



**Design Review Board
Regularly Scheduled Meeting
Monday, August 6, 2018
2:00 – 4:15 PM
Council Conference Room
280 Madison Ave N
Bainbridge Island, WA 98110**

AGENDA

- | | |
|---------|---|
| 2:00 PM | Call to Order (Attendance, Agenda, Ethics) |
| 2:05 PM | Approval of Minutes
June 18, 2018 |
| 2:10 PM | Discuss Green Building Incentive Program
James Weaver, Building Official |
| 2:30 PM | Design Standards and Subdivision Review Process
Christy Carr, Senior Planner (<i>Discussion Only</i>) |
| 4:00 PM | New/Old Business |
| 4:15 PM | Adjourn |

Call to Order (Attendance, Agenda, Ethics)
Review & Approve Minutes
Update from Director
BI High School Bldg 100 ([PLN51159](#))
Design Guidelines Scope of Service
New/Old Business
Adjourn

Call to Order (Attendance, Agenda, Ethics)

Chair Alan Grainger called the meeting to order at 2:03 pm. Design Review Board (DRB) members in attendance were Alan Grainger, Jim McNett, Joe Dunstan, and Peter Perry. Jason Wilkensen was absent and excused. City staff in attendance were Gary Christensen, Christy Carr Senior Planner, and Administrative Specialist Carla Lundgren who recorded the meeting and prepared minutes.

Review & Approve Minutes

Motion: I move to approve the June 4, 2018 minutes.
McNett/Perry: Motion passed 4-0.

Update from the Planning Director: Gary Christensen

(Discussion Only)

BI High School Bldg 100 ([PLN51159](#))

Project Manager: David Greetham, Senior Planner *(See Presentation Materials.)*

Design Guidelines Scope of Service: Christy Carr, Senior Planner

(Discussion Only - See handout.)

New/Old Business

All members agreed to cancel the July 2, 2018 meeting due to the Fourth of July holiday that week.

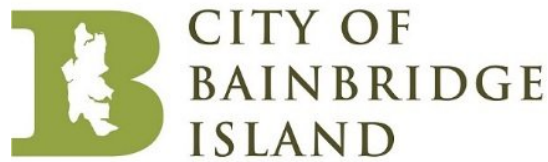
Adjourn

The meeting adjourned at 4:45pm.

Approved by:

Alan Grainger, Chair

Carla Lundgren, Administrative Specialist



Department of Planning and Community Development

Date: July 13, 2018
To: Gary Christensen, AICP, - Director
From: James Weaver, AICP, CBO, LEED AP - Building Official
Subject: Green Building Incentive Program - 2018

The adoption of the Bainbridge Island Comprehensive Plan Update in 2017 (“Comprehensive Plan Update”) included goals and policies (see Attachment A) related to provision of green building within the City of Bainbridge Island. The Planning and Community Development Department began implementation of these Comprehensive Plan goals and policies in July 2016 through the adoption of the International Green Construction Code as an optional regulatory code for new structures. This initial step has proven successful.

This memorandum is intended to serve as an introduction and provide background information on initiating a *Green Building Incentive Program* to foster green building principles and sustainable building efforts. It also summarizes through research the lessons learned from similar green building communities in Puget Sound which have been successful in the implementation of green building incentives; including but not limited to: issues such as site sustainability, water use efficiency, energy use efficiency, indoor environmental quality, and the impact on the atmosphere, materials, and resources through building. In addition, the memorandum describes incentives that have worked in other communities and suggests for further consideration policy choices that may benefit the City of Bainbridge Island.

1. Evaluation of Existing Green Building Certification Programs

The push toward sustainable design increased in the 1990s with the creation of the first green building rating system in the U.K. In 2000, the U.S. Green Building Council developed and released criteria also aimed at improving the environmental performance of buildings through its Leadership in Energy and Environmental Design (“LEED”) rating system for new construction. Others also responded to the growing interest and demand for sustainable design including the Green Building Initiative (“GBI”), which was created to assist the National Association of Homebuilders (“NAHB”) in promoting its Green Building Guidelines and Built Green local program.

Additional rating systems have been developed that seek to go beyond the limits of current policy and building practices to address broader issues of sustainability or evolving concepts

such as net zero energy and living building concepts that improve the natural environment or model nature's processes.

