with a minimum of two site visits- once before the drywall installation and another after the construction is complete.

Documentation of various practices is also required by both programs. For GPR, Raters are required to retain physical or electronic documentation to defend a position for any measure for five years.

For multifamily buildings, NGBS Green allows sampling of energy efficiency testing practices by all accredited verifiers. Verifiers who have completed higher-level training and accreditation can sample visual inspection practices. NGBS Green prohibits sampling for all other green practices. GPR allows sampling of nearly all practices.

The verification reports for NGBS Green certification are reviewed for both rough and final inspection by Home Innovation Research Labs. Every verification report is graded for accuracy and completeness. Verifiers who do not maintain a high-performance record are placed on probation. Further, verifiers and their verification reports are regularly audited for quality control.

Analysis

Verification in GPR requires Rater’s judgement for some practices which indicates a lack of a standard benchmark/specification for verification. Some practices also require interviewing staff identified by builders on site. The NGBS Green requires almost all practices to be either site verified or supported with documents.

CERTIFICATION COST

NGBS Green has more flexibility for cost savings when compared to GPR certification because of its broad cost structure that includes the number of stories and volume for multifamily buildings. Cost comparisons are shown in the table below for NGBS Green and GPR certification for various scenarios:

Table 10. Example Cost Comparison of NGBS Green Vs. GPR Certifications

3 Story Building with 10 Units	NGBS Green FEES		GPR FEES	
	Cost per building	Cost per Unit	Cost per project	Cost per Unit
<i>Application</i>	0	0	\$ 400.00	\$ 10.00
<i>Certification</i>	\$ 300.00	\$ 30.00	0	\$ 35.00
Total Cost	\$ 600.00		\$ 850.00 (33.3% higher than NGBS)	

4 to 8 Story Building with 100 Units	NGBS Green FEES		GPR FEES	
	Cost per building	Cost per Unit	Cost per project	Cost per Unit
<i>Application</i>	0	0	\$ 400.00	\$ 10.00
<i>Certification</i>	\$ 700.00	\$ 30.00	0	\$ 25.00
Total Cost	\$ 3,700.00		\$ 3,900.00 (5.4% higher than NGBS)	

2 Buildings with 50 Units Each	NGBS Green FEES		GPR FEES	
	Cost per building	Cost per Unit	Cost per project	Cost per Unit
<i>Application</i>	0	0	\$ 400.00	\$ 10.00
<i>Certification</i>	\$ 700.00	\$ 30.00	0	\$ 25.00
Total Cost	\$ 4,400.00 (12.8% higher than GPR)		\$ 3,900.00	

Analysis

While the cost of the NGBS Green certification is slightly higher for a project with multiple buildings, the overall cost of certification is higher for GPR certification, because of its additional application fees and same fee structure regardless of project size and number of stories.

CONCLUSION

The **ICC-700 National Green Building Standard** is an ANSI-approved green building rating system developed to provide “a uniform national platform for recognizing and advancing green construction and development.”⁴ Each version of the standard’s development process extended over two years and hundreds of meetings to deliberate how the hundreds of practices and thousands of points worked together. The Consensus Committee that developed it intended for it to be used in its entirety, without cherry-picking provisions.

The NGBS Green program was developed to provide certification for buildings that are compliant with the **ICC-700 National Green Building Standard** as written. There are numerous advantages of NGBS Green compared to the GPR including, larger scope, cost effectiveness, and standard process of development, making the NGBS clearly a better choice for existing buildings seeking a green certification.

⁴ **National Green Building Standard ICC-700 2020**, page ii

APPENDIX A:

