201X National Green Building Standard

ANSI Standard Revision Process

Public Comment Draft

(Non-Legislative Version)

September 23, 2011

Foreword

This draft is provided for the purpose of soliciting public comments on the changes to the 2008 National Green Building Standard. Only the changes to the 2008 Standard are open for public comment. In addition, all point assignments and all reference standards are open for public comment. Any comments on any other provisions of the Standard that have not changed from the 2008 Standard will not be accepted.

Public comments are accepted through **November 7, 2011** via a web-based form at www.nahbrc.com/ngbs.

Two versions of the Draft Standard are available for review: Legislative Version and Non-Legislative Version. Both versions are posted at www.nahbrc.com/ngbs.

The Legislative Version shows all changes in underline/~~strikethrough~~ format. The existing language that has not been changed is shown only for the purpose of providing context for review of the changes.

The Non-Legislative Version is provided to facilitate review of the Draft Standard by the public. *(Note: Where any differences are found between the Legislative and Non-Legislative versions, the Legislative Version takes precedence.)*

Portions of the Draft Standard include provisions, including point assignments, designated as TBD (to be determined). Those provisions will be finalized by the Consensus Committee and will be open for comment during the next public comment period.

The final draft of the revised Standard will be editorially reviewed for spelling, grammar, and format after all substantive changes will have been processed by the Consensus Committee.

CHAPTER 1

SCOPE AND ADMINISTRATION

SECTION 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. This Standard provides criteria for rating the environmental impact of design and construction practices to achieve conformance with specified performance levels for green residential buildings.

101.3 Intent. This Standard shall establish practices for the design and construction of green residential buildings, building sites, subdivisions, and renovation thereof. 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.

SECTION 102 - APPLICABILITY

102.1 Applicability. 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 be used for subdivisions, building sites, and the residential portions of alterations, additions, renovations, mixed-use residential buildings, and historic buildings, where applicable.

102.2 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 version of the codes, standard or other referenced documents shall be the version referenced in chapter 11.

102.3 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.

SECTION 103 - CONFORMANCE

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

103.2 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.

103.3 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.

103.4 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 104 - ADMINISTRATION

104.1 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

SECTION 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

ADDITION. An extension or increase in 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, 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 product used in site development or building construction that is composed, in whole or in significant part, of biological products, renewable agricultural materials (including plant, animal, and marine materials), or forestry materials.

BROWNFIELD (also EPA-Recognized Brownfield). Real property, the expansion, redevelopment, or reuse that may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant, and includes Brownfield Site as defined in Public Law 107-118 (H.R. 2869) - "Small Business Liability Relief and Brownfields Revitalization Act."

(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.

COGENERATION. An energy process that consecutively generates useful thermal and electric energy from the same fuel source.

COMMON AREA(S). Areas within a Site or Lot, Common Area(s) 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
Areas of a multi-unit 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.

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 or room within a building being heated or cooled, containing uninsulated ducts, or with a fixed opening directly into an adjacent conditioned space.

CONSTRUCTED WETLAND. An artificial wetland, marsh, or swamp created as a new or restored habitat for native and migratory wildlife, for anthropogenic discharge such as wastewater, stormwater runoff, or sewage treatment, for land reclamation after mining, refineries, or other ecological disturbances such as required mitigation for natural wetlands lost to a 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).

COP (Coefficient of Performance). A measure of the heating efficiency of ground and air source heat pumps defined as the ratio of the rate of heat provided by the heat pump to the rate of energy input, in consistent units, for a complete heat pump under defined operating conditions. (See EER as a measure of the cooling efficiency of heat pumps.)

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.

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 AREA. Areas within wetlands as defined by federal, state, or local regulations; areas of steep slopes; "Prime Farmland" as defined by the U.S. Department of Agriculture; areas of "critical habitat" for any federal or state threatened or endangered species, areas defined by state or local jurisdiction as environmentally sensitive.

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

EXISTING BUILDING. Building completed and occupied prior to any renovation considered under this Standard.

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 the NGBS.

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. Waste discharged from lavatories, bathtubs, showers, clothes washers, and laundry trays.

GREYFIELD SITE. A previously developed site with abandoned or underutilized structures, and little or no contamination or perceived contamination.

GROUND SOURCE HEAT PUMP. Space conditioning and/or water heating systems that employs a geothermal resource such as the ground, groundwater, or surface water as both a heat source and a heat sink and use a reversible refrigeration cycle to provide both heating and cooling.

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 that uses refrigerants to extract heat from air, liquid, or other sources.

HIGH-EFFICACY LAMPS. Compact fluorescent lamps, 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; and 3) 40 lumens per watt for lamps 15 watts or less.

HISTORIC BUILDING. 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.

LANDSCAPE PRACTICE, (LANDSCAPING). Any activity that modifies the visible features of an area of land and may include living elements, such as flora or fauna; natural elements such as terrain shape and elevation, or bodies of water; human elements such as fences or other material objects created and/or installed by humans; and 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.

LOT. A single parcel of land generally containing one primary structure or use. Lot development, as defined, may include multiple ownership (such as with a condominium building) or multiple uses (such as with a mixed-use building). A lot is predominately represented by a single-family dwelling unit, a multi-family structure, or a mixed-use building also containing offices and shops. Lots maybe located in urban, suburban and rural locations. A lot can be located within a site. (also see SITE)

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.

MAJOR REMODEL. A renovation and/or addition project with a scope that is broader than a single room or area of the building.

MANUFACTURED HOME CONSTRUCTION. Three-dimensional sections of the complete building or dwelling unit built in a factory to the 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/m2), solid wood walls having a mass greater than or equal to 20 pounds per square foot (98 kg/m2), and any other walls having a heat capacity greater than or equal to 6 Btu/ft2 _ °F [266 J/(m2 • 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). The Minimum Efficiency Reporting Value for filters in accordance with criteria contained in ASHRAE 52.2.

MINOR COMPONENT. Building materials or systems that are not considered major.

MINOR REMODEL. A limited renovation or addition involving only a kitchen renovation, a bathroom renovation, a basement renovation, a one-room addition, or a one-room addition plus one bathroom or kitchen.

MIXED-USE BUILDING. A building that incorporates a mixture of uses (e.g. residential, retail, commercial) in a single structure.

MIXED-USE DEVELOPMENT. A project that incorporates a mixture of uses (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.

MULTI-UNIT 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 or construction that completely replaces more than 75% of an existing building.

OPEN SPACE. An area of land or water that either remains in its natural state, is used for agriculture, or is otherwise 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, bath tubs, and sinks.

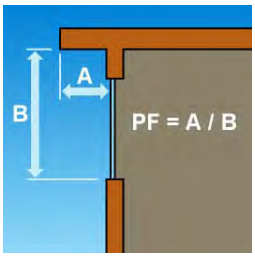
PRECUT. Materials cut to final size prior to delivery to site and ready for assembly.

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 ($h \times ft^2 \times °F/Btu$) [$(m^2 \times K)/W$].

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 is originated, produced, grows naturally, or occurs naturally within 500 miles (804.7 km) of the construction site if transported by truck or 1500 miles (2414 km) of the construction site if transported for not less than 80% of the total transport distance by rail or water.

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

RENEWABLE ENERGY. Energy derived from sources that are regenerative or cannot be depleted.

RENEWABLE ENERGY SOURCE. Source of energy (excluding minerals) derived from incoming solar radiation, including natural solar radiation itself, photosynthetic processes; from phenomenon resulting therefrom, including wind, hydropower, waves and tides, and lake or pond thermal differences; from decomposition of waste material, including methane from landfills; from processes that use regenerated materials, including wood and bio-based products; and from the internal heat of the earth, including nocturnal thermal exchanges.

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

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 light weight 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 received from 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 from the consumer. The product is sold with this capability, which can be built-in or added through an external device that easily connects to the appliance.

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

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, except that a basement shall be considered as a story above grade where the finished surface of the floor above the basement is:

1. More than 6 feet (1829 mm) above grade plane.
2. More than 6 feet (1829 mm) above the finished ground level for more than 50 percent of the total building perimeter.
3. More than 12 feet (3658 mm) above the finished ground level at any point.

SUBDIVISION. The division of a tract, lot, or parcel of land into two or more lots, plats, sites, or other divisions of land.

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

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/(m2 • K]).

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 (WATER CONSUMPTION FACTOR). The quotient of the total weighted per-cycle water consumption divided by the capacity of the clothes washer.

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 saturated by surface or ground water 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. Wetlands are further defined by the EPA in the *Code of Federal Regulations*.

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.

CHAPTER 3

COMPLIANCE METHOD

301 - GENERAL

301.1 Environmental rating levels. The building, project, site, and/or development's 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 Table 302, 303, or 305.5, as applicable.

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 multi-unit buildings shall be as prescribed in Section 304.

(3) The Adopting Entity shall allow new and innovative products and practices to be added where 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 for innovative products or practices. Innovative practices and products shall fall under Categories 1-6 from Table 303; however 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 to determine 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	**79**	**104**	**134**	**175**

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, the additional points prescribed in Category 7 shall be achieved from any of the categories. Where deemed appropriate by the Adopting Entity and 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 (1) (2)			
			BRONZE	SILVER	GOLD	EMERALD
1.	Chapter 5	Lot Design, Preparation, and Development	39	66	93	119
2.	Chapter 6	Resource Efficiency	45	79	113	146
3.	Chapter 7	Energy Efficiency	30	60	100	120
4.	Chapter 8	Water Efficiency	14	26	41	60
5.	Chapter 9	Indoor Environmental Quality	36	65	100	140
6.	Chapter 10	Operation, Maintenance, and Building Owner Education	8	10	11	12
7.		Additional Points from any category	50	100	100	100
		Total Points:	222	406	558	697

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

(2) 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 MULTI-UNIT BUILDINGS

304.1 Multi-unit buildings. All residential portions of a building shall meet the requirements of this Standard and partial compliance shall not be allowed. Unless otherwise noted, all units and residential common areas within a multi-unit building shall: 1) meet all mandatory requirements; and 2) achieve the threshold number of points required for the chosen environmental rating level in accordance with Table 303; and 3) achieve the same environmental rating level. For multi-unit buildings, points for the green building practices that apply to multiple units shall be credited once for the entire building. Where points are credited, practices shall be implemented in all units, as applicable. Where application of a prescribed practice allows for a different number of points for different units in a multi-unit building, the fewer number of points shall be awarded.

305 - GREEN REMODELING

305.1 Applicability. This section shall apply to any existing building where improvements are made via renovation and/or addition to the structure or landscape/hardscape. At least one major structural element of the existing building must remain (e.g. foundation). Complete tear downs must follow the new construction path of section 303 or 304 including all appropriate mandatory requirements. Buildings with additions of greater than 75% of the existing conditioned floor area must comply with section 303 or 304.

305.1.1 Practices

305.1.1 Major Remodels. Remodel projects must initially be evaluated according to section 305.2. Projects that do not qualify for meeting the requirements of 305.2 shall be considered per section 305.3.

305.2.1 Mandatory Practices. The building shall comply with all applicable mandatory practices in Chapter 11[new] regardless of whether the project scope of work addresses the mandatory practice

305.2.2 Consumption for both energy and water consumption shall be estimated for both before and after the remodeling. The occupancy and life style assumed and the method of making the consumption comparison should be the same for both estimates.

(1) Energy consumption comparison: Energy consumption shall be based on the estimated annual energy use due to heating, cooling, and water heating as determined by a third-party energy audit or analysis. The comparison is based on the percentage difference between the HERS index before and the HERS index after the remodeling calculated as follows:

(HERSbefore-HERSafter)/HERSbefore*100.

(2) Water consumption: Water consumption shall be based on the estimated annual use as determined by audit or analysis. The comparison is based on the percentage difference between the consumption before and the after the remodeling calculated as follows:

(Usage before **–** Usage after)/Usage before*100

305.2.3 Consumption in both categories of Section 305.3(1) and (2) shall be reduced to achieve the desired performance level of Table 305.4.

Table 305.2.3
Threshold Ratings for Green Remodels

Green Remodel Practice	Performance Level			
	BRONZE	SILVER	GOLD	EMERALD
Reduction in energy and water consumption in accordance with Section 305.2.2	20%	34%	43%	50%
Reduction water consumption in accordance with Section 305.2.2	20%	34%	43%	50%

305.2.4 Green Practices

Additional green practices shall be selected from sections 11.5, 11.6, and 11.9 to achieve the thresholds of Minimum Point Percentage listed in table 305.2.4 based on practices applicable to the scope of the project. The point percentage is calculated as follows:

(Points from practices implemented) / (Total Potential Applicable Points from the section)*100.

Applicable points are points available by implementing practices that are within the scope of the project. Practices that would require effort outside of the scope of the project are not included as Applicable Points. For example, if carpet is not being replaced as part of the project, the points for 11.901.5 are not Applicable Points. When a practice has multiple sub-practices the points for all the sub-practices are considered Applicable Points even if the scope of the project calls for only doing one of the sub-practices. For example, practice 11.503.1 concerning conservation of natural resources has 6 sub-practices; if any of the 6 sub-practices are included in the scope of the project work, then the applicable points for that practice would be 24 points in most situations. If the lot did not have any trees then the points related to sub-practices (4) & (5) would not be appropriate and then the Applicable Points would be 18 points. Points are not considered as Applicable Points simply because the existing building (prior to remodeling) exhibited the feature(s) required by the practice. Points are only available and

Applicable if the points are due to a practice that falls within the scope of the project. Features of the existing building that address mandatory practices contribute to the building meet the mandatory practice.

Table 305.2.4
Threshold Ratings for Green Remodels

Green Remodel Practice	Minimum Point Percentage			
	BRONZE	SILVER	GOLD	EMERALD
Section 11.5	TBD	TBD	TBD	TBD
Section 11.6	TBD	TBD	TBD	TBD
Section 11.9	TBD	TBD	TBD	TBD

When no practices from either section 11.5, 11.6, or 11.9 are applicable, those thresholds are not applicable to achieving a rating level.

305.2.5 The rating level for major renovations is determined by the lowest rating achieved by the project achieved in table 305.2.3 or table 305.2.4.

305.3 Minor Remodels

Minor remodeling projects are projects that are too small to achieve at least the Bronze level in section 305.2. Minor remodeling projects include kitchens, bathrooms, single story single room additions (less than 400 square feet), and basements. Green minor remodeling projects are not recognized as bronze, silver, gold, or emerald. Green minor remodeling projects are recognized as compliant when the project meets the applicable criteria in Chapter 12 for that specific type of project. Compliant projects must meet all the mandatory practices and at least 50% of the optional practices for that project type as specified in Chapter 12. If the small addition includes a kitchen and/or bathroom, then that project must meet all the applicable project type criteria.

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 303 based on practices herein, applies only to the site as defined in Chapter 2. The buildings on the site earn their own performance level by complying with the provisions of Section 303, 304, or 305.5, 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.	**4**
401.2 Greyfield site. A greyfield site is selected.	**5**
401.3 Brownfield site. A brownfield site is selected.	**TBD**
401.4 Low-slope site. A site with an average slope calculation of less than 15% is selected.	**TBD**
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 issues.	
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** **3**
402.4 Development Agreements. Developer requires purchaser(s) of lots to build the homes to a minimum NGBS certified green building bronze level or equivalent through a developer agreement or equivalent.	**TBD**

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.	**4**

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.	**4**
(2)	All or a percentage of roads are aligned with natural topography to reduce cut and fill.	
	(a) less than 25 percent	**1**
	(b) 25 percent to 75 percent	**3**
	(c) greater than 75 percent	**5**
(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.	**4**
(3)	Limits of clearing and grading are demarcated.	**4**

403.5 Storm water management. Storm water management design includes one or more of the following low-impact development techniques:		
(1)	Natural water and drainage features are preserved and used.	**6**
(2)	Use of vegetative swales, French drains, wetlands, drywells, rain gardens, and similar infiltration features.	**6**
(3)	Permeable materials are selected/specified for common area roads, driveways, parking areas, walkways, and patios.	
	(a) less than 25 percent	**1**
	(b) 25 percent to 75 percent	**3**
	(c) greater than 75 percent	**5**
(4)	Stormwater management practices that manage rainfall on-site and prevent the off-site discharge from all storms up to and including the volume of the 95th percentile storm event.	**TBD**
(5)	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 throughout the development or redevelopment process. Post construction runoff rate, volume, and duration do not exceed predevelopment rates.	**TBD**
(6)	Storm water management features/structures are designed for the reduction of nitrogen, phosphorus and sediment.	**TBD**

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.	**5**
(2)	On-site native or regionally appropriate trees and shrubs are conserved, maintained and reused for landscaping to the greatest extent possible.	**5**
(3)	Turf grass species, other vegetation, and trees that are native or regionally appropriate for local growing conditions are selected.	**4**
(4)	The percentage of all turf areas are limited as part of the landscaping.	
	(a) 0 percent	**4**
	(b) greater than 0 percent to less than 20 percent	**3**
	(c) 20 percent to less than 40 percent	**2**
	(d) 40 percent to 60 percent	**1**
(5)	Plants with similar watering needs are grouped (hydrozoning).	**5**
(6)	Species and locations for tree planting are identified and utilized to increase summer shading of streets, parking areas, and buildings and moderate temperatures.	**5**
(7)	Vegetative wind breaks or channels are designed as appropriate to local conditions.	**4**

(8)	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.	**3**
(9)	An integrated common area pest management plan to minimize chemical use in pesticides and fertilizers is developed.	**4**
(10)	Plans for the common area landscape watering system include a weather-based or moisture-based controller. Required irrigation systems should be designed in accordance with the Irrigation Association's *Turf and Landscape Best Management Practices*.	**6**
(11)	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.	**3**
(12)	Greywater irrigation systems are used to water common areas. Greywater used for irrigation conforms to all criteria within Section 802.1.	**TBD**
(13)	Cisterns, rain barrels, and similar tanks are structures 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 used for irrigation of lawn, trees, and gardens located in common areas. X percent of site area is to be irrigated by these means and demonstrated on the site plan. *(Secretariat Note: percentage to be assigned in public comment)*	**TBD**

403.7 Wildlife habitat. Measures are planned that will support wildlife habitat.	**5**

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.	**5**

403.9 Existing buildings. Existing building(s) and structure(s) is/are preserved, reused, modified, or disassembled for reuse or recycling of building materials.	**6**

403.10 Existing and recycled materials. Existing or recycled materials are used as follows. **(Points awarded for every 10 percent of total construction materials that are reused, deconstructed, and/or salvaged. The percentage is consistently calculated on a weight, volume, or cost basis.)**		**1**
(1)	Existing pavements, curbs, and aggregates are salvaged or reincorporated into the development.	
(2)	Recycled asphalt or concrete is utilized in the project.	

403.11 Environmentally sensitive areas. Environmentally sensitive areas as follows:		
(1)	Environmentally sensitive areas including steep slopes, prime farmland, critical habitats, and wetlands are avoided as follows:	
(a)	**< 25% of site undeveloped**	**TBD**
(b)	**25% - 75% of site undeveloped**	**TBD**
(c)	**> 75% of site undeveloped**	**TBD**

(2) Compromised environmentally sensitive areas are mitigated or restored.	**3**

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)	**4**

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.	**4**
(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**
(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.	**4**
(3) Open space is preserved as part of a wildlife corridor.	**5**
(4) Builder or member of builder's project team participates in a wildlife conservation	**5**

program.	

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 by one or more of the following:		
(1)	Off-street parking areas are shared or driveways are shared. An environmental and green approach to shared parking and driveways is achieved through the removal of driveways, and utilization of on-street parking and the use of alleys (shared common area driveways) for rear-loaded garages.	**5**
(2)	In a multi-unit project, 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 % to less than 50%	**2**
	(b) 50% to 75%	**3**
	(c) greater than 75%	**4**

405.2 Street widths.

(1) Street pavement widths are minimized per local code and are in accordance with Table 405.2. — **6**

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

(2) A waiver was secured by the developer from the local jurisdiction to allow for construction of streets below minimum width requirement. — **TBD**

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 Zoning. Innovative zoning techniques are implemented in accordance with the

following:	
(1) Innovative zoning ordinances or local laws 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 zoning techniques may be considered on a case-by-case basis.	**6**
(2) An increase to the permissible density, area, height, use, or other provisions of a local zoning law for a defined green benefit.	**6**
(3) Place-based amenities such as plazas, squares, and attached greens, located around civic, commercial, and mixed-use property are accessible by sidewalks, on-street parking, or provide for bike racks, for the purpose of promoting higher density living.	**6**

405.5 Wetlands. Constructed wetlands or other natural innovative wastewater or storm water treatment technologies are used.	**7**

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.	**3**
(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.	**TBD**
(3) Walkways, bikeways, street crossings, and entrances designed to promote pedestrian activity are provided. New buildings are connected to existing sidewalks and areas of development.	**3**
(4) Bicycle parking and racks are indicated on the site plan and constructed for mixed-use, multi-family buildings, and/or common areas.	**TBD**
(5) Bike sharing programs participate with the developer, and their facilities are planned for and constructed.	**TBD**
(6) Car sharing programs participate with the developer, and their facilities are planned for and constructed.	**TBD**

405.7 Density. The average density on a net developable area basis is:	
(1) 7 to less than 14 dwelling units per acre (per 4047 m2)	4
(2) 14 to less than 21 dwelling units per acre (per 4047 m2)	7
(3) 21 or greater dwelling units per acre (per 4047 m2)	10

405.8 Mixed-Use Development. (1) Mixed-use development is incorporated, or (2) for single-use sites 20 acres or less in size with boundaries adjacent to a minimum of two uses containing retail, services, and employment may achieve the mixed-use points, given that a pedestrian network of streets, sidewalks, pathways, or plazas exist that connect a majority of lots within the site with the adjacent non-residential uses.	**TBD**

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

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

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, multi-unit buildings, or additions thereto that contain dwelling units. The buildings on the lot earn their own performance level by complying with the provisions of Sections 303, 304, or 305.5, as applicable.

501
LOT SELECTION

501.1 Lot. The lot is selected to minimize environmental impact by one or more of the following:	
(1) The builder selects a lot within an NGBS certified green community or equivalent on which to build.	**4 for 4-star 3 for 3-star 2 for 2-star 1 for 1-star green community**
(2) An infill lot is selected.	**6**
(3) An infill lot is selected that is a greyfield.	**8**
(4) An EPA-recognized brownfield lot is selected.	**10**
(5) A lot with an average slope calculation of less than 15% is selected.	**TBD**

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 or within five miles (8046 m) of a mass transit station with provisions for parking.	**3**
(2) Walkways, street crossings, and entrances designed to promote pedestrian activity are provided. New buildings are connected to existing sidewalks and areas of development.	**3**
(3) A lot is selected within one-half mile (805 m) of six or more community resources [e.g., recreational facilities (such as pools, tennis courts, basketball courts), parks, grocery store, post office, place of worship, community center, daycare center, bank, school, restaurant, medical/dental office, laundromat/dry cleaner].	**3**
(4) 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	**TBD**

GREEN BUILDING PRACTICES	POINTS
bicycle lanes or on an infill lot located within 1/2 mile of a bicycle lane designated by the jurisdiction.	

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, 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 lot.

(To be awarded points allocated for design 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 resource inventory as high-priority resources.	**6**
(3) Items listed for protection in the 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.	**2**
(6) Ongoing maintenance of vegetation on the lot during construction is in accordance with TCIA A300 or locally accepted best practices.	**3**
(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 the use of terrain adaptive architecture including terracing, retaining walls, landscaping, or other re-stabilization techniques.	
(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 driveways and parking are aligned with natural topography to reduce cut and fill.	
(a) less than 25 percent	**1**

GREEN BUILDING PRACTICES	POINTS
(b) 25 percent to 75 percent	**3**
(c) greater than 75 percent	**5**
(3) Long-term erosion effects are reduced through the design and implementation of terracing, retaining walls, landscaping, or restabilization techniques.	**6**

(4) Underground parking uses the natural slope for parking entrances.	**4**

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 to minimize length of time that soils are exposed.	**5**
(2) At least 75% of total length of the installed utilities on the lot are installed using one or more alternative means: **(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	**5**
(3) Limits of clearing and grading are demarcated on the lot plan.	**5**

503.4 Storm water management. A storm water management design includes one or more of the following low-impact development techniques: **(For lots in a development, the points for items (1), (2), and (3) may be awarded for the lot when there is a community storm water management plan implemented and the builder does not violate that plan with respect to water leaving the lot.)**	
(1) Natural water and drainage features are preserved and used.	**6**
(2) Facilities that minimize concentrated flows and simulate flows found in natural hydrology by the use of vegetative swales, french drains, wetlands, drywells, rain gardens, and similar infiltration features.	**6**
(3) All or a percentage of impervious surfaces are minimized and permeable materials are used for driveways, parking areas, walkways, and patios.	
(a) less than 25 percent	**1**
(b) 25 percent to 75 percent	**3**
(c) greater than 75 percent	**5**
(4) A minimum of 50 percent of the roof is vegetated (green roof) using technology capable of withstanding the climate conditions of the jurisdiction and the microclimate conditions of the building site. Invasive plant species are not permitted.	**3**
(5) Stormwater management practices that manage rainfall on-site and prevent the off-site discharge from all storms up to and including the volume of the 95th percentile storm event.	**TBD**
(6) Conduct a hydrologic analysis that results in the design of a stormwater management system that maintains the pre-development (stable, natural) runoff hydrology of the site throughout the development or redevelopment process. Post-construction runoff rate, volume, and duration cannot exceed predevelopment rates.	**TBD**

GREEN BUILDING PRACTICES	POINTS
503.5 Landscape plan. A landscape 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 1-6)**	
(1) Where a lot is less than 50% turf, 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.	**5**
(2) Turf grass species, other vegetation, and trees are selected and specified on the lot plan that are native or regionally appropriate for local growing conditions.	**4**
(3) The percentage of turf areas that is designed to be mowed is limited and shown on the lot plan. The percentage is based on the landscaped area of the lot not including the home footprint, hardscape, and any undisturbed natural areas.	
(a) 0 percent	**4**
(b) greater than 0 percent to less than 20 percent	**3**
(c) 20 percent to less than 40 percent	**2**
(d) 40 percent to 60 percent	**1**
(4) Plants with similar watering needs are grouped (hydrozoning) and shown on the lot plan.	**5**
(5) Summer shading by planting installed to shade a minimum of 30% of building walls. To conform to summer shading, the effective shade coverage 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 five years after planting.	**5**
(6) Vegetative wind breaks or channels are designed to protect the lot and immediate surrounding lots as appropriate for local conditions.	**4**
(7) On-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**
(8) An integrated pest management plan is developed to minimize chemical use in pesticides and fertilizers.	**4**
503.6 Wildlife habitat. Measures are planned that will support wildlife habitat and include at least two of the following:	**4**
(1) Plants and gardens that will encourage wildlife, such as bird and butterfly gardens.	**TBD**
(2) Inclusion of a certified “backyard wildlife” program.	**TBD**
(3) Lots are adjacent to wildlife corridors, fish and game parks, or preserved areas and are designed with regard for this relationship.	**TBD**
(4) Outdoor lighting techniques are utilized with regard for wildlife.	**TBD**
503.7 Environmentally sensitive areas. Environmentally sensitive areas.	

GREEN BUILDING PRACTICES		POINTS
(1)	The lot does not contain any environmentally sensitive areas that are disturbed by the construction.	**3**
(2)	Compromised environmentally sensitive areas are mitigated or restored.	**3**

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 clearing, grading, trenching, paving on the lot, and installation of utilities on the lot 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.	**4**
(3)	Damage to designated existing trees and vegetation is mitigated during construction through pruning, root pruning, fertilizing, and watering.	**4**

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 storm water 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).	**3**
(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 storm water pollution prevention plan, where required.	**3**
(7)	Soil is improved with organic amendments and mulch.	**3**
(8)	Utilities on the lot are installed using one or more alternative means (e.g., tunneling	**5**

GREEN BUILDING PRACTICES	POINTS
instead of trenching, use of smaller equipment, use of low ground pressure equipment, use of geomats, shared utility trenches or easements).	
(9) Inspection reports of storm water best management practices are available.	**TBD**

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 practices are used to implement such practices.

