ICC/ASHRAE 700-2015

National Green Building Standard™

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PREFACE

INTRODUCTION

Green buildings are designed, constructed, and operated with a goal of minimizing their environmental footprint. In both new construction and renovation, the building and its site are designed in an integrated manner using environmentally preferable practices and materials from start to finish. Many green features also carry direct consumer benefits such as lower monthly utility bills, greater comfort, reduced maintenance, and increased value. To provide a uniform national platform for recognizing and advancing green construction and development, in 2007 the National Association of Home Builders (NAHB) and the International Code Council (ICC) partnered to establish the first consensus-based green building standard. The joint effort culminated in the publication of the 2008 *National Green Building Standard*™ (*NGBS*) that received approval from the American National Standards Institute (ANSI).

The standard was updated four years later to incorporate advances in building science, reflect recent model code improvements and add more choices for compliance. As its predecessor, the 2012 *NGBS* was developed in accordance with the ANSI requirements and the *NGBS* remains today the only consensus-based residential green building standard.

The latest installment of the *National Green Building Standard*™, 2015 *NGBS*, welcomed ASHRAE as a new partner to the development process. This broad-based collaboration of the leading code and standard development organizations and their continued commitment to the ANSI process further solidified the standing of the *NGBS* as the national benchmark for green residential construction in the United States. With over 73,000 dwelling units certified to date nationwide, the 2015 *NGBS* incorporates improvements and adds new practices gleaned from the standard's implementation in the field.

Using a points-based system, a home or building can attain one of four rating levels—Bronze, Silver, Gold, or Emerald—depending on the green practices included. For a building to attain any certification level, all applicable mandatory provisions must be implemented. The *Standard* also requires that the builder or remodeler incorporate a minimum number of features in each of six categories (lot development, resource efficiency, energy efficiency, water efficiency, indoor environmental quality, and homeowner education) for each rating level. The scope of the *Standard* includes single-family dwellings, townhomes, multifamily residential buildings, and building sites. Newly-constructed or remodeled buildings can achieve compliance.

The *Standard* provides developers, builders, and remodelers with a credible definition of green building and a useful measurement of its relative environmental rating. The expansive point-based system offers a process that can accommodate varying climates, market conditions, and homebuyer preferences.

DEVELOPMENT

The Consensus Committee for the 2015 *National Green Building Standard*™, consisting of 42 members, was assembled of those entities and interests that are affected by the provisions of the *Standard*. In addition, seven Task Groups were formed according to their specific area of technical expertise to serve as a resource to the Consensus Committee. The Task Groups included committee members and other subject experts. The entire *Standard* was open for the public to submit proposed changes before the Consensus Committee and the Task Groups began their work on revising and expanding the provisions of the *Standard*. The Consensus Committee met four times during 2014 and 2015 to discuss and take formal actions first on proposed changes and then on public comments. All meetings were open to the public to provide an opportunity to address the Consensus Committee. All committee actions were also balloted through formal letter ballots.

Overall, the Consensus Committee reviewed and acted upon nearly 600 proposed changes and public comments ranging from revisions to individual provisions to addition of new compliance options.

ANSI APPROVAL

The ICC/ASHRAE 700-2015 *National Green Building Standard*™ was approved by ANSI as an American National Standard on March 22, 2016.

MAINTENANCE

The development process for the *National Green Building Standard*™ is managed by the Home Innovation Research Labs, an ANSI Accredited Standards Developer. The Standard is revised on a continuous maintenance basis in accordance with the ANSI requirements. Proposals for revising the 2015 edition of the *National Green Building Standard*™ are welcome. Please visit the Home Innovation Research Labs website (www.homeinnovation.com/NGBS) for a proposal form and instructions.

DISCLAIMER

Home Innovation Research Labs, NAHB, ICC, ASHRAE, their members and those participating in the development of this Standard accept no liability resulting from compliance or noncompliance with the provisions. Home Innovation Research Labs, NAHB, ICC, or ASHRAE do not have the power or authority to enforce compliance with the contents of this Standard. Similarly, neither NAHB nor ICC nor ASHRAE makes any representations or warranties regarding enforcement, application or compliance with this Standard or any part thereof.

2015 Consensus Committee on the National Green Building Standard™

At the time of ANSI approval, the Consensus Committee consisted of the following members:

Chair	Robert Ross
Vice Chairs	Shirley Ellis, Chris Mathis
Committee Staff	Vladimir Kochkin, Kevin Kauffman
ICC Staff Liaison	Allan Bilka
ASHRAE Staff Liaison	Lilas Pratt

Committee Member	**Representative**
ACCA (U)	Donald Prather
Adams Craig (U)	Stephen Adams
Air-Conditioning, Heating and Refrigeration Institute (P)	Frank Stanonik
American Gas Association (P)	Ted Arthur Williams
American Iron and Steel Institute (P)	Maribeth S Rizzuto
American Wood Council (P)	Kenneth Bland
	Sam Francis (Alt.)
Cherry Hills Village (G)	Hope Medina
City and County of Broomfield Building Division (G)	Tim Pate
City of Des Moines (G)	Sean S. Devlin
City of Winter Park Florida Building and Permitting Department (G)	Kristopher R. Stenger
Coconino County Community Development Department (G)	Steven White
ConSol (U)	Mike Hodgson
Covestro LLC (P)	Jerry Phelan
DuPont Building Innovations (P)	Theresa A. Weston
Edison Electric Institute (P)	Steven Rosenstock
Environmental Solutions Group (U)	Steven Armstrong
Foster Associates (P)	Charles Foster
G&R Construction Services LLC (U)	Robert D. Ross
Gas Technology Institute/Carbon Management Information Center (P)	Neil P. Leslie
Habitat for Humanity International (U)	Rob Howard
	Ian Bukowski (Alt.)
Mathis Consulting Company (U)	R Christopher Mathis
	Bridget Herring (Alt.)
Mitchell & Best Homes (U)	Chad Riedy
Monument Construction (U)	Miles Haber
National Institute of Standards and Technology (G)	Nancy McNabb
National Multifamily Housing Council (U)	Paula Marie Cino
	Ron Nickson (Alt.)
North American Insulation Manufacturers Assoc. (P)	Charles C Cottrell
Northeast Energy Efficiency Partnerships (NEEP) (G)	Darren Port
Plastic Pipe and Fittings Association (PPFA) (P)	Michael Cudahy
Portland Cement Association (P)	David Shepherd
	Stephen S Szoke (Alt.)

Randy Melvin's High Performance Building and Code Solutions LLC (U)	Randall K. Melvin
Ryan Taylor Architects LLC (U)	Ryan Taylor
Schneider Electric (P)	Wayne H. Stoppelmoor, Jr.
Steve Easley & Associates (U)	Steve Easley
Texas A&M University (G)	Shirley Ellis
The American Institute of Architects (U)	David S. Collins
	Rachel Minnery (Alt.)
The Sullivan Company (U)	Paul Sullivan
The Laclede Group (U)	Sid Koltun
UL (P)	Josh Jacobs
U.S. Department of Energy (G)	Jeremiah Williams
U.S. Department of Housing & Urban Development (G)	Dana Bres
	Mike Blanford (Alt.)
Vinyl Siding Institute, Inc. (P)	Matthew Dobson
Window & Door Manufacturers Association (P)	Jeff Inks

Acknowledgement
The development of the 2015 *National Green Building Standard*™ (*NGBS*) would not have been possible without the contributions of time, effort, and insight by the Consensus Committee members, and the individuals who participated on the Task Groups. The organizations that sponsored this *NGBS* development process—ICC, ASHRAE, and NAHB—recognize and appreciate these contributions, as well as those of everyone who participated in the public hearings and formal comment process.

There is no implied or explicit endorsement of the 2015 *NGBS* by Consensus Committee members or by any other individuals and organizations participating in its development.

INTEREST CATEGORIES

Membership by Interest Category	
General Interest (G):	10
Producer Interest (P):	16
User Interest (U):	16
TOTAL:	**42**

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CHAPTER 1

SCOPE AND ADMINISTRATION

101 GENERAL

101.1 Title. The title of this document is the *National Green Building Standard*™, hereinafter referred to as "this Standard."

101.2 Scope. The provisions of this Standard shall apply to design and construction of the residential portion(s) of any building, not classified as an institutional use, in all climate zones. This Standard shall also apply to subdivisions, building sites, building lots, accessory structures, and the residential portions of alterations, additions, renovations, mixed-use buildings, and historic buildings.

101.3 Intent. The purpose of this Standard is to establish criteria for rating the environmental impact of design and construction practices to achieve conformance with specified performance levels for green residential buildings, renovation thereof, accessory structures, building sites, and subdivisions. This Standard is intended to provide flexibility to permit the use of innovative approaches and techniques. This Standard is not intended to abridge safety, health, or environmental requirements contained in other applicable laws, codes, or ordinances.

101.4 Referenced documents. The codes, standards, and other documents referenced in this Standard shall be considered part of the requirements of this Standard to the prescribed extent of each such reference. The edition of the code, standard, or other referenced document shall be the edition referenced in Chapter 13.

101.5 Appendices. Where specifically required by a provision in this Standard, that appendix shall apply. Appendices not specifically required by a provision of this Standard shall not apply unless specifically adopted.

102 CONFORMANCE

102.1 Mandatory practices. This Standard does not require compliance with any specific practice except those noted as mandatory.

102.2 Conformance language. The green building provisions are written in mandatory language by way of using the verbs "to be," "is," "are," etc. The intent of the language is to require the user to conform to a particular practice in order to qualify for the number of points assigned to that practice. Where the term "shall" is used, or the points are designated as "mandatory," the provision or practice is mandatory.

102.3 Documentation. Verification of conformance to green building practices shall be the appropriate construction documents, architectural plans, site plans, specifications, builder certification and sign-off, inspection reports, or other data that demonstrates conformance as determined by the Adopting Entity. Where specific documentation is required by a provision of the Standard, that documentation is noted with that provision.

102.4 Alternative compliance methods. Alternative compliance methods shall be acceptable where the Adopting Entity finds that the proposed green building practice meets the intent of this Standard.

SECTION 103 ADMINISTRATION

103.1 Administration. The Adopting Entity shall specify performance level(s) to be achieved as identified in Chapter 3 and shall provide a verification process to ensure compliance with this Standard.

CHAPTER 2

DEFINITIONS

201 GENERAL

201.1 Scope. Unless otherwise expressly stated, the following words and terms shall, for the purposes of this Standard, have the meanings shown in this chapter.

201.2 Interchangeability. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

201.3 Terms defined in other documents. Where terms are not defined in this Standard, and such terms are used in relation to the reference of another document, those terms shall have the definition in that document.

201.4 Terms not defined. Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.

SECTION 202 DEFINITIONS

ACCESSORY STRUCTURE. A structure, the use of which is customarily accessory to and incidental to that of the residential building; the structure is located on the same lot or site as the residential building; the structure does not contain a dwelling unit; and (1) is classified as Group U – Utility and Miscellaneous in accordance with the ICC International Building Code, or (2) is classified as accessory in accordance with the ICC International Residential Code, or (3) is classified as accessory to the residential use by a determination of the Adopting Entity.

ADDITION. An extension or increase in the conditioned space floor area or height of a building or structure.

ADOPTING ENTITY. The governmental jurisdiction, green building program, or any other third-party compliance assurance body that adopts this Standard, and is responsible for implementation and administration of the practices herein.

ADVANCED FRAMING. Code compliant layout, framing and engineering techniques that minimize the amount of framing products used and waste generated to construct a building while maintaining the structural integrity of the building.

AFUE (Annual Fuel Utilization Efficiency). The ratio of annual output energy to annual input energy which includes any non-heating season pilot input loss, and for gas or oil-fired furnaces or boilers, does not include electrical energy.

AIR BARRIER. Material(s) assembled and joined together to provide a barrier to air leakage through the building envelope. An air barrier may be a single material or a combination of materials.

AIR HANDLER. A blower or fan used for the purpose of distributing supply air to a room, space, or area.

AIR INFILTRATION. The uncontrolled inward air leakage into a building caused by the pressure effects of wind or the effect of differences in the indoor and outdoor air density or both.

AIR, MAKE-UP. Air that is provided to replace air being exhausted.

ARCHITECTURAL COATINGS. A material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, primers, paints, varnishes, sealers, and stains. An architectural coating is a material applied to stationary structures or their appurtenances at

the site of installation. Coatings applied in shop applications, sealants, and adhesives are not considered architectural coatings.

BIOBASED PRODUCT. A commercial or industrial material or product that is composed of, or derived from, in whole or in significant part, biological products or renewable agricultural materials, including plant, animal, and marine materials, or forestry materials

BROWNFIELD (also EPA-Recognized Brownfield). A site in which the expansion, redevelopment or reuse of would be required to address the presence or potential presence of a hazardous substance, pollutant or contaminant. Brownfield sites include:

- EPA-recognized brownfield sites as defined in Public Law 107-118 (H.R. 2869) "Small Business Liability Relief and Brownfields Revitalization Act," 40 CFR, Part 300; and
- Sites determined to be contaminated according to local or state regulation.

(i.e.: Pub.L. 107-118, § 1, Jan. 11, 2002, 115 Stat. 2356, provided that: "This Act [enacting 42 U.S.C.A. § 9628, amending this section, 42 U.S.C.A. § 9604, 42 U.S.C.A. § 9605, 42 U.S.C.A. § 9607, and 42 U.S.C.A. § 9622, and enacting provisions set out as notes under this section and 42 U.S.C.A. § 9607] may be cited as the 'Small Business Liability Relief and Brownfields Revitalization Act'.")

CERTIFIED GEOTHERMAL SERVICE CONTRACTOR. A person who has a current certification from the International Ground Source Heat Pump Association as an installer of ground source heat pump systems or as otherwise approved by the Adopting Entity.

CLIMATE ZONE. Climate zones are determined based on Figure 6(1).

CLUSTER DEVELOPMENT. A design technique that concentrates residential buildings and related infrastructure at a higher density within specified areas on a site. The remaining land on the site can then be used for low intensity uses such as recreation, common open space, farmland, or the preservation of historical sites and environmentally sensitive areas.

COMMON AREA(S).

1. Areas within a site or lot that are predominantly open spaces and consist of non-residential structures, landscaping, recreational facilities, roadways and walkways, which are owned and maintained by an incorporated or chartered entity such as a homeowner's association or governmental jurisdiction; or
2. Areas of a multifamily building that are outside the boundaries of a dwelling unit and are shared among or serve the dwelling units; including, but not limited to, hallways, amenity and resident services areas, parking areas, property management offices, mechanical rooms, and laundry rooms.

COMPONENT. See "Major Component" and/or "Minor Component".

COMPOST FACILITY. An outdoor bin or similar structure designed for the decomposition of organic material such as leaves, twigs, grass clippings, and vegetative food waste.

CONDITIONED SPACE. An area, room or space that is enclosed within the building thermal envelope and that is directly or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate thru openings with conditioned spaces, where they are separated from conditioned spaces by uninsulated walls, floors or ceilings or where they contain uninsulated ducts, piping or other sources of heating or cooling.

CONSTRUCTED WETLAND. An artificial wetland system (such as a marsh or swamp) created as new and/or restored habitat for native wetland plant and wildlife communities as well as to provide and/or restore wetland functions to the area. Constructed wetlands are often created as compensatory mitigation for ecological disturbances that result in a loss of natural wetlands from (1) anthropogenic discharge for wastewater, stormwater runoff, or sewage treatment; (2) mines or refineries; or (3) the development.

CONSTRUCTION WASTE MANAGEMENT PLAN. A system of measures designed to reduce, reuse, and recycle the waste generated during construction and to properly dispose of the remaining waste.

CONTINUOUS PHYSICAL FOUNDATION TERMITE BARRIER. An uninterrupted, non-chemical method of preventing ground termite infestation (e.g., aggregate barriers, stainless steel mesh, flashing, or plastic barriers).

COEFFICIENT OF PERFORMANCE (COP) – COOLING. The ratio of the rate of heat removal to the rate of energy input, in consistent units, for a complete refrigerating system of some specific portion of the system under designated operating conditions.

COEFFICIENT OF PERFORMANCE (COP) – HEATING. The ratio of the rate of heat delivered to the rate of energy input, in consistent units, for a complete heat pump system, including the compressor, and, if applicable, auxiliary heat, under designated operating conditions.

DAYLIGHT CONTROL. A device or system that provides automatic control of electric light levels based on the amount of daylight.

DEMAND CONTROLLED HOT WATER LOOP. A hot water circulation (supply and return) loop with a pump that runs "on demand" when triggered by a user-activated switch or motion-activated sensor.

DESUPERHEATER. An auxiliary heat exchanger that uses superheated gases from an air conditioner’s or heat pump's vapor-compression cycle to heat water.

DIRECT-VENT APPLIANCE. A fuel-burning appliance with a sealed combustion system that draws all air for combustion from the outside atmosphere and discharges all flue gases to the outside atmosphere.

DRAIN-WATER HEAT RECOVERY. A system to recapture the heat energy in drain water and use it to preheat cold water entering the water heater or other water fixtures.

DURABILITY. The ability of a building or any of its components to perform its required functions in its service environment over a period of time without unforeseen cost for maintenance or repair.

DWELLING UNIT. A single unit providing complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation.

DYNAMIC GLAZING. Any fenestration product that has the fully reversible ability to change its performance properties, including U-factor, SHGC, or VT.

EER (Energy Efficiency Ratio). A measure of the instantaneous energy efficiency of electric air conditioning defined as the ratio of net equipment cooling capacity in Btu/h to total rate of electric input in watts under designated operating conditions. When consistent units are used, this ratio becomes equal to COP. (See also Coefficient of Performance.)

ENERGY MANAGEMENT CONTROL SYSTEM. An integrated computerized control system that is intended to operate the heating, cooling, ventilation, lighting, water heating, and/or other energy-consuming appliances and/or devices for a building in order to reduce energy consumption. Also known as Building Automation Control (BAC) or Building Management Control System (BMCS).

ENERGY MONITORING DEVICE. A device installed within a building or dwelling unit that can provide near real-time data on whole building or dwelling unit energy consumption.

ENGINEERED WOOD PRODUCTS. Products that are made by combining wood strand, veneers, lumber or other wood fiber with adhesive or connectors to make a larger composite structure.

ENVIRONMENTAL IMPACT. See **LCA (Life Cycle Analysis/Assessment)**.

ENVIRONMENTALLY SENSITIVE AREAS.

1. Areas within wetlands as defined by federal, state, or local regulations;
2. Areas of steep slopes;
3. "Prime Farmland" as defined by the U.S. Department of Agriculture;
4. Areas of "critical habitat" for any federal or state threatened or endangered species;
5. Areas defined by state or local jurisdiction as environmentally sensitive; or,
6. Shoreline buffers that have important environmental functions as identified by the state or local jurisdiction, e.g., shoreline stability, pollutant removal, streamside shading, ecological flow protection.

EROSION CONTROLS. Measures that prevent soil from being removed by wind, water, ice, or other disturbance.

EXISTING BUILDING. A building erected prior to the date of the current adopted building code, or one for which a legal building occupancy permit has been issued.

EXISTING SUBDIVISION. An area of land, defined as "Site" in this Chapter, that has received all development approvals and has been platted and all infrastructure is complete at time of application to this Standard.

FROST-PROTECTED SHALLOW FOUNDATION. A foundation that does not extend below the design frost depth and is protected against the effects of frost in compliance with SEI/ASCE 32-01 or the provisions for frost-protected shallow foundations of the ICC IBC or IRC, as applicable.

GRADE PLANE. A reference plane representing the average of the finished ground level adjoining the building at all exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points within the area between the building and the lot line or, where the lot line is more than 6 feet (1830 mm) from the building, between the structure and a point 6 feet (1830 mm) from the building.

GRAY WATER. Untreated waste water that has not come into contact with waste water from water closets, urinals, kitchen sinks, or dishwashers. Gray water includes, but is not limited to, waste water from bathtubs, showers, lavatories, clothes washers, and laundry trays.

GREYFIELD SITE. A previously developed site with little or no contamination or perceived contamination.

GRID-INTERACTIVE ELECTRIC THERMAL STORAGE (GETS). An energy storage system that provides electric system grid operators such as utilities, independent system operators (ISOs) and regional transmission organizations (RTOs), with variable control of a building's space heating and service water heating end uses.

GROUND SOURCE HEAT PUMP. Where the earth is used as a heat sink in air conditioning or heat source in heating systems. This also applies to systems utilizing subsurface water.

HARDSCAPE. Asphalt, concrete, masonry, stone, wood, and other non-plant elements external to the building shell on a landscape.

HEAT PUMP. An appliance having heating or heating/cooling capability and which uses refrigerants to extract heat from air, liquid, or other sources.

HIGH-EFFICACY LAMPS. Compact fluorescent lamps (CFL); light emitting diode (LED); T-8 or smaller diameter linear fluorescent lamps; or lamps with a minimum efficacy of 1) 60 lumens per watt for lamps over 40 watts, 2) 50 lumens per watt for lamps over 15 watts to 40 watts, or 3) 40 lumens per watt for lamps 15 watts or less.

HISTORIC BUILDINGS. Buildings that are listed in or eligible for listing in the National Register of Historic Places (NRHP) or designated as being of historic or architectural significance under an appropriate state or local law.

HSPF (Heating Seasonal Performance Factor). The total seasonal heating output of a heat pump, in Btu, divided by the total electric energy input during the same period, in watt-hours using a defined test methodology.

HYDROZONING. A landscape practice that groups plants with similar watering needs together in an effort to conserve water.

ICF (INSULATING CONCRETE FORMS). A concrete forming system using stay-in-place forms of rigid foam plastic insulation, a hybrid of cement and foam insulation, a hybrid of cement and wood chips, or other insulating material for constructing cast-in-place concrete walls.

IMPERVIOUS SURFACE. Hard-covered ground area that prevents/retards the entry of water into the soil at that location, resulting in water flowing to another location. (Also see HARDSCAPE)

INDIRECT-FIRED WATER HEATER. A water storage tank, typically with no internal heating elements, that is connected by piping to an external heating source such as a gas or oil-fired boiler.

INFILL. A location including vacant or underutilized land that may apply to either a site or a lot and is located in an area served by existing infrastructure such as centralized water and sewer connections, roads, drainage, etc., and the site boundaries are adjacent to existing development on at least one side.

INTEGRATED PEST MANAGEMENT. A sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks.

INVASIVE PLANTS. Plants for which the species are not native to the ecosystem under consideration and that cause, or are likely to cause, economic or environmental harm or harm to human, animal or plant health. For the purposes of compliance with this standard, invasive plants are those that are included on local, state, or regional lists of plants determined to cause environmental harm and shall not be limited to those plants covered by law or regulation.

LANDSCAPE PRACTICE (LANDSCAPING). Any activity that modifies the visible features of an area of land. It may include:

1. Living elements, such as flora or fauna;
2. Natural elements such as terrain shape, elevation, or bodies of water;
3. Created or installed elements such as fences or other material objects;
4. Abstract elements such as the weather and lighting conditions.

LAVATORY FAUCET. A valve for dispensing hot and/or cold water to a basin used for washing hands and face, but not for food preparation.

LCA (Life Cycle Analysis/Assessment). An accounting and evaluation of the environmental aspects and potential impacts of materials, products, assemblies, or buildings throughout their life (from raw material acquisition through manufacturing, construction, use, operation, demolition, and disposal).

Level 2 Electric Vehicle Charging Station. A device that is used to supply electricity to a plug-in hybrid electric vehicle or a plug-in electric vehicle and is rated for use with 208 to 240 Volts AC input.

Level 3 Electric Vehicle Charging Station. A device that is used to supply electricity to a plug-in hybrid electric vehicle or a plug-in electric vehicle and is rated for use with 208 to 500 Volts, 3 phase electric AC input.

LOT. A portion or parcel of land considered as a unit.

LOW-IMPACT DEVELOPMENT. A storm water management approach that attempts to recreate the predevelopment hydrology of a site by using lot level topography and landscape to deter storm water runoff and promote soil infiltration and recharge.

LOW-VOC (PRODUCTS). Products or materials with volatile organic compound (VOC) emissions equal to or below the established thresholds as defined in the referenced VOC emissions requirements for each applicable section in this document. (Also see VOC.)

MAJOR COMPONENT.
1. All structural members and structural systems.
2. Building materials or systems that are typically applied as a part of over 50% of the surface area of the foundation, wall, floor, ceiling, or roof assemblies.

MANUFACTURED HOME CONSTRUCTION. Three-dimensional sections of the complete building or dwelling unit built in a factory in conformance with the HUD Manufactured Home Construction and Safety Standards (24 CFR, Part 3280) and transported to the jobsite to be joined together on a foundation.

MASS WALLS. Above-grade masonry or concrete walls having a mass greater than or equal to 30 pounds per square foot (146 kg/m^2), solid wood walls having a mass greater than or equal to 20 pounds per square foot (98 kg/m^2), and any other walls having a heat capacity greater than or equal to 6 Btu/ft^2•°F [266 J/(m^2 • K)] with a minimum of 50 percent of the required R-value on the exterior side of the wall's centerline.

MERV (Minimum Efficiency Reporting Value). Minimum efficiency-rated value for the effectiveness of air filters.

MINOR COMPONENT. Building materials or systems that are not considered a major component. (Also see Major Component.)

MIXED-USE BUILDING. A building that incorporates more than one use (e.g., residential, retail, commercial) in a single structure.

MIXED-USE DEVELOPMENT. A project that incorporates more than one use (e.g., residential, retail, commercial) on the same site.

MODULAR CONSTRUCTION. Three-dimensional sections of the complete building or dwelling unit built in a factory and transported to the jobsite to be joined together on a permanent foundation.

MULTIFAMILY BUILDING. A building containing multiple dwelling units and classified as R-2 under the ICC IBC.

NET DEVELOPABLE AREA. The land on which buildings may be constructed. Any land where buildings cannot be constructed due to environmental restrictors, or that is used for infrastructure or public purposes such as parks, schools, etc., is not considered net developable area.

NEW CONSTRUCTION. Construction of a new building.

OCCUPANCY SENSOR. Devices that generally use passive infrared and/or ultrasonic technology or a combination of multiple sensing technologies to automatically turn lights on and off or from one preset light level to another based on whether or not the sensor detects that a space is occupied.

ON-SITE RENEWABLE ENERGY SYSTEM. An energy generation system located on the building or building site that derives its energy from a renewable energy source.

OPEN SPACE. An area of land or water that (1) remains in its natural state, (2) is used for agriculture, or (3) is free from intensive development.

PANELIZED ASSEMBLIES. Factory-assembled wall panels, roof trusses, and/or other components installed on-site.

PERFORMANCE PATH. An alternative set of standards (to the Prescriptive Path) with defined performance metrics, as specified in Chapter 7 of this Standard.

PERMEABLE MATERIAL. A material that permits the passage of water vapor and/or liquid.

PLUMBING FIXTURE. A receptor or device that requires both a water-supply connection and a discharge to the drainage system, such as water closets, lavatories, bathtubs, and sinks.

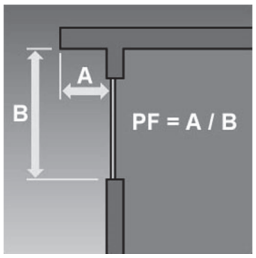
PRECUT. Materials cut to final size prior to delivery to site and ready for assembly.

PRESCRIPTIVE PATH. A set of provisions in a code or standard that must be adhered to for compliance.

PRESERVATION. The process of applying measures to maintain and sustain the existing materials, integrity, and/or form of a building, including its structure and building artifacts.

PROGRAMMABLE COMMUNICATING THERMOSTAT. A whole building or whole dwelling unit thermostat that can be monitored and controlled remotely.

PROJECTION FACTOR. The ratio of the overhang width to the overhang height above the door threshold or window sill (PF = A/B).



Projection Factor

R-VALUE (THERMAL RESISTANCE). The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area (h•ft2•°F/Btu)[(m2•K)/W].

RECYCLE. To recover and reprocess manufactured goods into new products.

RECYCLED CONTENT. Resources containing post-consumer or pre-consumer (post-industrial) recycled content.

> **POST-CONSUMER RECYCLED CONTENT.** Proportion of recycled material in a product generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product that can no longer be used for its intended purpose. This includes returns of material from the distribution chain.
>
> **PRE-CONSUMER (POST-INDUSTRIAL) RECYCLED CONTENT.** Proportion of recycled material in a product diverted from the waste stream during the manufacturing process. Pre-consumer recycled content does not include reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

REGIONAL MATERIAL. Material that originates, is produced, grows naturally, or occurs naturally within: (1) 500 miles (804.7 km) of the construction site if transported by truck, or (2) 1,500 miles (2,414 km) of the construction site if transported for not less than 80 percent of the total transport distance by rail or water. Products that are assembled or produced from multiple raw materials are considered regional materials if the weighted average (by weight or volume) of the distance the raw materials have been transported meet the distance criteria.

REMODELING. The process of restoring or improving an existing building, dwelling unit, or property.

RENEWABLE ENERGY. Energy derived from renewable energy sources.

RENEWABLE ENERGY SOURCE. Energy derived from solar radiation, wind, hydropower, waves, tides, biogas, biomass, or geothermal energy.

REPLACEMENT. The act or process of replacing material or systems.

REUSE. To divert a construction material, product, component, module, or a building from the construction and demolition waste stream, without recycling the material, in order to use it again.

SEDIMENT CONTROLS. Practices used on building sites to minimize the movement of sand, soil, and particulates or dust from construction from reaching waterways.

SEER (Seasonal Energy Efficiency Ratio). The total cooling output of an electric air conditioner (or heat pump) during its normal annual usage period for cooling, in Btu, divided by the total electric energy input during the same period, in watt-hours (Wh), expressed as Btu/Wh. SEER is the cooling performance equivalent measurement of HSPF.

SHGC (Solar Heat Gain Coefficient). The ratio of the solar heat gain entering the space through the fenestration assembly to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation which is then reradiated, conducted, or convected into the space.

SIP (Structural Insulated Panel). A structural sandwich panel that consists of a light-weight foam plastic core securely laminated between two thin, rigid wood structural panel facings; a structural panel that consists of lightweight foam plastic and cold-formed steel sheet or structural cold-formed steel members; or other similar non-interrupted structural panels.

SITE. Any area of land that is or will be developed into two or more parcels of land intended for multiple ownership, uses, or structures and designed to be part of an integrated whole such as a residential subdivision, mixed-use development, or master-planned community. Site, as defined, generally contains multiple lots. (Also see LOT)

SMART APPLIANCE. A product that has the capability to receive, interpret, and act on a signal transmitted by a utility, third-party energy service provider, or home energy management device, and automatically adjust its operation depending on both the signal's contents and settings by the consumer. The product has this capability either built-in or added through an external device that easily connects to the appliance.

SOLID FUEL-BURNING APPLIANCE. A chimney connected device designed for purposes of heating, cooking, or both that burns solid fuel.

STEEP SLOPES. Slopes equal to or greater than 25 percent (≥ 25%).

STORY. That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above.

STORY ABOVE GRADE. Any story having its finished floor surface entirely above grade plane, or in which the finished surface of the floor next above is:

- More than 6 feet (1829mm) above grade plane; or
- More than 12 feet (3658 mm) above the finished ground level at any point.

STRUCTURAL SYSTEMS. Load-bearing elements and systems that transfer lateral and vertical loads to the foundation and may include, but are not limited to load-bearing walls (interior or exterior), roofs, and other structural elements.

SUBDIVISION. A tract, lot, or parcel of land divided into two or more lots, plats, sites, or other divisions of land.

SWPPP (Stormwater Pollution Prevention Plan). A site-specific, written document or report that identifies required features specifically represented in the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP).

TERRAIN ADAPTIVE ARCHITECTURE. Architecture or landscape architecture where the design of the building or site has been specifically adapted to preserve unique features of the terrain.

UA. The total U-factor times area for a component or building.

URBAN. Areas within a designated census tract of 1,000 people per square mile or located within a Metropolitan Statistical Area primary city, as designated by the U.S. Census Bureau.

U-FACTOR (THERMAL TRANSMITTANCE). The coefficient of heat transmission (air to air) through a building envelope component or assembly, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films (Btu/h • ft^2 • °F) [W/(m^2 • K]).

VAPOR RETARDER CLASS. A measure of the ability of a material or assembly to limit the amount of moisture that passes through that material or assembly. Vapor retarder class shall be defined using the desiccant method with Procedure A of ASTM E 96 as follows:

- Class I: 0.1 perm or less
- Class II: 0.1 < perm = 1.0 perm
- Class III: 1.0 < perm = 10 perm

VENTILATION. The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

VOC (VOLATILE ORGANIC COMPOUNDS). A class of carbon-based molecules in substances and organic compounds that readily release gaseous vapors at room temperature as indoor pollutants and when reacting with other exterior pollutants can produce ground-level ozone.

WASTE HEAT. Heat discharged as a byproduct of one process to provide heat needed by a second process.

WATER FACTOR. The quantity of water, in gallons per cycle (Q), divided by a clothes washing machine clothes container capacity in cubic feet (C). The equation is WF=Q/C.

WATER-RESISTIVE BARRIER. A material behind an exterior wall covering that is intended to resist liquid water that has penetrated behind the exterior covering from further intruding into the exterior wall assembly.

WETLANDS. Areas that are inundated or saturated by the surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

WILDLIFE HABITAT/CORRIDOR. An ecological or environmental area that is inhabited by a particular species of animal, plant, or other type of organism. It is the natural environment in which an organism lives or the physical environment that surrounds (influences and is utilized by) a species population.

WOOD-BASED PRODUCT. Any material that consists of a majority of wood or constituents derived from wood (e.g., wood fiber) as measured by either weight or volume.

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CHAPTER 3

COMPLIANCE METHOD

301 GENERAL

301.1 Environmental rating levels. The building, project, site, and/or development environmental rating level shall consist of all mandatory requirements plus points assessed using the point system specified within this chapter. The rating level shall be in accordance with Section 302, 303, 304, or 305.3, as applicable. The designation for remodeled functional areas shall be in accordance with Section 305.4. The designation for accessory structures shall be in accordance with Section 306.

301.2 Awarding of points. Points shall be awarded as follows:

(1) The maximum number of points that can be awarded for each practice is noted with that practice.

(2) Point allocation for multifamily buildings shall be as prescribed in Section 304.

(3) The Adopting Entity shall allow the use of new and innovative products and practices deemed to meet the intent of this Standard. Points assigned for any new product or practice shall be determined by the Adopting Entity. A maximum of 20 points may be awarded at the discretion of the Adopting Entity. Innovative practices and products shall fall under Chapters 5-10 (Categories 1-6 in Table 303); however, these points shall only be assigned under Category 7. Point values shall be determined by comparing the innovative product or practice to a practice or product already described in the Standard. The applicant shall supply demonstrable, quantified data to support the innovative product or practice and to determine the practice's functional equivalent in the Standard for the points to be awarded.

302 GREEN SUBDIVISIONS

302.1 Site design and development. The threshold points required for the environmental rating levels to qualify a new or existing subdivision as green under this Standard shall be in accordance with Table 302 and based on points in Chapter 4.

Table 302
Threshold Point Ratings for Site Design and Development

Green Subdivision Category		Rating Level Points			
		One Star	Two Stars	Three Stars	Four Stars
Chapter 4	Site Design and Development	**95**	**122**	**149**	**176**

303 GREEN BUILDINGS

303.1 Green buildings. The threshold points required for the environmental rating levels for a green building shall be in accordance with Table 303. To qualify for one of these rating levels, all of the following shall be satisfied:

(1) The threshold number of points, in accordance with Table 303, shall be achieved as prescribed in Categories 1 through 6. The lowest level achieved in any category shall determine the overall rating level achieved for the building.

(2) In addition to the threshold number of points in each category, all mandatory provisions of each category shall be implemented.

(3) In addition to the threshold number of points prescribed in Categories 1 through 6 (which corresponds to Chapters 5-10), the additional points prescribed in Category 7 shall be achieved from any of the categories. Where deemed appropriate by the Adopting Entity based on regional conditions, additional points from Category 7 may be assigned to another category (or categories) to increase the threshold points required for that category (or categories). Points shall not be reduced by the Adopting Entity in any of the six other categories.

Table 303
Threshold Point Ratings for Green Buildings

Green Building Categories			Rating Level Points [a] [b]			
			BRONZE	SILVER	GOLD	EMERALD
1.	Chapter 5	Lot Design, Preparation, and Development	50	64	93	121
2.	Chapter 6	Resource Efficiency	43	59	89	119
3.	Chapter 7	Energy Efficiency	30	45	60	70
4.	Chapter 8	Water Efficiency	25	39	67	92
5.	Chapter 9	Indoor Environmental Quality	25	42	69	97
6.	Chapter 10	Operation, Maintenance, and Building Owner Education	8	10	11	12
7.		Additional Points from Any Category	50	75	100	100
		Total Points:	231	334	489	611

(a) In addition to the threshold number of points in each category, all mandatory provisions of each category shall be implemented.

(b) For dwelling units greater than 4,000 square feet (372 m^2), the number of points in Category 7 (Additional Points from Any Category) shall be increased in accordance with Section 601.1. The "Total Points" shall be increased by the same number of points.

304 GREEN MULTIFAMILY BUILDINGS

304.1 Multifamily buildings. All residential portions of a building shall meet the requirements of this Standard. Partial compliance shall not be allowed. Unless specifically addressed in other portions of this standard, all units and residential common areas within a multifamily building shall meet all mandatory requirements. Where features similar to dwelling unit features are installed in the common area, those features shall meet the standard of the dwelling unit. Green building practices for residential common areas may differ from requirements for dwelling units. Points for the green building practices that apply to multiple units shall be credited once for the entire building. Where points are credited, including where a weighted average is used, practices shall be implemented in all units, as applicable. Where application of a prescribed practice allows for a different number of points for different units in a multifamily building, the fewer number of points shall be awarded, unless noted that a weighted average is used.

305 GREEN REMODELING

305.1 Compliance. Compliance with Section 305 shall be voluntary unless specifically adopted as mandatory by the Adopting Entity.

305.2 Compliance options. The criteria for existing buildings shall be in accordance with Section 305.3 for whole-building ratings or Section 305.4 for compliance designations of building functional areas.

305.3 Whole-building rating criteria

305.3.1 Applicability. The provisions of Section 305.3 shall apply to remodeling of existing buildings. In addition to the foundation, at least 50 percent of the structural systems of the existing building shall remain in place after the remodel for the building to be eligible for compliance under Section 305.3.

305.3.1.1 Additions. For a remodeled building that includes an addition, the entire building including the addition shall comply with the criteria of Section 305.3. The total above-grade conditioned area added during a remodel shall not exceed 75% of the existing building's above-grade conditioned area. For multifamily buildings, the above-grade conditioned area shall be based on the entire building including all dwelling units and common areas.

305.3.2 Rating scope. The building rating achieved under Section 305.3 and the associated compliance criteria apply to the entire building after the remodel including any additions.

305.3.3 Mandatory practices. The building, including any additions and common areas, shall satisfy all practices designated as mandatory in Chapter 11.

305.3.4 Rating level. A minimum rating level of Bronze shall be achieved in each of the following categories: Energy efficiency (Sections 305.3.5), Water efficiency (Section 305.3.6), and Prescriptive practices (Section 305.3.7). The building rating level shall be the lowest rating level achieved in Sections 305.3.5, 305.3.6, and 305.3.7.

305.3.5 Energy efficiency. The energy efficiency rating level shall be based on the reduction in energy consumption resulting from the remodel in accordance with Table 305.3.5.

Table 305.3.5
Energy Rating Level Thresholds

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

305.3.5.1 Energy consumption reduction. The reduction in energy consumption resulting from the remodel shall be based on the estimated annual energy cost savings or source energy savings as determined by a third-party energy audit and analysis or utility consumption data. The reduction shall be the percentage difference between the consumption per square foot before and after the remodel calculated as follows:

[(consumption per square foot before remodel – consumption per square foot after remodel)/consumption per square foot before remodel]∗100

The occupancy and lifestyle assumed and the method of making the energy consumption estimates shall be the same for estimates before and after the remodel. The building configuration for the after-remodel estimate shall include any additions to the building or other changes to the configuration of the conditioned space. For multifamily buildings, the energy consumption shall be based on the entire building including all dwelling units and common areas.

305.3.6 Water efficiency. The water efficiency rating level shall be based on the reduction in water consumption resulting from the remodel in accordance with Table 305.3.6.

Table 305.3.6
Water Rating Level Thresholds

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

305.3.6.1 Water consumption reduction. Water consumption shall be based on the estimated annual use as determined by audit and analysis or use of utility consumption data. The reduction shall be the percentage difference between the consumption before and after the remodel calculated as follows:

[(consumption before remodel − consumption after remodel)/consumption before remodel]∗100%

The occupancy and lifestyle assumed and the method of making the water consumption estimates shall be the same for estimates before and after the remodel. The building configuration for the after-remodel estimate shall include any changes to the configuration of the building such as additions or new points of water use. For multifamily buildings, the water consumption shall be based on the entire building including all dwelling units and common areas.

305.3.7 Prescriptive practices. The point thresholds for the environmental rating levels based on compliance with the Chapter 11 prescriptive practices shall be in accordance with Table 305.3.7. Any practice listed in Chapter 11 shall be eligible for contributing points to the prescriptive threshold ratings. The attributes of the existing building that were in compliance with the prescriptive practices of Chapter 11 prior to the remodel and remain in compliance after the remodel shall be eligible for contributing points to the prescriptive threshold ratings.

Table 305.3.7
Prescriptive Threshold Point Ratings

	Rating Level			
	BRONZE	**SILVER**	**GOLD**	**EMERALD**
Chapter 11 prescriptive thresholds	88	125	181	225

305.4 Criteria for remodeled functional areas of buildings

305.4.1 Applicability. The provisions of Section 305.4 shall apply to remodeling of one or more of the following functional areas of the existing building as follows:

1. Addition, kitchen, bathroom, or basement in buildings other than multifamily buildings.
2. Kitchen or bathroom of an individual dwelling unit in a multifamily building.

305.4.1.1 Additions. The total above-grade conditioned area added during a remodel shall not exceed 400 square feet.

305.4.2 Compliant. Projects that meet all applicable requirements of Chapter 12 for that functional area shall be designated as *compliant*.

305.4.3 Designation. The designation achieved under Section 305.4 applies only to the specific functional area of the existing building. The existing building may have more than one *compliant* functional area.

305.4.4 Additions. A bathroom(s), kitchen, or finished basement included in an addition shall comply with all criteria specifically applicable to those functional areas in accordance with the provisions of Chapter 12.

305.4.5 Mandatory. Projects shall satisfy all applicable practices designated as mandatory in Chapter 12.

305.4.6 Existing attributes. The attributes of the existing building that were in compliance with the applicable provisions of Chapter 12 prior to the remodel and remain in compliance after the remodel shall be eligible for contributing to demonstration of compliance under Section 305.4.

306 GREEN ACCESSORY STRUCTURES

306.1 Applicability. The designation criteria for accessory structures shall be in accordance with Appendix E**.**

306.2 Compliance. Compliance with Appendix E shall be voluntary unless specifically adopted as mandatory. If specifically adopted, the adopting entity shall establish rules for compliance with Appendix E.

CHAPTER 4

SITE DESIGN AND DEVELOPMENT

GREEN BUILDING PRACTICES	POINTS
400 SITE DESIGN AND DEVELOPMENT	
400.0 Intent. This section applies to land development for the eventual construction of buildings or additions thereto that contain dwelling units. The rating earned under Section 302 based on practices herein, applies only to the site as defined in Chapter 2. The buildings on the site achieve a separate rating level or designation by complying with the provisions of Section 303, 304, 305, or 306, as applicable.	
401 SITE SELECTION	
401.0 Intent. The site is selected to minimize environmental impact by one or more of the following:	
401.1 Infill site. An infill site is selected.	**7**
401.2 Greyfield site. A greyfield site is selected.	**7**
401.3 Brownfield site. A brownfield site is selected.	**8**
402 PROJECT TEAM, MISSION STATEMENT, AND GOALS	
402.0 Intent. The site is designed and constructed by a team of qualified professionals trained in green development practices.	
402.1 Team. A knowledgeable team is established and team member roles are identified with respect to green lot design, preparation, and development. The project's green goals and objectives are written into a mission statement.	**4**
402.2 Training. Training is provided to on-site supervisors and team members regarding the green development practices to be used on the project.	**3**
402.3 Project checklist. A checklist of green development practices to be used on the project is created, followed, and completed by the project team regarding the site.	**Mandatory 4**
402.4 Development agreements. Through a developer agreement or equivalent, the developer requires purchasers of lots to construct the buildings in compliance with this Standard (or equivalent) certified to a minimum bronze rating level.	**6**

GREEN BUILDING PRACTICES	POINTS

403
SITE DESIGN

403.0 Intent. The project is designed to avoid detrimental environmental impacts, minimize any unavoidable impacts, and mitigate for those impacts that do occur. The project is designed to minimize environmental impacts and to protect, restore, and enhance the natural features and environmental quality of the site.

(To acquire points allocated for the design, the intent of the design is implemented.)

403.1 Natural resources. Natural resources are conserved by one or more of the following:		
(1)	A natural resources inventory is used to create the site plan.	**Mandatory 5**
(2)	A plan to protect and maintain priority natural resources/areas during construction is created. (Also see Section 404 for guidance in forming the plan.)	**Mandatory 5**
(3)	Member of builder's project team participates in a natural resources conservation program.	**4**
(4)	Streets, buildings, and other built features are located to conserve high priority vegetation.	**5**
(5)	Developer has a plan for removal or containment of invasive plants, as identified by a qualified professional, from the disturbed areas of the site.	**3**
(6)	Developer has a plan for removal or containment of invasive plants, as identified by a qualified professional, on the undisturbed areas of the site.	**6**

403.2 Building orientation. A minimum of 75 percent of the building sites are designed with the longer dimension of the structure to face within 20 degrees of south.	**6**

403.3 Slope disturbance. Slope disturbance is minimized by one or more of the following:		
(1)	Hydrological/soil stability study is completed and used to guide the design of all buildings on the site.	**5**
(2)	All or a percentage of roads are aligned with natural topography to reduce cut and fill.	
	(a) 10 percent to 25 percent	**1**
	(b) 25 percent to 75 percent	**4**
	(c) greater than 75 percent	**6**
(3)	Long-term erosion effects are reduced by the use of clustering, terracing, retaining walls, landscaping, and restabilization techniques.	**6**

403.4 Soil disturbance and erosion. A site Stormwater Pollution Prevention Plan (SWPPP) is developed in accordance with applicable stormwater Construction General Permits. The plan includes one or more of the following:		
(1)	Construction activities are scheduled to minimize length of time that soils are exposed.	**4**
(2)	Utilities are installed by alternate means such as directional boring in lieu of open-cut trenching. Shared easements or common utility trenches are utilized to minimize earth disturbance. Low ground pressure equipment or temporary matting is used to minimize excessive soil consolidation.	**5**
(3)	Limits of clearing and grading are demarcated.	**4**

GREEN BUILDING PRACTICES			POINTS
403.5 Stormwater management. The stormwater management system is designed to use low-impact development/green infrastructure practices to preserve, restore or mitigate changes in site hydrology due to land disturbance and the construction of impermeable surfaces through the use of one or more of the following techniques**:**			
(1)	A site assessment is conducted and a plan prepared and implemented that identifies important existing permeable soils, natural drainage ways and other water features, e.g., depressional storage, onsite to be preserved in order to maintain site hydrology.		**7**
(2)	A hydrologic analysis is conducted that results in the design and installation of a stormwater management system that maintains the predevelopment (stable, natural) runoff hydrology of the site through the development or redevelopment process. Ensure that post construction runoff rate, volume and duration do not exceed predevelopment rates, volume and duration.		**10**
(3)	Low-Impact Development/Green infrastructure stormwater management practices to promote infiltration and evapotranspiration are used to manage rainfall on the lot and prevent the off-lot discharge of runoff from all storms up to and including the volume of following storm events:		
	(a)	80th percentile storm event	**5**
	(b)	90th percentile storm event	**8**
	(c)	95th percentile storm event	**10**
(4)	Permeable materials are used for driveways, parking areas, walkways and patios according to the following percentages:		
	(a)	less than 25 percent	**2**
	(b)	25-50 percent	**5**
	(c)	greater than 50 percent	**10**
403.6 Landscape plan. A landscape plan is developed to limit water and energy use in common areas while preserving or enhancing the natural environment utilizing one or more of the following:			
(1)	A plan is formulated to restore or enhance natural vegetation that is cleared during construction. Landscaping is phased to coincide with achievement of final grades to ensure denuded areas are quickly vegetated.		**6**
(2)	On-site native or regionally appropriate trees and shrubs are conserved, maintained, and reused for landscaping to the greatest extent possible.		**6**
(3)	Non–invasive vegetation that is native or regionally appropriate for local growing conditions is selected to promote biodiversity.		**7**
(4)	EPA WaterSense Water Budget Tool or equivalent is used when implementing the maximum percentage of turf areas.		**2**
(5)	For landscaped vegetated areas, the maximum percentage of all turf areas is:		
	(a)	0 percent	**5**
	(b)	Greater than 0 percent to less than 20 percent	**4**
	(c)	20 percent to less than 40 percent	**3**
	(d)	40 percent to 60 percent	**2**

GREEN BUILDING PRACTICES		POINTS
(6)	To improve pollinator habitat, at least 10 percent of planted areas are composed of flowering and nectar producing plant species. Invasive plant species shall not be utilized.	**3**
(7)	Non-potable irrigation water is available to common areas	**2**
(8)	Non-potable irrigation water is available to lots.	**4**
(9)	Plants with similar watering needs are grouped (hydrozoning).	**4**
(10)	Species and locations for tree planting are identified and utilized to increase summer shading of streets, parking areas, and buildings and to moderate temperatures.	**5**
(11)	Vegetative wind breaks or channels are designed as appropriate to local conditions.	**4**
(12)	On-site tree trimmings or stump grinding of regionally appropriate trees are used to provide protective mulch during construction or as base for walking trails, and cleared trees are recycled as sawn lumber or pulp wood.	**4**
(13)	An integrated common area pest management plan to minimize chemical use in pesticides and fertilizers is developed.	**4**
(14)	Plans for the common area landscape watering system include a weather-based or soil moisture-based controller. Required irrigation systems are designed in accordance with the IA Landscape Irrigation Best Management Practices.	**6**
(15)	Trees that might otherwise be lost due to site construction are transplanted to other areas on-site or off-site using tree-transplanting techniques to ensure a high rate of survival.	**4**
(16)	Gray water irrigation systems are used to water common areas. Gray water used for irrigation conforms to all criteria of Section 802.1.	**7**
(17)	Cisterns, rain barrels, and similar tanks are designed to intercept and store runoff. These systems may be above or below ground, and they may drain by gravity or be pumped. Stored water may be slowly released to a pervious area, and/or used for irrigation of lawn, trees, and gardens located in common areas.	**6**

403.7 Wildlife habitat. Measures are planned that will support wildlife habitat.	**6**

403.8 Operation and maintenance plan. An operation and maintenance plan (manual) is prepared and outlines ongoing service of common open area, utilities (storm water, waste water), and environmental management activities.	**6**

403.9 Existing buildings. Existing building(s) and structure(s) is/are preserved, reused, modified, or disassembled for reuse or recycling of building materials.	**8**

403.10 Existing and recycled materials. Existing pavements, curbs, and aggregates are salvaged and reincorporated into the development or recycled asphalt or concrete materials are used as follows. **(Points awarded for every 10 percent of total materials used for pavement, curb, and aggregate that meet the criteria of this practice. The percentage is consistently calculated on a weight, volume, or cost basis.)**		**15 Max**
(1)	Existing pavements, curbs, and aggregates are reincorporated into the development.	**3**
(2)	Recycled asphalt or concrete with at least 50 percent recycled content is utilized in the project.	**2**

GREEN BUILDING PRACTICES	POINTS
403.11 Demolition of existing building. A demolition waste management plan is developed, posted at the jobsite, and implemented to recycle and/or salvage for reuse a minimum of 50 percent of the nonhazardous demolition waste. **(One additional point awarded for every 10 percent of nonhazardous demolition waste recycled and/or salvaged beyond 50 percent).**	**5** **10 max**

403.12 Environmentally sensitive areas. Environmentally sensitive areas are as follows:		
(1)	Environmentally sensitive areas are avoided as follows:	
	(a) <25 percent of environmentally sensitive areas left undeveloped	**2**
	(b) 25 percent – 75 percent of environmentally sensitive areas left undeveloped	**4**
	(c) >75 percent of environmentally sensitive areas left undeveloped	**7**
(2)	Environmentally sensitive areas are permanently protected by a conservation easement or similar mechanism.	**10**

404 SITE DEVELOPMENT AND CONSTRUCTION

404.0 Intent. Environmental impact during construction is avoided to the extent possible; impacts that do occur are minimized, and any significant impacts are mitigated.

