ICC 700-2024
National Green Building Standard®
DRAFT 3

Forward

Release of the Draft Standard. Those Public Comments that were Accepted or Accepted as Modified by the Consensus Committee at the September 4, 2024 meeting have been incorporated in this Draft Standard posted at www.HomeInnovation.com/NGBS. This draft is provided for the purpose of soliciting public comments on the substantive changes to the 2024 National Green Building Standard (NGBS) Draft 2. Only the specific changes shown in underline and ~~strikethrough~~ or sections of the Draft Standard that are directly impacted by these changes are open for public comment. Section cross references throughout the document are highlighted in yellow to aid in the review of changes.

Public comments are accepted through **November 18, 2024**.

Home Innovation procedures require conversions from one unit system to the other shall be provided in parenthesis following units in the text of the standards. Unit conversions have not been fully implemented into this draft of the Standard as practices are still subject to change.

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

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CHAPTER 1:
SCOPE & ADMINISTRATION

101 GENERAL

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

101.2 Scope. The provisions of this Standard shall apply to the design, construction, alteration, enlargement, and renovation of (1) all residential buildings, (2) residential portions of mixed-use buildings, or (3) mixed-use buildings where the residential portion is greater than 50% of the gross floor area. This Standard shall also apply to subdivisions, building sites, building lots, and accessory structures.

101.2.1 Residential designation. For the purpose of this Standard, all Group R occupancies as defined by the International Building Code and all buildings within the scope of the International Residential Code shall be considered residential. Assisted living facilities, residential board and care facilities, and group homes classified as an I-1 occupancy as defined by the International Building Code shall also be considered residential.

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

101.4 Referenced documents. The codes, standards, and other documents referenced in this Standard shall be considered part of the requirements of this Standard to the prescribed extent of each such reference. The edition of the code, standard, or other referenced document shall be the edition referenced in Chapter 14.

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

102 CONFORMANCE

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

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

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

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

103 ADMINISTRATION

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

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CHAPTER 2:
DEFINITIONS

201 GENERAL

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

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

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

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

202 DEFINITIONS

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

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

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

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

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

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

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

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

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

ARCHITECTURAL COATINGS. A material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, primers, paints, varnishes, sealers, and stains. An architectural coating is a material applied to stationary structures or their appurtenances at the site of installation. Coatings applied in shop applications, sealants, and adhesives are not considered architectural coatings.

AREA OF HIGH INTERSECTION DENSITY. An area whose existing streets and sidewalks create not less than 90 intersections per square mile (35 intersections per square kilometer).

AUTHORITY HAVING JURISDICTION (AHJ). An agency or agent responsible for enforcing this code.

BALANCED VENTILATION. Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate is within 10% of the total mechanical supply airflow rate.

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

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

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

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

BUILDING THERMAL ENVELOPE. The basement walls, exterior walls, floors, ceilings, roofs, and any other building element assemblies that enclose conditioned space or provide a boundary between conditioned space and exempt or unconditioned space.

CEMENTITIOUS MATERIALS. Materials utilizing hydraulic cement as a primary binder, such as concrete, mortar, grout, manufactured masonry, and fiber-cement.

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

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

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

COMMON AREA(S).

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

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

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

COMPRESSED NATURAL GAS (CNG) VEHICLE RESIDENTIAL FUELING APPLIANCE. A residential appliance that supplies compressed natural gas into a CNG vehicle.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

EER2 (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.)

EFFECTIVE FLUSH VOLUME. The flush volume when tested is in accordance with ASME A112.19.2: For single flush toilets, it is the volume of water used for one flush. For dual flush, it is the average volume of water for two reduced flushes and one full flush.

ELECTRIC VEHICLE CHARGING CAPABILITY. A parking stall that is EV Capable or EV Ready as defined by the National Electrical Code or by the *authority having jurisdiction*.

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, dwelling unit, or sleeping unit energy consumption.

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

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

ENVIRONMENTALLY SENSITIVE AREAS.

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

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

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

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

FENESTRATION. Products classified as either vertical fenestration or skylights.

SKYLIGHT. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal.

VERTICAL FENESTRATION. Windows (fixed or movable), opaque doors, glazed doors, glazed block and combination opaque/glazed doors composed of glass or other transparent or translucent glazing materials and installed at a slope not less than 60 degrees (1.05 rad) from horizontal.