505.1 Driveways and parking areas. Driveways and parking areas are minimized 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.	4
(2) In a multi-unit project, parking capacity is not to exceed the local minimum requirements.	4
(3) Structured parking is utilized to reduce the footprint of surface parking areas.	
(a) 25 % to less than 50%	2
(b) 50% to 75%	3
(c) greater than 75%	4

505.2 Heat island mitigation. One or more of the following strategies are provided for a minimum of 50 percent of the horizontal surface area of the hardscape on the lot:	**4**
(1) 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.	
(2) Light-colored hardscaping: Horizontal hardscaping materials are installed with a solar reflectance index of 29 or greater.	
(3) Permeable hardscaping: Permeable hardscaping materials are installed.	
(4) Roofs: Not less than 75 percent of the surface of the roof meets one or a combination of the following methods. **(a)** Minimum initial Solar Reflectance Index of 78 for a low-sloped roof (a slope less than or equal to 2:12) and a minimum initial Solar Reflectance Index of 29 for a steep-sloped roof (a slope of more than 2:12). **(b)** Roof is vegetated using technology capable of withstanding the climate conditions of the jurisdiction and the microclimate conditions of the building site. Invasive plant species are not permitted.	

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 4047 m^2)	**4**
(2) 14 to less than 21 dwelling units per acre (per 4047 m^2)	**7**

GREEN BUILDING PRACTICES	POINTS
(3) 21 or greater dwelling units per acre (per 4047 m^2)	**10**

505.4 Mixed-use development. The lot contains a mixed-use building.	**6**

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.	**TBD**

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 NAHBRC Z765. Only the finished floor area for stories above grade plane is included in the calculation.	
(1) less than or equal to 1,000 square feet (93 m^2)	**15**
(2) less than or equal to 1,500 square feet (139 m^2)	**12**
(3) less than or equal to 2,000 square feet (186 m^2)	**9**
(4) less than or equal to 2,500 square feet (232 m^2)	**6**
(5) 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 in Table 303, Category 7 for each performance level.)**	**Mandatory**
Multi-Unit Building Note*: For a multi-unit building, use a weighted average of the individual unit sizes in qualifying for available points.*	
601.2 Material usage. Structural systems are designed or construction techniques are implemented that reduce and optimize material usage.	**9 Points 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**

GREEN BUILDING PRACTICES	POINTS
(5) penetrations or trim area	**1**

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:	
(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 (2134 mm).	**8 Points Max**
(1) first stacked story	**4**
(2) for each additional stacked story	**2**

601.7 Site-applied finishing materials. Building materials or assemblies listed below that do not require additional site-applied material for finishing are incorporated in the building.	**12 Points Max**
(1) 90 percent or more of the installed building materials or assemblies listed below: **(Points awarded for each type (a-g) of material or assembly.)**	**5**
(2) 50 percent to less than 90 percent of the installed building material or assembly listed below: **(Points awarded for each type (a-g) of material or assembly.)**	**2**
(3) 35 percent to less than 50 percent of the installed building material or assembly listed below: **(Points awarded for each type (a-g) of material or assembly.)**	**1**
(a) pigmented, stamped, decorative, or final finish concrete or masonry **(b)** interior trim not requiring paint or stain **(c)** exterior trim not requiring paint or stain **(d)** window, skylight, and door assemblies not requiring paint or stain on exterior or interior surfaces **(e)** interior wall coverings or systems not requiring paint or stain or other type of finishing application **(f)** exterior wall coverings or systems not requiring paint or stain or other type of finishing application **(g)** pre-finished hardwood flooring	

GREEN BUILDING PRACTICES	POINTS
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**
601.9 Above grade wall systems. One or more of the following above grade wall systems that provide sufficient structural and thermal characteristics are used for a minimum of 75 percent of the gross exterior wall area of the building:	**4**
(1) adobe **(2)** concrete and/or masonry **(3)** logs **(4)** rammed earth	

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 all concrete slabs adjoining living space in accordance with Sections 602.1.1.1(1) or 602.1.1.1(2), as modified by Section 602.1.1.1(3):	**Mandatory**
(1) A minimum 4-inch-thick (102 mm) bed of ½-inch (13 mm) diameter or greater clean aggregate, covered with polyethylene or polystyrene sheeting in direct contact with the concrete slab, with the sheeting joints lapped in accordance with Section 602.1.4. **(2)** A minimum 4-inch-thick (102 mm) uniform layer of sand, overlain with a layer or strips of geotextile drainage matting, covered with polyethylene sheeting, with the sheeting joints lapped in accordance with Section 602.1.4. **(3)** Modification: In areas with free-draining soils, identified as Group 1 in the ICC IRC by a certified hydrologist, soil scientist, or engineer through a site visit, a gravel bed or geotextile matting is not required.	
602.1.1.2 Add a capillary break on footing to prevent moisture migration into foundation wall.	**3**
602.1.2 Foundation waterproofing. Enhanced foundation waterproofing is installed: **(1)** rubberized coating, or **(2)** drainage mat	**4**
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	**4**

GREEN BUILDING PRACTICES	POINTS
discharge to daylight, dry well, or sump pit.	
602.1.4 Crawlspaces.	
602.1.4.1 Crawlspace vapor retarder 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 up the wall sufficient to allow the material to be affixed with glue and furring strips.	**6**
(2) Walls. Damp-proof walls are provided below finished grade.	**Mandatory**
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 lapped 6 mil polyethylene or polystyrene.	**10**
(2) 6 mil polyethylene sheeting, lapped a minimum of 6 inches (152 mm), and taped at the seams.	**8**
602.1.5 Termite barrier. Continuous physical foundation termite barrier used with low toxicity treatment or with no chemical treatment is installed in geographical areas that have subterranean termite infestation potential determined in accordance with Figure 6(3).	**4**
602.1.6 Termite-resistant materials. Termite-resistant materials are used as follows:	
(1) In areas of slight to moderate termite infestation probability [as defined by Figure 6(3)] 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 [as defined by Figure 6(3)] 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 [as defined by Figure 6(3)] 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 installation 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**

GREEN BUILDING PRACTICES	POINTS
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**
602.1.8 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**
602.1.9 Flashing. Flashing is provided 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 are installed at all of the following locations, as applicable: **(a)** around exterior fenestrations, skylights and doors **(b)** at roof valleys **(c)** at deck, balcony, porch or stair to building 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 **(h)** drip edge is installed at eaves and rake edges.	**Mandatory**
(2) All window head and jamb flashing are self-adhered flashing complying with AAMA 711-07.	**2**
(3) Pan flashing is installed at sills of all exterior windows and doors	**2**
(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.	**2**
(5) A rainscreen wall design is used for exterior wall assemblies	**2 Points 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	**2**
(b) either a cladding material or a water-resistive barrier with enhanced drainage, meeting 75% drainage efficiency requirement of ASTM E2273.	**1**
(6) A drip cap is provided above windows and doors that are not flashed or protected by covering in accordance with Section 602.1	**2**
(7) Through wall flashing is installed at transitions between wall cladding materials, or wall construction types.	**2**
(8) Flashing is installed at expansion joints in stucco walls	**2**
602.1.10 Exterior doors. Entries at exterior door assemblies, inclusive of side lights, are covered by one of the following methods to protect the building from the effects of precipitation and solar radiation. A projection factor of 0.375 minimum is provided. Eastern-	**5 Points Max**

and western-facing entries in Climate Zones 1, 2, and 3, as determined in accordance with Figure 6(1) or Appendix C, have a projection factor of 1.0 minimum, unless otherwise protected from direct solar radiation by other means (e.g., screen wall, vegetation).

(a) installing a porch roof or awning
(b) extending the roof overhang
(c) recessing the exterior door

(1) main entrance door — **3**

(2) additional covered door assembly — **1**

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, based on inches of rainfall in Table 602.2, are provided over a minimum of 90 percent of exterior walls to protect the building envelope. — **4**

Table 602.2
Minimum Roof Overhang for One- & Two-Story Buildings

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

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

For SI: 12 inches = 304.8 mm

602.1.13 Drip edge. Drip edge is installed at eaves and gable roof edges. — **3**

602.1.14 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 at a minimum of 24 inches (610 mm) inside the exterior wall line of the building. — **Mandatory**

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

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

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 both of the following: — **3**

(1) products that are in accordance with the ENERGY STAR® cool roof certification or equivalent
(2) a vegetated roof system

GREEN BUILDING PRACTICES	POINTS
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**
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 in lieu of demolition. **(Points awarded for every 200 square feet (18.5 m^2) of floor area.)**	**1** **12 Points 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.)**	**1** **9 Points Max**
603.3 Scrap materials. Facilitation for sorting and reuse of scrap building material (e.g., provide a central storage area or dedicated bins).	**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. — **Points per Table 604.1**

Table 604.1
Recycled Content

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

605

GREEN BUILDING PRACTICES	POINTS

RECYCLED CONSTRUCTION WASTE

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

(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 with a goal of recycling or salvaging a minimum of 50 percent (by weight) of construction waste.	**6**

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 as 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 Points Max**
(1) a minimum of two types of materials are recycled	**3**
(2) for each additional recycled material	**1**

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 Points 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)** products with the minimum biobased contents of the USDA 7 CFR Part 2902 **(i)** 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 Points Max**

GREEN BUILDING PRACTICES	POINTS
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)** other product programs mutually recognized by PEFC	
(1) Where a minimum of two certified wood-based products are used for minor elements of the building, such as all trim, cabinetry, or millwork.	**3**
(2) Where a minimum of two certified wood-based products are used in major elements of the building, such as walls, floors, or roof.	**4**

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 Points Max**

607 RECYCLING

607.1 Recycling. Occupant recycling is 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	**3**
(2) Compost facility provided on-site	**3**

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: **(3 points awarded for each material.)**	**9 Points Max**
(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 elements or components of the building.	**10 Points Max**

(1)	one type of material	**2**
(2)	for each additional material	**2**

610
LIFE CYCLE ANALYSIS

610.1 Life cycle analysis. A life cycle analysis (LCA) tool is used to select environmentally preferable products or assemblies, or an LCA is conducted on the entire building. Points are awarded in accordance with 6010.1.1, 610.1.2(1), or 610.1.2(2). Only one method of analysis may be utilized. A reference service life for the building is to be 60 years for any life cycle analysis tool. Results of the LCA are reported in the manual required in Section 1003.1(1) of this standard in terms of the environmental impacts listed in this practice and it states if operating energy was included in its preparation.	**15 Points Max**
610.1.1 Whole-building life cycle analysis. A whole-building LCA is performed using a life cycle assessment and data compliant with ISO 14044 or other recognized standards.	**15**
610.1.2 Life cycle analysis 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 Points Max**
(1) Two products with the same intended use are compared based on LCA and the product with a 15% improvement in fossil fuel consumption and global warming potential is used. **(Points awarded per product/system comparison.)**	**2** **10 Points Max**
(2) An assembly is selected for the project that has environmental impact measures that are better than a functionally comparable assembly. 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 assemblies considered include all structural elements, insulation, and wall coverings: **(a)** exterior walls **(b)** roof/ceiling **(c)** interior walls or ceilings **(d)** intermediate floors **Exception:** Electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators, and conveying systems are not included in the assessment. The environmental impact measures to be considered are chosen from the following: **(a)** Fossil fuel consumption **(b)** Global warming potential **(c)** Acidification potential **(d)** Eutrophication potential **(e)** Ozone depletion potential **(f)** Human health respiratory effects potential from particulates **(Points are awarded based on the number of assemblies that improve upon environmental impact measures by 15%.)** **Table 610.1.2(2)**	**Points per Table 610.1.2(2)** **10 Points Max**

Assembly LCA

	4 Measures	6 Measures
	POINTS	
2 Assemblies	**3**	**6**
3 Assemblies	**4**	**8**
4 Assemblies	**5**	**10**

611INNOVATIVE 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. **(1 point awarded per percent.)**	**10 points Max**

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. Certification third-party agency is ISO Guide 65 accredited.		**4 Points Max**
(1)	50% or more of carpet installed (by square feet) is third-party certified to NSF/ANSI 140.	**1**
(2)	50% or more of resilient flooring installed (by square feet) is third-party certified to NSF/ANSI 332.	**1**
(3)	50% or more of the insulation installed (by square feet) is third-party certified to EcoLogo CCD-016.	**1**
(4)	50% or more of interior wall coverings installed (by square feet) is third-party certified to NSF/ANSI 342	**1**

611.3 Universal Design Elements. Dwelling incorporates one or more of the following universal design elements.		**10 Points Max**
(1)	Any no-step entrance into the dwelling which 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, whose pitch does not exceed 1 in 12 and which 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 commode and bathing fixture, if applicable.	**1**
	Note: *Reasonable construction tolerances are allowed.*	

611.4 Food waste disposers. A minimum of one food waste disposer is installed at the	**1**

primary kitchen sink.	

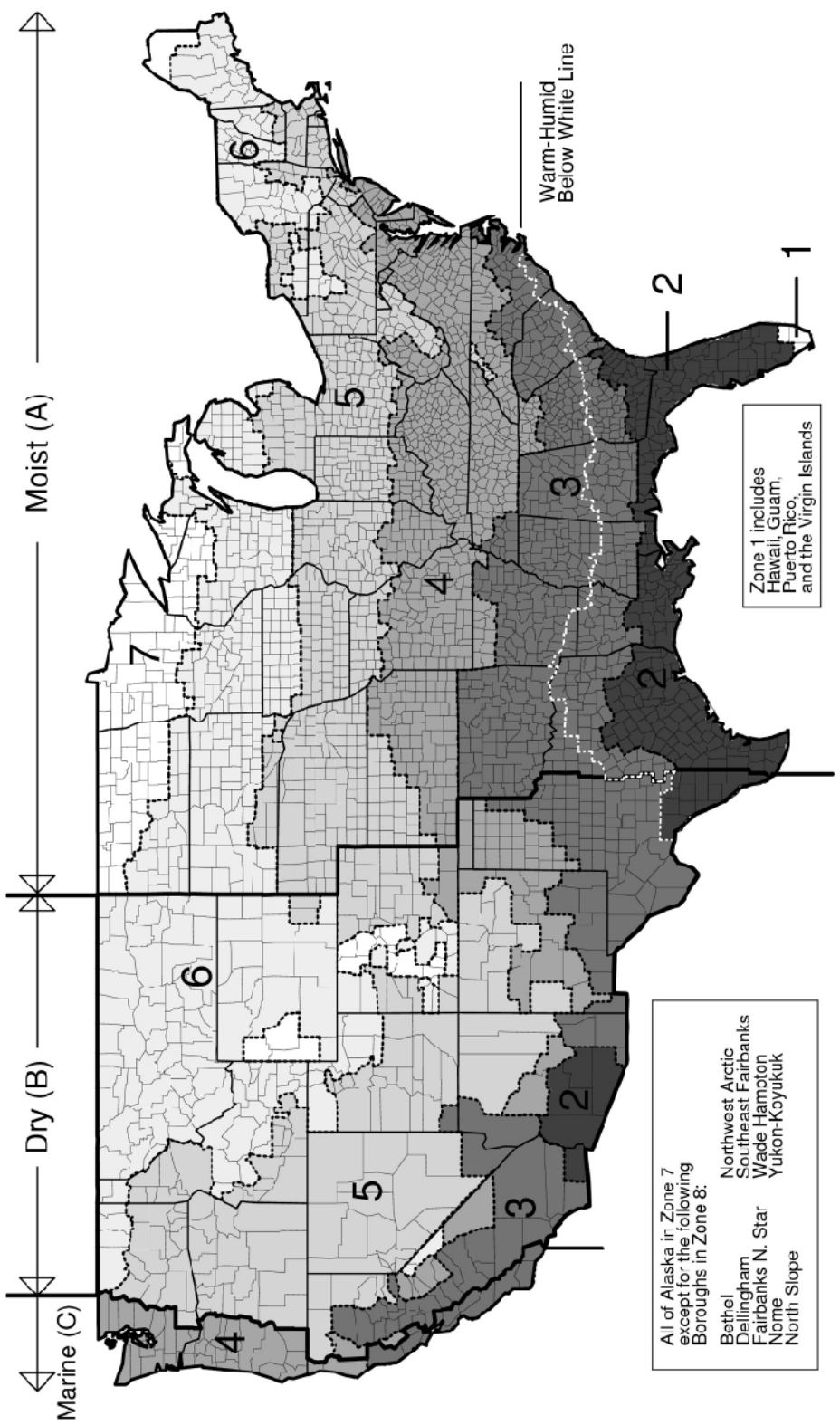


FIGURE 6(1)
CLIMATE ZONES

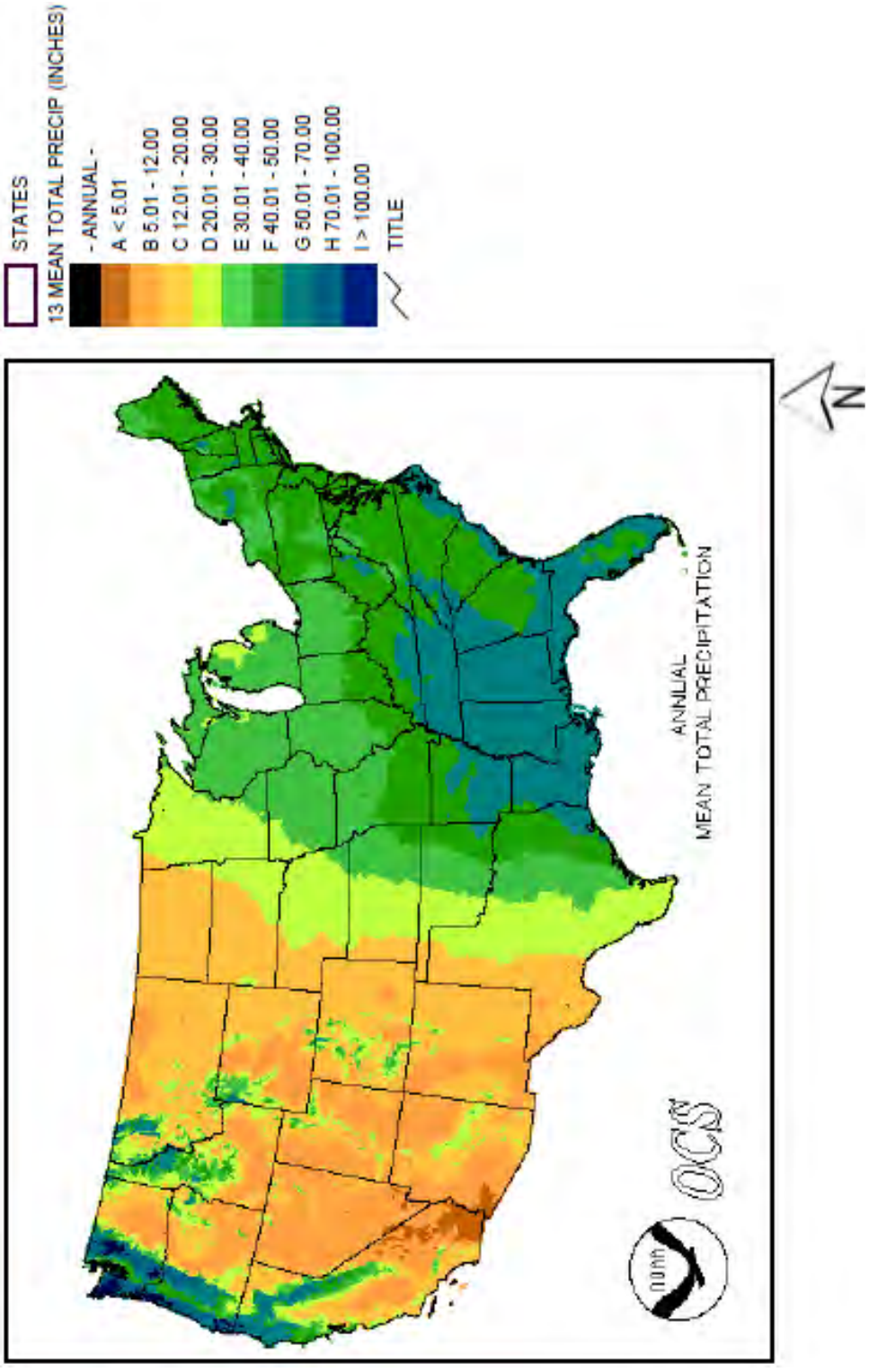


FIGURE 6(2)
ANNUAL MEAN TOTAL PRECIPITATION
(inches) (Source: http://cdo.ncdc.noaa.gov/climaps/prec0113.pdf)

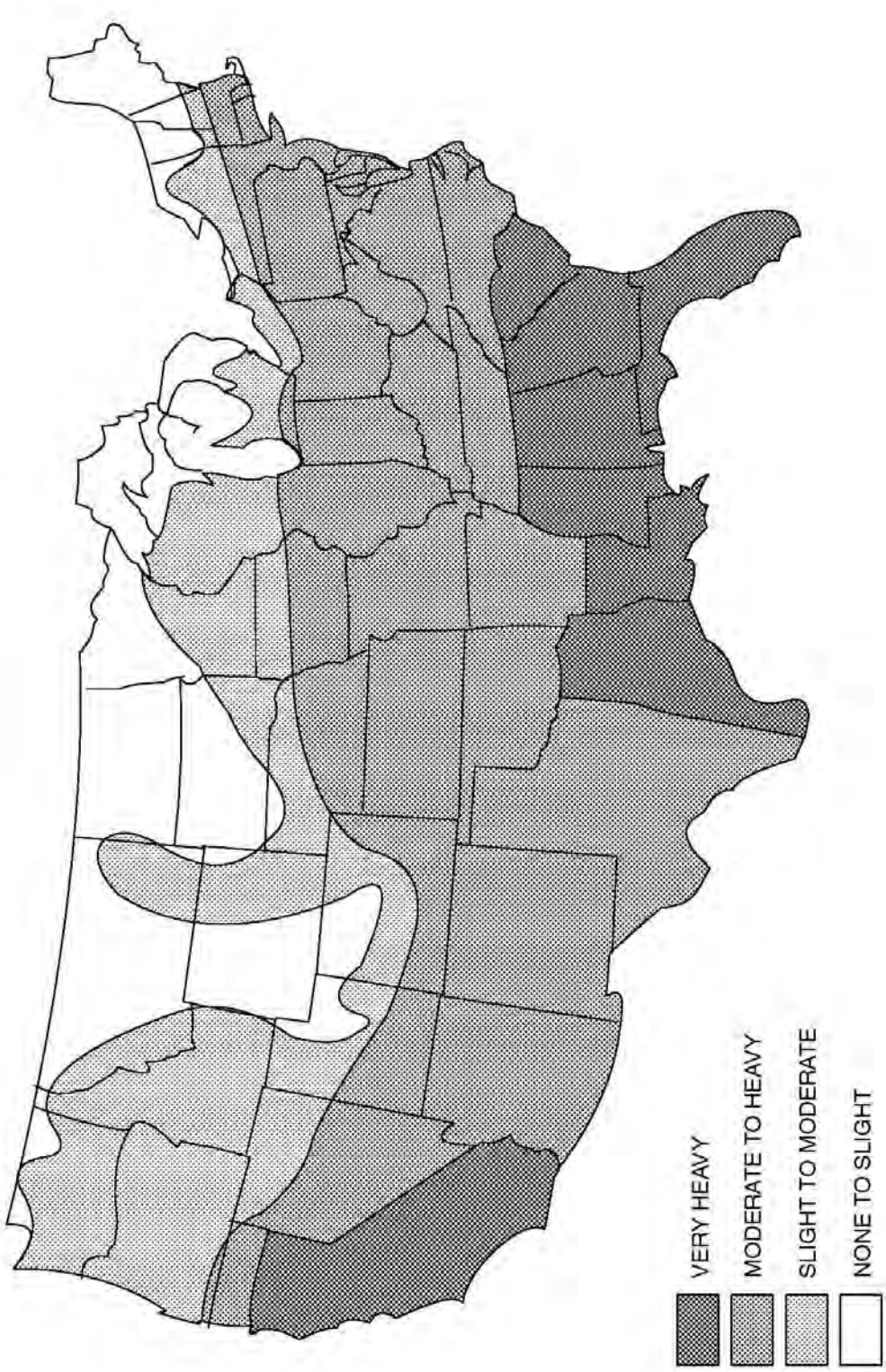


FIGURE 6(3)
TERMITE INFESTATION PROBABILITY MAP

CHAPTER 7

ENERGY EFFICIENCY

GREEN BUILDING PRACTICES	POINTS
701 **MINIMUM ENERGY EFFICIENCY REQUIREMENTS**	
701.1 Mandatory requirements. The building shall comply with either Section 702 (Performance Path) or Section 703 (Prescriptive Path). Items listed as "mandatory" in Section 701.4 apply to both the Performance and Prescriptive Paths.	
701.1.1 Minimum Performance Path requirements. A building complying with Section 702 shall exceed the baseline minimum performance required by the ICC IECC by 15 percent, and shall include a minimum of two practices from Section 704. **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 704. **701.1.3 Alternative bronze level compliance.** As an alternative, any building that qualifies as an ENERGY STAR Version 3.0 Qualified Home or demonstrates compliance with the 2012 IECC or Chapter 11 of the 2012 IRC achieves the bronze level for Chapter 7. **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.	
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 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**
701.4.2 Duct systems.	
701.4.2.1 Duct air sealing. Ducts 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.	**Mandatory**
701.4.2.2 Supply ducts. Building cavities are not used as supply ducts.	**Mandatory**
701.4.2.3 Duct system sizing. Duct system is sized and designed in accordance with	**Mandatory**

ACCA Manual D or equivalent.

701.4.3 Insulation and air sealing.

701.4.3.1 Building Thermal Envelope. 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.

701.4.3.2 Air sealing and insulation. The compliance of the building envelope air tightness and insulation installation is demonstrated in accordance with Section 701.4.3.2(1) or 701.4.3.2(2). **Mandatory**

(1) Testing option. Building envelope tightness and insulation installation is considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 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. During testing:

(a) Exterior windows and doors, fireplace and stove doors are closed, but not sealed;
(b) Dampers are closed, but not sealed, including exhaust, intake, makeup 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 are not sealed; and
(g) Supply and return registers are not sealed.

(2) Visual inspection option. Building envelope tightness and insulation installation are considered acceptable when the items listed in Table 701.4.3.2(2) applicable to the method of construction, are field verified.

Table 701.4.3.2(2)
Air Barrier and Insulation Inspection Component Criteria

COMPONENT	CRITERIA
Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.

	Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material. Air-permeable insulation is inside of an air barrier.
Ceiling/attic	Air barrier in any dropped ceiling/soffit is substantially aligned with insulation and anygaps are sealed. Attic access (except unvented attic), knee wall door, or drop down stair is sealed.
Walls	Corners and headers are insulated. Junction of foundation and sill plate is sealed.
Windows and doors	Space between window/door jambs and framing is sealed.
Rim joists	Rim joists are insulated and include an air barrier.
Floors (including above-garage and cantilevered floors)	Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of insulation.
Crawl space walls	Insulation is permanently attached to walls. Exposed earth in unvented crawl spaces is covered with Class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation.
Garage separation	Air sealing is provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures are air tight, IC rated, and sealed to drywall. Exception—fixtures in conditioned space.
Plumbing and wiring	Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.
Shower/tub on exterior wall	Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.
Electrical/phone box on exterior walls	Air barrier extends behind boxes or air sealed-type boxes are installed.
Common wall	Air barrier is installed in common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
Fireplace	Fireplace walls include an air barrier.

701.4.3.3 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/m2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/ m2), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer.	**Mandatory**
Exception: Site built windows, skylights and doors.	
701.4.3.4 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 E 283 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 wall or ceiling covering.	**Mandatory**
701.4.4 High-efficacy lighting. A minimum of 50 percent of the total hard-wired lighting fixtures, or the bulbs in those fixtures, qualify as high efficacy or equivalent.	**Mandatory**
701.4.5 Boiler supply piping. Boiler supply piping is insulated in unconditioned spaces.	**Mandatory**

GREEN BUILDING PRACTICES	POINTS

702 PERFORMANCE PATH

702.1 Point allocation. Points from Section 702 (Performance Path) shall not be combined with points from Section 703 (Prescriptive Path).	**Mandatory**

702.2 Energy cost performance levels.	
702.2.1 ICC IECC analysis. Energy efficiency features are implemented to achieve energy cost performance that meets the ICC IECC. A documented analysis using software in accordance with ICC IECC, Section 405, or ICC IECC Section 506.2 through 506.5, applied as defined in the ICC IECC, is required.	**TBD**
702.2.2 Energy cost performance analysis. 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.	
(1) 15 percent	**30**
(2) 30 percent	**60**
(3) 50 percent	**100**
(4) 60 percent	**120**

703 PRESCRIPTIVE PATH

703.1 Building envelope

703.1.1 UA improvement. The total building thermal envelope UA is in accordance with Table 703.1.2 and is less than or equal to the total UA resulting from the U-factors provided in Table 703.1.1. Where insulation is used to achieve the UA improvements, a third-party grading of the installation as achieving Grade 1 is required. Total UA is documented using RESCheck or equivalent report and supplied to verify the baseline and the UA improvement. **Points per Table 703.1.1**

Table 703.1.1
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	Crawl Space Wall U-Factor[c]
1	1.2	0.75	0.035	0.082	0.197	0.064	0.36	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.36	0.477
3	0.5	0.65	0.035	0.082	0.141	0.047	0.91	0.136
4 except Marine	0.35	0.6	0.03	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.6	0.03	0.057	0.082	0.033	0.059	0.065
6	0.35	0.6	0.026	0.057	0.06	0.033	0.05	0.065
7 and 9	0.35	0.6	0.026	0.057	0.057	0.028	0.05	0.065

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.
b. When 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 703.1.2
Improvement in Total Building Thermal Envelope UA

Minimum UA Improvement		Climate Zone				
	1	2	3	4	5-6	7-8
		Points				
0 to < 5%	0	0	0	0	0	0
5% to <10%	0	5	6	7	8	9
10% to <15%	0	10	12	14	16	18
15% to <20%	0	15	18	21	24	27
≥20%	0	20	24	28	32	36

703.1.2 Insulation installation. The insulation installation is graded by a third party and is in accordance with Sections 703.1.2.1, 703.1.2.2, and/or 703.1.2.3 as applicable. Grade 3 insulation installation is not permitted. Grade 2 installation is permitted only for bronze level buildings.