Green product standards also began to appear in the marketplace in the 1980s and increased in the 1990s. The focus also expanded to include a broader range of environmental issues and the impacts of products during their manufacture, use, and reuse. There is now a proliferation of standards, rating, and certification programs in the marketplace to help guide, demonstrate, and document efforts to deliver sustainable, high-performance buildings. It is estimated that there are nearly 600 green product certifications in the world with nearly 100 in use in the U.S., and the numbers continue to grow.

There are also green building rating programs in use that vary in their approach with some outlining prerequisites and optional credits, while others take a prescriptive approach, and still others suggest performance-based requirements that can be met in different ways for different products and project types. As a result, it can be challenging and time consuming determining which standards, certifications, and rating programs are most credible and applicable to a particular project. For the purpose of a *Green Building Incentive Program* for Bainbridge Island, the most prevalent, commonly used, and widely adopted green building certification processes are discussed in this memorandum.

a) U.S. Green Building Council – LEED Green Building Certification

LEED (Leadership in Energy and Environmental Design) is the most widely used green building rating system in the world. Available for virtually all building, community, and home project types, LEED provides a framework to create healthy, highly efficient, and cost-saving green buildings. LEED certification is a globally recognized symbol of sustainability achievement. LEED has five main evaluation categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, and Indoor Environmental Quality. LEED buildings have the overall goal to save energy, water, and resources, to generate less waste, and to support human health. Over 92,000 projects in 165 countries and territories have used the U.S. Green Building Council LEED certification process. LEED has four certification levels for increasing levels of incorporation of green building: Certified, Silver, Gold, and Platinum.

LEED certification can be processed by third party vendors. LEED certification includes a flat registration fee and a certification fee to the organization, which is based on a project's size and the rating system the project was registered under. Registration fees are due at a project's registration; certification fees are due when an application is submitted for review.

The benefit of LEED certification is that it is a well-known and universal certification process and includes high priority standards that evaluate a given building throughout its lifecycle. The well-known and documented aspects of LEED certification make the process of construction, materials, and green development much more unified and commonplace, with minimal impacts to building construction timetables. Possible disadvantages include that LEED is time consuming, requires abundant documentation, and that LEED does not specifically include adequate community issues or contextual relationships outside the building or development footprint.

A Green Building Incentive Program for Bainbridge Island could incorporate, LEED Silver, or higher Gold, or highest Platinum certification levels as the threshold for incorporating U.S. Green Building Council LEED certified buildings as Bainbridge Island green buildings.

b) International Living Futures Institute - Living Building Challenge, Petals, & Zero Energy.

The International Living Future Institute's ("ILFI") Living Building Challenge is the world's most rigorous proven performance standard for buildings. People from around the world use the regenerative design framework to create spaces that, like a flower, give more than they take. The Living Building Challenge is organized into seven performance areas, known as "Petals": Place, Water, Energy, Health & Happiness, Materials, Equity, and Beauty. Each Petal is further subdivided into "Imperatives," which address specific issues through detailed requirements. The ILFI's Zero Energy Building Certification™ was created to allow projects to demonstrate zero energy performance, building an advanced cohort of projects with the integrity of third-party performance certification.

The Living Building Challenge emphasizes the efforts to create buildings that generate more energy than they use, capture and treat all water on site, and are made using healthy materials. The Living Building Challenge has two core rules: (1) all Imperatives assigned to a typology are mandatory; and (2) Living Building Challenge certification requires actual, rather than anticipated, performance demonstrated over twelve consecutive months. The Living Building Challenge recognizes the ideal scale for solutions is not always within a property boundary. Projects are encouraged to register as early in the development/occupancy process as possible.

Similar to LEED, the Living Building Challenge certification can be processed by third party vendors. Living Building Challenge, Petals, and Zero Energy certification includes both a registration fee and a certification fee to the organization. Certification fees are flat fees based upon building type. Documentation for Living Building Challenge certification is audited and is required far beyond the initial occupancy of the structure.