NGBS MANDATORY PRACTICES FOR EXISTING BUILDING CERTIFICATION

Practice #	Practice
11.602.1.1	Capillary breaks: A capillary break and vapor retarder are installed at concrete slabs in accordance with ICC IRC Sections R506.2.2 and R506.2.3 or ICC IBC Sections 1907 and 1805.4.1
11.602.1.7.1	Insulation in cavities is dry in accordance with manufacturer's instructions when enclosed (e.g., with drywall)
11.602.1.8	Water-resistive barrier: Where required by the ICC, IRC, or IBC, a water-resistive barrier and/or drainage plane system is installed behind newly installed exterior veneer and/or siding and where there is evidence of a moisture problem.
11.602.1.9	Flashing provided to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage
11.602.1.11	Tile backing materials: Tile backing materials installed under tiled surfaces in wet areas are in accordance with ASTM C1178, C1278, C1288, or C1325
11.602.1.13	Ice barrier: In areas where there has been a history or ice forming along the eaves causing a backup of water, an ice barrier is installed in accordance with the ICC IRC or IBC at roof eaves of pitched roofs and extends a minimum of 24 inches (610 mm) inside the exterior wall line of the building.
11.602.1.14	Architectural features: All horizontal ledgers are sloped away to provide gravity drainage as appropriate for the application
11.602.4.1	Finished grade at all sides of a building is sloped to provide a minimum of 6 inches of fall within 10 feet of the edge of the building. Where lot lines, walls, slopes, or other physical barriers prohibit 6 inches of fall within 10 feet, the final grade is sloped away from the edge of the building at a minimum slope of 2 percent
11.605.2	Hazardous waste: The construction waste management plan shall include information on the proper handling and disposal of hazardous waste. All hazardous waste is properly handled and disposed off
11.305.2.5	Energy efficiency: The building shall comply with Section 305.5.1 or 305.2.5.2
11.701.4.0	Minimum energy efficiency requirements: Additions, alterations, or renovations to an existing building system or portion thereof shall comply with the provisions of the ICC IECC as they relate to new construction without requiring the unaltered portion(s) if the existing building or building system to comply with the ICC IECC. An addition complies with the IECC if the addition complies or if the existing building and addition comply with the ICC IECC as a single building
11.701.4.1.1	HVAC system sizing: Newly installed or modified space heating and cooling system is sized according to heating and cooling loads calculated using ACCA Manual J, or equivalent. New equipment is selected using ACCA Manual S or equivalent
11.701.4.1.2	Radiant and hydronic space heating: When installed as primary heat source in the building, new radiant or hydronic space heating system is designed, installed, and documented, using industry-approved guidelines and standards (e.g. ACCA Manual J, AJRI I=B=R. ANSI/ACCA 5 QI-2010, or an accredited design professional's and manufacturer's recommendations.)
11.701.4.2.1	Duct air sealing: Newly installed, modified, or ducts that are exposed during the remodel are air sealed. All duct sealing materials are in conformance with UL 181A or UL 181B specifications and are installed in accordance with manufacturer's instructions.
11.701.4.2.2	Duct and Plenums: Building framing cavities are not used as ducts or plenums, Existing building cavities currently used as supply ducts exposed during the remodel are lined
11.701.4.2.3	Duct system sizing: New or modified Duct system is sized and designed in accordance with ACCA Manual D or equivalent

Practice #	Practice
11.701.4.3.1	<p>Building Thermal Envelope Air Sealing: The building thermal envelope exposed or created during the remodel is durably sealed to limit infiltration. The sealing methods between dissimilar materials allow for differential expansion and contraction. The following are caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material, suitable film, or solid material:</p> <ul style="list-style-type: none"> (a) All joints, seams and penetrations (b) Site-built windows, doors, and skylights (c) Openings between window and door assemblies and their respective jambs and framing (d) Utility penetrations (e) Dropped ceilings or chases adjacent to the thermal envelope (f) knee walls (g) Walls, ceilings, and floors separating conditioned spaces from unconditioned space (h) Behind tubs and showers on exterior walls (i) Common walls between dwelling units or sleeping units (j) Attic access openings (k) Joints of framing members at rim joists (l) Top and bottom plates (m) Other sources or infiltration
11.701.4.3.2	<p>Air barrier, air sealing, building envelope testing and insulation: For portions of the building envelope that are exposed or created during the remodel, building envelope air tightness and insulation is verified to be in accordance with this section and section 11.701.4.3.2.1. Insulation installation other than Grade 1 is not permitted.</p>
11.701.4.3.2.1	<p>Grade I insulation installation: Field-installed insulation products to ceilings, walls, floors, band joists, rim joists, conditioned attics, basements, and crawlspaces, except as specially noted, are verified as Grade I by a third-party in accordance with the following:</p> <ul style="list-style-type: none"> (1) Inspection is conducted before insulation is covered (2) Air-permeable insulation is enclosed on all six sides and is in substantial contact with the sheathing material on one or more sides (interior or exterior) of the cavity. Air permeable insulation in ceilings is not required to be enclosed when the insulation is installed in substantial contact with the surfaces it is intended to insulate. (3) Cavity insulation uniformly fills each cavity side-to-side and top-to-bottom, without substantial gaps or voids around obstructions (such as blocking or bridging) (4) Cavity insulation compression or incomplete fill amounts to 2 percent or less, presuming the compressed or incomplete areas are a minimum of 70 percent of the intended fill thickness; occasional small gaps are acceptable. (5) Exterior rigid insulation has substantial contact with the structural framing members or sheathing is not visible from the interior through gaps in the cavity insulation (6) Cavity insulation is split, installed, and/or fitted tightly around wiring and other services. (7) Exterior sheathing is not visible from the interior through gaps in the cavity insulation (8) Faced batt insulation is permitted to have side-stapled tabs, provided that tabs are stapled neatly with no buckling, and provided the batt is compressed only at the edges of each cavity, to the depth of the table itself (9) Where properly installed, ICFs, SIPs, and other wall systems that provide integral insulation are deemed in compliance with this section.