404.1 On-site supervision and coordination. On-site supervision and coordination is provided during clearing, grading, trenching, paving, and installation of utilities to ensure that specified green development practices are implemented. (also see Section 403.4)	**5**

404.2 Trees and vegetation. Designated trees and vegetation are preserved by one or more of the following:		
(1)	Fencing or equivalent is installed to protect trees and other vegetation.	**4**
(2)	Trenching, significant changes in grade, compaction of soil, and other activities are avoided in critical root zones (canopy drip line) in “tree save” areas.	**5**
(3)	Damage to designated existing trees and vegetation is mitigated during construction through pruning, root pruning, fertilizing, and watering.	**4**

404.3 Soil disturbance and erosion. On-site soil disturbance and erosion are minimized by implementation of one or more of the following:		
(1)	Limits of clearing and grading are staked out prior to construction.	**5**
(2)	“No disturbance” zones are created using fencing or flagging to protect vegetation and sensitive areas from construction vehicles, material storage, and washout.	**4**
(3)	Sediment and erosion controls are installed and maintained.	**5**
(4)	Topsoil is stockpiled and covered with tarps, straw, mulch, chipped wood, vegetative cover, or other means capable of protecting it from erosion for later use to establish landscape plantings.	**5**

GREEN BUILDING PRACTICES		POINTS
(5)	Soil compaction from construction equipment is reduced by distributing the weight of the equipment over a larger area by laying lightweight geogrids, mulch, chipped wood, plywood, OSB (oriented strand board), metal plates, or other materials capable of weight distribution in the pathway of the equipment.	**4**
(6)	Disturbed areas are stabilized within the EPA-recommended 14-day period.	**4**
(7)	Soil is improved with organic amendments and mulch.	**4**

404.4 Wildlife habitat. Measures are implemented to support wildlife habitat.		
(1)	Wildlife habitat is maintained.	**5**
(2)	Measures are instituted to establish or promote wildlife habitat.	**5**
(3)	Open space is preserved as part of a wildlife corridor.	**6**
(4)	Builder or member of builder's project team participates in a wildlife conservation program.	**5**

405 INNOVATIVE PRACTICES

405.0 Intent. Innovative site design, preparation, and development practices are used to enhance environmental performance. Waivers or variances from local development regulations are obtained, and innovative zoning practices are used to implement such practices, as applicable.

405.1 Driveways and parking areas. Driveways and parking areas are minimized or mitigated by one or more of the following:		
(1)	Off-street parking areas are shared or driveways are shared; on-street parking is utilized; and alleys (shared common area driveways) are used for rear-loaded garages.	**5**
(2)	In multifamily projects, parking capacity is not to exceed the local minimum requirements.	**5**
(3)	Structured parking is utilized to reduce the footprint of surface parking areas.	
	(a) 25 percent to less than 50 percent	**3**
	(b) 50 percent to 75 percent	**5**
	(c) greater than 75 percent	**8**
(4)	Water permeable surfaces, including vegetative paving systems, are utilized to reduce the footprint of impervious surface driveways, fire lanes, streets or parking areas.	
	(a) 10 % to less than 25%	**2**
	(b) 25% to 75%	**4**
	(c) greater than 75%	**6**

GREEN BUILDING PRACTICES	POINTS
405.2 Street widths.	
(1) Street pavement widths are minimized per local code and are in accordance with Table 405.2.	**6**
(2) A waiver was secured by the developer from the local jurisdiction to allow for construction of streets below minimum width requirement.	**8**
405.3 Cluster development. Cluster development enables and encourages flexibility of design and development of land in such a manner as to preserve the natural and scenic qualities of the site by utilizing an alternative method for the layout, configuration and design of lots, buildings and structures, roads, utility lines and other infrastructure, parks, and landscaping.	**10**
405.4 Planning. Innovative planning techniques are implemented in accordance with the following:	
(1) Innovative planning techniques are used or developed for permissible adjustments to population density, area, height, open space, mixed-use, or other provisions for the specific purpose of open space, natural resource preservation or protection and/or mass transit usage. Other innovative planning techniques may be considered on a case-by-case basis.	**10**
(2) Provide common or public spaces of a minimum of 1/6 acre that are within ¼ mile walk to 80 percent of planned and existing units and entrances to non-residential buildings. Both existing and newly constructed squares, parks, paseos, plazas, and similar uses qualify under this criterion.	**10**
405.5 Wetlands. Constructed wetlands or other natural innovative wastewater or stormwater treatment technologies are used.	**8**
405.6 Multi-modal transportation. Multi-modal transportation access is provided in accordance with one or more of the following:	
(1) A site is selected with a boundary within one-half mile (805 m) of pedestrian access to a mass transit system or within five miles of a mass transit station with available parking.	**5**
(2) A site is selected where all lots within the site are located within one-half mile (805 m) of pedestrian access to a mass transit system.	**7**
(3) A system of walkways, bikeways, street crossings, or pathways designed to promote connectivity to existing and planned community amenities are provided.	

Table 405.2
Maximum Street Widths

Facility Type	Maximum Width
Collector street with parking (one side only)	31 feet
Collector street without parking	26 feet
Local access with parking (one side only)	27 feet
Local access street without parking	20 feet
Queuing (one-lane) streets with parking	24 feet
Alleys and queuing (one-lane) streets without parking	17 feet

For SI: 1 foot = 304.8 mm

GREEN BUILDING PRACTICES		POINTS
	(a) Create a network of sidewalks and paths that provide a minimum level of connectivity of at least 90 bikeway or pathway intersections per square mile.	**5**
	(b) Create a network of sidewalks and paths that provide a minimum level of connectivity of at least 140 bikeway or pathway intersections per square mile.	**10**
(4)	Dedicated bicycle parking and racks are indicated on the site plan and a minimum of six spaces are constructed for, multifamily buildings, and/or each developed common area.	**1 point for each 6 spaces 6 max**
(5)	Bike sharing programs participate with the developer and facilities for bike sharing are planned for and constructed.	**5**
(6)	Car sharing programs participate with the developer and facilities for car sharing are planned for and constructed.	**5**

405.7 Density. The average density on a net developable area basis is:		
(1)	7 to less than 14 dwelling units per acre (per 4,047 m^2)	**5**
(2)	14 to less than 21 dwelling units per acre (per 4,047 m^2)	**7**
(3)	21 or greater dwelling units per acre (per 4,047 m^2)	**10**

405.8 Mixed-use development. (1) Mixed-use development is incorporated, or (2) for single-use sites 20 acres or less in size, 80% of the units are within ½ mile walk of 5 non-residential uses and where a system of walkways, bikeways, street crossings or pathways is designed to promote connectivity to those uses.	**9**

405.9 Open space. A portion of the gross area of the community is set aside as open space. **(Points awarded for every 10 percent of the community set aside as open space)**	**1**

405.10 Community garden(s). A portion of the site is established as a community garden(s) for the residents of the site to provide local food production for residents or area consumers.	**3**

CHAPTER 5

LOT DESIGN, PREPARATION, AND DEVELOPMENT

GREEN BUILDING PRACTICES	POINTS

500 LOT DESIGN, PREPARATION, AND DEVELOPMENT

500.0 Intent. This section applies to lot development for the eventual construction of residential buildings, multifamily buildings, or additions thereto that contain dwelling units.

501 LOT SELECTION

501.1 Lot. Lot is selected in accordance with Section 501.1(1) or Section 501.1(2).		
(1)	A lot is selected within a site certified to this Standard or equivalent;	**15**
(2)	A lot is selected to minimize environmental impact by one or more of the following:	
	(a) An infill lot is selected.	**10**
	(b) A lot is selected that is a greyfield.	**10**
	(c) An EPA-recognized brownfield lot is selected.	**15**

501.2 Multi-modal transportation. A range of multi-modal transportation choices are promoted by one or more of the following:		
(1)	A lot is selected within one-half mile (805 m) of pedestrian access to a mass transit system	**6**
(2)	A lot is selected within five miles (8,046 m) of a mass transit station with provisions for parking.	**3**
(3)	Walkways, street crossings, and entrances designed to promote pedestrian activity are provided. New buildings are connected to existing sidewalks and areas of development.	**5**
(4)	A lot is selected within one-half mile (805 m) of six or more community resources. No more than two each of the following use category can be counted toward the total: Recreation, Retail, Civic, and Services. Examples of resources in each category include, but are not limited to the following: *Recreation: recreational facilities (such as pools, tennis courts, basketball courts), parks.* *Retail: grocery store, restaurant, retail store.* *Civic: post office, place of worship, community center.* *Services: bank, daycare center, school, medical/dental office, laundromat/dry cleaners.*	**4**
(5)	Bicycle use is promoted by building on a lot located within a community that has rights-of-way specifically dedicated to bicycle use in the form of paved paths or bicycle lanes, or on an infill lot located within 1/2 mile of a bicycle lane designated by the jurisdiction.	**5**
(6)	Dedicated bicycle parking and racks are indicated on the site plan and constructed for mixed-use and multifamily buildings:	
	(a) Minimum of 1 bicycle parking space per 3 residential units	**2**
	(b) Minimum of 1 bicycle parking space per 2 residential units	**4**
	(c) Minimum of 1 bicycle parking space per 1 residential unit.	**6**

GREEN BUILDING PRACTICES	POINTS

502
PROJECT TEAM, MISSION STATEMENT, AND GOALS

502.1 Project team, mission statement, and goals. A knowledgeable team is established and team member roles are identified with respect to green lot design, preparation, and development. The project's green goals and objectives are written into a mission statement.	**4**

503
LOT DESIGN

503.0 Intent. The lot is designed to avoid detrimental environmental impacts first, to minimize any unavoidable impacts, and to mitigate for those impacts that do occur. The project is designed to minimize environmental impacts and to protect, restore, and enhance the natural features and environmental quality of the lot.

(Points awarded only if the intent of the design is implemented.)

503.1 Natural resources. Natural resources are conserved by one or more of the following:		
(1)	A natural resources inventory is completed under the direction of a qualified professional.	**5**
(2)	A plan is implemented to conserve the elements identified by the natural resource inventory as high-priority resources.	**6**
(3)	Items listed for protection in the natural resource inventory plan are protected under the direction of a qualified professional.	**4**
(4)	Basic training in tree or other natural resource protection is provided for the on-site supervisor.	**4**
(5)	All tree pruning on-site is conducted by a certified arborist or other qualified professional.	**3**
(6)	Ongoing maintenance of vegetation on the lot during construction is in accordance with TCIA A300 or locally accepted best practices.	**4**
(7)	Where a lot adjoins a landscaped common area, a protection plan from construction activities next to the common area is implemented.	**5**

503.2 Slope disturbance. Slope disturbance is minimized by one or more of the following:		
(1)	The use of terrain adaptive architecture.	**5**
(2)	Hydrological/soil stability study is completed and used to guide the design of all buildings on the lot.	**5**
(3)	All or a percentage of driveways and parking are aligned with natural topography to reduce cut and fill.	
	(a) 10 percent to 25 percent	**1**
	(b) 25 percent to 75 percent	**4**
	(c) greater than 75 percent	**6**
(4)	Long-term erosion effects are reduced through the design and implementation of clustering, terracing, retaining walls, landscaping, or restabilization techniques.	**6**
(5)	Underground parking uses the natural slope for parking entrances.	**5**

GREEN BUILDING PRACTICES		POINTS
503.3 Soil disturbance and erosion. Soil disturbance and erosion are minimized by one or more of the following: (also see Section 504.3)		
(1)	Construction activities are scheduled such that disturbed soil that is to be left unworked for more than 21 days is stabilized within 14 days.	**5**
(2)	At least 75% of total length of the utilities on the lot are designed to use one or more alternative means:	**5**
	(a) tunneling instead of trenching	
	(b) use of smaller (low ground pressure) equipment or geomats to spread the weight of construction equipment	
	(c) shared utility trenches or easements	
	(d) placement of utilities under paved surfaces instead of yards	
(3)	Limits of clearing and grading are demarcated on the lot plan.	**5**
503.4 Stormwater management. The stormwater management system is designed to use low-impact development/green infrastructure practices to preserve, restore or mitigate changes in site hydrology due to land disturbance and the construction of impermeable surfaces through the use of one or more of the following techniques:		
(1)	A site assessment is conducted and a plan prepared and implemented that identifies important existing permeable soils, natural drainage ways and other water features, e.g., depressional storage, onsite to be preserved in order to maintain site hydrology.	**7**
(2)	A hydrologic analysis is conducted that results in the design of a stormwater management system that maintains the pre-development (stable, natural) runoff hydrology of the site through the development or redevelopment process. Ensure that post construction runoff rate, volume and duration do not exceed predevelopment rates, volume and duration.	**10**
(3)	Low-Impact Development/Green infrastructure stormwater management practices to promote infiltration and evapotranspiration are used to manage rainfall on the lot and prevent the off-lot discharge of runoff from all storms up to and including the volume of following storm events:	
	(a) 80th percentile storm event	**5**
	(b) 90th percentile storm event	**8**
	(c) 95th percentile storm event	**10**
(4)	Permeable materials are used for driveways, parking areas, walkways, patios, and recreational surfaces and the like according to the following percentages:	
	(a) less than 25 percent	**5**
	(b) 25-50 percent	**8**
	(c) Greater than 50 percent	**10**

GREEN BUILDING PRACTICES		POINTS
503.5 Landscape plan. A plan for the lot is developed to limit water and energy use while preserving or enhancing the natural environment. **(Where "front" only or "rear" only plan is implemented, only half of the points (rounding down to a whole number) are awarded for Items (1)-(8)**		
(1)	A plan is formulated and implemented that protects, restores, or enhances natural vegetation on the lot.	
	(a) 100 percent of the natural area	**4**
	(b) 50 percent of the natural area	**3**
	(c) 25 percent of the natural area	**2**
	(d) 12 percent of the natural area	**1**
(2)	Non-invasive vegetation that is native or regionally appropriate for local growing conditions is selected to promote biodiversity.	**7**
(3)	To improve pollinator habitat, at least 10 percent of planted areas are composed of flowering and nectar producing plant species. Invasive plant species shall not be utilized.	**3**
(4)	EPA WaterSense Water Budget Tool or equivalent is used when implementing the maximum percentage of turf areas.	**2**
(5)	For landscaped vegetated areas, the maximum percentage of turf area is:	
	(a) 0 percent	**5**
	(b) Greater than 0 percent to less than 20 percent	**4**
	(c) 20 percent to less than 40 percent	**3**
	(d) 40 percent to 60 percent	**2**
(6)	Plants with similar watering needs are grouped (hydrozoning) and shown on the lot plan.	**5**
(7)	Summer shading by planting installed to shade a minimum of 30 percent of building walls. To conform to summer shading, the effective shade coverage (five years after planting) is the arithmetic mean of the shade coverage calculated at 10 am for eastward facing walls, noon for southward facing walls, and 3 pm for westward facing walls on the summer solstice.	**5**
(8)	Vegetative wind breaks or channels are designed to protect the lot and immediate surrounding lots as appropriate for local conditions.	**5**
(9)	Site or community generated tree trimmings or stump grinding of regionally appropriate trees are used on the lot to provide protective mulch during construction or for landscaping.	**3**
(10)	An integrated pest management plan is developed to minimize chemical use in pesticides and fertilizers.	**4**
(11)	Developer has a plan for removal or containment of invasive plants from the disturbed areas of the site.	**3**
(12)	Developer implements a plan for removal or containment of invasive plants on the undisturbed areas of the site.	**6**

GREEN BUILDING PRACTICES		POINTS
503.6 Wildlife habitat. Measures are planned to support wildlife habitat and include at least two of the following:		
(1)	Plants and gardens that encourage wildlife, such as bird and butterfly gardens.	**3**
(2)	Inclusion of a certified “backyard wildlife” program.	**3**
(3)	The lot is adjacent to a wildlife corridor, fish and game park, or preserved areas and is designed with regard for this relationship.	**3**
(4)	Outdoor lighting techniques are utilized with regard for wildlife.	**3**
503.7 Environmentally sensitive areas. The lot is in accordance with one or both of the following:		
(1)	The lot does not contain any environmentally sensitive areas that are disturbed by the construction.	**4**
(2)	On lots with environmentally sensitive areas, mitigation and/or restoration is conducted to preserve ecosystem functions lost through development and construction activities.	**4**
503.8 Demolition of existing building. A demolition waste management plan is developed, posted at the jobsite, and implemented to recycle and/or salvage with a goal of recycling or salvaging a minimum of 50 percent of the nonhazardous demolition waste. **(One additional point awarded for every 10 percent of nonhazardous demolition waste recycled and/or salvaged beyond 50 percent).**		**5**
504 LOT CONSTRUCTION		
504.0 Intent. Environmental impact during construction is avoided to the extent possible; impacts that do occur are minimized and any significant impacts are mitigated.		
504.1 On-site supervision and coordination. On-site supervision and coordination is provided during on-the-lot clearing, grading, trenching, paving, and installation of utilities to ensure that specified green development practices are implemented. (also see Section 503.3)		**4**
504.2 Trees and vegetation. Designated trees and vegetation are preserved by one or more of the following:		
(1)	Fencing or equivalent is installed to protect trees and other vegetation.	**3**
(2)	Trenching, significant changes in grade, and compaction of soil and critical root zones in all “tree save” areas as shown on the lot plan are avoided.	**5**
(3)	Damage to designated existing trees and vegetation is mitigated during construction through pruning, root pruning, fertilizing, and watering.	**4**

GREEN BUILDING PRACTICES		POINTS
504.3 Soil disturbance and erosion implementation. On-site soil disturbance and erosion are minimized by one or more of the following in accordance with the SWPPP or applicable plan: (also see Section 503.3)		
(1)	Sediment and erosion controls are installed on the lot and maintained in accordance with the stormwater pollution prevention plan, where required.	**5**
(2)	Limits of clearing and grading are staked out on the lot.	**5**
(3)	"No disturbance" zones are created using fencing or flagging to protect vegetation and sensitive areas on the lot from construction activity.	**5**
(4)	Topsoil from either the lot or the site development is stockpiled and stabilized for later use and used to establish landscape plantings on the lot.	**5**
(5)	Soil compaction from construction equipment is reduced by distributing the weight of the equipment over a larger area (laying lightweight geogrids, mulch, chipped wood, plywood, OSB, metal plates, or other materials capable of weight distribution in the pathway of the equipment).	**4**
(6)	Disturbed areas on the lot that are complete or to be left unworked for 21 days or more are stabilized within 14 days using methods as recommended by the EPA or in the approved SWPPP, where required.	**3**
(7)	Soil is improved with organic amendments or mulch.	**3**
(8)	Utilities on the lot are installed using one or more alternative means (e.g., tunneling instead of trenching, use of smaller equipment, use of low ground pressure equipment, use of geomats, shared utility trenches or easements).	**5**
(9)	Inspection reports of stormwater best management practices are available.	**3**

505 INNOVATIVE PRACTICES

505.0 Intent. Innovative lot design, preparation, and development practices are used to enhance environmental performance. Waivers or variances from local development regulations are obtained and innovative zoning is used to implement such practices.

505.1 Driveways and parking areas. Driveways and parking areas are minimized or mitigated by one or more of the following:		
(1)	Off-street parking areas are shared or driveways are shared. Waivers or variances from local development regulations are obtained to implement such practices, if required.	**5**
(2)	In a multifamily project, parking capacity does not exceed the local minimum requirements.	**5**
(3)	Structured parking is utilized to reduce the footprint of surface parking areas.	
	(a) 25 percent to less than 50 percent	**4**
	(b) 50 percent to 75 percent	**5**
	(c) greater than 75 percent	**6**
(4)	Water permeable surfaces, including vegetative paving systems, are utilized to reduce the footprint of impervious surface driveways, fire lanes, streets or parking areas.	
	(a) 10 percent to less than 25 percent	**1**
	(b) 25 percent to 75 percent	**2**
	(c) greater than 75 percent	**3**

GREEN BUILDING PRACTICES	POINTS
505.2 Heat island mitigation. Heat island effect is mitigated by the following.	
(1) Hardscape: Not less than 50 percent of the surface area of the hardscape on the lot meets one or a combination of the following methods.	**5**
(a) Shading of hardscaping: Shade is provided from existing or new vegetation (within five years) or from trellises. Shade of hardscaping is to be measured on the summer solstice at noon.	
(b) Light-colored hardscaping: Horizontal hardscaping materials are installed with a solar reflectance index (SRI) of 29 or greater. The SRI is calculated in accordance with ASTM E1980. A default SRI value of 35 for new concrete without added color pigment is permitted to be used instead of measurements.	
(c) Permeable hardscaping: Permeable hardscaping materials are installed.	
(2) Roofs: Not less than 75 percent of the exposed surface of the roof is vegetated using technology capable of withstanding the climate conditions of the jurisdiction and the microclimate conditions of the building lot. Invasive plant species are not permitted.	**5**

505.3 Density. The average density on the lot on a net developable area basis is:	
(1) 7 to less than 14 dwelling units per acre (per 4,047 m^2)	**4**
(2) 14 to less than 21 dwelling units per acre (per 4,047 m^2)	**5**
(3) 21 to less than 35 dwelling units per acre (per 4,047 m^2)	**6**
(4) 35 to less than 70 dwelling units per acre (per 4,047 m^2)	**7**
(5) 70 or greater dwelling units per acre (per 4,047 m^2)	**8**

505.4 Mixed-use development. The lot contains a mixed-use building.	**8**

505.5 Community garden(s). A portion of the lot is established as a community garden(s), available to residents of the lot, to provide for local food production to residents or area consumers.	**3**

505.6 Multi-unit plug-in electric vehicle charging. Plug-in electric vehicle charging capability is provided for at least 1 percent of parking stalls. Electrical capacity in main electric panels supports Level 2 charging (208/240V-40 amp). Each stall is provided with conduit and wiring infrastructure from the electric panel to support Level 2 charging (208/240V-40 amp) service to the designated stalls, and stalls are equipped with either Level 2 charging AC grounded outlets (208/240V-40 amp) or Level 2 charging stations (240V/40A) by a third party charging station.	**4**

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CHAPTER 6

RESOURCE EFFICIENCY

GREEN BUILDING PRACTICES	POINTS
601 QUALITY OF CONSTRUCTION MATERIALS AND WASTE	
601.0 Intent. Design and construction practices that minimize the environmental impact of the building materials are incorporated, environmentally efficient building systems and materials are incorporated, and waste generated during construction is reduced.	
601.1 Conditioned floor area. Finished floor area of a dwelling unit is limited. Finished floor area is calculated in accordance with ANSI Z765 for single family and ANSI/BOMA Z65.4 for multifamily buildings. Only the finished floor area for stories above grade plane is included in the calculation.	
(1) less than or equal to 700 square feet (65 m^2)	**14**
(2) less than or equal to 1,000 square feet (93 m^2)	**12**
(3) less than or equal to 1,500 square feet (139 m^2)	**9**
(4) less than or equal to 2,000 square feet (186 m^2)	**6**
(5) less than or equal to 2,500 square feet (232 m^2)	**3**
(6) greater than 4,000 square feet (372 m^2) **(For every 100 square feet (9.29 m^2) over 4,000 square feet (372 m^2), one point is to be added to rating level points shown in Table 303, Category 7 for each rating level.)**	**Mandatory**
Multifamily Building Note*: For a multifamily building, a weighted average of the individual unit sizes is used for this practice.*	
601.2 Material usage. Structural systems are designed or construction techniques are implemented that reduce and optimize material usage.	**9 Max**
(1) Minimum structural member or element sizes necessary for strength and stiffness in accordance with advanced framing techniques or structural design standards are selected.	**3**
(2) Higher-grade or higher-strength of the same materials than commonly specified for structural elements and components in the building are used and element or component sizes are reduced accordingly.	**3**
(3) Performance-based structural design is used to optimize lateral force-resisting systems.	**3**
601.3 Building dimensions and layouts. Building dimensions and layouts are designed to reduce material cuts and waste. This practice is used for a minimum of 80 percent of the following areas:	
(1) floor area	**3**
(2) wall area	**3**
(3) roof area	**3**
(4) cladding or siding area	**3**
(5) penetrations or trim area	**1**

GREEN BUILDING PRACTICES	POINTS
601.4 Framing and structural plans. Detailed framing or structural plans, material quantity lists and on-site cut lists for framing, structural materials, and sheathing materials are provided.	**4**
601.5 Prefabricated components. Precut or preassembled components, or panelized or precast assemblies are utilized for a minimum of 90 percent for the following system or building:	**13 Max**
(1) floor system	**4**
(2) wall system	**4**
(3) roof system	**4**
(4) modular construction for the entire building located above grade	**13**
(5) manufactured home construction for the entire building located above grade	**13**
601.6 Stacked stories. Stories above grade are stacked, such as in 1½-story, 2-story, or greater structures. The area of the upper story is a minimum of 50 percent of the area of the story below based on areas with a minimum ceiling height of 7 feet (2,134 mm).	**8 Max**
(1) first stacked story	**4**
(2) for each additional stacked story	**2**
601.7 Prefinished materials. Prefinished building materials or assemblies listed below have no additional site-applied finishing material are installed.	**12 Max**
(a) interior trim not requiring paint or stain	
(b) exterior trim not requiring paint or stain	
(c) window, skylight, and door assemblies not requiring paint or stain on one of the following surfaces: i. exterior surfaces ii. interior surfaces	
(d) interior wall coverings or systems, floor systems, and/or ceiling systems not requiring paint or stain or other type of finishing application	
(e) exterior wall coverings or systems, floor system, and/or ceiling systems not requiring paint or stain or other type of finishing application	
(1) 90 percent or more of the installed building materials or assemblies listed above: **(Points awarded for each type of material or assembly.)**	**5**
(2) 50 percent to less than 90 percent of the installed building material or assembly listed above: **(Points awarded for each type of material or assembly.)**	**2**
(3) 35 percent to less than 50 percent of the installed building material or assembly listed above: **(Points awarded for each type of material or assembly.)**	**1**
601.8 Foundations. A foundation system that minimizes soil disturbance, excavation quantities, and material usage, such as frost-protected shallow foundations, isolated pier and pad foundations, deep foundations, post foundations, or helical piles is selected, designed, and constructed. The foundation is used on 50 percent or more of the building footprint.	**3**

GREEN BUILDING PRACTICES	POINTS
601.9 Above-grade wall systems. Above-grade wall systems that, at a minimum, provide the structural and thermal characteristics of *mass walls* and are used for a minimum of 75 percent of the gross exterior wall area of the building.	**4**

602
ENHANCED DURABILITY AND REDUCED MAINTENANCE

602.0 Intent. Design and construction practices are implemented that enhance the durability of materials and reduce in-service maintenance.	
602.1 Moisture management – building envelope	
602.1.1 Capillary breaks	
602.1.1.1 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.	**Mandatory**
602.1.1.2 A capillary break between the footing and the foundation wall is provided to prevent moisture migration into foundation wall.	**3**
602.1.2 Foundation waterproofing. Enhanced foundation waterproofing is installed using one or both of the following:	**4**
(1) rubberized coating, or	
(2) drainage mat	
602.1.3 Foundation drainage	
602.1.3.1 Where required by the ICC IRC or IBC for habitable and usable spaces below grade, exterior drain tile is installed.	**Mandatory**
602.1.3.2 Interior and exterior foundation perimeter drains are installed and sloped to discharge to daylight, dry well, or sump pit.	**4**
602.1.4 Crawlspaces	
602.1.4.1 Vapor retarder in unconditioned vented crawlspace is in accordance with the following, as applicable. Joints of vapor retarder overlap a minimum of 6 inches (152 mm) and are taped.	
(1) Floors. Minimum 6-mil vapor retarder installed on the crawlspace floor and extended at least 6 inches up the wall and is attached and sealed to the wall.	**6**
(2) Walls. Dampproof walls are provided below finished grade.	**Mandatory**

GREEN BUILDING PRACTICES	POINTS
602.1.4.2 Crawlspace that is built as a conditioned area is sealed to prevent outside air infiltration and provided with conditioned air at a rate not less than 0.02 cfm (.009 L/s) per square foot of horizontal area and one of the following is implemented:	
(1) a concrete slab over 6-mil polyethylene sheeting, or other Class I vapor retarder installed in accordance with Section 408.3 or Section 506 of the International Residential Code.	**8**
(2) 6-mil polyethylene sheeting, or other Class I vapor retarder installed in accordance with Section 408.3 or Section 506 of the International Residential Code.	**Mandatory**
602.1.5 Termite barrier. Continuous physical foundation termite barrier provided:	
(1) In geographic areas that have moderate to heavy infestation potential in accordance with figure 6(3), a no or low toxicity treatment is also installed.	**4**
(2) In geographic areas that have a very heavy infestation potential in accordance with figure 6(3), in addition a low toxicity bait and kill termite treatment plan is selected and implemented.	**4**
602.1.6 Termite-resistant materials. In areas of termite infestation probability as defined by Figure 6(3), termite-resistant materials are used as follows:	
(1) In areas of slight to moderate termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings within the first 2 feet (610 mm) above the top of the foundation.	**2**
(2) In areas of moderate to heavy termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings within the first 3 feet (914 mm) above the top of the foundation.	**4**
(3) In areas of very heavy termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings.	**6**
602.1.7 Moisture control measures	
602.1.7.1 Moisture control measures are in accordance with the following:	
(1) Building materials with visible mold are not installed or are cleaned or encapsulated prior to concealment and closing.	**2**
(2) Insulation in cavities is dry in accordance with manufacturer's instructions when enclosed (e.g., with drywall).	**Mandatory 2**
(3) The moisture content of lumber is sampled to ensure it does not exceed 19 percent prior to the surface and/or cavity enclosure.	**4**
602.1.7.2 Moisture content of subfloor, substrate, or concrete slabs is in accordance with the appropriate industry standard for the finish flooring to be applied.	**2**
602.1.7.3 Building envelope assemblies are designed for moisture control based on documented hygrothermal simulation or field study analysis. Hygrothermal analysis is required to incorporate representative climatic conditions, interior conditions and include heating and cooling seasonal variation.	**4**
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 exterior veneer and/or siding.	**Mandatory**

GREEN BUILDING PRACTICES		POINTS
602.1.9 Flashing. Flashing is provided as follows to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details are provided in the construction documents and are in accordance with the fenestration manufacturer's instructions, the flashing manufacturer's instructions, or as detailed by a registered design professional.		
(1)	Flashing is installed at all of the following locations, as applicable:	**Mandatory**
	(a) around exterior fenestrations, skylights, and doors	
	(b) at roof valleys	
	(c) at all building-to-deck, -balcony, -porch, and -stair intersections	
	(d) at roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets	
	(e) at ends of and under masonry, wood, or metal copings and sills	
	(f) above projecting wood trim	
	(g) at built-in roof gutters, and	
	(h) drip edge is installed at eave and rake edges.	
(2)	All window and door head and jamb flashing is either self-adhered flashing complying with AAMA 711-13 or liquid applied flashing complying with AAMA 714-15 and installed in accordance with fenestration or flashing manufacturer's installation instructions.	**2**
(3)	Pan flashing is installed at sills of all exterior windows and doors.	**3**
(4)	Seamless, preformed kickout flashing or prefabricated metal with soldered seams is provided at all roof-to-wall intersections. The type and thickness of the material used for roof flashing including but not limited kickout and step flashing is commensurate with the anticipated service life of the roofing material.	**3**
(5)	A rainscreen wall design as follows is used for exterior wall assemblies.	**4 Max**
	(a) A system designed with minimum 1/4-inch air space exterior to the water-resistive barrier, vented to the exterior at top and bottom of the wall, and integrated with flashing details; or,	**4**
	(b) A cladding material or a water-resistive barrier with enhanced drainage, meeting 75 percent drainage efficiency determined in accordance with ASTM E2273.	**2**
(6)	Through-wall flashing is installed at transitions between wall cladding materials or wall construction types.	**2**
(7)	Flashing is installed at expansion joints in stucco walls.	**2**

602.1.10 Exterior doors. Entries at exterior door assemblies, inclusive of side lights (if any), are covered by one of the following methods to protect the building from the effects of precipitation and solar radiation. Either a storm door or a projection factor of 0.375 minimum is provided. Eastern- and western-facing entries in Climate Zones 1, 2, and 3, as determined in accordance with Figure 6(1) or Appendix C, have either a storm door or a projection factor of 1.0 minimum, unless protected from direct solar radiation by other means (e.g., screen wall, vegetation).		**2 per exterior door** **6 Max**
	(a) installing a porch roof or awning	
	(b) extending the roof overhang	
	(c) recessing the exterior door	
	(d) Installing a storm door	

GREEN BUILDING PRACTICES	POINTS

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. **Mandatory**

602.1.12 Roof overhangs. Roof overhangs, in accordance with Table 602.1.12, are provided over a minimum of 90 percent of exterior walls to protect the building envelope. **4**

Table 602.1.12
Minimum Roof Overhang for One- & Two-Story Buildings

Inches of Rainfall (1)	Eave Overhang (Inches)	Rake Overhang (Inches)
≤40	12	12
>41 and ≤70	18	12
>70	24	12

(1) Annual mean total rainfall in inches is in accordance with Figure 6(2).

For SI: 12 inches = 304.8 mm

602.1.13 Ice barrier. In areas where there has been a history of 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. **Mandatory**

602.1.14 Architectural features. Architectural features that increase the potential for water intrusion are avoided:

(1)	All horizontal ledgers are sloped away to provide gravity drainage as appropriate for the application.	**Mandatory 1**
(2)	No roof configurations that create horizontal valleys in roof design.	**2**
(3)	No recessed windows and architectural features that trap water on horizontal surfaces.	**2**

602.2 Roof surfaces. A minimum of 90 percent of roof surfaces, not used for roof penetrations and associated equipment, on-site renewable energy systems such as photovoltaics or solar thermal energy collectors, or rooftop decks, amenities and walkways, are constructed of one or more of the following: **3**

(1)	products that are in accordance with the ENERGY STAR® cool roof certification or equivalent
(2)	a vegetated roof system
(3)	Minimum initial SRI of 78 for low-sloped roof (a slope less than 2:12) and a minimum initial SRI of 29 for a steep-sloped roof (a slope equal to or greater than 2:12). The SRI is calculated in accordance with ASTM E1980. Roof products are certified and labeled.

602.3 Roof water discharge. A gutter and downspout system or splash blocks and effective grading are provided to carry water a minimum of 5 feet (1524 mm) away from perimeter foundation walls. **4**

GREEN BUILDING PRACTICES	POINTS
602.4 Finished grade	
602.4.1 Finished grade at all sides of a building is sloped to provide a minimum of 6 inches (150 mm) of fall within 10 feet (3048 mm) of the edge of the building. Where lot lines, walls, slopes, or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3048 mm), the final grade is sloped away from the edge of the building at a minimum slope of 2 percent.	**Mandatory**
602.4.2 The final grade is sloped away from the edge of the building at a minimum slope of 5 percent.	**1**
602.4.3 Water is directed to drains or swales to ensure drainage away from the structure.	**1**
603 REUSED OR SALVAGED MATERIALS	
603.0 Intent. Practices that reuse or modify existing structures, salvage materials for other uses, or use salvaged materials in the building's construction are implemented.	
603.1 Reuse of existing building. Major elements or components of existing buildings and structures are reused, modified, or deconstructed for later use. **(Points awarded for every 200 square feet (18.5 m^2) of floor area.)**	**1** **12 Max**
603.2 Salvaged materials. Reclaimed and/or salvaged materials and components are used. The total material value and labor cost of salvaged materials is equal to or exceeds 1 percent of the total construction cost. **(Points awarded per 1% of salvaged materials used based on the total construction cost.)** **(Materials, elements, or components awarded points under Section 603.1 shall not be awarded points under Section 603.2.)**	**1** **9 Max**
603.3 Scrap materials. Sorting and reuse of scrap building material is facilitated (e.g., a central storage area or dedicated bins are provided).	**4**
604 RECYCLED-CONTENT BUILDING MATERIALS	
604.1 Recycled content. Building materials with recycled content are used for two minor and/or two major components of the building.	**per Table 604.1**

Table 604.1
Recycled Content

Material Percentage Recycled Content	Points For 2 Minor	Points For 2 Major
25% to less than 50%	**1**	**2**
50% to less than 75%	**2**	**4**
more than 75%	**3**	**6**

GREEN BUILDING PRACTICES	POINTS

605
RECYCLED CONSTRUCTION WASTE

605.0 Intent. Waste generated during construction is recycled. All waste classified as hazardous is properly handled and disposed of.

(Points not awarded for hazardous waste removal.)

605.1 Construction waste management plan. A construction waste management plan is developed, posted at the jobsite, and implemented diverting, through reuse, salvage, recycling, or manufacturer reclamation, a minimum of 50 percent (by weight) of nonhazardous construction and demolition waste from disposal. For this practice, land clearing debris is not considered construction waste. Materials used as alternative daily cover are considered construction waste and do not count toward recycling or salvaging. For remodeling projects or demolition of an existing facility, the waste management plan includes the recycling of 95 percent of electronic waste components (such as printed circuit boards from computers, building automation systems, HVAC, fire and security control boards) by an EPA certified E-Waste recycling facility.	**6**
Exceptions:	
(1) Waste materials generated from land clearing, soil and sub-grade excavation and all manner of vegetative debris shall not be in the calculations.	
(2) A recycling facility (traditional or E-Waste) offering material receipt documentation is not available within 50 miles of the jobsite.	

605.2 On-site recycling. On-site recycling measures following applicable regulations and codes are implemented, such as the following:	**7**
(a) Materials are ground or otherwise safely applied on-site as soil amendment or fill. A minimum of 50 percent (by weight) of construction and land-clearing waste is diverted from landfill.	
(b) Alternative compliance methods approved by the Adopting Entity.	
(c) Compatible untreated biomass material (lumber, posts, beams, etc.) are set aside for combustion if a solid fuel-burning appliance per Section 901.2.1(2) will be available for on-site renewable energy.	

605.3 Recycled construction materials. Construction materials (e.g., wood, cardboard, metals, drywall, plastic, asphalt roofing shingles, or concrete) are recycled offsite.	**6 Max**
(1) a minimum of two types of materials are recycled	**3**
(2) for each additional recycled material type	**1**

GREEN BUILDING PRACTICES	POINTS

606
RENEWABLE MATERIALS

606.0 Intent. Building materials derived from renewable resources are used.

606.1 Biobased products. The following biobased products are used:		**8 Max**
	(a) certified solid wood in accordance with Section 606.2	
	(b) engineered wood	
	(c) bamboo	
	(d) cotton	
	(e) cork	
	(f) straw	
	(g) natural fiber products made from crops (soy-based, corn-based)	
	(h) other biobased materials with a minimum of 50 percent biobased content (by weight or volume)	
(1)	Two types of biobased materials are used, each for more than 0.5 percent of the project's projected building material cost.	**3**
(2)	Two types of biobased materials are used, each for more than 1 percent of the project's projected building material cost.	**6**
(3)	For each additional biobased material used for more than 0.5 percent of the project's projected building material cost.	**1** **2 Max**

606.2 Wood-based products. Wood or wood-based products are certified to the requirements of one of the following recognized product programs:		
	(a) American Forest Foundation's *American Tree Farm System*® (ATFS)	
	(b) Canadian Standards Association's *Sustainable Forest Management System Standards* (CSA Z809)	
	(c) *Forest Stewardship Council* (FSC)	
	(d) *Program for Endorsement of Forest Certification Systems* (PEFC)	
	(e) *Sustainable Forestry Initiative® Program* (SFI)	
	(f) National Wood Flooring Association's *Responsible Procurement Program* (RPP)	
	(g) other product programs mutually recognized by PEFC	
(1)	A minimum of two certified wood-based products are used for minor components of the building.	**3**
(2)	A minimum of two certified wood-based products are used in major components of the building.	**4**

606.3 Manufacturing energy. Materials manufactured using a minimum of 33 percent of the primary manufacturing process energy derived from (1) renewable sources, (2) combustible waste sources, or (3) renewable energy credits (RECs) are used for major components of the building. **(2 points awarded per material.)**	**6 Max**

GREEN BUILDING PRACTICES	POINTS
607 RECYCLING AND WASTE REDUCTION	
607.1 Recycling and composting. Recycling and composting by the occupant are facilitated by one or more of the following methods:	
(1) A built-in collection space in each kitchen and an aggregation/pick-up space in a garage, covered outdoor space, or other area for recycling containers is provided.	**3**
(2) Compost facility is provided on the site.	**3**
607.2 Food waste disposers. A minimum of one food waste disposer is installed at the primary kitchen sink.	**1**
608 RESOURCE-EFFICIENT MATERIALS	
608.1 Resource-efficient materials. Products containing fewer materials are used to achieve the same end-use requirements as conventional products, including but not limited to:	**9 Max 3 per each material**
(1) lighter, thinner brick with bed depth less than 3 inches and/or brick with coring of more that 25 percent	
(2) engineered wood or engineered steel products	
(3) roof or floor trusses	
609 REGIONAL MATERIALS	
609.1 Regional materials. Regional materials are used for major and/or minor components of the building. **For a component to comply with this practice, a minimum of 75% of all products in that component category must be sourced regionally, e.g., stone veneer category – 75 percent or more of the stone veneer on a project must be sources regionally.**	**10 Max 2 per each major component and 1 per each minor component**
610 LIFE CYCLE ASSESSMENT	
610.1 Life cycle assessment. A life cycle assessment (LCA) tool is used to select environmentally preferable products, assemblies, or, entire building designs. Points are awarded in accordance with Section 610.1.1 or 610.1.2. Only one method of analysis or tool may be utilized. The reference service life for the building is 60 years for any life cycle analysis tool. Results of the LCA are reported in the manual required in Section 1001.1 or 1002.1(1) of this Standard in terms of the environmental impacts listed in this practice and it is stated if operating energy was included in the LCA.	**15 Max**

GREEN BUILDING PRACTICES	POINTS
610.1.1 Whole-building life cycle assessment. A whole-building LCA is performed in conformance with ASTM E2921 using ISO14044 compliant life cycle assessment.	**15 max**
(1) Execute LCA at the whole building level through a comparative analysis between the final and reference building designs as set forth under Standard Practice, ASTM E2921. The assessment criteria includes the following environmental impact categories:	**8**
(a) Primary energy use	
(b) Global warming potential	
(c) Acidification potential	
(d) Eutrophication potential	
(e) Ozone depletion potential	
(f) Smog potential	
(2) Execute LCA on regulated loads throughout the building operations life cycle stage. Conduct simulated energy performance analyses in accordance with Section 702.2.1 ICC IECC analysis (IECC Section 405) in establishing the comparative performance of final versus reference building designs. Primary energy use savings and global warming potential avoidance from simulation analyses results are determined using energy supplier, utility, or EPA electricity generation and other fuels energy conversion factors and electricity generation and other fuels emission rates for the locality or Sub-Region in which the building is located	**5**
(3) Execute full LCA, including use-phase, through calculation of operating energy impacts (c) – (f) using local or regional emissions factors from energy supplier, utility, or EPA.	**2**

610.1.2 Life cycle assessment for a product or assembly. An environmentally preferable product or assembly is selected for an application based upon the use of an LCA tool that incorporates data methods compliant with ISO 14044 or other recognized standards that compare the environmental impact of products or assemblies.	**10 Max**

610.1.2.1 Product LCA. A product with improved environmental impact measures compared to another product(s) intended for the same use is selected. The environmental impact measures used in the assessment are selected from the following:	**per Table 610.1.2.1 10 Max**
(a) Primary energy use	
(b) Global warming potential	
(c) Acidification potential	
(d) Eutrophication potential	
(e) Ozone depletion potential	
(f) Smog potential	
(Points are awarded for each product/system comparison where the selected product/system improved upon the environmental impact measures by an average of 15 percent.)	

Table 610.1.2.1
Product LCA

4 Impact Measures	5 Impact Measures
POINTS	
2	3

GREEN BUILDING PRACTICES	POINTS

610.1.2.2 Building assembly LCA. A building assembly with improved environmental impact measures compared to an alternative assembly of the same function is selected. The full life cycle, from resource extraction to demolition and disposal (including but not limited to on-site construction, maintenance and replacement, material and product embodied acquisition, and process and transportation energy), is assessed. The assessment includes all structural elements, insulation, and wall coverings of the assembly. The assessment does not include electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators, and conveying systems. The following types of building assemblies are eligible for points under this practice: **per Table 610.1.2.2 10 Max**

- **(a)** exterior walls
- **(b)** roof/ceiling
- **(c)** interior walls or ceilings
- **(d)** intermediate floors

The environmental impact measures used in the assessment are selected from the following:

- **(a)** Primary energy use
- **(b)** Global warming potential
- **(c)** Acidification potential
- **(d)** Eutrophication potential
- **(e)** Ozone depletion potential
- **(f)** Smog potential

(Points are awarded based on the number of types of building assemblies that improve upon environmental impact measures by an average of 15 percent.)

Table 610.1.2.2
Building Assembly LCA

Number of Types of Building Assemblies	4 Impact Measures	5 Impact Measures
	POINTS	
2 types	**3**	**6**
3 types	**4**	**8**
4 types	**5**	**10**

611 INNOVATIVE PRACTICES

611.1 Manufacturer's environmental management system concepts. Product manufacturer's operations and business practices include environmental management system concepts, and the production facility is registered to ISO 14001 or equivalent. The aggregate value of building products from registered ISO 14001 or equivalent production facilities is 1 percent or more of the estimated total building materials cost. **10 Max**

(1 point awarded per percent.)