(Points not awarded in this section if already awarded under Section 703.1.1.)

Points per Table 703.1.2

Table 703.1.2
Insulation Installation Grades

Grade	POINTS
1	**15**
2	**10**

703.1.2.1 Both Grade 1 and Grade 2 installations are in accordance with the following:

(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.

703.1.2.2 Grade 1 installation is in accordance with the following:

(1) 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).

(2) 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.

(3) Exterior rigid insulation has substantial contact with the structural framing members or sheathing materials and is tightly fitted at joints.

(4) Cavity insulation is split, installed, and/or fitted tightly around wiring and other services.

(5) Exterior sheathing is not visible from the interior through gaps in the cavity insulation.

(6) 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.

(7) Where properly installed, ICFs, SIPs, and other wall systems that provide integral insulation are deemed in compliance with the Grade 1 insulation installation requirements.

(8) Grade 1 insulation meets or exceeds all requirements for Grade 2 insulation.

703.1.2.3 Grade 2 installation is in accordance with the following:

(1) A maximum of 2 percent of the surface area of insulation is missing. Compression or incomplete fill amounts to 10 percent or less, presuming the compressed or incomplete areas are a minimum of 70 percent of the intended fill thickness.

(2) In unconditioned basements or crawlspaces insulation is installed in substantial contact with the subfloor surfaces.
- **(a)** floor insulation over vented or ambient conditions is enclosed on six sides.
- **(b)** floor insulation over unconditioned basements is not required to be enclosed on six sides.

(3) Ceiling insulation is not required to be enclosed when the insulation is installed in substantial contact with the drywall or plywood surfaces it is intended to insulate.

(4) Eave baffles or equivalent construction is installed to prevent wind intrusion.

(5) Installation with occasional installation defects is permitted: gaps around wiring, electrical outlets, plumbing and other intrusions; rounded edges or shoulders.

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

Points per Table 703.1.3

Table 703.1.3
Exterior Mass Walls

	Mass Construction	
	≥3 in. to <6 in.	≥6 in.
	POINTS	
Climate Zones 1, 2, 3, 4 except marine, and 5 dry.	**4**	**6**
Climate Zones 4 marine, 5 except dry, and 6.	**3**	**5**
Climate Zones 7 and 8	**0**	**0**

For SI: 1 inch = 25.4 mm

GREEN BUILDING PRACTICES	POINTS

703.1.4 A radiant barrier with an emittance of 0.05 or less is used. The product is tested in accordance with ASTM C-1371-98 or ASTM E408-71 (2002) and is installed in accordance with the manufacturer's installation specifications.

Points per Table 703.1.4

Table 703.1.4
Radiant Barriers

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

703.1.5 Building envelope leakage. The maximum leakage rate is in accordance with the following:

(a) 5 ACH50	**3**
(b) 4 ACH50	**6**
(c) 3 ACH50	**9**
(d) 2 ACH50	**12**
(e) 1 ACH50	**15**

703.1.6 Fenestration

703.1.6.1 NFRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with Table 703.1.6.1. 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

Table 703.1.6.1
Fenestration Specifications

Climate Zones	U-Factor	SHGC
	Windows and Exterior Doors (maximum certified ratings)	
1	0.65	0.30
2	0.65	0.30
3	0.40	0.30
4 to 8	0.35	Any
	Skylights and TDDs (maximum certified ratings)	
1 and 2	0.75	0.30
3	0.65	0.30
4 to 8	0.60	Any

703.1.6.2 The NFRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with Table 703.1.6.2(a) or (b). 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.

Points per Table 703.1.6.2(a) or Table 703.1.6.2(b)

Table 703.1.6.2(a)
Enhanced Fenestration Specifications

Climate	U-Factor	SHGC	POINTS

Zones	Windows and Exterior Doors (maximum certified ratings)		
1 and 2	0.60	0.27	**TBD**
3	0.35	0.30	**TBD**
4	0.32	0.40	**TBD**
5 to 8	0.30	Any	**TBD**
	Skylights and TDDs (maximum certified ratings)		
1 and 2	0.70	0.30	**TBD**
3	0.57	0.30	**TBD**
4	0.55	0.40	**TBD**
5 to 8	0.55	Any	**TBD**

For Climate Zones 5-8 an equivalent energy performance is permitted based on either (1) windows with a U-factor = 0.31 and an SHGC ≥ 0.35, or, a U-factor = 0.32 and an SHGC ≥ 0.40 or (2) windows meeting the ENERGY STAR Equivalent Energy Performance requirements.

Table 703.1.6.2(b)
Enhanced Fenestration Specifications

Climate Zones	U-Factor	SHGC	**Points**
	Windows and Exterior Doors (maximum certified ratings)		
1 and 2	0.40	0.25	**TBD**
3	0.30	0.25	**TBD**
4	0.28	0.40	**TBD**
4	0.25	0.40	**TBD**
5 to 8	0.25	Any	**TBD**
5 to 8	0.22	Any	**TBD**
	Skylights and TDDs (maximum certified ratings)		
1 & 2	0.50	0.30	**TBD**
3	0.50	0.35	**TBD**
4	0.50	0.40	**TBD**
5 to 8	0.50	Any	**TBD**

703.2 HVAC equipment efficiency

703.2.1 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 combined annual efficiency of 0.80. **4**

703.2.2 Furnace and/or boiler efficiency is in accordance with one of the following:
(Where multiple systems are used, points awarded based on the system with the lowest efficiency.)

(1) Gas and propane heaters: **Points per Table 703.2.2(1)**

Table 703.2.2(1)
Gas and Propane Heaters

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

(2) Oil furnace:

Points per Table 703.2.2(2)

Table 703.2.2(2)
Oil Furnace

	Climate Zone					
	1	2	3	4	5	6-8
	POINTS					
≥ 83% AFUE	**0**	**1**	**3**	**3**	**7**	**7**
≥ 90% AFUE	**0**	**2**	**5**	**8**	**11**	**14**

(3) Gas boiler:

Points per Table 703.2.2(3)

Table 703.2.2(3)
Gas Boiler

	Climate Zone					
	1	2	3	4	5	6-8
	POINTS					
≥ 85% AFUE	**0**	**1**	**3**	**4**	**6**	**7**
≥ 90% AFUE	**0**	**2**	**5**	**8**	**11**	**14**
≥ 94% AFUE	**0**	**3**	**7**	**10**	**14**	**17**

(4) Oil boiler:

Points per Table 703.2.2(4)

Table 703.2.2(4)
Oil Boiler

	Climate Zone					
	1	2	3	4	5	6-8
	POINTS					
≥ 85% AFUE	**0**	**1**	**3**	**4**	**6**	**7**
≥ 90% AFUE	**0**	**2**	**5**	**8**	**11**	**14**

703.2.3 Boiler is equipped with temperature reset control or burner delay control. **1**

703.2.4 Heat pump heating efficiency is in accordance with Table 703.2.4. Refrigerant charge is verified for compliance with manufacturer's instructions. **Points per Table 703.2.4**

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

Table 703.2.4
Heat Pump Heating

	Climate Zone					
	1	2	3	4	5	6-8
	POINTS					
8.2 HSPF (11.5 EER)	**0**	**1**	**2**	**5**	**7***	**7***
9.0 HSPF (12.5 EER)	**0**	**2**	**5**	**10**	**11***	**12***

***** Zones 5-8 require consideration for use of resistance heat in cold climates when installing a heat pump.

703.2.5 Cooling efficiency is in accordance with one of the following. Refrigerant charge is verified for compliance with manufacturer's instructions.

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

(1) Air conditioner and heat pump cooling:

Points per Table 703.2.5(1)

Table 703.2.5(1)
Air Conditioner and Heat Pump Cooling

	Climate Zone					
	1	2	3	4	5	6-8
	POINTS					
≥ 14 SEER (11.5 EER)	**8**	**6**	**2**	**2**	**1**	**1**
≥ 15 SEER (12.5 EER)	**12**	**10**	**4**	**3**	**2**	**2**
≥ 17 SEER (12.5 EER)	**18**	**14**	**6**	**4**	**3**	**3**
≥ 19+ SEER (12.5 EER)	**24**	**18**	**8**	**4**	**3**	**3**

(2) Water source and cooled air conditioners**:**

Points per Table 703.2.5(2)

Table 703.2.5(2)
Water Source and Cooled Air Conditioners

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

703.2.6 Ground source heat pump is installed by a Certified Geothermal Service Contractor in accordance with one of the following ENERGY STAR levels:
(Where multiple systems are used, points awarded based on the system with the lowest efficiency.)

(1) Open loop: ≥ 16.2 EER / ≥ 3.6 COP	**20**
(2) Closed loop: ≥ 14.1 EER / ≥ 3.3 COP	**20**
(3) Direct expansion: ≥ 15.0 EER / ≥ 3.5 COP	**20**
(4) Any type (open, closed, direct expansion): ≥ 24 EER / ≥ 4.3 COP	**30**
(5) Any type (open, closed, direct expansion): ≥ 28 EER / ≥ 4.8 COP	**35**
703.2.7 ENERGY STAR, or equivalent, ceiling fan(s) are installed. **(Points awarded per building.)**	**1**
703.2.8 Whole building or whole dwelling unit fan(s) with insulated louvers and a sealed enclosure is installed. **(Points awarded per building.)**	**2**
703.2.9 In multi-unit buildings, an advanced electric and fossil fuel submetering system is installed to monitor electricity and fossil fuel consumption for each unit. At a minimum, the information is available to the occupants on a monthly basis.	
(1) Install a device providing monthly consumption information.	**1**

(2) Install a device that can provide near real-time energy consumption information.	**4**
703.2.10 An ENERGY STAR, or equivalent, programmable thermostat is installed to control each heating and cooling zone. **(Points awarded per dwelling unit.)**	**1**

703.3 Duct Systems	
703.3.1 All space heating is provided by a system(s) that does not include air ducts.	**15**
703.3.2 All space cooling is provided by a system(s) that does not include air ducts.	**15**
703.3.3 Ductwork is in accordance with all of the following:	**12**
(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.	
703.3.4 Duct Leakage. The entire central HVAC duct system, including air handlers and register boots, is tested by a third party for leakage at a pressure differential of 0.1 inches w.g. (25 Pa). The maximum leakage as a percent of the system design flow rate is in accordance with the following:	
(1) 6 percent for ductwork entirely outside the building's thermal envelope	**15**
(2) 6 percent for ductwork entirely inside the building's thermal envelope	**5**
(3) 6 percent for ductwork both inside and outside the building's thermal envelope	**15**

703.4 Water heating design, equipment, and installation	
703.4.1 Water heater Energy Factor (EF) is equal to or greater than the following: **(Where multiple systems are used, points awarded based on the system with the lowest efficiency.)**	
(1) Gas water heating	**Points per Table 703.4.1(1)(a) or Table 703.4.1(1)(b)**

Table 703.4.1(1)(a)
Gas Water Heating
(Storage with input rate of 75,000 Btu/h or less or instantaneous input rate of 200,000 Btu/h or less)

Size (gallons)	Energy Factor	POINTS
30 to < 40	0.64	**1**
40 to < 50	0.62	**1**
50 to < 65	0.60	**1**
65 to < 75	0.58	**1**
≥75	0.56	**1**
Any	0.80	**10**

For SI: 1 gallon = 3.785 L

Table 703.4.1(1)(b)
Gas Water Heating
(Storage with input rate of greater than 75,000 Btu/h or instantaneous input rate greater than 200,000 Btu/h)

Size (gallons)	Thermal Efficiency	POINTS
Any	82-86%	**1**
Any	> 86%	**10**

(2) Electric water heating

Points per Table 703.4.1(2)

Table 703.4.1(2)
Electric Water Heating

Size (gallons)	Energy Factor	POINTS
30 to < 40	0.95	**1**
40 to < 50	0.94	**1**
50 to < 65	0.92	**1**
65 to < 80	0.90	**1**
80 to < 100	0.88	**1**
≥100	0.86	**1**

For SI: 1 gallon = 3.785 L

(3) Oil water heating

Points per Table 703.4.1(3)

Table 703.4.1(3)
Oil Water Heating

Size (gallons)	Energy Factor	POINTS
30 to < 50	0.59	**1**
≥50	0.55	**1**

For SI: 1 gallon = 3.785 L

(4) Heat pump water heating

Points per Table 703.4.1(4)

Table 703.4.1(4)
Heat Pump Water Heating

	Energy Factor	POINTS
Heat Pump	1.5	**7**
Heat Pump	2.0	**10**

703.4.2 Desuperheater is installed by a qualified installer or is pre-installed in the factory.

Points per Table 703.4.2

Table 703.4.2
Desuperheater

	Climate Zone	
	Zone 1-4	**Zone 5-8**
	POINTS	
Desuperheater	**5**	**2**

703.4.3 Drain-water heat recovery system is installed in multi-family units. **(Points awarded per building.)**

2

703.4.4 Indirect-fired water heater storage tanks heated from boiler systems are installed.	**1**
703.4.5 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.	**Points per Table 703.4.5**

Table 703.4.5
Solar Hot Water Systems

SEF - Electric Tank	SEF - Gas Tank	POINTS
1.30 - 1.50	0.85 - 1.00	**8**
1.51 - 1.80	1.01 - 1.20	**11**
1.81 - 2.30	1.21 - 1.50	**14**
2.31 - 3.00	1.51 - 2.00	**17**
≥ 3.01	≥ 2.01	**20**

703.5 Lighting and appliances	
703.5.1 Hard-wired lighting. Hard-wired lighting is in accordance with one of the following:	
(1) A minimum of 50 percent of the total hard-wired lighting fixtures qualify as ENERGY STAR or equivalent.	**8**
(2) A minimum of 80 percent of the exterior lighting wattage has an efficiency of 40 lumens per watt minimum or be a solar-powered light fixture.	**TBD**
703.5.2 Recessed lighting fixtures. The number of recessed light fixtures that penetrate the thermal envelope are less than 1 per 400 square feet (37.16 m^2) of total conditioned floor area and are in accordance with Section 701.4.3.4.	**2**
703.5.3 Appliances. ENERGY STAR or equivalent appliance(s) are installed:	
(1) Refrigerator	**5**
(2) Dishwasher	**2**
(3) washing machine	**4**
703.5.4 Induction cooktop. Induction cooktop is installed.	**1**

703.6 Passive solar design	
703.6.1 Sun-tempered design. Building orientation, sizing of glazing, and design of overhangs are in accordance with all of the following:	**5**
(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 703.6.1(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.

(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 703.6.1(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 704.3.

703.6.2 Window shading. Automated solar protection is installed to provide shading for windows. **1**

703.6.3 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)

(2) Overhangs are installed to provide shading on south-facing glazing in accordance with Section 703.6.1(7).

(Points not awarded if points are taken under Section 703.6.1.) **(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 that are fully adhered to a masonry base or other masonry material and is 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.	
703.6.4 Passive solar heating design. In addition to the sun-tempered design features in Section 703.6.1, all of the following are implemented:	**4**
(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 703.6.1. **(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 703.6.4 (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 703.6.1(9), provisions for forced airflow to adjoining areas are implemented as needed.	

704
ADDITIONAL PRACTICES

704.1 Application of additional practice points. Points from Section 704 can be added to	

points earned in Section 702 (Performance Path), Section 703 (Prescriptive Path), or Section 701.1.3 (alternative bronze level compliance).	

704.2 Lighting	
704.2.1 Occupancy sensors. Occupancy sensors are installed on indoor lights, and photo or motion sensors are installed on outdoor lights to control lighting.	
(1) 25 percent of lighting	**2**
(2) 50 percent of lighting	**4**
704.2.2 TDDs and skylights. Tubular daylighting device (TDD) or a skylight with sealed, insulated, low-E glass is installed in rooms without windows. **(Points awarded per building.)**	**2**
704.2.3 Lighting outlets. Occupancy sensors are installed for a minimum of 80 percent of hard-wired lighting outlets.	**1**

704.3 Return ducts and transfer grills. Return ducts or transfer grilles are installed in every room with a door. This practice does not apply to bathrooms, kitchens, closets, pantries, and laundry rooms.	**5**
704.4 HVAC design and installation	
704.4.1 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 manufacturers' training program).	**1**
704.4.2 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.	
704.4.4 Manufacturer's label or printed specifications for sealed air handler (except furnaces) indicates the leakage is less than or equal to 2 percent of design airflow at a pressure of 1-inch w.g. (1250 Pa). Air handlers are tested with inlets, outlets, and condensate drain ports sealed, and filter box in place.	**4**

704.5 Installation and performance verification.	
704.5.1 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 being covered, and another inspection upon completion of	**5**

the project. 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.

(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 703.1.2.

(4) Windows, skylights, and doors are flashed, caulked, and sealed in accordance with manufacturer's recommendations and in accordance with Section 701.4.3.

704.5.2 Testing. Testing above mandatory requirements is conducted to verify performance.

704.5.2.1 Building envelope leakage testing.

(1) Both a blower door test and visual inspection are performed as described in 701.4.3.2. **5**

(2) Third-party verification is completed. **5**

704.5.2.2 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: **8**

(1) Measured flow at each supply and return register is within 25 percent of design flow.
(2) Total airflow is within 10 percent of design flow.

704.5.3 Insulating hot water pipes. Insulation with a minimum thermal resistance (R-value) of at least R-3 is applied to the following: **1**

(a) piping larger than 3/4 in. outside diameter
(b) piping serving more than one dwelling unit
(c) piping branches serving kitchen sinks
(d) piping located outside the conditioned space
(e) piping from the water heater to a distribution manifold
(f) piping located under a floor slab
(g) buried piping
(h) piping in recirculation systems other than demand recirculation systems
(i) all other piping except the piping that meets the length requirements of Table 704.5.3

Table 704.5.3
Maximum Pipe Run Length

Nominal Pipe Diameter of largest pipe in run (inches)	Maximum pipe length (feet)[1]
3/8	30
1/2	20
3/4	10

1. Total length of all piping from the distribution manifold or the recirculation loop to a point of use.

705 INNOVATIVE PRACTICES

705.1 Energy consumption control. A whole building or whole dwelling unit device is installed that controls or monitors energy consumption.	**7 Points Max**
(1) programmable communicating thermostat	**2**
(2) Energy-monitoring device	**4**
(3) energy management control system	**7**

705.2 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.	**2**
(2) The buyer of the building selects a renewable energy service plan provided by the utility prior to occupancy of the building with a minimum two year commitment.	**5**

705.3 Smart Appliances and Systems. Smart Appliances and Systems are installed as follows:	
(1) Refrigerator	**TBD**
(2) Freezer	**TBD**
(3) Dishwasher	**TBD**
(4) Clothes Dryer	**TBD**
(5) Clothes Washer	**TBD**
(6) Room Air Conditioner	**TBD**
(7) HVAC Systems	**TBD**
(8) Service Hot Water Heating Systems	**TBD**

705.4 Pumps.	
705.4.1 Pool, spa, and water features equipped with filtration pumps as follows:	
(1) Two-speed pump(s) is installed.	**1**
(2) Electronically controlled variable-speed pump(s) is installed (efficiencies 90% or greater).	**3**
705.4.2 Sump pump(s) with electrically commutated motors (ECMs) or permanent split capacitor (PSC) motors is installed (efficiencies 90% or greater).	**1**

705.5 Additional renewable energy options	
705.5.1 Photovoltaic panels are installed on the property.	**1**

(Points awarded per 100 W of system rating per 2,000 square feet of total conditioned floor area of the building.)	
705.5.2 Other on-site renewable energy source is installed (e.g., wind energy, on-site micro-hydro power, active solar space heating systems solar thermal hydronic heating system, photovoltaic hybrid heating system). **(Points awarded per 100 W of system rating per 2,000 square feet of total conditioned floor area of the building.)**	**One-half**

705.6 Parking garage efficiency. Structured parking garages are designed to require no mechanical ventilation for fresh air requirements.	**2**

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 **801.1.1** Indoor hot water usage is reduced by one of the following practices: **(Points awarded only for one of the items.)**	
(1) All hot water piping that runs to the plumbing fixtures in all kitchens and bathrooms is 40 feet (12,192 mm) or less in length from the water heater or multi-unit building's recirculating loop and is sized in accordance with the code for the specified application.	**2**
(2) All hot water piping that runs to the plumbing fixtures in all kitchens and bathrooms is 30 feet (9144 mm) or less from the water heater or multi-unit building's recirculating loop and is sized in accordance with the code for the specified application.	**3**
(3) One of the following piping system designs is implemented:	
(a) use of structured-type plumbing with demand-controlled hot water loops, in which the volume of water contained in the pipe and fixture fittings downstream of the recirculating trunk line is a maximum of 4 cups (0.95 liters) (57.75 cubic inches) (0.25 gallons), or	**6**
(b) engineered parallel piping system (i.e., manifold system) in which the hot water line distance from the water heater to the parallel piping system is less than 15 feet (4570 mm) and the parallel piping to any fixture fittings contains a maximum of 8 cups (1.89 liters) (115.50 cubic inches) (0.50 gallons), or	**6**
(c) central core plumbing system with all plumbing fixture fittings (e.g., faucets, showerheads) located such that the volume of water contained in each pipe run between the water heater and any fixture fitting is a maximum of 6 cups (1.42 liters) (86.63 cubic inches) (0.38 gallons).	**8**
(d) central hot water recirculation system in multi-unit 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 (9144 mm) and the parallel piping to the fixture fittings contains a maximum of 8 cups (1.89 liters) (115.50 cubic inches) (0.50 gallons).	**TBD**
(4) Pipe runs exceeding 40 feet (12,192 mm) from the water heater to fixture locations are aided by one of the following: **(a)** tankless water heater is installed at point of use and is served only by cold water or a solar-assisted system. **(b)** on-demand hot water recirculation system is installed with a water temperature sensor pump switch.	**1**

801.2 Water-conserving appliances. ENERGY STAR or equivalent water-conserving appliances are installed.	
(1) dishwasher	**2**
(2) washing machine, or	**8**
(3) washing machine with a water factor of 6.0 or less	**12**
Multi-Unit Building Note*: Washing machines are installed in individual units or provided in common areas of multi-unit buildings.*	
801.4 Showerheads. Showerheads are in accordance with the following:	
(1) The 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.)**	**1 3 Points Max**
(2) All showerheads meet the requirements of 801.4(1).	
(Points awarded per shower compartment based on 801.4(2)(a) or 801.4(2)(b).)	
(a) 2.0 to less than 2.5 gpm	**1 Additional Point**
(b) 1.6 to less than 2.0 gpm	**2 Additional Points**
(3) Any control that can shut off water flow without affecting temperature is installed. **(Points awarded per shutoff.)**	**1 3 Points Max**
For SI: 1 gallon per minute = 3.785 L/m	

801.5 Faucets	
801.5.1 Water-efficient lavatory faucets with 1.5 gpm (5.68 L/m) or less maximum flow rate when 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.)**	**1 3 Points Max**
(2) all lavatory faucets in the dwelling unit and common areas	**2 Additional Points**
801.5.2 Self-closing valve, motion sensor, metering, or pedal-activated faucet is installed to enable intermittent on/off operation. **(Points awarded per fixture.)**	**1 3 Points Max**

GREEN BUILDING PRACTICES	POINTS
801.6 Water closets and urinals. Water closets and urinals are in accordance with the following:	
(1) Gold and emerald levels: All water closets and urinals are in accordance with Section 801.6.	**Mandatory**
(2) A water closet is installed with an effective flush volume of 1.28 gallons (4.85 L) or less when tested in accordance with ASME A112.19.2 (all water closets) or when tested in accordance with ASME A112.19.14 (all dual flush water closets), and is in accordance with EPA WaterSense *Tank-Type High-Efficiency Toilet*, or **(Points awarded per fixture.)**	**6 18 Points Max**
(3) All water closets are in accordance with Section 801.6(2).	**24 Points**
(a) Dual flush (or other) water closets are used that have a flush volume of 1.2 gallons or less and comply with 801.6(2); and all other water closets comply with 801.6(2). **(Points awarded per toilet)**	**2 Additional Points 4 Additional Points Max**
(b) One or more urinals are installed with a flush volume of 0.5 gallons (1.9L) or less when tested in accordance with ASME A112.19.2 and all other water closets comply with 801.6(2).	**2 Additional Points**
(c) One or more composting or waterless toilets and/or urinals are installed and all other water closets comply with 801.6(2).	**8 Additional Points**

801.7 Irrigation systems	
801.7.1 High-Distribution Uniformity (DU) rotating spray heads are installed in lieu of spray heads for turf or landscaping.	**6**
801.7.2 Drip Irrigation installed for each landscape type.	**8**
801.7.3 Landscape Plan & Implementation are executed by a certified WaterSense Professional or equivalent as approved by adopting entity.	**5 Additional Points**
801.7.4 Drip Irrigation Zones Implemented show plant type by name and water use or need for each emitter.	**5 Additional Points**
801.7.5 The irrigation system(s) is controlled by a smart controller. **(Points for 801.7.4(3) are not addittive with points for 801.7.4(a) or 801.7.4(b).)**	
(1) Evapotranspiration (ET) based irrigation controller with a rain sensor.	**4**
(2) Soil moisture sensor based irrigation controller.	**4**
(3) No irrigation is installed and a landscape plan is developed in accordance with Section 503.5, as applicable.	**15**

801.8 Rainwater collection and distribution. Rainwater collection and distribution is provided.	
801.8.1 Rainwater is used for irrigation in accordance with the following:	

GREEN BUILDING PRACTICES	POINTS
(1) Rainwater is diverted for landscape irrigation without impermeable water storage, or	**5**
(2) Rainwater is diverted for landscape irrigation with impermeable water storage.	
(a) 50 - 499 gallon storage capacity, or	**5**
(b) 500 - 2499 gallon storage capacity, or	**10**
(c) 2500 gallon or larger storage capacity (system is designed by a professional certified by The American Rainwater Catchment Systems Association or equivalent), or	**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**
801.8.2 Rainwater is used for interior demand in the following way (system is designed by a professional certified by The American Rainwater Catchment Systems Association or equivalent):	
(1) Rainwater provides for partial domestic demand (any locally approved uses). **(Points awarded per appliance or fixture.)**	**5** **20 Points Max**
(2) Rainwater provides for total domestic demand.	**25**

801.9 Sediment filters. Water filter is installed to reduce sediment and protect plumbing fixtures for the whole building or whole dwelling unit.	**1**

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.)**	
(1) each water closet flushed by reclaimed, gray, or recycled water **(Points awarded per fixture or appliance.)**	**5** **20 Points Max**
(2) irrigation from reclaimed, gray, or recycled water on-site	**10**

802.2 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	

GREEN BUILDING PRACTICES	POINTS
802.3 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 is approved by appropriate regional authority.	**20**
802.4 Recirculating humidifier. Where a humidifier is required, a recirculating humidifier is used in lieu of a traditional "flow through" type.	**1**
802.5 Advanced wastewater treatment system. Advanced wastewater (aerobic) treatment system is installed and treated water is used on site. **(Points awarded for either Section 802.5 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. Natural draft furnaces, boilers and water heaters are permitted to be installed within the conditioned spaces if located in a mechanical room that has an outdoor air source, and is otherwise sealed and insulated to separate it from the conditioned space(s).	**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)	**TBD**
(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 National Fuel Gas Code or the applicable local gas appliance installation code. Gas-fired fireplaces and direct heating equipment are vented to the outdoors.	**Mandatory**
901.1.5 Natural gas and propane fireplaces that are power vented or direct vented have permanently fixed glass fronts or gasketed doors, and comply with ANSI Z21.88/CSA 2.33 or ANSI Z21.50/CSA 2.22.	**TBD**
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**
901.2 Solid fuel-burning appliances.	**Mandatory**
901.2.1 Solid fuel-burning fireplaces, inserts, stoves and heaters are code compliant and are in accordance with the following requirements:	

GREEN BUILDING PRACTICES	POINTS
(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.	**4**
(2) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are EPA certified.	**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 the requirements of 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.	**7**

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**

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 Points 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	**2**

accordance with CPA A208.1 and CPA A208.2, respectively. **(Points awarded per product group.)**	
(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 3. **(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 kitchen and bath vanity cabinets are in accordance with KCMA ESP 04 (or equivalent) or CARB *Composite Wood Air Toxic Contaminant Measure Standard*.	**3**

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**
(2) A minimum of 85 percent of installed carpet area, carpet cushion (padding), and carpet adhesives are in accordance with 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 Guide 65, such as, but not limited to, those in Appendix D.	
Exception: Footnote b in Table 4.1 of CDPH/EHLB Standard Method v1.1 does not apply. Formaldehyde maximum allowable concentration is 16.5 µg/m^3 (13.5 ppb).	
(a) carpet	**6**
(b) carpet cushion	**2**
(c) carpet adhesives	**2**

901.7 Hard-surface flooring. A minimum of 10% of the conditioned floor space has pre-finished hard-surface flooring installed and at least 85 percent of all prefinished installed hard-surface flooring is in accordance with the emission concentration limits 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 Guide 65, such as, but not limited to, those found in Appendix D. 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 section:	**6**
Exception: Footnote b in Table 4.1 of CDPH/EHLB Standard Method v1.1 does not apply. Formaldehyde maximum allowable concentration is 16.5 µg/m^3 (13.5 ppb).	
(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	

901.8 Wall coverings. When at least 10% 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 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 Guide 65, such as, but not limited to, those in Appendix D.	**4**
Exception: Footnote b in Table 4.1 of CDPH/EHLB Standard Method v1.1 does not apply. Formaldehyde maximum allowable concentration is 16.5 µg/m3 (13.5 ppb).	