FENESTRATION PRODUCT, FIELD-FABRICATED. A fenestration product whose frame is made at the construction site of standard dimensional lumber or other materials that were not previously cut, or otherwise formed with the specific intention of being used to fabricate a fenestration product or exterior door. Field fabricated does not include site-built fenestration.

FENESTRATION PRODUCT, SITE-BUILT. A fenestration designed to be made up of field-glazed or field-assembled units using specific factory cut or otherwise factory-formed framing and glazing units. Examples of site-built fenestration include storefront systems, curtain walls, and atrium roof systems.

FLOOR AREA, GROSS. The floor area within the inside perimeter of the exterior walls of the building under consideration, exclusive of vent shafts and courts, without deduction for corridors, stairways, ramps, closets, the thickness of interior walls, columns, or other features. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the useable area under the horizontal projection of the roof or floor above. The gross floor area shall not include shafts with no opening or interior courts.

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 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 ft (1.80~~30 m~~m) from the building, between the structure and a point 6 ft (1.83~~0 m~~m) from the building.

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

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

GRID-INTERACTIVE BATTERY STORAGE (GIBS). A battery storage system that provides electric system grid operators such as utilities, independent system operators (ISOs) and regional transmission organizations (RTOs), with automatic control that is capable of receiving and automatically responding to a signal for charge and discharge.

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

GROUND SOURCE HEAT PUMP. A system that uses the earth or subsurface water as a heat sink for air conditioning and as a heat source for heating.

HARDSCAPE. Asphalt, concrete, masonry, stone, wood, and other pavers external to the building shell on a landscape.

HAZARDOUS WASTE. A solid waste, or combination of solid waste, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (a) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. A solid waste is a hazardous waste if it is specifically listed by the US EPA as a hazardous waste or as determined by the AHJ.

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

HIGH INTERSECTION DENSITY. Defined under "Area of High Intersection Density."

HIGH-EFFICACY LAMPS. Compact fluorescent lamps (CFL); light emitting diode (LED); T-8 or smaller diameter linear fluorescent lamps; or lamps with an efficacy not less than: 1) 60 lumens per watt for lamps over 40 watts, 2) 50 lumens per watt for lamps over 15 watts to 40 watts, or 3) 40 lumens per watt for lamps 15 watts or less.

HISTORIC BUILDING. Any building or structure that is one or more of the following:

1. Listed, or certified as eligible for listing, by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.
2. Designated as historic under an applicable state or local law.
3. Certified as a contributing resource within a National Register-listed, state-designated, or locally designated historic district.

HSPF2 (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 not less than 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.

INTEGRATED WATER FACTOR (IWF). a measure of water efficiency that considers gallons of water consumed per cubic foot of capacity. The lower the IWF, the more water efficient the clothes water.

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

JALOUSIE WINDOW. A window consisting of a series of overlapping horizontal frameless louvers which pivot simultaneously in a common frame and are actuated by one or more operating devices so that the bottom edge of each louver swings outward and the top edge swings inward during operation.

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

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

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

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

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

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

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

LOW-IMPACT DEVELOPMENT. A stormwater management approach that attempts to recreate the predevelopment hydrology of a site by using lot level topography and landscape to deter stormwater 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.

MASS BALANCE APPROACH. A set of rules that can be used to determine the amount of content related to an environmental attribute in a product.

MASS WALLS. Above-grade masonry or concrete walls having a mass greater than or equal to 30 pounds per square foot (146 kg/m^2), solid wood walls having a mass greater than or equal to 20 pounds per square foot (98 kg/m^2), and any other walls having a heat capacity greater than or equal to 6 Btu/ft^2•°F [266 J/(m^2 • K)] with not less than 50% of the required R-value on the exterior side of the wall's centerline.

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

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

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

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

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

MULTIFAMILY AND MIXED-USE BUILDINGS. A building, which can be mixed-use, containing multiple dwelling units or sleeping units and classified as R-2 or I-1 under the IBC.

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

NEW CONSTRUCTION. Building for which an active permit has been issued or for which a Certificate of Occupancy has been issued within the last 12 months~~Construction of a new building~~.

NON-RESIDENTIAL SPACES. Spaces not designated as residential in § 101.2.1.

OCCUPANCY SENSOR. Devices that generally use passive infrared and/or ultrasonic technology or a combination of multiple sensing technologies to automatically turn lights on and off or from one preset light level to another based on whether the sensor detects that a space is occupied.