611.2 Sustainable products. One or more of the following products are used for at least 30% of the floor or wall area of the entire dwelling unit, as applicable. Products are certified by a third-party agency accredited to ISO 17065.		**9 Max**
(1)	50% or more of carpet installed (by square feet) is certified to NSF 140.	**3**
(2)	50% or more of resilient flooring installed (by square feet) is certified to NSF 332.	**3**
(3)	50% or more of the insulation installed (by square feet) is certified to EcoLogo CCD-016.	**3**

GREEN BUILDING PRACTICES		POINTS
(4)	50% or more of interior wall coverings installed (by square feet) is certified to NSF 342.	**3**
(5)	50% or more of the gypsum board installed (by square feet) is certified to UL 100.	**3**
(6)	50% or more of the door leafs installed (by number of door leafs) is certified to UL 102.	**3**
(7)	50% or more of the tile installed (by square feet) is certified to TCNA A138.1 Specifications for Sustainable Ceramic Tiles, Glass Tiles and Tile Installation Materials.	**3**

611.3 Universal design elements. Dwelling incorporates one or more of the following universal design elements. Conventional industry construction tolerances are permitted.		**12 Max**
(1)	Any no-step entrance into the dwelling which (1) is accessible from a substantially level parking or drop-off area (no 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 (2) provides a minimum 32-inch wide clearance into the dwelling.	**3**
(2)	Minimum 36-inch wide accessible route from the no-step entrance into at least one visiting room in the dwelling and into at least one full or half bathroom which has a minimum 32-inch clear door width and a 30-inch by 48-inch clear area inside the bathroom outside the door swing.	**3**
(3)	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**
(4)	Blocking or equivalent installed in the accessible bathroom walls for future installation of grab bars at water closet and bathing fixture, if applicable.	**1**
(5)	All interior and exterior door handles are levers rather than knobs.	**1**
(6)	All sink faucet controls are single-handle controls of both volume and temperature.	**1**
(7)	Interior convenience Power receptacles, communication connections (for cable, phone, Ethernet, etc.) and switches are placed between 15" and 48" above the finished floor. Additional switches to control devices and systems (such as alarms, home theaters and other equipment) not required by the local building code may be installed as desired.	**1**
(8)	All light switches are rocker-type switches or other similar switches that can be operated by pressing them (with assistive devices). Toggle-type switches may not be used.	**1**
(9)	Any of the following can be controlled with a (wireless) mobile device such as a smartphone, tablet or laptop computer: HVAC, lighting, alarm system or door locks	**1**

611.4 Product declarations. A minimum of 10 different products installed in the building project, at the time of certificate of occupancy, comply with one of the following sub-sections. Declarations, reports, and assessments are submitted to the Adopting Entity and contain documentation of the critical peer review by an independent third party, results from the review, the reviewer's name, company name, contact information, and date of the review.	**5**

GREEN BUILDING PRACTICES	POINTS

611.4.1 Industry-wide declaration. A Type III industry-wide environmental product declaration (EPD) is submitted for each product. Where the program operator explicitly recognizes the EPD as representative of the product group on a National level, it is considered industry-wide. In the case where an industry-wide EPD represents only a subset of an industry group, as opposed to being industry-wide, the manufacturer is required be explicitly recognized as a participant by the EPD program operator. All EPDs are required to be consistent with ISO Standards 14025 and 21930 with at least a cradle-to-gate scope.

(Each product complying with Section 611.4.1 shall be counted as one product for compliance with Section 611.4.)

611.4.2 Product Specific Declaration. A product specific Type III EPD are submitted for each product. The product specific declaration shall be manufacturer specific for an individual product or product family. All Type III EPDs are required to be certified as complying, at a minimum, with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930.

(Each product complying with Section 611.4.2 shall be counted as two products for compliance with Section 611.4.)

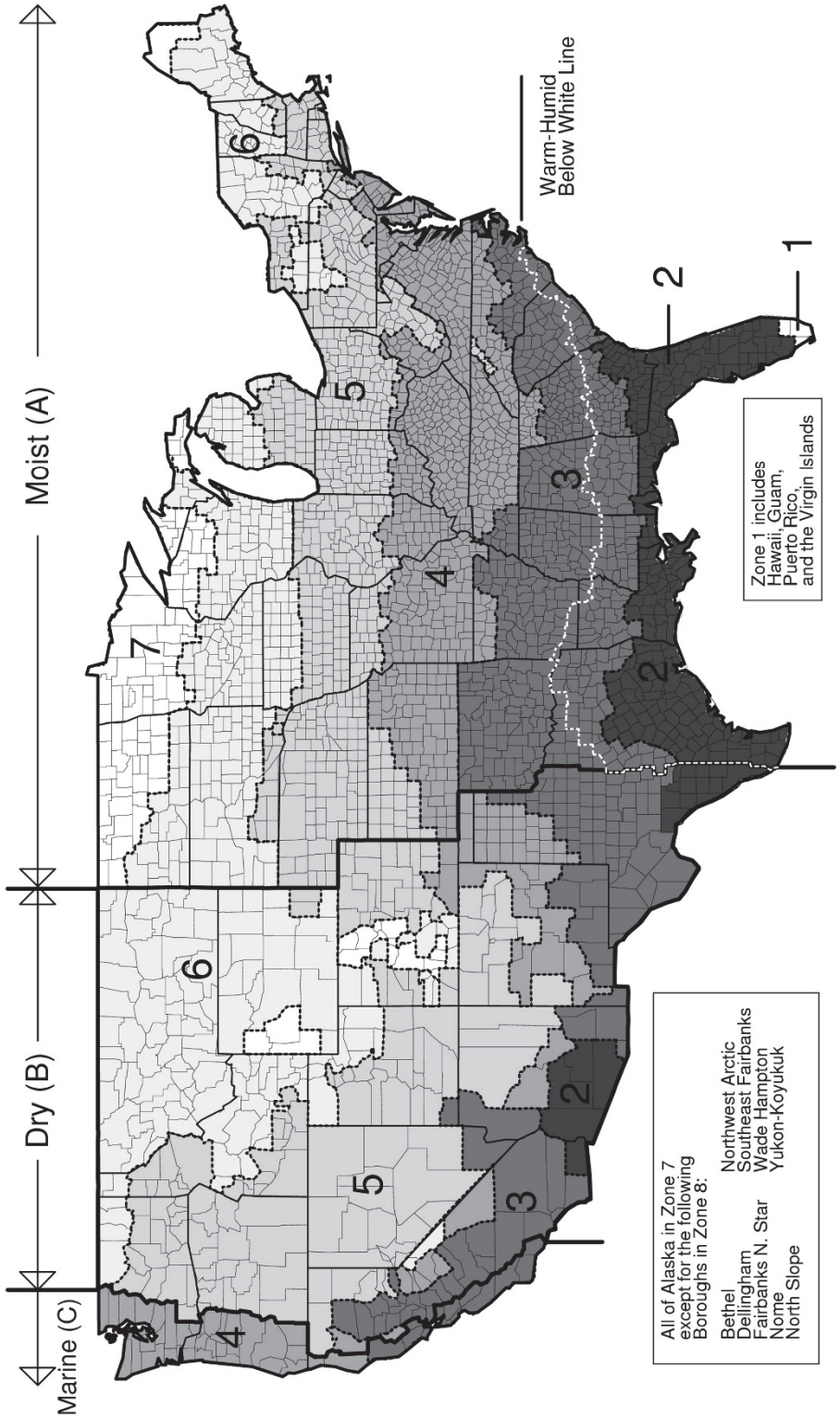

FIGURE 6(1)
CLIMATE ZONES

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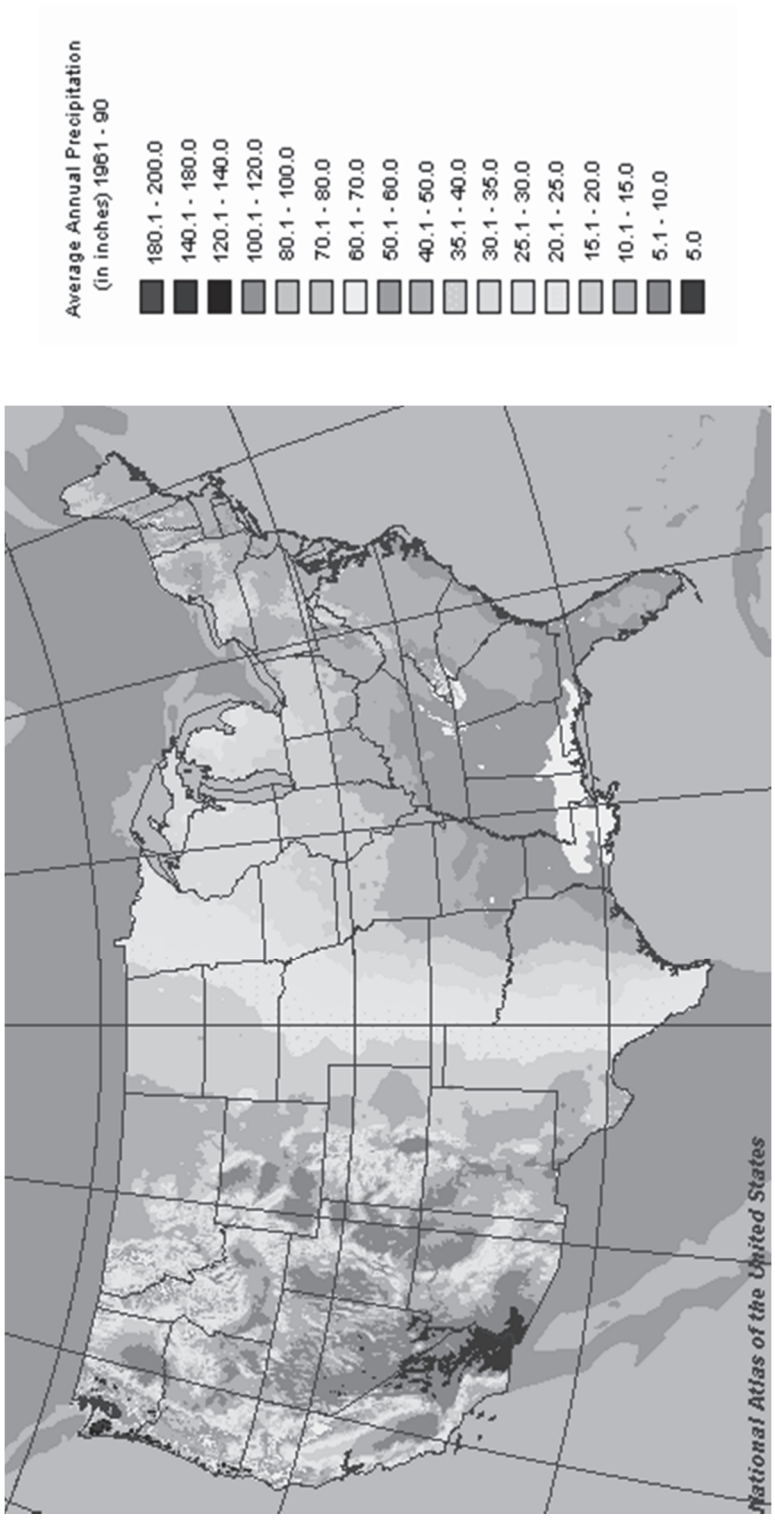

FIGURE 6(2)
AVERAGE ANNUAL PRECIPITATION (inches)

(Source: www.nationalatlas.gov)

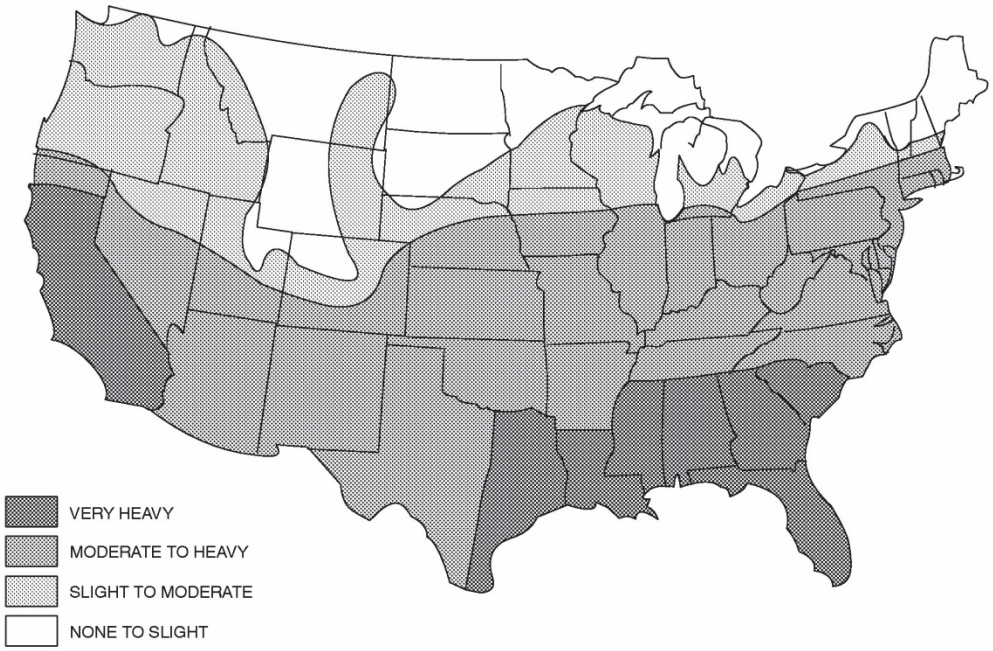

FIGURE 6(3)
TERMITE INFESTATION PROBABILITY MAP

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CHAPTER 7

ENERGY EFFICIENCY

GREEN BUILDING PRACTICES	POINTS

701
MINIMUM ENERGY EFFICIENCY REQUIREMENTS

701.1 Mandatory requirements. The building shall comply with Section 702 (Performance Path), Section 703 (Prescriptive Path), or Section 704 (HERS Index Target Path). Items listed as "mandatory" in Section 701.4 apply to all Paths. Unless otherwise noted, buildings in the Tropical Climate Zone shall comply with Climate Zone 1 requirements.

701.1.1 Minimum Performance Path requirements. A building complying with Section 702 shall include a minimum of two practices from Section 705.

701.1.2 Minimum Prescriptive Path requirements. A building complying with Section 703 shall obtain a minimum of 30 points from Section 703 and shall include a minimum of two practices from Section 705.

701.1.3 HERS Index Target Path requirements. A building complying with Section 704 shall obtain a minimum of 30 points from Section 704 and shall include a minimum of two practices from Section 705.

701.1.4 Alternative bronze and silver level compliance. As an alternative, any building that qualifies as an ENERGY STAR Version 3.0 Certified Home or ENERGY STAR Multifamily High Rise Version 1.0 Rev. 03 building achieves the bronze level for Chapter 7. As an alternative, any building that qualifies as an ENERGY STAR Version 3.1 Certified Home or ENERGY STAR Multifamily High Rise Version 1.0 Rev. 03 (with the baseline at ASHRAE 90.1-2010) building achieves the silver level for Chapter 7. As an alternative in the Tropical Climate Zone, any building that meets all of the requirements in IECC Section R401.2.1 (Tropical Zone) achieves the silver level for Chapter 7. The buildings achieving compliance under Section 701.1.4 are not eligible for achieving a rating level above silver.

701.2 Emerald level points. The Performance Path shall be used to achieve the emerald level.

701.3 Adopting entity review. A review by the Adopting Entity or designated third party shall be conducted to verify design and compliance with Chapter 7.

701.4 Mandatory practices

GREEN BUILDING PRACTICES	POINTS
701.4.1 HVAC systems	
701.4.1.1 HVAC system sizing. Space heating and cooling system is sized according to heating and cooling loads calculated using ACCA Manual J, or equivalent. Equipment is selected using ACCA Manual S or equivalent.	**Mandatory**
701.4.1.2 Radiant and hydronic space heating. Where installed as a primary heat source in the building, radiant or hydronic space heating system is designed, installed, and documented, using industry-approved guidelines and standards (e.g., ACCA Manual J, AHRI I=B=R, ACCA 5 QI-2010, or an accredited design professional's and manufacturer's recommendations).	**Mandatory**
701.4.2 Duct systems	
701.4.2.1 Duct air sealing. Ducts 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.	**Mandatory**
701.4.2.2 Ducts and Plenums. Building framing cavities are not used as ducts or plenums.	**Mandatory**
701.4.2.3 Duct system sizing. Duct system is sized and designed in accordance with ACCA Manual D or equivalent.	**Mandatory**
701.4.3 Insulation and air sealing.	
701.4.3.1 Building Thermal Envelope Air Sealing. The building thermal envelope 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:	**Mandatory**
(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 and ceilings separating a garage from conditioned spaces.	
(h) Behind tubs and showers on exterior walls.	
(i) Common walls between dwelling units.	
(j) Attic access openings.	
(k) Rim joist junction.	
(l) Other sources of infiltration.	

GREEN BUILDING PRACTICES	POINTS
701.4.3.2 Air sealing and insulation. Grade II and III insulation installation is not permitted. Building envelope air tightness and insulation installation is verified to be in accordance with Section 701.4.3.2(1) and 701.4.3.2(2).	**Mandatory**
(1) **Testing.** Building envelope tightness is tested. Testing is conducted in accordance with ASTM E-779 using a blower door at a test pressure of 1.04 psf (50 Pa). Testing is conducted after rough-in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances. Testing is conducted under the following conditions:	
(a) Exterior windows and doors, fireplace and stove doors are closed, but not sealed;	
(b) Dampers are closed, but not sealed, including exhaust, intake, make-up air, backdraft and flue dampers;	
(c) Interior doors are open;	
(d) Exterior openings for continuous ventilation systems and heat recovery ventilators are closed and sealed;	
(e) Heating and cooling systems are turned off;	
(f) HVAC duct terminations are not sealed; and	
(g) Supply and return registers are not sealed.	
Multifamily Building Note: *Testing by dwelling units, groups of dwelling units, or the building as a whole is acceptable.*	
(2) **Visual inspection.** The air barrier and insulation items listed in Table 701.4.3.2(2) are field verified by visual inspection.	

701.4.3.2.1 Grade I insulation installations are in accordance with the following:	**Mandatory**
(1) Grading applies to field-installed insulation products.	
(2) Grading applies to ceilings, walls, floors, band joists, rim joists, conditioned attics basements and crawlspaces, except as specifically noted.	
(3) Inspection is conducted before insulation is covered.	
(4) 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.	
(5) 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).	
(6) 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.	
(7) Exterior rigid insulation has substantial contact with the structural framing members or sheathing materials and is tightly fitted at joints.	
(8) Cavity insulation is split, installed, and/or fitted tightly around wiring and other services.	
(9) Exterior sheathing is not visible from the interior through gaps in the cavity insulation.	
(10) Faced batt insulation is permitted to have side-stapled tabs, provided the 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 tab itself.	
(11) Where properly installed, ICFs, SIPs, and other wall systems that provide integral insulation are deemed in compliance with the Grade 1 insulation installation requirements.	

Table 701.4.3.2(2)
Air Barrier and Insulation Installation

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings. drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within comers and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/doorjambs and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.

GREEN BUILDING PRACTICES	POINTS
701.4.3.3 Multifamily air leakage alternative. Multifamily buildings four or more stories in height and in compliance with IECC section C402.5 (Air leakage-thermal envelope) are deemed to comply with Sections 701.4.3.1 and 701.4.3.2.	
701.4.3.4 Fenestration air leakage. 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/m^2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m^2), when tested in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled. This practice does not apply to site-built windows, skylights, and doors.	**Mandatory**
701.4.3.5 Recessed lighting. Recessed luminaires installed in the building thermal envelope are sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires 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 recessed luminaires are sealed with a gasket or caulk between the housing and the interior of the wall or ceiling covering.	**Mandatory**
701.4.4 High-efficacy lighting. Lighting efficacy in dwelling units is in accordance with one of the following:	**Mandatory**
(1) A minimum of 75 percent of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent	
(2) Lighting power density, measured in watts/square foot, is 1.1 or less.	
701.4.5 Boiler supply piping. Boiler supply piping in unconditioned space is insulated.	**Mandatory**
702 PERFORMANCE PATH	
702.1 Point allocation. Points from Section 702 (Performance Path) shall not be combined with points from Section 703 (Prescriptive Path) or Section 704 (HERS Index Target Path).	**Mandatory for Section 702**
702.2 Energy performance levels	
702.2.1 ICC IECC analysis. Energy efficiency features are implemented to achieve energy cost or source energy performance that meets the ICC IECC. A documented analysis using software in accordance with ICC IECC, Section R405, or ICC IECC Section C407.2 through C407.5, applied as defined in the ICC IECC, is required.	**Mandatory for Section 702**
702.2.2 Energy performance analysis. Energy savings levels above the ICC IECC are determined through an analysis that includes improvements in building envelope, air infiltration, heating system efficiencies, cooling system efficiencies, duct sealing, water heating system efficiencies, lighting, and appliances. Points are assigned using the following formula: **Points = 30 + (percent above ICC IECC 2015) * 2**	
Multifamily Building Note: *Modeling is completed building-wide using one of the following methods: whole building energy modeling, a unit-by-unit approach, or a building average of a unit-by-unit approach.*	

GREEN BUILDING PRACTICES	POINTS
702.2.3 Tropical standard reference design. For the Tropical Climate Zone, the standard reference design shall use the specifications in IECC Section R401.2.1 (Tropical Zone).	
703 PRESCRIPTIVE PATH	
703.1 Mandatory practices	**30**
703.1.1 UA Compliance. The building thermal envelope is in compliance with Section 703.1.1.1 or 703.1.1.2. **Exception:** Section 703.1.1 is not required for Tropical Climate Zone.	**Mandatory for Section 703**
703.1.1.1 Maximum UA. For IECC residential, the total building UA is less than or equal to the total maximum UA as computed by 2015 IECC Section R402.1.5. For IECC commercial, the total UA is less than or equal to the sum of the UA for 2015 IECC Tables C402.1.4 and C402.4, including the U-factor times the area and C-factor or F-factor times the perimeter. The total UA proposed and baseline calculations are documented. REScheck or COMcheck is deemed to provide UA calculation documentation.	
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 IECC Table R402.1.1 or Tables C402.1.3 and C402.4. The SHGC is in accordance with the 2015 IECC requirements.	
703.1.2 Building Envelope Leakage. The building thermal envelope is in accordance with 2015 IECC R402.4.1.2 or C402.5 as applicable. **Exception:** Section 703.1.2 is not required for Tropical Climate Zone.	**Mandatory for Section 703**
703.1.3 Duct Testing. The duct system is in accordance with 2015 IECC R403.3.2 through R403.3.5 as applicable.	**Mandatory for Section 703**

GREEN BUILDING PRACTICES	POINTS

703.2 Building envelope

703.2.1 UA improvement. The total building thermal envelope UA is less than or equal to the total UA resulting from the U-factors provided in Table 703.2.1(a) or IECC Tables C402.1.4 and C402.4, as applicable. Where insulation is used to achieve the UA improvement, the insulation installation is in accordance with Grade 1 requirements as graded by a third-party. Total UA is documented using a RESCheck, COMCheck, or equivalent report to verify the baseline and the UA improvement.

Per Table 703.2.1(b)

Table 703.2.1(a)
Equivalent U-Factors[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawlspace Wall U-Factor[c]
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	0.060	0.098	0.047	0.091[C]	0.136
4 except Marine	0.35	0.55	0.026	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.060	0.082	0.033	0.050	0.055
6	0.32	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	0.045	0.057	0.028	0.050	0.055

a. Non-fenestration U-factors shall be obtained from measurement, calculation, or an approved source.
b. Where more the half the insulation is on the interior, the mass wall U-factors is a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except in Marine, and the same as the frame wall U-factor in Marine Zone 4 and Zones 5 through 8.
c. Basement wall U-factor of 0.360 in warm-humid locations.

Table 703.2.1(b)
Points for Improvement in Total Building Thermal Envelope UA

Minimum UA Improvement	Climate Zone							
	1[a]	2	3	4	5	6	7	8
	POINTS							
0 to <5%	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5% to <10%	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
10% to <15%	**3**	**6**	**5**	**6**	**6**	**6**	**5**	**7**
15% to <20%	**5**	**9**	**8**	**9**	**9**	**9**	**8**	**10**
20% to <25%	**6**	**12**	**10**	**12**	**12**	**12**	**11**	**13**
25% to <30%	**8**	**15**	**13**	**16**	**14**	**15**	**14**	**17**
30% to <35%	**10**	**18**	**16**	**19**	**17**	**18**	**16**	**20**
≥35%	**11**	**21**	**18**	**22**	**20**	**21**	**19**	**23**

a. Tropical Climate Zone: Points are Climate Zone 1 points divided by 2 and rounded down

Exception: Tropical Climate Zone, crawl space, basement, floor u-factors are not applicable.

GREEN BUILDING PRACTICES	POINTS

703.2.2 Mass walls. More than 75 percent of the above-grade exterior opaque wall area of the building is mass walls.

Per Table 703.2.2

Table 703.2.2
Exterior Mass Walls

Mass thickness	Climate Zone			
	1-4	5	6	7-8
	POINTS			
≥3 inch to <6 inch	**1**	**0**	**0**	**0**
>6 inch	**3**	**2**	**2**	**0**

703.2.3 A radiant barrier with an emittance of 0.05 or less is used in the attic. The product is tested in accordance with ASTM C1371 and installed in accordance with the manufacturer's instructions.

Per Table 703.2.3

Table 703.2.3
Radiant Barriers

Climate Zone	POINTS
Tropical	**3**
1	**2**
2-3	**3**
4-5	**1**
6-8	**0**

(In climate zones 1-3, one point maximum for multifamily buildings four or more stories in height.)

703.2.4 Building envelope leakage. The maximum building envelope leakage rate is in accordance with Table 703.2.4 and whole building ventilation is provided in accordance with Section 902.2.1.

Per Table 703.2.4

Table 703.2.4
Building Envelope Leakage

Max Envelope Leakage Rate (ACH50)	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
4	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**
3	**2**	**4**	**-**	**-**	**-**	**-**	**-**	**-**
2	**3**	**5**	**3**	**4**	**4**	**6**	**8**	**7**
1	**4**	**7**	**5**	**7**	**7**	**10**	**15**	**11**

(Points not awarded if points are taken under Section 705.6.2.1)

703.2.5 Fenestration

703.2.5.1 NFRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) on an area-weighted average basis do not exceed the values in Table 703.2.5.1. Area weighted averages are calculated separately for the categories of 1) windows and exterior doors and 2) skylights and tubular daylighting devices (TDDs). Decorative fenestration elements with a combined total maximum area of 15 square feet (1.39 m^2) or 10 percent of the total glazing area, whichever is less, are not required to comply with this practice.

Mandatory for Section 703

GREEN BUILDING PRACTICES	POINTS

703.2.5.1.1 Dynamic glazing. Dynamic glazing is permitted to satisfy the SHGC requirements of Table 703.2.5.1 provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4 and the dynamic glazing is automatically controlled to modulate the amount of solar gain into the space in multiple steps. Fenestration with dynamic glazing is considered separately from other fenestration and area-weighted averaging with fenestration that does not use dynamic glazing is not permitted. Dynamic glazing is not required to be automatically controlled or comply with minimum SHGC ratio when both the lower and higher labeled SHGC already comply with the requirements of Table 703.2.5.1.

Table 703.2.5.1
Fenestration Specifications

Climate Zones	U-Factor	SHGC
	Windows and Exterior Doors (maximum certified ratings)	
1	0.50	0.25
2	0.40	0.25
3	0.35	0.25
4	0.35	0.40
5 to 8	0.32	Any
	Skylights and TDDs (maximum certified ratings)	
1	0.75	0.30
2	0.65	0.30
3	0.55	0.30
4	0.55	0.40
5 to 8	0.55	Any

Exception: For Sun-tempered designs meeting the requirements of Section 703.7.1, the SHGC is permitted to be 0.40 or higher on south facing glass.

703.2.5.2 The NFRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with Table 703.2.5.2(a), (b), or (c). Decorative fenestration elements with a combined total maximum area of 15 square feet (1.39 m^2) or 10 percent of the total glazing area, whichever is less, are not required to comply with this practice.	**Per Table 703.2.5.2(a) or Table 703.2.5.2(b) or Table 703.2.5.2(c)**

703.2.5.2.1 Dynamic glazing. Dynamic glazing is permitted to satisfy the SHGC requirements of Tables 703.2.5.2(a), 703.2.5.2(b), and 703.2.5.2(c) provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4, and the dynamic glazing is automatically controlled to modulate the amount of solar gain into the space in multiple steps. Fenestration with dynamic glazing is considered separately from other fenestration, and area-weighted averaging with fenestration that does not use dynamic glazing is not permitted. Dynamic glazing is not required to be automatically controlled or comply with minimum SHGC ratio when both the lower and higher labeled SHGC already comply with the requirements of Tables 703.2.5.2(a), 703.2.5.2(b), and 703.2.5.2(c).

GREEN BUILDING PRACTICES	POINTS

Table 703.2.5.2(a)
Enhanced Fenestration Specifications

Climate Zones	U-Factor Windows & Exterior Doors	SHGC Windows & Exterior Doors	U-Factor Skylights & TDDs	SHGC Skylights & TDDs	POINTS
1	0.40	0.25	0.60	0.28	**1**
2	0.40	0.25	0.60	0.28	**1**
3	0.30	0.25	0.53	0.28	**2**
4	0.30	0.40	0.53	0.35	**3**
5	0.27[a]	Any	0.50	Any	**3**
6	0.27[a]	Any	0.50	Any	**4**
7	0.27[a]	Any	0.50	Any	**4**
8	0.27[a]	Any	0.50	Any	**4**

Exception: For Sun-tempered designs meeting the requirements of Section 703.7.1, the SHGC is permitted to be 0.40 or higher on south facing glass.
a. An equivalent energy performance is permitted based on fenestration meeting the requirements of Section B. Equivalent Energy Performance in ENERGY STAR Product Specification Residential Windows, Doors, and Skylights, Eligibility Criteria Version 6.0.

Table 703.2.5.2(b)
Enhanced Fenestration Specifications

Climate Zone	U-Factor Windows & Exterior Doors	SHGC Windows & Exterior Doors	U-Factor Skylights & TDDs	SHGC Skylights & TDDs	POINTS
1	0.38	0.25	0.55	0.28	**2**
2	0.38	0.25	0.53	0.28	**3**
3	0.30	0.25	0.50	0.28	**4**
4	0.28	0.40	0.50	0.35	**4**
5	0.25	Any	0.48	Any	**4**
6	0.25	Any	0.48	Any	**5**
7	0.25	Any	0.46	Any	**5**
8	0.25	Any	0.46	Any	**4**

Exception: For Sun-tempered designs meeting the requirements of Section 703.7.1, the SHGC is permitted to be 0.40 or higher on south facing glass.

Table 703.2.5.2(c)
Enhanced Fenestration Specifications

Climate Zones	U-Factor Windows & Exterior Doors	SHGC Windows & Exterior Doors	U-Factor Skylights & TDDs	SHGC Skylights & TDDs	POINTS
4	0.25	0.40	0.45	0.40	**6**
5-8	0.22	Any	0.42	Any	**6**

(Points for multifamily buildings four or more stories in height are awarded at 3 times the point value listed in Table 703.2.5.2(c))

GREEN BUILDING PRACTICES	POINTS

703.3 HVAC equipment efficiency

703.3.0 Multiple heating and cooling systems. For multiple heating or cooling systems in one home, practices 703.3.1 through 703.3.6 apply to the system that supplies 80% or more of the total installed heating or cooling capacity. Where multiple systems each serve less than 80% of the total installed heating or cooling capacity, points under Sections 703.3.1 through 703.3.6 are awarded either for the system eligible for the fewest points or the weighted average of the systems. The weighted average shall be calculated in accordance with the following equation and be based upon the efficiency and capacity of the equipment as selected in accordance with ACCA Manual S with it loads calculated in accordance with ACCA Manual J.

Weighted Average = $[(E_{unit\ 1}*C_{unit\ 1})+(E_{unit\ 2}*C_{unit\ 2})+\ldots+(E_{unit\ n}*C_{unit\ n})] / (C_{unit\ 1}+C_{unit\ 2}+\ldots+C_{unit\ n})$
where:
E = Rated AHRI efficiency for unit
C = Rated heating or cooling capacity for unit
n = Unit count

703.3.1 Combination space heating and water heating system (combo system) is installed using either a coil from the water heater connected to an air handler to provide heat for the building or dwelling unit, or a space heating boiler using an indirect-fired water heater. Devices have a minimum combined annual efficiency of 0.80 and a minimum water heating recovery efficiency of 0.87.	**4**

703.3.2 Furnace and/or boiler efficiency is in accordance with one of the following:

(1) Gas and propane heaters: **Per Table 703.3.2(1)(a) or 703.3.2(1)(b)**

Table 703.3.2(1)(a)
Gas and Propane Heaters

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥90% AFUE	**0**	**2**	**3**	**6**	**6**	**9**	**10**	**12**
≥92% AFUE	**0**	**2**	**4**	**7**	**8**	**10**	**12**	**14**
≥94% AFUE	**0**	**3**	**4**	**9**	**9**	**12**	**14**	**16**
≥96% AFUE	**1**	**3**	**5**	**10**	**10**	**14**	**16**	**19**
≥98% AFUE	**1**	**3**	**6**	**11**	**12**	**16**	**18**	**21**

Table 703.3.2(1)(b)
Gas and Propane Heaters for Multifamily Buildings Four or More Stories in Height

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥90% AFUE	**0**	**4**	**4**	**8**	**8**	**10**	**11**	**13**
≥92% AFUE	**0**	**4**	**4**	**9**	**10**	**11**	**12**	**14**
≥94% AFUE	**0**	**5**	**5**	**10**	**11**	**12**	**14**	**16**
≥96% AFUE	**0**	**5**	**5**	**12**	**12**	**13**	**15**	**17**
≥98% AFUE	**0**	**6**	**6**	**13**	**13**	**14**	**16**	**18**

GREEN BUILDING PRACTICES	POINTS

(2) Oil furnace:

Per Table 703.3.2(2)

Table 703.3.2(2)
Oil Furnace

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥85% AFUE	**0**	**1**	**2**	**3**	**3**	**4**	**5**	**6**
≥90% AFUE	**0**	**2**	**3**	**6**	**6**	**9**	**10**	**12**

(3) Gas boiler:

Per Table 703.3.2(3)

Table 703.3.2(3)
Gas Boiler

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥85% AFUE	**0**	**1**	**1**	**2**	**3**	**4**	**4**	**4**
≥90% AFUE	**0**	**1**	**2**	**4**	**6**	**7**	**8**	**6**
≥94% AFUE	**0**	**2**	**3**	**5**	**8**	**9**	**10**	**8**
≥96% AFUE	**0**	**2**	**4**	**6**	**9**	**11**	**12**	**10**

(4) Oil boiler:

Per Table 703.3.2(4)

Table 703.3.2(4)
Oil Boiler

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥85% AFUE	**0**	**1**	**1**	**3**	**3**	**4**	**4**	**5**
≥90% AFUE	**1**	**2**	**3**	**5**	**6**	**7**	**9**	**10**

703.3.3 Heat pump heating efficiency is in accordance with Table 703.3.3(1) or Table 703.3.3(2) or Table 703.3.3(3). Refrigerant charge is verified for compliance with manufacturer's instructions utilizing a method in Section 4.3 of ACCA 5 QI-2010.

Per Table 703.3.3(1) or Table 703.3.3(2) or Table 703.3.3(3)

Table 703.3.3(1)
Electric Heat Pump Heating

Efficiency	Climate Zone					
	1	2	3	4	5	6-8[a]
	POINTS					
≥8.5 HSPF (11.5 EER)	**0**	**1**	**1**	**2**	**2**	**2**
≥9.0 HSPF (12.5 EER)	**0**	**2**	**4**	**5**	**6**	**10**
≥9.5 HSPF	**0**	**3**	**7**	**7**	**11**	**18**
≥10.0 HSPF	**1**	**5**	**10**	**10**	**15**	**26**

a. Equipment designed to operate in cold climates is recommended to minimize use of resistance heat when installing a heat pump in Zones 6-8.

GREEN BUILDING PRACTICES	POINTS

Table 703.3.3(2)
Electric Heat Pump Heating for Multifamily Buildings Four or More Stories in Height

Efficiency	Climate Zone					
	1	2	3	4	5	6-8[a]
	POINTS					
≥8.5 HSPF (11.5 EER)	**0**	**3**	**4**	**8**	**11**	**13**

a. Equipment designed to operate in cold climates is recommended to minimize use of resistance heat when installing a heat pump in Zones 6-8.

Table 703.3.3(3)
Gas Engine-Driven Heat Pump Heating

Efficiency	Climate Zone					
	1	2	3	4	5	6-8
	POINTS					
≥1.3 COP at 47°F	**2**	**7**	**11**	**14**	**16**	**18**

703.3.4 Cooling efficiency is in accordance with Table 703.3.4(1) or Table 703.3.4(2). Refrigerant charge is verified for compliance with manufacturer's instructions utilizing a method in Section 4.3 of ACCA 5 QI-2010.

Per Table 703.3.4(1) or Table 703.3.4(2)

Table 703.3.4(1)
Electric Air Conditioner and Heat Pump Cooling[a]

Efficiency	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥15 SEER (12.5 EER)	**9**	**6**	**3**	**1**	**1**	**1**	**1**	**0**
≥17 SEER (12.5 EER)	**11**	**9**	**7**	**3**	**3**	**2**	**2**	**0**
≥19 SEER (12.5 EER)	**19**	**12**	**10**	**6**	**4**	**4**	**4**	**0**
≥21 SEER	**26**	**15**	**14**	**8**	**6**	**6**	**5**	**0**

a. Tropical Climate Zone: where none of the occupied space is air conditioned and where ceiling fans are provided for bedrooms and the largest space which is not used as a bedroom, 20 points is awarded.

Table 703.3.4(2)
Gas Engine-Driven Heat Pump Cooling

Efficiency	Climate Zone					
	1	2	3	4	5	6-8
	POINTS					
>1.2 COP at 95°F	**3**	**6**	**3**	**1**	**1**	**0**

703.3.5 Water source cooling and heating efficiency is in accordance with Table 703.3.5. Refrigerant charge is verified for compliance with manufacturer's instructions utilizing a method in Section 4.3 of ACCA 5 QI-2010.

Per Table 703.3.5

Table 703.3.5
Water Source Cooling And Heating

Efficiency	Climate Zone					
	1	2	3	4	5	6-8
	POINTS					
≥15 EER, ≥4.0 COP	**14**	**18**	**22**	**30**	**37**	**37**

GREEN BUILDING PRACTICES	POINTS

703.3.6 Ground source heat pump is installed by a Certified Geothermal Service Contractor in accordance with Table 703.2.5. Refrigerant charge is verified for compliance with manufacturer's instructions utilizing a method in Section 4.3 of ACCA 5 QI-2010.

Per Table 703.3.6

Table 703.3.6
Ground source heat pump[a]

Efficiency	Climate Zone				
	1	2	3	4	5-6
	POINTS				
16.0 EER 3.6 COP	**1**	**1**	**2**	**16**	**22**
24 EER 4.3 COP	**24**	**29**	**22**	**31**	**35**
28 EER 4.8 COP	**42**	**46**	**35**	**42**	**44**

a. The ground loop is sized to account for the ground conductance and the expected minimum incoming water temperature to achieve rated performance.

703.3.7 ENERGY STAR, or equivalent, ceiling fans are installed.

(Points awarded per building.)

1

(For Tropical Climate Zone and Climate Zones 2B, 3B, and 4B: points awarded per fan where AC is not installed in the dwelling unit (Max 8 points), and where points awarded in Section 703.3.8 for these specific climate zones, points shall not be awarded in Section 703.3.7)

703.3.8 Whole-building or whole-dwelling unit fan(s) with insulated louvers and a sealed enclosure is installed.

(Points awarded per building.)

Per Table 703.3.8

Table 703.3.8
Whole dwelling unit fan

Climate Zone		
1-3, Tropical	4-6	7-8
POINTS		
4	**3**	**0**

703.4 Duct systems

703.4.1 All space heating is provided by a system(s) that does not include air ducts.

Per Table 703.4.1

Table 703.4.1
Ductless heating system

Climate Zone					
1	2	3	4	5	6-8
POINTS					
0	**2**	**4**	**6**	**8**	**8**

(No points awarded for multifamily buildings four or more stories in height.)

GREEN BUILDING PRACTICES	POINTS

703.4.2 All space cooling is provided by a system(s) that does not include air ducts.

Per Table 703.4.2

Table 703.4.2
Ductless cooling system

Climate Zone					
1	2	3	4	5	6-8
POINTS					
8	**8**	**4**	**2**	**1**	**0**

(No points awarded for multifamily buildings four or more stories in height.)

703.4.3 Ductwork is in accordance with all of the following:

Per Table 703.4.3

(1) Building cavities are not used as return ductwork.

(2) Heating and cooling ducts and mechanical equipment are installed within the conditioned building space.

(3) Ductwork is not installed in exterior walls.

Table 703.4.3
Ducts

Climate Zone					
1	2	3	4	5	6-8
POINTS					
8	**10**	**8**	**8**	**8**	**4**

(No points awarded for multifamily buildings four or more stories in height.)

703.4.4 Duct Leakage. The entire central HVAC duct system, including air handlers and register boots, is tested by a third party for total leakage at a pressure differential of 0.1 inches w.g. (25 Pa) and maximum air leakage is equal to or less than 6 percent of the system design flow rate or 4 cubic feet per minute per 100 square feet of conditioned floor area.

Per Table 703.4.4

Table 703.4.4
Duct Leakage

Ductwork location	Climate Zone					
	1	2	3	4	5	6-8
	POINTS					
ductwork *entirely outside* the building's thermal envelope	**4**	**5**	**4**	**3**	**2**	**1**
ductwork *entirely inside* the building's thermal envelope	**1**	**1**	**1**	**1**	**1**	**1**
ductwork *inside and outside* the building's thermal envelope	**3**	**4**	**3**	**2**	**1**	**1**

(Points not awarded if points are taken under Section 705.6.2.3)

GREEN BUILDING PRACTICES	POINTS

703.5 Water heating system

703.5.1 Water heater Energy Factor (EF) is in accordance with the following:

(Where multiple systems are used, points awarded based on the system with the lowest efficiency.)

(1) Gas water heating

Per Table 703.5.1(1)(a) or 703.5.1(1)(b)

Table 703.5.1(1)(a)
Gas Water Heating[a]

Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
0.67 to <0.80	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**1**
≥0.80	**4**	**4**	**3**	**3**	**3**	**3**	**3**	**2**

a. Points for multifamily buildings four or more stories in height are awarded at 2 times the point value listed in Table 703.5.1(1)(a)

Table 703.5.1(1)(b)
Gas Water Heating
(Storage with input rate greater than 75,000 Btu/h or instantaneous input rate greater than 200,000 Btu/h)

Thermal Efficiency	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥0.90	**6**	**6**	**5**	**3**	**3**	**3**	**3**	**2**
≥0.95	**7**	**7**	**5**	**4**	**4**	**4**	**4**	**2**

(2) Electric water heating

Per Table 703.5.1(2)(a) or Table 703.5.1(2)(b)

Table 703.5.1(2)(a)
Electric Water Heating

Energy Factor or Thermal Efficiency	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥0.95	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

Table 703.5.1(2)(b)
Electric Instantaneous Water Heating[a]

Energy Factor or Thermal Efficiency[b]	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥0.97	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**

a. Applies to any size water heater.
b. Electric instantaneous water heaters have either an Energy Factor (capacity less than or equal to 12 kW) or a Thermal Efficiency (capacity greater than 12 kW).

GREEN BUILDING PRACTICES	POINTS

(3) Oil water heating

Per Table 703.5.1(3)

Table 703.5.1(3)
Oil Water Heating

Size (gallons)	Energy Factor	Climate Zone							
		1	2	3	4	5	6	7	8
		POINTS							
30 to <50	0.59	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
≥50	0.59	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

For SI: 1 gallon = 3.785 L

(4) Heat pump water heating

Per Table 703.5.1(4)

Table 703.5.1(4)
Heat Pump Water Heating

Energy Factor	Climate Zone						
	1	2	3	4	5	6	7-8
	POINTS						
1.5 to <2.0	**8**	**5**	**4**	**3**	**2**	**2**	**1**
2.0 to <2.2	**16**	**9**	**8**	**6**	**5**	**4**	**2**
2.2	**19**	**10**	**9**	**7**	**6**	**5**	**3**

703.5.2 Desuperheater is installed by a qualified installer or is pre-installed in the factory. **Per Table 703.5.2**

Table 703.5.2
Desuperheater

Climate Zone						
1	2	3	4	5	6	7-8
POINTS						
23	**17**	**9**	**7**	**5**	**4**	**2**

703.5.3 Drain-water heat recovery system is installed. **2**

(Points awarded per building.)

703.5.4 Indirect-fired water heater storage tanks heated from boiler systems are installed. **1**

703.5.5 Solar water heater. SRCC (Solar Rating & Certification Corporation) OG 300 rated, or equivalent, solar domestic water heating system is installed. Solar Energy Factor (SEF) as defined by SRCC is in accordance with Table 703.4.5. **Per Table 703.5.5**

Table 703.5.5
Solar Hot Water Systems

SEF	Climate Zone							
	Tropical &1	2	3	4	5	6	7-8	
	POINTS							
SEF ≥ 1.3	**1**	**2**	**3**	**5**	**7**	**8**	**7**	
SEF ≥ 1.51	**2**	**2**	**4**	**7**	**10**	**11**	**11**	
SEF ≥ 1.81	**2**	**3**	**6**	**10**	**14**	**16**	**15**	
SEF ≥ 2.31	**4**	**5**	**9**	**16**	**21**	**23**	**22**	
SEF ≥ 3.01	**6**	**8**	**12**	**23**	**30**	**34**	**33**	

GREEN BUILDING PRACTICES	POINTS

703.6 Lighting and appliances

703.6.1 Hard-wired lighting. Hard-wired lighting is in accordance with one of the following:

(1) A minimum percent of the total hard-wired interior luminaires or lamps qualify as ENERGY STAR or equivalent. — **Per Table 703.6.1(1)**

Table 703.6.1(1)
Hard-wired Lighting

Minimum percent of fixtures	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
95%	**3**	**3**	**3**	**2**	**2**	**2**	**2**	**2**

(2) A minimum of 80 percent of the exterior lighting wattage has a minimum efficacy of 40 lumens per watt or is solar-powered. — **1**

(3) In multifamily buildings, common area lighting power density (LPD) is less than 0.51 Watts per square foot. — **7**

703.6.2 Appliances. ENERGY STAR or equivalent appliance(s) are installed:

(1) Refrigerator — **Per Table 703.6.2(1)**

Table 703.6.2(1)
Refrigerator

Climate Zone							
1	2	3	4	5	6	7	8
POINTS							
1	**1**	**1**	**1**	**1**	**1**	**1**	**1**

(2) Dishwasher — **1**

(3) Washing machine — **4**

703.7 Passive solar design

703.7.1 Sun-tempered design. Building orientation, sizing of glazing, and design of overhangs are in accordance with all of the following: — **4**

(1) The long side (or one side if of equal length) of the building faces within 20 degrees of true south.

(2) Vertical glazing area is between 5 and 7 percent of the gross conditioned floor area on the south face [also see Section 703.7.1(8)].

(3) Vertical glazing area is less than 2 percent of the gross conditioned floor area on the west face, and glazing is ENERGY STAR compliant or equivalent.

(4) Vertical glazing area is less than 4 percent of the gross conditioned floor area on the east face, and glazing is ENERGY STAR compliant or equivalent.

(5) Vertical glazing area is less than 8 percent of the gross conditioned floor area on the north face, and glazing is ENERGY STAR compliant or equivalent.

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(6) Skylights, where installed, are in accordance with the following:

- **(a)** shades and insulated wells are used, and all glazing is ENERGY STAR compliant or equivalent
- **(b)** horizontal skylights are less than 0.5 percent of finished ceiling area
- **(c)** sloped skylights on slopes facing within 45 degrees of true south, east, or west are less than 1.5 percent of the finished ceiling area

(7) Overhangs or adjustable canopies or awnings or trellises provide shading on south-facing glass for the appropriate climate zone in accordance with Table 703.6.1(7):

Table 703.7.1(7)
South-Facing Window Overhang Depth

		Vertical distance between bottom of overhang and top of window sill				
		≤7' 4"	**≤6' 4"**	**≤5' 4"**	**≤4' 4"**	**≤3' 4"**
Climate Zone	**1 & 2 & 3**	2' 8"	2' 8"	2' 4"	2' 0"	2' 0"
	4 & 5 & 6	2' 4"	2' 4"	2' 0"	2' 0"	1' 8"
	7 & 8	2' 0"	1' 8"	1' 8"	1' 4"	1' 0"

For SI: 1 inch = 25.4 mm

(8) The south face windows have a SHGC of 0.40 or higher.

(9) Return air or transfer grilles/ducts are in accordance with Section 705.4.

Multifamily Building Note*: The site is designed such that at least 40 percent of the* multifamily *dwelling units have one south facing wall (within 15 degrees) containing at least 50 percent of glazing for entire unit, Effective shading is required for passive solar control on all south facing glazing. The floor area of at least 15 feet from the south facing perimeter glazing is massive and exposed to capture solar heat during the day and reradiate at night.*

703.7.2 Window shading. Automated solar protection or dynamic glazing is installed to provide shading for windows.	**1**

703.7.3 Passive cooling design. Passive cooling design features are in accordance with three or more of the following:

Points for three items:	**3**
Points for one additional item:	**1**

(1) Exterior shading is provided on east and west windows using one or a combination of the following:

- **(a)** vine-covered trellises with the vegetation separated a minimum of 1 foot (305 mm) from face of building
- **(b)** moveable awnings or louvers
- **(c)** covered porches
- **(d)** attached or detached conditioned/unconditioned enclosed space that provides full shade of east and west windows (e.g., detached garage, shed, or building)

GREEN BUILDING PRACTICES	POINTS

(2) Overhangs are installed to provide shading on south-facing glazing in accordance with Section 703.7.1(7).

(Points not awarded if points are taken under Section 703.7.1.)

(3) Windows and/or venting skylights are located to facilitate cross ventilation.

(4) Solar reflective roof or radiant barrier is installed in climate zones 1, 2, or 3 and roof material achieves a 3-year aged criteria of 0.50.