901.9 Architectural coatings. A minimum of 85 percent of the architectural coatings are in accordance with either Section 901.9.1 or Section 901.9.2, not both:	
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 below the detection limit for the method) **(2)** GreenSeal GS-11 Standard for Paints and Coatings **(3)** CARB *Suggested Control Measure for Architectural Coatings* (see Table 901.9.1).	

Table 901.9.1
VOC Content Limits For Architectural Coatings[c,d,e]

Coating Category	LIMIT[a] (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[b]
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
Shellacş, 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. Limits are expressed as *VOC* Regulatory (except as noted), thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.
b. Limit is expressed as *VOC* actual.
c. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.
d. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008.
e. Table 806.3(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.

901.9.2 Site-applied interior products are in accordance with 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 Guide 65, such as, but not limited to, those found in Appendix D.	**8**

GREEN BUILDING PRACTICES	POINTS
Exception: Footnote b in Table 4.1 of CDPH/EHLB Standard Method v1.1 does not apply. Formaldehyde maximum allowable concentration is 16.5 µg/m3 (13.5 ppb).	

901.10 Adhesives and sealants. Interior low-VOC adhesives and sealants located inside the water proofing envelope: A minimum of 85 percent of 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 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 Guide 65, such as, but not limited to, those found in Appendix D.	**8**
	Exception: Footnote b in Table 4.1 of CDPH/EHLB Standard Method v1.1 does not apply. Formaldehyde maximum allowable concentration is 16.5 µg/m3 (13.5 ppb).	
(2)	GreenSeal GS-36 Adhesives for Commercial Use	**5**
	OR	
(3)	SCAQMD Rule 1168 (see Table 901.10.2), excluding products that are purchased in containers that are less than 16 ounces	**5**

Table 901.10.2
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
Dry wall 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

GREEN BUILDING PRACTICES	POINTS
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.	
901.11 Insulation. Emissions of wall, ceiling, and floor insulation materials are in accordance with 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 Guide 65, such as, but not limited to, those in Appendix D.	**4**
Exception: Footnote b in Table 4.1 of CDPH/EHLB Standard Method v1.1 does not apply. Formaldehyde maximum allowable concentration is 16.5 µg/m3 (13.5 ppb).	
901.12 Carbon monoxide (CO) alarms. Where not required by local codes, a carbon monoxide (CO) alarm is installed in a central location outside of each separate sleeping area in the immediate vicinity of the bedrooms. The CO alarm(s) is located in accordance with NFPA 720 and is hard-wired with a battery back-up. The alarm device(s) is certified by a third-party for conformance to either CSA 6.19 or UL 2034.	**3**
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 multi-unit building are designated as non-smoking areas with posted signage.	**1**
(2) Exterior smoking areas of a multi-unit 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.	**Mandatory**

(2) Clothes 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 Points Max**
(1) for first device	**5**
(2) for each additional device	**2**
902.1.3 Kitchen range, bathroom, and laundry exhaust are verified to specification. Ventilation airflow at the point of exhaust is tested to a minimum of 100 cfm (47.2 L/s) intermittent or 25 cfm (11.8 L/s) continuous for kitchens, and 50 cfm (23.6 L/s) intermittent or 20 cfm (9.4 L/s) continuous for bathrooms and/or laundry.	**8**
902.1.4 Exhaust fans are ENERGY STAR, as applicable.	**12 Points 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**

902.2 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.	
(1) exhaust or supply fan(s) ready for continuous operation and with appropriately labeled controls	**8**
(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	**10**
(3) heat-recovery ventilator	**15**
(4) energy-recovery ventilator	**17**
902.2.2 Ventilation airflow is tested to achieve the design fan airflow at point of exhaust in accordance with Section 902.2.1.	**8**
902.2.3 MERV filters 8 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 MERV 8 filters.	**3**

902.3 Radon control. Radon control measures are in accordance with ICC IRC Appendix F. Zones are defined in Figure 9(1).	
(1) Buildings located in Zone 1	**Mandatory**
(a) a passive radon system is installed	**10**
(b) an active radon system is installed	**18**
(2) Buildings located in Zone 2 or Zone 3	

(a) a passive or active radon system is installed	**10**

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.	**5**
902.6 Living space contaminants. The living space is sealed to prevent unwanted contaminants.	
(1) Attic access, knee wall door, or drop down stair is caulked, gasketed, or otherwise sealed.	**2**
(2) All penetrations (e.g., top plates, HVAC register boots, recessed can lights) are sealed in the following areas:	
(a) attic/ceiling	**2**
(b) wall	**2**
(c) floors	**2**

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**

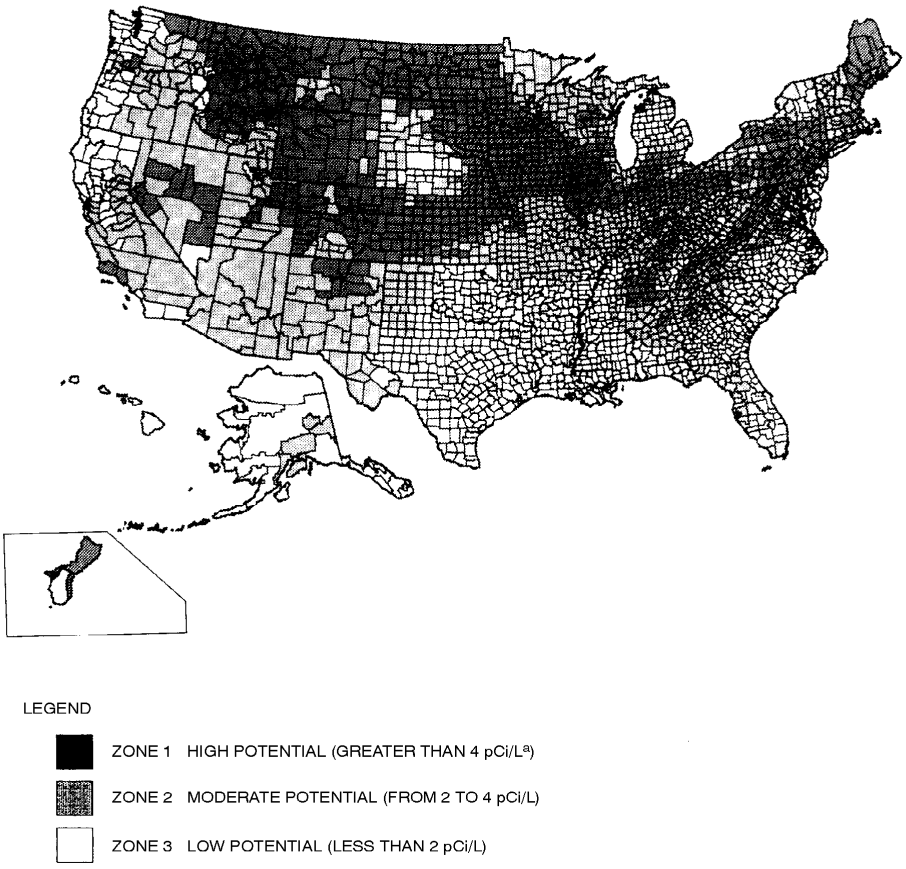
903.2 Duct insulation. All HVAC ducts, plenums, and trunks in unconditioned attics, basements, and crawl spaces are insulated to a minimum of R-6. Outdoor air supplies to ventilation systems are insulated to a minimum of R-6.	
(1) insulated to a minimum of R-6	**Mandatory**
(2) insulated to a minimum of R-8	**2**

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 remaining climate zones.)**	**8**
(1) additional dehumidification system(s)	
(2) central HVAC system equipped with additional controls to operate in dehumidification mode	

904
INNOVATIVE PRACTICES

904.1 Humidity monitoring system. A humidity monitoring system is installed with a mobile base unit that displays a reading of temperature and relative humidity at the base unit with a minimum of two remote units. One remote unit is placed permanently inside the conditioned space in a central location, excluding attachment to exterior walls, and another remote unit is placed permanently outside of the conditioned space.	**2**

904.2 Kitchen exhaust. A kitchen exhaust unit(s) that equals or exceeds 400 cfm (189 L/s) is installed, and makeup air is provided.	**2**



a. pCi/L standard for picocuries per liter of radon gas. EPA recommends that all homes that measure 4 pCi/L and greater be mitigated.

The United States Environmental Protection Agency and the United States 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. This Table lists the Zone 1 counties illustrated on the map. More detailed information can be obtained from state-specific booklets (EPA-402-R-93-021 through 070) available through State Radon Offices or from U.S. EPA Regional Offices.

FIGURE 9(1)
EPA MAP OF RADON ZONES

CHAPTER 10

OPERATION, MAINTENANCE, AND BUILDING OWNER EDUCATION

GREEN BUILDING PRACTICES	POINTS

1001
BUILDING OWNERS' MANUAL FOR ONE- AND TWO-FAMILY DWELLINGS

1001.0 Intent. Information on the building's use, maintenance, and green components is provided.

1001.1 A building owner's manual is provided that includes the following, as available and applicable. **(Points awarded per two items. Points awarded for both mandatory and non-mandatory items.)**	**1**
(1) A green building program certificate or 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) Information on local recycling programs.	
(5) Information on available local utility programs that purchase a portion of energy from renewable energy providers.	
(6) Explanation of the benefits of using energy-efficient lighting systems [e.g., compact fluorescent light bulbs, light emitting diode (LED)] in high-usage areas.	
(7) A list of practices to conserve water and energy.	
(8) Local public transportation options.	
(9) A diagram showing the location of safety valves and controls for major building systems.	
(10) 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.	
(11) 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).	

(12) 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. **(13)** Maintenance checklist. **(14)** List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials. **(15)** Information on organic pest control, fertilizers, deicers, and cleaning products. **(16)** Information on native landscape materials and/or those that have low-water requirements. **(17)** Information on methods of maintaining the building's relative humidity in the range of 30 percent to 60 percent. **(18)** Instructions for inspecting the building for termite infestation. **(19)** Instructions for maintaining gutters and downspouts and importance of diverting water a minimum of 5 feet away from foundation. **(20)** A narrative detailing the importance of maintenance and operation in retaining the attributes of a green-built building. **(21)** Where storm water management measures are installed on the lot, information on the location, purpose, and upkeep of these measures.	

1002
TRAINING OF BUILDING OWNERS ON OPERATION AND MAINTENANCE FOR ONE- AND TWO-FAMILY DWELLINGS AND MULTI-UNIT BUILDINGS

1002.1 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:	**6**
(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 practices	

1003
CONSTRUCTION, OPERATION, AND MAINTENANCE MANUALS AND TRAINING FOR MULTI-UNIT BUILDINGS

1003.0 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
1003.1 Building construction manual. A building construction manual, including five or more of the following, is compiled and distributed in accordance with Section 1003.0. **(Points awarded per two items. Points awarded for both mandatory and 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.	

1003.2 Operations manual. Operations manuals are created and distributed to the responsible parties in accordance with Section 1003.0. Between all of the operation manuals, five or more of the following options are included. ***(Points awarded per two items. Points awarded for both mandatory and 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.	**Mandatory**
(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.	

1003.3 Maintenance manual. Maintenance manuals are created and distributed to the responsible parties in accordance with Section 1003.0. Between all of the maintenance manuals, five or more of the following options are included. ***(Points awarded per two items. Points awarded for both mandatory and 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.	

1004 INNOVATIVE PRACTICES

1004.1 (Reserved)	

CHAPTER 11

REMODELING

11.1 **Intent** This chapter sets the mandatory green practices for any remodeling project done pursuant to this standard. A remodeling project can consist of renovating an existing building, constructing an addition to an existing building, or both.	
11.2 Some of the practices in sections 11.5, 11.6, 11.7, 11.8, 11.9, 11.10 are classified as applying to New Work or Re-Work. These practices have slightly different requirements depending on if the construction is new or if it is part of renovating existing structure. The practice applies to New Work when the practice is in relation to creating and finishing new structure. The practice applies to Re-Work when the practice is in relation to renovating existing structure and finishes. For example an addition would be all New Work. Installing new partition walls to divide an existing room into two rooms would be New Work. Repairing and painting existing drywall would be Re-Work as would replacing carpet and finish flooring. Practices that are not identified as New Work or Re-work apply equally to any work done on the project or to the entire building when applicable.	
11.3 Intentionally left blank	

11.4 Intentionally left blank	

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

1.503.0 Intent. The lot changes are designed to avoid detrimental environmental impacts first, 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 that may be disturbed during remodeling **(To be awarded points allocated for design 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 resource inventory as high priority resources.	**6**
(3) Items listed for protection in the 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.	**2**
(6) Ongoing maintenance of vegetation during construction is in accordance with TCIA A300.	**3**
11.503.2 Slope disturbance. Slope disturbance is minimized by one or more of the following. **(Points awarded only if there are developable steep slopes on the lot.)**	

(1) All or a percentage of building on steep slopes is avoided.	**(1)**
(a) less than 25 percent	**2**
(b) 25 percent to 75 percent	**3**
(c) greater than 75 percent	**4**
(3) All or a percentage of paved areas and parking are aligned with natural topography to reduce cut and fill.	**(3)**
(a) less than 25 percent	**1**
(b) 25 percent to 75 percent	**3**
(c) greater than 75 percent	**5**
(4) Long-term erosion effects are reduced through the design and implementation of terracing, retaining walls, landscaping, and restabilization techniques.	**(4)**
(5) Underground parking on the lot uses the natural slope for parking entrances.	**4**
11.503.3 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 to minimize length of time that soils are exposed.	**5**
(2) Newly installed Utilities are installed using 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 driveways, and hardscape surfaces instead of yards.	
(3) Limits of clearing and grading are demarcated on the lot plan.	**5**
11.503.4 Storm water management. Storm water is managed using one or more of the following low impact development techniques:	
(1) Natural water and drainage features are preserved and used.	**6**
(2) A storm water management plan is developed and implemented that minimizes concentrated flows and simulates flows found in natural hydrology (e.g., vegetative swales, french drains, wetlands, drywells, and rain gardens).	**6**
(3) All or a percentage of impervious surfaces are minimized and permeable materials are used for driveways, parking areas, walkways, and patios.	
(a) less than 25 percent	**1**
(b) 25 percent to 75 percent	**3**
(c) greater than 75 percent	**5**
11.503.5 Landscape plan. If the project includes landscaping to more than 50% of the available area then a landscape plan for the lot is developed to limit water and energy use while preserving or enhancing the natural environment. Otherwise this section is not applicable.	
(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.	**5**

(2) Turf grass species, other vegetation, and trees are selected that are native or regionally appropriate for local growing conditions.	**4**
(3) A percentage or all turf areas are limited.	
(a) 0 percent	**4**
(b) greater than 0 percent to less than 25 percent	**3**
(c) 25 percent to less than 50 percent	**2**
(d) 50 percent to 75 percent	**1**
(4) Plants with similar watering needs are grouped (hydrozoning).	**5**
(5) Species and locations for tree planting are identified that will provide summer shading of streets, parking areas, and buildings to moderate temperatures.	**5**
Deleted wind break	
(7) On-site tree trimmings or stump grinding of regionally appropriate trees are used to provide protective mulch during construction, and cleared trees are recycled as sawn lumber or pulp wood.	**3**
(8) An integrated pest management plan is developed to minimize chemical use in pesticides and fertilizers.	**4**
Delete wildlife habitat	**4**
11.503.8 Environmentally sensitive areas. Environmentally sensitive areas.	
(1) Environmentally sensitive areas are avoided or restored if disturbed	**3**

11.504.0 Intent. Environmental impact during remodeling is avoided to the extent possible; impacts that do occur are minimized, and any significant impacts are mitigated. If no lot or landscape work is in the scope of the project then this section is not applicable.	
11.504.1 On-site supervision and coordination. On-site supervision and coordination is provided during clearing, grading, trenching, paving, and installation of utilities on the lot to ensure that specified green development practices are implemented. (also see Section 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 "tree save" areas are avoided.	**4**
(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. On-site soil disturbance and erosion are minimized by one or more of the following: (also see Section 503.3)	
(1) Limits of clearing and grading are staked out.	**5**
(2) "No disturbance" zones are created using fencing or flagging to protect vegetation and	**5**

sensitive areas from construction activity.	
(3) Sediment and erosion controls are installed and maintained in accordance with the storm water pollution prevention plan, where required.	**5**
(4) Topsoil is stockpiled and stabilized for later use to establish landscape plantings.	**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).	**3**
(6) Disturbed areas 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 storm water pollution prevention plan, where required.	**3**
(7) Soil is improved with organic amendments and mulch.	**3**
(8) Newly installed Utilities 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**

11.505.0 Intent. Innovative lot design, preparation and development practices are used to enhance environmental performance. Waivers or variances from local zoning regulations are obtained, and innovative practices are used to achieve such performance. If the scope of the project does not affect 50% or more of the available lot then this practice does not apply.	**4**
11.505.2 Heat island mitigation. Heat island mitigation. Any combination of the following strategies are provided on the lot for a minimum of 50 percent of the horizontal surface area of the hardscape: **(1)** 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. **(2)** Light-colored hardscaping: Horizontal hardscaping materials are installed with a solar reflectance index of 29 or greater.	**4**

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. Conditioned floor area after the remodeling, as defined by ICC IRC and calculated in accordance with NAHBRC Z765, is limited. Dwelling unit size is to be calculated in accordance with NAHBRC Z765. Only the conditioned floor area for stories above grade plane is to be included in the calculation.	
(1) less than or equal to 1,000 square feet (93 m^2)	**15**
(2) less than or equal to 1,500 square feet (139 m^2)	**12**
(3) less than or equal to 2,000 square feet (186 m^2)	**9**
(4) less than or equal to 2,500 square feet (232 m^2)	**6**

Multi-Unit Building Note*: For a multi-unit building, use a weighted average of the individual unit sizes in qualifying for available points.*	
11.601.2 New Work - Material usage. Building-code-compliant structural systems or advanced framing techniques are implemented that optimize material usage. **(Points awarded for each system or framing technique implemented.)**	**3** **9 Points Max**
11.601.3 New Work - Building dimensions and layouts of additions 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) Window/door and trim areas	**1**
11.601.4 New Work - 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**
11.601.5 New Work - 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:	
(1) floor system	**4**
(2) wall system	**4**
(3) roof system	**4**
(4) modular construction for the entire building located above grade	**13**
11.601.6 New Work - Stacked stories. New 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 (2134 mm).	**8 Points Max**
(1) first new stacked story	**4**
(2) for each additional new stacked story	**2**
11.601.7 Site applied finishing materials. Building materials or assemblies listed below and that do not require additional site applied material for finishing are incorporated in the building.	**12 Points Max**
(1) 90 percent or more of the newly installed building materials or assemblies listed below: **(Points awarded for each type (a-e) of material or assembly.)**	**5**
(2) 50 percent to less than 90 percent of the newly installed building material or assembly listed below: **(Points awarded for each type (a-e) of material or assembly.)**	**2**
(a) pigmented, stamped, decorative, or final finish concrete or masonry **(b)** trim not requiring paint or stain **(c)** window, skylight, and door assemblies not requiring paint or stain on exterior or interior surfaces **(d)** Wall coverings or systems not requiring paint or stain or other type of finishing application	

11.601.8 New Work - Foundations. Foundations, such as frost-protected shallow foundations, pier and pad foundations, post foundations and other similar foundation types, are designed and constructed.	**3**

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 New Work - Exterior doors. Newly constructed entries into the conditioned space from the outdoors, inclusive of side lights, are covered by one of the following methods to protect the building from the effects of precipitation and solar radiation. 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), have a projection factor of 1.0 minimum, unless otherwise protected from direct solar radiation by other means (e.g., screen wall, vegetation). **5 Points Max**

(a) installing a porch roof or awning
(b) extending the roof overhang
(c) recessing the exterior door

(1) main entrance door **3**

(2) additional covered door assembly **1**

11.602.2 New Work - Roof overhangs. Roof overhangs, based on inches rainfall in Table 602.2, are provided over a minimum of 90 percent of exterior walls to protect the building envelope. **4**

Table 602.2
Minimum Roof Overhang for One- & Two-Story Buildings

Inches Rainfall (1)	Eave Overhang (Inches)	Rake Overhang (Inches)
Less than 20	12	12
21 to 40	12	12
41 to 70	18	12
More than 70	24	12

(1) Average annual inches of rainfall are in accordance with Figure 6(2)

For SI: 1 foot = 304.8 mm

11.602.3 Foundation drainage.

11.602.3.1a New Work - Where required by the ICC IRC or IBC for habitable and usable spaces below grade, exterior drainage system compliant with the IRC or IBC is installed. **Mandatory**

11.602.3.1b Re-Work - Habitable or usable existing space below grade has exterior drain tile installed where required by the ICC IRC or IBC if there is evidence of moisture issues in the space. **Mandatory**

11.602.4 Drip edge. Drip edge is installed at eaves and gable roof edges. **3**

11.602.5 New Work - Roof water discharge. A gutter and downspout system or splash blocks **4**

and effective grading are provided to carry water a minimum of 5 feet (1524 mm) away from perimeter foundation walls.	
11.602.6 Finished grade. Finish grade at all sides of 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 5 percent and the water is directed to drains or swales to ensure drainage away from the structure.	**Mandatory**
11.602.7 New Work -Termite barrier. Continuous physical foundation termite barrier is installed in geographical areas that have subterranean termite infestation potential determined in accordance with Figure 6(3).	**4**
11.602.8 New Work - Termite-resistant materials. Termite-resistant materials are used as follows:	
(1) In areas of slight to moderate termite infestation probability (as defined by Figure 6(3)) for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, windows, 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 (as defined by Figure 6(3)) for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, windows, 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 (as defined by Figure 6(3)) for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, windows, exterior decks, and exterior claddings.	**6**
11.602.9 Water-resistive barrier. Where required by the ICC IRC or IBC, a water-resistive barrier and/or drainage plane system is installed behind all newly installed exterior veneer and/or siding.	**Mandatory**
11.602.10a New Work - 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 at a minimum of 24 inches (610 mm) inside the exterior wall line of the building.	**Mandatory**
11.602.10b Re- Work – Ice Barrier. When the existing building has 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 and extends at a minimum of 24 inches (610 mm) inside the exterior wall line of the building.	**Mandatory**
11.602.11 New Work - Foundation waterproofing. Enhanced foundation waterproofing is installed: **(1)** rubberized coating, or **(2)** drainage mat	**4**
11.602.12 New Work - Flashing. Flashing details are shown on the plans and flashing is installed at all of the following locations, as applicable: **(1)** around exterior fenestrations, skylights and doors **(2)** roof valleys **(3)** deck/balcony to building intersections **(4)** at roof-to-wall intersection and at roof-to-chimney intersections	**6**

(5) a drip cap is provided above windows and doors that are not flashed or protected by covering in accordance with Section 602.1	
11.602.13 Roof surfaces. A minimum of 90 percent of roof surfaces are constructed of one or both of the following:	**3**
(1) products that are in accordance with the ENERGY STAR® cool roof certification or equivalent **(2)** a green (landscaped) roof system	
11.602.14 Recycling. Recycling by the occupants is facilitated by one or more of the following methods:	**6 Points Max**
(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	**3**
(2) Compost facility provided on-site	**3**

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 New Work - Reuse of existing building. Major elements of existing buildings and structures are reused, modified, or deconstructed for later use in lieu of demolition. Possibly calculate by percentage of materials re-used **(Points awarded for every 200 square feet (18.5 m^2) of floor area.)**	**1** **12 Points 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.	**3**
11.603.3 Scrap materials. Facilitation for sorting and reuse of scrap building material (e.g., provide a central storage area or dedicated bins) are provided on site and used during construction.	**4**

11.604 RECYCLED-CONTENT BUILDING MATERIALS

11.604.1 Recycled content. Newly installed building materials with recycled content are used for two minor and/or two major components of the building. **Points per Table 604.1**

Table 604.1
Recycled Content

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

11.605 RECYCLED CONSTRUCTION WASTE

11.605.0

All waste classified as hazardous shall be properly handled and disposed.	**Mandatory**
11.605.1 Construction waste management plan. A construction waste management plan is developed, posted at the jobsite, and implemented with a goal of recycling or salvaging a minimum of 50 percent (by weight) of construction and land-clearing waste.	**6**
11.605.3 Recycled construction materials. Construction materials (e.g., wood, cardboard, metals, drywall, plastic, asphalt roofing shingles, or concrete) are recycled offsite.	**6 Points Max**
(1) a minimum of two types of materials are recycled	**3**
(2) for each additional recycled material	**1**
11.605.4 Hazardous materials outside of the basic scope of the project are removed.	**Points TBD**

11.606 RENEWABLE MATERIALS

11.606.0 Intent. Newly installed building materials derived from renewable resources are used.	
11.606.1 Biobased products. The following biobased products are used:	**8 Points 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)** products with the minimum biobased contents of the USDA 7 CFR Part 2902 **(i)** other biobased materials with a minimum of 50 percent biobased content (by weight or volume)	
11.606.1(1) Two types of biobased materials are used, each for more than 0.5 percent of the project's projected building material cost.	**3**
11.606.1(2) Two types of biobased materials are used, each for more than 1 percent of the project's projected building material cost.	**6**
11.606.1(3) For each additional biobased material used for more than 0.5 percent of the project's projected building material cost.	**1** **2 Points Max**
11.606.2 Wood-based products. Newly installed wood or wood-based products are certified to the requirements of one of the following recognized product programs: **(a)** AFF *American Tree Farm System*® **(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)** other product programs mutually recognized by PEFC	
11.606.2(1) Where a minimum of two certified wood-based products are used for minor elements of the building, such as all trim, cabinetry, or millwork.	**3**
11.606.2(2) Where a minimum of two certified wood-based products are used in major elements of the building, such as walls, floors, or roof.	**4**
11.606.3 Manufacturing energy. Newly installed 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 Points Max**

11.607 RESOURCE-EFFICIENT MATERIALS

11.607.1 Newly installed Products containing fewer raw materials but still meeting the same end-use requirements as conventional products are used for a major element of the building, including but not limited to: **(3 points awarded for each material.)**	**9 Points Max**
(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	

608 INDIGENOUS MATERIALS

11.608.1 Indigenous materials are used for major elements of the building.	**10 Points Max**
(1) one type of material	**2**
(2) for each additional material	**2**

11.609.1 A more environmentally preferable product or assembly is selected for an application based upon the use of a Life Cycle Assessment (LCA) tool compliant with ISO 14044 or other recognized standards that compare the environmental impact of at least two approaches for building materials, assemblies, or the whole building.	**15 Points Max**
(1) per product/system analysis	**3**
(2) whole building LCA analysis	**15**

610 INNOVATIVE PRACTICES

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

11.701.4 .1 HVAC systems.	**Mandatory**
11.701.4.1.1a New Work. Space heating and cooling system/equipment is sized according to heating and cooling loads calculated using ACCA Manual J, or equivalent.	
11.701.4.1.1b Re-Work. When the HVAC system is modified, space heating and cooling system/equipment is sized according to heating and cooling loads calculated using ACCA Manual J, or equivalent.	