The benefit of the Living Building Challenge certification is a holistic approach to building that requires all project stakeholders to consider the real-life cycle impact of design, construction, and operation. Living Building Challenge certification benefits from the ongoing performance of the building and the context that it operates within as part of the evaluation. If all future buildings were constructed to meet the requirements of all Living Building Challenge Petals, growth in emissions from the building sector would cease, and efforts to improve existing stock could yield real reductions in global carbon emissions. Possible disadvantages include that the strict nature of the Living Building Challenge requires that there are no optional credits and little flexibility with changes that often occur on site, requiring the design team to carefully consider the impact of every design choice no matter how minor. Similar challenges are the time-consuming nature of the certification and documentation. Additionally, the requirement to manage the day-to-day activity and energy usage for the occupants and their use of the space is a component of the certification. This may create contractual challenges where current regulations do not enforce these measures and real estate leases and other ownership transactions may not have the tools to implement the long term Living Building Challenge requirements regarding the building occupants.

The *Green Building Incentive Program* for Bainbridge Island could incorporate any of the Zero Energy, Petals, or the Living Building Challenge certifications as a threshold for incorporating ILFI certified buildings as Bainbridge Island green buildings.

c) National Builders Association (King & Snohomish Counties) – Built Green Program

Built Green is an environmentally-friendly, residential building program of the Master Builders Association of King and Snohomish Counties, developed in partnership with the National Association of Home Builders. The Built Green program specifically optimizes regional requirements in coordination with jurisdictions and other agencies in Washington State, which sets standards of excellence that have a significant impact on housing, health, and the environment and are achievable today. Built Green provides builders and consumers with easy-to-understand rating systems, which quantify environmentally-friendly building practices for remodeling, new home construction, and community and multi-family development projects. Built Green has three major functions: (1) certification of green homes and communities with its tiered rating system and holistic checklist; (2) support of builders and associates through its member network; and (3) education of both the public and those in the building industry on the advantages of green homes and how to support sustainability in the building industry and in our communities.

Like the other green building certification programs, the Built Green certification can be processed by third party vendors. Built Green certification includes both a registration fee and a certification fee to the organization. The *Green Building Incentive Program* for Bainbridge Island could incorporate any of the Built Green three-star, four-star, five star, or Emerald star certification levels to serve as the threshold for incorporating Built Green certified buildings as Bainbridge Island green buildings.

d) Additional Green Building Certification Analysis (EPA Analysis and Evaluation)

In 2017, the U.S. Environmental Protection Agency released an independent analysis and evaluation of the most prevalent Green Building model codes and Green Building Certification systems including the LEED, Living Building Challenge, the National Association of Home Builders, and the International Green Construction Code. A summary of the evaluation is attached to this memorandum (see Attachment B).

2. Analysis of Other Programs Successfully Implemented Throughout Puget Sound

The U.S. Green Building Council (“USGBC”) notes that buildings are responsible for almost 40% of annual CO2 emissions nationally, higher than both industrial and transportation contributions. Further, in the U.S., buildings consume approximately 14% of all potable water and contribute millions of tons of construction waste to landfills each year. Numerous cities in Puget Sound are undertaking their own pursuit of working toward sustainability and incorporating green building incentives into their communities. The following information includes programs from Seattle, Issaquah, Redmond, and Shoreline, which have been identified as some of the most progressive and successful programs from communities in Puget Sound

and those that served as source material for much of the proposed *Green Building Incentive Program* for Bainbridge Island.

a) City of Seattle

Seattle is a national leader in sustainable development and energy conservation and has set ambitious targets for reducing building energy use to become a carbon neutral city by 2050. Seattle is also the home to the *Bullitt Center*, constructed as the greenest commercial building in the world, which is celebrating its 5th anniversary this year. Recently, Seattle created the Office of Sustainability and Environment (“OSE”). OSE partners with the community to create strategies to help achieve shared environmental goals and coordinates among City departments, the Mayor's Office, and the City Council to ensure successful implementation of these strategies. OSE integrates equity by elevating opportunities to increase racial, social, and environmental justice throughout Seattle's environmental work.

In 2016—with a revision and clarification in 2017—the City of Seattle adopted a green building standard, a voluntary incentive for buildings that provides additional development capacity, such as extra floor area or height in exchange for meeting a green building standard. The green building standard is meant to improve energy and water conservation beyond the current code requirements, to use resources wisely, and to promote healthy environments, all in exchange for additional development capacity.