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

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

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

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

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

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

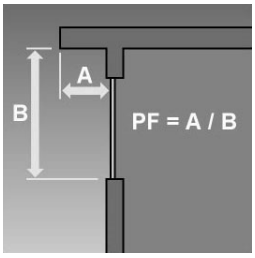
PRECUT. Materials cut to final size prior to delivery to site and ready for assembly.

~~**PRESCRIPTIVE PATH.** A set of provisions in a code or standard that shall 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/sleeping 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

RAINSCREEN SYSTEM. An assembly applied to the exterior side of an exterior wall which consists of, not less than, an outer layer, an inner layer, and a cavity between them sufficient for the passive removal of liquid water and water vapor.

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

READILY ACCESIBLE. Capable of being reached quickly for operation, renewal, or inspection without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders or access equipment.

RECLAIMED WATER. Non-potable water provided by a wastewater utility, treated to comply with the requirements of the Authority Having Jurisdiction (AHJ) for the intended uses. The water may be sanitized to allow for above ground landscape irrigation or flush sanitary fixtures. May also be known as Recycled Water in some areas.

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

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

POST-CONSUMER RECYCLED CONTENT. Proportion of recycled material in a product generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product that can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

PRE-CONSUMER (POST-INDUSTRIAL) RECYCLED CONTENT. Proportion of recycled material in a product diverted from the waste stream during the manufacturing process. Pre-consumer recycled content does not include reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

REGIONAL MATERIAL. Material that originates, is produced, grows naturally, or occurs naturally within: (1) 500 miles (804.70 km) of the construction site if transported by truck, or (2) 1,500 miles (2,40014 km) of the construction site if transported for not less than 80% of the total transport distance by rail or water. Products that are assembled or produced from multiple raw materials are considered regional materials where the weighted average (by weight or volume) of the distance the raw materials have been transported comply with the distance criteria.

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

RENEWABLE ENERGY. Energy derived from renewable energy sources.

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

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

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

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

SEER2 (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. SEER2 is the cooling performance equivalent measurement of HSPF2.

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.

SILL OR PAN FLASHING. Material installed at the base of the rough opening to allow water which may enter through or around the window/door to drain out.

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

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

SLEEPING UNIT. A room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a dwelling unit are not sleeping units.

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

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

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

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

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

- More than 6 ft (18~~29 m~~m) above grade plane; or
- More than 12 ft (3~~6~~7~~58 m~~m) above the finished ground level at any point.

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

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

SUPPLEMENTARY CEMENTITIOUS MATERIALS. Inorganic materials that, used in combination with Portland or blended cements, contribute to the properties of a cementitious mixture through hydraulic or pozzolanic activity or both.

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

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

TROPICAL WOOD PRODUCTS. Building materials derived from trees grown and harvested between the Tropic of Cancer and Tropic of Capricorn.

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

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

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

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

- Class I: 0.1 perm or less (5.7 ng/Pa • s • m^2)

- Class II: greater than 0.1 ~~<perm =~~to 1.0 perm (>5.7 to ≤ 57 ng/Pa • s • m²)
- Class III: greater than 1.0 ~~<perm =~~ to 10 perm (>57 to ≤ 572 ng/Pa • s • m²)

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

VENTILATION AIR. That portion of supply air that comes from the outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designation space.

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

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

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

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

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

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

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

CHAPTER 3:
COMPLIANCE METHOD

301 GENERAL

301.1 Environmental rating levels. The building, project, site, and/or development environmental rating level shall consist of all mandatory requirements plus points assessed using the point system specified within this chapter. The rating level shall be in accordance with § 302, § 303, § 304, or § 305, as applicable. The designation for accessory structures shall be in accordance with § 306.

301.1.1 Non-residential spaces. Non-residential spaces in mixed-use buildings shall comply with Chapter 13 (Commercial Spaces) of this Standard or IgCC § 501.3.7.2 and Chapters 6-10, excluding § 601.3.1.

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

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

(2) Point allocation for multifamily and mixed-use buildings shall be as prescribed in § 304.

(3) The Adopting Entity shall allow the use of new and innovative products and practices deemed to comply with the intent of this Standard. Points assigned for any new product or practice shall be determined by the Adopting Entity. The Adopting Entity shall award no more than 20 points for such products or practices. Point values shall be determined by comparing the innovative product or practice to a product or practice already described in the Standard. The applicant shall supply demonstrable, quantified data to support the innovative product or practice and to determine the practice's functional equivalent in the Standard for the points to be awarded.