11.701.4.1.2 HVAC Systems TG 7 will need to see what the task group on this section changes in order to complete this.	**Mandatory**
New Work. Where installed as a primary heat source in the building, radiant or hydronic space heating system is designed using industry-approved guidelines (e.g., ACCA Manual J, GAMA H-22, or an accredited design professional's and manufacturer's recommendations).	
Re-Work. Where an existing radiant or hydronic space heating system serves as the primary heat source in the existing portion of the building and it is modified, the modified system is designed using industry-approved guidelines (e.g., ACCA Manual J, GAMA H-22, or an accredited design professional's and manufacturer's recommendations).	

11.701.4.2.1 Duct systems.	**Mandatory**
New Work. Ducts are sealed with tape complying with UL 181, mastic, gaskets, or an approved system as required by the ICC IRC, Section M1601.3.1, or ICC IMC, Section 603.9, to reduce leakage.	
Re-Work. Ducts that are modified as part of the remodel are sealed with tape complying with UL 181, mastic, gaskets, or an approved system as required by the ICC IRC, Section M1601.3.1, or ICC IMC, Section 603.9, to reduce leakage.	

11.701.4.2.2 Supply Duct Systems.	**Mandatory**
New Work. Building cavities are not used as supply ducts.	
Re-Work. No additional building cavities are used as supply ducts.	

11. 701.4.3.1(1) Insulation and air sealing.	**Mandatory**
New Work. General. Insulation and air sealing is in accordance with the following:	
Insulation. Insulation is installed in accordance with the manufacturer's instructions or local code, as applicable.	
Re-Work. General. Insulation and air sealing is in accordance with the following:	
Insulation. Newly installed Insulation is installed in accordance with the manufacturer's instructions or local code, as applicable.	

11. 701.4.3.1(2) Shafts (duct shaft, piping shaft/penetrations, flue shaft).	**Mandatory**
New Work. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam. Fire-rated collars and caulking are installed where required.	
Re-Work. Openings to unconditioned space that become accessible during the remodeling are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam. Fire-rated collars and caulking are installed where required.	

11.701.4.3.2 (1) **Floors, foundations, and crawlspaces**	
New Work. (including insulated floors above garages and cantilevered floors)	
(a) Insulation is installed to maintain permanent contact with the underside of the subfloor decking, enveloping any attached ductwork within the thermal envelope without compression or air gaps in the insulation. This practice does not apply to ducts or other mechanical equipment that is	

adjacent to the underside of the subfloor. **(b)** Batt and loose-fill insulation is held in place by permanent attachments or systems in accordance with the manufacturer's instructions.	
Re-Work. (including insulated floors above garages and cantilevered floors)	
(a) Newly installed Insulation is installed to maintain permanent contact with the underside of the subfloor decking, enveloping any attached ductwork within the thermal envelope without compression or air gaps in the insulation. This practice does not apply to ducts or other mechanical equipment that is adjacent to the underside of the subfloor. **(b)** Newly installed Batt and loose-fill insulation is held in place by permanent attachments or systems in accordance with the manufacturer's instructions.	

11.701.4.3.2 (2) Crawlspace.	
New and Re-Work. Where insulated, crawlspace wall insulation is permanently attached to the walls. Exposed earth in unvented crawlspaces is covered with continuous vapor retarder with overlapping joints that are taped or masticed.	**Mandatory**

11.701.4.3.3(1) Windows and doors.	
New Work. Caulking, gasketing, adhesive flashing tape, foam sealant, or weatherstripping is installed forming a complete air barrier.	**Mandatory**
Re-Work. Newly installed doors and windows have caulking, gasketing, adhesive flashing tape, foam sealant, or weather stripping installed forming a complete air barrier. Existing windows and doors are inspected and any air barrier weaknesses are corrected.	**Mandatory**

11.701.4.3.3(2) Band joist and rim joists.	**Mandatory**
New Work. Band and rim joists are insulated and air sealed.	
Re-Work. Band and rim joists which become accessible during the remodeling are insulated and air sealed.	

11.701.4.3.3(3) Between foundation and sill plate bottom plate.	**Mandatory**
New Work.	
(a) Sill sealer or other material that will expand and contract is installed between foundation and sill plate and **(b)** Caulk or the equivalent is installed to seal the bottom plate of exterior walls.	
Re-Work.	
(a) When the bottom plate of exterior walls is exposed during the remodeling caulk or the equivalent is installed to seal the bottom plate of exterior walls.	

11.701.4.3.3(4) Skylights and knee walls.	**Mandatory**
New Work. Skylight shafts and knee walls are insulated to the same level as the exterior walls.	
Re-Work. Newly installed skylight shafts and knee walls are insulated to the same level as the exterior walls.	

11.701.4.3.3(5) Exterior architectural features.	
New Work. Code required building envelope insulation and air sealing are not disrupted at exterior architectural features such as stairs and decks.	**Mandatory**

11.701.4.3.4(1) Ceilings and attics. Attic access (except unvented attics).	
New and Re-Work. Attic access, knee wall door, or drop-down stair is covered with insulation and gasketed. Knee wall door is an insulated unit or is covered with	**Mandatory**

insulation.	

11.701.4.3.4(2) Ceilings and attics. Recessed lighting.	**Mandatory**
New Work. Recessed light fixtures that penetrate the thermal envelope are airtight, IC-rated, and sealed with gasket, caulk, or foam.	
Re-Work. Recessed light fixtures that penetrate the thermal envelope that can be accessed during the remodeling are airtight, IC-rated, and sealed with gasket, caulk, or foam.	

11.701.4.3.4(3) Ceilings and attics. Eave vents.	
New Work. Where ceiling/attic assemblies or designs have eave vents, baffles or other means are implemented to minimize air movement into or under the insulation.	**Mandatory**

11.701.4.4.1 Fenestration

New Work. NFRC-certified U-factor and SHGC windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with ENERGY STAR, or equivalent, or Table 701.4.4.1. Decorative fenestration elements with a 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.

Table 701.4.4.1
Fenestration Specifications

Climate Zones	U-Factor	SHGC
	Windows and Exterior Doors (maximum certified ratings)	
1 and 2	0.65	0.40
3	0.40	0.40
4 to 8	0.35	Any
	Skylights and TDDs (maximum certified ratings)	
1 to 3	0.75	0.40
4 to 8	0.60	Any

Re-Work. Newly installed windows, doors and TDDs are NFRC-certified U-factor and SHGC are in accordance with ENERGY STAR, or equivalent, or Table 701.4.4.1. Decorative fenestration elements with a 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.

Table 701.4.4.1
Fenestration Specifications

Climate Zones	U-Factor	SHGC
	Windows and Exterior Doors (maximum certified ratings)	
1 and 2	0.65	0.40
3	0.40	0.40
4 to 8	0.35	Any
	Skylights and TDDs (maximum certified ratings)	
1 to 3	0.75	0.40
4 to 8	0.60	Any

Mandatory

11.704.4.1 Ducts	**Mandatory**
New Work. Duct system is sized, designed, and installed in accordance with ACCA Manual D or equivalent.	
Re-Work. Modifications to the existing duct system are sized, designed, and installed in accordance with ACCA Manual D or equivalent.	

11.901.1.1 Space and water heating options	
11.26.1 New Work. Natural draft space heating or water heating equipment is not located in conditioned spaces, including conditioned crawlspaces. Natural draft equipment is permitted to be installed within the conditioned spaces if located in a mechanical room that has an outdoor air source, and is otherwise sealed and insulated to separate it from the conditioned space(s).	**Mandatory**

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 and water heating equipment is installed within conditioned space:	
(1) direct vent furnace or boiler	5
(2) water heater	
(a) power vent water heater	3
(b) direct vent water heater	5

11.901.1.4 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 Fireplaces and fuel-burning appliances. Fireplaces and fuel-burning appliances (except cooking appliances, clothes dryers, water heaters, and furnaces) located in conditioned space are in accordance with the following: **[Section 901.2.1(2)(a) is not mandatory.]**	**Mandatory**
11.901.2.1 New Work. Fireplaces and natural draft fuel-burning appliances are code compliant, vented to the outdoors, and have adequate combustion and ventilation air provided to minimize spillage or back-drafting, in accordance with the following, as applicable.	
(1) Natural gas and propane fireplaces that are power vented or direct vented, are equipped with permanently fixed glass fronts or gasketed doors, and comply with CSA Z21.88a/CSA 2.33a or CSA Z21.50/CSA 2.22.	**Mandatory**
(2) Solid fuel-burning appliances are in accordance with the following requirements:	
(a) Wood-burning fireplaces are equipped with gasketed doors designed to operate with	**4**

the doors closed, outside combustion air, and a means is provided for sealing the flue to minimize interior air (heat) loss when not in operation.	
(b) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are EPA certified.	**Mandatory**
(c) 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).	**Mandatory**
(d) Pellet (biomass) stoves and furnaces are in accordance with the requirements of ASTM E1509 or are EPA certified.	**Mandatory**
(e) Masonry heaters are in accordance with the definitions in ASTM E1602 and ICC IBC, Section 2112.1.	**Mandatory**
Re-Work *Removal of or rendering permanently unusable an existing fireplace and/or other fuel-burning appliances that are not in accordance with Section 901.2.1.*	***2***
Re-Work *Replacement of each existing fireplace that is not in accordance with Section 901.2.1 with a fireplace that is in accordance with Section 901.2.1.*	***2***

11.901.2.2 Fireplaces, woodstoves, pellet stoves, or masonry heaters are not in the dwelling unit.	**7**

11.901.3 Garages.	
11.28 .1 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**
(b) A continuous air barrier is provided between walls and ceilings separating the garage space from the conditioned living spaces.	**Mandatory**
(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.	**4**
(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.	
(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 10 Points Max**
(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 and HUD Title 24, Part 3280. **(Points awarded per product group.)**	**2**
(4) Particleboard, MDF, or hardwood plywood is in accordance with CPA 2. **(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 Carpets. Carpets are in accordance with the following:	
(1) Wall-to-wall carpeting is not adjacent to water closets and bathing fixtures.	**Mandatory**
(2) A minimum of 85 percent of newly installed carpet area, carpet cushion (padding), and carpet adhesives are in accordance with the emission levels of CDPH 01350, as certified by a third-party program, such as the Carpet and Rug Institute's (CRI) *Green Label Plus Indoor Air Quality Program*.	
(a) Carpet	**6**
(b) carpet cushion	**2**
(c) carpet adhesives	**2**
11.901.6 Hard-surface flooring. At least 25% of the newly installed flooring is hardsurface flooring and a minimum of 85 percent of newly installed hard-surface flooring is in accordance with the emission concentration limits of CDPH 01350 (using the office scenario), as certified by a third-party program, such as the Resilient Floor Covering Institute's *FloorScore Indoor Air Certification Program* or the GREENGUARD Environmental Institute's *Children and Schools Certification Program*.	**6**
11.901.7 Wall coverings. At least one typical room has newly installed wall coverings and minimum of 85 percent of newly installed wall coverings are in accordance with the emission concentration limits of CDPH 01350, as certified by a third-party program, such as the Scientific Certification Systems *(SCS) Indoor Advantage Gold Program* or the GREENGUARD Environmental Institute's *Children and Schools Certification Program*.	**4**
11.901.8 Architectural coatings. A minimum of 85 percent of the newly applied architectural coatings are in accordance with either Section 901.8.1 or Section 901.8.2, not both:	
11.901.8.1 Site-applied interior products are in accordance with one or more of the following standards:	**5**
(1) Zero VOC as determined by EPA Method 24 (VOC content below the detection limit for the method)	

(2) CARB *Suggested Control Measure for Architectural Coatings* **(3)** GS-11 **(4)** VOC limits in accordance with: **(a)** 50 grams/liter flat **(b)** 100 grams/liter non flat **(c)** 350 grams/liter clear wood varnish **(d)** 550 grams/liter clear wood lacquer	
11.901.8.2 Site-applied interior products are in accordance with the emissions levels of CDPH 01350, as certified by a third party program such as the GREENGUARD Environmental Institute's *Children and Schools Certification Program* or the Scientific Certification Systems *Indoor Advantage Gold Program*.	**8**
When the building is occupied during the renovation a minimum of 85 percent of the newly applied architectural coatings are in accordance with either Section 901.8.1 or Section 901.8.2	***Mandatory 1***

11.901.9 Adhesives and sealants. A minimum of 85 percent of newly applied site-applied adhesives and sealants are in accordance with Section 901.9.1 and/or Section 901.9.2.	
11.901.9.1 Exterior low-VOC adhesives and sealants: A minimum of 85 percent of site-applied products used for the installation of subfloors and on the exterior of the project are in accordance with one of the following:	**5**
(1) The California Air Resources Board consumer products regulation as follows: **(a)** Construction Adhesives: VOC content not to exceed 7 percent by weight or 75 grams/liter, whichever is greater. **(b)** The VOC content of reactive sealants (i.e., silicones, polyurethanes, and hybrids, such as MS Polymer and silylated polyurethane resin or SPUR) not to exceed 4 percent by weight or 50 grams/liter, whichever is greater. **(c)** The VOC content of all other caulks and sealants not to exceed 2 percent by weight or 30 grams/liter, whichever is greater. **(d)** The VOC content of contact adhesives not to exceed 55 percent by weight or 480 grams/liter, whichever is greater. **(2)** GS-36	
11.901.9.2 Interior low-VOC adhesives and sealants. A minimum of 85 percent of site-applied products used within the interior of the building are in accordance with one of the following, as applicable.	**5**
(1) CDPH 01350, as certified by a third party program, such as the GREENGUARD Environmental Institute's *Children and Schools Certification Program* or the Scientific Certifications Systems *Indoor Advantage Gold Program*. **(2)** GS-36	

11.901.10 Cabinets. All new kitchen and bath cabinets are in accordance with one of the following. **(Where more than one of the following practices is used, the practice with the fewer number of points is awarded.)**	
(1) Kitchen and bath vanity cabinets in accordance with KCMA ESP 01, or equivalent, are	**2**

	installed.	
(2)	Kitchen and bath vanity cabinets in accordance with CARB *Composite Wood Air Toxic Contaminant Measure Standard* are installed.	**3**
(3)	Kitchen and bath vanity cabinets are installed that contain no added urea formaldehyde or are in accordance with GGPS.EC.010.R0, ASTM D 6670, or equivalent.	**5**

11.901.11 Insulation. Newly installed Insulation is in accordance with the following.		
(1)	Formaldehyde emissions of wall, ceiling, and floor insulation materials are in accordance with the emissions levels of CDPH 01350, as certified by a third-party program, such as the GREENGUARD Environmental Institute's *Children and Schools Certification Program* or the Scientific Certifications Systems *Indoor Advantage Gold Program*.	**4**
(2)	Formaldehyde emissions of duct insulation materials are in accordance with the emissions levels of CDPH 01350, as certified by a third-party program, such as the GREENGUARD Environmental Institute's *Children and Schools Certification Program* or the Scientific Certifications Systems *Indoor Advantage Gold Program*.	**1**

11.901.12 Carbon monoxide (CO) alarms. A carbon monoxide (CO) alarm is installed in a central location outside of each separate sleeping area in the immediate vicinity of the bedrooms. The CO alarm(s) is located in accordance with NFPA 720 and is hard-wired with a battery back-up. The alarm device(s) is certified by a third-party for conformance with either CSA 6.19 or UL 2034.	**3**

11.901.14 Non-smoking areas. All interior common areas of a multi-unit building are designated as non-smoking areas with posted signage.	**1**

11.*901.* *For building constructed prior to 1978, lead-safe work practices are used during renovation, remodeling, painting, and demolition.*	***Mandatory***

11.902.1 New Work. 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.	**Mandatory**
(2)	Clothes dryers are vented to the outdoors.	**Mandatory**
Re-Work. Spot ventilation is in accordance with the following:		
(2)	Clothes 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**

11.902.1.2 Bathroom and/or laundry exhaust fan is provided with an automatic timer and/or humidistat:	**9 Points Max**
for first device	**5**
for each additional device	**2**
11.902.1.3 Kitchen range, bathroom, and laundry exhaust are verified to specification. Ventilation airflow at the point of exhaust is tested to a minimum of 100 cfm (47.2 L/s) intermittent or 25 cfm (11.8 L/s) continuous for kitchens, and 50 cfm (23.6 L/s) intermittent or 20 cfm (9.4 L/s) continuous for bathrooms and/or laundry.	**8**
11.902.1.4 Exhaust fans are ENERGY STAR, as applicable.	**6 Points Max**
ENERGY STAR, or equivalent, fans	**2**
(Points awarded per fan.)	
ENERGY STAR, or equivalent, fans operating at or below 1 sone	**3**
(Points awarded per fan.)	

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.	
(2) *The addition or renovation area are sealed off from the occupied portion of the building or dwelling unit. The same HVAC system for conditioning the air in renovated and occupied space is not used.*	
(3) *The building or dwelling unit is not occupied during the entire construction period and Sections 902.4(1) and 902.4(2) are implemented.*	

11.902.5 Central vacuum systems. Central vacuum system is installed and vented to the outside.	**5**
11.902.6 Living space contaminants. The living space is sealed to prevent unwanted contaminants.	
(1) Attic access, knee wall door, or drop down stair is caulked, gasketed, or otherwise sealed.	**2**
(2) All penetrations, (e.g., top plates, HVAC register boots, recessed can lights), are sealed in the following areas:	
(a) attic/ceiling	**2**
(b) wall	**2**
(c) floors	**2**

11.903.1 Tile backing materials.	
11.36.1 New Work. Tile backing materials installed under tiled surfaces in wet areas are in accordance with ASTM C1178, C1278, C1288, or C1325.	**Mandatory**
11.36.2 Re-Work. Existing tiled surfaces in wet areas are inspected and any areas with evidence of moisture damaged are repaired with tile backing materials installed under tiled surfaces are in accordance with ASTM C1178, C1278, C1288, or C1325.	

11.903.2.1 Capillary breaks	
11.37.1 New Work. A capillary break and vapor retarder are installed at all concrete slabs in accordance with Sections 903.2.1(1) or 903.2.1(2), as modified by Section 903.2.1(3): **(1)** A minimum 4-inch-thick (102 mm) bed of ½-inch (13 mm) diameter or greater clean aggregate, covered with polyethylene or polystyrene sheeting in direct contact with the concrete slab, with the sheeting joints lapped in accordance with Section 903.3. **(2)** A minimum 4-inch-thick (102 mm) uniform layer of sand, overlain with a layer or strips of geotextile drainage matting, covered with polyethylene sheeting, with the sheeting joints lapped in accordance with Section 903.3. **(3)** Modification: **(a)** In areas with free-draining soils, identified as Group 1 in the ICC IRC by a certified hydrologist, soil scientist, or engineer through a site visit, a gravel bed or geotextile matting is not required. **(b)** In Dry climate locations, as defined by Figure 6(1), polyethylene sheeting is not required unless required for radon resistance (Section 902.3).	**Mandatory**
11.37.2 Re-Work. A capillary break and vapor retarder are installed at newly installed concrete slabs in accordance with Sections 903.2.1(1) or 903.2.1(2), as modified by Section 903.2.1(3): **(1)** A minimum 4-inch-thick (102 mm) bed of ½-inch (13 mm) diameter or greater clean aggregate, covered with polyethylene or polystyrene sheeting in direct contact with the concrete slab, with the sheeting joints lapped in accordance with Section 903.3. **(2)** A minimum 4-inch-thick (102 mm) uniform layer of sand, overlain with a layer or strips of geotextile drainage matting, covered with polyethylene sheeting, with the sheeting joints lapped in accordance with Section 903.3. **(3)** Modification: **(a)** In areas with free-draining soils, identified as Group 1 in the ICC IRC by a certified hydrologist, soil scientist, or engineer through a site visit, a gravel bed or geotextile matting is not required. **(b)** In Dry climate locations, as defined by Figure 6(1), polyethylene sheeting is not required unless required for radon resistance (Section 902.3).	

11.903.2.2 a capillary break is installed on new footings to prevent moisture migration into foundation wall.	**3**

11.903.3.1 Crawlspaces **New Work.** Crawlspace vapor retarder is in accordance with the following, as applicable. Joints of vapor retarder overlap a minimum of 6 inches (152 mm) and are taped. Walls. Damp-proof walls are provided below finished grade.	**Mandatory**

Re-Work. Existing crawlspace is inspected and when there is evidence of a moisture problem a crawlspace vapor retarder is installed in accordance with the following, as applicable. Joints of vapor retarder overlap a minimum of 6 inches (152 mm) and are taped. Damp-proof walls are provided below finished grade.	
11.903.3.2 Crawl space 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 lapped 6 mil polyethylene or polystyrene	**10**
(2) 6 mil polyethylene sheeting, lapped a minimum of 6 inches (152 mm), and taped at the seams	**8**

11.903.4.1 Moisture control measures **New and Re-Work.** Walls are not enclosed (e.g., with drywall) if the insulation has a high moisture content. Wet insulation products are dry before enclosing.	**Mandatory**

11.903.4.2 Moisture control measures.	
Moisture content of subfloor, substrate, or concrete slabs is in accordance with the appropriate industry standard for the new finish flooring to be applied.	**Mandatory**
(1) Building materials with visible mold are not installed or are cleaned or encapsulated prior to concealment and closing.	**2**
(3) The moisture content of lumber is sampled to ensure it does not exceed 19 percent prior to the surface and/or wall cavity enclosure.	**4**

11.903.6 Duct insulation.	
New Work. All HVAC ducts, plenums, and trunks in unconditioned attics, basements, and crawl spaces are insulated to a minimum of R-6. Outdoor air supplies to ventilation systems are insulated to a minimum of R-6.	**Mandatory**
Re-Work. All HVAC ducts, plenums, and trunks in unconditioned attics, basements, and crawl spaces that become accessible during the remodeling are insulated to a minimum of R-6. Outdoor air supplies to ventilation systems are insulated to a minimum of R-6.	
11.903.5 Plumbing	
11.903.5.1 Plumbing distribution lines are not installed in newly constructed exterior wall cavities.	**2**
(1) *A minimum of 50 percent of exterior wall piping is removed.*	***3***
(2) *A minimum of 50 percent of exterior wall piping is insulated.*	***2***
11.903.5.2 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**
11.903.5.3 Plumbing is not installed in unconditioned spaces.	**5**
11.*903.7* *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*	***8***

following:	
(Points not awarded in remaining climate zones.)	
(1) additional dehumidification system(s) **(2)** central HVAC system equipped with additional controls to operate in dehumidification mode	

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

11.*904.3*	
11.43.1 New and Re-Work. All gas dryer vents are sealed and vented outdoors.	**Mandatory**

11.1001.1 For Single Family homes An building owner's manual is provided that includes a minimum of at least 9 of the following, as available and applicable. **(Points awarded per two items. Points awarded for both mandatory and non-mandatory items.)**		**1**
(1)	A green building program certificate or completion document.	**Mandatory**
(2)	List of green building features included in the scope of the remodeling project.	**Mandatory**
(3)	Product manufacturer's manuals or product data sheet for newly 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)	Information on local recycling programs.	
(5)	Information on available local utility programs that purchase a portion of energy from renewable energy providers.	
(6)	Explanation of the benefits of using energy efficient lighting systems (e.g., compact fluorescent light bulbs, light emitting diode (LED)) in high usage areas	
(7)	A list of practices to conserve water and energy.	
(8)	Local public transportation options.	
(9)	A diagram showing the location of safety valves and controls for major building systems.	
(10)	Where frost-protected shallow foundations are used, owner is informed of precautions including: • instructions to not remove or damage insulation when modifying landscaping • providing heat to the building as required by the ICC IRC or IBC • keeping base materials beneath and around the building free from moisture due to	

broken water pipes or other water sources **(11)** A list of local service providers that offer regularly scheduled service and maintenance contracts to assure 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).	
(12) 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. **(13)** Maintenance checklist. **(14)** List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials. **(15)** Information on organic pest control, fertilizers, deicers, and cleaning products. **(16)** Information on native landscape materials and/or those that have low-water requirements. **(17)** Information on methods of maintaining the building's relative humidity in the range of 30 percent to 60 percent. **(18)** Instructions for inspecting the building for termite infestation. **(19)** Instructions for maintaining gutters and downspouts and importance of diverting water a minimum of five feet away from foundation. **(20)** A narrative detailing the importance of maintenance and operation in retaining the attributes of a green-built building.	
(21) *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"*	

11.1002.1 Training of Building Owners	
11.46.1 Building owners/occupants are familiarized with the green building goals and strategies implemented and the impacts of the occupants' practices on the costs of operating the building. Training is provided to the responsible party(ies) regarding all newly installed equipment operation and control systems. Systems include, but are not limited to, the following: HVAC filters, thermostat, appliances, water heater, and fan controls.	**Mandatory**

11.1003 Multi-unit Building Operations	
Maintenance and operations Manuals: The operations and maintenance manuals for multi-family buildings are updated to reflect the remodeling changes and are provided to the responsible parties.	**Mandatory**

11.1003.1 A building construction manual, including five or more of the following, is compiled and distributed in accordance with Section 1003.0. **(Points awarded per two items. Points awarded for both mandatory and 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, and the individual measures achieved by the building.	**Mandatory**
(3) Warranty, operation, and maintenance instructions for all newly installed equipment, fixtures, appliances, and finishes.	**Mandatory**
(4) Record drawings of the building used in the remodeling. **(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.	

11.1003.2 Operations manuals are created and distributed to the responsible parties in accordance with Section 1003.0. Between all of the operation manuals, six or more of the following options are included. ***(Points awarded per two items. Points awarded for both mandatory and 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.	**Mandatory**
(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.	

11.1003.3 Maintenance manuals are created and distributed to the responsible parties in	**1**

accordance with Section 1003.0. Between all of the maintenance manuals, six or more of the following options are included. ***(Points awarded per two items. Points awarded for both mandatory and non-mandatory items.)***	
(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 assure 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 importance of diverting water a minimum of five 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.	

CHAPTER 12

Small Renovations

Intent – This chapter defines the green practices that are appropriate for small renovations.

12.1 Bathroom Renovations

12.1.1 Mandatory Practices for Bathroom Renovations

12.1.1.1 Resource Efficiency
12.1.1.1 (a) Recycled content. Building materials with recycled content are used for two minor or major components of the renovation.

12.1.1.1(b) Demolition Waste. All waste classified as hazardous generated during demolition shall be properly handled and disposed.

12.1.1.1(c) Demolition Waste. At least 50% of demolition waste not classified as hazardous is diverted from landfill.

12.1.1.1(d) Wood-based products. All newly installed rough framing materials are certified to the requirements of one of the following recognized product programs:

AFF *American Tree Farm System®*
Canadian Standards Association's *Sustainable Forest Management System Standards* (CSA Z809)
Forest Stewardship Council (FSC)
Program for Endorsement of Forest Certification Systems (PEFC)
Sustainable Forestry Initiative® Program (SFI)
other product programs mutually recognized by PEFC

12.1.1.1(e) Recycled content. Building materials with at least 25% recycled content are used in the renovation. The cost of these materials exceeds 3% of the project contract price.

12.1.1.1(d) Newly installed finish flooring materials have manufacturer's recommendation for use in bathrooms.

12.1.1.2 Energy Efficiency
12.1.1.2(a) Fenestration. NFRC-certified U-factor and SHGC windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with ENERGY STAR, or equivalent, or Table 701.4.4.1. Decorative fenestration elements with a 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.

Table 701.4.4.1
Fenestration Specifications

Climate Zones	U-Factor	SHGC
	Windows and Exterior Doors (maximum certified ratings)	
1 and 2	0.65	0.40
3	0.40	0.40
4 to 8	0.35	Any
	Skylights and TDDs (maximum certified ratings)	
1 to 3	0.75	0.40
4 to 8	0.60	Any

12.1.1.2(b) Building Envelope. When the renovation involves exposing the wall cavity such that insulation can be upgraded and the UA is less than required by ICC IECC, Section 402.1.4, the UA of the exposed envelope is increase by at least 50%.