Practice #	Practice
701.4.3.4	<p>Fenestration air leakage: Newly installed Windows, skylights and sliding glass doors have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m²), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m²), when tested in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory verifying compliance with the applicable infiltration rate shall be submitted to demonstrate compliance with this practice. This practice does not appear to field-fabricated fenestration products</p> <p>Exception: For Tropical Zones only, jalousie windows are permitted to be used as conditioned space boundary and shall have an air infiltration rate of not more than 1.3 cfm per square foot.</p>
11.701.4.3.5	<p>Lighting and building thermal envelope: Newly installed luminaries installed in the building thermal envelope which penetrate the air barrier are sealed to limit air leakage between conditioned and unconditioned spaces. All luminaries are IC-rated and labeled as meeting ASTM E283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All luminaries installed in the building thermal envelope which penetrate the air barrier are sealed with a gasket or caulk between the housing and the interior of the wall or ceiling covering.</p>
11.701.4.4	<p>High-efficacy lighting: A minimum of 90 percent of newly installed hard-wired lighting fixtures or the bulbs in those fixtures shall be high efficacy.</p>
11.701.4.6	<p>Fenestration specifications: The NFRC-certified U-factor and SHGC of newly installed windows, exterior doors, skylights, and tubular daylighting devices (TDDs) do not exceed the values in Table 11.703.2.5.1</p>
11.701.4.7	<p>Replacement fenestration: Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the NFRC-certified U-factor and SHGC of the replacement fenestration unit do not exceed the values in Table 11.703.2.5.1</p>
11.802.6.1	<p>Irrigation systems: Where an irrigation system is installed, an irrigation plan and implementation are executed by a qualified professional or equivalent</p>
11.901.1.4	<p>Newly installed gas-fired fireplaces and direct heating equipment is listed and is installed in accordance with the NFPA 54, ICC IFGC, or the applicable local gas appliance installation code. Gas-fired fireplaces within dwelling units or sleeping units and direct heating equipment are vented to the outdoors. Alcohol burning devices and kerosene heaters are vented to the outdoors</p>
11.901.2.1	<p>Newly installed solid fuel-burning fireplaces, inserts, stoves and heaters are code compliant and are in accordance with the following requirements:</p> <ol style="list-style-type: none"> (1) Site-built masonry wood-burning fireplaces use outside combustion air and include a means of sealing the fuel and combustion air outlets to minimize interior air (heat) loss when not in operation. (2) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are an EPA Phase 2 Emission Level Qualified Model. (3) Wood stove and fireplace inserts, as defined in UL 1482 Section 3.8, are in accordance with the certification requirements of UL 1482 and are in accordance with the emission requirements of the EPA Certification and the State of Washington WAC 173-433-100(3) (4) Pellet (biomass) stoves and furnaces are in accordance with ASTM E1509 or are EPA certified (5) Masonry heaters are in accordance with the definitions in ASTM E1602 and ICC IBC Section 2112.1
11.901.3(1)	<p>Attached garage</p> <ol style="list-style-type: none"> (a) Where installed in the common wall between the attached garage and conditioned space, the door is tightly sealed and gasketed. (b) A continuous air barrier is provided between walls and ceilings separating the garage space from the conditioned living spaces