(5) Internal exposed thermal mass is a minimum of three inches (76 mm) in thickness. Thermal mass consists of concrete, brick, and/or tile fully adhered to a masonry base or other masonry material in accordance with one or a combination of the following:

- **(a)** A minimum of 1 square foot (0.09 m^2) of exposed thermal mass of floor per 3 square feet (2.8 m^2) of gross finished floor area.
- **(b)** A minimum of 3 square feet (2.8 m^2) of exposed thermal mass in interior walls or elements per square foot (0.09 m^2) of gross finished floor area.

(6) Roofing material is installed with a minimum 0.75 inch (19 mm) continuous air space offset from the roof deck from eave to ridge.

703.7.4 Passive solar heating design. In addition to the sun-tempered design features in Section 703.7.1, all of the following are implemented: **4**

(Points shall not be awarded in the Tropical Climate Zone)

(1) Additional glazing, no greater than 12 percent, is permitted on the south wall. This additional glazing is in accordance with the requirements of Section 703.7.1.

(2) Additional thermal mass for any room with south-facing glazing of more than 7 percent of the finished floor area is provided in accordance with the following:

- **(a)** Thermal mass is solid and a minimum of 3 inches (76 mm) in thickness. Where two thermal mass materials are layered together (e.g., ceramic tile on concrete base) to achieve the appropriate thickness, they are fully adhered to (touching) each other.
- **(b)** Thermal mass directly exposed to sunlight is provided in accordance with the following minimum ratios:
  - **(i)** Above latitude 35 degrees: 5 square feet (0.465 m^2) of thermal mass for every 1 square foot (0.0929 m^2) of south-facing glazing.
  - **(ii)** Latitude 30 degrees to 35 degrees: 5.5 square feet (0.51 m^2) of thermal mass for every 1 square foot (0.0929 m^2) of south-facing glazing.
  - **(iii)** Latitude 25 degrees to 30 degrees: 6 square feet (0.557 m^2) of thermal mass for every 1 square foot (0.0929 m^2) of south-facing glazing.
- **(c)** Thermal mass not directly exposed to sunlight is permitted to be used to achieve thermal mass requirements of Section 703.7.4 (2) based on a ratio of 40 square feet (3.72 m^2) of thermal mass for every 1 square foot (0.0929 m^2) of south-facing glazing.

(3) In addition to return air or transfer grilles/ducts required by Section 703.7.1(9), provisions for forced airflow to adjoining areas are implemented as needed.

GREEN BUILDING PRACTICES	POINTS

704
HERS INDEX TARGET PATH

704.1 HERS index target compliance. Compliance with the energy chapter shall be permitted to be based on the EPA HERS Index Target Procedure for Energy Star Qualified Homes. Points from Section 704 (HERS Index Target) shall not be combined with points from Section 702 (Performance Path) or Section 703 (Prescriptive Path).

704.2 Point calculation. Points for Section 704 shall be computed based on Steps "1a" through "1d" of the EPA HERS Index Target Procedure. Points shall be computed individually for each building as follows:

30 + (percent less than EnergyStar HERS Index Target for that building) * 2.

705
ADDITIONAL PRACTICES

705.1 Application of additional practice points. Points from Section 705 can be added to points earned in Section 702 (Performance Path), Section 703 (Prescriptive Path), Section 704 (HERS Index Target Path), or Section 701.1.4 (alternative bronze and silver level compliance).

705.2 Lighting

705.2.1 Lighting controls

(Percentages for point thresholds are based on lighting not required for means of egress or security lighting as defined by local building codes.)

705.2.1.1 Interior lighting. In dwelling units, permanently installed interior lighting fixtures are controlled with an occupancy sensor, or dimmer:		
(1)	50 percent to less than 75 percent of lighting fixtures.	**1**
(2)	A minimum of 75 percent of lighting fixtures.	**2**

705.2.1.2 Exterior lighting. Photo or motion sensors are installed on 75 percent of outdoor lighting fixtures to control lighting. **(Percentages for point thresholds does not include lighting equipped with photovoltaics.)**	**1**

705.2.1.3 Multifamily common areas		
(1)	In a multifamily building, occupancy sensors, or dimmers are installed in common areas (except corridors and stairwells).	
(a)	50 percent to less than 75 percent of lighting fixtures.	**1**
(b)	A minimum of 75 percent of lighting fixtures.	**2**

GREEN BUILDING PRACTICES		POINTS
(2)	In a multifamily building, occupancy controls are installed to automatically reduce light levels in interior corridors and exit stairwells when the space is unoccupied. Light levels are reduced by:	
	(a) 50 percent to less than 75 percent or to local minimum requirements	**2**
	(b) A minimum of 75 percent	**3**
705.2.1.4 In a multifamily building, occupancy controls are installed to automatically reduce light levels in garages and parking structures when the space is unoccupied. Light levels are reduced by:		
(1)	50 percent to less than 75 percent or to local minimum requirements	**2**
(2)	A minimum of 75 percent	**3**
705.2.2 TDDs and skylights. A tubular daylighting device (TDD) or a skylight that meets the requirements of Table 703.2.5.2(a) is installed in rooms without windows. **(Points awarded per building.)**		**2**
705.2.3 Lighting outlets. Occupancy sensors are installed for a minimum of 80 percent of hard-wired lighting outlets in the interior living space.		**1**
705.2.4 Recessed luminaires. The number of recessed luminaires that penetrates the thermal envelope is less than 1 per 400 square feet (37.16 m^2) of total conditioned floor area and they are in accordance with Section **701.4.3.5**.		**1**
705.3 Induction cooktop. Induction cooktop is installed.		**1**
705.4 Return ducts and transfer grilles. Return ducts or transfer grilles are installed in every room with a door. Return ducts or transfer grilles are not required for bathrooms, kitchens, closets, pantries, and laundry rooms.		**2**
705.5 HVAC design and installation		
705.5.1 HVAC contractor and service technician are certified by a nationally or regionally recognized program (e.g., North American Technician Excellence, Inc. (NATE), Air Conditioning Contractors of Americas Quality Assured Program (ACCA/QA), Building Performance Institute (BPI), Radiant Panel Association, or a manufacturer's training program).		**1**
705.5.2 Performance of the heating and/or cooling system is verified by the HVAC contractor in accordance with all of the following:		**3**
(1)	Start-up procedure is performed in accordance with the manufacturer's instructions.	
(2)	Refrigerant charge is verified by super-heat and/or sub-cooling method.	
(3)	Burner is set to fire at input level listed on nameplate.	
(4)	Air handler setting/fan speed is set in accordance with manufacturer's instructions.	
(5)	Total airflow is within 10 percent of design flow.	
(6)	Total external system static does not exceed equipment capability at rated airflow.	

GREEN BUILDING PRACTICES	POINTS
705.6 Installation and performance verification	
705.6.1 Third-party on-site inspection is conducted to verify compliance with all of the following, as applicable. Minimum of two inspections are performed: one inspection after insulation is installed and prior to covering, and another inspection upon completion of the building. Where multiple buildings or dwelling units of the same model are built by the same builder, a representative sample inspection of a minimum of 15 percent of the buildings or dwelling units is permitted.	**3**
(1) Ducts are installed in accordance with the ICC IRC or IMC and ducts are sealed.	
(2) Building envelope air sealing is installed.	
(3) Insulation is installed in accordance with Section 701.4.3.2.1.	
(4) Windows, skylights, and doors are flashed, caulked, and sealed in accordance with manufacturer's instructions and in accordance with Section 701.4.3.	
705.6.2 Testing. Testing is conducted to verify performance.	
705.6.2.1 Air leakage validation of building or dwelling units. A visual inspection is performed as described in 701.4.3.2(2) and air leakage testing is performed in accordance with ASTM E779 or ASTM E1827. **(Points awarded only for buildings where building envelope leakage testing is not required by 2015 IECC.)** **(Points not awarded if points are taken under Section 703.2.4)**	
(1) A blower door test.	**3**
(2) Third-party verification is completed.	**5**
705.6.2.2 HVAC airflow testing. Balanced HVAC airflows are demonstrated by flow hood or other acceptable flow measurement tool by a third party. Test results are in accordance with both of the following:	**5**
(1) Measured flow at each supply and return register meets or exceeds the requirements in ACCA 5 QI-2010, Section 5.2.	
(2) Total airflow meets or exceeds the requirements in ACCA 5 QI-2010, Section 5.2.	
705.6.2.3 HVAC duct leakage testing. One of the following is achieved: **(Points awarded only for buildings where duct leakage testing is not required by IECC.)** **(Points not awarded if points are taken under Section 703.4.4)**	
(1) Duct leakage is in accordance with IECC R403.3.3 and R403.3.4.	**3**
(2) Duct leakage is in accordance with IECC R403.3.3 and R403.3.4, and testing is conducted by an independent third party.	**5**

GREEN BUILDING PRACTICES	POINTS
705.6.3 Insulating hot water pipes. Insulation with a minimum thermal resistance (R-value) of at least R-3 is applied to the following, as applicable: **(Points awarded only where these practices are not required by IECC.)**	**1**
(a) piping 3/4-inch and larger in outside diameter	
(b) piping serving more than one dwelling unit	
(c) piping located outside the conditioned space	
(d) piping from the water heater to a distribution manifold	
(e) piping located under a floor slab	
(f) buried piping	
(g) supply and return piping in recirculation systems other than demand recirculation systems	
705.6.4 Potable hot water demand re-circulation system.	
705.6.4.1 Potable hot water demand re-circulation system is installed in a single-family unit.	**1**
705.6.4.2 Potable hot water demand re-circulation system is installed in a multifamily unit in place of a standard circulation pump and control.	**2**
705.7 Submetering system. In multifamily buildings, an advanced electric and fossil fuel submetering system is installed to monitor electricity and fossil fuel consumption for each unit. The device provides consumption information on a monthly or near real-time basis. The information is available to the occupants at a minimum on a monthly basis.	**1**
706 INNOVATIVE PRACTICES	
706.1 Energy consumption control. A whole-building or whole-dwelling unit device or system is installed that controls or monitors energy consumption.	**3 Max**
(1) programmable communicating thermostat with the capability to be controlled remotely	**1**
(2) energy-monitoring device or system	**1**
(3) energy management control system	**3**
(4) programmable thermostat with control capability based on occupant presence or usage pattern	**1**
(5) lighting control system	**1**

GREEN BUILDING PRACTICES	POINTS
706.2 Renewable energy service plan. Renewable energy service plan is provided as follows:	
(1) Builder selects a renewable energy service plan provided by the local electrical utility for interim (temporary) electric service. The builder's local administrative office has renewable energy service.	**1**
(2) The buyer of the building selects one of the following renewable energy service plans provided by the utility prior to occupancy of the building with a minimum two-year commitment.	
(a) less than half of the dwelling's projected electricity and gas use is provided by renewable energy	**1**
(b) half or more of the of the dwelling's projected electricity and gas use is provided by renewable energy	**2**
706.3 Smart appliances and systems. Smart appliances and systems are installed as follows:	
(1) Refrigerator	
(2) Freezer	
(3) Dishwasher	
(4) Clothes Dryer	
(5) Clothes Washer	
(6) Room Air Conditioner	
(7) HVAC Systems	
(8) Service Hot Water Heating Systems	
Three to five smart appliances installed	**1**
Six or more smart appliances installed	**2**
(Items (7) and (8) are permitted to count as two appliances each for the purpose of awarding points.) **(where points awarded in Section 706.3, points shall not be awarded in Section 706.7 and 706.9)**	
706.4 Pumps	
706.4.1 Pool, spa, and water features equipped with filtration pumps as follows:	
(1) Electronically controlled variable-speed pump(s) is installed (full load efficiency of 90 percent or greater).	**1**
(2) Electronically controlled variable-speed pump(s) is installed (full load efficiency of 90 percent or greater) in a pool	**3**
706.4.2 Sump pump(s) with electrically commutated motors (ECMs) or permanent split capacitor (PSC) motors is installed (full load efficiency of 90 percent or greater).	**1**

GREEN BUILDING PRACTICES	POINTS
706.5 On-site renewable energy system. An on-site renewable energy system(s) is installed on the property. **(Points shall not be awarded in this section for solar thermal or geothermal systems that provide space heating, space cooling, or water heating, Points for these systems are awarded in Section 703.)** **(Where onsite renewable energy is included in Section 702 Performance Path or 704 HERS Index Target Path, Section 706.5 shall not be awarded.)** ***Multifamily Building Note:*** *Conditioned common area and non-residential space is excluded for the purpose of calculating number of units.*	**2 points per kW Divided by number of dwelling units**
706.6 Parking garage efficiency. Structured parking garages are designed to require no mechanical ventilation for fresh air requirements.	**2**
706.7 Grid-interactive electric thermal storage system. A grid-interactive electric thermal storage system is installed.	
(1) Grid-Interactive Water Heating System	**1**
(2) Grid-Interactive Space Heating and cooling System **(where points awarded in Section 706.7, points shall not be awarded in Section 706.3 and 706.9)**	**1**
706.8 Electrical vehicle charging station. A Level 2 or Level 3 electric vehicle charging station is installed on the building site. (Note: Charging station shall not be included in the building energy consumption.)	**2**
706.9 Automatic demand response. Automatic demand response system is installed that curtails energy usage upon a signal from the utility or an energy service provider is installed. **(where points awarded in Section 706.9, points shall not be awarded in Section 706.3 and 706.7)**	**1**

CHAPTER 8

WATER EFFICIENCY

GREEN BUILDING PRACTICES	POINTS
801 INDOOR AND OUTDOOR WATER USE	
801.0 Intent. Measures that reduce indoor and outdoor water usage are implemented.	
801.1 Indoor hot water usage. Indoor hot water supply system is in accordance with one of the practices listed in items (1) through (5). The maximum water volume from the source of hot water to the termination of the fixture supply is determined in accordance with Tables 801.1(1) or 801.1(2). The maximum pipe length from the source of hot water to the termination of the fixture supply is 50 feet. **(Where more than one water heater is used or where more than one type of hot water supply system, including multiple circulation loops, is used, points are awarded only for the system that qualifies for the minimum number of points.)** **(Systems with circulation loops are eligible for points only if pumps are demand controlled. Circulation systems with timers or aquastats and constant-on circulation systems are not eligible to receive points.)** **(Points awarded only if the pipes are insulated in accordance with Section 705.6.3.)**	
(1) The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 128 ounces (1 gallon or 3.78 liters).	**11**
(2) The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 64 ounces (0.5 gallon or 1.89 liters).	**17**
(3) The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 32 ounces (0.25 gallon or 0.945 liters).	**29**
(4) A demand controlled hot water priming pump is installed on the main supply pipe of the circulation loop and the maximum volume from this supply pipe to the furthest fixture is 24 ounces (0.19 gallons or 0.71 liters).	**35**
(a) The volume in the circulation loop (supply) from the water heater or boiler to the branch for the furthest fixture is no more than 128 ounces (1 gallon or 3.78 liters).	**4 Additional**
(5) A central hot water recirculation system is implemented in multifamily buildings in which the hot water line distance from the recirculating loop to the engineered parallel piping system (i.e., manifold system) is less than 30 feet (9,144 mm) and the parallel piping to the fixture fittings contains a maximum of 64 ounces (1.89 liters) (115.50 cubic inches) (0.50 gallons).	**9**

GREEN BUILDING PRACTICES	POINTS

(6) Tankless water heater(s) with at least 0.5 gallon (1.89 liters) of storage are installed, or a tankless water heater that ramps up to at least 110F within 5 seconds is installed. The storage may be internal or external to the tankless water heater.

4 Additional

Table 801.1(1)
Maximum Pipe Length Conversion Table[a]

Nominal Pipe Size (inch)	Liquid Ounces per Foot of Length	Main, Branch, and Fixture Supply System Volume Category			Branch and Fixture Supply Volume from Circulation Loop
		128 ounces (1 gallons) [per 801.1(1)]	64 ounces (0.5 gallon) [per 801.1(2)]	32 ounces (0.25 gallon) [per 801.1(3)]	24 ounces (0.19 gallon) [per 801.1(4)]
		Maximum Pipe Length (feet)			
1/4[b]	0.33	50	50	50	50
5/16[b]	0.5	50	50	50	48
3/8[b]	0.75	50	50	43	32
1/2	1.5	50	43	21	16
5/8	2	50	32	16	12
3/4	3	43	21	11	8
7/8	4	32	16	8	6
1	5	26	13	6	5
1 1/4	8	16	8	4	3
1 1/2	11	12	6	3	2
2	18	7	4	2	1

a. Maximum pipe length figures apply when the entire pipe run is one nominal diameter only. Where multiple pipe diameters are used, the combined volume shall not exceed the volume limitation in Section 801.1.

b. The maximum flow rate through 1/4 inch nominal piping shall not exceed 0.5 gpm. The maximum flow rate through 5/16 inch nominal piping shall not exceed 1 gpm. The maximum flow rate through 3/8 inch nominal piping shall not exceed 1.5 gpm.

Table 801.1(2)
Common Hot Water Pipe Internal Volumes
OUNCES OF WATER PER FOOT OF PIPE

Size Nominal, Inch	Copper Type M	Copper Type L	Copper Type K	CPVC CTS SDR 11	CPVC SCH 40	CPVC SCH 80	PE-RT SDR 9	Composite ASTM F 1281	PEX CTS SDR 9	PP SDR 7.4 F2389	PP SDR 9 F2389
3/8	1.06	0.97	0.84	N/A	1.17	N/A	0.64	0.63	0.64	N/A	N/A
1/2	1.69	1.55	1.45	1.25	1.89	1.46	1.18	1.31	1.18	1.72	1.96
3/4	3.43	3.22	2.90	2.67	3.38	2.74	2.35	3.39	2.35	2.69	3.06
1	5.81	5.49	5.17	4.43	5.53	4.57	3.91	5.56	3.91	4.41	5.01
1 ¼	8.70	8.36	8.09	6.61	9.66	8.24	5.81	8.49	5.81	6.90	7.83
1 ½	12.18	11.83	11.45	9.22	13.2	11.38	8.09	13.88	8.09	10.77	12.24
2	21.08	20.58	20.04	15.79	21.88	19.11	13.86	21.48	13.86	17.11	19.43

GREEN BUILDING PRACTICES	POINTS
801.2 Water-conserving appliances. ENERGY STAR or equivalent water-conserving appliances are installed.	
(1) dishwasher	**2**
(2) washing machine, or	**13**
(3) washing machine with a water factor of 4.0 or less	**24**
Multifamily Building Note*: Washing machines are installed in individual units or provided in common areas of* multifamily *buildings.*	
801.3 Showerheads. Showerheads are in accordance with the following:	
(1) The total maximum combined flow rate of all showerheads controlled by a single valve at any point in time in a shower compartment is 1.6 to less than 2.5 gpm. Maximum of two valves are installed per shower compartment. The flow rate is tested at 80 psi (552 kPa) in accordance with ASME A112.18.1. Showerheads are served by an automatic compensating valve that complies with ASSE 1016 or ASME A112.18.1 and specifically designed to provide thermal shock and scald protection at the flow rate of the showerhead. **(Points awarded per shower compartment. In multifamily buildings, the average of the points assigned to individual dwelling units may be used as the number of points awarded for this practice, rounded to the nearest whole number.)**	**4 for first compartment** **1 for each additional compartment in dwelling** **7 Max**
(2) All shower compartments in the dwelling unit(s) and common areas meet the requirements of 801.3(1) and all showerheads are in accordance with one of the following:	
(a) 2.0 to less than 2.5 gpm	**6 Additional**
(b) 1.6 to less than 2.0 gpm	**10 Additional**
(c) Less than 1.6 gpm	**14 Additional**
(3) Any shower control that can shut off water flow without affecting temperature is installed. **(Points awarded per shower control.)**	**1** **3 Max**
For SI: 1 gallon per minute = 3.785 L/m	
801.4 Lavatory faucets	
801.4.1 Water-efficient lavatory faucets with a maximum flow rate of 1.5 gpm (5.68 L/m), tested at 60 psi (414 kPa) in accordance with ASME A112.18.1, are installed:	
(1) a bathroom (all faucets in a bathroom are in compliance) **(Points awarded for each bathroom. In multifamily buildings, the average of the points assigned to individual dwelling units may be used as the number of points awarded for this practice, rounded to the nearest whole number.)**	**1** **3 Max**
(2) all lavatory faucets in the dwelling unit(s)	**6 Additional**
801.4.2 Self-closing valve, motion sensor, metering, or pedal-activated faucet is installed to enable intermittent on/off operation. **(Points awarded per fixture.)**	**1** **3 Max**

GREEN BUILDING PRACTICES	POINTS
801.5 Water closets and urinals. Water closets and urinals are in accordance with the following: **(Points awarded for 801.5(2) or 801.5(3), not both.)**	
(1) Gold and emerald levels: All water closets and urinals are in accordance with Section 801.5.	**Mandatory**
(2) A water closet is installed with an effective flush volume of 1.28 gallons (4.85 L) or less and meets the flush performance criteria when tested in accordance with ASME A112.19.2/CSA B45.1 or ASME A112.19.14 as applicable. **(Points awarded per fixture. In multifamily buildings, the average of the points assigned to individual dwelling units may be used as the number of points awarded for this practice, rounded to the nearest whole number.)**	**2** **6 Max**
(3) All water closets are in accordance with Section 801.5(2).	**11**
(4) All water closets are in accordance with Section 801.5(2) and one or more of the following are installed:	
(a) Water closets that have a flush volume of 1.2 gallons or less. **(Points awarded per toilet. In multifamily buildings, the average of the points assigned to individual dwelling units may be used as the number of points awarded for this practice, rounded to the nearest whole number.)**	**1 Additional** **3 Additional Max**
(b) One or more urinals with a flush volume of 0.5 gallons (1.9L) or less when tested in accordance with ASME A112.19.2.	**1 Additional**
(c) One or more composting or waterless toilets and/or urinals.	**6 Additional**
801.6 Irrigation systems	
801.6.1 Sprinkler nozzles have a maximum precipitation rate of 1.20 inches per hour for turf or landscaping. Nozzle performance is tested by an accredited third party laboratory and results are posted on Smart Water Application Technologies website or similar.	**6**
801.6.2 Drip irrigation is installed.	**13 Max**
(1) Drip irrigation is installed for all landscape beds.	**4**
(2) Subsurface drip is installed for all turf grass areas.	**4**
(3) Drip irrigation zones specifications show plant type by name and water use/need for each emitter (Points awarded only if specifications are implemented.)	**5**
801.6.3 Where an irrigation system is installed, an irrigation plan and implementation are executed by a qualified professional certified by a WaterSense labeled program or equivalent program as approved by Adopting Entity.	**Mandatory**

GREEN BUILDING PRACTICES		POINTS
801.6.4 The irrigation system(s) is controlled by a smart controller or no irrigation is installed. **(Points are not additive.)**		
(1)	Evapotranspiration (ET) based irrigation controller with a rain sensor or soil moisture sensor based irrigation controller.	**8**
(2)	Irrigation controllers are labeled by EPA WaterSense program	**10**
(3)	No irrigation is installed and a landscape plan is developed in accordance with Section 503.5, as applicable.	**15**
801.6.5 All irrigation zones utilize pressure regulation so emission devices (sprinklers and drip emitters) operate at manufacturer's recommended operating pressure.		**3**
801.7 Rainwater collection and distribution. Rainwater collection and distribution is provided.		
801.7.1 Rainwater is used for irrigation in accordance with one of the following:		
(1)	Rainwater is diverted for landscape irrigation without impermeable water storage	**5**
(2)	Rainwater is diverted for landscape irrigation with impermeable water storage in accordance with one of the following:	
	(a) 50 – 499 gallon storage capacity	**5**
	(b) 500 – 2499 gallon storage capacity	**10**
	(c) 2500 gallon or larger storage capacity (system is designed by a professional certified by The American Rainwater Catchment Systems Association or equivalent)	**15**
	(d) All irrigation demands are met by rainwater capture (documentation demonstrating the water needs of the landscape is provided and the system is designed by a professional certified by The American Rainwater Catchment Systems Association or equivalent).	**25**
801.7.2 Rainwater is used for indoor domestic demand as follows. The system is designed by a professional certified by The American Rainwater Catchment Systems Association or equivalent.		
(1)	Rainwater is used to supply an indoor appliance or fixture for any locally approved use. **(Points awarded per appliance or fixture.)**	**5** **15 Max**
(2)	Rainwater provides for total domestic demand.	**25**
801.8 Sediment filters. Water filter is installed to reduce sediment and protect plumbing fixtures for the whole building or the entire dwelling unit.		**1**

GREEN BUILDING PRACTICES	POINTS
802 INNOVATIVE PRACTICES	
802.1 Reclaimed, gray, or recycled water. Reclaimed, gray, or recycled water is used as permitted by applicable code. **(Points awarded for either Section 802.1(1) or 802.1(2), not both.)** **(Points awarded for either Section 802.6 or 802.1, not both.)**	
(1) each water closet flushed by reclaimed, gray, or recycled water **(Points awarded per fixture or appliance.)**	**5 20 Max**
(2) irrigation from reclaimed, gray, or recycled water on-site	**10**
802.2 Reclaimed water, graywater, or rainwater pre-piping. Reclaimed, graywater, or rainwater systems are rough plumbed (and permanently marked, tagged or labeled) into buildings for future use.	**3 per roughed in system**
802.3 Automatic shutoff water devices. One of the following automatic shutoff water supply devices is installed. Where a fire sprinkler system is present, installer is to ensure the device will not interfere with the operation of the fire sprinkler system.	**2**
(1) excess water flow automatic shutoff	
(2) leak detection system with automatic shutoff	
802.4 Engineered biological system or intensive bioremediation system. An engineered biological system or intensive bioremediation system is installed and the treated water is used on site. Design and implementation are approved by appropriate regional authority.	**20**
802.5 Recirculating humidifier. Where a humidifier is required, a recirculating humidifier is used in lieu of a traditional “flow through” type.	**1**
802.6 Advanced wastewater treatment system. Advanced wastewater (aerobic) treatment system is installed and treated water is used on site. **(Points awarded for either Section 802.6 or 802.1, not both.)**	**20**

CHAPTER 9

INDOOR ENVIRONMENTAL QUALITY

GREEN BUILDING PRACTICES	POINTS
901 POLLUTANT SOURCE CONTROL	
901.0 Intent. Pollutant sources are controlled.	
901.1 Space and water heating options	
901.1.1 Natural draft furnaces, boilers, or water heaters are not located in conditioned spaces, including conditioned crawlspaces, unless located in a mechanical room that has an outdoor air source and is sealed and insulated to separate it from the conditioned space(s). **(Points are awarded only for buildings that use natural draft combustion space or water heating equipment.)**	**5**
901.1.2 Air handling equipment or return ducts are not located in the garage, unless placed in isolated, air-sealed mechanical rooms with an outside air source.	**5**
901.1.3 The following combustion space heating or water heating equipment is installed within conditioned space:	
(1) all furnaces or all boilers	
(a) power-vent furnace(s) or boiler(s)	**3**
(b) direct-vent furnace(s) or boiler(s)	**5**
(2) all water heaters	
(a) power-vent water heater(s)	**3**
(b) direct-vent water heater(s)	**5**
901.1.4 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 and direct heating equipment are vented to the outdoors.	**Mandatory**
901.1.5 Natural gas and propane fireplaces are direct vented, have permanently fixed glass fronts or gasketed doors, and comply with CSA Z21.88/CSA 2.33 or CSA Z21.50b/CSA 2.22b.	**7**
901.1.6 The following electric equipment is installed:	
(1) heat pump air handler in unconditioned space	**2**
(2) heat pump air handler in conditioned space	**5**

GREEN BUILDING PRACTICES	POINTS
901.2 Solid fuel-burning appliances	
901.2.1 Solid fuel-burning fireplaces, inserts, stoves and heaters are code compliant and are in accordance with the following requirements:	**Mandatory**
(1) Site-built masonry wood-burning fireplaces use outside combustion air and include a means of sealing the flue and the combustion air outlets to minimize interior air (heat) loss when not in operation.	**4**
(2) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are EPA certified or Phase 2 Qualified.	**6**
(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).	**6**
(4) Pellet (biomass) stoves and furnaces are in accordance with ASTM E1509 or are EPA certified.	**6**
(5) Masonry heaters are in accordance with the definitions in ASTM E1602 and ICC IBC Section 2112.1.	**6**
901.2.2 Fireplaces, woodstoves, pellet stoves, or masonry heaters are not installed.	**6**
901.3 Garages. Garages are in accordance with the following:	
(1) Attached garage	
(a) Doors installed in the common wall between the attached garage and conditioned space are tightly sealed and gasketed.	**Mandatory 2**
(b) A continuous air barrier is provided separating the garage space from the conditioned living spaces.	**Mandatory 2**
(c) For one- and two-family dwelling units, a 100 cfm (47 L/s) or greater ducted or 70 cfm (33 L/s) cfm or greater unducted wall exhaust fan is installed and vented to the outdoors and is designed and installed for continuous operation or has controls (e.g., motion detectors, pressure switches) that activate operation for a minimum of 1 hour when either human passage door or roll-up automatic doors are operated. For ducted exhaust fans, the fan airflow rating and duct sizing are in accordance with Appendix A.	**8**
(2) A carport is installed, the garage is detached from the building, or no garage is installed.	**10**
901.4 Wood materials. A minimum of 85 percent of material within a 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:	**10 Max**
(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 as follows: Exposure 1 or Exterior for plywood, and Exposure 1 for OSB.	**Mandatory**
(2) Particleboard and MDF (medium density fiberboard) is manufactured and labeled in accordance with CPA A208.1 and CPA A208.2, respectively. **(Points awarded per product group.)**	**2**

GREEN BUILDING PRACTICES	POINTS
(3) Hardwood plywood in accordance with HPVA HP-1. **(Points awarded per product group.)**	**2**
(4) Particleboard, MDF, or hardwood plywood is in accordance with CPA 4. **(Points awarded per product group.)**	**3**
(5) Composite wood or agrifiber panel products contain no added urea-formaldehyde or are in accordance with the CARB *Composite Wood Air Toxic Contaminant Measure Standard*. **(Points awarded per product group.)**	**4**
(6) Non-emitting products. **(Points awarded per product group.)**	**4**

901.5 Cabinets. A minimum of 85 percent of installed cabinets are in accordance with one or both of the following: **(Where both of the following practices are used, only 3 points are awarded.)**	
(1) All parts of the cabinet are made of solid wood or non-formaldehyde emitting materials such as metal or glass.	**5**
(2) The composite wood used in wood cabinets is in accordance with CARB *Composite Wood Air Toxic Contaminant Measure Standard* or equivalent as certified by a third-party program such as, but not limited to, those in Appendix D.	**3**

901.6 Carpets. Wall-to-wall carpeting is not installed adjacent to water closets and bathing fixtures.	**Mandatory**

901.7 Floor materials. The following types of finished flooring materials are used. The materials have emission levels in accordance with CDPH/EHLB Standard Method v1.1. Product is tested by a laboratory with the CDPH/EHLB Standard Method v1.1 within the laboratory scope of accreditation to ISO/IEC 17025 and certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D. **(Points are awarded for every 10% of conditioned floor space using one of the below materials.)**	**1** **8 max**
(1) Hard surface flooring: Prefinished installed hard-surface flooring is installed. Where post-manufacture coatings or surface applications have not been applied, the following hard surface flooring types are deemed to comply with the emission requirements of this practice:	
(a) Ceramic tile flooring	
(b) Organic-free, mineral-based flooring	
(c) Clay masonry flooring	
(d) Concrete masonry flooring	
(e) Concrete flooring	
(f) Metal flooring	
(2) Carpet and carpet cushion is installed. **(When carpet cushion meeting the emission limits of the practice is also installed, the percentage of compliant carpet area is calculated at 1.33 times the actual installed area.)**	

GREEN BUILDING PRACTICES	POINTS
901.8 Wall coverings. A minimum of 10 percent of the interior wall surfaces are covered and a minimum of 85 percent of wall coverings are in accordance with the emission concentration limits of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.	**4**

901.8 Wall coverings. A minimum of 10 percent of the interior wall surfaces are covered and a minimum of 85 percent of wall coverings are in accordance with the emission concentration limits of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D. **4**

901.9 Interior architectural coatings. A minimum of 85 percent of the interior architectural coatings are in accordance with either Section 901.9.1 or Section 901.9.3, not both. A minimum of 85 percent of architectural colorants are in accordance with Section 901.9.2.

Exception: Interior architectural coatings that are formulated to remove formaldehyde and other aldehydes in indoor air and are tested and labeled in accordance with ISO 16000-23, Indoor air -- Part 23: Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials.

901.9.1 Site-applied interior architectural coatings, which are inside the water proofing envelope, are in accordance with one or more of the following: **5**

(1) Zero VOC as determined by EPA Method 24 (VOC content is below the detection limit for the method)

(2) GreenSeal GS-11

(3) CARB *Suggested Control Measure for Architectural Coatings* (see Table 901.9.1).

Table 901.9.1
VOC Content Limits For Architectural Coatings[a,b,c]

Coating Category	LIMIT[d] (g/l)
Flat Coatings	50
Non-flat Coatings	100
Non-flat High-Gloss Coatings	150
Specialty Coatings:	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete/Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings	120[e]
Magnesite Cement Coatings	450

GREEN BUILDING PRACTICES	POINTS

Coating Category	LIMIT[d] (g/l)
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multi-Color Coatings	250
Pre-Treatment Wash Primers	420
Primers, Sealers, and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs, Clear	730
Shellacs, Opaque	550
Specialty Primers, Sealers, and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Tub and Tile Refinish Coatings	420
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350
Zinc-Rich Primers	340

a. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.
b. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008.
c. Table 901.9.1 architectural coating regulatory category and VOC content compliance determination shall conform to the California Air Resources Board Suggested Control Measure for Architectural Coatings dated February 1, 2008.
d. Limits are expressed as VOC Regulatory (except as noted), thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.
e. Limit is expressed as VOC actual.

901.9.2 Architectural coating colorant additive VOC content is in accordance with Table 901.9.2. **(Points for 901.9.2 are awarded only if base architectural coating is in accordance with 901.9.1.)** — **1**

Table 901.9.2
VOC Content Limits for Colorants

Colorant	LIMIT (g/l)
Architectural Coatings, excluding IM Coatings	50
Solvent-Based IM	600
Waterborne IM	50

901.9.3 Site-applied interior architectural coatings, which are inside the waterproofing envelope, are in accordance with the emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix D. — **8**

GREEN BUILDING PRACTICES	POINTS

901.10 Interior adhesives and sealants. A minimum of 85 percent of site-applied adhesives and sealants located inside the waterproofing envelope are in accordance with one of the following, as applicable.

(1)	The emission levels are in accordance with CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix D.	**8**
(2)	GreenSeal GS-36.	**5**
(3)	SCAQMD Rule 1168 in accordance with Table 901.10(3), excluding products that are sold in 16-ounce containers or less and are regulated by the California Air Resources Board (CARB) Consumer Products Regulations.	**5**

Table 901.10(3)
Site Applied Adhesive and Sealants VOC Limits[a,b]

ADHESIVE OR SEALANT	VOC LIMIT (g/l)
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
Architectural sealants	250
Architectural sealant primer Non-porous Porous	 250 775
Modified bituminous sealant primer	500
Other sealant primers	750
CPVC solvent cement	490
PVC solvent cement	510
ABS solvent cement	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140

a. VOC limit less water and less exempt compounds in grams/liter
b. For low-solid adhesives and sealants, the VOC limit is expressed in grams/liter of material as specified in Rule 1168. For all other adhesives and sealants, the VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds as specified in Rule 1168.

GREEN BUILDING PRACTICES	POINTS
901.11 Insulation. Emissions of 85 percent of wall, ceiling, and floor insulation materials are in accordance with the emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. Insulation is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.	**4**
901.12 Carbon monoxide (CO) alarms. A carbon monoxide (CO) alarm is provided in accordance with the IRC Section R315.	**Mandatory**
901.13 Building entrance pollutants control. Pollutants are controlled at all main building entrances by one of the following methods:	
(1) Exterior grilles or mats are installed in a fixed manner and may be removable for cleaning.	**1**
(2) Interior grilles or mats are installed in a fixed manner and may be removable for cleaning.	**1**
901.14 Non-smoking areas. Environmental tobacco smoke is minimized by one or more of the following:	
(1) All interior common areas of a multifamily building are designated as non-smoking areas with posted signage.	**1**
(2) Exterior smoking areas of a multifamily building are designated with posted signage and located a minimum of 25 feet from entries, outdoor air intakes, and operable windows.	**1**
902 POLLUTANT CONTROL	
902.0 Intent. Pollutants generated in the building are controlled.	
902.1 Spot ventilation	
902.1.1 Spot ventilation is in accordance with the following:	
(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. **(Points are awarded only if a window complying with IRC Section R303.3 is provided in addition to mechanical ventilation.)**	**Mandatory 1**
(2) Clothes dryers (except listed and labeled condensing ductless dryers) are vented to the outdoors.	**Mandatory**
(3) Kitchen exhaust units and/or range hoods are ducted to the outdoors and have a minimum ventilation rate of 100 cfm (47.2 L/s) for intermittent operation or 25 cfm (11.8 L/s) for continuous operation.	**8**
902.1.2 Bathroom and/or laundry exhaust fan is provided with an automatic timer and/or humidistat:	**11 Max**
(1) for first device	**5**
(2) for each additional device	**2**

GREEN BUILDING PRACTICES	POINTS
902.1.3 Kitchen range, bathroom, and laundry exhaust are verified to air flow specification. Ventilation airflow at the point of exhaust is tested to a minimum of:	**8**
(a) 100 cfm (47.2 L/s) intermittent or 25 cfm (11.8 L/s) continuous for kitchens, and	
(b) 50 cfm (23.6 L/s) intermittent or 20 cfm (9.4 L/s) continuous for bathrooms and/or laundry	

902.1.4 Exhaust fans are ENERGY STAR, as applicable.	**12 Max**
(1) ENERGY STAR, or equivalent, fans **(Points awarded per fan.)**	**2**
(2) ENERGY STAR, or equivalent, fans operating at or below 1 sone **(Points awarded per fan.)**	**3**

902.1.5 Fenestration in spaces other than those identified in 902.1.1 through 902.1.4 are designed for stack effect or cross-ventilation in accordance with all of the following:	**3**
(1) Operable windows, operable skylights, or sliding glass doors with a total area of at least 15 percent of the conditioned floor area are provided.	
(2) Insect screens are provided for all operable windows, operable skylights, and sliding glass doors.	
(3) A minimum of two operable windows or sliding glass doors are placed in adjacent or opposite walls. If there is only one wall surface in that space exposed to the exterior, the minimum windows or sliding glass doors may be on the same wall.	

902.2 Building ventilation systems

902.2.1 One of the following whole building ventilation systems is implemented and is in accordance with the specifications of Appendix B and an explanation of the operation and importance of the ventilation system is included in either 1001.1 or 1002.2.	**Mandatory where the maximum air infiltration rate is less than 5.0 ACH50**
(1) exhaust or supply fan(s) ready for continuous operation and with appropriately labeled controls	**3**
(2) balanced exhaust and supply fans with supply intakes located in accordance with the manufacturer's guidelines so as to not introduce polluted air back into the building	**6**
(3) heat-recovery ventilator	**7**
(4) energy-recovery ventilator	**8**

902.2.2 Ventilation airflow is tested to achieve the design fan airflow at point of exhaust in accordance with Section 902.2.1.	**4**

GREEN BUILDING PRACTICES	POINTS
902.2.3 MERV filters 8 to 13 are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of MERV 8 to 13 filters.	**2**
902.2.4 MERV filters 14 or greater are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of the filter used.	**3**
902.3 Radon control. Radon control measures are in accordance with ICC IRC Appendix F. Zones as defined in Figure 9(1).	
(1) Buildings located in Zone 1	**Mandatory**
(a) a passive radon system is installed	**7**
(b) an active radon system is installed	**10**
(2) Buildings located in Zone 2 or Zone 3	
(a) a passive or active radon system is installed	**7**
902.4 HVAC system protection. One of the following HVAC system protection measures is performed.	**3**
(1) HVAC supply registers (boots), return grilles, and rough-ins are covered during construction activities to prevent dust and other pollutants from entering the system.	
(2) Prior to owner occupancy, HVAC supply registers (boots), return grilles, and duct terminations are inspected and vacuumed. In addition, the coils are inspected and cleaned and the filter is replaced if necessary.	
902.5 Central vacuum systems. Central vacuum system is installed and vented to the outside.	**3**
902.6 Living space contaminants. The living space is sealed in accordance with Section 701.4.3.1 to prevent unwanted contaminants.	**Mandatory**

903
MOISTURE MANAGEMENT: VAPOR, RAINWATER, PLUMBING, HVAC

903.0 Intent. Moisture and moisture effects are controlled.	
903.1 Plumbing	
903.1.1 Cold water pipes in unconditioned spaces are insulated to a minimum of R-4 with pipe insulation or other covering that adequately prevents condensation.	**2**
903.1.2 Plumbing is not installed in unconditioned spaces.	**5**

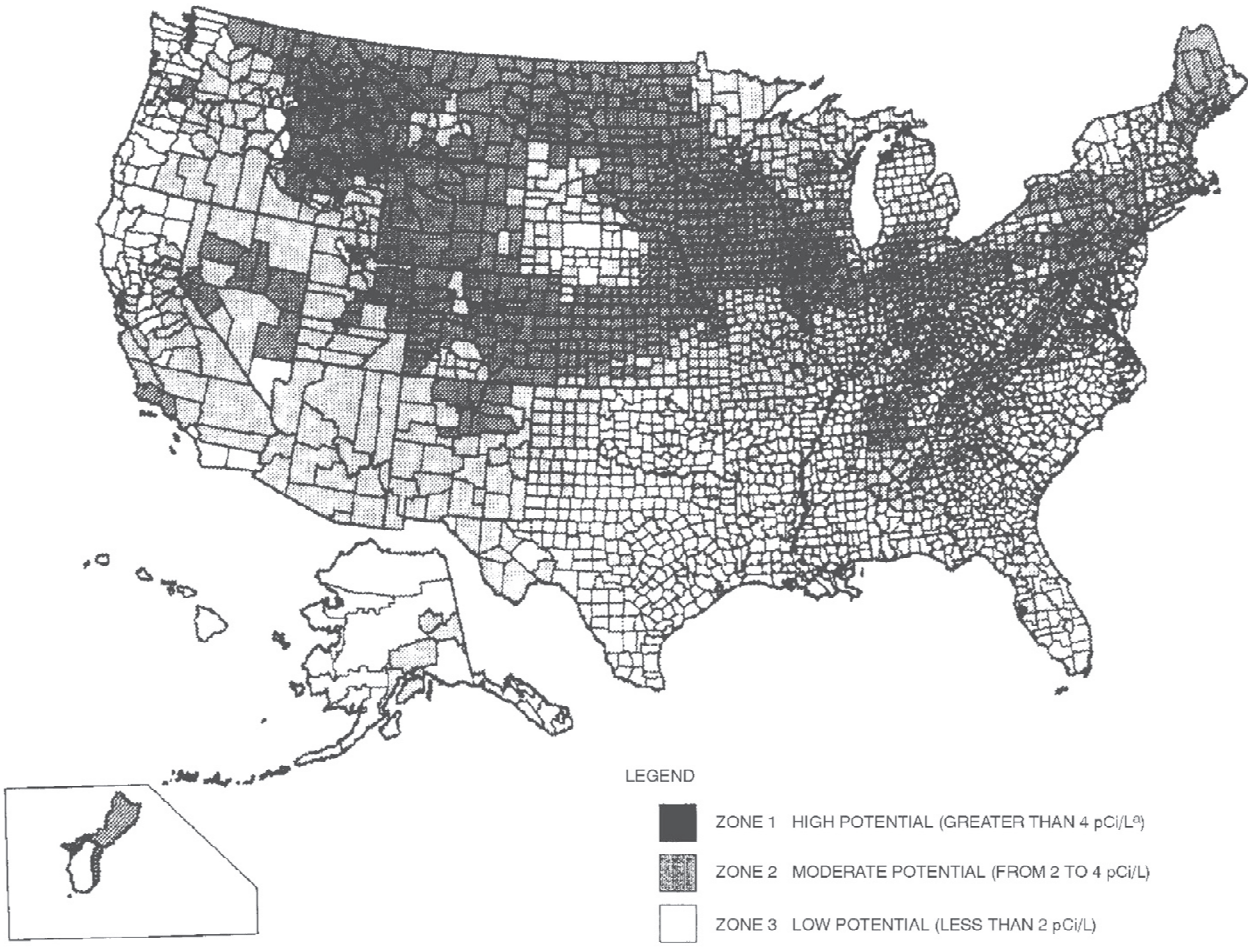
GREEN BUILDING PRACTICES	POINTS
903.2 Duct insulation. Ducts are in accordance with one of the following.	
(1) All HVAC ducts, plenums, and trunks are located in conditioned space.	**1**
(2) All HVAC ducts, plenums, and trunks are in conditioned space. All HVAC ducts are insulated to a minimum of R4.	**3**
903.3 Relative humidity. In climate zones 1A, 2A, 3A, 4A, and 5A as defined by Figure 6(1), equipment is installed to maintain relative humidity (RH) at or below 60 percent using one of the following: **(Points not awarded in other climate zones.)**	**7**
(1) additional dehumidification system(s)	
(2) central HVAC system equipped with additional controls to operate in dehumidification mode	

904 INDOOR AIR QUALITY

904.0 Intent. IAQ is protected by best practices to control ventilation, moisture, pollutant sources and sanitation.	
904.1 Indoor Air Quality (IAQ) during construction. Wood is dry before close-in (602.1.7.1(3)), materials comply with emission criteria (901.4- 901.11), sources of water infiltration or condensation observed during construction have been eliminated, accessible interior surfaces are dry and free of visible suspect growth (per ASTM D7338-10 section 6.3), and water damage (per ASTM D7338-10 section 7.4.3).	**2**
904.2 Indoor Air Quality (IAQ) Post Completion. Verify there are no moisture, mold, and dust issues per 602.1.7.1(3), 901.4-901.11, ASTM D7338 Section 6.3, and ASTM D7338 Section 7.4.3.	**3**

905 INNOVATIVE PRACTICES

905.1 Humidity monitoring system. A humidity monitoring system is installed with a mobile base unit that displays readings of temperature and relative humidity. The system has a minimum of two remote sensor units. One remote sensor unit is placed permanently inside the conditioned space in a central location, excluding attachment to exterior walls, and another remote sensor unit is placed permanently outside of the conditioned space.	**2**
905.2 Kitchen exhaust. A kitchen exhaust unit(s) that equals or exceeds 400 cfm (189 L/s) is installed, and make-up air is provided.	**2**



a. pCi/L standard for picocuries per liter of radon gas. The U.S. Environmental Protection Agency (EPA) recommends that all homes that measure 4 pCi/L and greater be mitigated.

The EPA and the U.S. Geological Survey have evaluated the radon potential in the United States and have developed a map of radon zones designed to assist *building officials* in deciding whether radon-resistant features are applicable in new construction.

The map assigns each of the 3,141 counties in the United States to one of three zones based on radon potential. Each zone designation reflects the average short-term radon measurement that can be expected to be measured in a building without the implementation of radon control methods. The radon zone designation of highest priority is Zone 1. More detailed information can be obtained from state-specific booklets (EPA-402-R-93-021 through 070) available through state radon offices or from EPA regional offices.

FIGURE 9(1)
EPA MAP OF RADON ZONES

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CHAPTER 10

OPERATION, MAINTENANCE, AND BUILDING OWNER EDUCATION

GREEN BUILDING PRACTICES		POINTS
1001 HOMEOWNER'S MANUAL AND TRAINING GUIDELINES FOR ONE- AND TWO-FAMILY DWELLINGS		
1001.0 Intent. Information on the building's use, maintenance, and green components is provided.		
1001.1 Homeowner's manual. A homeowner's manual is provided and stored in a permanent location in the dwelling that includes the following, as available and applicable. **(Points awarded per two items. Points awarded for non-mandatory items.)**		**1 8 Max**
(1)	A National Green Building Standard certificate with a web link and completion document.	**Mandatory**
(2)	List of green building features (can include the national green building checklist).	**Mandatory**
(3)	Product manufacturer's manuals or product data sheet for installed major equipment, fixtures, and appliances. If product data sheet is in the building owners' manual, manufacturer's manual may be attached to the appliance in lieu of inclusion in the building owners' manual.	**Mandatory**
(4)	Maintenance checklist.	
(5)	Information on local recycling and composting programs.	
(6)	Information on available local utility programs that purchase a portion of energy from renewable energy providers.	
(7)	Explanation of the benefits of using energy-efficient lighting systems [e.g., compact fluorescent light bulbs, light emitting diode (LED)] in high-usage areas.	
(8)	A list of practices to conserve water and energy.	
(9)	Information on the importance and operation of the home's fresh air ventilation system.	
(10)	Local public transportation options.	
(11)	A diagram showing the location of safety valves and controls for major building systems.	
(12)	Where frost-protected shallow foundations are used, owner is informed of precautions including:	
	(a) instructions to not remove or damage insulation when modifying landscaping.	
	(b) providing heat to the building as required by the ICC IRC or IBC.	
	(c) keeping base materials beneath and around the building free from moisture caused by broken water pipes or other water sources.	
(13)	A list of local service providers that offer regularly scheduled service and maintenance contracts to ensure proper performance of equipment and the structure (e.g., HVAC, water-heating equipment, sealants, caulks, gutter and downspout system, shower and/or tub surrounds, irrigation system).	