Seattle also incorporates a sustainable building policy, originally adopted in 2000 and significantly expanded in scope in 2011, which requires city-funded buildings to be built to green building certification standards. The Seattle policy is discussed further in this memorandum under city-funded buildings.

b) City of Issaquah

In 2017, the Issaquah City Council adopted a sustainable building action strategy. This strategy aims to position Issaquah as a leader in sustainable building through specific, actionable measures focusing on building and infrastructure design, construction, renovation, operation, education, and outreach.

Issaquah’s strategy identifies five overarching themes that align with the city’s priorities and sustainable building goals:

1. Walk the Talk and Lead the Way: A focus on municipal leadership through demonstrated city actions and commitments is crucial to promote and maintain a culture of sustainable building innovation in Issaquah.
2. Re-Think Car Habitat: Activities that support a reduced reliance on auto-based trips and a parking dominated landscape, and promote walking, biking, transit, transportation services, and other cleaner and more efficient forms of mobility.
3. Toward Carbon Neutral Buildings: In alignment with city goals and the King County-Cities Climate Collaboration commitments, Issaquah must implement large-scale strategies to enhance efficiency and reduce the use of fossil fuels.

4. Connect to the Outdoors: A consistent city goal is protection and promotion of the natural environment through responsible building, development, land use, and transportation practices and policies.
5. Foster Innovation: Innovation is an important driver for development of collaborative and leading solutions to community-wide challenges.

Issaquah has continued to advocate for sustainable building with the establishment of Issaquah's Sustainable Building and Infrastructure Resolution, which promotes environmental responsibility, including requirements for implementation of LEED and Built Green standards for city-owned buildings. More recently, Issaquah has been praised for established partnerships with its school district, seven homebuilders, Port Blakely Communities, Rowley Properties, Microsoft, and Life Care Services. Issaquah offers free expedited permit services for Built Green 5-Star, Built Green Emerald Star, or LEED Gold certified buildings. Over nineteen percent of all Issaquah homes have some form of Built Green certification. Amongst medium sized cities in King County, Issaquah can be considered above average in sustainability practices.

c) City of Redmond

The City of Redmond initiated its Green Building and Green Infrastructure Incentive Program in 2016. The Redmond Green Building and Green Infrastructure Incentive Program encourages developers and homebuilders to incorporate green building and green infrastructure techniques, including low impact development techniques, into new residential developments. Techniques include site planning to better take account of natural site features, achieving LEED or Built Green certification, retaining native vegetation, planting drought-resistant native landscaping, amending soils with compost, reducing impervious (hardscape) surface area, reusing rainwater from roofs, using pervious materials where appropriate, minimizing site disturbance during development, and installing green (vegetated) roofs. Implementing these techniques will result in increased natural resource conservation, lower home operating costs, and better stewardship of Redmond's drinking water aquifer.

The Redmond Green Building and Green Infrastructure Incentive Program gives applicants the option to incorporate elements of green building and green infrastructure into development projects. The program is entirely voluntary, incentive based, and projects may benefit from priority building permit processing, online & print recognition, a sustainable development award from the City, lot size reduction in certain zones for clustering, or alternative road standards.

d) City of Shoreline

In 2017, Shoreline City Council unanimously adopted its Deep Green Incentive Program ("DGIP") to encourage the construction of more sustainable buildings in the city. DGIP provides flexibility in the application of development standards, expedited permitting, and fee reductions to promote construction of green buildings that meet the most stringent levels of available certification programs. Shoreline's adopted green building program included the U.S. Green Building Council's LEED Platinum level; the International Living Future Institute's Living Building Challenge Petal Recognition and Net Zero Energy Building certifications; and the Master Builders Association's Built Green 5-Star and Emerald Star certification levels.

- e) Other Puget Sound communities were reviewed for adopted Green Building programs

Additional jurisdictions throughout the Puget Sound Region incorporate the use of electronic permitting to facilitate green building processes and practices within their own building departments. Many jurisdictions were researched, but the most robust programs—those described above—are discussed in this memorandum.

3. Green Building Policy Choices

- a) Mandatory Green Building Standards for all City-Owned Buildings

Various Puget Sound cities have required their projects to be built to green building standards. They have, through their own green building programs, become strong advocates for green building construction and have led the way.