Practice #	Practice
11.901.4	<p>Wood materials: A minimum of 85 percent of newly installed material within product group (i.e., wood structural panels, countertops, composite trim/doors, custom woodwork, and/or component closet shelving) is manufactured in accordance with the following:</p> <p>(1) Structural plywood used for floor, wall, and/or roof sheathing is compliant with DOC PS 1 and/or DOC PS 2. OSB used for floor, wall, and/or roof sheathing is compliant with DOC PS 2. The panels are made with moisture-resistant adhesives. The trademark indicates these adhesives are as follows: Exposure 1 or Exterior for plywood, and Exposure 1 for OSB.</p>
11.901.6	<p>Carpets: Wall-to-wall carpeting is not installed adjacent to water closets and bathing fixtures</p>
11.901.9.4	<p>When the building is occupied during the remodel, a minimum of 85 percent of the newly applied interior architectural coatings are in accordance with either § 11.901.9.1 or § 11.901.9.3</p>
11.901.13	<p>Carbon monoxide (CO) alarms: A carbon monoxide (CO) alarm is provided in accordance with the IRC Section R315</p>
11.901.16	<p>Lead-safe work practices: For buildings constructed before 1978, lead-safe work practices are used during the remodeling</p>
11.902.1.1	<p>Spot ventilation</p> <p>(1) Bathrooms are vented to the outdoors. The minimum ventilation rate is 50 cfm (23.6 L/s) for intermittent operation or 20 cfm (9.4 L/s) for continuous operation in bathrooms.</p> <p>(2) Clothes dryers (except listed and labeled condensing ductless dryers) are vented to the outdoors</p>
11.902.3	<p>Radon reduction measures: Radon reduction measures are in accordance with IRC Appendix F or § 11.902.3.1 Radon Zones as identified by the AHJ or, if the zone is not identified by the AHJ, as defined in Figure 9(1). This practice is not mandatory if the existing building has been tested for radon and is in accordance with federal and local acceptable limits.</p>
11.902.6	<p>Living space contaminants: The living space is sealed in accordance with Section 11.701.4.3.1 to prevent unwanted contaminants.</p>
11.904.3	<p>Microbial growth & moisture inspection and remediation: A visual inspection is performed to confirm the following:</p> <p>(1) Verify that no visible signs of discoloration and microbial growth on ceilings, walls or floors, or other building assemblies Or If minor microbial growth is observed (less than within a total area of 25 square feet) in homes or multifamily buildings, reference EPA Document 402-K-02-003 (A Brief Guide to Mold, Moisture, and Your Home) for guidance on how to properly remediate the issue. If microbial growth is observed, on a larger scale in homes or multifamily buildings (greater than 25 sq ft), reference EPA document 402-k-01-001 (Mold Remediation in Schools and Commercial Buildings) for guidance on how to properly remediate the issue</p> <p>(2) Verify that there are no visible signs of water damage or pooling. If signs of water damage pooling are observed, verify that the source of water damage or pooling are observed, verify that the source of the leak has been repaired, and that damaged materials are either properly dried or replaced as needed.</p>
11.1002.1	<p>Building construction manual: A building construction manual, including five or more of the following, is compiled and distributed in accordance with Section 11.1002.2</p> <p>(1) A narrative detailing the importance of construction a green building, including a list of green building attributes included in the building. This narrative is included in all responsible parties' manuals</p> <p>(2) A local green building program certificate as well as a copy of National Green Building Standard, as adopted by the Adopting Entity, and the individual measures achieved by the building.</p> <p>(3) Warranty, operation, and maintenance instructions for all equipment, fixtures, appliances, and finishes.</p>

Practice #	Practice
11.1002.2	<p>Operations manual: Operations manuals are created and distributed to the responsible parties in accordance with Section 11.1002.0. Between all of the operation manuals, five or more of the following options are included:</p> <ul style="list-style-type: none"> (1) A narrative detailing the importance of operating and living in a green building. This narrative is included in all responsible parties' manuals (2) A list of practices to conserve water and energy (e.g., turning off lights when not in use, switching the rotation of ceiling fans in changing seasons, purchasing ENERGY STAR appliances and electronics)
11.1002.3	<p>Maintenance manual: Maintenance manuals are created and distributed to the responsible parties in accordance with Section 11.1002.0. Between all of the maintenance manuals, five or more of the following options are included:</p> <ul style="list-style-type: none"> (1) A narrative detailing the importance of maintaining a green building. This narrative is included in all responsible parties' manuals.
11.1002.4	<p>Training of building owners: Building owners are familiarized with the role of occupants in achieving green goals. On-site training is provided to the responsible party(ies) regarding newly installed equipment operation and maintenance, control systems, and occupant actions that will improve the environmental performance of the building. These include:</p> <ul style="list-style-type: none"> (1) HVAC filters (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 (8) whole-dwelling mechanical ventilation system
11.1002.5	<p>Multifamily occupant manual: An occupant manual is compiled and distributed in accordance with Section 1002.0. [Points awarded for non-mandatory items.]</p> <ul style="list-style-type: none"> (1) NGBS certificate (2) List of green building features (3) Operations manuals for all appliances and occupant operated equipment including lighting and ventilation controls, thermostats, etc.