12.1.1.2(c) Lighting. A minimum of 50 percent of the newly installed hard-wired lighting fixtures qualify as ENERGY STAR or equivalent and a minimum of 50 percent of the bulbs in existing hard-wired lighting fixtures qualify as ENERGY STAR or equivalent.

12.1.1.2(d) All washing machines, if installed, are ENERGY STAR or equivalent.

12.1.1.3 Water Efficiency

12.1.1.3(a) The water consumption of bathroom fixtures complies with:

Showerheads. The total showerhead flow rate at any point in time in each shower compartment is in accordance is less than 2.5 gpm. The total flow rate is tested at 80 psi (552 kPa) in accordance with ASME A112.18.1. Showers are equipped with 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.

Faucets. Water-efficient lavatory faucets with 1.5 gpm (5.68 L/m) or less maximum flow rate when tested at 60 psi (414 kPa) in accordance with ASME A112.18.1 are installed.

Water Closets. A water closet is installed with an effective flush volume of 1.28 gallons (4.85 L) or less when tested in accordance with ASME A112.19.2 (all water closets) and ASME A112.19.14 (all dual flush water closets), and is in accordance with EPA WaterSense *Tank-Type High-Efficiency Toilet*.

12.1.1.4 Indoor Environmental Quality

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

12.1.1.4(b) Newly applied interior products are in accordance with one or more of the following standards:

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

CARB *Suggested Control Measure for Architectural Coatings*

GS-11

VOC limits in accordance with:

(a) 50 grams/liter flat
(b) 100 grams/liter non flat
(c) 350 grams/liter clear wood varnish
(d) 550 grams/liter clear wood lacquer

CDPH 01350, as certified by a third party program such as the GREENGUARD Environmental Institute's *Children and Schools Certification Program* or the Scientific Certification Systems *Indoor Advantage Gold Program*

12.1.1.4(c) Interior low-VOC adhesives and sealants. A minimum of 85 percent of newly applied products used within the interior of the building are in accordance with one of the following, as applicable.

CDPH 01350, as certified by a third party program, such as the GREENGUARD Environmental Institute's *Children and Schools Certification Program* or the Scientific Certifications Systems *Indoor Advantage Gold Program*.

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12.1.1.4(d) 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.

12.1.1.4(e) HVAC System Protection. *The renovation area is sealed off from the occupied portion of the building or dwelling unit. The same HVAC system for conditioning the air in renovated and occupied space is not used.* HVAC supply registers (boots), return grilles, and rough-ins in the renovation area are covered during construction activities to prevent dust and other pollutants from entering the system.

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

12.1.1.5(g) Moisture Control. Building materials with visible mold are not installed or utilized or are cleaned or encapsulated prior to concealment and closing. Any water damaged materials replaced or repaired prior to enclosing.

12.1.1.6 Home Owner Education

12.1.1.6 (a) Building owners/occupants are familiarized with the green building goals and strategies implemented during the renovation and the impacts of the occupants' practices on the costs of operating the building. Training is provided to the responsible party(ies) regarding all equipment operation and control systems in the bathroom.

12.1.2 Optional Practices for Bathroom Renovations

12.1.2.1Resource Efficiency
12.1.2.1(a) Wood-based products. Wood based materials that are certified to the requirements of one of the following recognized product programs are used for:
12.1.2.1(a)(i) Newly installed cabinets
(a) (ii) Newly installed trim
AFF *American Tree Farm System®*
Canadian Standards Association's *Sustainable Forest Management System Standards* (CSA Z809)
Forest Stewardship Council (FSC)
Program for Endorsement of Forest Certification Systems (PEFC)
Sustainable Forestry Initiative® Program (SFI)
other product programs mutually recognized by PEFC

12.1.2.1(b) Recycled content. Building materials with recycled content are used in the renovation meeting one of the criteria in Table 12.1.2.1(a). These materials are in excess of those required to meet 12.1.1.1(e).

Table 12.1.2.1(a)

Recycled Content	Cost of Materials
25% or more	5% of project contract price
50% or more	4% of project contract price
75% or more	3% of project contract price

12.1.2.1(c) Salvaged materials. Reclaimed and/or salvaged materials and components are used. The value of the material and labor cost of salvaged materials is equal to or exceeds 1 percent of the project contract price.

12.1.2.2 Indoor Environmental Quality
12.1.2.2(a) Cabinets. Bath vanity cabinets in accordance with one of the following are installed:
KCMA ESP 01, or equivalent
CARB *Composite Wood Air Toxic Contaminant Measure Standard*
Containing no added urea formaldehyde or are in accordance with GGPS.EC.010.R0, ASTM D 6670, or equivalent

12.1.2.2(b) Drywall materials. All newly installed drywall materials are moisture and mildew resistant.

12.2 Green Kitchen Remodel

All applicable requirements must be met.
12.2.1 At least 75% of all major kitchen appliances must be energy star.
12.2.2 Newly applied interior paint products are in accordance with one or more of the following standards:
Zero VOC as determined by EPA Method 24 (VOC content below the detection limit for the method)
CARB *Suggested Control Measure for Architectural Coatings*
GS-11
VOC limits in accordance with:
(a) 50 grams/liter flat
(b) 100 grams/liter non flat
(c) 350 grams/liter clear wood varnish
(d) 550 grams/liter clear wood lacquer
CDPH 01350, as certified by a third party program such as the GREENGUARD Environmental Institute's *Children and Schools Certification Program* or the Scientific Certification Systems *Indoor Advantage Gold Program*

12.2.3 Fenestration. Newly installed windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with ENERGY STAR, or equivalent, or Table 701.4.4.1. Decorative fenestration elements with a 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.

Table 701.4.4.1
Fenestration Specifications

Climate Zones	U-Factor	SHGC
	Windows and Exterior Doors (maximum certified ratings)	
1 and 2	0.65	0.40
3	0.40	0.40
4 to 8	0.35	Any
	Skylights and TDDs (maximum certified ratings)	
1 to 3	0.75	0.40
4 to 8	0.60	Any

12.2.3 Newly installed doors and windows have caulking, gasketing, adhesive flashing tape, foam sealant, or weather stripping installed forming a complete air barrier. Existing windows and doors are inspected and any air barrier weaknesses are corrected.

12.2.4 All gutted or newly constructed exterior walls and exterior ceilings must be insulated to a minimum R-value for the climate zone per table: "Can we insert values based on current code?"

Minimum R-value

Climate Zone	1	2	3	4	5	6	7+
Walls							
Ceiling/attic							

12.2.5 Insulation and wall framing must be dry with no evidence of mold prior to enclosing the wall with new drywall.
12.2.6 At least 50%f finished materials installed must be pre-finished.
12.2.7 Cabinets must be KCMA ESP01 or equivalent.
12.2.8 A place for recycling of household items (glass, paper, plastic, etc) must be provided or 50% of newly installed building materials must contain at least 35% recycled content.
12.2.9 Interior low-VOC adhesives and sealants. All newly applied products used within the interior of the building are in accordance with one of the following, as applicable.

CDPH 01350, as certified by a third party program, such as the GREENGUARD Environmental Institute's *Children and Schools Certification Program* or the Scientific Certifications Systems *Indoor Advantage Gold Program*.
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12.2.10 Kitchen exhaust fan must be vented outside.
12.2.11 A garbage disposal must be installed in the kitchen sink unless local regulations prohibit installation.
12.2.12 All hazardous material that is removed or disturbed must be properly handled and disposed.
12.2.13 Lighting – practice details TBD
12.2.13 Disposal of Existing Kitchen – practice details TBD
12.2.14 Water Usage – practice details TBD

12.3 Basement Remodeling

12.3.1**Design and Planning**
12.3.1.1 Concrete moisture test – practice details TBD
12.3.1.2 Moisture intrusion assessment

Space below grade has exterior drain tile installed or other moisture mitigation system installed where required by the ICC IRC or IBC if there is evidence of moisture issues in the space.

12.3.1.3 Radon test – if above 4.0pcl add mitigation and verify it is functioning.

12.3.2Framing

12.3.2.1 Maintain 1” gap between exterior block or poured concrete wall and new interior framing.
12.3.2.2 Framing lumber is from one of the following certified programs or framing lumber is reused or reclaimed materials:

AFF *American Tree Farm System*®
Canadian Standards Association’s *Sustainable Forest Management System Standards* (CSA Z809)
Forest Stewardship Council (FSC)
Program for Endorsement of Forest Certification Systems (PEFC)
Sustainable Forestry Initiative® Program (SFI)
other product programs mutually recognized by PEFC

12.3.2 HVAC
12.3.2.1 No transite heat.
12.3.2.2 Exposed or newly installed Ducts are sealed with tape complying with UL 181, mastic, gaskets, or an approved system as required by the ICC IRC, Section M1601.3.1, or ICC IMC, Section 603.9, to reduce leakage.

12.3.4 Plumbing
12.3.4.1 Bathroom – Bathroom installation or remodeling that is part of a basement remodel must comply with the section 12.1
12.3.4.2 Accessible hot water lines are insulated to a minimum of R-4.

12.3.5 Electrical
12.3.5.1CFL, LED, or dimmers. – practice details TBD

12.3.6 Insulation
12.3.6.1 Exterior walls are insulated to a minimum of R-13.
12.3.6.2 Rim joists are insulated to a minimum of R – TBD.
12.3.6.2 Air Sealing – practice details TBD
12.3.6.3 Vapor barrier – practice details TBD

12.3.7 Sheetrock
12.3.7.1 Walls are enclosed with mold resistant sheetrock or other mold resistant material.

12.3.8 Trim and Cabinets
Cabinet and trim materials are from one of the following certified sources or are reclaimed or reused materials:

AFF *American Tree Farm System*®
Canadian Standards Association’s *Sustainable Forest Management System Standards* (CSA Z809)
Forest Stewardship Council (FSC)
Program for Endorsement of Forest Certification Systems (PEFC)
Sustainable Forestry Initiative® Program (SFI)
other product programs mutually recognized by PEFC

12.3.8 Cabinet and trim materials contain no added urea formaldehyde.

12.3.9 Countertops
Recycled content, reused, reclaimed, or locally sourced. – practice details TBD.

12.3.10 Tile
Recycled content, reused, reclaimed, or locally sourced. – practice details TBD.

12.3.11 Appliances
When there is an Energy Star appliance available, Energy Star appliances are installed.

12.3.12 Floorcovering

Floors are not covered with carpet.

12.3.13 Paint and Stain

Newly applied interior paint or stain products are in accordance with one or more of the following standards:

Zero VOC as determined by EPA Method 24 (VOC content below the detection limit for the method)
CARB *Suggested Control Measure for Architectural Coatings*
GS-11
VOC limits in accordance with:
(a) 50 grams/liter flat
(b) 100 grams/liter non flat
(c) 350 grams/liter clear wood varnish
(d) 550 grams/liter clear wood lacquer
CDPH 01350, as certified by a third party program such as the GREENGUARD Environmental Institute's *Children and Schools Certification Program* or the Scientific Certification Systems *Indoor Advantage Gold Program*

12.4 Small Addition

12.4.0.1 A small addition that includes a kitchen shall also comply with section 12.2
12.4.0.2 A small addition that also includes a bathroom shall also comply with section 12.1

12.4.1 LOT DESIGN, PREPARATION, AND DEVELOPMENT

12.4.1.1 A tree preservation plan is provided and implemented for any tree larger than 8" diameter breast high, whose dripline extends over the area of disturbance.

12.4.1.2 Sediment control measures which prevent the flow of silt from the work area and stockpiles are established prior to land disturbing activities.

12.4.1.3 Low impact development measures are provided, to prevent an increased flow of stormwater runoff[1] into public rights-of-way, or adjacent properties or natural watersheds.

12.4.2 RESOURCE EFFICIENCY

12.4.2.1 Finished grade: Finish grade at all sides of the additon is sloped to provide a minimum of 6 inches (150 mm) of fall within 10 feet (3048 mm) of the edge of the addition. 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 addition at a minimum slope of 5 percent and the water is directed to drains or swales to ensure drainage away from the structure.

12.4.2.2 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.

12.4.2.3 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 and extends at a minimum of 24 inches (610 mm) inside the exterior wall line of the addition.

12.4.2.5 Construction waste management plan: A construction waste management plan is developed, posted at the jobsite, and implemented with a goal of recycling or salvaging a minimum of 50 percent (by weight) of construction and land-clearing waste. The construction waste management plan includes information on the proper handling and disposal of hazardous wastes

12.4.2.6 Hazardous waste: All waste classified as hazardous waste is properly handled and disposed of.

12.4.3 ENERGY EFFICIENCY

12.4.3.1 Space heating and cooling:

(1) *Where new space heating and cooling system/equipment is installed to serve existing space and the addition, or to serve the addition independently*, the system/equipment is sized according to heating and cooling loads calculated using ACCA Manual J, or equivalent. Where installed as a primary heat source in the building, radiant or hydronic space heating system is designed using industry-approved guidelines (e.g., ACCA Manual J, GAMA H-22, or an accredited design professional's and manufacturer's recommendations).

(2) Where existing *space heating and cooling system/equipment is extended to serve the addition, the capacity of the existing system is adequate for the additional loads, as determined by using ACCA Manual J, or equivalent.*

12.4.3.2 Duct system in new space: Newly installed ducts are sealed with tape complying with UL 181, mastic,

1 Relative to flow rates prior to construction

gaskets, or an approved system as required by the ICC IRC, Section M1601.3.1, or ICC IMC, Section 603.9 to reduce leakage. Building cavities in the addition are not used as supply ducts.

12.4.3.3 Insulation and air sealing :

(1) Insulation for the addition is installed in accordance with the manufacturer's instructions or local code, as applicable.

(2) Openings from the addition into unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam. Fire-rated collars and caulking are installed where required.

(3) Where insulated, wall insulation in the new crawlspace is permanently attached to the walls. Exposed earth in new unvented crawlspaces is covered with continuous vapor retarder with overlapping joints that are taped or masticed.

(4) Caulking, gasketing, adhesive flashing tape, foam sealant, or weatherstripping is installed forming a complete air barrier for newly installed windows and doors.

(5) Newly installed band and rim joists are insulated and air sealed.

(6) Sill sealer or other material that will expand and contract is installed between new foundation and sill plate. Caulk or the equivalent is installed to seal the bottom plate of new exterior walls.

(7) New skylight shafts and knee walls are insulated to the same level as the exterior walls.

(8) Code required building envelope insulation and air sealing for the addition are not disrupted at exterior architectural features such as stairs and decks.

(9) Attic access, knee wall door, or drop-down stair in the addition is covered with insulation and gasketed. Knee wall door is insulated unit or is covered with insulation.

(10) Recessed light fixtures that penetrate the thermal envelope of the addition are airtight, IC-rated, and sealed with gasket, caulk, or foam

(11) Where ceiling/attic assemblies or designs for the addition have eave vents, baffles or other means are implemented to minimize air movement into or under the insulation.

12.4.3.4 Fenestration (per 701.4.4.1)

NFRC-certified U-factor and SHGC windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with ENERGY STAR, or equivalent, or Table 701.4.4.1. Decorative fenestration elements with a 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.

Table 701.4.4.1
Fenestration Specifications

Climate Zones	U-Factor	SHGC
	Windows and Exterior Doors (maximum certified ratings)	
1 and 2	0.65	0.40
3	0.40	0.40
4 to 8	0.35	Any
	Skylights and TDDs (maximum certified ratings)	
1 to 3	0.75	0.40
4 to 8	0.60	Any

12.4.3.5 U/A is 15% less than the minimum required by the current IECC or prevailing code for the jurisdiction, whichever is less restrictive.

12.4.3.6 Duct system sizing (per 704.4.1) Duct system in the addition is sized, designed, and installed in accordance with ACCA Manual D or equivalent.

12.4.4 INDOOR ENVIRONMENTAL QUALITY

12.4.4.1 Natural draft equipment (per 901.1.1) Natural draft space heating or water heating equipment is not located in conditioned spaces of the addition, including conditioned crawlspaces. Natural draft equipment is

permitted to be installed within the conditioned spaces if located in a mechanical room that has an outdoor air source, and is otherwise sealed and insulated to separate it from the conditioned space(s).

12.4.4.2 Fireplaces, etc (per 901.2.1)

Fireplaces and natural draft fuel-burning appliances are code compliant, vented to the outdoors, and have adequate combustion and ventilation air provided to minimize spillage or back-drafting, in accordance with the following, as applicable.

(1) Natural gas and propane fireplaces that are power vented or direct vented, are equipped with permanently fixed glass fronts or gasketed doors, and comply with CSA Z21.88a/CSA 2.33a or CSA Z21.50/CSA 2.22.

(2) Solid fuel burning appliances are in accordance with the following requirements:

(b) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are EPA certified.

(c) 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).

(d) Pellet (biomass) stoves and furnaces are in accordance with the requirements of ASTM E1509 or are EPA certified.

(e) Masonry heaters are in accordance with the definitions in ASTM E1602 and ICC IBC, Section 2112.1.

12.4.4.3 Garages (per 901.3.1 (a) and (b)) Where installed in the common wall between the attached garage and conditioned space in the addition, the door is tightly-sealed and gasketed. A continuous air barrier is provided between walls and ceilings of the addition separating the garage space from the conditioned living spaces.

12.4.4.4 Plywood and sheathing (per 901.4 (1)) A minimum of 85% of the structural plywood used for floor, wall, and/or roof sheathing of the addition 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.

12.4.4.5 Carpet (per 901.5 (1)) Wall-to-wall carpeting is not installed adjacent to water closets and bathing fixtures.

12.4.4.6 Arch Coatings when building is occupied (per 901.8)

Architectural coatings. When the building is occupied during the construction of the addition a minimum of 85 percent of the architectural coatings are in accordance with either Section 901.8.1 or Section 901.8.2, not both:

901.8.1 Site-applied interior products are in accordance with one or more of the following standards:

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

(2) CARB *Suggested Control Measure for Architectural Coatings*

(3) GS-11

(4) VOC limits in accordance with:
- **(a)** 50 grams/liter flat
- **(b)** 100 grams/liter non flat
- **(c)** 350 grams/liter clear wood varnish
- **(d)** 550 grams/liter clear wood lacquer

901.8.2 Site-applied interior products are in accordance with the emissions levels of CDPH 01350, as certified by a third party program such as the GREENGUARD Environmental Institute's *Children and Schools Certification Program* or the Scientific Certification Systems *Indoor Advantage Gold Program*.

12.4.4.6 Adhesives and sealant when building is occupied (per 901.9)

Adhesives and sealants. When the building is occupied during the construction of the addition, a minimum of 85 percent of site-applied adhesives and sealants are in accordance with Section 901.9.1 and/or Section 901.9.2.

901.9.1 Exterior low-VOC adhesives and sealants: A minimum of 85 percent of site-applied products used for the installation of subfloors and on the exterior of the project are in accordance with one of the following:

(1) The California Air Resources Board consumer products regulation as follows:

- **(a)** Construction Adhesives: VOC content not to exceed 7 percent by weight or 75 grams/liter, whichever is greater.
- **(b)** The VOC content of reactive sealants (i.e., silicones, polyurethanes, and hybrids, such as MS Polymer and silylated polyurethane resin or SPUR) not to exceed 4 percent by weight or 50 grams/liter, whichever is greater.
- **(c)** The VOC content of all other caulks and sealants not to exceed 2 percent by weight or 30 grams/liter, whichever is greater.
- **(d)** The VOC content of contact adhesives not to exceed 55 percent by weight or 480 grams/liter, whichever is greater.

(2) GS-36

12.4.4.8 Lead safe (per 901.15) *For building constructed prior to 1978, lead-safe work practices are used during renovation, remodeling, painting, and demolition.*

12.4.4.9 Spot ventilation (per 902.1.1 (1) and (2)

Spot ventilation for the addition 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 are vented to the outdoors.

12.4.4.10 Radon control measures are in accordance with ICC IRC Appendix F

12.4.4.11 HVAC system protection (per 902.4 – select one measure)

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.

Addition and Renovation Note: *Section 902.4(1) does not apply to additions and renovations except as noted in Addition and Renovation Note (3) below.*

(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.

Addition and Renovation Note: *As an alternative to Section 902.4(2), one of the following options is implemented:*

(1) *During construction, a construction indoor air quality (IAQ) schedule is developed that includes, at minimum, all of the following:*

- ***(a)*** *type of construction activity*
- ***(b)*** *ability to occupy the building or dwelling unit*
- ***(c)*** *IAQ protections for occupant(s) of the building or dwelling unit*
- ***(d)*** *hazardous waste removal*
- ***(e)*** *name and age of occupants of the building or dwelling unit at a specific time*

(2) *The addition or renovation area are sealed off from the occupied portion of the building or dwelling unit. The same HVAC system for conditioning the air in renovated and occupied space is not used.*

(3) *The building or dwelling unit is not occupied during the entire construction period and Sections 902.4(1) and 902.4(2) are implemented.*

12.4.4.12 Tile backing (per 903.1) Tile backing materials installed under tiled surfaces in wet areas are in

accordance with ASTM C1178, C1278, C1288, or C1325

12.4.4.13 Capillary breaks (per 903.2.1)

A capillary break and vapor retarder are installed at all concrete slabs in the addition in accordance with Sections 903.2.1(1) or 903.2.1(2), as modified by Section 903.2.1(3):
(1) A minimum 4-inch (102 mm) thick bed of ½-inch (13 mm) diameter or greater clean aggregate, covered with polyethylene or polystyrene sheeting in direct contact with the concrete slab, with the sheeting joints lapped in accordance with Section 903.3.
(2) A minimum 4-inch (102 mm) thick uniform layer of sand, overlain with a layer or strips of geotextile drainage matting, covered with polyethylene sheeting, with the sheeting joints lapped in accordance with Section 903.3.
(3) Modification: **(a)** In areas with free-draining soils, identified as Group 1 in the ICC IRC by a certified hydrologist, soil scientist, or engineer through a site visit, a gravel bed or geotextile matting is not required. **(b)** In Dry climate locations, as defined by Figure 6(1), polyethylene sheeting is not required unless required for radon resistance (Section 902.3).

12.4.4.14 Crawlspace vapor retarder and damp proof (per 903.3.1)

Addition crawlspace vapor retarder 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 up the wall sufficient to allow the material to be affixed with glue and furring strips.
(2) Walls. Damp-proof walls are provided below finished grade.

12.4.4.15 Moisture in walls not yet enclosed (per 903.4.1 (2)) Walls of the addition are not enclosed (e.g. with drywall) if the insulation has a high moisture content. Wet insulation products are dry before enclosing.

12.4.4.16 Moisture content of substrates (per 903.4.2) Moisture content of subfloor, substrate, or concrete slabs in the addition is in accordance with the appropriate industry standard for the finish flooring to be applied.

12.4.4.17 Duct insulation in unconditioned space (per 903.6 (1)) All HVAC ducts, plenums, and trunks in unconditioned attics, basements, and crawl spaces of the addition are insulated to a minimum of R-6. Outdoor air supplies to ventilation systems are insulated to a minimum of R-6.

12.4.5 OPERATION, MAINTENANCE, AND BUILDING OWNER EDUCATION

A building owner's manual is provided that includes the following, as available and applicable.
(1) A green building program certificate or completion document.
(2) List of green building features in the addition (can include the national green building checklist).
(3) Product manufacturer's manuals or product data sheet for installed major equipment, fixtures, and appliances in the addition. 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.

CHAPTER 13

REFERENCED DOCUMENTS

SECTION 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.

SECTION 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	2006	Residential Duct Systems	704.4.1
Manual J	2006	Residential Load Calculation, Eighth Edition, Version 2	701.4.1.1, 701.4.1.2
Manual S	2004	Residential Equipment Selection	704.5.1
Manual T	1983	Air Distribution Basics for Residential and Small Commercial Buildings	704.4.1

AFF		*American Forest Foundation, Inc.* *1111 Nineteenth Street, NW* *Suite 780* *Washington, DC 20036* *www.forestfoundation.org*	*(202) 463-2462*
2004-2008 AFF Standards	2004	American Tree Farm System Standards for Sustainability for Forest Certification, including Performance Measures and Field Indicators	606.2(a)

ASHRAE		*American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.* *1791 Tullie Circle, N.E.* *Atlanta, GA 30329* *www.ashrae.org*	*(404) 636-8400*
52.2	1999	Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size	202

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	2005	Plumbing Supply Fittings	801.4, 801.5.1
A112.19.2	2003	Vitreous China Plumbing Fixtures and Hydraulic Requirements for Water Closets and Urinals	801.6(2), 801.6(3)
A112.19.14	2006	Six-Liter Water Closets Equipped with a Dual Flushing Device	801.6(2)

ASSE		*American Society of Sanitary Engineering* *901 Canterbury, Suite A* *Westlake, OH 44145* *www.asse-plumbing.org*	*(440) 835-3040*
1016	2005	Performance Requirements for Automatic Compensating Valves for Individual Showers and Tub/Shower Combinations	801.4

ASTM		*ASTM International, Inc.* *100 Barr Harbor Drive, PO Box C700* *West Conshohocken, PA 19428* *www.astm.org*	*(610) 832-9500*
C1178	2006	Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel	903.1
C1278	2006	Standard Specification for Fiber-Reinforced Gypsum Panel	903.1
C1288	2004	Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets	903.1
C1325	2004	Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets	903.1
D6670	2007	Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products	901.10(3)
E1509	2005	Standard Specification for Room Heaters, Pellet Fuel-Burning Type	901.2.1(2)(d)
E1602	2003	Standard Guide for Construction of Solid Fuel Burning Masonry Heaters	901.2.1(2)(e)

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), 901.10(2)
	2000	Suggested Control Measure for Architectural Coatings	901.8.1(2)

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.	901.5(2), 901.6, 901.7, 901.8.2, 901.9.2(1), 901.11(1), 901.11(2)

CPA		*Composite Panel Association* *18922 Premiere Court* *Gaithersburg, MD 20879-1574* *www.pbmdf.com*	*(301) 670-0604*
A208.1	1999	Particleboard	901.4(2)
A208.2	2002	Medium Density Fiberboard (MDF) for Interior Application	901.4(2)
CPA 3	2008	Environmentally Preferable Product Specification	901.4(4)

CSA		*CSA International* *8501 East Pleasant Valley Road* *Cleveland, OH 44131-5575* *www.csa-international.org*	*(216) 524-4990*
6.19	2001	Residential Carbon Monoxide Alarming Devices	901.12
Z21.50/CSA 2.22	2007	Vented Gas Fireplaces	901.2.1(1)
Z21.88a-2007/CSA 2.33a	2007	Vented Gas Fireplace Heaters w/ Addenda 1	901.2.1(1)
Z809	2002	Sustainable Forest Management Requirements and Guidance (SFM)	606.2(b)

DOC		*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	2007	Construction and Industrial Plywood	901.4(1)
PS-2	2004	Performance Standard for Wood-based Structural-use Panels	901.4(1)

DOE		*U.S. Department of Energy* *1000 Independence Ave., SW* *Washington, DC 20585* *www.energy.gov*	*800-345-3363*
v. 4.0.1	2007	RESCheck	703.1.1

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	1001.1
Method 24	2000	Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings	901.8.1(1)
	1990	Asbestos in the Home: A Homeowner's Guide	1001.1
ENERGY STAR® Documents			
	September 7, 2005	ENERGY STAR Homes Guidelines	701.1.3
	January 1, 2007	ENERGY STAR Program Requirements for Clothes Washers	704.2.5, 801.2
	January 1, 2007	ENERGY STAR Program Requirements for Dishwashers	704.2.5, 801.2
	April 1, 2001	ENERGY STAR Program Requirements for Geothermal Heat Pumps – Eligibility Criteria Version 2.0	703.4.6
	1995	ENERGY STAR Program Requirements for Programmable Thermostats – Eligibility Criteria Version 1.	703.4.10
	August 1, 2008	ENERGY STAR Program Requirements for Residential Light Fixtures	704.2.1
	August 3, 2007	ENERGY STAR Program Eligibility Criteria for Residential Refrigerators and/or Freezers	704.2.5
	September 1, 2006	ENERGY STAR Program Requirements for Residential Ceiling Fans – Eligibility Criteria Version 2.1	703.4.7
	October 1, 2003	ENERGY STAR Program Requirements for Residential Ventilating Fans – Eligibility Criteria Version 2.0	902.1.4(1) & (2)
	June 6, 2005	ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Eligibility Criteria Version 3.0	701.4.4.1, 704.3.1.1
	1999	ENERGY STAR Program Requirements for Roof Products – Eligibility Criteria Version 1.2	602.13
WaterSense Documents			
	January 24, 2007	WaterSense: Tank-Type High-Efficiency Toilet Specification	801.6(2)
	October 27, 2006	WaterSense: Professionals in System Design, Installation & Maintenance, and System Auditing	801.7.2