The City of Seattle's Sustainable Building Policy calls for new city-funded projects and major renovations with over 5,000 square feet of occupied space to achieve a LEED Gold standard. In addition, such projects must meet additional energy efficiency, water, waste, and bicycle parking requirements. Minor renovation and tenant improvement projects that impact 5,000 square feet or more and involve changes to mechanical, electrical, and plumbing systems must also meet LEED Gold standards, as well as additional requirements for water and waste. Since 2013, 33 LEED certified City buildings have been completed under Seattle's Sustainable Building Policy.

The City of Issaquah's first goal in its Green Action Strategy is similar: "1. Walk the Talk and Lead the Way: A focus on municipal leadership through demonstrated City actions and commitments." Acknowledging the increased costs of city construction (often 30%-40% greater) to incorporate green building is a tradeoff that each City Council is required to undertake in these commitments.

Both the City of Redmond and the City of Shoreline incorporate policies regarding city-owned buildings within their prospective green building incentive programs. These commitments acted as an important tool for furthering implementation of advanced sustainability within the built environment to meet city-wide goals and positions those cities as regional and international leaders.

- b) Reduce Plan Check and Building Permit Fees

Consider adding a new subsection to BIMC 15.04.050, authorizing a "Green Building Fee Incentive" in the form of a 25 % reduction on plan check and building permit issuance fees for any structure that is certified as LEED Silver, Evergreen Sustainable Development version 3.0, Built Green 4-Star, or Living Building Challenge Petal. Proof of ongoing certification shall be required during construction and project certification documentation must be completed prior to final occupancy.

c) Provide Expedited Permit Review

Consider adding a new subsection to BIMC 15.04.070, authorizing a “Green Building Priority Processing Incentive” in the form of expedited permit processing for any structure that is certified as LEED Platinum, Evergreen Sustainable Development version 3.0, Built Green Emerald Star, or Living Building Challenge Petal. Proof of ongoing certification shall be required during construction and project certification documentation must be completed prior to final occupancy.

d) Require Commercial Structures to Qualify for Green Building Certifications

Consider adding a new subsection to BIMC 15.04.020 requiring that all occupied commercial structures in excess of 1,000 square feet be certified as LEED silver, Evergreen Sustainable Development version 3.0, Built Green 3-Star, or Living Building Challenge Net Zero or Petal, or any higher certifications. This requirement would be mandatory for all new commercial structures on Bainbridge Island.

e) Create Green Building Program Recognition

Consider adding a new subsection to BIMC 15.04.070, authorizing “Green Building Incentive Program Recognition” to be given by the Director through publication, recognition, and/or issuance of sustainability certificates from the Planning and Community Development Department for any structure that is certified as any of the required green building certifications.

Policy LU 5.5

Implement a *green building* code.

LU Action #3 Amend the City's development code to implement green building codes. Utilize lessons learned from communities of comparable environmental and socio-economic characteristics to implement green building codes which address issues such as site sustainability, water use efficiency, energy use efficiency, indoor environmental quality, and the impact on the atmosphere, materials and resources by buildings.

Policy EC 3.1

Encourage the use of *green building* materials and techniques in all types of construction, as well as design approaches that are responsive to changing conditions.

Policy EC 10.2

Partner with Island architects, landscape architects, builders and related construction professionals to draft development standards and practices that incorporate *green building* practices and *context-sensitive design*.

Goal EN-4

Encourage sustainable development that maintains diversity of healthy, functioning ecosystems that are essential for maintaining our quality of life and economic viability into the future.

Policy EN 4.1

Employ conservation design methods and principles such as *low impact development* techniques for managing storm and waste water, *green building* materials, high-efficiency heating and lighting systems.

Policy HO 6.4

Create a new *conservation villages* permit process to apply outside of *designated centers* to increase housing choices including *affordable housing* and requiring *green building* practices while better conserving *open space*.

Policy U 14.2

Encourage the conservation of electrical energy, especially during periods of peak usage, and encourage energy saving building code strategies, local renewable energy, and other cost effective approaches to meeting the island's energy needs, including distributed energy systems.