GREEN BUILDING PRACTICES	POINTS
(14) A photo record of framing with utilities installed. Photos are taken prior to installing insulation, clearly labeled, and included as part of the building owners' manual.	
(15) List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials.	
(16) Information on organic pest control, fertilizers, deicers, and cleaning products.	
(17) Information on native landscape materials and/or those that have low water requirements.	
(18) Information on methods of maintaining the building's relative humidity in the range of 30 percent to 60 percent.	
(19) Instructions for inspecting the building for termite infestation.	
(20) Instructions for maintaining gutters and downspouts and importance of diverting water a minimum of 5 feet away from foundation.	
(21) A narrative detailing the importance of maintenance and operation in retaining the attributes of a green-built building.	
(22) Where stormwater management measures are installed on the lot, information on the location, purpose, and upkeep of these measures.	
(23) Explanation of and benefits from green cleaning in the home.	
(24) Retrofit energy calculator that provides baseline for future energy retrofits.	
1001.2 Training of initial homeowners. Initial homeowners are familiarized with the role of occupants in achieving green goals. Training is provided to the responsible party(ies) regarding equipment operation and maintenance, control systems, and occupant actions that will improve the environmental performance of the building. These include:	**Mandatory**
(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.	

1002
CONSTRUCTION, OPERATION, AND MAINTENANCE MANUALS AND TRAINING FOR MULTIFAMILY BUILDINGS

1002.0 Intent. Manuals are provided to the responsible parties (owner, management, tenant, and/or maintenance team) regarding the construction, operation, and maintenance of the building. Paper or digital format manuals are to include information regarding those aspects of the building's construction, maintenance, and operation that are within the area of responsibilities of the respective recipient. One or more responsible parties are to receive a copy of all documentation for archival purposes.

GREEN BUILDING PRACTICES		POINTS
1002.1 Building construction manual. A building construction manual, including five or more of the following, is compiled and distributed in accordance with Section 1002.0. **(Points awarded per two items. Points awarded for non-mandatory items.)**		**1**
(1)	A narrative detailing the importance of constructing a green building, including a list of green building attributes included in the building. This narrative is included in all responsible parties' manuals.	**Mandatory**
(2)	A local green building program certificate as well as a copy of the *National Green Building Standard™*, as adopted by the Adopting Entity, and the individual measures achieved by the building.	**Mandatory**
(3)	Warranty, operation, and maintenance instructions for all equipment, fixtures, appliances, and finishes.	**Mandatory**
(4)	Record drawings of the building.	
(5)	A record drawing of the site including stormwater management plans, utility lines, landscaping with common name and genus/species of plantings.	
(6)	A diagram showing the location of safety valves and controls for major building systems.	
(7)	A list of the type and wattage of light bulbs installed in light fixtures.	
(8)	A photo record of framing with utilities installed. Photos are taken prior to installing insulation and clearly labeled.	

1002.2 Operations manual. Operations manuals are created and distributed to the responsible parties in accordance with Section 1002.0. Between all of the operation manuals, five or more of the following options are included. **(Points awarded per two items. Points awarded for non-mandatory items.)**		**1**
(1)	A narrative detailing the importance of operating and living in a green building. This narrative is included in all responsible parties' manuals.	**Mandatory**
(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).	**Mandatory**
(3)	Information on methods of maintaining the building's relative humidity in the range of 30 percent to 60 percent.	
(4)	Information on opportunities to purchase renewable energy from local utilities or national green power providers and information on utility and tax incentives for the installation of on-site renewable energy systems.	
(5)	Information on local and on-site recycling and hazardous waste disposal programs and, if applicable, building recycling and hazardous waste handling and disposal procedures.	
(6)	Local public transportation options.	
(7)	Explanation of the benefits of using compact fluorescent light bulbs, LEDs, or other high-efficiency lighting.	
(8)	Information on native landscape materials and/or those that have low water requirements.	
(9)	Information on the radon mitigation system, where applicable.	

GREEN BUILDING PRACTICES		POINTS
(10)	A procedure for educating tenants in rental properties on the proper use, benefits, and maintenance of green building systems including a maintenance staff notification process for improperly functioning equipment.	
(11)	Information on the importance and operation of the building's fresh air ventilation system.	

1002.3 Maintenance manual. Maintenance manuals are created and distributed to the responsible parties in accordance with Section 1002.0. Between all of the maintenance manuals, five or more of the following options are included. **(Points awarded per two items. Points awarded for non-mandatory items.)**		**1**
(1)	A narrative detailing the importance of maintaining a green building. This narrative is included in all responsible parties' manuals.	**Mandatory**
(2)	A list of local service providers that offer regularly scheduled service and maintenance contracts to ensure proper performance of equipment and the structure (e.g., HVAC, water-heating equipment, sealants, caulks, gutter and downspout system, shower and/or tub surrounds, irrigation system).	
(3)	User-friendly maintenance checklist that includes:	
	(a) HVAC filters	
	(b) thermostat operation and programming	
	(c) lighting controls	
	(d) appliances and settings	
	(e) water heater settings	
	(f) fan controls	
(4)	List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials.	
(5)	Information on organic pest control, fertilizers, deicers, and cleaning products.	
(6)	Instructions for maintaining gutters and downspouts and the importance of diverting water a minimum of 5 feet away from foundation.	
(7)	Instructions for inspecting the building for termite infestation.	
(8)	A procedure for rental tenant occupancy turnover that preserves the green features.	
(9)	An outline of a formal green building training program for maintenance staff.	
(10)	A green cleaning plan which includes guidance on sustainable cleaning products.	

1002.4 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 equipment operation and maintenance, control systems, and occupant actions that will improve the environmental performance of the building. These include:		**Mandatory**
(1)	HVAC filters	
(2)	thermostat operation and programming	
(3)	lighting controls	
(4)	appliances operation	

GREEN BUILDING PRACTICES	POINTS
(5) water heater settings and hot water use	
(6) fan controls	
(7) recycling and composting practices	

1003 PUBLIC EDUCATION

1003.0 Intent. Increase public awareness of the National Green Building Standard and projects constructed in accordance with National Green Building Standard to help increase demand for high-performance homes.

1003.1 Public education. One or more of the following is implemented.	**2 Max**
(1) **Signage.** Signs showing the project is designed and built in accordance with the National Green Building Standard are posted on the construction site.	**1**
(2) **Certification Plaques.** National Green Building Standard certification plaques with rating level attainted are placed in a conspicuous location near the utility area of the home or, in a conspicuous location near the main entrance of a multifamily building.	**1**
(3) **Education.** A URL for the National Green Building Standard is included on site signage, builder website (or property website for multifamily buildings), and marketing materials for homes certified under the National Green Building Standard.	**1**

1004 POST OCCUPANCY PERFORMANCE ASSESSMENT

1004.0 Intent. A verification system for post occupancy assessment of the building is intended to be a management tool for the building owner to determine if energy or water usage have deviated from expected levels so that inspection and correction action can be taken.

1004.1 Verification system. A verification system plan is provided in the building owner's manual (Sections 1001 or 1002). The verification system provides methods for demonstrating continued energy and water savings that are determined from the building's initial year of occupancy of water and energy consumption as compared to annualized consumption at least every four years.	
(1) Verification plan is developed top monitor post-occupancy energy and water use and is provided in the building owner's manual.	**1**
(2) Verification system is installed in the building to monitor post-occupancy energy and water use.	**3**

1005 INNOVATIVE PRACTICES

1005.1 (Reserved)

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CHAPTER 11

REMODELING

GREEN BUILDING PRACTICES	POINTS
Note: Where applicable, section numbering in Chapter 11 parallels a corresponding practice in a previous chapter.	
11.500 LOT DESIGN, PREPARATION, AND DEVELOPMENT	
11.500.0 Intent. This section applies to the lot and changes to the lot due to remodeling of an existing building.	
11.501 LOT SELECTION	
11.501.2 Multi-modal transportation. A range of multi-modal transportation choices are promoted by one or more of the following:	
(1) The building is located within one-half mile (805 m) of pedestrian access to a mass transit system.	**6**
(2) The building is located within five miles (8,046 m) of a mass transit station with provisions for parking.	**3**
(3) The building is located within one-half mile (805 m) of six or more community resources. No more than two each of the following use category can be counted toward the total: Recreation, Retail, Civic, and Services. Examples of resources in each category include, but are not limited to the following: *Recreation: recreational facilities (such as pools, tennis courts, basketball courts), parks.* *Retail: grocery store, restaurant, retail store.* *Civic: post office, place of worship, community center.* *Services: bank, daycare center, school, medical/dental office, Laundromat/dry cleaners.*	**4**
(4) The building is on a lot located within a community that has rights-of-way specifically dedicated to bicycle use in the form of paved paths or bicycle lanes, or is on an infill lot located within 1/2 mile of a bicycle lane designated by the jurisdiction.	**5**
(5) Dedicated bicycle parking and racks are constructed for mixed-use and multifamily buildings:	
(a) Minimum of 1 bicycle parking space per 3 residential units	**2**
(b) Minimum of 1 bicycle parking space per 2 residential units	**4**
(c) Minimum of 1 bicycle parking space per 1 residential unit.	**6**
11.502 PROJECT TEAM, MISSION STATEMENT, AND GOALS	
11.502.1 Project team, mission statement, and goals. A knowledgeable team is established and team member roles are identified with respect to green lot design, preparation, and development. The project's green goals and objectives are written into a mission statement.	**4**

GREEN BUILDING PRACTICES	POINTS

11.503 LOT DESIGN

11.503.0 Intent. The lot is designed to avoid detrimental environmental impacts first, to minimize any unavoidable impacts, and to mitigate for those impacts that do occur. The project is designed to minimize environmental impacts and to protect, restore, and enhance the natural features and environmental quality of the lot.

(Points awarded only if the intent of the design is implemented.)

11.503.1 Natural resources. Natural resources are conserved by one or more of the following:		
(1)	A natural resources inventory is completed under the direction of a qualified professional.	**5**
(2)	A plan is implemented to conserve the elements identified by the natural resource inventory as high-priority resources.	**6**
(3)	Items listed for protection in the natural resource inventory plan are protected under the direction of a qualified professional.	**4**
(4)	Basic training in tree or other natural resource protection is provided for the on-site supervisor.	**4**
(5)	All tree pruning on-site is conducted by a certified arborist or other qualified professional.	**3**
(6)	Ongoing maintenance of vegetation on the lot during construction is in accordance with TCIA A300 or locally accepted best practices.	**4**
(7)	Where a lot adjoins a landscaped common area, a protection plan from the remodeling construction activities next to the common area is implemented.	**5**

11.503.2 Slope disturbance. Slope disturbance is minimized by one or more of the following:		
(1)	The use of terrain-adaptive architecture.	**5**
(2)	Hydrological/soil stability study is completed and used to guide the design of any additions to buildings on the lot.	**5**
(3)	All or a percentage of new driveways and parking are aligned with natural topography to reduce cut and fill.	
	(a) 10 percent to 25 percent	**1**
	(b) 25 percent to 75 percent	**4**
	(c) greater than 75 percent	**6**
(4)	Long-term erosion effects are reduced through the design and implementation of clustering, terracing, retaining walls, landscaping, or restabilization techniques.	**6**
(5)	Underground parking uses the natural slope for parking entrances.	**5**

11.503.3 Soil disturbance and erosion. Soil disturbance and erosion are minimized by one or more of the following: (also see Section 11.504.3)		
(1)	Remodeling construction activities are scheduled such that disturbed soil that is to be left unworked for more than 21 days is stabilized within 14 days.	**5**

GREEN BUILDING PRACTICES			POINTS
(2)	The new utilities on the lot are designed to use one or more alternative means:		**5**
	(a)	tunneling instead of trenching	
	(b)	use of smaller (low ground pressure) equipment or geomats to spread the weight of construction equipment	
	(c)	shared utility trenches or easements	
	(d)	placement of utilities under paved surfaces instead of yards	
(3)	Limits of new clearing and grading are demarcated on the lot plan.		**5**
11.503.4 Stormwater Management. The stormwater management system is designed to use low-impact development/green infrastructure practices to preserve, restore or mitigate changes in site hydrology due to land disturbance and the construction of impermeable surfaces through the use of one or more of the following techniques:			
(1)	A site assessment is conducted and a plan prepared and implemented that identifies important existing permeable soils, natural drainage ways and other water features, e.g., depressional storage, onsite to be preserved in order to maintain site hydrology.		**7**
(2)	Low-Impact Development/Green infrastructure stormwater management practices to promote infiltration and evapotranspiration are used to manage rainfall on the lot and prevent the off-lot discharge of runoff from all storms up to and including the volume of following storm events:		
	(a)	80th percentile storm event	**5**
	(b)	90th percentile storm event	8
	(c)	95th percentile storm event	10
(3)	Permeable materials are used for driveways, parking areas, walkways, patios, and recreational surfaces and the like according to the following percentages:		
	(a)	less than 25 percent	**5**
	(b)	25-50 percent	8
	(c)	Greater than 50 percent	10
11.503.5 Landscape plan. A plan for the lot is developed to limit water and energy use while preserving or enhancing the natural environment. **(Where "front" only or "rear" only plan is implemented, only half of the points (rounding down to a whole number) are awarded for Items (1)-(8)**			
(1)	A plan is formulated and implemented that protects, restores, or enhances natural vegetation on the lot.		
	(a)	100 percent of the natural area	**4**
	(b)	50 percent of the natural area	**3**
	(c)	25 percent of the natural area	**2**
	(d)	12 percent of then natural area	**1**
(2)	Non-invasive vegetation that is native or regionally appropriate for local growing conditions is selected to promote.		**4**

GREEN BUILDING PRACTICES		POINTS
(3)	To improve pollinator habitat, at least 10 percent of planted areas are composed of flowering and nectar producing plant species. Invasive plant species shall not be utilized.	**3**
(4)	EPA WaterSense Water Budget Tool or equivalent is used when implementing the maximum percentage of turf areas.	**2**
(5)	For landscaped vegetated areas, the maximum percentage of all turf areas is:	
	(a) 0 percent	**5**
	(b) Greater than 0 percent to less than 20 percent	**4**
	(c) 20 percent to less than 40 percent	**3**
	(d) 40 percent to 60 percent	**2**
(6)	Plants with similar watering needs are grouped (hydrozoning) and shown on the lot plan.	**5**
(7)	Summer shading by planting installed to shade a minimum of 30 percent of building walls. To conform to summer shading, the effective shade coverage (five years after planting) is the arithmetic mean of the shade coverage calculated at 10 am for eastward facing walls, noon for southward facing walls, and 3 pm for westward facing walls on the summer solstice.	**5**
(8)	Vegetative wind breaks or channels are designed to protect the lot and immediate surrounding lots as appropriate for local conditions.	**4**
(9)	Site- or community-generated tree trimmings or stump grinding of regionally appropriate trees are used on the site to provide protective mulch during construction or for landscaping.	**3**
(10)	An integrated pest management plan is developed to minimize chemical use in pesticides and fertilizers.	**4**
(11)	Developer has a plan for removal or containment of invasive plants from the disturbed areas of the site.	**3**
(12)	Developer implements a plan for removal or containment of invasive plants on the undisturbed areas of the site.	**6**

11.503.6 Wildlife habitat. Measures are planned to support wildlife habitat and include at least two of the following:		
(1)	Plants and gardens that encourage wildlife, such as bird and butterfly gardens.	**3**
(2)	Inclusion of a certified “backyard wildlife” program.	**3**
(3)	The lot is adjacent to a wildlife corridor, fish and game park, or preserved areas and is designed with regard for this relationship.	**3**
(4)	Outdoor lighting techniques are utilized with regard for wildlife.	**3**

11.503.7 Environmentally sensitive areas. The lot is in accordance with one or both of the following:		
(1)	The lot does not contain any environmentally sensitive areas that are disturbed during remodeling.	**4**
(2)	On lots with environmentally sensitive areas, mitigation and/or restoration is conducted to preserve ecosystem functions lost through remodeling activities.	**4**

GREEN BUILDING PRACTICES	POINTS

11.504 LOT CONSTRUCTION

11.504.0 Intent. Environmental impact during construction is avoided to the extent possible; impacts that do occur are minimized, and any significant impacts are mitigated.

11.504.1 On-site supervision and coordination. On-site supervision and coordination is provided during on-lot-lot clearing, grading, trenching, paving, and installation of utilities to ensure that specified green development practices are implemented. (also see Section 11.503.3)	**4**

11.504.2 Trees and vegetation. Designated trees and vegetation are preserved by one or more of the following:		
(1)	Fencing or equivalent is installed to protect trees and other vegetation.	**3**
(2)	Trenching, significant changes in grade, and compaction of soil and critical root zones in all “tree save” areas as shown on the lot plan are avoided.	**5**
(3)	Damage to designated existing trees and vegetation is mitigated during construction through pruning, root pruning, fertilizing, and watering.	**4**

11.504.3 Soil disturbance and erosion implementation. On-site soil disturbance and erosion during remodeling are minimized by one or more of the following in accordance with the SWPPP or applicable plan: (also see Section 11.503.3)		
(1)	Sediment and erosion controls are installed on the lot and maintained in accordance with the stormwater pollution prevention plan, where required.	**5**
(2)	Limits of clearing and grading are staked out on the lot.	**5**
(3)	“No disturbance” zones are created using fencing or flagging to protect vegetation and sensitive areas on the lot from construction activity.	**5**
(4)	Topsoil from either the lot or the site development is stockpiled and stabilized for later use and used to establish landscape plantings on the lot.	**5**
(5)	Soil compaction from construction equipment is reduced by distributing the weight of the equipment over a larger area (laying lightweight geogrids, mulch, chipped wood, plywood, OSB, metal plates, or other materials capable of weight distribution in the pathway of the equipment).	**4**
(6)	Disturbed areas on the lot that are complete or to be left unworked for 21 days or more are stabilized within 14 days using methods as recommended by the EPA, or in the approved SWPPP, where required.	**3**
(7)	Soil is improved with organic amendments and mulch.	**3**
(8)	Newly installed utilities on the lot are installed using one or more alternative means (e.g., tunneling instead of trenching, use of smaller equipment, use of low ground pressure equipment, use of geomats, shared utility trenches or easements).	**5**

GREEN BUILDING PRACTICES	POINTS

11.505 INNOVATIVE PRACTICES

11.505.0 Intent. Innovative lot design, preparation and development practices are used to enhance environmental performance. Waivers or variances from local development regulations are obtained, and innovative zoning is used to implement such practices.

11.505.1 Driveways and parking areas. Driveways and parking areas are minimized or mitigated by one or more of the following:		
(1)	Off-street parking areas are shared or driveways are shared. Waivers or variances from local development regulations are obtained to implement such practices, if required.	**5**
(2)	In a multifamily project, parking capacity does not exceed the local minimum requirements.	**5**
(3)	Structured parking is utilized to reduce the footprint of surface parking areas.	
	(a) 25 percent to less than 50 percent	**4**
	(b) 50 percent to 75 percent	**5**
	(c) greater than 75 percent	**6**
(4)	Water permeable surfaces, including vegetative paving systems, are utilized to reduce the footprint of impervious surface driveways, fire lanes, streets or parking areas.	
	(a) 10 percent to less than 25 percent	**1**
	(b) 25 percent to 75 percent	**2**
	(c) Greater than 75 percent	**3**

11.505.2 Heat island mitigation. Heat island effect is mitigated by one or both of the following.		**4**
(1)	Hardscape: Not less than 50 percent of the surface area of the hardscape on the lot meets one or a combination of the following methods.	**5**
	(a) Shading of hardscaping: Shade is provided from existing or new vegetation (within five years) or from trellises. Shade of hardscaping is to be measured on the summer solstice at noon.	
	(b) Light-colored hardscaping: Horizontal hardscaping materials are installed with a solar reflectance index (SRI) of 29 or greater. The SRI is calculated in accordance with ASTM E1980. A default SRI value of 35 for new concrete without added color pigment is permitted to be used instead of measurements.	
	(c) Permeable hardscaping: Permeable hardscaping materials are installed.	
(2)	Roofs: Not less than 75 percent of the exposed surface of the roof is vegetated using technology capable of withstanding the climate conditions of the jurisdiction and the microclimate of the building lot. Invasive plant species are not permitted.	**5**

11.505.3 Density. The average density on the lot on a net developable area basis is:		
(1)	7 to less than 14 dwelling units per acre (per 4,047 m^2)	**4**
(2)	14 to less than 21 dwelling units per acre (per 4,047 m^2)	**5**
(3)	21 to less than 35 dwelling units per acre (per 4,047 m^2)	**6**
(4)	35 to less than 70 dwelling units per acre (per 4,047 m^2)	**7**
(5)	70 or greater dwelling units per acre (per 4,047 m^2)	**8**

GREEN BUILDING PRACTICES	POINTS
11.505.4 Mixed-use development. The lot contains a mixed-use building.	**8**
11.505.5 Community Garden(s). A portion of the lot is established as a community garden(s), available to residents of the lot, to provide for local food production to residents or area consumers.	**3**
11.505.6 Multi-unit plug-in electric vehicle charging. Plug-in electric vehicle charging capability is provided for at least 1 percent of parking stalls. Electrical capacity in main electric panels supports Level 2 charging (208/240V-40 amp). Each stall is provided with conduit and wiring infrastructure from the electric panel to support Level 2 charging (208/240V-40 amp) service to the designated stalls, and stalls are equipped with either Level 2 charging AC grounded outlets (208/240V-40 amp) or Level 2 charging stations (240V/40A) by a third party charging station.	**4**

11.601 QUALITY OF CONSTRUCTION MATERIALS AND WASTE

11.601.0 Intent. Design and construction practices that minimize the environmental impact of the building materials are incorporated, environmentally efficient building systems and materials are incorporated, and waste generated during construction is reduced.

11.601.1 Conditioned floor area. Finished floor area of a dwelling unit after the remodeling is limited. Finished floor area is calculated in accordance with ANSI Z765 for single family and ANSI/BOMA Z65.4 for multifamily buildings. Only the finished floor area for stories above grade plane is included in the calculation.		
(1)	Less than or equal to 700 square feet (65 m^2)	**14**
(2)	less than or equal to 1,000 square feet (93 m^2)	**12**
(3)	less than or equal to 1,500 square feet (139 m^2)	**9**
(4)	less than or equal to 2,000 square feet (186 m^2)	**6**
(5)	less than or equal to 2,500 square feet (232 m^2)	**3**
(6)	greater than 4,000 square feet (372 m^2) **(For every 100 square feet (9.29 m^2) over 4,000 square feet (372 m^2), one point is to be added the threshold points shown in Table 305.3.7 for each rating level.)**	**Mandatory**
***Multifamily Building Note**: For a multifamily building, a weighted average of the individual unit sizes is used for this practice.*		

11.601.2 Material usage. Newly installed structural systems are designed or construction techniques are implemented that reduce and optimize material usage. **(Points awarded only when the newly installed portion of each structural system comprises at least 25 percent of the total area of that structural system after the remodel)**		**9 Max**
(1)	Minimum structural member or element sizes necessary for strength and stiffness in accordance with advanced framing techniques or structural design standards are selected.	**3**

GREEN BUILDING PRACTICES		POINTS
(2)	Higher-grade or higher-strength of the same materials than commonly specified for structural elements and components in the building are used and element or component sizes are reduced accordingly.	**3**
(3)	Performance-based structural design is used to optimize lateral force-resisting systems.	**3**

11.601.3 Building dimensions and layouts. Building dimensions and layouts are designed to reduce material cuts and waste. This practice is used for a minimum of 80 percent of the newly installed areas: **(Points awarded only when the newly installed area of the building comprises at least 25 percent of the total area of that element of the building after the remodel)**		
(1)	floor area	**3**
(2)	wall area	**3**
(3)	roof area	**3**
(4)	cladding or siding area	**3**
(5)	penetrations or trim area	**1**

11.601.4 Framing and structural plans. Detailed framing or structural plans, material quantity lists and on-site cut lists for newly installed framing, structural materials, and sheathing materials are provided.	**4**

11.601.5 Prefabricated components. Precut or preassembled components, or panelized or precast assemblies are utilized for a minimum of 90 percent for the following system or building: **(Points awarded only when the newly installed system comprises at least 25 percent of the total area of that system of the building after the remodel)**		**13 Max**
(1)	floor system	**4**
(2)	wall system	**4**
(3)	roof system	**4**
(4)	modular construction for any new construction located above grade	**13**

11.601.6 Stacked stories. Stories above grade are stacked, such as in 1½-story, 2-story, or greater structures. The area of the upper story is a minimum of 50 percent of the area of the story below, based on areas with a minimum ceiling height of 7 feet (2,134 mm).		**8 Max**
(1)	first stacked story	**4**
(2)	for each additional stacked story	**2**

11.601.7 Prefinished materials. Prefinished building materials or assemblies listed below have no additional site-applied finishing material are installed.		**12 Max**
(a)	interior trim not requiring paint or stain	
(b)	exterior trim not requiring paint or stain	
(c)	window, skylight, and door assemblies not requiring paint or stain on one of the following surfaces: i. exterior surfaces ii. interior surfaces	

GREEN BUILDING PRACTICES	POINTS
(d) interior wall coverings or systems, floor systems, and/or ceiling systems not requiring paint or stain or other type of finishing application	
(e) exterior wall coverings or systems, floor systems, and/or ceiling systems not requiring paint or stain or other type of finishing application	
(1) 90 percent or more (after the remodel) of the installed building materials or assemblies listed above: **(Points awarded for each type of material or assembly.)**	**5**
(2) 50 percent to less than 90 percent (after the remodel) of the installed building material or assembly listed above: **(Points awarded for each type of material or assembly.)**	**2**
(3) 35 percent to less than 50 percent (after the remodel) of the installed building material or assembly listed above: **(Points awarded for each type of material or assembly.)**	**1**

11.601.8 Foundations. A foundation system that minimizes soil disturbance, excavation quantities and material usage, such as frost-protected shallow foundations, isolated pier and pad foundations, deep foundations, post foundations, or helical piles is selected, designed, and constructed. The foundation is used on 25 percent or more of the building footprint after the remodel.	**3**

11.602 ENHANCED DURABILITY AND REDUCED MAINTENANCE

11.602.0 Intent. Design and construction practices are implemented that enhance the durability of materials and reduce in-service maintenance.

11.602.1 Moisture management – building envelope

11.602.1.1 Capillary breaks

11.602.1.1.1 A capillary break and vapor retarder are installed at concrete slabs in accordance with IRC Sections R506.2.2 and R506.2.3 or IBC Sections 1910 and 1805.4.1. **This practice is not mandatory for existing slabs without apparent moisture problem.**	**Mandatory**
11.602.1.1.2 A capillary break to prevent moisture migration into foundation wall is provided between the footing and the foundation wall on all new foundations, and on not less than 25 percent of the total length of the foundation after the remodel.	**3**
11.602.1.2 Foundation waterproofing. Enhanced foundation waterproofing is installed on all new foundations, and on not less than 25 percent of the total length of the foundation after the remodel using one or both of the following:	**4**
(1) rubberized coating, or	
(2) drainage mat	

GREEN BUILDING PRACTICES	POINTS
11.602.1.3 Foundation drainage	
11.602.1.3.1 Where required by the ICC IRC or IBC for habitable and usable spaces below grade, exterior drain tile is installed. **This practice is not mandatory for existing space without apparent moisture problem.**	**Mandatory**
11.602.1.3.2 Interior and exterior foundation perimeter drains are installed and sloped to discharge to daylight, dry well, or sump pit on all new foundations and not less than 25 percent of the total length of the foundation after the remodel.	**4**
11.602.1.4 Crawlspaces.	
11.602.1.4.1 Vapor retarder for all new unconditioned vented crawlspace foundations and not less than 25 percent of the total area after the remodel is in accordance with the following, as applicable. Joints of vapor retarder overlap a minimum of 6 inches (152 mm) and are taped.	
(1) Floors. Minimum 6 mil vapor retarder installed on the crawlspace floor and extended at least 6 inches up the wall and is attached and sealed to the wall.	**6**
(2) Walls. Dampproof walls are provided below finished grade. **This practice is not mandatory for existing walls without apparent moisture problem.**	**Mandatory**
11.602.1.4.2 For all new foundations and not less than 25 percent of the total area of the crawlspace after the remodel, crawlspace that is built as a conditioned area is sealed to prevent outside air infiltration and provided with conditioned air at a rate not less than 0.02 cfm (.009 L/s) per square foot of horizontal area and one of the following is implemented:	
(1) a concrete slab over 6 mil polyethylene sheeting or other Class I vapor retarder installed in accordance with ICC IRC Section 408.3 or Section 506.	**8**
(2) 6 mil polyethylene sheeting or other Class I vapor retarder installed in accordance with ICC IRC Section 408.3 or Section 506. **This practice is not mandatory for existing foundations without apparent moisture problem.**	**Mandatory**
11.602.1.5 Termite barrier. Continuous physical foundation termite barrier provided:	
(1) In geographic areas that have moderate to heavy infestation potential in accordance with figure 6(3), a no or low toxicity treatment is also installed.	**4**
(2) In geographic areas that have a very heavy infestation potential in accordance with figure 6(3), in addition a low toxicity bait and kill termite treatment plan is selected and implemented.	**4**
11.602.1.6 Termite-resistant materials. In areas of termite infestation probability as defined by Figure 6(3), termite-resistant materials are used as follows:	
(1) In areas of slight to moderate termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings within the first 2 feet (610 mm) above the top of the foundation.	**2**

GREEN BUILDING PRACTICES		POINTS
(2)	In areas of moderate to heavy termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings within the first 3 feet (914 mm) above the top of the foundation.	**4**
(3)	In areas of very heavy termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings.	**6**

11.602.1.7 Moisture control measures

11.602.1.7.1 Moisture control measures are in accordance with the following:		
(1)	Building materials with visible mold are not installed or are cleaned or encapsulated prior to concealment and closing.	**2**
(2)	Insulation in cavities is dry in accordance with manufacturer's instructions when enclosed (e.g., with drywall).	**Mandatory 2**
(3)	The moisture content of lumber is sampled to ensure it does not exceed 19 percent prior to the surface and/or cavity enclosure.	**4**

11.602.1.7.2 Moisture content of subfloor, substrate, or concrete slabs is in accordance with the appropriate industry standard for the finish flooring to be applied.	**2**

11.602.1.7.3 Building envelope assemblies that are designed for moisture control based on documented hygrothermal simulation or field study analysis. Hygrothermal analysis is required to incorporate representative climatic conditions, interior conditions and include heating and cooling seasonal variation.	**4**

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.	**Mandatory**

11.602.1.9 Flashing. Flashing is provided as follows to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details are provided in the construction documents and are in accordance with the fenestration manufacturer's instructions, the flashing manufacturer's instructions, or as detailed by a registered design professional. **Points awarded only when practices (2)-(7) are implemented in all newly installed construction and not less than 25 percent of the applicable building elements for the entire building after the remodel.**		
(1)	Flashing is installed at all of the following locations, as applicable:	**Mandatory**
	(a) around exterior fenestrations, skylights and doors	
	(b) at roof valleys	
	(c) at all building-to-deck, -balcony, -porch, and -stair intersections	
	(d) at roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets	
	(e) at ends of and under masonry, wood, or metal copings and sills	

GREEN BUILDING PRACTICES			POINTS
	(f)	above projecting wood trim	
	(g)	at built-in roof gutters, and	
	(h)	drip edge is installed at eave and rake edges. **These practices are not mandatory for existing building elements without apparent moisture problem.**	
(2)		All window and door head and jamb flashing is either self-adhered flashing complying with AAMA 711-13 or liquid applied flashing complying with AAMA 714-15 and installed in accordance with flashing fenestration or manufacturer's installation instructions.	**2**
(3)		Pan flashing is installed at sills of all exterior windows and doors	**3**
(4)		Seamless, preformed kickout flashing, or prefabricated metal with soldered seams is provided at all roof-to-wall intersections. The type and thickness of the material used for roof flashing including but not limited kickout and step flashing is commensurate with the anticipated service life of the roofing material.	**3**
(5)		A rainscreen wall design as follows is used for exterior wall assemblies	**4 Max**
	(a)	a system designed with minimum ¼-inch air space exterior to the water-resistive barrier, vented to the exterior at top and bottom of the wall and integrated with flashing details, or	**4**
	(b)	a cladding material or a water-resistive barrier with enhanced drainage, meeting 75 percent drainage efficiency determined in accordance with ASTM E2273.	**2**
(6)		Through-wall flashing is installed at transitions between wall cladding materials, or wall construction types.	**2**
(7)		Flashing is installed at expansion joints in stucco walls.	**2**

11.602.1.10 Exterior doors. Entries at exterior door assemblies, inclusive of side lights (if any), are covered by one of the following methods to protect the building from the effects of precipitation and solar radiation. Either a storm door or a projection factor of 0.375 minimum is provided. Eastern- and western-facing entries in Climate Zones 1, 2, and 3, as determined in accordance with Figure 6(1) or Appendix C, have either a storm door or a projection factor of 1.0 minimum, unless protected from direct solar radiation by other means (e.g., screen wall, vegetation).			**2 per exterior door** **6 Max**
	(a)	installing a porch roof or awning	
	(b)	extending the roof overhang	
	(c)	recessing the exterior door	
	(d)	Installing a storm door	

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. **This practice is not mandatory for existing tile surfaces without apparent moisture problem.**	**Mandatory**

GREEN BUILDING PRACTICES	POINTS

11.602.1.12 Roof overhangs. Roof overhangs, in accordance with Table 11.602.1.12, are provided over a minimum of 90 percent of exterior walls to protect the building envelope. **4**

Table 11.602.1.12
Minimum Roof Overhang for One- & Two-Story Buildings

Inches of Rainfall (1)	Eave Overhang (Inches)	Rake Overhang (Inches)
≤40	12	12
>41 and ≤70	18	12
>70	24	12

(1) Annual mean total rainfall in inches is in accordance with Figure 6(2).
For SI: 12 inches = 304.8 mm

11.602.1.13 Ice barrier. In areas where there has been a history of 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. **Mandatory**

11.602.1.14 Architectural features. Architectural features that increase the potential for the water intrusion are avoided:

(1)	All horizontal ledgers are sloped away to provide gravity drainage as appropriate for the application.	**Mandatory 1**
(2)	No roof configurations that create horizontal valleys in roof design.	**2**
(3)	No recessed windows and architectural features that trap water on horizontal surfaces.	**2**

11.602.2 Roof surfaces. A minimum of 90 percent of roof surfaces, not used for roof penetrations and associated equipment, on-site renewable energy systems such as photovoltaics or solar thermal energy collectors, or rooftop decks, amenities and walkways, are constructed of one or more of the following: **3**

(1)	products that are in accordance with the ENERGY STAR® cool roof certification or equivalent
(2)	a vegetated roof system
(3)	Minimum initial SRI of 78 for low-sloped roof (a slope less than 2:12) and a minimum initial SRI of 29 for a steep-sloped roof (a slope equal to or greater than 2:12). The SRI is calculated in accordance with ASTM E1980. Roof products are certified and labeled.

11.602.3 Roof water discharge. A gutter and downspout system or splash blocks and effective grading are provided to carry water a minimum of 5 feet (1524 mm) away from perimeter foundation walls. **4**

GREEN BUILDING PRACTICES	POINTS
11.602.4 Finished grade	
11.602.4.1 Finished grade at all sides of a building is sloped to provide a minimum of 6 inches (150 mm) of fall within 10 feet (3048 mm) of the edge of the building. Where lot lines, walls, slopes, or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3048 mm), the final grade is sloped away from the edge of the building at a minimum slope of 2 percent.	**Mandatory**
11.602.4.2 The final grade is sloped away from the edge of the building at a minimum slope of 5 percent.	**1**
11.602.4.3 Water is directed to drains or swales to ensure drainage away from the structure.	**1**
11.603 REUSED OR SALVAGED MATERIALS	
11.603.0 Intent. Practices that reuse or modify existing structures, salvage materials for other uses, or use salvaged materials in the building's construction are implemented.	
11.603.1 Reuse of existing building. Major elements or components of existing buildings and structures are reused, modified, or deconstructed for later use. **(Points awarded for every 200 square feet (18.5 m^2) of floor area.)**	**1** **12 Max**
11.603.2 Salvaged materials. Reclaimed and/or salvaged materials and components are used. The total material value and labor cost of salvaged materials is equal to or exceeds 1 percent of the total construction cost. **(Points awarded per 1% of salvaged materials used based on the total construction cost.)** **(Materials, elements, or components awarded points under Section 11.603.1 shall not be awarded points under Section 11.603.2.)**	**1** **9 Max**
11.603.3 Scrap materials. Sorting and reuse of scrap building material is facilitated (e.g., a central storage area or dedicated bins are provided).	**4**
11.604 RECYCLED-CONTENT BUILDING MATERIALS	
11.604.1 Recycled content. Building materials with recycled content are used for two minor and/or two major components of the building.	**Per Table 11.604.1**

Table 11.604.1
Recycled Content

Material Percentage Recycled Content	Points For 2 Minor	Points For 2 Major
25% to less than 50%	**1**	**2**
50% to less than 75%	**2**	**4**
more than 75%	**3**	**6**

GREEN BUILDING PRACTICES	POINTS

11.605
RECYCLED CONSTRUCTION WASTE

11.605.0 Intent. Waste generated during construction is recycled. All waste classified as hazardous is properly handled and disposed of.

11.605.1 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.	**Mandatory**

11.605.2 Construction waste management plan. A construction waste management plan is developed, posted at the jobsite, and implemented diverting through methods such as reuse, salvage, recycling, or manufacturer reclamation, a minimum of 50 percent (by weight) of nonhazardous construction and demolition materials, excluding land-clearing waste, from disposal in landfills and combustion, excluding energy and material recovery. Materials used as alternative daily cover are considered construction waste and do not count toward recycling or salvaging.	**6**
For remodeling projects or demolition of an existing facility, the waste management plan includes the recycling of 95% of electronic waste components (such as printed circuit boards from computers, building automation systems, HVAC, fire and security control boards), by a third-party certified E-Waste recycling facility.	
Exceptions:	
(1) Waste materials generated from land clearing, soil and sub-grade excavation and all manner of vegetative debris shall not be in the calculations.	
(2) A recycling facility (traditional or E-Waste) offering material receipt documentation is not available within 50 miles of the jobsite.	

11.605.3 On-site recycling. On-site recycling measures following applicable regulations and codes are implemented, such as the following:	**7**
(a) Materials are ground or otherwise safely applied on-site as soil amendment or fill. A minimum of 50 percent (by weight) of construction and land-clearing waste is diverted from landfill.	
(b) Alternative compliance methods approved by the Adopting Entity.	
(c) Compatible untreated biomass material (lumber, posts, beams etc.) are set aside for combustion if a Solid Fuel Burning Appliance per Section 11.901.2.1(2) will be available for on-site renewable energy.	

11.605.4 Recycled construction materials. Construction materials (e.g., wood, cardboard, metals, drywall, plastic, asphalt roofing shingles, or concrete) are recycled offsite.	**6 Max**
(1) a minimum of two types of materials are recycled	**3**
(2) for each additional recycled material type	**1**

GREEN BUILDING PRACTICES	POINTS

11.606 RENEWABLE MATERIALS

11.606.0 Intent. Building materials derived from renewable resources are used.

11.606.1 Biobased products. The following biobased products are used:		**8 Max**
(a)	certified solid wood in accordance with Section 11.606.2	
(b)	engineered wood	
(c)	bamboo	
(d)	cotton	
(e)	cork	
(f)	straw	
(g)	natural fiber products made from crops (soy-based, corn-based)	
(h)	other biobased materials with a minimum of 50 percent biobased content (by weight or volume)	
(1)	Two types of biobased materials are used, each for more than 0.5 percent of the project's projected building material cost.	**3**
(2)	Two types of biobased materials are used, each for more than 1 percent of the project's projected building material cost.	**6**
(3)	For each additional biobased material used for more than 0.5 percent of the project's projected building material cost.	**1** **2 Max**

11.606.2 Wood-based products. Wood or wood-based products are certified to the requirements of one of the following recognized product programs:		
(a)	American Forest Foundation's *American Tree Farm System*® (ATFS)	
(b)	Canadian Standards Association's *Sustainable Forest Management System Standards* (CSA Z809)	
(c)	*Forest Stewardship Council* (FSC)	
(d)	*Program for Endorsement of Forest Certification Systems* (PEFC)	
(e)	*Sustainable Forestry Initiative® Program (SFI)*	
(f)	*National Wood Flooring Association's Responsible Procurement Program (RPP)*	
(g)	other product programs mutually recognized by PEFC	
(1)	A minimum of two certified wood-based products are used for minor components of the building.	**3**
(2)	A minimum of two certified wood-based products are used in major components of the building.	**4**

11.606.3 Manufacturing energy. Materials are used for major components of the building that are manufactured using a minimum of 33 percent of the primary manufacturing process energy derived from renewable sources, combustible waste sources, or renewable energy credits (RECs). **(2 points awarded per material.)**	**6 Max**

GREEN BUILDING PRACTICES	POINTS
11.607 RECYCLING AND WASTE REDUCTION	
11.607.1 Recycling and composting. Recycling and composting by the occupant are facilitated by one or more of the following methods:	
(1) A built-in collection space in each kitchen and an aggregation/pick-up space in a garage, covered outdoor space, or other area for recycling containers is provided.	**3**
(2) Compost facility is provided on the site.	**3**
11.607.2 Food waste disposers. A minimum of one food waste disposer is installed at the primary kitchen sink.	**1**
11.608 RESOURCE-EFFICIENT MATERIALS	
11.608.1 Resource-efficient materials. Products containing fewer materials are used to achieve the same end-use requirements as conventional products, including but not limited to:	**9 Max 3 per each material**
(1) lighter, thinner brick with bed depth less than 3 inches and/or brick with coring of more that 25 percent	
(2) engineered wood or engineered steel products	
(3) roof or floor trusses	
11.609 REGIONAL MATERIALS	
11.609.1 Regional materials. Regional materials are used for major and/or minor components of the building. **(For a component to comply with this practice, a minimum of 75% of all products in that component category must be sourced regionally, e.g., stone veneer category – 75 percent or more of the stone veneer on a project must be sources regionally.)**	**10 Max 2 per each major component and 1 per each minor component**
11.610 LIFE CYCLE ASSESSMENT	
11.610.1 Life cycle assessment. A life cycle assessment (LCA) tool is used to select environmentally preferable products, assemblies, or, entire building designs. Points are awarded in accordance with Section 11.610.1.1 or 11.610.1.2. Only one method of analysis or tool may be utilized. A reference service life for the building is 60 years for any life cycle analysis tool. Results of the LCA are reported in the manual required in Section 11.1001.1 or 11.1002.1(1) of this Standard in terms of the environmental impacts listed in this practice and it states if operating energy was included in the LCA.	**15 Max**

GREEN BUILDING PRACTICES	POINTS
11.610.1.1 Whole-building life cycle assessment. A whole-building LCA is performed in conformance with ASTM E2921 using ISO14044 compliant life cycle assessment.	**15**
(1) Execute LCA at the whole building level through a comparative analysis between the final and reference building designs as set forth under Standard Practice, ASTM E2921. The assessment criteria includes the following environmental impact categories:	
(a) Primary energy use	
(b) Global warming potential	
(c) Acidification potential	
(d) Eutrophication potential	
(e) Ozone depletion potential	
(f) Smog potential	**8**
(2) Execute LCA on regulated loads throughout the building operations life cycle stage. Conduct simulated energy performance analyses in accordance with Section 702.2.1 ICC IECC analysis (IECC Section 405) in establishing the comparative performance of final versus reference building designs. Primary energy use savings and global warming potential avoidance from simulation analyses results are determined using energy supplier, utility, or EPA electricity generation and other fuels energy conversion factors and electricity generation and other fuels emission rates for the locality or Sub-Region in which the building is located	**5**
(3) Execute full LCA, including use-phase, through calculation of operating energy impacts (c) – (f) using local or regional emissions factors from energy supplier, utility, or EPA.	**2**

11.610.1.2 Life cycle assessment for a product or assembly. An environmentally preferable product or assembly is selected for an application based upon the use of an LCA tool that incorporates data methods compliant with ISO 14044 or other recognized standards that compare the environmental impact of products or assemblies.	**10 Max**

11.610.1.2.1 Product LCA. A product with improved environmental impact measures compared to another product(s) intended for the same use is selected. The environmental impact measures used in the assessment are selected from the following:	**Per Table 11.610.1.2.1 10 Max**
(a) Primary energy use	
(b) Global warming potential	
(c) Acidification potential	
(d) Eutrophication potential	
(e) Ozone depletion potential	
(f) Smog potential	
(Points awarded for each product/system comparison where the selected product/system improved upon the environmental impact measures by an average of 15 percent.)	

Table 11.610.1.2.1
Product LCA

4 Impact Measures	5 Impact Measures
POINTS	
2	**3**

GREEN BUILDING PRACTICES	POINTS

11.610.1.2.2 Assembly LCA. An assembly with improved environmental impact measures compared to a functionally comparable assembly is selected. The full life cycle, from resource extraction to demolition and disposal (including but not limited to on-site construction, maintenance and replacement, material and product embodied acquisition, and process and transportation energy), is assessed. The assessment does not include electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators, and conveying systems. The following functional building elements are eligible for points under this practice:

Per Table 11.610.1.2.2 10 Max

(a) exterior walls

(b) roof/ceiling

(c) interior walls or ceilings

(d) intermediate floors

The environmental impact measures used in the assessment are selected from the following:

(a) Primary energy use

(b) Global warming potential

(c) Acidification potential

(d) Eutrophication potential

(e) Ozone depletion potential

(f) Smog potential

(Points are awarded based on the number of functional building elements that improve upon environmental impact measures by an average of 15 percent.)

Table 11.610.1.2.2
Assembly LCA

	4 Impact Measures	5 Impact Measures
	POINTS	
2 functional building elements	**3**	**6**
3 functional building elements	**4**	**8**
4 functional building elements	**5**	**10**

11.611 INNOVATIVE PRACTICES

11.611.1 Manufacturer's environmental management system concepts. Product manufacturer's operations and business practices include environmental management system concepts, and the production facility is registered to ISO 14001 or equivalent. The aggregate value of building products from registered ISO 14001 or equivalent production facilities is 1 percent or more of the estimated total building materials cost.

(1 point awarded per percent.)

10 Max

GREEN BUILDING PRACTICES		POINTS
11.611.2 Sustainable products. One or more of the following products are used for at least 30% of the floor or wall area of the entire dwelling unit, as applicable. Products are certified by a third-party agency accredited to ISO 17065.		**9 Max**
(1)	50% or more of carpet installed (by square feet) is certified to NSF 140.	**3**
(2)	50% or more of resilient flooring installed (by square feet) is certified to NSF 332.	**3**
(3)	50% or more of the insulation installed (by square feet) is certified to EcoLogo CCD-016.	**3**
(4)	50% or more of interior wall coverings installed (by square feet) is certified to NSF 342	**3**
(5)	50% or more of the gypsum board installed (by square feet) is certified to UL 100.	**3**
(6)	50% or more of the door leafs installed (by number of door leafs) is certified to UL 102.	**3**
(7)	50% or more of the tile installed (by square feet) is certified to TCNA A138.1 Specifications for Sustainable Ceramic Tiles, Glass Tiles and Tile Installation Materials.	**3**
11.611.3 Universal design elements. Dwelling incorporates one or more of the following universal design elements. Conventional industry tolerances are permitted.		**12 Max**
(1)	Any no-step entrance into the dwelling which (1) is accessible from a substantially level parking or drop-off area (no 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 (2) provides a minimum 32-inch wide clearance into the dwelling.	**3**
(2)	Minimum 36-inch wide accessible route from the no-step entrance into at least one visiting room in the dwelling and into at least one full or half bathroom which has a minimum 32-inch clear door width and a 30-inch by 48-inch clear area inside the bathroom outside the door swing.	**3**
(3)	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**
(4)	Blocking or equivalent installed in the accessible bathroom walls for future installation of grab bars at water closet and bathing fixture, if applicable.	**1**
(5)	All interior and exterior door handles are levers rather than knobs.	**1**
(6)	All sink faucet controls are single-handle controls of both volume and temperature.	**1**
(7)	Interior convenience power receptacles, communication connections (for cable, phone, Ethernet, etc.) and switches are placed between 15 and 48 inches above the finished floor. Additional switches to control devices and systems (such as alarms, home theaters and other equipment) not required by the local building code may be installed as desired.	**1**
(8)	All light switches are rocker-type switches or other similar switches that can be operated by pressing them (with assistive devices) – no toggle-type switches may be used.	**1**
(9)	Anyone of the following can be controlled with a (wireless) mobile device such as a smartphone, tablet or laptop computer: HVAC, lighting, alarm system or door locks	**1**
11.611.4 Product declarations. A minimum of 10 different products installed in the building project, at the time of certificate of occupancy, comply with one of the following sub-sections. Declarations, reports, and assessments are submitted to the Adopting Entity and contain documentation of the critical peer review by an independent third party, results from the review, the reviewer's name, company name, contact information, and date of the review.		**5**

GREEN BUILDING PRACTICES	POINTS
11.611.4.1 Industry-wide declaration. A Type III industry-wide environmental product declaration (EPD) is submitted for each product. Where the program operator explicitly recognizes the EPD as representative of the product group on a National level, it is considered industry-wide. In the case where an industry-wide EPD represents only a subset of an industry group, as opposed to being industry-wide, the manufacturer is required be explicitly recognized as a participant by the EPD program operator. All EPDs are required to be consistent with ISO Standards 14025 and 21930 with at least a cradle-to-gate scope. **(Each product complying with Section 11.611.4.1 shall be counted as one product for compliance with Section 11.611.4.)**	
11.611.4.2 Product Specific Declaration. A product specific Type III EPD are submitted for each product. The product specific declaration shall be manufacturer specific for an individual product or product family. All Type III EPDs are required to be certified as complying, at a minimum, with the goal and scope for the cradle-to-gate requirements in accordance with ISO Standards 14025 and 21930. **(Each product complying with Section 11.611.4.2 shall be counted as two products for compliance with Section 11.611.4.)**	
11.701 MINIMUM ENERGY EFFICIENCY REQUIREMENTS	
11.701.4 Mandatory practices	
11.701.4.0 Minimum energy efficiency requirements. Additions, alterations, or renovations to an existing building, building system or portion there of comply with the provisions of the International Energy Conservation Code as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with this code. An addition complies with the IECC if the addition complies or if the existing building and addition comply with the IECC as a single building.	**Mandatory**
11.701.4.1 HVAC systems	
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.	**Mandatory**
11.701.4.1.2 Radiant and hydronic space heating. Where installed as a 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, AHRI I=B=R, ANSI/ACCA 5 QI-2010, or an accredited design professional's and manufacturer's recommendations).	**Mandatory**

GREEN BUILDING PRACTICES	POINTS
11.701.4.2 Duct systems	
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.	**Mandatory**
11.701.4.2.2 Ducts 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.	**Mandatory**
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.	**Mandatory**
11.701.4.3 Insulation and air sealing	
11.701.4.3.1 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:	**Mandatory**
(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 and ceilings separating a garage from conditioned spaces.	
(h) Behind tubs and showers on exterior walls.	
(i) Common walls between dwelling units.	
(j) Attic access openings.	
(k) Rim joist junction.	
(l) Other sources of infiltration.	