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	2002	FSC Principles and Criteria for Forest Stewardship	606.2(c)

GAMA		*GAMA-An Association of Appliance & Equipment Manufacturers* *Hydronics Institute Division* *2107 Wilson Boulevard, Suite 600* *Arlington, VA 22201* *www.gamanet.org*	*(703) 525-7060*
H-22	2001	Heat Loss Calculation Guide	701.4.2.1

GREENGUARD		*GREENGUARD Environmental Institute* *1341 Capital Circle, Suite A* *Atlanta, Georgia 30067* *www.greenguard.org*	*(800) 427-9681*
GGPS.EC.010.R0	2001	GREENGUARD Emission Criteria – Systems Furniture	901.10(3)

GS		*Green Seal* *1001 Connecticut Avenue, NW* *Suite 827* *Washington, DC 20036* *www.greenseal.org*	*(202) 872-6400*
GS-11	1993	Green Seal Environmental Standards: Paints	901.8.1(3)
GS-36	2000	Green Seal Environmental Standards: Commercial Adhesives	901.9.1(2), 901.9.2(2)

HPVA		*Hardwood Plywood Veneer Association* *1825 Michael Faraday Drive* *Reston, VA 20190* *www.hpva.org*	*(703) 435-2900*
HP-1	2004	National Standard for Hardwood and Decorative Plywood	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	2005	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	2009	International Building Code	202, 602.3.1, 602.9, 602.10, 703.1.1, 901.2.1(2)(e), 1001.1(10)
IECC	2004	International Energy Conservation Code	B201.1
IECC	2009	International Energy Conservation Code	701.1.1, 702.2, 703.1.1
IMC	2009	International Mechanical Code	701.4.2.1, 704.6.1(1)
IPC	2009	International Plumbing Code	903.5.3
IRC	2009	International Residential Code	202, 305.1, 601.1, 602.3.1, 602.9, 602.10, 701.4.2.1, 703.1.1, 704.6.1(1), 802.1, 902.3, 903.2.1(3), 1001.1(10)

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*
14044	2006	Environmental management -- Life cycle assessment -- Requirements and guidelines	609.1
14001	2004	Environmental management systems -- Requirements with guidance for use	610.1

KCMA		*Kitchen Cabinet Manufacturers Association* *1899 Preston White Drive* *Reston, VA 20191* *www.kcma.org*	*(703) 264-1690*
ESP 01	2006	Environmental Stewardship Certification Program	901.10(1)

NAHBRC		*NAHB Research Center* *400 Prince George's Boulevard* *Upper Marlboro, MD 20774* *www.nahbrc.org*	*(800) 638-8556*
Z765	2003	Single-Family Residential Buildings - Square Footage - Method for Calculating	305.1, 601.1

NFPA		*National Fire Protection Association* *1 Batterymarch Park* *Quincy, MA 02169* *www.nfpa.org*	*(617) 770-3000*
720	2005	Standard for the Installation of Carbon Monoxide (CO) Warning Equipment in Dwelling Units	901.12

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	2007	PEFC Council Minimum Requirements Checklist	606.2(d) & (f)

RFCI		*Resilient Floor Covering Institute* *401 East Jefferson Street, Suite 102* *Rockville, Maryland 20850* *www.rfci.com*	*(301) 340-8580*
SCS-EC-10	2004	Environmental Certification Program - Indoor Air Quality Performance	901.6

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	2002	Operating Guidelines and Minimum Standards for Certifying Solar Water Heating Systems	704.3.2.1

SFI		*Sustainable Forestry Initiative, Inc.* *1600 Wilson Boulevard* *Suite 810* *Arlington, VA 22209* *www.sfiprogram.org*	*(703) 875-9500*
2005-2009 Standard	2004	Sustainable Forestry Initiative Standard (SFIS)	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

UL		*Underwriters Laboratories Inc.* *333 Pfingsten Road* *Northbrook, IL 60062-2096* *www.ul.com*	*(877) 854-3577*
127	1996	Standard for Factory Built Fireplaces	901.2.1(2)(b)
181	2005	The Standard for Safety for Factory-Made Air Ducts and Air Connectors	701.4.2.1
1482	1996	Standard for Solid-Fuel Type Room Heaters	901.2.1(2)(c)
2034	1996	Single and Multiple Station Carbon Monoxide Alarms	901.12

USDA		*U.S. Department of Agriculture* *1400 Independence Ave., SW* *Washington, DC 20250* *www.usda.gov*	*(202) 720-2791*
7 CFR Part 2902	2006	Designation of Biobased Items for Federal Procurement; Final Rule	606.1

WSL		*Washington State Legislature* *106 Legislative Building* *Olympia, WA 98504-0600* *www.leg.wa.gov*	*(360) 786-7573*
WAC 173-433-100(3)	2007	Solid Fuel Burning Devices - Emission Performance Standards	901.2.1(2)(c)

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 Acknowledgement. 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.

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 Acknowledgement. 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 62.2-2007 *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 is in zone 3B or 3C of the ICC* IECC 2004 Climate Zone Map (see ASHRAE 62.2*, Figure 8.2),
> **(b)** 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
> **(c)** 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.

Equation B201.1a		
$Qfan = 0.01Afloor + 7.5(Nbr + 1)$		
where		
Qfan	=	fan flow rate, cfm
Afloor	=	floor area, ft^2
Nbr	=	number of bedrooms; not to be less than one

Equation B201.1b		
$Qfan = 0.05Afloor + 3.5(Nbr + 1)$		
where		
Qfan	=	fan flow rate, L/s
Afloor	=	floor area, m^2
Nbr	=	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 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 B201.4. The system must be designed so that it can operate automatically based on a timer. The intermittent mechanical ventilation system must operate at least one hour out of every twelve.

B201.4 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, and the ventilation effectiveness from Table B201.2.

Equation B201.2
$Qf = Qr / (\varepsilon f)$
where
Qf = fan flow rate
Qr = ventilation air requirement (from Table B201.1a or B201.1b)
ε = ventilation effectiveness (from Table B201.2)
f = fractional on time
If the system runs at least once every three hours, 1.0 can be used as the ventilation effectiveness. (See *ASHRAE 62.2*,* Appendix B for an example of this calculation.)

TABLE B201.2

Ventilation Effectiveness for Intermittent Fans

Daily Fractional On-Time, f	Ventilation Effectiveness, ε
$f \leq 35\%$	0.33
$35\% \leq f < 60\%$	0.50
$60\% \leq f < 80\%$	0.75
$80\% \leq f$	1.0

B201.5 Restrictions on System Type. Use of certain ventilation strategies is restricted in specific climates as follows.

B201.5.1 Hot, Humid Climates. In hot, humid climates, whole-house mechanical net exhaust flow shall not exceed 7.5 cfm per 100 ft2 (35 L/s per 100 m2). (See ASHRAE 62.2*, Section 8 for a listing of hot, humid US climates.)

B201.5.2 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
CLIMATE ZONES

TABLE C100 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*	3A Cleburne	3A Fayette	3A Lowndes*	3A Russell*
2A Baldwin*	3A Coffee*	3A Franklin	3A Macon*	3A Shelby
3A Barbour*	3A Colbert	3A Geneva*	3A Madison	3A St. Clair
3A Bibb	3A Conecuh*	3A Greene	3A Marengo*	3A Sumter
3A Blount	3A Coosa	3A Hale	3A Marion	3A Talladega
3A Bullock*	3A Covington*	3A Henry*	3A Marshall	3A Tallapoosa
3A Butler*	3A Crenshaw*	3A Houston*	2A Mobile*	3A Tuscaloosa
3A Calhoun	3A Cullman	3A Jackson	3A Monroe*	3A Walker
3A Chambers	3A Dale*	3A Jefferson	3A Montgomery*	3A Washington*
3A Cherokee	3A Dallas*	3A Lamar	3A Morgan	3A Wilcox*
3A Chilton	3A DeKalb	3A Lauderdale	3A Perry*	3A Winston
3A Choctaw*	3A Elmore*	3A Lawrence	3A Pickens	
3A Clarke*	3A Escambia*	3A Lee	3A Pike*	
3A Clay	3A Etowah	3A Limestone	3A Randolph	

ALASKA

7 Aleutians East	8 Fairbanks North Star	7 Matanuska-Susitna	8 Southeast Fairbanks
7 Aleutians West	7 Haines	8 Nome	7 Valdez-Cordova
7 Anchorage	7 Juneau	8 North Slope	8 Wade Hampton
8 Bethel	7 Kenai Peninsula	8 Northwest Arctic	7 Wrangell-Petersburg
7 Bristol Bay	7 Ketchikan Gateway	7 Prince of Wales-Outer Ketchikan	7 Yakutat
7 Denali	7 Kodiak Island	7 Sitka	8 Yukon-Koyukuk
8 Dillingham	7 Lake and Peninsula	7 Skagway-Hoonah Angoon	

ARIZONA

5B Apache	4B Gila	2B La Paz	5B Navajo	3B Santa Cruz
3B Cochise	3B Graham	2B Maricopa	2B Pima	4B Yavapai
5B Coconino	3B Greenlee	3B Mohave	2B Pinal	2B Yuma

ARKANSAS

3A Arkansas	3A Craighead	3A Howard	3A Miller*	3A Randolph
3A Ashley	3A Crawford	3A Independence	3A Mississippi	3A Saline
4A Baxter	3A Crittenden	4A Izard	3A Monroe	3A Scott
4A Benton	3A Cross	3A Jackson	3A Montgomery	4A Searcy
4A Boone	3A Dallas	3A Jefferson	3A Nevada	3A Sebastian
3A Bradley	3A Desha	3A Johnson	4A Newton	3A Sevier*
3A Calhoun	3A Drew	3A Lafayette*	3A Ouachita	3A Sharp
4A Carroll	3A Faulkner	3A Lawrence	3A Perry	3A St. Francis
3A Chicot	3A Franklin	3A Lee	3A Phillips	4A Stone
3A Clark	4A Fulton	3A Lincoln	3A Pike	3A Union*
3A Clay	3A Garland	3A Little River*	3A Poinsett	3A Van Buren
3A Cleburne	3A Grant	3A Logan	3A Polk	4A Washington
3A Cleveland	3A Greene	3A Lonoke	3A Pope	3A White
3A Columbia*	3A Hempstead*	4A Madison	3A Prairie	3A Woodruff
3A Conway	3A Hot Spring	4A Marion	3A Pulaski	3A Yell

CALIFORNIA

3C Alameda	2B Imperial	5B Modoc	3B San Diego	3C Sonoma
6B Alpine	4B Inyo	6B Mono	3C San Francisco	3B Stanislaus
4B Amador	3B Kern	3C Monterey	3B San Joaquin	3B Sutter
3B Butte	3B Kings	3C Napa	3C San Luis Obispo	3B Tehama
4B Calaveras	4B Lake	5B Nevada	3C San Mateo	4B Trinity
3B Colusa	5B Lassen	3B Orange	3C Santa Barbara	3B Tulare
3B Contra Costa	3B Los Angeles	3B Placer	3C Santa Clara	4B Tuolumne
4C Del Norte	3B Madera	5B Plumas	3C Santa Cruz	3C Ventura
4B El Dorado	3C Marin	3B Riverside	3B Shasta	3B Yolo
3B Fresno	4B Mariposa	3B Sacramento	5B Sierra	3B Yuba
3B Glenn	3C Mendocino	3C San Benito	5B Siskiyou	
4C Humboldt	3B Merced	3B San Bernardino	3B Solano	

COLORADO

5B Adams	6B Custer	7 Hinsdale	7 Mineral	7 Rio Grande
6B Alamosa	5B Delta	5B Huerfano	6B Moffat	7 Routt
5B Arapahoe	5B Denver	7 Jackson	5B Montezuma	6B Saguache
6B Archuleta	6B Dolores	5B Jefferson	5B Montrose	7 San Juan
4B Baca	5B Douglas	5B Kiowa	5B Morgan	6B San Miguel
5B Bent	6B Eagle	5B Kit Carson	4B Otero	5B Sedgwick
5B Boulder	5B Elbert	7 Lake	6B Ouray	7 Summit
6B Chaffee	5B El Paso	5B La Plata	7 Park	5B Teller
5B Cheyenne	5B Fremont	5B Larimer	5B Phillips	5B Washington
7 Clear Creek	5B Garfield	4B Las Animas	7 Pitkin	5B Weld
6B Conejos	5B Gilpin	5B Lincoln	5B Prowers	5B Yuma
6B Costilla	7 Grand	5B Logan	5B Pueblo	
5B Crowley	7 Gunnison	5B Mesa	6B Rio Blanco	

CONNECTICUT

5A (all)

DELAWARE

4A (all)

DISTRICT OF COLUMBIA

4A (all)

FLORIDA

2A Alachua*	2A Duval*	2A Holmes*	1A Miami-Dade*	2A Seminole*
2A Baker*	2A Escambia*	2A Indian River*	1A Monroe*	2A St. Johns*
2A Bay*	2A Flagler*	2A Jackson*	2A Nassau*	2A St. Lucie*
2A Bradford*	2A Franklin*	2A Jefferson*	2A Okaloosa*	2A Sumter*
2A Brevard*	2A Gadsden*	2A Lafayette*	2A Okeechobee*	2A Suwannee*
1A Broward*	2A Gilchrist*	2A Lake*	2A Orange*	2A Taylor*
2A Calhoun*	2A Glades*	2A Lee*	2A Osceola*	2A Union*
2A Charlotte*	2A Gulf*	2A Leon*	2A Palm Beach*	2A Volusia*
2A Citrus*	2A Hamilton*	2A Levy*	2A Pasco*	2A Wakulla*
2A Clay*	2A Hardee*	2A Liberty*	2A Pinellas*	2A Walton*
2A Collier*	2A Hendry*	2A Madison*	2A Polk*	2A Washington*
2A Columbia*	2A Hernando*	2A Manatee*	2A Putnam*	
2A DeSoto*	2A Highlands*	2A Marion*	2A Santa Rosa*	
2A Dixie*	2A Hillsborough*	2A Martin*	2A Sarasota*	

GEORGIA

2A Appling*	3A Cobb	2A Grady*	3A McDuffie	3A Sumter*
2A Atkinson*	3A Coffee*	3A Greene	2A McIntosh*	3A Talbot
2A Bacon*	2A Colquitt*	3A Gwinnett	3A Meriwether	3A Taliaferro
2A Baker*	3A Columbia	4A Habersham	2A Miller*	2A Tattnall*
3A Baldwin	2A Cook*	4A Hall	2A Mitchell*	3A Taylor*
4A Banks	3A Coweta	3A Hancock	3A Monroe	3A Telfair*
3A Barrow	3A Crawford	3A Haralson	3A Montgomery*	3A Terrell*
3A Bartow	3A Crisp*	3A Harris	3A Morgan	2A Thomas*
3A Ben Hill*	4A Dade	3A Hart	4A Murray	3A Tift*
2A Berrien*	4A Dawson	3A Heard	3A Muscogee	2A Toombs*
3A Bibb	2A Decatur*	3A Henry	3A Newton	4A Towns
3A Bleckley*	3A DeKalb	3A Houston*	3A Oconee	3A Treutlen*
2A Brantley*	3A Dodge*	3A Irwin*	3A Oglethorpe	3A Troup
2A Brooks*	3A Dooly*	3A Jackson	3A Paulding	3A Turner*
2A Bryan*	3A Dougherty*	3A Jasper	3A Peach*	3A Twiggs*
3A Bulloch*	3A Douglas	2A Jeff Davis*	4A Pickens	4A Union
3A Burke	3A Early*	3A Jefferson	2A Pierce*	3A Upson
3A Butts	2A Echols*	3A Jenkins*	3A Pike	4A Walker
3A Calhoun*	2A Effingham*	3A Johnson*	3A Polk	3A Walton
2A Camden*	3A Elbert	3A Jones	3A Pulaski*	2A Ware*
3A Candler*	3A Emanuel*	3A Lamar	3A Putnam	3A Warren
3A Carroll	2A Evans*	2A Lanier*	3A Quitman*	3A Washington
4A Catoosa	4A Fannin	3A Laurens*	4A Rabun	2A Wayne*
2A Charlton*	3A Fayette	3A Lee*	3A Randolph*	3A Webster*
2A Chatham*	4A Floyd	2A Liberty*	3A Richmond	3A Wheeler*
3A Chattahoochee*	3A Forsyth	3A Lincoln	3A Rockdale	4A White
4A Chattooga	4A Franklin	2A Long*	3A Schley*	4A Whitfield
3A Cherokee	3A Fulton	2A Lowndes*	3A Screven*	3A Wilcox*
3A Clarke	4A Gilmer	4A Lumpkin	2A Seminole*	3A Wilkes
3A Clay*	3A Glascock	3A Macon*	3A Spalding	3A Wilkinson
3A Clayton	2A Glynn*	3A Madison	4A Stephens	3A Worth*
2A Clinch*	4A Gordon	3A Marion*	3A Stewart*	

HAWAII

1A (all)*

IDAHO

5B Ada	6B Bonneville	6B Custer	5B Kootenai	5B Owyhee
6B Adams	6B Boundary	5B Elmore	5B Latah	5B Payette
6B Bannock	6B Butte	6B Franklin	6B Lemhi	5B Power
6B Bear Lake	6B Camas	6B Fremont	5B Lewis	5B Shoshone
5B Benewah	5B Canyon	5B Gem	5B Lincoln	6B Teton
6B Bingham	6B Caribou	5B Gooding	6B Madison	5B Twin Falls
6B Blaine	5B Cassia	5B Idaho	5B Minidoka	6B Valley
6B Boise	6B Clark	6B Jefferson	5B Nez Perce	5B Washington
6B Bonner	5B Clearwater	5B Jerome	6B Oneida	

ILLINOIS

5A Adams	5A DuPage	5A Jo Daviess	5A McLean	5A Scott
4A Alexander	5A Edgar	4A Johnson	5A Menard	4A Shelby
4A Bond	4A Edwards	5A Kane	5A Mercer	5A Stark
5A Boone	4A Effingham	5A Kankakee	4A Monroe	4A St. Clair
5A Brown	4A Fayette	5A Kendall	4A Montgomery	5A Stephenson
5A Bureau	5A Ford	5A Knox	5A Morgan	5A Tazewell
5A Calhoun	4A Franklin	5A Lake	5A Moultrie	4A Union
5A Carroll	5A Fulton	5A La Salle	5A Ogle	5A Vermilion
5A Cass	4A Gallatin	4A Lawrence	5A Peoria	4A Wabash
5A Champaign	5A Greene	5A Lee	4A Perry	5A Warren
4A Christian	5A Grundy	5A Livingston	5A Piatt	4A Washington
5A Clark	4A Hamilton	5A Logan	5A Pike	4A Wayne
4A Clay	5A Hancock	5A Macon	4A Pope	4A White
4A Clinton	4A Hardin	4A Macoupin	4A Pulaski	5A Whiteside
5A Coles	5A Henderson	4A Madison	5A Putnam	5A Will
5A Cook	5A Henry	4A Marion	4A Randolph	4A Williamson
4A Crawford	5A Iroquois	5A Marshall	4A Richland	5A Winnebago
5A Cumberland	4A Jackson	5A Mason	5A Rock Island	5A Woodford
5A DeKalb	4A Jasper	4A Massac	4A Saline	
5A De Witt	4A Jefferson	5A McDonough	5A Sangamon	
5A Douglas	5A Jersey	5A McHenry	5A Schuyler	

INDIANA

5A Adams	5A Elkhart	4A Jefferson	4A Ohio	4A Sullivan
5A Allen	5A Fayette	4A Jennings	4A Orange	4A Switzerland
5A Bartholomew	4A Floyd	5A Johnson	5A Owen	5A Tippecanoe
5A Benton	5A Fountain	4A Knox	5A Parke	5A Tipton
5A Blackford	5A Franklin	5A Kosciusko	4A Perry	5A Union
5A Boone	5A Fulton	5A Lagrange	4A Pike	4A Vanderburgh
4A Brown	4A Gibson	5A Lake	5A Porter	5A Vermillion
5A Carroll	5A Grant	5A La Porte	4A Posey	5A Vigo
5A Cass	4A Greene	4A Lawrence	5A Pulaski	5A Wabash
4A Clark	5A Hamilton	5A Madison	5A Putnam	5A Warren
5A Clay	5A Hancock	5A Marion	5A Randolph	4A Warrick
5A Clinton	4A Harrison	5A Marshall	4A Ripley	4A Washington
4A Crawford	5A Hendricks	4A Martin	5A Rush	5A Wayne
4A Daviess	5A Henry	5A Miami	4A Scott	5A Wells
4A Dearborn	5A Howard	4A Monroe	5A Shelby	5A White
5A Decatur	5A Huntington	5A Montgomery	4A Spencer	5A Whitley
5A De Kalb	4A Jackson	5A Morgan	5A Starke	
5A Delaware	5A Jasper	5A Newton	5A Steuben	
4A Dubois	5A Jay	5A Noble	5A St. Joseph	

IOWA

5A Adair	6A Clay	6A Hancock	5A Madison	6A Sac
5A Adams	6A Clayton	6A Hardin	5A Mahaska	5A Scott
6A Allamakee	5A Clinton	5A Harrison	5A Marion	5A Shelby
5A Appanoose	5A Crawford	5A Henry	5A Marshall	6A Sioux
5A Audubon	5A Dallas	6A Howard	5A Mills	5A Story
5A Benton	5A Davis	6A Humboldt	6A Mitchell	5A Tama
6A Black Hawk	5A Decatur	6A Ida	5A Monona	5A Taylor
5A Boone	6A Delaware	5A Iowa	5A Monroe	5A Union
6A Bremer	5A Des Moines	5A Jackson	5A Montgomery	5A Van Buren
6A Buchanan	6A Dickinson	5A Jasper	5A Muscatine	5A Wapello
6A Buena Vista	5A Dubuque	5A Jefferson	6A O'Brien	5A Warren
6A Butler	6A Emmet	5A Johnson	6A Osceola	5A Washington
6A Calhoun	6A Fayette	5A Jones	5A Page	5A Wayne
5A Carroll	6A Floyd	5A Keokuk	6A Palo Alto	6A Webster
5A Cass	6A Franklin	6A Kossuth	6A Plymouth	6A Winnebago
5A Cedar	5A Fremont	5A Lee	6A Pocahontas	6A Winneshiek
6A Cerro Gordo	5A Greene	5A Linn	5A Polk	5A Woodbury
6A Cherokee	6A Grundy	5A Louisa	5A Pottawattamie	6A Worth
6A Chickasaw	5A Guthrie	5A Lucas	5A Poweshiek	6A Wright
5A Clarke	6A Hamilton	6A Lyon	5A Ringgold	

KANSAS

4A Allen	4A Doniphan	4A Jackson	4A Morris	4A Saline
4A Anderson	4A Douglas	4A Jefferson	4A Morton	5A Scott
4A Atchison	4A Edwards	5A Jewell	4A Nemaha	4A Sedgwick
4A Barber	4A Elk	4A Johnson	4A Neosho	4A Seward
4A Barton	5A Ellis	4A Kearny	5A Ness	4A Shawnee
4A Bourbon	4A Ellsworth	4A Kingman	5A Norton	5A Sheridan
4A Brown	4A Finney	4A Kiowa	4A Osage	5A Sherman
4A Butler	4A Ford	4A Labette	5A Osborne	5A Smith
4A Chase	4A Franklin	5A Lane	4A Ottawa	4A Stafford
4A Chautauqua	4A Geary	4A Leavenworth	4A Pawnee	4A Stanton
4A Cherokee	5A Gove	4A Lincoln	5A Phillips	4A Stevens
5A Cheyenne	5A Graham	4A Linn	4A Pottawatomie	4A Sumner
4A Clark	4A Grant	5A Logan	4A Pratt	5A Thomas
4A Clay	4A Gray	4A Lyon	5A Rawlins	5A Trego
5A Cloud	5A Greeley	4A Marion	4A Reno	4A Wabaunsee
4A Coffey	4A Greenwood	4A Marshall	5A Republic	5A Wallace
4A Comanche	5A Hamilton	4A McPherson	4A Rice	4A Washington
4A Cowley	4A Harper	4A Meade	4A Riley	5A Wichita
4A Crawford	4A Harvey	4A Miami	5A Rooks	4A Wilson
5A Decatur	4A Haskell	5A Mitchell	4A Rush	4A Woodson
4A Dickinson	4A Hodgeman	4A Montgomery	4A Russell	4A Wyandotte

KENTUCKY

4A (all)

LOUISIANA

2A Acadia*	2A East Baton Rouge*	3A Madison*	2A St. Landry*
2A Allen*	3A East Carroll	3A Morehouse	2A St. Martin*
2A Ascension*	2A East Feliciana*	3A Natchitoches*	2A St. Mary*
2A Assumption*	2A Evangeline*	2A Orleans*	2A St. Tammany*
2A Avoyelles*	3A Franklin*	3A Ouachita*	2A Tangipahoa*
2A Beauregard*	3A Grant*	2A Plaquemines*	3A Tensas*
3A Bienville*	2A Iberia*	2A Pointe Coupee*	2A Terrebonne*
3A Bossier*	2A Iberville*	2A Rapides*	3A Union*
3A Caddo*	3A Jackson*	3A Red River*	2A Vermilion*
2A Calcasieu*	2A Jefferson*	3A Richland*	3A Vernon*
3A Caldwell*	2A Jefferson Davis*	3A Sabine*	2A Washington*
2A Cameron*	2A Lafayette*	2A St. Bernard*	3A Webster*
3A Catahoula*	2A Lafourche*	2A St. Charles *	2A West Baton Rouge*
3A Claiborne*	3A La Salle*	2A St. Helena*	3A West Carroll
3A Concordia*	3A Lincoln*	2A St. James*	2A West Feliciana*
3A De Soto*	2A Livingston*	2A St. John the Baptist*	3A Winn*

MAINE

6A Androscoggin	6A Hancock	6A Oxford	6A Somerset
7 Aroostook	6A Kennebec	6A Penobscot	6A Waldo
6A Cumberland	6A Knox	6A Piscataquis	6A Washington
6A Franklin	6A Lincoln	6A Sagadahoc	6A York

MARYLAND				
4A Allegany	4A Caroline	4A Frederick	4A Montgomery	4A Talbot
4A Anne Arundel	4A Carroll	5A Garrett	4A Prince George's	4A Washington
4A Baltimore	4A Cecil	4A Harford	4A Queen Anne's	4A Wicomico
4A Baltimore (city)	4A Charles	4A Howard	4A Somerset	4A Worcester
4A Calvert	4A Dorchester	4A Kent	4A St. Mary's	

MASSACHUSETTS

5A (all)

MICHIGAN

6A Alcona	6A Clare	6A Iosco	6A Marquette	6A Otsego
6A Alger	5A Clinton	7 Iron	6A Mason	5A Ottawa
5A Allegan	6A Crawford	6A Isabella	6A Mecosta	6A Presque Isle
6A Alpena	6A Delta	5A Jackson	6A Menominee	6A Roscommon
6A Antrim	6A Dickinson	5A Kalamazoo	5A Midland	5A Saginaw
6A Arenac	5A Eaton	6A Kalkaska	6A Missaukee	6A Sanilac
7 Baraga	6A Emmet	5A Kent	5A Monroe	7 Schoolcraft
5A Barry	5A Genesee	7 Keweenaw	5A Montcalm	5A Shiawassee
5A Bay	6A Gladwin	6A Lake	6A Montmorency	5A St. Clair
6A Benzie	7 Gogebic	5A Lapeer	5A Muskegon	5A St. Joseph
5A Berrien	6A Grand Traverse	6A Leelanau	6A Newaygo	5A Tuscola
5A Branch	5A Gratiot	5A Lenawee	5A Oakland	5A Van Buren
5A Calhoun	5A Hillsdale	5A Livingston	6A Oceana	5A Washtenaw
5A Cass	7 Houghton	7 Luce	6A Ogemaw	5A Wayne
6A Charlevoix	6A Huron	7 Mackinac	7 Ontonagon	6A Wexford
6A Cheboygan	5A Ingham	5A Macomb	6A Osceola	
7 Chippewa	5A Ionia	6A Manistee	6A Oscoda	