Comparison of Green Building Standards

Standard	International Code Council's 2012 <i>International Green Construction Code</i> (IgCC), 2012 edition COBI Adopted July 2016	American Society of Heating, Refrigeration, and Air-Conditioning Engineers' ANSI/ASHRAE/USGBC/IES Standard 189.1-2011, <i>Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings</i> (ASHRAE 189.1), 2011 edition	National Association of Home Builders' ICC 700 <i>National Green Building Standard</i> (NGBS), 2012 edition	Green Building Initiative's ANSI/GBI 01-2010: <i>Green Building Assessment Protocol for Commercial Buildings</i> (Green Globes), 2010 edition	U.S. Green Building Council's <i>Leadership in Energy and Environmental Design</i> (LEED®)	The International Living Future Institute's <i>Living Building Challenge</i> , version 2.1 (May 2012)
Description	A model code that contains minimum requirements for increasing the environmental and health performance of buildings' sites and structures. Generally, it applies to the design and construction of all types of buildings except single- and two-family residential structures, multifamily structures with three or fewer stories, and temporary structures. For more information, see the 2012 International Green Construction Code. EXIT	A model code that contains minimum requirements for increasing the environmental and health performance of buildings' sites and structures. Generally, it applies to the design and construction of all types of buildings except single-family homes, multifamily homes with three or fewer stories, and modular and mobile homes. For more information, see ASHRAE Standard 189.1. EXIT	A rating and certification system that aims to encourage increased environmental and health performance in residences and residential portions of buildings. Its criteria apply to the design and construction of homes and subdivisions. For more information, see the National Association of Home Builders' "Sustainability" EXIT webpage.	A series of rating and certification systems that encourage improved environmental and health performance for all types of buildings except residential structures. Green Globes is administered in the United States by the Green Building Initiative. For more information, see Green Globes Certification. EXIT	A series of rating systems aimed at increasing the environmental and health performance of buildings' sites and structures and of neighborhoods. LEED® covers the design, construction, and operations of all types of buildings. For more information, see the U.S. Green Building Council's LEED webpage. EXIT	A certification system that advocates for transformation in the design, construction, and operation of buildings. In addition to encouraging improved environmental and health performance, it supports the building of structures that are restorative, regenerative, and an integral component of the local ecology and culture. For more information, see the Living Building Challenge. EXIT
Standard Type ¹	Model code	Model code	Rating and certification system	Rating and certification system	Rating and certification system	Certification system

Standard	International Code Council's 2012 <i>International Green Construction Code (IgCC)</i> , 2012 edition COBI Adopted July 2016	American Society of Heating, Refrigeration, and Air-Conditioning Engineers' ANSI/ASHRAE/USGBC/IES Standard 189.1-2011, <i>Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings</i> (ASHRAE 189.1), 2011 edition	National Association of Home Builders' ICC 700 <i>National Green Building Standard</i> (NGBS), 2012 edition	Green Building Initiative's ANSI/GBI 01-2010: <i>Green Building Assessment Protocol for Commercial Buildings</i> (Green Globes), 2010 edition	U.S. Green Building Council's <i>Leadership in Energy and Environmental Design (LEED®)</i>	The International Living Future Institute's <i>Living Building Challenge</i> , version 2.1 (May 2012)
Mandatory/ Voluntary²	• Mandatory	• Mandatory	• Voluntary	• Voluntary	• Voluntary	• Voluntary
Building Type(s)	• Commercial: all • Industrial: all but manufacturing systems and equipment • Mixed use: all • Residential: multifamily with more than three stories	• Commercial: all • Industrial: all • Mixed use: all • Residential: multifamily with more than three stories	• Mixed use: residential space • Residential: all except institutional uses	• Commercial: all • Mixed use: all • Residential: multifamily	• Commercial: all • Industrial: all • Mixed use: all • Residential: all	• Commercial: all • Industrial: all • Mixed use: all • Residential: all
Project Type	• New construction • Additions • Alterations	• New construction • Additions	• New construction • Additions • Alterations	• New construction • Additions • Alterations • Existing buildings	• New construction • Existing buildings • Additions	• All
Subject Areas	• Sustainable sites • Energy efficiency • Water efficiency • Materials and resource use • Indoor environmental quality • Emissions • Operations and maintenance	• Sustainable sites • Energy efficiency • Water efficiency • Materials and resource use • Indoor environmental quality • Construction and operations plans	• Sustainable sites • Energy efficiency • Water efficiency • Materials and resource use • Indoor environmental quality • Operations and maintenance • Building owner education	• Sustainable sites • Energy efficiency • Water efficiency • Materials and resource use • Indoor environmental quality • Emissions • Project/environmental management	• Sustainable sites • Energy efficiency • Water efficiency • Materials and resource use • Indoor environmental quality • Emissions • Operations and maintenance	• Sustainable sites • Energy efficiency • Water efficiency • Materials and resource use • Indoor environmental quality • Equity • Aesthetics