GREEN BUILDING PRACTICES	POINTS
11.701.4.3.2 Air sealing and insulation. Grade II and III insulation installation is not permitted. Building envelope air tightness and insulation installation is verified to be in accordance with Section 11.701.4.3.2(1) and 11.701.4.3.2(2).	**Mandatory**
(1) **Testing.** Building envelope tightness is tested. Testing is conducted in accordance with ASTM E-779 using a blower door at a test pressure of 1.04 psf (50 Pa). Testing is conducted after rough-in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances. Testing is conducted under the following conditions:	
(a) Exterior windows and doors, fireplace and stove doors are closed, but not sealed;	
(b) Dampers are closed, but not sealed, including exhaust, intake, make-up air, backdraft, and flue dampers;	
(c) Interior doors are open;	
(d) Exterior openings for continuous ventilation systems and heat recovery ventilators are closed and sealed;	
(e) Heating and cooling system(s) is turned off;	
(f) HVAC ducts terminations are not sealed; and	
(g) Supply and return registers are not sealed.	
Multifamily Building Note: *Testing by dwelling units, groups of dwelling units, or the building as a whole is acceptable.*	
(2) **Visual inspection.** The air barrier and insulation items listed in Table 11.701.4.3.2(2) are field verified by visual inspection.	

11.701.4.3.2.1 Grade I insulation installations are in accordance with the following:	**Mandatory**
(1) Grading applies to field-installed insulation products.	
(2) Grading applies to ceilings, walls, floors, band joists, rim joists, conditioned attics basements and crawlspaces, except as specifically noted.	
(3) Inspection is conducted before insulation is covered.	
(4) 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.	
(5) 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).	
(6) 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.	
(7) Exterior rigid insulation has substantial contact with the structural framing members or sheathing materials and is tightly fitted at joints.	
(8) Cavity insulation is split, installed, and/or fitted tightly around wiring and other services.	
(9) Exterior sheathing is not visible from the interior through gaps in the cavity insulation.	
(10) Faced batt insulation is permitted to have side-stapled tabs, provided the 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 tab itself.	
(11) Where properly installed, ICFs, SIPs, and other wall systems that provide integral insulation are deemed in compliance with the Grade 1 insulation installation requirements.	

Table 11.701.4.3.2(2)
Air Barrier and Insulation Installation

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings. drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within comers and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/doorjambs and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.

GREEN BUILDING PRACTICES	POINTS
11.701.4.3.3 Multifamily air leakage alternative. Multifamily buildings four or more stories in height and in compliance with IECC section C402.5 (Air leakage-thermal envelope) are deemed to comply with Sections 701.4.3.1 and 701.4.3.2.	
11.701.4.3.4 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/m^2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m^2), when tested in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled. This practice does not apply to site-built windows, skylights, and doors.	**Mandatory**
11.701.4.3.5 Recessed lighting. Newly installed recessed luminaires installed in the building thermal envelope are sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires 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 recessed luminaires are sealed with a gasket or caulk between the housing and the interior of the wall or ceiling covering.	**Mandatory**
11.701.4.4 High-efficacy lighting. Lighting efficacy in dwelling units is in accordance with one of the following:	**Mandatory**
(1) A minimum of 75 percent of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent	
(2) Lighting power density, measured in watts/square foot, is 1.1 or less.	
11.701.4.5 Boiler supply piping. Boiler supply piping in unconditioned space that is accessible during the remodel is insulated.	**Mandatory**
11.701.4.6 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 703.2.5.1.	**Mandatory**
11.701.4.7 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 703.2.5.1.	**Mandatory**
11.901 POLLUTANT SOURCE CONTROL	
11.901.0 Intent. Pollutant sources are controlled.	
11.901.1 Space and water heating options	
11.901.1.1 Natural draft furnaces, boilers, or water heaters are not located in conditioned spaces, including conditioned crawlspaces, unless located in a mechanical room that has an outdoor air source, and is sealed and insulated to separate it from the conditioned space(s). **(Points are awarded only for buildings that use natural draft combustion space or water heating equipment.)**	**5**

GREEN BUILDING PRACTICES	POINTS
11.901.1.2 Air handling equipment or return ducts are not located in the garage, unless placed in isolated, air-sealed mechanical rooms with an outside air source.	**5**
11.901.1.3 The following combustion space heating or water heating equipment is installed within conditioned space:	
(1) all furnaces or all boilers	
(a) power-vent furnace(s) or boiler(s)	**3**
(b) direct-vent furnace(s) or boiler(s)	**5**
(2) all water heaters	
(a) power-vent water heater(s)	**3**
(b) direct-vent water heater(s)	**5**
11.901.1.4 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 and direct heating equipment are vented to the outdoors.	**Mandatory**
11.901.1.5 Natural gas and propane fireplaces are direct vented have permanently fixed glass fronts or gasketed doors, and comply with CSA Z21.88/CSA 2.33 or CSA Z21.50/CSA 2.22.	**7**
11.901.1.6 The following electric equipment is installed:	
(1) heat pump air handler in unconditioned space	**2**
(2) heat pump air handler in conditioned space	**5**
11.901.2 Solid fuel-burning appliances.	
11.901.2.1 Newly installed solid fuel-burning fireplaces, inserts, stoves and heaters are code compliant and are in accordance with the following requirements:	**Mandatory**
(1) Site-built masonry wood-burning fireplaces are equipped with outside combustion air and a means of sealing the flue and the 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 EPA certified or Phase 2 Qualified.	
(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 the requirements of ASTM E1509 or are EPA certified.	
(5) Masonry heaters are in accordance with the definitions in ASTM E1602 and ICC IBC, Section 2112.1.	
(6) Removal of or rendering unusable an existing fireplace or fuel burning appliance that is not in accordance with 11.901.2.1 or replacement of each fireplace or appliance that is not in accordance with 11.901.2.1 with a compliant appliance.	

GREEN BUILDING PRACTICES	POINTS
11.901.2.2 Fireplaces, woodstoves, pellet stoves, or masonry heaters are not installed.	**6**

11.901.3 Garages. Garages are in accordance with the following:			
(1)	Attached garage		
	(a)	Where installed in the common wall between the attached garage and conditioned space, the door is tightly sealed and gasketed.	**Mandatory 2**
	(b)	A continuous air barrier is provided between walls and ceilings separating the garage space from the conditioned living spaces.	**Mandatory 2**
	(c)	For one- and two-family dwelling units, a 100 cfm (47 L/s) or greater ducted, or 70 cfm (33 L/s) cfm or greater unducted wall exhaust fan is installed and vented to the outdoors, designed and installed for continuous operation, or has controls (e.g., motion detectors, pressure switches) that activate operation for a minimum of 1 hour when either human passage door or roll-up automatic doors are operated. For ducted exhaust fans, the fan airflow rating and duct sizing are in accordance with Appendix A.	**8**
(2)	A carport is installed, the garage is detached from the building, or no garage is installed.		**10**

11.901.4 Wood materials. A minimum of 85 percent of newly installed material within a 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:		**10 Max**
(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 as follows: Exposure 1 or Exterior for plywood, and Exposure 1 for OSB.	**Mandatory**
(2)	Particleboard and MDF (medium density fiberboard) is manufactured and labeled in accordance with CPA A208.1 and CPA A208.2, respectively. **(Points awarded per product group.)**	**2**
(3)	Hardwood plywood in accordance with HPVA HP-1. **(Points awarded per product group.)**	**2**
(4)	Particleboard, MDF, or hardwood plywood is in accordance with CPA 4. **(Points awarded per product group.)**	**3**
(5)	Composite wood or agrifiber panel products contain no added urea-formaldehyde or are in accordance with the CARB *Composite Wood Air Toxic Contaminant Measure Standard*. **(Points awarded per product group.)**	**4**
(6)	Non-emitting products. **(Points awarded per product group.)**	**4**

11.901.5 Cabinets. A minimum of 85 percent of newly installed cabinets are in accordance with one or both of the following: **(Where both of the following practices are used, only three points are awarded.)**		
(1)	All parts of the cabinet are made of solid wood or non-formaldehyde emitting materials such as metal or glass.	**5**
(2)	The composite wood used in wood cabinets are in accordance with CARB Composite Wood Air Toxic Contaminant Measure Standard or equivalent as certified by a program such as but not limited to, those in Appendix D.	**3**

GREEN BUILDING PRACTICES	POINTS
11.901.6 Carpets. Carpets are in accordance with the following:	
(1) Wall-to-wall carpeting is not installed adjacent to water closets and bathing fixtures.	**Mandatory**
11.901.7 Floor materials. The following types of finished flooring materials are used. The materials have emission levels in accordance with CDPH/EHLB Standard Method v1.1. Product is tested by a laboratory with the CDPH/EHLB Standard Method v1.1 within the laboratory scope of accreditation to ISO/IEC 17025 and certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D. **(Points are awarded for every 10% of conditioned floor space using one of the below materials.)**	**1** **8 max**
(1) Hard surface flooring: Prefinished installed hard-surface flooring is installed. Where post-manufacture coatings or surface applications have not been applied, the following hard surface flooring types are deemed to comply with the emission requirements of this practice:	
(a) Ceramic tile flooring	
(b) Organic-free, mineral-based flooring	
(c) Clay masonry flooring	
(d) Concrete masonry flooring	
(e) Concrete flooring	
(f) Metal flooring	
(g) Glass	
(2) Carpet and carpet cushion is installed.	
(When carpet cushion meeting the emission limits of the practice is also installed, the percentage of compliant carpet area is calculated at 1.33 times the actual installed area.)	
11.901.8 Wall coverings. When at least 10 percent of the interior wall surfaces are covered, a minimum of 85 percent of wall coverings are in accordance with the emission concentration limits of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.	**4**
11.901.9 Interior architectural coatings. A minimum of 85 percent of newly applied interior architectural coatings are in accordance with either Section 11.901.9.1 or Section 11.901.9.3, not both. A minimum of 85 percent of architectural colorants are in accordance with Section 11.901.9.2.	
Exception: Interior architectural coatings that are formulated to remove formaldehyde and other aldehydes in indoor air and are tested and labeled in accordance with ISO 16000-23, Indoor air – Part 23: Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials.	

GREEN BUILDING PRACTICES	POINTS

11.901.9.1 Site-applied interior architectural coatings, which are inside the waterproofing envelope, are in accordance with one or more of the following: **5**

(1) Zero VOC as determined by EPA Method 24 (VOC content below the detection limit for the method)

(2) GreenSeal GS-11

(3) CARB *Suggested Control Measure for Architectural Coatings* (see Table 11.901.9.1)

Table 11.901.9.1
VOC Content Limits For Architectural Coatings[a,b,c]

Coating Category	LIMIT[d] (g/l)
Flat Coatings	50
Non-flat Coatings	100
Non-flat - High Gloss Coatings	150
Specialty Coatings:	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete/Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings	120[e]
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multi-Color Coatings	250
Pre-Treatment Wash Primers	420
Primers, Sealers, and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs, Clear	730
Shellacs, Opaque	550
Specialty Primers, Sealers, and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340

GREEN BUILDING PRACTICES	POINTS

Coating Category	LIMIT[d] (g/l)
Traffic Marking Coatings	100
Tub and Tile Refinish Coatings	420
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350
Zinc-Rich Primers	340

a. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.
b. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008.
c. Table 11.901.9.1 architectural coating regulatory category and VOC content compliance determination shall conform to the California Air Resources Board Suggested Control Measure for Architectural Coatings dated February 1, 2008.
d. Limits are expressed as VOC Regulatory (except as noted), thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.
e. Limit is expressed as VOC actual.

11.901.9.2 Architectural coating colorant additive VOC content is in accordance with Table 11.901.9.2.

(Points for 11.901.9.2 are awarded only if base architectural coating is in accordance with 11.901.9.1.)

1

Table 11.901.9.2
VOC content limits for colorants

Colorant	LIMIT (g/l)
Architectural Coatings, excluding IM Coatings	50
Solvent-Based IM	600
Waterborne IM	50

11.901.9.3 Site-applied interior architectural coatings are in accordance with the emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix D.

8

11.901.9.4 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.

Mandatory

GREEN BUILDING PRACTICES	POINTS
11.901.10 Interior adhesives and sealants. Interior low-VOC adhesives and sealants located inside the water proofing envelope: A minimum of 85 percent of newly applied site-applied products used within the interior of the building are in accordance with one of the following, as applicable.	
(1) The emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined when tested by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix D.	**8**
(2) GreenSeal GS-36	**5**
(3) SCAQMD Rule 1168 in accordance with Table 11.901.10(3), excluding products that are sold in 16 ounce containers or less and are regulated by the California Air Resources Board (CARB) Consumer Products Regulation.	**5**

Table 11.901.10(3)
Site Applied Adhesive and Sealants VOC Limits[a,b]

ADHESIVE OR SEALANT	VOC LIMIT (g/l)
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
Architectural sealants	250
Architectural sealant primer Non-porous Porous	 250 775
Modified bituminous sealant primer	500
Other sealant primers	750
CPVC solvent cement	490
PVC solvent cement	510
ABS solvent cement	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140

a. VOC limit less water and less exempt compounds in grams/liter
b. For low-solid adhesives and sealants, the VOC limit is expressed in grams/liter of material as specified in Rule 1168. For all other adhesives and sealants, the VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds as specified in Rule 1168.

GREEN BUILDING PRACTICES		POINTS
11.901.11 Insulation. Emissions of 85 percent of newly installed wall, ceiling, and floor insulation materials are in accordance with the emission levels of CDPH/EHLB. Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.		**4**
11.901.12 Carbon monoxide (CO) alarms. A carbon monoxide (CO) alarm is provided in accordance with the IRC Section R315.		**Mandatory**
11.901.13 Building entrance pollutants control. Pollutants are controlled at all main building entrances by one of the following methods:		
(1)	Exterior grilles or mats are installed in a fixed manner and may be removable for cleaning.	**1**
(2)	Interior grilles or mats are installed in a fixed manner and may be removable for cleaning.	**1**
11.901.14 Non-smoking areas. Environmental tobacco smoke is minimized by one or more of the following:		
(1)	All interior common areas of a multifamily building are designated as non-smoking areas with posted signage.	**1**
(2)	Exterior smoking areas of a multifamily building are designated with posted signage and located a minimum of 25 feet from entries, outdoor air intakes, and operable windows.	**1**
11.901.15 Lead-safe work practices. For buildings constructed before 1978, lead-safe work practices are used during the remodeling.		**Mandatory**

11.902 POLLUTANT CONTROL

11.902.0 Intent. Pollutants generated in the building are controlled.

11.902.1 Spot ventilation

11.902.1.1 Spot ventilation is in accordance with the following:		
(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. **(Points are awarded only if a window complying with IRC Section R303.3 is provided in addition to mechanical ventilation.)**	**Mandatory 1**
(2)	Clothes dryers (except listed and labeled condensing ductless dryers) are vented to the outdoors.	**Mandatory**
(3)	Kitchen exhaust units and/or range hoods are ducted to the outdoors and have a minimum ventilation rate of 100 cfm (47.2 L/s) for intermittent operation or 25 cfm (11.8 L/s) for continuous operation.	**8**

GREEN BUILDING PRACTICES	POINTS
11.902.1.2 Bathroom and/or laundry exhaust fan is provided with an automatic timer and/or humidistat:	**11 Max**
(1) for first device	**5**
(2) for each additional device	**2**

11.902.1.3 Kitchen range, bathroom, and laundry exhaust are verified to air flow specification. Ventilation airflow at the point of exhaust is tested to a minimum of:	**8**
(a) 100 cfm (47.2 L/s) intermittent or 25 cfm (11.8 L/s) continuous for kitchens, and	**6**
(b) 50 cfm (23.6 L/s) intermittent or 20 cfm (9.4 L/s) continuous for bathrooms and/or laundry.	

11.902.1.4 Exhaust fans are ENERGY STAR, as applicable.	**12 Max**
(1) ENERGY STAR, or equivalent, fans **(Points awarded per fan.)**	**2**
(2) ENERGY STAR, or equivalent, fans operating at or below 1 sone **(Points awarded per fan.)**	**3**

11.902.1.5 Fenestration in spaces other than those identified in 902.1.1 through 902.1.4 are designed for stack effect or cross-ventilation in accordance with all of the following:	**3**
(1) Operable windows, operable skylights, or sliding glass doors with a total area of at least 15 percent of the conditioned floor area are provided.	
(2) Insect screens are provided for all operable windows, operable skylights, and sliding glass doors.	
(3) A minimum of two operable windows or sliding glass doors are placed in adjacent or opposite walls. If there is only one wall surface in that space exposed to the exterior, the minimum windows or sliding glass doors may be on the same wall.	

11.902.2 Building ventilation systems

11.902.2.1 One of the following whole building ventilation systems is implemented and is in accordance with the specifications of Appendix B and an explanation of the operation and importance of the ventilation system is included in either 11.1001.1 or 11.1002.2.	**Mandatory where the maximum air infiltration rate is less than 5.0 ACH50**
(1) exhaust or supply fan(s) ready for continuous operation and with appropriately labeled controls	**3**
(2) balanced exhaust and supply fans with supply intakes located in accordance with the manufacturer's guidelines so as to not introduce polluted air back into the building	**6**
(3) heat-recovery ventilator	**7**
(4) energy-recovery ventilator	**8**

GREEN BUILDING PRACTICES	POINTS
11.902.2.2 Ventilation airflow is tested to achieve the design fan airflow at point of exhaust in accordance with Section 11.902.2.1.	**4**
11.902.2.3 MERV filters 8 to13 are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of MERV 8 to 13 filters.	**2**
11.902.2.4 MERV filters 14 or greater are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of the filter used.	**3**
11.902.3 Radon control. Radon control measures are in accordance with ICC IRC Appendix F. Zones are defined in Figure 9(1). This practice is not mandatory if the existing building has been tested for radon and is accordance with federal and local acceptable limits.	
(1) Buildings located in Zone 1	**Mandatory**
(a) a passive radon system is installed	**7**
(b) an active radon system is installed	**10**
(2) Buildings located in Zone 2 or Zone 3	
(a) a passive or active radon system is installed	**7**
11.902.4 HVAC system protection. One of the following HVAC system protection measures is performed.	**3**
(1) HVAC supply registers (boots), return grilles, and rough-ins are covered during construction activities to prevent dust and other pollutants from entering the system.	
(2) Prior to owner occupancy, HVAC supply registers (boots), return grilles, and duct terminations are inspected and vacuumed. In addition, the coils are inspected and cleaned and the filter is replaced if necessary.	
11.902.5 Central vacuum systems. Central vacuum system is installed and vented to the outside.	**3**
11.902.6 Living space contaminants. The living space is sealed in accordance with Section 11.701.4.3.1 to prevent unwanted contaminants.	**Mandatory**

11.903 MOISTURE MANAGEMENT: VAPOR, RAINWATER, PLUMBING, HVAC

11.903.0 Intent. Moisture and moisture effects are controlled.

11.903.1 Plumbing

11.903.1.1 Cold water pipes in unconditioned spaces are insulated to a minimum of R-4 with pipe insulation or other covering that adequately prevents condensation.	**2**

GREEN BUILDING PRACTICES	POINTS
11.903.1.2 Plumbing is not installed in unconditioned spaces.	**5**
11.903.2 Duct insulation. Ducts are in accordance with one of the following:	
(1) All HVAC ducts, plenums, and trunks in are conditioned space.	**1**
(2) All HVAC ducts, plenums, and trunks in are conditioned space. All HVAC ducts are insulated to a minimum of R4.	**3**
11.903.3 Relative humidity. In climate zones 1A, 2A, 3A, 4A, and 5A as defined by Figure 6(1), equipment is installed to maintain relative humidity (RH) at or below 60 percent using one of the following: **(Points not awarded in other climate zones.)**	**7**
(1) additional dehumidification system(s)	
(2) central HVAC system equipped with additional controls to operate in dehumidification mode	
11.904 INDOOR AIR QUALITY	
11.904.0 Intent. IAQ is protected by best practices to control ventilation, moisture, pollutant sources and sanitation.	
11.904.1 Indoor Air Quality (IAQ) during construction. Wood is dry before close-in (11.602.1.7.1(3)), materials comply with emission criteria (11.901.4- 11.901.11), sources of water infiltration or condensation observed during construction have been eliminated, accessible interior surfaces are dry and free of visible suspect growth (per ASTM D7338-10 section 6.3), and water damage (per ASTM D7338-10 section 7.4.3).	**2**
11.904.2 Indoor Air Quality (IAQ) post completion. Verify there are no moisture, mold, and dust issues per 11.602.1.7.1(3), 11.901.4-11.901.11, ASTM D7388 Section 6.3, and ASTM D7338 Section 7.4.3.	**3**
11.905 INNOVATIVE PRACTICES	
11.905.1 Humidity monitoring system. A humidity monitoring system is installed with a mobile base unit that displays readings of temperature and relative humidity. The system has a minimum of two remote sensor units. One remote unit is placed permanently inside the conditioned space in a central location, excluding attachment to exterior walls, and another remote sensor unit is placed permanently outside of the conditioned space.	**2**
11.905.2 Kitchen exhaust. A kitchen exhaust unit(s) that equals or exceeds 400 cfm (189 L/s) is installed, and make-up air is provided.	**2**

GREEN BUILDING PRACTICES	POINTS

11.1001
HOMEOWNER'S MANUAL AND TRAINING GUIDELINES FOR ONE- AND TWO-FAMILY DWELLINGS

11.1001.0 Intent. Information on the building's use, maintenance, and green components is provided.	

11.1001.1 Homeowner's manual. A homeowner's manual is provided and stored in a permanent location in the dwelling that includes the following, as available and applicable. **(Points awarded per two items. Points awarded for non-mandatory items.)**		**1** **8 Max**
(1)	A National Green Building Standard certificate with web link and completion document.	**Mandatory**
(2)	List of green building features (can include the national green building checklist).	**Mandatory**
(3)	Product manufacturer's manuals or product data sheet for newly installed major equipment, fixtures, and appliances including product model numbers and serial numbers. If product data sheet is in the building owners' manual, manufacturer's manual may be attached to the appliance in lieu of inclusion in the building owners' manual.	**Mandatory**
(4)	Maintenance checklist.	
(5)	Information on local recycling and composting programs.	
(6)	Information on available local utility programs that purchase a portion of energy from renewable energy providers.	
(7)	Explanation of the benefits of using energy-efficient lighting systems [e.g., compact fluorescent light bulbs, light emitting diode (LED)] in high-usage areas.	
(8)	A list of practices to conserve water and energy.	
(9)	Information on the importance and operation of the home's fresh air ventilation system.	
(10)	Local public transportation options.	
(11)	A diagram showing the location of safety valves and controls for major building systems.	
(12)	Where frost-protected shallow foundations are used, owner is informed of precautions including:	
	(a) instructions to not remove or damage insulation when modifying landscaping.	
	(b) providing heat to the building as required by the ICC IRC or IBC.	
	(c) keeping base materials beneath and around the building free from moisture caused by broken water pipes or other water sources.	
(13)	A list of local service providers that offer regularly scheduled service and maintenance contracts to ensure proper performance of equipment and the structure (e.g., HVAC, water-heating equipment, sealants, caulks, gutter and downspout system, shower and/or tub surrounds, irrigation system).	
(14)	A photo record of framing with utilities installed. Photos are taken prior to installing insulation, clearly labeled, and included as part of the building owners' manual.	
(15)	List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials.	
(16)	Information on organic pest control, fertilizers, deicers, and cleaning products.	

GREEN BUILDING PRACTICES		POINTS
(17)	Information on native landscape materials and/or those that have low-water requirements.	
(18)	Information on methods of maintaining the building's relative humidity in the range of 30 percent to 60 percent.	
(19)	Instructions for inspecting the building for termite infestation.	
(20)	Instructions for maintaining gutters and downspouts and importance of diverting water a minimum of 5 feet away from foundation.	
(21)	A narrative detailing the importance of maintenance and operation in retaining the attributes of a green-built building.	
(22)	Where stormwater management measures are installed on the lot, information on the location, purpose, and upkeep of these measures.	
(23)	For buildings originally built before 1978, the EPA publications "Reducing Lead Hazards When Remodeling Your Home" and "Asbestos in Your Home: A Homeowner's Guide".	
(24)	Explanation of and benefits from green cleaning in the home.	
(25)	Retrofit energy calculator that provides baseline for future energy retrofits.	

11.1001.2 Training of initial building owners. Initial building owners are familiarized with the role of occupants in achieving green goals. 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:	**Mandatory 8**
(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	

11.1002 CONSTRUCTION, OPERATION, AND MAINTENANCE MANUALS AND TRAINING FOR MULTIFAMILY BUILDINGS

11.1002.0 Intent. Manuals are provided to the responsible parties (owner, management, tenant, and/or maintenance team) regarding the construction, operation, and maintenance of the building. Paper or digital format manuals are to include information regarding those aspects of the building's construction, maintenance, and operation that are within the area of responsibilities of the respective recipient. One or more responsible parties are to receive a copy of all documentation for archival purposes.

GREEN BUILDING PRACTICES		POINTS
11.1002.1 Building construction manual. A building construction manual, including five or more of the following, is compiled and distributed in accordance with Section 11.1002.0. **(Points awarded per two items. Points awarded for non-mandatory items.)**		**1**
(1)	A narrative detailing the importance of constructing a green building, including a list of green building attributes included in the building. This narrative is included in all responsible parties' manuals.	**Mandatory**
(2)	A local green building program certificate as well as a copy of the *National Green Building Standard*™, as adopted by the Adopting Entity, and the individual measures achieved by the building.	**Mandatory**
(3)	Warranty, operation, and maintenance instructions for all equipment, fixtures, appliances, and finishes.	**Mandatory**
(4)	Record drawings of the building.	
(5)	A record drawing of the site including stormwater management plans, utility lines, landscaping with common name and genus/species of plantings.	
(6)	A diagram showing the location of safety valves and controls for major building systems.	
(7)	A list of the type and wattage of light bulbs installed in light fixtures.	
(8)	A photo record of framing with utilities installed. Photos are taken prior to installing insulation and clearly labeled.	

11.1002.2 Operations manual. Operations manuals are created and distributed to the responsible parties in accordance with Section 11.1002.0. Among all of the operation manuals, five or more of the following options are included. **(Points awarded per two items. Points awarded for non-mandatory items.)**		**1**
(1)	A narrative detailing the importance of operating and living in a green building. This narrative is included in all responsible parties' manuals.	**Mandatory**
(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).	**Mandatory**
(3)	Information on methods of maintaining the building's relative humidity in the range of 30 percent to 60 percent.	
(4)	Information on opportunities to purchase renewable energy from local utilities or national green power providers and information on utility and tax incentives for the installation of on-site renewable energy systems.	
(5)	Information on local and on-site recycling and hazardous waste disposal programs and, if applicable, building recycling and hazardous waste handling and disposal procedures.	
(6)	Local public transportation options.	
(7)	Explanation of the benefits of using compact fluorescent light bulbs, LEDs, or other high-efficiency lighting.	
(8)	Information on native landscape materials and/or those that have low water requirements.	
(9)	Information on the radon mitigation system, where applicable.	
(10)	A procedure for educating tenants in rental properties on the proper use, benefits, and maintenance of green building systems including a maintenance staff notification process for improperly functioning equipment.	
(11)	Information on the importance and operation of the building's fresh air ventilation system.	

GREEN BUILDING PRACTICES	POINTS
11.1002.3 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. **(Points awarded per two items. Points awarded for non-mandatory items.)**	**1**
(1) A narrative detailing the importance of maintaining a green building. This narrative is included in all responsible parties' manuals.	**Mandatory**
(2) A list of local service providers that offer regularly scheduled service and maintenance contracts to ensure proper performance of equipment and the structure (e.g., HVAC, water-heating equipment, sealants, caulks, gutter and downspout system, shower and/or tub surrounds, irrigation system).	
(3) User-friendly maintenance checklist that includes:	
(a) HVAC filters	
(b) thermostat operation and programming	
(c) lighting controls	
(d) appliances and settings	
(e) water heater settings	
(f) fan controls	
(4) List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials.	
(5) Information on organic pest control, fertilizers, deicers, and cleaning products.	
(6) Instructions for maintaining gutters and downspouts and the importance of diverting water a minimum of 5 feet away from foundation.	
(7) Instructions for inspecting the building for termite infestation.	
(8) A procedure for rental tenant occupancy turnover that preserves the green features.	
(9) An outline of a formal green building training program for maintenance staff.	
(10) A green cleaning plan which includes guidance on sustainable cleaning products.	

11.1002.4 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:
(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

GREEN BUILDING PRACTICES	POINTS

11.1003 PUBLIC EDUCATION

11.1003.0 Intent. Increase public awareness of the National Green Building Standard and projects constructed in accordance with National Green Building Standard to help increase demand for high-performance homes.	

11.1003.1 Public Education. One or more of the following is implemented:		**2 Max**
(1)	**Signage.** Signs showing the project is designed and built in accordance with the National Green Building Standard are posted on the construction site.	**1**
(2)	**Certification Plaques.** National Green Building Standard certification plaques with rating level attainted are placed in a conspicuous location near the utility area of the home or, in a conspicuous location near the main entrance of a multifamily building.	**1**
(3)	**Education.** A URL for the National Green Building Standard is included on site signage, builder website (or property website for multifamily buildings), and marketing materials for homes certified under the National Green Building Standard.	**1**

11.1005 INNOVATIVE PRACTICES

11.1005.1 (Reserved)

CHAPTER 12

REMODELING OF FUNCTIONAL AREAS

GREEN BUILDING PRACTICES

Note: Where applicable, section numbering in Chapter 12 parallels a corresponding practice in a previous chapter.

12.0 REMODELING OF FUNCTIONAL AREAS

12.0 Intent. This chapter sets forth the mandatory green building practices for remodeling functional areas of buildings. The intent of Chapter 12 is to address the most common remodeling projects: complete kitchen, full bathroom, complete basement, attic conversion to habitable space, or an addition less than 50% of the existing original conditioned floor area not to exceed 800 square feet. Chapter 12 is not intended to be used for rating minor alterations.

12.0.1 Applicability. Each applicable practice in Section 12.1 shall be met for any of the remodeled functional areas included in Chapter 12. Additionally, the requirements of Sections 12.2, 12.3, 12.4, or 12.5 that are specific to each of the functional areas shall be met. Unless otherwise required, the requirements of Chapter 12 only apply to the remodeled functional area.

12.1 GENERAL

12.1.601.2 Material usage. Structural systems required for the remodel are designed or construction techniques are implemented that reduce and optimize material usage using at least one of the following methods

(1)	Minimum structural member or element sizes necessary for strength and stiffness in accordance with advanced framing techniques or structural design standards are selected.
(2)	Higher-grade or higher-strength of the same materials than commonly specified for structural elements and components in the building are used and element or component sizes are reduced accordingly.
(3)	Performance-based structural design is used to optimize lateral force-resisting systems.

12.1.602.1.7.1 Moisture control measures. Moisture control measures for newly installed materials are in accordance with the following:

(1)	Building materials with visible mold are not installed or are cleaned or encapsulated prior to concealment and closing.
(2)	Insulation in cavities is dry in accordance with manufacturer's installation instructions when enclosed (e.g., with drywall).

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12.1.602.1.7.2 Moisture content. Moisture content of subfloor, substrate, or concrete slabs is in accordance with the appropriate industry standard for the finish flooring to be applied during the remodel.

12.1.602.1.11 Tile backing materials. Newly installed tile backing materials under tiled surfaces in wet areas are in accordance with ASTM C1178, C1278, C1288, or C1325.

12.1(A) Product or material selection. At least two newly installed types of materials from Section 12.1(A) are used.

12.1(A).601.7 Prefinished materials. One or more of the prefinished building materials or assemblies listed below have no additional site-applied finishing material installed.

(a) interior trim not requiring paint or stain

(b) exterior trim not requiring paint or stain

(c) window, skylight, and door assemblies not requiring paint or stain on one of the following surfaces:
i. exterior surfaces
ii. interior surfaces

(d) interior wall coverings or systems, floor systems, and/or ceiling systems not requiring paint or stain or other type of finishing application

(e) exterior wall coverings or systems, floor systems, and/or ceiling systems not requiring paint or stain or other type of finishing application

12.1(A).603.2 Reused and salvaged materials. Reclaimed and/or salvaged materials and components are used in the remodel.

12.1(A).604.1 Recycled content. Newly installed building materials with at least 25% recycled content are used for two components of the remodel.

12.1(A).605.1 Construction waste management plan. A construction waste management plan is developed, posted at the jobsite, and implemented diverting, through methods such as reuse, salvage, recycling, or manufacturer reclamation, a targeted amount (by weight) of nonhazardous construction and demolition materials from disposal in landfills and combustion, excluding energy and material recovery.

For remodeling projects, the waste management plan includes the recycling of 95 percent of electronic waste components (such as printed circuit boards from computers, building automation systems, HVAC, fire and security control boards) by a third-party certified E-Waste recycling facility

Exceptions: A recycling facility (traditional or E-Waste) offering material receipt documentation is not available within 50 miles of the jobsite.

12.1(A).606.1 Biobased products. Two or more of the following biobased products are used in the remodel.

(a) certified solid wood in accordance with Section 12.1(A).606.2

(b) engineered wood

(c) bamboo

(d) cotton

(e) cork

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(f)	straw
(g)	natural fiber products made from crops (soy-based, corn-based)
(h)	other biobased materials with a minimum of 50 percent biobased content (by weight or volume)

12.1(A).606.2 Wood-based products. Wood or wood-based products installed during the remodel are certified to the requirements of one of the following recognized product programs:

(a)	American Forest Foundation's American Tree Farm System® (ATFS)
(b)	Canadian Standards Association's Sustainable Forest Management System Standards (CSA Z809)
(c)	Forest Stewardship Council (FSC)
(d)	Program for Endorsement of Forest Certification Systems (PEFC)
(e)	Sustainable Forestry Initiative® Program (SFI)
(f)	National Wood Flooring Association's Responsible Procurement Program (RPP)
(g)	other product programs mutually recognized by PEFC

12.1(A).608.1 Resource-efficient materials. One or more products containing fewer materials are used in the remodel to achieve the same end-use requirements as conventional products, including but not limited to:

(a)	lighter, thinner brick with bed depth less than 3 inches and/or brick with coring of more that 25 percent
(b)	engineered wood or engineered steel products
(c)	roof or floor trusses

12.1(A).609.1 Regional materials. One or more regional materials are used in the remodel for major and/or minor components of the building.

(For a component to comply with this practice, a minimum of 75% of all products in that component category must be sourced regionally, e.g., stone veneer category – 75 percent or more of the stone veneer on a project must be sources regionally.)

12.1(A).610.1 Life cycle assessment. A life cycle assessment (LCA) tool is used to select environmentally preferable products, assemblies, or entire functional area in accordance with Section 12.1(A).610.1.1 or 12.1(A).610.1.2, respectively. Only one method of analysis or tool may be utilized. The reference service life is 60 years for any LCA tool. Results of the LCA are reported in terms of the environmental impacts listed in this practice and it is stated if operating energy was included in the LCA.

GREEN BUILDING PRACTICES

12.1(A).610.1.1 Functional area life cycle assessment. An LCA is performed in conformance with ASTM E2921 for an entire functional area using ISO14044 compliant life cycle assessment.

(1) Execute LCA at the functional area level through a comparative analysis between the final and reference building designs as set forth under Standard Practice, ASTM E2921. The assessment criteria includes the following environmental impact categories:

- **(a)** primary energy use
- **(b)** Global warming potential
- **(c)** Acidification potential
- **(d)** Eutrophication potential
- **(e)** Ozone depletion potential
- **(f)** Smog potential

(2) Execute LCA on regulated loads throughout the building operations life cycle stage. Conduct simulated energy performance analyses in accordance with Section 702.2.1 ICC IECC analysis (IECC Section 405) in establishing the comparative performance of final versus reference building designs. Primary energy use savings and global warming potential avoidance from simulation analyses results are determined using energy supplier, utility, or EPA electricity generation and other fuels energy conversion factors and electricity generation and other fuels emission rates for the locality or Sub-Region in which the building is located.

(3) Execute full LCA, including use-phase, through calculation of operating energy impacts (c) – (f) using local or regional emissions factors from energy supplier, utility, or EPA.

12.1(A).610.1.2 Life cycle assessment for a product or assembly. An environmentally preferable product or assembly is selected for an application based upon the use of an LCA tool that incorporates data methods compliant with ISO 14044 or other recognized standards that compare the environmental impact of products or assemblies.

(1) Two or more products with the same intended use are compared based on LCA and the product with at least a 15% average improvement is selected. A minimum of four environmental impact measures are included in the comparison. The environmental impact measures to be considered are chosen from the following:

- **(a)** primary energy use
- **(b)** global warming potential
- **(c)** acidification potential
- **(d)** eutrophication potential
- **(e)** ozone depletion potential
- **(f)** smog potential

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(2) An assembly with improved environmental impact measures that are on average at least 15% better than a comparable functionally assembly is selected. A minimum of four environmental impact measures are included in the comparison. The full life cycle, from resource extraction to demolition and disposal (including but not limited to on-site construction, maintenance and replacement, material and product embodied acquisition, and process and transportation energy), is assessed. The assessment includes all structural elements, insulation, and wall coverings of the assembly. The assessment does not include electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators, and conveying systems. The following functional building elements are eligible for points under this practice:

- **(a)** exterior walls
- **(b)** roof/ceiling
- **(c)** interior walls or ceilings
- **(d)** intermediate floors

The environmental impact measures to be considered are chosen from the following:

- **(a)** primary energy use
- **(b)** global warming potential
- **(c)** acidification potential
- **(d)** eutrophication potential
- **(e)** ozone depletion potential
- **(f)** smog potential

12.1(A).611.1 Manufacturer's environmental management system concepts. For one or more products used in the remodel, the product's manufacturer's operations and business practices include environmental management system concepts, and the production facility is registered to ISO 14001 or equivalent.

12.1(A).611.2 Sustainable products. One or more of the following products are used. Certification third-party agency is ISO 17065 accredited.

(1) 50% or more of carpet installed (by square feet) is third-party certified to NSF/ANSI 140.

(2) 50% or more of resilient flooring installed (by square feet) is third-party certified to NSF/ANSI 332.

(3) 50% or more of the insulation installed (by square feet) is third-party certified to EcoLogo CCD-016.

(4) 50% or more of interior wall coverings installed (by square feet) is third-party certified to NSF/ANSI 342.

(5) 50% or more of the gypsum board installed (by square feet) is third-party certified to UL 100.

(6) 50% or more of the door leafs installed (by number of door leafs) is third-party certified to UL 102.

(7) 50% or more of the tile installed (by square feet) is third-party certified to TCNA A138.1 Specifications for sustainable ceramic tiles, glass tiles and tile installation materials.

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12.1.605.0 Hazardous materials and waste. All hazardous materials exposed during the remodel are removed or comply with federal and local regulations. All waste classified as hazardous shall be properly handled and disposed of.

12.1.701.4.0 minimum energy efficiency requirements. Additions, alterations, or renovations to an existing building, building system or portion thereof comply with the provisions of the International Energy Conservation Code as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with this code. An addition complies with the IECC if the addition complies or if the existing building and addition comply with the IECC as a single building.

12.1.701.4.1.1 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. Where existing equipment is used, Manual J is used to verify the capacity is appropriate for the remodel.

12.1.701.4.2.1 Duct air sealing. Newly installed or modified ducts or ducts that are exposed during the remodel are air sealed. All duct sealing materials are rated to UL 181A or UL 181B specifications and are used in accordance with manufacturer's instructions.

12.1.701.4.2.2 Ducts 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.

12.1.701.4.2.3 Duct system sizing. New duct system is sized and designed in accordance with ACCA Manual D or equivalent.

12.1.701.4.3.1 Building thermal envelope air sealing. The portions of the building thermal envelope that are exposed or created during the remodel are 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:

(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 and ceilings separating a garage from conditioned spaces.
(h)	Behind tubs and showers on exterior walls.
(i)	Common walls between dwelling units.
(j)	Attic access openings.
(k)	Rim joist junction.
(l)	Other sources of infiltration.

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12.1.701.4.3.2 Air sealing and insulation. Grade II and III installation is not permitted for newly installed insulation. For the portions of the building envelope that are exposed or created during the remodel, air barrier and insulation items listed in Table 12.1.701.4.3.2(2) are field verified via visual inspection.

12.1.701.4.3.2.1 Grade I insulation installations are in accordance with the following:		**Mandatory**
(1)	Grading applies to field-installed insulation products.	
(2)	Grading applies to ceilings, walls, floors, band joists, rim joists, conditioned attics basements and crawlspaces, except as specifically noted.	
(3)	Inspection is conducted before insulation is covered.	
(4)	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.	
(5)	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).	
(6)	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.	
(7)	Exterior rigid insulation has substantial contact with the structural framing members or sheathing materials and is tightly fitted at joints.	
(8)	Cavity insulation is split, installed, and/or fitted tightly around wiring and other services.	
(9)	Exterior sheathing is not visible from the interior through gaps in the cavity insulation.	
(10)	Faced batt insulation is permitted to have side-stapled tabs, provided the 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 tab itself.	
(11)	Where properly installed, ICFs, SIPs, and other wall systems that provide integral insulation are deemed in compliance with the Grade 1 insulation installation requirements.	

Table 12.1.701.4.3.2(2)
Air Barrier and Insulation Installation

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings. drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within comers and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/doorjambs and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.

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12.1.701.4.3.4 Fenestration air leakage. Newly installed windows, skylights, and sliding glass doors (except site-built windows, skylights, and doors) have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m^2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m^2), when tested in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory, and are listed and labeled.
12.1.701.4.3.5 Recessed lighting. Newly installed recessed luminaires installed in the building thermal envelope are sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires 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 recessed luminaires are sealed with a gasket or caulk between the housing and the interior of the wall or ceiling covering.

12.1.701.4.4 High-efficacy lighting. Lighting efficacy in dwelling units is in accordance with one of the following:	**Mandatory**
(1) A minimum of 75 percent of the total hard-wired lighting fixtures or the bulbs in those fixtures qualify as high efficacy or equivalent	
(2) Lighting power density, measured in watts/square foot, is 1.1 or less.	

12.1.701.4.5 Boiler supply piping. Insulate all newly installed boiler supply piping in unconditioned space and insulate existing boiler supply piping in unconditioned space where accessible.
12.1.701.4.6 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 703.2.5.1.
12.1.701.4.7 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 703.2.5.1.
12.1.703.6.2 Appliances. All newly installed major appliances in the remodeled portion of the building are ENERGY STAR or equivalent:
12.1.901.1.4 Gas-fired equipment. Newly installed gas-fired fireplaces and direct heating equipment is listed and is installed in accordance with NFPA 54, ICC IFGC, or the applicable local gas appliance installation code. Gas-fired fireplaces within dwelling units and direct heating equipment are vented to the outdoors.

12.1.901.2.1 Solid fuel-burning appliances. Newly installed solid fuel-burning fireplaces, inserts, stoves, and heaters are code compliant and are in accordance with the following requirements:
(1) Site-built masonry wood-burning fireplaces are equipped with outside combustion air and a means of sealing the flue and the 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 EPA certified or Phase 2 Qualified.

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(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 the requirements of ASTM E1509 or are EPA certified.
(5)	Masonry heaters are in accordance with the definitions in ASTM E1602 and ICC IBC, Section 2112.1.

12.1.901.3 Attached garages. Newly installed door(s) in the common wall between the attached garage and conditioned space is tightly sealed and gasketed.

12.1.901.4 Wood materials. A minimum of 85 percent of newly installed wood structural panels 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 as follows: Exposure 1 or Exterior for plywood, and Exposure 1 for OSB.

12.1.901.5 Cabinets. A minimum of 85 percent of newly installed cabinets are in accordance with one or any combination of the following:

(1)	All parts of the cabinet are made of solid wood or non-formaldehyde emitting materials such as metal or glass.
(2)	The composite wood used in wood cabinets are in accordance with CARB Composite Wood Air Toxic Contaminant Measure Standard or equivalent as certified by a third-party program such as but not limited to, those in Appendix D.

12.1.901.6 Carpets. Carpets in the remodeled portion of the building are in accordance with the following:

(1)	Wall-to-wall carpeting is not installed adjacent to water closets and bathing fixtures.

12.1.901.7 Floor materials. The following types of finished flooring materials are used. The materials have emission levels in accordance with CDPH/EHLB Standard Method v1.1. Product is tested by a laboratory with the CDPH/EHLB Standard Method v1.1 within the laboratory scope of accreditation to ISO/IEC 17025 and certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.

(1)	Hard surface flooring: Prefinished installed hard-surface flooring is installed. Where post-manufacture coatings or surface applications have not been applied, the following hard surface flooring types are deemed to comply with the emission requirements of this practice:	
	(a)	Ceramic tile flooring
	(b)	Organic-free, mineral-based flooring
	(c)	Clay masonry flooring
	(d)	Concrete masonry flooring
	(e)	Concrete flooring
	(f)	Metal flooring
	(g)	Glass
(2)	Carpet and carpet cushion is installed	

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12.1.901.8 Interior wall coverings. At least 85 percent of newly installed interior wall coverings are in accordance with the emission concentration limits of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.

12.1.901.9 Architectural coatings. A minimum of 85 percent of newly applied architectural coatings in the remodeled portion of the building are in accordance with either Section 12.1.901.9.1 or Section 12.1.901.9.2.

Exception: Interior architectural coatings that are formulated to remove formaldehyde and other aldehydes in indoor air and are tested and labeled in accordance with ISO 16000-23, Indoor air – Part 23: Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials.

12.1.901.9.1 New site-applied interior architectural coatings, which are inside the water-proofing envelope, are in accordance with one or more of the following:

(1) Zero VOC as determined by EPA Method 24 (VOC content below the detection limit for the method)

(2) GreenSeal GS-11

(3) CARB Suggested Control Measure for Architectural Coatings (see Table 12.1.901.9.1).

Table 12.1.901.9.1
VOC Content Limits For Architectural Coatings[a,b,c]

Coating Category	LIMIT[d] (g/l)
Flat Coatings	50
Non-flat Coatings	100
Non-flat High-Gloss Coatings	150
Specialty Coatings:	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete/Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350
Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings	120[e]
Magnesite Cement Coatings	450

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Coating Category	LIMIT[d] (g/l)
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multi-color Coatings	250
Pre-treatment Wash Primers	420
Primers, Sealers, and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs, Clear	730
Shellacs, Opaque	550
Specialty Primers, Sealers, and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Tub and Tile Refinish Coatings	420
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350
Zinc-rich Primers	340

a. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.
b. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008.
c. Table 12.1.901.9.1 architectural coating regulatory category and VOC content compliance determination shall conform to the California Air Resources Board Suggested Control Measure for Architectural Coatings dated February 1, 2008.
d. Limits are expressed as VOC Regulatory (except as noted), thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.
e. Limit is expressed as VOC actual.

12.1.901.9.2 New site-applied interior architectural coatings are in accordance with the emission levels of CDPH/EHLB Standard Method v1.1, footnote b in Table 4.1 does not apply (i.e., maximum allowable formaldehyde concentration is 16.5 µg/m^3 (13.5 ppb)). Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.

12.1.901.10 Adhesives and sealants. Interior low-VOC adhesives and sealants located inside the waterproofing envelope: A minimum of 85 percent of newly applied site-applied adhesive and sealant products used within the interior of the building are in accordance with one of the following, as applicable.

(1) The emission levels of CDPH/EHLB Standard Method v1.1 when tested by a laboratory with the CDPH/EHLB Standard Method v1.1 within the laboratory scope of accreditation to ISO/IEC 17025 and certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix D.

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(2) GreenSeal GS-36

OR

(3) SCAQMD Rule 1168 (see Table 12.1.901.10.(3)), excluding products that are sold in 16-ounce containers or less and are regulated by the California Air Resource Board (CARB) Consumer Products Regulation.

Table 12.1.901.10.(3)
Site Applied Adhesive and Sealants VOC Limits[a,b]

ADHESIVE	VOC LIMIT (g/l)
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
Architectural sealants	250
Architectural sealant primer Non-porous Porous	 250 775
Modified bituminous sealant primer	500
Other sealant primers	750
CPVC solvent cement	490
PVC solvent cement	510
ABS solvent cement	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140

a. VOC limit less water and less exempt compounds in grams/liter
b. For low-solid adhesives and sealants, the VOC limit is expressed in grams/liter of material as specified in Rule 1168. For all other adhesives and sealants, the VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds as specified in Rule 1168.