MINNESOTA

7 Aitkin	6A Dakota	6A Lac qui Parle	6A Olmsted	6A Steele
6A Anoka	6A Dodge	7 Lake	7 Otter Tail	6A Stevens
7 Becker	6A Douglas	7 Lake of the Woods	7 Pennington	7 St. Louis
7 Beltrami	6A Faribault	6A Le Sueur	7 Pine	6A Swift
6A Benton	6A Fillmore	6A Lincoln	6A Pipestone	6A Todd
6A Big Stone	6A Freeborn	6A Lyon	7 Polk	6A Traverse
6A Blue Earth	6A Goodhue	7 Mahnomen	6A Pope	6A Wabasha
6A Brown	7 Grant	7 Marshall	6A Ramsey	7 Wadena
7 Carlton	6A Hennepin	6A Martin	7 Red Lake	6A Waseca
6A Carver	6A Houston	6A McLeod	6A Redwood	6A Washington
7 Cass	7 Hubbard	6A Meeker	6A Renville	6A Watonwan
6A Chippewa	6A Isanti	7 Mille Lacs	6A Rice	7 Wilkin
6A Chisago	7 Itasca	6A Morrison	6A Rock	6A Winona
7 Clay	6A Jackson	6A Mower	7 Roseau	6A Wright
7 Clearwater	7 Kanabec	6A Murray	6A Scott	6A Yellow Medicine
7 Cook	6A Kandiyohi	6A Nicollet	6A Sherburne	
6A Cottonwood	7 Kittson	6A Nobles	6A Sibley	
7 Crow Wing	7 Koochiching	7 Norman	6A Stearns	

MISSISSIPPI

3A Adams*	3A Forrest*	3A Kemper	3A Noxubee	3A Tate
3A Alcorn	3A Franklin*	3A Lafayette	3A Oktibbeha	3A Tippah
3A Amite*	3A George*	3A Lamar*	3A Panola	3A Tishomingo
3A Attala	3A Greene*	3A Lauderdale	2A Pearl River*	3A Tunica
3A Benton	3A Grenada	3A Lawrence*	3A Perry*	3A Union
3A Bolivar	2A Hancock*	3A Leake	3A Pike*	3A Walthall*
3A Calhoun	2A Harrison*	3A Lee	3A Pontotoc	3A Warren*
3A Carroll	3A Hinds*	3A Leflore	3A Prentiss	3A Washington
3A Chickasaw	3A Holmes	3A Lincoln*	3A Quitman	3A Wayne*
3A Choctaw	3A Humphreys	3A Lowndes	3A Rankin*	3A Webster
3A Claiborne*	3A Issaquena	3A Madison	3A Scott	3A Wilkinson*
3A Clarke	3A Itawamba	3A Marion*	3A Sharkey	3A Winston
3A Clay	2A Jackson*	3A Marshall	3A Simpson*	3A Yalobusha
3A Coahoma	3A Jasper	3A Monroe	3A Smith*	3A Yazoo
3A Copiah*	3A Jefferson*	3A Montgomery	2A Stone*	
3A Covington*	3A Jefferson Davis*	3A Neshoba	3A Sunflower	
3A DeSoto	3A Jones*	3A Newton	3A Tallahatchie	

MISSOURI

5A Adair	4A Clay	4A Iron	4A Montgomery	5A Schuyler
5A Andrew	5A Clinton	4A Jackson	4A Morgan	5A Scotland
5A Atchison	4A Cole	4A Jasper	4A New Madrid	4A Scott
4A Audrain	4A Cooper	4A Jefferson	4A Newton	4A Shannon
4A Barry	4A Crawford	4A Johnson	5A Nodaway	5A Shelby
4A Barton	4A Dade	5A Knox	4A Oregon	4A St. Charles
4A Bates	4A Dallas	4A Laclede	4A Osage	4A St. Clair
4A Benton	5A Daviess	4A Lafayette	4A Ozark	4A Ste. Genevieve
4A Bollinger	5A DeKalb	4A Lawrence	4A Pemiscot	4A St. Francois
4A Boone	4A Dent	5A Lewis	4A Perry	4A St. Louis
5A Buchanan	4A Douglas	4A Lincoln	4A Pettis	4A St. Louis (city)
4A Butler	4A Dunklin	5A Linn	4A Phelps	4A Stoddard
5A Caldwell	4A Franklin	5A Livingston	5A Pike	4A Stone
4A Callaway	4A Gasconade	5A Macon	4A Platte	5A Sullivan
4A Camden	5A Gentry	4A Madison	4A Polk	4A Taney
4A Cape Girardeau	4A Greene	4A Maries	4A Pulaski	4A Texas
4A Carroll	5A Grundy	5A Marion	5A Putnam	4A Vernon
4A Carter	5A Harrison	4A McDonald	5A Ralls	4A Warren
4A Cass	4A Henry	5A Mercer	4A Randolph	4A Washington
4A Cedar	4A Hickory	4A Miller	4A Ray	4A Wayne
5A Chariton	5A Holt	4A Mississippi	4A Reynolds	4A Webster
4A Christian	4A Howard	4A Moniteau	4A Ripley	5A Worth
5A Clark	4A Howell	4A Monroe	4A Saline	4A Wright

MONTANA

6B (all)

NEBRASKA

5A (all)

NEVADA

5B Carson City (city)	5B Elko	5B Lander	5B Nye	5B White Pine
5B Churchill	5B Esmeralda	5B Lincoln	5B Pershing	
3B Clark	5B Eureka	5B Lyon	5B Storey	
5B Douglas	5B Humboldt	5B Mineral	5B Washoe	

NEW HAMPSHIRE

6A Belknap	5A Cheshire	6A Grafton	6A Merrimack	5A Strafford
6A Carroll	6A Coos	5A Hillsborough	5A Rockingham	6A Sullivan

NEW JERSEY

4A Atlantic	4A Cumberland	5A Mercer	5A Passaic	5A Warren
5A Bergen	4A Essex	4A Middlesex	4A Salem	
4A Burlington	4A Gloucester	4A Monmouth	5A Somerset	
4A Camden	4A Hudson	5A Morris	5A Sussex	
4A Cape May	5A Hunterdon	4A Ocean	4A Union	

NEW MEXICO

4B Bernalillo	3B Dona Ana	4B Lincoln	5B Rio Arriba	4B Socorro
5B Catron	3B Eddy	5B Los Alamos	4B Roosevelt	5B Taos
3B Chaves	4B Grant	3B Luna	5B Sandoval	5B Torrance
4B Cibola	4B Guadalupe	5B McKinley	5B San Juan	4B Union
5B Colfax	5B Harding	5B Mora	5B San Miguel	4B Valencia
4B Curry	3B Hidalgo	3B Otero	5B Santa Fe	
4B DeBaca	3B Lea	4B Quay	4B Sierra	

NEW YORK

5A Albany	5A Dutchess	6A Madison	5A Putnam	6A Sullivan
6A Allegany	5A Erie	5A Monroe	4A Queens	5A Tioga
4A Bronx	6A Essex	6A Montgomery	5A Rensselaer	6A Tompkins
6A Broome	6A Franklin	4A Nassau	4A Richmond	6A Ulster
6A Cattaraugus	6A Fulton	4A New York	5A Rockland	6A Warren
5A Cayuga	5A Genesee	5A Niagara	5A Saratoga	5A Washington
5A Chautauqua	5A Greene	6A Oneida	5A Schenectady	5A Wayne
5A Chemung	6A Hamilton	5A Onondaga	6A Schoharie	4A Westchester
6A Chenango	6A Herkimer	5A Ontario	6A Schuyler	6A Wyoming
6A Clinton	6A Jefferson	5A Orange	5A Seneca	5A Yates
5A Columbia	4A Kings	5A Orleans	6A Steuben	
5A Cortland	6A Lewis	5A Oswego	6A St. Lawrence	
6A Delaware	5A Livingston	6A Otsego	4A Suffolk	

NORTH CAROLINA

4A Alamance	3A Chowan	4A Guilford	5A Mitchell	4A Rutherford
4A Alexander	4A Clay	4A Halifax	3A Montgomery	3A Sampson
5A Alleghany	4A Cleveland	4A Harnett	3A Moore	3A Scotland
3A Anson	3A Columbus*	4A Haywood	4A Nash	3A Stanly
5A Ashe	3A Craven	4A Henderson	3A New Hanover*	4A Stokes
5A Avery	3A Cumberland	4A Hertford	4A Northampton	4A Surry
3A Beaufort	3A Currituck	3A Hoke	3A Onslow*	4A Swain
4A Bertie	3A Dare	3A Hyde	4A Orange	4A Transylvania
3A Bladen	3A Davidson	4A Iredell	3A Pamlico	3A Tyrrell
3A Brunswick*	4A Davie	4A Jackson	3A Pasquotank	3A Union
4A Buncombe	3A Duplin	3A Johnston	3A Pender*	4A Vance
4A Burke	4A Durham	3A Jones	3A Perquimans	4A Wake
3A Cabarrus	3A Edgecombe	4A Lee	4A Person	4A Warren
4A Caldwell	4A Forsyth	3A Lenoir	3A Pitt	3A Washington
3A Camden	4A Franklin	4A Lincoln	4A Polk	5A Watauga
3A Carteret*	3A Gaston	4A Macon	3A Randolph	3A Wayne
4A Caswell	4A Gates	4A Madison	3A Richmond	4A Wilkes
4A Catawba	4A Graham	3A Martin	3A Robeson	3A Wilson
4A Chatham	4A Granville	4A McDowell	4A Rockingham	4A Yadkin
4A Cherokee	3A Greene	3A Mecklenburg	3A Rowan	5A Yancey

NORTH DAKOTA

6A Adams	7 Divide	6A LaMoure	7 Pembina	6A Stark
7 Barnes	6A Dunn	6A Logan	7 Pierce	7 Steele
7 Benson	7 Eddy	7 McHenry	7 Ramsey	7 Stutsman
6A Billings	6A Emmons	6A McIntosh	6A Ransom	7 Towner
7 Bottineau	7 Foster	6A McKenzie	7 Renville	7 Traill
6A Bowman	6A Golden Valley	7 McLean	6A Richland	7 Walsh
7 Burke	7 Grand Forks	6A Mercer	7 Rolette	7 Ward
6A Burleigh	6A Grant	6A Morton	6A Sargent	7 Wells
7 Cass	7 Griggs	7 Mountrail	7 Sheridan	7 Williams
7 Cavalier	6A Hettinger	7 Nelson	6A Sioux	
6A Dickey	7 Kidder	6A Oliver	6A Slope	

OHIO

4A Adams	5A Darke	5A Hocking	5A Miami	4A Scioto
5A Allen	5A Defiance	5A Holmes	5A Monroe	5A Seneca
5A Ashland	5A Delaware	5A Huron	5A Montgomery	5A Shelby
5A Ashtabula	5A Erie	5A Jackson	5A Morgan	5A Stark
5A Athens	5A Fairfield	5A Jefferson	5A Morrow	5A Summit
5A Auglaize	5A Fayette	5A Knox	5A Muskingum	5A Trumbull
5A Belmont	5A Franklin	5A Lake	5A Noble	5A Tuscarawas
4A Brown	5A Fulton	4A Lawrence	5A Ottawa	5A Union
5A Butler	4A Gallia	5A Licking	5A Paulding	5A Van Wert
5A Carroll	5A Geauga	5A Logan	5A Perry	5A Vinton
5A Champaign	5A Greene	5A Lorain	5A Pickaway	5A Warren
5A Clark	5A Guernsey	5A Lucas	4A Pike	4A Washington
4A Clermont	4A Hamilton	5A Madison	5A Portage	5A Wayne
5A Clinton	5A Hancock	5A Mahoning	5A Preble	5A Williams
5A Columbiana	5A Hardin	5A Marion	5A Putnam	5A Wood
5A Coshocton	5A Harrison	5A Medina	5A Richland	5A Wyandot
5A Crawford	5A Henry	5A Meigs	5A Ross	
5A Cuyahoga	5A Highland	5A Mercer	5A Sandusky	

OKLAHOMA

3A Adair	3A Cotton	3A Jackson	3A McIntosh	3A Roger Mills
3A Alfalfa	3A Craig	3A Jefferson	3A Murray	3A Rogers
3A Atoka	3A Creek	3A Johnston	3A Muskogee	3A Seminole
4B Beaver	3A Custer	3A Kay	3A Noble	3A Sequoyah
3A Beckham	3A Delaware	3A Kingfisher	3A Nowata	3A Stephens
3A Blaine	3A Dewey	3A Kiowa	3A Okfuskee	4B Texas
3A Bryan	3A Ellis	3A Latimer	3A Oklahoma	3A Tillman
3A Caddo	3A Garfield	3A Le Flore	3A Okmulgee	3A Tulsa
3A Canadian	3A Garvin	3A Lincoln	3A Osage	3A Wagoner
3A Carter	3A Grady	3A Logan	3A Ottawa	3A Washington
3A Cherokee	3A Grant	3A Love	3A Pawnee	3A Washita
3A Choctaw	3A Greer	3A Major	3A Payne	3A Woods
4B Cimarron	3A Harmon	3A Marshall	3A Pittsburg	3A Woodward
3A Cleveland	3A Harper	3A Mayes	3A Pontotoc	
3A Coal	3A Haskell	3A McClain	3A Pottawatomie	
3A Comanche	3A Hughes	3A McCurtain	3A Pushmataha	

OREGON

5B Baker	5B Deschutes	4C Josephine	5B Morrow	5B Wasco
4C Benton	4C Douglas	5B Klamath	4C Multnomah	4C Washington
4C Clackamas	5B Gilliam	5B Lake	4C Polk	5B Wheeler
4C Clatsop	5B Grant	4C Lane	5B Sherman	4C Yamhill
4C Columbia	5B Harney	4C Lincoln	4C Tillamook	
4C Coos	5B Hood River	4C Linn	5B Umatilla	
5B Crook	4C Jackson	5B Malheur	5B Union	
4C Curry	5B Jefferson	4C Marion	5B Wallowa	

PENNSYLVANIA

5A Adams	4A Chester	5A Fulton	5A Mercer	5A Sullivan
5A Allegheny	5A Clarion	5A Greene	5A Mifflin	6A Susquehanna
5A Armstrong	6A Clearfield	5A Huntingdon	5A Monroe	6A Tioga
5A Beaver	5A Clinton	5A Indiana	4A Montgomery	5A Union
5A Bedford	5A Columbia	5A Jefferson	5A Montour	5A Venango
5A Berks	5A Crawford	5A Juniata	5A Northampton	5A Warren
5A Blair	5A Cumberland	5A Lackawanna	5A Northumberland	5A Washington
5A Bradford	5A Dauphin	5A Lancaster	5A Perry	6A Wayne
4A Bucks	4A Delaware	5A Lawrence	4A Philadelphia	5A Westmoreland
5A Butler	6A Elk	5A Lebanon	5A Pike	5A Wyoming
5A Cambria	5A Erie	5A Lehigh	6A Potter	4A York
6A Cameron	5A Fayette	5A Luzerne	5A Schuylkill	
5A Carbon	5A Forest	5A Lycoming	5A Snyder	
5A Centre	5A Franklin	6A McKean	5A Somerset	

RHODE ISLAND

5A (all)

SOUTH CAROLINA

3A Abbeville	3A Cherokee	3A Florence	3A Lee	3A Saluda
3A Aiken	3A Chester	3A Georgetown*	3A Lexington	3A Spartanburg
3A Allendale*	3A Chesterfield	3A Greenville	3A Marion	3A Sumter
3A Anderson	3A Clarendon	3A Greenwood	3A Marlboro	3A Union
3A Bamberg*	3A Colleton*	3A Hampton*	3A McCormick	3A Williamsburg
3A Barnwell*	3A Darlington	3A Horry*	3A Newberry	3A York
3A Beaufort*	3A Dillon	3A Jasper*	3A Oconee	
3A Berkeley*	3A Dorchester*	3A Kershaw	3A Orangeburg	
3A Calhoun	3A Edgefield	3A Lancaster	3A Pickens	
3A Charleston*	3A Fairfield	3A Laurens	3A Richland	

SOUTH DAKOTA

6A Aurora	6A Corson	6A Hand	6A Marshall	6A Spink
6A Beadle	6A Custer	6A Hanson	6A McCook	6A Stanley
5A Bennett	6A Davison	6A Harding	6A McPherson	6A Sully
5A Bon Homme	6A Day	6A Hughes	6A Meade	5A Todd
6A Brookings	6A Deuel	5A Hutchinson	5A Mellette	5A Tripp
6A Brown	6A Dewey	6A Hyde	6A Miner	6A Turner
6A Brule	5A Douglas	5A Jackson	6A Buffalo	5A Union
6A Buffalo	6A Edmunds	6A Jerauld	6A Butte	6A Walworth
6A Butte	6A Fall River	6A Jones	6A Campbell	5A Yankton
6A Campbell	6A Faulk	6A Kingsbury	6A Perkins	6A Ziebach
5A Charles Mix	6A Grant	6A Lake	6A Potter	
6A Clark	5A Gregory	6A Lawrence	6A Roberts	
5A Clay	6A Haakon	6A Lincoln	6A Sanborn	
6A Codington	6A Hamlin	6A Lyman	6A Shannon	

TENNESSEE

4A Anderson	4A Decatur	3A Henderson	4A Maury	4A Sequatchie
4A Bedford	4A DeKalb	4A Henry	4A McMinn	4A Sevier
4A Benton	4A Dickson	4A Hickman	3A McNairy	3A Shelby
4A Bledsoe	3A Dyer	4A Houston	4A Meigs	4A Smith
4A Blount	3A Fayette	4A Humphreys	4A Monroe	4A Stewart
4A Bradley	4A Fentress	4A Jackson	4A Montgomery	4A Sullivan
4A Campbell	4A Franklin	4A Jefferson	4A Moore	4A Sumner
4A Cannon	4A Gibson	4A Johnson	4A Morgan	3A Tipton
4A Carroll	4A Giles	4A Knox	4A Obion	4A Trousdale
4A Carter	4A Grainger	3A Lake	4A Overton	4A Unicoi
4A Cheatham	4A Greene	3A Lauderdale	4A Perry	4A Union
3A Chester	4A Grundy	4A Lawrence	4A Pickett	4A Van Buren
4A Claiborne	4A Hamblen	4A Lewis	4A Polk	4A Warren
4A Clay	4A Hamilton	4A Lincoln	4A Putnam	4A Washington
4A Cocke	4A Hancock	4A Loudon	4A Rhea	4A Wayne
4A Coffee	3A Hardeman	4A Macon	4A Roane	4A Weakley
3A Crockett	3A Hardin	3A Madison	4A Robertson	4A White
4A Cumberland	4A Hawkins	4A Marion	4A Rutherford	4A Williamson
4A Davidson	3A Haywood	4A Marshall	4A Scott	4A Wilson

TEXAS

2A Anderson*	3B Crane	4B Hartley	2A Madison*	2A San Patricio*
3B Andrews	3B Crockett	3B Haskell	3A Marion*	3A San Saba*
2A Angelina*	3B Crosby	2A Hays*	3B Martin	3B Schleicher
2A Aransas*	3B Culberson	3B Hemphill	3B Mason	3B Scurry
3A Archer	4B Dallam	3A Henderson*	2A Matagorda*	3B Shackelford
4B Armstrong	3A Dallas*	2A Hidalgo*	2B Maverick*	3A Shelby*
2A Atascosa*	3B Dawson	2A Hill*	3B McCulloch	4B Sherman
2A Austin*	4B Deaf Smith	4B Hockley	2A McLennan*	3A Smith*
4B Bailey	3A Delta	3A Hood*	2A McMullen*	3A Somervell*
2B Bandera*	3A Denton*	3A Hopkins*	2B Medina*	2A Starr*
2A Bastrop*	2A DeWitt*	2A Houston*	3B Menard	3A Stephens
3B Baylor	3B Dickens	3B Howard	3B Midland	3B Sterling
2A Bee*	2B Dimmit*	3B Hudspeth	2A Milam*	3B Stonewall
2A Bell*	4B Donley	3A Hunt*	3A Mills*	3B Sutton
2A Bexar*	2A Duval*	4B Hutchinson	3B Mitchell	4B Swisher
3A Blanco*	3A Eastland	3B Irion	3A Montague	3A Tarrant*
3B Borden	3B Ector	3A Jack	2A Montgomery*	3B Taylor
2A Bosque*	2B Edwards*	2A Jackson*	4B Moore	3B Terrell
3A Bowie*	3A Ellis*	2A Jasper*	3A Morris*	3B Terry
2A Brazoria*	3B El Paso	3B Jeff Davis	3B Motley	3B Throckmorton
2A Brazos*	3A Erath*	2A Jefferson*	3A Nacogdoches *	3A Titus*
3B Brewster	2A Falls*	2A Jim Hogg*	3A Navarro*	3B Tom Green
4B Briscoe	3A Fannin	2A Jim Wells*	2A Newton*	2A Travis*
2A Brooks*	2A Fayette*	3A Johnson*	3B Nolan	2A Trinity*
3A Brown*	3B Fisher	3B Jones	2A Nueces*	2A Tyler*
2A Burleson*	4B Floyd	2A Karnes*	4B Ochiltree	3A Upshur*
3A Burnet*	3B Foard	3A Kaufman*	4B Oldham	3B Upton
2A Caldwell*	2A Fort Bend*	3A Kendall*	2A Orange*	2B Uvalde*
2A Calhoun*	3A Franklin*	2A Kenedy*	3A Palo Pinto*	2B Val Verde*
3B Callahan	2A Freestone*	3B Kent	3A Panola*	3A Van Zandt*
2A Cameron*	2B Frio*	3B Kerr	3A Parker*	2A Victoria*
3A Camp*	3B Gaines	3B Kimble	4B Parmer	2A Walker*
4B Carson	2A Galveston*	3B King	3B Pecos	2A Waller*
3A Cass*	3B Garza	2B Kinney*	2A Polk*	3B Ward
4B Castro	3A Gillespie*	2A Kleberg*	4B Potter	2A Washington*
2A Chambers*	3B Glasscock	3B Knox	3B Presidio	2B Webb*
2A Cherokee*	2A Goliad*	3A Lamar*	3A Rains*	2A Wharton*
3B Childress	2A Gonzales*	4B Lamb	4B Randall	3B Wheeler
3A Clay	4B Gray	3A Lampasas*	3B Reagan	3A Wichita
4B Cochran	3A Grayson	2B La Salle*	2B Real*	3B Wilbarger
3B Coke	3A Gregg*	2A Lavaca*	3A Red River*	2A Willacy*
3B Coleman	2A Grimes*	2A Lee*	3B Reeves	2A Williamson*
3A Collin*	2A Guadalupe*	2A Leon*	2A Refugio*	2A Wilson*
3B Collingsworth	4B Hale	2A Liberty*	4B Roberts	3B Winkler
2A Colorado*	3B Hall	2A Limestone*	2A Robertson*	3A Wise
2A Comal*	3A Hamilton*	4B Lipscomb	3A Rockwall*	3A Wood*
3A Comanche*	4B Hansford	2A Live Oak*	3B Runnels	4B Yoakum
3B Concho	3B Hardeman	3A Llano*	3A Rusk*	3A Young
3A Cooke	2A Hardin*	3B Loving	3A Sabine*	2B Zapata*
2A Coryell*	2A Harris*	3B Lubbock	3A San Augustine*	2B Zavala*
3B Cottle	3A Harrison*	3B Lynn	2A San Jacinto*	

UTAH

5B Beaver	6B Duchesne	5B Kane	5B San Juan	5B Utah
6B Box Elder	5B Emery	5B Millard	5B Sanpete	6B Wasatch
6B Cache	5B Garfield	6B Morgan	5B Sevier	3B Washington
6B Carbon	5B Grand	5B Piute	6B Summit	5B Wayne
6B Daggett	5B Iron	6B Rich	5B Tooele	5B Weber
5B Davis	5B Juab	5B Salt Lake	6B Uintah	

VERMONT

6A (all)

VIRGINIA

4A (all)

WASHINGTON

5B Adams	5B Douglas	4C King	4C Pacific	6B Stevens
5B Asotin	6B Ferry	4C Kitsap	6B Pend Oreille	4C Thurston
5B Benton	5B Franklin	5B Kittitas	4C Pierce	4C Wahkiakum
5B Chelan	5B Garfield	5B Klickitat	4C San Juan	5B Walla Walla
4C Clallam	5B Grant	4C Lewis	4C Skagit	4C Whatcom
4C Clark	4C Grays Harbor	5B Lincoln	5B Skamania	5B Whitman
5B Columbia	4C Island	4C Mason	4C Snohomish	5B Yakima
4C Cowlitz	4C Jefferson	6B Okanogan	5B Spokane	

WEST VIRGINIA				
5A Barbour	5A Grant	4A Logan	5A Nicholas	5A Summers
4A Berkeley	5A Greenbrier	5A Marion	5A Ohio	5A Taylor
4A Boone	5A Hampshire	5A Marshall	5A Pendleton	5A Tucker
4A Braxton	5A Hancock	4A Mason	4A Pleasants	4A Tyler
5A Brooke	5A Hardy	4A McDowell	5A Pocahontas	5A Upshur
4A Cabell	5A Harrison	4A Mercer	5A Preston	4A Wayne
4A Calhoun	4A Jackson	5A Mineral	4A Putnam	5A Webster
4A Clay	4A Jefferson	4A Mingo	5A Raleigh	5A Wetzel
5A Doddridge	4A Kanawha	5A Monongalia	5A Randolph	4A Wirt
5A Fayette	5A Lewis	4A Monroe	4A Ritchie	4A Wood
4A Gilmer	4A Lincoln	4A Morgan	4A Roane	4A Wyoming

WISCONSIN

6A Adams	7 Douglas	6A Kewaunee	6A Ozaukee	7 Taylor
7 Ashland	6A Dunn	6A La Crosse	6A Pepin	6A Trempealeau
6A Barron	6A Eau Claire	6A Lafayette	6A Pierce	6A Vernon
7 Bayfield	7 Florence	7 Langlade	6A Polk	7 Vilas
6A Brown	6A Fond du Lac	7 Lincoln	6A Portage	6A Walworth
6A Buffalo	7 Forest	6A Manitowoc	7 Price	7 Washburn
7 Burnett	6A Grant	6A Marathon	6A Racine	6A Washington
6A Calumet	6A Green	6A Marinette	6A Richland	6A Waukesha
6A Chippewa	6A Green Lake	6A Marquette	6A Rock	6A Waupaca
6A Clark	6A Iowa	6A Menominee	6A Rusk	6A Waushara
6A Columbia	7 Iron	6A Milwaukee	6A Sauk	6A Winnebago
6A Crawford	6A Jackson	6A Monroe	7 Sawyer	6A Wood
6A Dane	6A Jefferson	6A Oconto	6A Shawano	
6A Dodge	6A Juneau	7 Oneida	6A Sheboygan	
6A Door	6A Kenosha	6A Outagamie	6A St. Croix	

WYOMING

6B Albany	6B Crook	6B Laramie	5B Platte	6B Uinta
6B Big Horn	6B Fremont	7 Lincoln	6B Sheridan	6B Washakie
6B Campbell	5B Goshen	6B Natrona	7 Sublette	6B Weston
6B Carbon	6B Hot Springs	6B Niobrara	6B Sweetwater	
6B Converse	6B Johnson	6B Park	7 Teton	

US TERRITORIES

AMERICAN SAMOA
1A (all)*

GUAM
1A (all)*

NORTHERN MARIANA ISLANDS
1A (all)*

PUERTO RICO
1A (all)*

VIRGIN ISLANDS
1A (all)*

C200
INTERNATIONAL CLIMATE ZONES

C201 International climate zones. The climate *zone* for any location outside the United States shall be determined by applying Table C201(1) and then Table C201(2).

TABLE C201(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 $P_{in} < 0.44 \times (TF - 19.5)$ [$P_{cm} < 2.0 \times (TC + 7)$ 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 C201(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 CHAPTER 9 INDOOR ENVIRONMENTAL QUALITY

NGBS Section	Example third-party certification programs compliant with the corresponding section
901.5 Carpets	Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program
901.6 Hard-surface flooring	GREENGUARD Environmental Institute Children & Schools Certification Program Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program
901.7 Wall coverings	GREENGUARD Environmental Institute Children & Schools Certification Program Scientific Certification Systems (SCS) Indoor Advantage Gold Program
901.8 Architectural coatings	GREENGUARD Environmental Institute Children & Schools Certification Program Scientific Certification Systems (SCS) Indoor Advantage Gold Program Green Seal
901.9 Adhesives and sealants	GREENGUARD Environmental Institute Children and Schools Certification Program Scientific Certifications Systems (SCS) Indoor Advantage Gold Program CRI Green Label Plus Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program Green Seal
901.11 Insulation	GREENGUARD Environmental Institute Children and Schools Certification Program Scientific Certifications Systems (SCS) Indoor Advantage Gold Program