Standard	International Code Council's 2012 <i>International Green Construction Code</i> (IgCC), 2012 edition COBI Adopted July 2016	American Society of Heating, Refrigeration, and Air-Conditioning Engineers' ANSI/ASHRAE/USGBC/IES Standard 189.1-2011, <i>Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings</i> (ASHRAE 189.1), 2011 edition	National Association of Home Builders' ICC 700 <i>National Green Building Standard</i> (NGBS), 2012 edition	Green Building Initiative's ANSI/GBI 01-2010: <i>Green Building Assessment Protocol for Commercial Buildings</i> (Green Globes), 2010 edition	U.S. Green Building Council's <i>Leadership in Energy and Environmental Design</i> (LEED®)	The International Living Future Institute's <i>Living Building Challenge</i>, version 2.1 (May 2012)
Community Adoption/Use	- Designed to be incorporated into a jurisdiction's codes and ordinances and function as an overlay to other International Code Council model codes. - Requires adoption by a governing jurisdiction before it becomes mandatory. - Jurisdictions that do not have other International Code Council codes in place might want to make a detailed review of local building ordinances to ensure that they adequately correlate with this code. - In addition to the mandatory requirements, IgCC offers jurisdictions a range of options for increasing the stringency of the code or encouraging improved levels of performance in areas of particular importance to the community.	- ASHRAE 189.1 is designed to be used and enforced with a jurisdiction's other building codes and ordinances. - Requires adoption by a governing jurisdiction before it becomes mandatory. - Jurisdictions might want to make a detailed review of local building ordinances to ensure that they adequately correlate with this standard.	Communities could use this standard as the basis for a voluntary program to encourage construction of greener homes.	Communities could use this protocol as the basis for a voluntary program that encourages construction of greener commercial buildings.	Communities could use the rating systems to encourage greener construction of commercial buildings, homes, or neighborhoods.	Communities could use this system as the basis for a green building program.

Standard	International Code Council's 2012 <i>International Green Construction Code</i> (IgCC), 2012 edition COBI Adopted July 2016	American Society of Heating, Refrigeration, and Air-Conditioning Engineers' ANSI/ASHRAE/USGBC/IES Standard 189.1-2011, <i>Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings</i> (ASHRAE 189.1), 2011 edition	National Association of Home Builders' ICC 700 <i>National Green Building Standard</i> (NGBS), 2012 edition	Green Building Initiative's ANSI/GBI 01-2010: <i>Green Building Assessment Protocol for Commercial Buildings</i> (Green Globes), 2010 edition	U.S. Green Building Council's <i>Leadership in Energy and Environmental Design</i> (LEED®)	The International Living Future Institute's <i>Living Building Challenge</i>, version 2.1 (May 2012)
Certification/Compliance Process	- Designed to be incorporated into a jurisdiction's codes and ordinances and enforced by building officials and inspectors. - All provisions of the model code are designed to be mandatory, except those the jurisdiction indicates are not applicable or those designated as project electives. Project electives give jurisdictions the flexibility to encourage the consideration and implementation of beneficial practices without making those particular practices mandatory.	- Designed to be incorporated into a jurisdiction's codes and ordinances and enforced by building officials and inspectors. - Based on mandatory requirements with two compliance path options: Prescriptive Path (considered to be the simpler option with minimal choices and few calculations) and Performance Path (considered to be the more sophisticated option that provides flexibility and more options but also requires greater effort).	- There are four green certification levels for homes: Bronze, Silver, Gold, and Emerald. Land Developments can earn One, Two, Three, or Four Stars. - NGBS contains few minimum criteria but allows the builder or developer great flexibility in selecting green building practices. - Projects receive points in each subject area for reaching certain performance or construction goals. - Certification requires verification by third-party inspectors accredited by the National Association of Home Builders (NAHB) at the rough-in stage and on completion. Inspector verifies that every criterion cited by the builder in the NAHB's online scoring tool has been met.	- Certification to one of four levels (i.e., 1 to 4 globes) requires achieving minimum thresholds of 1,000 points. - Has no minimum criteria (i.e., does not require any specific practices), but instead rates buildings on the green building practices that the builder has chosen to include. - Does not require any ongoing documentation, but it might be required as proof of compliance during the third-party assessment. - Requires third-party review of building documentation and onsite walk-throughs.	- LEED® points are awarded on a 100-point scale, and credits are weighted to reflect their potential environmental impacts. Ten bonus credits are available, four of which address regionally specific environmental issues. A project must satisfy all prerequisites and earn a minimum number of points to be certified. Third-party certification is required. - Includes four levels of certification: Certified, Silver, Gold, or Platinum.	- Projects must meet up to 20 requirements to achieve full certification. However, partial recognition is attainable, including a Net Zero Energy Building Certification. - The certification process involves a review of written elements and a site visit by an independent auditor.