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12.1.901.11 Insulation. Emissions of newly installed wall, ceiling, and floor insulation materials are in accordance with the emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix D.

12.1.901.15 Lead-safe work practices. For buildings constructed before 1978, lead-safe work practices are used during the remodeling.

12.1.902.1.1 Spot ventilation. Spot ventilation is in accordance with the following:

(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.

(2) Clothes dryers (except listed and labeled condensing ductless dryers) are vented to the outdoors.

12.1.902.4 HVAC system protection. One of the following HVAC system protection measures is performed.

(1) HVAC supply registers (boots), return grilles, and rough-ins are covered during construction activities to prevent dust and other pollutants from entering the system.

(2) Prior to owner occupancy, HVAC supply registers (boots), return grilles, and duct terminations are inspected and vacuumed, if necessary. In addition, the coils are inspected and cleaned and the filter is replaced if necessary.

12.1.903.2 Duct insulation. All newly installed, exposed, or modified HVAC ducts, plenums, and trunks in unconditioned attics, basements, and crawlspaces are insulated to a minimum of R-6. Outdoor air supplies to ventilation systems are insulated to a minimum of R-6.

12.2 KITCHEN REMODELS

12.2.0 Applicability. In addition to the practices listed in Section 12.1, the following practices are mandatory for all kitchen remodels.

12.2.607.1 Recycling and composting. Recycling and composting by the occupants are facilitated by means of a built-in collection space in the kitchen or an aggregation/collection space in a garage, covered outdoor space, or other area for recycling containers.

12.2.607.2 Food waste disposers. Where allowed by local code, a food waste disposer is installed at each newly installed primary kitchen sink.

12.2.801.4.1 Faucets. Newly installed lavatory faucets have a maximum flow rate of 1.5 gpm (5.68 L/m) or less when tested at 60 psi (414 kPa) in accordance with ASME A112.18.1.

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12.3 BATHROOM REMODELS

12.3.0 Applicability. In addition to the practices listed in Section 12.1, the following practices are mandatory for all bathroom remodels.

12.3.611.3 Universal design elements. Where existing walls are exposed and where new walls are constructed, blocking or equivalent is installed to accommodate the future installation of grab bars at water closet(s) and bathing fixture(s).

12.3.801.3 Showerheads. The total maximum combined flow rate of all newly installed showerheads that are controlled by a single valve at any point in time in a shower compartment is 1.6 to less than 2.5 gpm. Maximum of two valves are installed per shower compartment. The flow rate is tested at 80 psi (552 kPa) in accordance with ASME A112.18.1. Showerheads are served by an automatic compensating valve that complies with ASSE 1016 or ASME A112.18.1 and specifically designed to provide thermal shock and scald protection at the flow rate of the showerhead.

12.3.801.4.1 Faucets. Newly installed lavatory faucets have a maximum flow rate of 1.5 gpm (5.68 L/m) or less when tested at 60 psi (414 kPa) in accordance with ASME A112.18.1.

12.3.801.5 Water closets. All newly installed water closets have an effective flush volume of 1.28 gallons (4.85 L) or less when tested in accordance with ASME A112.19.2 or ASME A112.19.14 as applicable, and is in accordance with EPA WaterSense Tank-Type Toilets.

12.4 BASEMENT REMODELS

12.4.0 Applicability. In addition to the practices listed in Section 12.1, the following practices are mandatory for all basement remodels.

12.4.1 Moisture inspection. Prior to any construction activity, the basement is inspected for evidence of moisture problems. Any identified moisture problems are corrected prior to covering any walls or floors.

12.4.2 Kitchen. When the basement remodel includes a kitchen, the remodel shall also comply with the practices in Section 12.2.

12.4.3 Bathroom. When the basement remodel includes a bathroom, the remodel shall also comply with the practices in Section 12.3.

12.4.902.3 Radon control. In Radon Zone 1, passive or active radon control system is installed in accordance with ICC IRC Appendix F.

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12.5 CONVERSION OF PREVIOUSLY UNCONDITIONED SPACE TO CONDITIONED SPACE

12.5.0 Applicability. In addition to the practices listed in Section 12.1, the following practices are mandatory for all conversions of previously unconditioned spaces into conditioned spaces such as, but not limited to attics, garages, etc.

12.5.1 Moisture inspection. Prior to any construction activity, the space to be converted shall be inspected for evidence of moisture problems. Any identified moisture problems are corrected prior to covering any ceilings, walls, or floors.

12.5.2 Kitchen. When the space to be converted includes a kitchen, the remodel shall also comply with the practices in Section 12.2.

12.5.3 Bathroom. When the space to be converted includes a bathroom, the remodel shall also comply with the practices in Section 12.3.

12.5.4 Knee walls. When the space to be converted includes a knee wall, the remodel shall also comply with 12.1.701.4.3.1.

12.6 ADDITIONS

12.6.0 Applicability. In addition to the practices listed in Section 12.1, the following practices are mandatory for all addition remodels.

12.6.1 Kitchen. When the addition includes a kitchen, the remodel shall also comply with the practices in Section 12.2.

12.6.2 Bathroom. When the addition includes a bathroom, the remodel shall also comply with the practices in Section 12.3.

12.6.503.5 Landscape plan. Where the addition disturbs more than 1,000 square feet of the lot, a landscape plan for the lot is developed to limit water and energy use while preserving or enhancing the natural environment. Landscaping is phased to coincide with achievement of final grades to ensure denuded areas are quickly vegetated.

12.6.602.1.1.1 Capillary break. A capillary break and vapor retarder are installed at concrete slabs in the addition in accordance with IRC Sections R506.2.2 and R506.2.3 or IBC Sections 1910 and 1805.4.1.

12.6.602.1.3.1 Exterior drain tile. Where required by the ICC IRC or IBC for habitable and usable spaces of the addition below grade, exterior drain tile is installed.

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12.6.602.1.4.1 Crawlspace. Vapor retarder in unconditioned vented crawlspace for the addition is in accordance with the following, as applicable. Joints of vapor retarder overlap a minimum of 6 inches (152 mm) and are taped.

(1) Floors. Minimum 6 mil vapor retarder installed on the crawlspace floor, extended at least 6 inches up the wall, and attached and sealed to the wall.

(2) Walls. Dampproof walls are provided below finished grade.

12.6.602.1.8 Water-resistive barrier. Where required by the ICC IRC or IBC, a water-resistive barrier and/or drainage-plane system is installed behind exterior veneer and/or siding of the addition.

12.6.602.1.9 Flashing. Flashing is provided for the addition and for the intersection where the addition joins the existing building, to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details are provided in the construction documents and are in accordance with the fenestration manufacturer's instructions, the flashing manufacturer's instructions, or as detailed by a registered design professional. Flashing is installed at all of the following locations, as applicable:

(a) around exterior fenestrations, skylights, and doors

(b) at roof valleys

(c) at all building-to-deck, -balcony, -porch, and -stair intersections

(d) at roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets

(e) at ends of and under masonry, wood, or metal copings and sills

(f) above projecting wood trim

(g) at built-in roof gutters, and

(h) drip edge is installed at eave and rake edges.

12.6.602.1.13 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier is installed on the addition 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.

12.6.602.1.14 Architectural features. New architectural features that increase the potential for water intrusion are avoided:

(1) No roof configurations that create horizontal valleys in roof design.

(2) No recessed windows and architectural features that trap water on horizontal surfaces.

(3) All horizontal ledgers are sloped away to provide gravity drainage as appropriate for the application.

GREEN BUILDING PRACTICES

12.6.602.4.1 Finished grade. Finished grade at all sides of the addition is sloped to provide a minimum of 6 inches (150 mm) of fall within 10 feet (3,048 mm) of the edge of the building. Where lot lines, walls, slopes, or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3,048 mm), the final grade is sloped away from the edge of the building at a minimum slope of 2 percent.

12.6.902.3 Radon control. In Radon Zone 1, a passive or active radon control system is installed in accordance with ICC IRC Appendix F.

CHAPTER 13

REFERENCED DOCUMENTS

1301 GENERAL

1301.1 This chapter lists the codes, standards, and other documents that are referenced in various sections of this Standard. The codes, standards, and other documents are listed herein indicating the promulgating agency of the document, the document identification, the effective date and title, and the section or sections of this Standard that reference the document. Unless indicated otherwise, the first printing of the document is referenced.

1301.2 The application of the referenced documents shall be as specified in Section 102.2.

1302 REFERENCED DOCUMENTS

ACCA		*Air Conditioning Contractors of America* *2800 Shirlington Road, Suite 300* *Arlington, VA 22206* *www.acca.org*	*(703) 575-4477*
Manual D	2014	Residential Duct Systems	701.4.2.3, 11.701.4.2.3, 12.1.701.4.2.3
Manual J	2011	Residential Load Calculation, Eighth Edition, Version 2.1	701.4.1.1, 701.4.1.2, 703.3.0, 11.701.4.1.1, 11.701.4.1.2, 12.1.701.4.1.1
Manual S	2014	Residential Equipment Selection	701.4.1.1, 703.3.0, 11.701.4.1.1, 12.1.701.4.1.1
5 QI	2010	HVAC Quality Installation Specification	701.4.1.2, 703.3.3, 703.3.4, 703.3.5, 703.3.6, 705.6.2.2(1), 705.6.2.2(2), 11.701.4.1.2

AFF		*American Forest Foundation, Inc.* *1111 Nineteenth Street, NW* *Suite 780* *Washington, DC 20036* *www.forestfoundation.org*	*(202) 463-2462*
2010-2015 AFF Standards	2010	American Tree Farm System Standards for Sustainability for Forest Certification, including Performance Measures and Field Indicators	606.2(a), 11.606.2(a), 12.1(A).606.2(a)

AAMA		*American Architectural Manufacturers Association* *1827 Walden Office Square, Suite 550* *Schaumburg, Illinois 60173-4268* *http://www.aamanet.org/*	*(847) 303-5664*
711	2013	The Voluntary Specification for Self Adhering Flashing Used for Installation of Exterior Wall Fenestration Products	602.1.9(2), 11.602.1.9(2)
714	2015	Voluntary Specification for Liquid Applied Flashing Used to Create a Water-Resistive Seal around Exterior Wall Openings in Buildings	602.1.9(2), 11.602.1.9(2)
AAMA/WDMA/CSA 101/I.S.2/A440 UP3	2008		701.4.3.4, 11.701.4.3.4, 12.1.701.4.3.4

AHRI		*Air-Conditioning, Heating, and Refrigeration Institute (AHRI)* *2111 Wilson Blvd, Suite 500* *Arlington, VA 22201* *www.ahrinet.org*	*(703) 524-8800*
I=B=R	2009	Heat Loss Calculation Guide	701.4.1.2, 11.701.4.1.2

ASCE		*American Society of Civil Engineers* *1801 Alexander Bell Drive* *Reston, VA 20191* *www.asce.org*	*(800) 548-2723*
32-01	2001	Design and Construction of Frost-Protected Shallow Foundations	202

ASME		*American Society of Mechanical Engineers* *Three Park Avenue* *New York, NY 10016* *www.asme.org*	*(800) 843-2763*
A112.18.1	2012	Plumbing Supply Fittings	801.3(1), 801.4.1, 12.2.801.5.1, 12.3.801.4, 12.3.801.5.1
A112.19.2/CSA B45.1	2013	Vitreous China Plumbing Fixtures and Hydraulic Requirements for Water Closets and Urinals	801.5(2), 801.5(4)b, 12.3.801.6
A112.19.14	2013	Six-Liter Water Closets Equipped with a Dual Flushing Device	801.5(2), 12.3.801.6

ASSE		*American Society of Sanitary Engineering* *901 Canterbury, Suite A* *Westlake, OH 44145* *www.asse-plumbing.org*	*(440) 835-3040*
1016	2011	Automatic Compensation Valves for Individual Showers and Tub/Shower Combinations	801.3(1), 12.3.801.4

ASTM		*ASTM International, Inc.* *100 Barr Harbor Drive, PO Box C700* *West Conshohocken, PA 19428* *www.astm.org*	*(610) 832-9500*
C1178	2013	Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel	602.1.11, 11.602.1.11, 12.1.602.1.11
C1278 – 07a/1278M – 07a	2011	Standard Specification for Fiber-Reinforced Gypsum Panel	602.1.11, 11.602.1.11, 12.1.602.1.11
C1288	2010	Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets	602.1.11, 11.602.1.11, 12.1.602.1.11
C1325-08b	2008	Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units	602.1.11, 11.602.1.11, 12.1.602.1.11
C1371	2010	Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers	703.2.3
D7338	2010	Standard Guide for Assessment Of Fungal Growth in Buildings	904.1, 904.2, 11.904.1, 11.904.2

E283	2012	Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen	701.4.3.5, 11.701.4.3.5, 12.1.701.4.3.5
E779	2010	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization	705.6.2.1
E1509	2012	Standard Specification for Room Heaters, Pellet Fuel-Burning Type	901.2.1(4), 11.901.2.1(4), 12.1.901.2.1(3)
E1602	2010	Standard Guide for Construction of Solid Fuel Burning Masonry Heaters	901.2.1(5), 11.901.2.1(5), 12.1.901.2.1(3)
E1827	2011	Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door	705.6.2.1
E1980	2011	Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low Sloped Opaque Surfaces	505.2(1)b, 602.2(3), 11.505.2(1)b, 11.602.2(3)
E2273	2011	Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies	602.1.9(5)b, 11.602.1.9(5)b
E2921	2013	Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes and Rating Systems	610.1.1, 610.1.1(1)a, 11.610.1.1, 11.610.1.1(1)a, 12.1(A).610.1.1, 12.1(A).610.1.1(1)a

BOMA		*Building Owners and Managers Association International* *1101 15th St., NW* *Suite 800* *Washington, DC 20005* *www.boma.org*	*(202) 408-2662*
Z65.4	2010	Multi-Unit Residential Buildings: Standard Methods of Measurement	601.1, 11.601.1

CARB		*California Air Resources Board* *1001 "I" Street* *P.O. Box 2815* *Sacramento, CA 95812* *www.arb.ca.gov*	*(916) 322-2990*
	2007	Composite Wood Air Toxic Contaminant Measure Standard	901.4(5), 901.5(2), 11.901.4(5), 11.901.5(2), 12.1.901.5
	2008	Suggested Control Measure for Architectural Coatings	901.9.1(3), 11.901.9.1(3), 12.1.901.9.1(3)
	2011	The California Consumer Products Regulations	901.10(3), 11.901.10(3), 12.1.901.10(3)

CDPH		*California Department of Public Health* *850 Marina Bay Parkway* *Richmond, CA 94804* *www.cdph.ca.gov*	*(510) 620-2864*
	2010	Standard Method For The Testing And Evaluation Of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers Version 1.1.	901.7, 901.8, 901.9.3, 901.10(1), 901.11, 11.901.6(2), 11.901.7, 11.901.8, 11.901.9.3, 11.901.10(1), 11.901.11, 12.1.901.7, 12.1.901.8, 12.1.901.9.2, 12.11.901.10(1), 12.1.901.11

CPA		*Composite Panel Association* *18922 Premiere Court* *Gaithersburg, MD 20879-1574* *www.pbmdf.com*	*(301) 670-0604*
A208.1	2009	Particleboard Standard	901.4(2), 11.901.4(2)
A208.2	2009	MDF Standard	901.4(2), 11.901.4(2)
CPA 4	2011	The Eco-Certified Composite™ (ECC) Standard	901.4(4), 11.901.4(4)

CSA		*CSA International* *8501 East Pleasant Valley Road* *Cleveland, OH 44131-5575* *www.csa-international.org*	*(216) 524-4990*
6.19	2011	Residential Carbon Monoxide Alarming Devices	
ANSI Z21.50/CSA 2.22	2014	Vented Gas Fireplaces w/ Addenda b	901.1.5, 11.901.1.5
ANSI Z21.88/CSA 2.33	2014	Vented Gas Fireplace Heaters	901.1.5, 11.901.1.5
Z809	2013	Sustainable Forest Management Requirements and Guidance (SFM)	606.2(b), 11.606.2(b), 12.1(A).606.2(b)

DOC/NIST		*United States Department of Commerce* *National Institute of Standards and Technology* *100 Bureau Drive Stop 3460* *Gaithersburg, MD 20899-3460* *www.nist.gov*	*(301) 975-2000*
PS 1-09	2010	Construction and Industrial Plywood	901.4(1), 11.901.4(1), 12.1.901.4
PS 2-10	2011	Performance Standard for Wood-based Structural-use Panels	901.4(1), 11.901.4(1), 12.1.901.4

DOE		*U.S. Department of Energy* *1000 Independence Ave., SW* *Washington, DC 20585* *www.energy.gov*	*800-345-3363*
v. 4.6.1	2015	REScheck	703.1.1, 703.2.1
v. 4.4.0	2015	COMCheck	703.1.1, 703.2.1

EcoLogo		*The EcoLogo Program* *171 Nepean Street, Suite 400* *Ottawa, ON, K2P 0B4, CANADA*	*(800) 478-0399*
CCD-016	2005	Thermal Insulation Materials	611.2(3), 11.611.2(3), 12.1(A).611.2(3)

EPA		*Environmental Protection Agency* *1200 Pennsylvania Avenue, NW* *Washington, DC 20460* *www.epa.gov*	*(202) 564-4700*
EPA 747-K-97-001	1997	Reducing Lead Hazards When Remodeling Your Home	11.1001.1(23)
Method 24	2000	Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings	901.9.1(1), 11.901.9.1(1), 12.1.901.9.1(1)
	1990	Asbestos in the Home: A Homeowner's Guide	11.1001.1(23)
ENERGY STAR® Documents			
	June 1, 2013	ENERGY STAR Certified Homes, Version 3 (Rev. 08) HERS Index Target Procedure for National Program Requirements	701.1, 701.1.3, 704.1, 704.2
	August 29, 2013	ENERGY STAR for Homes Version 3.0 Guidelines	701.1.4
	April 13, 2015	ENERGY STAR for Homes Version 3.1 Guidelines	701.1.4
	January 1, 2015	ENERGY STAR Multifamily High Rise Version 1 (Rev 03)	701.1.4
	January 1, 2014	ENERGY STAR Program Requirements for Clothes Washers, Version 7.0	703.6.2(3), 801.2(2), 801.2(3)
	January 20, 2013	ENERGY STAR Program Requirements for Dishwashers, Version 5.2	703.6.2(2), 801.2(1)
	December 1, 2009	ENERGY STAR Program Requirements for Geothermal Heat Pumps – Eligibility Criteria Version 3.1	703.2.5
	April 1, 2012	ENERGY STAR Program Requirements for Luminaires, Version 1.2	703.5.1(1), 703.6.1(1)
	April 28, 2014	ENERGY STAR Program Eligibility Criteria for Residential Refrigerators and/or Freezers, Version 5	703.6.2(1)
	April 1, 2012	ENERGY STAR Program Requirements for Residential Ceiling Fans – Eligibility Criteria Version 3.0	703.3.7
	April 1, 2012	ENERGY STAR Program Requirements for Residential Ventilating Fans – Eligibility Criteria Version 3.2	902.1.4(1), 902.1.4(2), 11.902.1.4(1), 11.902.1.4(2)
	January 17, 2014	ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Eligibility Criteria Version 6.0	703.2.5.2.1, 703.7.1(3),(4),(5),(6)a
	2012	ENERGY STAR Program Requirements for Roof Products – Eligibility Criteria Version 2.3	602.2(1), 11.602.2(1)

WaterSense Documents			
	May 20, 2014	WaterSense Specification for Tank-Type Toilets, Version 1.2	801.6(2), 12.3.801.6
	November 3, 2011	WaterSense Specification for Weather-Based Irrigation Controllers, Version 1.0	801.6.4(2)
	October 27, 2014	WaterSense: Professionals in System Design, Installation & Maintenance, and System Auditing Version 1.1	801.6.3
	December 9, 2014	WaterSense Water Budget Approach Version 1.02	403.6(4), 503.5(4), 11.503.5(4)

FSC		*Forest Stewardship Council* *FSC International Center* *Charles-de-Gaulle 5* *53113 Bonn, Germany* *www.fsc.org*	*49 228 367 66 0*
FSC-STD-01-001 (Version 4-0) EN	2013	FSC Principles and Criteria for Forest Stewardship v5	606.2(c), 11.606.2(c), 12.1(A).606.2(c)

GS		*Green Seal* *1001 Connecticut Avenue, NW* *Suite 827* *Washington, DC 20036* *www.greenseal.org*	*(202) 872-6400*
GS-11	2013	Paints and Coatings 3.1	901.9.1(2), 11.901.9.1(2), 12.1.901.9.1(2)
GS-36	2013	Adhesives for Commercial Use 2.1	901.10(2), 11.901.10(2), 12.1.901.10(2)

HPVA		*Hardwood Plywood Veneer Association* *1825 Michael Faraday Drive* *Reston, VA 20190* *www.hpva.org*	*(703) 435-2900*
HP-1	2009	American National Standard for Hardwood and Decorative Plywood	901.4(3), 11.901.4(3)

HUD		*U.S. Department of Housing and Urban Development* *451 7th Street SW* *Washington, DC 20410* *www.hud.gov*	*(202) 708-1112*
24 CFR, Part 3280	2014	Manufactured Home Construction and Safety Standards	202

ICC		*International Code Council* *500 New Jersey Ave, NW, 6th Floor* *Washington, DC 20001* *www.iccsafe.org*	*(888) 422-7233*
IBC	2015	International Building Code	202, 602.1.1.1, 602.1.3.1, 602.1.8, 602.1.13. 901.2.1(5), 1001.1(12)b, 11.602.1.1.1, 11.602.1.3.1, 11.602.1.8, 11.602.1.13, 11.901.2.1(5), 11.1001.1(12)b, 12.1.901.2.1(3), 12.6.602.1.1.1, 12.6.602.1.3.1, 12.6.602.1.8, 12.6.602.1.13,
ICC-400	2012	Standard on the Design and Construction of Log Structures	Table 701.4.3.2(2)
IECC	2015	International Energy Conservation Code	610.1.1(2), 701.1.4, 701.4.3.3, 702.2.1, 702.2.2, 702.2.3, 703.1.1.1, 703.1.1.2, 703.1.2, 703.1.3, 703.2.1, 705.6.2.1, 705.6.2.3(1), 705.6.2.3(2), 705.6.3, 11.610.1.1(2), 11.701.4.0, 11.701.4.3.3, 12.1.610.1.1(2), 12.1.701.4.0
IFGC	2015	International Fuel Gas Code	901.1.4, 11.901.1.4, 12.1.901.1.4
IMC	2015	International Mechanical Code	705.6.1(1)

IRC	2015	International Residential Code	202, 602.1.1.1, 602.1.3.1, 602.1.4.2(1), 602.1.4.2(2), 602.1.8, 602.1.13, 602.1.14, 705.6.1(1), 901.12, 902.1.1(1) 902.3, 1001.1(12)b, 11.602.1.1.1, 11.602.1.3.1, 11.602.1.4.2(1), 11.602.1.4.2(2), 11.602.1.8, 11.602.1.13, 11.901.12, 11.902.1.1(1) 11.902.3, 11.1001.1(12)b, 12.4.902.3, 12.6.602.1.1.1, 12.6.602.1.3.1, 12.6.602.1.8, 12.6.602.1.13, 12.6.902.3

IA		IRRIGATION ASSOCIATION & AMERICAN SOCIETY OF IRRIGATION CONSULTANTS 8280 Willow Oaks Corporate Drive, Suite 400 Fairfax, VA 22031 www.irrigation.org	(703) 536-7080
	2014	Landscape Irrigation Best Management Practices	403.6(14)

ISO		*International Organization for Standardization* *1, ch. de la Voie-Creuse,* *Case postale 56* *CH-1211 Geneva 20, Switzerland* *www.iso.org*	*41 22 749 01 11*
14025	2006	Environmental labels and declarations – Type III environmental declarations – Principles and procedures	611.4.1, 611.4.2, 11.611.4.1, 11.611.4.2
14044	2006	Environmental management – Life cycle assessment – Requirements and guidelines	610.1.1, 610.1.2, 11.610.1.1, 11.610.1.2, 12.1(A).610.1.1, 12.1(A).610.1.2
14001	2004	Environmental management systems – Requirements with guidance for use	611.1, 11.611.1, 12.1(A).611.1
16000-23	2009	Indoor air – Part 23: Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials	901.9, 11.901.9, 12.1.901.9
17025	2005	General requirements for the competence of testing and calibration laboratories	901.7, 901.8, 901.9.3, 901.10(1), 901.11, 11.901.7, 11.901.8, 11.901.9.3, 11.901.10(1), 11.901.11, 12.1.901.7, 12.1.901.8, 12.1.901.9.2, 12.1.901.10(1), 12.1.901.11
17065	2012	Conformity assessment – Requirements for bodies certifying products, processes and services	611.2, 901.7, 901.8, 901.9.3, 901.10(1), 901.11, 11.611.2, 11.901.7, 11.901.8, 11.901.9.3, 11.901.10(1), 11.901.11, 12.1(A).611.2, 12.1.901.7, 12.1.901.8, 12.1.901.9.2, 12.11.901.10(1) 12.1.901.11
21930	2007	Sustainability in building construction – Environmental declaration of building products	611.4.1, 611.4.2. 11.611.4.1, 11.611.4.2

Home Innovation		*Home Innovation Research Labs* *400 Prince George's Boulevard* *Upper Marlboro, MD 20774* *www.homeinnovation.com*	*(800) 638-8556*
Z765	2013	Single-Family Residential Buildings - Square Footage - Method for Calculating	601.1, 11.601.1

NFPA		*National Fire Protection Association* *1 Batterymarch Park* *Quincy, MA 02169* *www.nfpa.org*	*(617) 770-3000*
54	2012	National Fuel Gas Code	901.1.4, 11.901.1.4, 12.1.901.1.4

NFRC		*National Fenestration Rating Council* *6305 Ivy Lane, Suite 140* *Greenbelt, MD 20770* *http://www.nfrc.org*	*(301) 589-1776*
400	2010	Procedure for Determining Fenestration Product Air Leakage	701.4.3.4, 11.701.4.3.4, 12.1.701.4.3.4

NSF		*NSF International* *P.O. Box 130140* *789 N. Dixboro Road* *Ann Arbor, MI 48113-0140, USA* *www.nsf.org*	*(800) 673-6275*
NSF/ANSI 140	2013	Sustainable Carpet Assessment	611.2(1), 11.611.2(1), 12.1(A).611.2(1)
NSF/ANSI 332	2012	Sustainability Assessment for Resilient Floor Coverings	611.2(2), 11.611.2(2), 12.1(A).611.2(2)
NSF/ANSI 342	2012	Sustainability Assessment for Wallcovering Products	611.2(4), 11.611.2(4), 12.1(A).611.2(4)

NWFA		*National Wood Flooring Association* *111 Chesterfield Industrial Boulevard* *Chesterfield, Missouri 63005* *http://www.nwfa.org*	*(800) 422-4556*
	2011	Responsible Procurement Program	606.2(f), 11.606.2(f), 12.1(A).606.2(f)

PEFC		*Pan European Forest Council* *2éme Etage* *17 Rue des Girondins* *Merl-Hollerich* *L - 1626 Luxembourg* *www.pefc.org*	*352 26 25 90 59*
GL 2	2011	PEFC Council Minimum Requirements Checklist	606.2(d) & (g), 11.606.2(d) & (g), 12.1(A).606.2(d) & (g)

SCAQMD		*South Coast AQMD* *21865 Copley Dr* *Diamond Bar, CA 91765*	*(909) 396-2000*
Rule 1168	2011	Adhesive and Sealant Applications	901.10(3), 11.901.10(3), 12.1.901.10(3)

SRCC		*Solar Rating and Certification Corporation* *c/o FSEC* *1679 Clearlake Road* *Cocoa, FL 32922-5703* *www.solar-rating.org*	*(321) 638-1537*
OG 300	2014	Operating Guidelines and Minimum Standards for Certifying Solar Water Heating Systems	703.5.5

SFI		*Sustainable Forestry Initiative, Inc.* *1600 Wilson Boulevard, Su* *www.sfiprogram.org*	*(703) 875-9500*
2010-2014 Standard	2010	Sustainable Forestry Initiative Standard (SFIS)	606.2(e), 11.606.2(e), 12.1(A).606.2(e)

TCIA		*Tree Care Industry Association* *3 Perimeter Road, Unit 1* *Manchester, NH 03103* *www.tcia.org*	*(603) 314-5380*
A300	2001	Standards for Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices	503.1(6), 11.503.1(6)

TCNA		*Tile Council of North America* *100 Clemson Research Blvd.* *Anderson, SC 29625* *http://www.tileusa.com*	*(864) 646-8453*
A138.1	2011	Green Squared: American National Standard Specifications for Sustainable Ceramic Tiles, Glass Tiles, and Tile Installation Materials	611.2(7), 11.611.2(7), 12.1(A).611.2(7)

UL		*Underwriters Laboratories Inc.* *333 Pfingsten Road* *Northbrook, IL 60062-2096* *www.ul.com*	*(877) 854-3577*
127	2011	Factory-Built Fireplaces	901.2.1(2), 11.901.2.1(2), 12.1.901.2.1(2)
181	2013	The Standard for Safety for Factory-Made Air Ducts and Air Connectors	701.4.2.1, 11.701.4.2.1, 12.1.701.4.2.1
1482	2011	Solid-Fuel Type Room Heaters	901.2.1(3), 11.901.2.1(3), 12.1.901.2.1(3)
100	2012	Interim Sustainability Requirements for Gypsum Boards and Panels	611.2(5), 11.611.2(5), 12.1(A).611.2(5)
102	2012	Standard for Sustainability for Door Leafs	611.2(6), 11.611.2(6), 12.1(A).611.2(6)

USDA		*U.S. Department of Agriculture* *1400 Independence Ave., SW* *Washington, DC 20250* *www.usda.gov*	*(202) 720-2791*
7 CFR Part 2902	2014	Designation of Biobased Items for Federal Procurement; Final Rule	606.1(h)

WSL		*Washington State Legislature* *106 Legislative Building* *Olympia, WA 98504-0600* *www.leg.wa.gov*	*(360) 786-7573*
WAC 173-433-100(3)	2014	Solid Fuel Burning Devices - Emission Performance Standards	901.2.1(3), 11.901.2.1(3) 12.1.901.2.1(3)

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APPENDIX A

DUCTED GARAGE EXHAUST FAN SIZING CRITERIA

A100
SCOPE AND APPLICABILITY

A101.1 Applicability of Appendix A. Appendix A is part of this Standard.

A101.2 Scope. The provisions contained in Appendix A provide the criteria necessary for complying with Section 901.3(1)(c) for the installation of ducted exhaust fans in garages. To receive points for implementing Practice 901.3(1)(c), the fan airflow rating and duct sizing for ducted exhaust fans are to be in accordance with the applicable criteria of Appendix A.

A101.3 Acknowledgment. The text of Appendix A, Section A200 and related Table are extracted from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) Standard 62.2-2007 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*, Section 7.3 and Table 7.1, respectively, and is used with the permission of ASHRAE. The referenced Section and Table numbers within the extracted text are modified to be applicable to Appendix A of this Standard.

A200
AIR FLOW RATING

A201.1 Airflow rating. The airflows required by this standard refer to the delivered airflow of the system as installed and tested using a flow hood, flow grid, or other airflow measuring device. Alternatively, the airflow rating at a pressure of 0.25 in. w.c. (62.5 Pa) may be used, provided the duct sizing meets the prescriptive requirements of Table A201 or manufacturers' design criteria.

TABLE A201

Prescriptive Duct Sizing

	Duct Type							
Fan Rating	**Flex Duct**				**Smooth Duct**			
cfm @ 0.25 in. w.g. (L/s @ 62.5 Pa)	50 (25)	80 (40)	100 (50)	125 (65)	50 (25)	80 (40)	100 (50)	125 (65)
Diameter, in. (mm)	**Maximum Length, ft (m)**							
3 (75)	X	X	X	X	5 (2)	X	X	X
4 (100)	70 (27)	3 (1)	X	X	105 (35)	35 (12)	5 (2)	X
5 (125)	NL	70 (27)	35 (12)	20 (7)	NL	135 (45)	85 (28)	55 (18)
6 (150)	NL	NL	125 (42)	95 (32)	NL	NL	NL	145 (48)
7 (175) and above	NL	NL	NL	NL	NL	NL	NL	NL

This table assumes no elbows. Deduct 15 ft (5 m) of allowable duct length for each elbow.

NL = no limit on duct length of this size.

X = not allowed, any length of duct of this size with assumed turns and fitting will exceed the rated pressure drop.

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APPENDIX B

WHOLE BUILDING VENTILATION SYSTEM SPECIFICATIONS

B100
SCOPE AND APPLICABILITY

B101.1 Applicability of Appendix B. Appendix B is part of this Standard.

B101.2 Scope. The provisions contained in Appendix B provide the specifications necessary for complying with Section 902.2.1 for the installation of whole building ventilation systems. To receive points for implementing Practice 902.2.1, the chosen whole building ventilation system is to be in accordance with the applicable specifications of Appendix B.

B101.3 Acknowledgment. The text of Appendix B, Section B200 and related Tables are extracted from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) Standard 62.2-2010 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*, Section 4, and is used with the permission of ASHRAE. The referenced Section and Table numbers within the extracted text are modified to be applicable to Appendix B of this Standard. "*" indicates added reference to ICC or ASHRAE 62.2 to provide clarity.

B200
WHOLE-BUILDING VENTILATION

B201.1 Ventilation Rate. A mechanical exhaust system, supply system, or combination thereof shall be installed for each dwelling unit to provide whole-building ventilation with outdoor air each hour at no less than the rate specified in Tables B201.1a and B201.1b or, equivalently, Equations B201.1a and B201.1b, based on the floor area of the conditioned space and number of bedrooms.

> **Exceptions:** Whole-building mechanical systems are not required provided that at least one of the following conditions is met:
>
> **(a)** the building has no mechanical cooling and is in zone 1 or 2 of the ICC* IECC Climate Zone Map (see ASHRAE 62.2*, Figure 8.2), or
> **(b)** the building is thermally conditioned for human occupancy for less than 876 hours per year,
>
> *and* if the authority having jurisdiction determines that window operation is a locally permissible method of providing ventilation.

B201.1.1 Different Occupant Density. Tables B201.1a and B201.1b and Equations B201.1a and B201.1b assume two persons in a studio or one-bedroom dwelling unit and an additional person for each additional bedroom. Where higher occupant densities are known, the rate shall be increased by 7.5 cfm (3.5 L/s) for each additional person. When approved by the authority having jurisdiction, lower occupant densities may be used.

B201.1.2 Alternative Ventilation. Other methods may be used to provide the required ventilation rates (of Tables B201.1a and B201.1b) when approved by a licensed design professional.

B201.1.3 Infiltration Credit. Section B201.1 includes a default credit for ventilation provided by infiltration of 2 cfm/100 ft^2 (10 L/s per 100 m^2) of occupiable floor space. For buildings built prior to the application of this standard, when excess infiltration has been measured using *ANSI/ASHRAE Standard 136, A Method of Determining Air Change Rates in Detached Dwellings,*[1] the rates in Section B201.1 may be decreased by half of the excess of the rate calculated from Standard 136 that is above the default rate. No increase to the rate in Section B201.1 is required if measured infiltration in accordance with Standard 136 is lower than the default rate.

Equation B201.1a

$$Q_{fan} = 0.01A_{floor} + 7.5(N_{br} + 1)$$

where

Q_{fan} = fan flow rate, cfm

A_{floor} = floor area, ft^2

N_{br} = number of bedrooms; not to be less than one

Equation B201.1b

$$Q_{fan} = 0.05A_{floor} + 3.5(N_{br} + 1)$$

where

Q_{fan} = fan flow rate, L/s

A_{floor} = floor area, m^2

N_{br} = number of bedrooms; not to be less than one

TABLE B201.1a (I-P)
Ventilation Air Requirements, cfm

Floor Area	Bedrooms				
(ft^2)	0–1	2–3	4–5	6–7	>7
<1500	30	45	60	75	90
1501–3000	45	60	75	90	105
3001–4500	60	75	90	105	120
4501–6000	75	90	105	120	135
6001–7500	90	105	120	135	150
>7500	105	120	135	150	165

TABLE B201.1b (SI)
Ventilation Air Requirements, L/s

Floor Area	Bedrooms				
(m^2)	0–1	2–3	4–5	6–7	>7
<139	14	21	28	35	42
139.1–279	21	28	35	42	50
279.1–418	28	35	42	50	57
418.1–557	35	42	50	57	64
557.1–697	42	50	57	64	71
>697	50	57	64	71	78

[1] *ANSI/ASHRAE Standard 136-1993 (RA 2006), A Method of Determining Air Change Rates in Detached Dwellings.* American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., Atlanta, GA.

B201.2 System Type. The whole-house ventilation system shall consist of one or more supply or exhaust fans and associated ducts and controls. Local exhaust fans shall be permitted to be part of a mechanical exhaust system. Outdoor air ducts connected to the return side of an air handler shall be permitted as supply ventilation if manufacturers' requirements for return air temperature are met. See ASHRAE 62.2*, Appendix B for guidance on selection of methods.

B201.3 Airflow Measurement. The airflow required by this section is the quantity of outdoor ventilation air supplied and/or indoor air exhausted by the ventilation system as installed and shall be measured using a flow hood, flow grid, or other airflow measuring device. Ventilation airflow of systems with multiple operating modes shall be tested in all modes designed to meet this section.

B201.4 Control and Operation. The "fan on" switch on a heating or air-conditioning system shall be permitted as an operational control for systems introducing ventilation air through a duct to the return side of an HVAC system. Readily accessible override control must be provided to the occupant. Local exhaust fan switches and "fan on" switches shall be permitted as override controls. Controls, including the "fan-on" switch of a conditioning system, must be appropriately labeled.

> **Exception:** An intermittently operating, whole-house mechanical ventilation system may be used if the ventilation rate is adjusted, according to the exception to Section B201.5. The system must be designed so that it can operate automatically based on a timer. The intermittent mechanical ventilation system must operate at least once per day and must operate at least 10 percent of the time.

B201.5 Delivered Ventilation. The delivered ventilation rate shall be calculated as the larger of the total supply or total exhaust and shall be no less than specified in Section B201.1 during each hour of operation.

> **Exception:** The effective ventilation rate of an intermittent system is the combination of its delivered capacity, its daily fractional on-time, cycle time, and the ventilation effectiveness from Table B201.2. The fan flow rate required to achieve an effective ventilation rate that is equivalent to the continuous ventilation requirement shall be calculated from the following equation:

Equation B201.5

$$Q_f = Q_r \,/\, (\varepsilon f)$$

where

Q_f = fan flow rate during the on-cycle

Q_r = ventilation air requirement (from Table B201.1a or B201.1b)

T_{cyc} = fan cycle time, defined as the total time for one on-cycle and one off-cycle (used in Table B201.5)

ε = ventilation effectiveness (from Table B201.5)

f = fractional on time, defined as the on-time for one cycle divided by the cycle time

TABLE B201.5
Ventilation Effectiveness for Intermittent Fans

Fractional On-Time, f	Cycle Time, T_{cyc} (h)			
	0-4	8	12	24
0.1	1.00	0.79	*	*
0.2	1.00	0.84	0.56	*
0.3	1.00	0.89	0.71	*
0.4	1.00	0.92	0.81	0.20
0.5	1.00	0.94	0.87	0.52
0.6	1.00	0.97	0.92	0.73
0.7	1.00	0.98	0.96	0.86
0.8	1.00	0.99	0.98	0.94
0.9	1.00	1.00	1.00	0.99
1.0	1.00	1.00	1.00	1.00

See Chapter 10 of Guideline 24 for an example of this calculation.

For values not listed, use the next higher value for cycle time or the next lower value for Fractional On-Time. Linear interpolation is allowed for intermediate Fractional On-Times. The maximum allowed Cycle Time is 24 hours and the minimum allowed Fractional On-Time is 0.1.

B201.6 Restrictions on System Type. Use of certain ventilation strategies is restricted in specific climates as follows.

B201.6.1 Hot, Humid Climates. In hot, humid climates, whole-house mechanical net exhaust flow shall not exceed 7.5 cfm per 100 ft^2 (35 L/s per 100 m^2). (See ASHRAE 62.2*, Section 8 for a listing of hot, humid US climates.)

B201.6.2 Very Cold Climates. Mechanical supply systems exceeding 7.5 cfm per 100 ft^2 (35 L/s per 100 m^2) shall not be used in very cold climates. (See ASHRAE 62.2*, Section 8 for a listing of very cold US climates.)

> **Exception:** These ventilation strategies are not restricted if the authority having jurisdiction approves the envelope design as being moisture resistant.

APPENDIX C

CLIMATE ZONES

C100
SCOPE AND APPLICABILITY

C101.1 Applicability of Appendix C. Appendix C is part of this Standard. Text identified as "User Note" is not considered part of this Standard.

C101.2 Scope. The provisions contained in Appendix C provide the criteria necessary for complying with the climate-specific provisions of this Standard.

C200
CLIMATE ZONES

TABLE C200
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

ALABAMA
3A Autauga*
2A Baldwin*
3A Barbour*
3A Bibb
3A Blount
3A Bullock*
3A Butler*
3A Calhoun
3A Chambers
3A Cherokee
3A Chilton
3A Choctaw*
3A Clarke*
3A Clay
3A Cleburne
3A Coffee*
3A Colbert
3A Conecuh*
3A Coosa
3A Covington*
3A Crenshaw*
3A Cullman
3A Dale*
3A Dallas*
3A DeKalb
3A Elmore*
3A Escambia*
3A Etowah
3A Fayette
3A Franklin
3A Geneva*
3A Greene
3A Hale
3A Henry*
3A Houston*
3A Jackson
3A Jefferson
3A Lamar
3A Lauderdale
3A Lawrence
3A Lee
3A Limestone
3A Lowndes*
3A Macon*
3A Madison
3A Marengo*
3A Marion
3A Marshall
2A Mobile*
3A Monroe*
3A Montgomery*
3A Morgan
3A Perry*
3A Pickens
3A Pike*
3A Randolph
3A Russell*
3A Shelby
3A St. Clair
3A Sumter
3A Talladega
3A Tallapoosa
3A Tuscaloosa
3A Walker
3A Washington*
3A Wilcox*
3A Winston

ALASKA
7 Aleutians East
7 Aleutians West
7 Anchorage
8 Bethel
7 Bristol Bay
7 Denali
8 Dillingham
8 Fairbanks North Star
7 Haines
7 Juneau
7 Kenai Peninsula
7 Ketchikan Gateway
7 Kodiak Island
7 Lake and Peninsula
7 Matanuska-Susitna
8 Nome
8 North Slope
8 Northwest Arctic
7 Prince of Wales-Outer Ketchikan
7 Sitka
7 Skagway-Hoonah Angoon
8 Southeast Fairbanks
7 Valdez-Cordova
8 Wade Hampton
7 Wrangell-Petersburg
7 Yakutat
8 Yukon-Koyukuk

ARIZONA
5B Apache
3B Cochise
5B Coconino
4B Gila
3B Graham
3B Greenlee
2B La Paz
2B Maricopa
3B Mohave
5B Navajo
2B Pima
2B Pinal
3B Santa Cruz
4B Yavapai
2B Yuma

ARKANSAS
3A Arkansas
3A Ashley
4A Baxter
4A Benton
4A Boone
3A Bradley
3A Calhoun

(continued)

TABLE C200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

4A Carroll
3A Chicot
3A Clark
3A Clay
3A Cleburne
3A Cleveland
3A Columbia*
3A Conway
3A Craighead
3A Crawford
3A Crittenden
3A Cross
3A Dallas
3A Desha
3A Drew
3A Faulkner
3A Franklin
4A Fulton
3A Garland
3A Grant
3A Greene
3A Hempstead*
3A Hot Spring
3A Howard
3A Independence
4A Izard
3A Jackson
3A Jefferson
3A Johnson
3A Lafayette*
3A Lawrence
3A Lee
3A Lincoln
3A Little River*
3A Logan
3A Lonoke
4A Madison
4A Marion
3A Miller*
3A Mississippi
3A Monroe
3A Montgomery
3A Nevada
4A Newton
3A Ouachita
3A Perry
3A Phillips
3A Pike
3A Poinsett
3A Polk
3A Pope
3A Prairie
3A Pulaski
3A Randolph
3A Saline
3A Scott
4A Searcy
3A Sebastian
3A Sevier*
3A Sharp
3A St. Francis
4A Stone
3A Union*
3A Van Buren
4A Washington
3A White
3A Woodruff
3A Yell

CALIFORNIA
3C Alameda
6B Alpine
4B Amador
3B Butte
4B Calaveras
3B Colusa
3B Contra Costa
4C Del Norte
4B El Dorado
3B Fresno
3B Glenn
4C Humboldt
2B Imperial
4B Inyo
3B Kern
3B Kings
4B Lake
5B Lassen
3B Los Angeles
3B Madera
3C Marin
4B Mariposa
3C Mendocino
3B Merced
5B Modoc
6B Mono
3C Monterey
3C Napa
5B Nevada
3B Orange
3B Placer
5B Plumas
3B Riverside
3B Sacramento
3C San Benito
3B San Bernardino
3B San Diego
3C San Francisco
3B San Joaquin
3C San Luis Obispo
3C San Mateo
3C Santa Barbara
3C Santa Clara
3C Santa Cruz
3B Shasta
5B Sierra
5B Siskiyou
3B Solano
3C Sonoma
3B Stanislaus
3B Sutter
3B Tehama
4B Trinity
3B Tulare
4B Tuolumne
3C Ventura
3B Yolo
3B Yuba

COLORADO
5B Adams
6B Alamosa
5B Arapahoe
6B Archuleta
4B Baca
5B Bent
5B Boulder
5B Broomfield
6B Chaffee
5B Cheyenne
7 Clear Creek
6B Conejos
6B Costilla
5B Crowley
6B Custer
5B Delta
5B Denver
6B Dolores
5B Douglas
6B Eagle
5B Elbert
5B El Paso
5B Fremont
5B Garfield
5B Gilpin
7 Grand
7 Gunnison
7 Hinsdale
5B Huerfano
7 Jackson
5B Jefferson
5B Kiowa
5B Kit Carson
7 Lake
5B La Plata
5B Larimer
4B Las Animas
5B Lincoln
5B Logan
5B Mesa
7 Mineral
6B Moffat
5B Montezuma
5B Montrose
5B Morgan
4B Otero
6B Ouray
7 Park
5B Phillips
7 Pitkin
5B Prowers
5B Pueblo
6B Rio Blanco
7 Rio Grande
7 Routt
6B Saguache
7 San Juan
6B San Miguel
5B Sedgwick
7 Summit
5B Teller
5B Washington
5B Weld
5B Yuma

CONNECTICUT
5A (all)

DELAWARE
4A (all)

DISTRICT OF COLUMBIA
4A (all)

FLORIDA
2A Alachua*
2A Baker*
2A Bay*
2A Bradford*
2A Brevard*
1A Broward*
2A Calhoun*
2A Charlotte*
2A Citrus*
2A Clay*
2A Collier*
2A Columbia*
2A DeSoto*
2A Dixie*
2A Duval*
2A Escambia*
2A Flagler*
2A Franklin*
2A Gadsden*
2A Gilchrist*
2A Glades*

TABLE C200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.
Asterisk (*) indicates a warm-humid location.