Standard	International Code Council's 2012 <i>International Green Construction Code</i> (IgCC), 2012 edition COBI Adopted July 2016	American Society of Heating, Refrigeration, and Air-Conditioning Engineers' ANSI/ASHRAE/USGBC/IES Standard 189.1-2011, <i>Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings</i> (ASHRAE 189.1), 2011 edition	National Association of Home Builders' ICC 700 <i>National Green Building Standard</i> (NGBS), 2012 edition	Green Building Initiative's ANSI/GBI 01-2010: <i>Green Building Assessment Protocol for Commercial Buildings</i> (Green Globes), 2010 edition	U.S. Green Building Council's <i>Leadership in Energy and Environmental Design</i> (LEED®)	The International Living Future Institute's <i>Living Building Challenge</i>, version 2.1 (May 2012)
Relationship to Other Standards	- ANSI/ASHRAE/USGBC/IES Standard 189.1-2011, <i>Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings</i> (ASHRAE 189.1) is an alternate compliance path to IgCC; i.e., in jurisdictions that adopt IgCC, a builder has the option to design and construct a building in accordance with the provisions of ASHRAE 189.1 rather than those of IgCC. - IgCC provides jurisdictions with options for mandating that residential structures comply with the National Association of Home Builders' <i>National Green Building Standard</i> (ICC-700). - IgCC is designed to coordinate and integrate with the family of International Code Council codes and complement voluntary green building rating systems. - Some provisions reference standards published by other organizations, e.g., ASTM International, National Science Foundation, and South Coast Air Quality Management District.	- It is an alternate compliance path for the <i>International Green Construction Code</i> (IgCC); i.e., in jurisdictions that adopt IgCC, a builder has the option to design and construct a building in accordance with the provisions of 189.1 rather than those of IgCC. - ASHRAE 189.1 is designed to complement voluntary green building rating systems. - Some provisions reference standards published by other organizations, e.g., ASTM International, National Science Foundation, and South Coast Air Quality Management District.	- Includes a separate green rating system for entire subdivisions, similar to the LEED for Neighborhood Development system. - Many of the mandatory measures found in the ICC 700 National Green Building Standard are consistent with the family of International Code Council's codes.	Modeled after Building Research Establishment Environmental Assessment Method (BREEAM).	Meeting or achieving ASHRAE standards is necessary for achieving several of the LEED® credits, including ASHRAE 90.1-2007 and 62.1-2007.	

¹ In the building community, there is no consistent use or definition of the terms "standard" or "code." EPA uses the term "standard" here in a broad sense to mean "something established by authority, custom, or general consent as a model or example: CRITERION" (Merriam-Webster). EPA uses it as an umbrella term to encompass model codes, rating systems, and other publications that provide criteria for the design, construction, and maintenance of buildings.

² Any standard can be adopted as a voluntary or mandatory program. We indicate here the intent of the authors.