(continued)

2A Gulf*
2A Hamilton*
2A Hardee*
2A Hendry*
2A Hernando*
2A Highlands*
2A Hillsborough*
2A Holmes*
2A Indian River*
2A Jackson*
2A Jefferson*
2A Lafayette*
2A Lake*
2A Lee*
2A Leon*
2A Levy*
2A Liberty*
2A Madison*
2A Manatee*
2A Marion*
2A Martin*
1A Miami-Dade*
1A Monroe*
2A Nassau*
2A Okaloosa*
2A Okeechobee*
2A Orange*
2A Osceola*
2A Palm Beach*
2A Pasco*
2A Pinellas*
2A Polk*
2A Putnam*
2A Santa Rosa*
2A Sarasota*
2A Seminole*
2A St. Johns*
2A St. Lucie*
2A Sumter*
2A Suwannee*
2A Taylor*
2A Union*
2A Volusia*
2A Wakulla*
2A Walton*
2A Washington*

GEORGIA

2A Appling*
2A Atkinson*
2A Bacon*
2A Baker*
3A Baldwin
4A Banks
3A Barrow
3A Bartow
3A Ben Hill*
2A Berrien*
3A Bibb
3A Bleckley*
2A Brantley*
2A Brooks*
2A Bryan*
3A Bulloch*
3A Burke
3A Butts
3A Calhoun*
2A Camden*
3A Candler*
3A Carroll
4A Catoosa
2A Charlton*
2A Chatham*
3A Chattahoochee*
4A Chattooga
3A Cherokee
3A Clarke
3A Clay*
3A Clayton
2A Clinch*
3A Cobb
3A Coffee*
2A Colquitt*
3A Columbia
2A Cook*
3A Coweta
3A Crawford
3A Crisp*
4A Dade
4A Dawson
2A Decatur*
3A DeKalb
3A Dodge*
3A Dooly*
3A Dougherty*
3A Douglas
3A Early*
2A Echols*
2A Effingham*
3A Elbert
3A Emanuel*
2A Evans*
4A Fannin
3A Fayette
4A Floyd
3A Forsyth
4A Franklin
3A Fulton
4A Gilmer
3A Glascock
2A Glynn*
4A Gordon
2A Grady*
3A Greene
3A Gwinnett
4A Habersham
4A Hall
3A Hancock
3A Haralson
3A Harris
3A Hart
3A Heard
3A Henry
3A Houston*
3A Irwin*
3A Jackson
3A Jasper
2A Jeff Davis*
3A Jefferson
3A Jenkins*
3A Johnson*
3A Jones
3A Lamar
2A Lanier*
3A Laurens*
3A Lee*
2A Liberty*
3A Lincoln
2A Long*
2A Lowndes*
4A Lumpkin
3A Macon*
3A Madison
3A Marion*
3A McDuffie
2A McIntosh*
3A Meriwether
2A Miller*
2A Mitchell*
3A Monroe
3A Montgomery*
3A Morgan
4A Murray
3A Muscogee
3A Newton
3A Oconee
3A Oglethorpe
3A Paulding
3A Peach*
4A Pickens
2A Pierce*
3A Pike
3A Polk
3A Pulaski*
3A Putnam
3A Quitman*
4A Rabun
3A Randolph*
3A Richmond
3A Rockdale
3A Schley*
3A Screven*
2A Seminole*
3A Spalding
4A Stephens
3A Stewart*
3A Sumter*
3A Talbot
3A Taliaferro
2A Tattnall*
3A Taylor*
3A Telfair*
3A Terrell*
2A Thomas*
3A Tift*
2A Toombs*
4A Towns
3A Treutlen*
3A Troup
3A Turner*
3A Twiggs*
4A Union
3A Upson
4A Walker
3A Walton
2A Ware*
3A Warren
3A Washington
2A Wayne*
3A Webster*
3A Wheeler*
4A White
4A Whitfield
3A Wilcox*
3A Wilkes
3A Wilkinson
3A Worth*

HAWAII

1A (all)*

IDAHO

5B Ada
6B Adams
6B Bannock
6B Bear Lake
5B Benewah
6B Bingham
6B Blaine
6B Boise
6B Bonner
6B Bonneville
6B Boundary
6B Butte
6B Camas

TABLE C200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

5B Canyon
6B Caribou
5B Cassia
6B Clark
5B Clearwater
6B Custer
5B Elmore
6B Franklin
6B Fremont
5B Gem
5B Gooding
5B Idaho
6B Jefferson
5B Jerome
5B Kootenai
5B Latah
6B Lemhi
5B Lewis
5B Lincoln
6B Madison
5B Minidoka
5B Nez Perce
6B Oneida
5B Owyhee
5B Payette
5B Power
5B Shoshone
6B Teton
5B Twin Falls
6B Valley
5B Washington

ILLINOIS

5A Adams
4A Alexander
4A Bond
5A Boone
5A Brown
5A Bureau
5A Calhoun
5A Carroll
5A Cass
5A Champaign
4A Christian
5A Clark
4A Clay
4A Clinton
5A Coles
5A Cook
4A Crawford
5A Cumberland
5A DeKalb
5A De Witt
5A Douglas
5A DuPage
5A Edgar
4A Edwards
4A Effingham
4A Fayette
5A Ford
4A Franklin
5A Fulton
4A Gallatin
5A Greene
5A Grundy
4A Hamilton
5A Hancock
4A Hardin
5A Henderson
5A Henry
5A Iroquois
4A Jackson
4A Jasper
4A Jefferson
5A Jersey
5A Jo Daviess
4A Johnson
5A Kane
5A Kankakee
5A Kendall
5A Knox
5A Lake
5A La Salle
4A Lawrence
5A Lee
5A Livingston
5A Logan
5A Macon
4A Macoupin
4A Madison

(continued)

4A Marion
5A Marshall
5A Mason
4A Massac
5A McDonough
5A McHenry
5A McLean
5A Menard
5A Mercer
4A Monroe
4A Montgomery
5A Morgan
5A Moultrie
5A Ogle
5A Peoria
4A Perry
5A Piatt
5A Pike
4A Pope
4A Pulaski
5A Putnam
4A Randolph
4A Richland
5A Rock Island
4A Saline
5A Sangamon
5A Schuyler
5A Scott
4A Shelby
5A Stark
4A St. Clair
5A Stephenson
5A Tazewell
4A Union
5A Vermilion
4A Wabash
5A Warren
4A Washington
4A Wayne
4A White
5A Whiteside
5A Will
4A Williamson
5A Winnebago
5A Woodford

INDIANA

5A Adams
5A Allen
5A Bartholomew
5A Benton
5A Blackford
5A Boone
4A Brown
5A Carroll
5A Cass
4A Clark
5A Clay
5A Clinton
4A Crawford
4A Daviess
4A Dearborn
5A Decatur
5A De Kalb
5A Delaware
4A Dubois
5A Elkhart
5A Fayette
4A Floyd
5A Fountain
5A Franklin
5A Fulton
4A Gibson
5A Grant
4A Greene
5A Hamilton
5A Hancock
4A Harrison
5A Hendricks
5A Henry
5A Howard
5A Huntington
4A Jackson
5A Jasper
5A Jay
4A Jefferson
4A Jennings
5A Johnson
4A Knox
5A Kosciusko
5A Lagrange
5A Lake
5A La Porte
4A Lawrence
5A Madison
5A Marion
5A Marshall
4A Martin
5A Miami
4A Monroe
5A Montgomery
5A Morgan
5A Newton
5A Noble
4A Ohio
4A Orange
5A Owen
5A Parke
4A Perry
4A Pike
5A Porter
4A Posey
5A Pulaski
5A Putnam
5A Randolph
4A Ripley
5A Rush
4A Scott
5A Shelby
4A Spencer
5A Starke
5A Steuben
5A St. Joseph
4A Sullivan
4A Switzerland
5A Tippecanoe
5A Tipton
5A Union
4A Vanderburgh
5A Vermillion
5A Vigo
5A Wabash
5A Warren
4A Warrick
4A Washington
5A Wayne

TABLE C200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.
Asterisk (*) indicates a warm-humid location.

(continued)

5A Wells
5A White
5A Whitley

IOWA
5A Adair
5A Adams
6A Allamakee
5A Appanoose
5A Audubon
5A Benton
6A Black Hawk
5A Boone
6A Bremer
6A Buchanan
6A Buena Vista
6A Butler
6A Calhoun
5A Carroll
5A Cass
5A Cedar
6A Cerro Gordo
6A Cherokee
6A Chickasaw
5A Clarke
6A Clay
6A Clayton
5A Clinton
5A Crawford
5A Dallas
5A Davis
5A Decatur
6A Delaware
5A Des Moines
6A Dickinson
5A Dubuque
6A Emmet
6A Fayette
6A Floyd
6A Franklin
5A Fremont
5A Greene
6A Grundy
5A Guthrie
6A Hamilton
6A Hancock
6A Hardin
5A Harrison
5A Henry
6A Howard
6A Humboldt
6A Ida
5A Iowa
5A Jackson
5A Jasper
5A Jefferson
5A Johnson
5A Jones
5A Keokuk
6A Kossuth
5A Lee
5A Linn
5A Louisa
5A Lucas
6A Lyon
5A Madison
5A Mahaska
5A Marion
5A Marshall
5A Mills
6A Mitchell
5A Monona
5A Monroe
5A Montgomery
5A Muscatine
6A O'Brien
6A Osceola
5A Page
6A Palo Alto
6A Plymouth
6A Pocahontas
5A Polk
5A Pottawattamie
5A Poweshiek
5A Ringgold
6A Sac
5A Scott
5A Shelby
6A Sioux
5A Story
5A Tama
5A Taylor
5A Union
5A Van Buren
5A Wapello
5A Warren
5A Washington
5A Wayne
6A Webster
6A Winnebago
6A Winneshiek
5A Woodbury
6A Worth
6A Wright

KANSAS
4A Allen
4A Anderson
4A Atchison
4A Barber
4A Barton
4A Bourbon
4A Brown
4A Butler
4A Chase
4A Chautauqua
4A Cherokee
5A Cheyenne
4A Clark
4A Clay
5A Cloud
4A Coffey
4A Comanche
4A Cowley
4A Crawford
5A Decatur
4A Dickinson
4A Doniphan
4A Douglas
4A Edwards
4A Elk
5A Ellis
4A Ellsworth
4A Finney
4A Ford
4A Franklin
4A Geary
5A Gove
5A Graham
4A Grant
4A Gray
5A Greeley
4A Greenwood
5A Hamilton
4A Harper
4A Harvey
4A Haskell
4A Hodgeman
4A Jackson
4A Jefferson
5A Jewell
4A Johnson
4A Kearny
4A Kingman
4A Kiowa
4A Labette
5A Lane
4A Leavenworth
4A Lincoln
4A Linn
5A Logan
4A Lyon
4A Marion
4A Marshall
4A McPherson
4A Meade
4A Miami
5A Mitchell
4A Montgomery
4A Morris
4A Morton
4A Nemaha
4A Neosho
5A Ness
5A Norton
4A Osage
5A Osborne
4A Ottawa
4A Pawnee
5A Phillips
4A Pottawatomie
4A Pratt
5A Rawlins
4A Reno
5A Republic
4A Rice
4A Riley
5A Rooks
4A Rush
4A Russell
4A Saline
5A Scott
4A Sedgwick
4A Seward
4A Shawnee
5A Sheridan
5A Sherman
5A Smith
4A Stafford
4A Stanton
4A Stevens
4A Sumner
5A Thomas
5A Trego
4A Wabaunsee
5A Wallace
4A Washington
5A Wichita
4A Wilson
4A Woodson
4A Wyandotte

KENTUCKY
4A (all)

LOUISIANA
2A Acadia*
2A Allen*
2A Ascension*
2A Assumption*
2A Avoyelles*
2A Beauregard*
3A Bienville*
3A Bossier*
3A Caddo*

TABLE C200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

(continued)

2A Calcasieu*
3A Caldwell*
2A Cameron*
3A Catahoula*
3A Claiborne*
3A Concordia*
3A De Soto*
2A East Baton Rouge*
3A East Carroll
2A East Feliciana*
2A Evangeline*
3A Franklin*
3A Grant*
2A Iberia*
2A Iberville*
3A Jackson*
2A Jefferson*
2A Jefferson Davis*
2A Lafayette*
2A Lafourche*
3A La Salle*
3A Lincoln*
2A Livingston*
3A Madison*
3A Morehouse
3A Natchitoches*
2A Orleans*
3A Ouachita*
2A Plaquemines*
2A Pointe Coupee*
2A Rapides*
3A Red River*
3A Richland*
3A Sabine*
2A St. Bernard*
2A St. Charles *
2A St. Helena*
2A St. James*
2A St. John the Baptist*
2A St. Landry*
2A St. Martin*
2A St. Mary*
2A St. Tammany*
2A Tangipahoa*
3A Tensas*
2A Terrebonne*
3A Union*
2A Vermilion*
3A Vernon*
2A Washington*
3A Webster*
2A West Baton Rouge*
3A West Carroll
2A West Feliciana*
3A Winn*

MAINE
6A Androscoggin
7 Aroostook
6A Cumberland
6A Franklin
6A Hancock
6A Kennebec
6A Knox
6A Lincoln
6A Oxford
6A Penobscot
6A Piscataquis
6A Sagadahoc
6A Somerset
6A Waldo
6A Washington
6A York

MARYLAND
4A Allegany
4A Anne Arundel
4A Baltimore
4A Baltimore (city)
4A Calvert
4A Caroline
4A Carroll
4A Cecil
4A Charles
4A Dorchester
4A Frederick
5A Garrett
4A Harford
4A Howard
4A Kent
4A Montgomery
4A Prince George's
4A Queen Anne's
4A Somerset
4A St. Mary's
4A Talbot
4A Washington
4A Wicomico
4A Worcester

MASSACHUSETTS
5A (all)

MICHIGAN
6A Alcona
6A Alger
5A Allegan
6A Alpena
6A Antrim
6A Arenac
7 Baraga
5A Barry
5A Bay
6A Benzie
5A Berrien
5A Branch
5A Calhoun
5A Cass
6A Charlevoix
6A Cheboygan
7 Chippewa
6A Clare
5A Clinton
6A Crawford
6A Delta
6A Dickinson
5A Eaton
6A Emmet
5A Genesee
6A Gladwin
7 Gogebic
6A Grand Traverse
5A Gratiot
5A Hillsdale
7 Houghton
6A Huron
5A Ingham
5A Ionia
6A Iosco
7 Iron
6A Isabella
5A Jackson
5A Kalamazoo
6A Kalkaska
5A Kent
7 Keweenaw
6A Lake
5A Lapeer
6A Leelanau
5A Lenawee
5A Livingston
7 Luce
7 Mackinac
5A Macomb
6A Manistee
6A Marquette
6A Mason
6A Mecosta
6A Menominee
5A Midland
6A Missaukee
5A Monroe
5A Montcalm
6A Montmorency
5A Muskegon
6A Newaygo
5A Oakland
6A Oceana
6A Ogemaw
7 Ontonagon
6A Osceola
6A Oscoda
6A Otsego
5A Ottawa
6A Presque Isle
6A Roscommon
5A Saginaw
6A Sanilac
7 Schoolcraft
5A Shiawassee
5A St. Clair
5A St. Joseph
5A Tuscola
5A Van Buren
5A Washtenaw
5A Wayne
6A Wexford

MINNESOTA
7 Aitkin
6A Anoka
7 Becker
7 Beltrami
6A Benton
6A Big Stone
6A Blue Earth
6A Brown
7 Carlton
6A Carver
7 Cass
6A Chippewa
6A Chisago
7 Clay
7 Clearwater
7 Cook
6A Cottonwood
7 Crow Wing
6A Dakota
6A Dodge
6A Douglas
6A Faribault
6A Fillmore
6A Freeborn
6A Goodhue
7 Grant
6A Hennepin
6A Houston
7 Hubbard
6A Isanti
7 Itasca
6A Jackson
7 Kanabec
6A Kandiyohi

TABLE C200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

7 Kittson
7 Koochiching
6A Lac qui Parle
7 Lake
7 Lake of the Woods
6A Le Sueur
6A Lincoln
6A Lyon
7 Mahnomen
7 Marshall
6A Martin
6A McLeod
6A Meeker
7 Mille Lacs
6A Morrison
6A Mower
6A Murray
6A Nicollet
6A Nobles
7 Norman
6A Olmsted
7 Otter Tail
7 Pennington
7 Pine
6A Pipestone
7 Polk
6A Pope
6A Ramsey
7 Red Lake
6A Redwood
6A Renville
6A Rice
6A Rock
7 Roseau
6A Scott
6A Sherburne
6A Sibley
6A Stearns
6A Steele
6A Stevens
7 St. Louis
6A Swift
6A Todd
6A Traverse
6A Wabasha
7 Wadena
6A Waseca
6A Washington
6A Watonwan
7 Wilkin
6A Winona
6A Wright
6A Yellow Medicine

MISSISSIPPI
3A Adams*
3A Alcorn
3A Amite*
3A Attala
3A Benton
3A Bolivar
3A Calhoun
3A Carroll
3A Chickasaw
3A Choctaw
3A Claiborne*
3A Clarke
3A Clay
3A Coahoma
3A Copiah*
3A Covington*
3A DeSoto
3A Forrest*
3A Franklin*
3A George*
3A Greene*
3A Grenada
2A Hancock*
2A Harrison*
3A Hinds*
3A Holmes
3A Humphreys
3A Issaquena
3A Itawamba
2A Jackson*
3A Jasper
3A Jefferson*
3A Jefferson Davis*
3A Jones*
3A Kemper
3A Lafayette
3A Lamar*
3A Lauderdale
3A Lawrence*
3A Leake
3A Lee
3A Leflore
3A Lincoln*
3A Lowndes
3A Madison
3A Marion*
3A Marshall
3A Monroe
3A Montgomery
3A Neshoba
3A Newton
3A Noxubee
3A Oktibbeha
3A Panola
2A Pearl River*
3A Perry*
3A Pike*
3A Pontotoc
3A Prentiss
3A Quitman
3A Rankin*
3A Scott
3A Sharkey
3A Simpson*
3A Smith*
2A Stone*
3A Sunflower
3A Tallahatchie
3A Tate
3A Tippah
3A Tishomingo
3A Tunica
3A Union
3A Walthall*
3A Warren*
3A Washington
3A Wayne*
3A Webster
3A Wilkinson*
3A Winston
3A Yalobusha
3A Yazoo

MISSOURI
5A Adair
5A Andrew
5A Atchison
4A Audrain
4A Barry
4A Barton
4A Bates
4A Benton
4A Bollinger
4A Boone
5A Buchanan
4A Butler
5A Caldwell
4A Callaway
4A Camden
4A Cape Girardeau
4A Carroll
4A Carter
4A Cass
4A Cedar
5A Chariton
4A Christian
5A Clark
4A Clay
5A Clinton
4A Cole
4A Cooper
4A Crawford
4A Dade
4A Dallas
5A Daviess
5A DeKalb
4A Dent
4A Douglas
4A Dunklin
4A Franklin
4A Gasconade
5A Gentry
4A Greene
5A Grundy
5A Harrison
4A Henry
4A Hickory
5A Holt
4A Howard
4A Howell
4A Iron
4A Jackson
4A Jasper
4A Jefferson
4A Johnson
5A Knox
4A Laclede
4A Lafayette
4A Lawrence
5A Lewis
4A Lincoln
5A Linn
5A Livingston
5A Macon
4A Madison
4A Maries
5A Marion
4A McDonald
5A Mercer
4A Miller
4A Mississippi
4A Moniteau
4A Monroe
4A Montgomery
4A Morgan
4A New Madrid
4A Newton
5A Nodaway
4A Oregon
4A Osage
4A Ozark
4A Pemiscot
4A Perry
4A Pettis
4A Phelps
5A Pike
4A Platte
4A Polk
4A Pulaski
5A Putnam

TABLE C200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

5A Ralls
4A Randolph
4A Ray
4A Reynolds
4A Ripley
4A Saline
5A Schuyler
5A Scotland
4A Scott
4A Shannon
5A Shelby
4A St. Charles
4A St. Clair
4A Ste. Genevieve
4A St. Francois
4A St. Louis
4A St. Louis (city)
4A Stoddard
4A Stone
5A Sullivan
4A Taney
4A Texas
4A Vernon
4A Warren
4A Washington
4A Wayne
4A Webster
5A Worth
4A Wright

MONTANA
6B (all)

NEBRASKA
5A (all)

NEVADA
5B Carson City (city)
5B Churchill
3B Clark
5B Douglas
5B Elko
5B Esmeralda
5B Eureka
5B Humboldt
5B Lander
5B Lincoln
5B Lyon
5B Mineral
5B Nye
5B Pershing
5B Storey
5B Washoe
5B White Pine

NEW HAMPSHIRE
6A Belknap
6A Carroll
5A Cheshire
6A Coos
6A Grafton
5A Hillsborough
6A Merrimack
5A Rockingham
5A Strafford
6A Sullivan

NEW JERSEY
4A Atlantic
5A Bergen
4A Burlington
4A Camden
4A Cape May
4A Cumberland
4A Essex
4A Gloucester
4A Hudson
5A Hunterdon
5A Mercer
4A Middlesex
4A Monmouth
5A Morris
4A Ocean
5A Passaic
4A Salem
5A Somerset
5A Sussex
4A Union
5A Warren

(continued)

NEW MEXICO
4B Bernalillo
5B Catron
3B Chaves
4B Cibola
5B Colfax
4B Curry
4B DeBaca
3B Dona Ana
3B Eddy
4B Grant
4B Guadalupe
5B Harding
3B Hidalgo
3B Lea
4B Lincoln
5B Los Alamos
3B Luna
5B McKinley
5B Mora
3B Otero
4B Quay
5B Rio Arriba
4B Roosevelt
5B Sandoval
5B San Juan
5B San Miguel
5B Santa Fe
4B Sierra
4B Socorro
5B Taos
5B Torrance
4B Union
4B Valencia

NEW YORK
5A Albany
6A Allegany
4A Bronx
6A Broome
6A Cattaraugus
5A Cayuga
5A Chautauqua
5A Chemung
6A Chenango
6A Clinton
5A Columbia
5A Cortland
6A Delaware
5A Dutchess
5A Erie
6A Essex
6A Franklin
6A Fulton
5A Genesee
5A Greene
6A Hamilton
6A Herkimer
6A Jefferson
4A Kings
6A Lewis
5A Livingston
6A Madison
5A Monroe
6A Montgomery
4A Nassau
4A New York
5A Niagara
6A Oneida
5A Onondaga
5A Ontario
5A Orange
5A Orleans
5A Oswego
6A Otsego
5A Putnam
4A Queens
5A Rensselaer
4A Richmond
5A Rockland
5A Saratoga
5A Schenectady
6A Schoharie
6A Schuyler
5A Seneca
6A Steuben
6A St. Lawrence
4A Suffolk
6A Sullivan
5A Tioga
6A Tompkins
6A Ulster
6A Warren
5A Washington
5A Wayne
4A Westchester
6A Wyoming
5A Yates

NORTH CAROLINA
4A Alamance
4A Alexander
5A Alleghany
3A Anson
5A Ashe
5A Avery
3A Beaufort
4A Bertie
3A Bladen
3A Brunswick*
4A Buncombe
4A Burke
3A Cabarrus
4A Caldwell
3A Camden
3A Carteret*
4A Caswell
4A Catawba
4A Chatham
4A Cherokee
3A Chowan
4A Clay
4A Cleveland
3A Columbus*
3A Craven
3A Cumberland
3A Currituck
3A Dare
3A Davidson
4A Davie
3A Duplin
4A Durham
3A Edgecombe
4A Forsyth

TABLE C200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.
Asterisk (*) indicates a warm-humid location.

(continued)

4A Franklin
3A Gaston
4A Gates
4A Graham
4A Granville
3A Greene
4A Guilford
4A Halifax
4A Harnett
4A Haywood
4A Henderson
4A Hertford
3A Hoke
3A Hyde
4A Iredell
4A Jackson
3A Johnston
3A Jones
4A Lee
3A Lenoir
4A Lincoln
4A Macon
4A Madison
3A Martin
4A McDowell
3A Mecklenburg
5A Mitchell
3A Montgomery
3A Moore
4A Nash
3A New Hanover*
4A Northampton
3A Onslow*
4A Orange
3A Pamlico
3A Pasquotank
3A Pender*
3A Perquimans
4A Person
3A Pitt
4A Polk
3A Randolph
3A Richmond
3A Robeson
4A Rockingham
3A Rowan
4A Rutherford
3A Sampson
3A Scotland
3A Stanly
4A Stokes
4A Surry
4A Swain
4A Transylvania
3A Tyrrell
3A Union
4A Vance
4A Wake
4A Warren
3A Washington
5A Watauga
3A Wayne
4A Wilkes
3A Wilson
4A Yadkin
5A Yancey

NORTH DAKOTA

6A Adams
7 Barnes
7 Benson
6A Billings
7 Bottineau
6A Bowman
7 Burke
6A Burleigh
7 Cass
7 Cavalier
6A Dickey
7 Divide
6A Dunn
7 Eddy
6A Emmons
7 Foster
6A Golden Valley
7 Grand Forks
6A Grant
7 Griggs
6A Hettinger
7 Kidder
6A LaMoure
6A Logan
7 McHenry
6A McIntosh
6A McKenzie
7 McLean
6A Mercer
6A Morton
7 Mountrail
7 Nelson
6A Oliver
7 Pembina
7 Pierce
7 Ramsey
6A Ransom
7 Renville
6A Richland
7 Rolette
6A Sargent
7 Sheridan
6A Sioux
6A Slope
6A Stark
7 Steele
7 Stutsman
7 Towner
7 Traill
7 Walsh
7 Ward
7 Wells
7 Williams

OHIO

4A Adams
5A Allen
5A Ashland
5A Ashtabula
5A Athens
5A Auglaize
5A Belmont
4A Brown
5A Butler
5A Carroll
5A Champaign
5A Clark
4A Clermont
5A Clinton
5A Columbiana
5A Coshocton
5A Crawford
5A Cuyahoga
5A Darke
5A Defiance
5A Delaware
5A Erie
5A Fairfield
5A Fayette
5A Franklin
5A Fulton
4A Gallia
5A Geauga
5A Greene
5A Guernsey
4A Hamilton
5A Hancock
5A Hardin
5A Harrison
5A Henry
5A Highland
5A Hocking
5A Holmes
5A Huron
5A Jackson
5A Jefferson
5A Knox
5A Lake
4A Lawrence
5A Licking
5A Logan
5A Lorain
5A Lucas
5A Madison
5A Mahoning
5A Marion
5A Medina
5A Meigs
5A Mercer
5A Miami
5A Monroe
5A Montgomery
5A Morgan
5A Morrow
5A Muskingum
5A Noble
5A Ottawa
5A Paulding
5A Perry
5A Pickaway
4A Pike
5A Portage
5A Preble
5A Putnam
5A Richland
5A Ross
5A Sandusky
4A Scioto
5A Seneca
5A Shelby
5A Stark
5A Summit
5A Trumbull
5A Tuscarawas
5A Union
5A Van Wert
5A Vinton
5A Warren
4A Washington
5A Wayne
5A Williams
5A Wood
5A Wyandot

OKLAHOMA

3A Adair
3A Alfalfa
3A Atoka
4B Beaver
3A Beckham
3A Blaine
3A Bryan
3A Caddo
3A Canadian
3A Carter
3A Cherokee
3A Choctaw

TABLE C200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

(continued)

4B Cimarron
3A Cleveland
3A Coal
3A Comanche
3A Cotton
3A Craig
3A Creek
3A Custer
3A Delaware
3A Dewey
3A Ellis
3A Garfield
3A Garvin
3A Grady
3A Grant
3A Greer
3A Harmon
3A Harper
3A Haskell
3A Hughes
3A Jackson
3A Jefferson
3A Johnston
3A Kay
3A Kingfisher
3A Kiowa
3A Latimer
3A Le Flore
3A Lincoln
3A Logan
3A Love
3A Major
3A Marshall
3A Mayes
3A McClain
3A McCurtain
3A McIntosh
3A Murray
3A Muskogee
3A Noble
3A Nowata
3A Okfuskee
3A Oklahoma
3A Okmulgee
3A Osage
3A Ottawa
3A Pawnee
3A Payne
3A Pittsburg
3A Pontotoc
3A Pottawatomie
3A Pushmataha
3A Roger Mills
3A Rogers
3A Seminole
3A Sequoyah
3A Stephens
4B Texas
3A Tillman
3A Tulsa
3A Wagoner
3A Washington
3A Washita
3A Woods
3A Woodward

OREGON
5B Baker
4C Benton
4C Clackamas
4C Clatsop
4C Columbia
4C Coos
5B Crook
4C Curry
5B Deschutes
4C Douglas
5B Gilliam
5B Grant
5B Harney
5B Hood River
4C Jackson
5B Jefferson
4C Josephine
5B Klamath
5B Lake
4C Lane
4C Lincoln
4C Linn
5B Malheur
4C Marion
5B Morrow
4C Multnomah
4C Polk
5B Sherman
4C Tillamook
5B Umatilla
5B Union
5B Wallowa
5B Wasco
4C Washington
5B Wheeler
4C Yamhill

PENNSYLVANIA
5A Adams
5A Allegheny
5A Armstrong
5A Beaver
5A Bedford
5A Berks
5A Blair
5A Bradford
4A Bucks
5A Butler
5A Cambria
6A Cameron
5A Carbon
5A Centre
4A Chester
5A Clarion
6A Clearfield
5A Clinton
5A Columbia
5A Crawford
5A Cumberland
5A Dauphin
4A Delaware
6A Elk
5A Erie
5A Fayette
5A Forest
5A Franklin
5A Fulton
5A Greene
5A Huntingdon
5A Indiana
5A Jefferson
5A Juniata
5A Lackawanna
5A Lancaster
5A Lawrence
5A Lebanon
5A Lehigh
5A Luzerne
5A Lycoming
6A McKean
5A Mercer
5A Mifflin
5A Monroe
4A Montgomery
5A Montour
5A Northampton
5A Northumberland
5A Perry
4A Philadelphia
5A Pike
6A Potter
5A Schuylkill
5A Snyder
5A Somerset
5A Sullivan
6A Susquehanna
6A Tioga
5A Union
5A Venango
5A Warren
5A Washington
6A Wayne
5A Westmoreland
5A Wyoming
4A York

RHODE ISLAND
5A (all)

SOUTH CAROLINA
3A Abbeville
3A Aiken
3A Allendale*
3A Anderson
3A Bamberg*
3A Barnwell*
3A Beaufort*
3A Berkeley*
3A Calhoun
3A Charleston*
3A Cherokee
3A Chester
3A Chesterfield
3A Clarendon
3A Colleton*
3A Darlington
3A Dillon
3A Dorchester*
3A Edgefield
3A Fairfield
3A Florence
3A Georgetown*
3A Greenville
3A Greenwood
3A Hampton*
3A Horry*
3A Jasper*
3A Kershaw
3A Lancaster
3A Laurens
3A Lee
3A Lexington
3A Marion
3A Marlboro
3A McCormick
3A Newberry
3A Oconee
3A Orangeburg
3A Pickens
3A Richland
3A Saluda
3A Spartanburg
3A Sumter
3A Union
3A Williamsburg
3A York

TABLE C200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

(continued)

SOUTH DAKOTA
6A Aurora
6A Beadle
5A Bennett
5A Bon Homme
6A Brookings
6A Brown
6A Brule
6A Buffalo
6A Butte
6A Campbell
5A Charles Mix
6A Clark
5A Clay
6A Codington
6A Corson
6A Custer
6A Davison
6A Day
6A Deuel
6A Dewey
5A Douglas
6A Edmunds
6A Fall River
6A Faulk
6A Grant
5A Gregory
6A Haakon
6A Hamlin
6A Hand
6A Hanson
6A Harding
6A Hughes
5A Hutchinson
6A Hyde
5A Jackson
6A Jerauld
6A Jones
6A Kingsbury
6A Lake
6A Lawrence
6A Lincoln
6A Lyman
6A Marshall
6A McCook
6A McPherson
6A Meade
5A Mellette
6A Miner
6A Minnehaha
6A Moody
6A Pennington
6A Perkins
6A Potter
6A Roberts
6A Sanborn
6A Shannon
6A Spink
6A Stanley
6A Sully
5A Todd
5A Tripp
6A Turner
5A Union
6A Walworth
5A Yankton
6A Ziebach

TENNESSEE
4A Anderson
4A Bedford
4A Benton
4A Bledsoe
4A Blount
4A Bradley
4A Campbell
4A Cannon
4A Carroll
4A Carter
4A Cheatham
3A Chester
4A Claiborne
4A Clay
4A Cocke
4A Coffee
3A Crockett
4A Cumberland
4A Davidson
4A Decatur
4A DeKalb
4A Dickson
3A Dyer
3A Fayette
4A Fentress
4A Franklin
4A Gibson
4A Giles
4A Grainger
4A Greene
4A Grundy
4A Hamblen
4A Hamilton
4A Hancock
3A Hardeman
3A Hardin
4A Hawkins
3A Haywood
3A Henderson
4A Henry
4A Hickman
4A Houston
4A Humphreys
4A Jackson
4A Jefferson
4A Johnson
4A Knox
3A Lake
3A Lauderdale
4A Lawrence
4A Lewis
4A Lincoln
4A Loudon
4A Macon
3A Madison
4A Marion
4A Marshall
4A Maury
4A McMinn
3A McNairy
4A Meigs
4A Monroe
4A Montgomery
4A Moore
4A Morgan
4A Obion
4A Overton
4A Perry
4A Pickett
4A Polk
4A Putnam
4A Rhea
4A Roane
4A Robertson
4A Rutherford
4A Scott
4A Sequatchie
4A Sevier
3A Shelby
4A Smith
4A Stewart
4A Sullivan
4A Sumner
3A Tipton
4A Trousdale
4A Unicoi
4A Union
4A Van Buren
4A Warren
4A Washington
4A Wayne
4A Weakley
4A White
4A Williamson
4A Wilson

TEXAS
2A Anderson*
3B Andrews
2A Angelina*
2A Aransas*
3A Archer
4B Armstrong
2A Atascosa*
2A Austin*
4B Bailey
2B Bandera
2A Bastrop*
3B Baylor
2A Bee*
2A Bell*
2A Bexar*
3A Blanco*
3B Borden
2A Bosque*
3A Bowie*
2A Brazoria*
2A Brazos*
3B Brewster
4B Briscoe
2A Brooks*
3A Brown*
2A Burleson*
3A Burnet*
2A Caldwell*
2A Calhoun*
3B Callahan
2A Cameron*
3A Camp*
4B Carson
3A Cass*
4B Castro
2A Chambers*
2A Cherokee*
3B Childress
3A Clay
4B Cochran
3B Coke
3B Coleman
3A Collin*
3B Collingsworth
2A Colorado*
2A Comal*
3A Comanche*
3B Concho
3A Cooke
2A Coryell*
3B Cottle
3B Crane
3B Crockett
3B Crosby
3B Culberson
4B Dallam
3A Dallas*
3B Dawson
4B Deaf Smith

TABLE C200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

(continued)

3A Delta
3A Denton*
2A DeWitt*
3B Dickens
2B Dimmit
4B Donley
2A Duval*
3A Eastland
3B Ector
2B Edwards
3A Ellis*
3B El Paso
3A Erath*
2A Falls*
3A Fannin
2A Fayette*
3B Fisher
4B Floyd
3B Foard
2A Fort Bend*
3A Franklin*
2A Freestone*
2B Frio
3B Gaines
2A Galveston*
3B Garza
3A Gillespie*
3B Glasscock
2A Goliad*
2A Gonzales*
4B Gray
3A Grayson
3A Gregg*
2A Grimes*
2A Guadalupe*
4B Hale
3B Hall
3A Hamilton*
4B Hansford
3B Hardeman
2A Hardin*
2A Harris*
3A Harrison*
4B Hartley
3B Haskell
2A Hays*
3B Hemphill
3A Henderson*
2A Hidalgo*
2A Hill*
4B Hockley
3A Hood*
3A Hopkins*
2A Houston*
3B Howard
3B Hudspeth
3A Hunt*
4B Hutchinson
3B Irion
3A Jack
2A Jackson*
2A Jasper*
3B Jeff Davis
2A Jefferson*
2A Jim Hogg*
2A Jim Wells*
3A Johnson*
3B Jones
2A Karnes*
3A Kaufman*
3A Kendall*
2A Kenedy*
3B Kent
3B Kerr
3B Kimble
3B King
2B Kinney
2A Kleberg*
3B Knox
3A Lamar*
4B Lamb
3A Lampasas*
2B La Salle
2A Lavaca*
2A Lee*
2A Leon*
2A Liberty*
2A Limestone*
4B Lipscomb
2A Live Oak*
3A Llano*
3B Loving
3B Lubbock
3B Lynn
2A Madison*
3A Marion*
3B Martin
3B Mason
2A Matagorda*
2B Maverick
3B McCulloch
2A McLennan*
2A McMullen*
2B Medina
3B Menard
3B Midland
2A Milam*
3A Mills*
3B Mitchell
3A Montague
2A Montgomery*
4B Moore
3A Morris*
3B Motley
3A Nacogdoches*
3A Navarro*
2A Newton*
3B Nolan
2A Nueces*
4B Ochiltree
4B Oldham
2A Orange*
3A Palo Pinto*
3A Panola*
3A Parker*
4B Parmer
3B Pecos
2A Polk*
4B Potter
3B Presidio
3A Rains*
4B Randall
3B Reagan
2B Real
3A Red River*
3B Reeves
2A Refugio*
4B Roberts
2A Robertson*
3A Rockwall*
3B Runnels
3A Rusk*
3A Sabine*
3A San Augustine*
2A San Jacinto*
2A San Patricio*
3A San Saba*
3B Schleicher
3B Scurry
3B Shackelford
3A Shelby*
4B Sherman
3A Smith*
3A Somervell*
2A Starr*
3A Stephens
3B Sterling
3B Stonewall
3B Sutton
4B Swisher
3A Tarrant*
3B Taylor
3B Terrell
3B Terry
3B Throckmorton
3A Titus*
3B Tom Green
2A Travis*
2A Trinity*
2A Tyler*
3A Upshur*
3B Upton
2B Uvalde
2B Val Verde
3A Van Zandt*
2A Victoria*
2A Walker*
2A Waller*
3B Ward
2A Washington*
2B Webb
2A Wharton*
3B Wheeler
3A Wichita
3B Wilbarger
2A Willacy*
2A Williamson*
2A Wilson*
3B Winkler
3A Wise
3A Wood*
4B Yoakum
3A Young
2B Zapata
2B Zavala

UTAH

5B Beaver
6B Box Elder
6B Cache
6B Carbon
6B Daggett
5B Davis
6B Duchesne
5B Emery
5B Garfield
5B Grand
5B Iron
5B Juab
5B Kane
5B Millard
6B Morgan
5B Piute
6B Rich
5B Salt Lake
5B San Juan
5B Sanpete
5B Sevier
6B Summit
5B Tooele
6B Uintah
5B Utah
6B Wasatch
3B Washington
5B Wayne

TABLE C200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant.
Asterisk (*) indicates a warm-humid location.

5B Weber

VERMONT
6A (all)

VIRGINIA
4A (all)

WASHINGTON
5B Adams
5B Asotin
5B Benton
5B Chelan
4C Clallam
4C Clark
5B Columbia
4C Cowlitz
5B Douglas
6B Ferry
5B Franklin
5B Garfield
5B Grant
4C Grays Harbor
4C Island
4C Jefferson
4C King
4C Kitsap
5B Kittitas
5B Klickitat
4C Lewis
5B Lincoln
4C Mason
6B Okanogan
4C Pacific
6B Pend Oreille
4C Pierce
4C San Juan
4C Skagit
5B Skamania
4C Snohomish
5B Spokane
6B Stevens
4C Thurston
4C Wahkiakum
5B Walla Walla
4C Whatcom
5B Whitman
5B Yakima

WEST VIRGINIA
5A Barbour
4A Berkeley
4A Boone
4A Braxton
5A Brooke
4A Cabell
4A Calhoun
4A Clay
5A Doddridge
5A Fayette
4A Gilmer
5A Grant
5A Greenbrier
5A Hampshire
5A Hancock
5A Hardy
5A Harrison
4A Jackson
4A Jefferson
4A Kanawha
5A Lewis
4A Lincoln
4A Logan
5A Marion
5A Marshall
4A Mason
4A McDowell
4A Mercer
5A Mineral
4A Mingo
5A Monongalia
4A Monroe
4A Morgan
5A Nicholas
5A Ohio
5A Pendleton
4A Pleasants
5A Pocahontas
5A Preston
4A Putnam

(continued)

5A Raleigh
5A Randolph
4A Ritchie
4A Roane
5A Summers
5A Taylor
5A Tucker
4A Tyler
5A Upshur
4A Wayne
5A Webster
5A Wetzel
4A Wirt
4A Wood
4A Wyoming

WISCONSIN
6A Adams
7 Ashland
6A Barron
7 Bayfield
6A Brown
6A Buffalo
7 Burnett
6A Calumet
6A Chippewa
6A Clark
6A Columbia
6A Crawford
6A Dane
6A Dodge
6A Door
7 Douglas
6A Dunn
6A Eau Claire
7 Florence
6A Fond du Lac
7 Forest
6A Grant
6A Green
6A Green Lake
6A Iowa
7 Iron
6A Jackson
6A Jefferson
6A Juneau
6A Kenosha
6A Kewaunee
6A La Crosse
6A Lafayette
7 Langlade
7 Lincoln
6A Manitowoc
6A Marathon
6A Marinette
6A Marquette
6A Menominee
6A Milwaukee
6A Monroe
6A Oconto
7 Oneida
6A Outagamie
6A Ozaukee
6A Pepin
6A Pierce
6A Polk
6A Portage
7 Price
6A Racine
6A Richland
6A Rock
6A Rusk
6A Sauk
7 Sawyer
6A Shawano
6A Sheboygan
6A St. Croix
7 Taylor
6A Trempealeau
6A Vernon
7 Vilas
6A Walworth
7 Washburn
6A Washington
6A Waukesha
6A Waupaca
6A Waushara
6A Winnebago
6A Wood

WYOMING
6B Albany
6B Big Horn
6B Campbell
6B Carbon
6B Converse
6B Crook
6B Fremont
5B Goshen
6B Hot Springs
6B Johnson
6B Laramie
7 Lincoln
6B Natrona
6B Niobrara
6B Park
5B Platte
6B Sheridan
7 Sublette
6B Sweetwater
7 Teton
6B Uinta
6B Washakie
6B Weston

U.S. TERRITORIES

AMERICAN SAMOA
1A (all)*

GUAM
1A (all)*

NORTHERN MARIANA ISLANDS
1A (all)*

PUERTO RICO
1A (all)*

VIRGIN ISLANDS
1A (all)*

C300
INTERNATIONAL CLIMATE ZONES

C301 International climate zones. The climate *zone* for any location outside the United States shall be determined by applying Table C301(1) and then Table C301(2).

TABLE C301(1)
INTERNATIONAL CLIMATE ZONE DEFINITIONS

MAJOR CLIMATE TYPE DEFINITIONS
Marine (C) Definition – Locations meeting all four criteria: 1. Mean temperature of coldest month between -3°C (27°F) and 18°C (65°F) 2. Warmest month mean <22°C (72°F) 3. At least four months with mean temperatures over 10°C (50°F) 4. Dry season in summer. The month with the heaviest precipitation in the cold season has at least three times as much precipitation as the month with the least precipitation in the rest of the year. The cold season is October through March in the Northern Hemisphere and April through September in the Southern Hemisphere.
Dry (B) Definition—Locations meeting the following criteria: Not marine and P_{in} <0.44 × (*TF* - 19.5) [P_{cm}<2.0 × (*TC* + 7) in SI units] where: P_{in} = Annual precipitation in inches (cm) T = Annual mean temperature in °F (°C)
Moist (A) Definition – Locations that are not marine and not dry.
Warm-humid Definition – Moist (A) locations where either of the following wet-bulb temperature conditions shall occur during the warmest six consecutive months of the year: 1. 67°F (19.4°C) or higher for 3,000 or more hours; or 2. 73°F (22.8°C) or higher for 1,500 or more hours

For SI: °C = [(°F)-32]/1.8; 1 inch = 2.54 cm.

TABLE C301(2)
INTERNATIONAL CLIMATE ZONE DEFINITIONS

ZONE NUMBER	THERMAL CRITERIA	
	IP Units	SI Units
1	9000 <CDD50°F	5000 < CDD10°C
2	6300 < CDD50°F ≤ 9000	3500 < CDD10°C ≤ 5000
3A and 3B	4500 < CDD50°F ≤ 6300 AND HDD65°F ≤ 5400	2500 < CDD10°C ≤ 3500 AND HDD18°C ≤ 3000
4A and 4B	CDD50°F ≤ 4500 AND HDD65°F ≤ 5400	CDD10°C ≤ 2500 AND HDD18°C ≤ 3000
3C	HDD65°F ≤ 3600	HDD18°C ≤ 2000
4C	3600 < HDD65°F ≤ 5400	2000 < HDD18°C ≤ 3000
5	5400 < HDD65°F ≤ 7200	3000 < HDD18°C ≤ 4000
6	7200 < HDD65°F ≤ 9000	4000 < HDD18°C ≤ 5000
7	9000 < HDD65°F ≤ 12600	5000 < HDD18°C ≤ 7000
8	12600 < HDD65°F	7000 < HDD18°C

For SI: °C = [(°F)-32]/1.8

APPENDIX D

EXAMPLES OF THIRD-PARTY PROGRAMS FOR INDOOR ENVIRONMENTAL QUALITY

D100 SCOPE AND APPLICABILITY

D101.1 Applicability of Appendix D. Appendix D is not part of this Standard.

D101.2 Scope. Appendix D provides examples of third-party programs for indoor environmental quality that can be used to demonstrate compliance with the applicable provisions of this Standard.

D200 CONFORMANCE

TABLE D200(1)
Examples of Third-party Certification Programs

Related Section of Standard	Examples of Third-party Certification Programs Compliant with the Corresponding Section
901.5 Cabinets	Kitchen Cabinet Manufacturers Association (KCMA) Environmental Stewardship Program (ESP)
901.6 Carpets	Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program
901.7 Hard-surface flooring	UL GREENGUARD Gold Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program
901.8 Wall coverings	UL GREENGUARD Gold Scientific Certification Systems (SCS) Indoor Advantage Gold Program
901.9 Architectural coatings	UL GREENGUARD Gold Scientific Certification Systems (SCS) Indoor Advantage Gold Program Green Seal-11 Standard for Paints and Coatings UL 2768
901.10 Adhesives and sealants	UL GREENGUARD Scientific Certifications Systems (SCS) Indoor Advantage Gold Program Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program Green Seal-36 Standard for Adhesives for Commercial Use
901.11 Insulation	UL GREENGUARD Gold Scientific Certifications Systems (SCS) Indoor Advantage Gold Program

TABLE D200(2)
Contact Information for the Example Third-party Certification Programs

Third-party Certification Program	Contact Information for the Program Administrator
Kitchen Cabinet Manufacturers Association (KCMA) Environmental Stewardship Program (ESP)	*Kitchen Cabinet Manufacturers Association* *1899 Preston White Drive* *Reston, VA 20191* *www.kcma.org* *(703) 264-1690*
Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program	*Carpet and Rug Institute* *730 College Drive* *Dalton, Georgia 30720* *United States of America* *http://www.carpet-rug.org* *(706) 278-3176*
UL GREENGUARD Gold	*Underwriters Laboratories Inc. 333 Pfingsten Road* *Northbrook, IL 60062-2096* *www.ul.com* *(877) 854-3577*
Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program	*Resilient Floor Covering Institute* *115 Broad Street, Suite 201* *LaGrange, Georgia 30240* *http://www.rfci.com*
Scientific Certification Systems (SCS) Indoor Advantage Gold Program	*Scientific Certification Systems* *2000 Powell Street, Suite 600* *Emeryville, California 94608* *http://www.scscertified.com* *(510) 452-8000*
Green Seal-11 Standard for Paints and Coatings	*Green Seal* *1001 Connecticut Avenue, NW, Suite 827* *Washington, DC 20036-5525* *http://www.greenseal.org/* *(202) 872-6400*
UL 2768	*Underwriters Laboratories Inc.* *333 Pfingsten Road* *Northbrook, IL 60062-2096* *www.ul.com* *(877) 854-3577*

APPENDIX E

ACCESSORY STRUCTURES

E100
SCOPE AND APPLICABILITY

E101.1 Applicability of Appendix E. Appendix E is part of this Standard. Text identified as "User Note" is not considered part of this Standard.

E101.2 Scope. The provisions contained in Appendix E provide the criteria necessary for complying with Section 306 for accessory structures.

E201
CONFORMANCE

E201.1 Conformance. Accessory structures that meet all applicable requirements of Appendix E shall be designated as *conforming*. The *conforming* designation for the accessory structure is separate from the rating achieved by the residential buildings located on the same site or lot. Where residential buildings located on the same lot have not achieved a rating in accordance with this Standard, the accessory structures shall not be eligible for designation under this Appendix. Each accessory structure shall seek a separate designation of *conforming* based on the rules established by the Adopting Entity in accordance with Section E202. The residential building shall not receive points for any practices implemented only for the accessory structure.

E202
CONFORMANCE CRITERIA

E202 Conformance Criteria. Accessory structures shall implement practices from Chapters 5 through 10 in accordance with Sections E202.1 through E202.7.

E202.1 The practices that are mandatory for the residential building shall also be mandatory for the accessory structure unless these practices are exempt under Sections E202.5 or E202.7.

E202.2 All land development practices associated with construction of the accessory structure shall comply with the land development practices for the residential building located on the same lot.

E202.3 For the accessory structures that use the same basic construction and mechanical systems as the residential buildings, the design and construction of the accessory structures shall meet the practices or the intent of the practices implemented to achieve compliance for the residential building located on the same site or lot.

E202.4 For the accessory structures that use basic construction or mechanical systems that are different from the residential buildings, the design and construction of the accessory structures shall meet the intent of the practice implemented to achieve compliance for the residential building located on the same site or lot.

E202.5 Where the residential buildings located on the same site or lot include construction methods or systems that do not have functionally equivalent methods or systems as part of the accessory structure, the accessory structure does not need to comply with any of the practices implemented for the residential building with regard to such construction methods or systems.

User note: *Examples of the practices that may be exempt from implementation in accessory structures include, but are not limited to:*

1) *Section 601.1 Conditioned floor area.*

2) *Section 601.5 Prefabricated components – accessory structure is not required to be modular if the residential building is modular.*

3) *Section 601.6 Stacked stories – accessory structures are not required to have more than one story if the residential building is more than one story.*

4) *Section 602.2 Roof surfaces – if the residential building has a landscaped roof, the accessory structure is not required to have a landscaped roof.*

5) *Chapter 7 Energy efficiency – unconditioned spaces in the accessory structure are not required to comply with Chapter 7.*

6) *Section 902.3 Radon control except for habitable space.*

E202.6 Where the accessory structure includes construction methods or systems that do not have functionally equivalent counterparts as part of the residential buildings located on the same site or lot, the Adopting Entity shall review such construction methods and systems and shall establish an approach for meeting the overall intent of the Standard with regard to the minimum acceptable threshold.

E202.7 Where the use of the accessory structure does not necessitate the implementation of a specific practice in the same manner as the practice applies to the residential building, such practice for the accessory structure may be exempted by the Adopting Entity.

User note: *Examples of the practices that may be exempted from implementation in accessory structures include, but are not limited to:*

1) *Section 602.1.14 Ice barrier – if the accessory structure does not contain conditioned space, ice barrier is not required.*

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I