302 GREEN SUBDIVISIONS

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

302.1.1 Site design and development obtaining thresholds in Table 302 are permitted to be verified, certified, and marketed as such prior to the verification of green buildings.

302.1.2 Developments are permitted to be marketed as a green subdivision. Developer shall provide clear explanation that the rating only applies to the development and not the buildings.

303 GREEN BUILDINGS

303.1 Compliance options. The criteria for new buildings shall be in accordance with § 303.2 for residential buildings, the residential portion of mixed-use buildings, or mixed-use buildings or § 303.3 for compliance for single-family homes, townhomes, and duplexes.

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

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

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

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

Exception: Where the builder is unable to control a majority of items in Chapter 5 due to timing and lack of

Table 302

Threshold Point Ratings for Site Design and Development

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

Table 303
Threshold Point Ratings for Green Buildings

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

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

(b) For dwelling units greater than 4,000 ft² (371.61~~2~~ m²), the number of points in Category 7 (Additional Points from Any Category) shall be increased in accordance with § 601.1. The "Total Points" shall be increased by the same number of points.

relationship to the Lot Design, Preparation, and Development, green ratings on the home are permitted to be obtained by eliminating rating requirements and points from Chapter 5. Rating threshold requirements are permitted to be adjusted accordingly. Builders shall provide evidence of this impossibility to the Adopting Entity and provide disclaimer statement on marketing materials when this occurs.

303.3 Single-family homes, townhomes, and duplexes. Single-family homes, townhomes, and duplexes complying with all applicable requirements of Chapter 12 shall be deemed Certified.

304 GREEN MULTIFAMILY AND MIXED USE BUILDINGS

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

304.2 Alternative IgCC compliance. As an alternative, any multifamily or mixed-use building that complies with the IgCC shall be designated as achieving the gold rating level. Additionally, acceptable air tightness of individual residential units shall be demonstrated by a blower door test. The testing and sampling procedure shall be in accordance with the ENERGY STAR Multifamily High Rise Program Testing and Verification Protocols, Version 1.0, Revision 03 - 2015, with an allowable leakage not greater than 0.3 cfm/sf (1.5 L/s/m²) of enclosure bounding the apartment at an induced pressure difference of 0.2 in w.g. (50 pa~~scals~~).

305 EXISTING BUILDING

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

305.2 Whole-building rating criteria

305.2.1 Applicability. The provisions of § 305.2 shall apply to existing buildings. In addition to the foundation, not less than 50% of the structural systems of the existing building shall remain in place after any remodeling activities for the building to be eligible for compliance under § 305.2. Eligible projects shall have their Certificate of Occupancy not less than 12 months prior to NGBS registration.

305.2.1.1 Additions. For an existing building that includes an addition, the entire building including the addition shall comply with the criteria of § 305.2. The total above-grade conditioned area added during a remodel shall not exceed 75% of the existing building's

above-grade conditioned area. For multifamily and mixed-use buildings, the above-grade conditioned area shall be based on the entire building including all dwelling units/sleeping units and common areas. EXCEPTION: Historic buildings are exempt from the 75% limitation.

305.2.2 Rating scope. The building rating achieved under § 305.2 and the associated compliance criteria apply to the entire building after the remodel including any additions.

305.2.3 Mandatory practices. Additions, alterations, or repairs to an existing building, building system or portion thereof shall comply with the Mandatory requirements of Chapter 11. Unaltered portions of the existing building shall not be required to comply with Mandatory requirements except when life safety or visible moisture issues exist.

305.2.4 Rating level. A minimum rating level of Bronze shall be achieved in each of the following categories: Energy efficiency § 305.2.5), Water efficiency (§ 305.2.6), and Prescriptive practices (§ 305.2.7). The building rating level shall be the lowest rating level achieved in § 305.2.5, § 305.2.6, or § 305.2.7.

305.2.5 Energy efficiency. The building shall comply with § 11.701.1 and the compliance requirements of Table 305.2.5~~§ 305.2.5.1 or § 305.2.5.2 or § 305.2.5.3~~.

~~**305.2.5.1 Energy consumption reduction path.** The energy efficiency rating level shall be based on the reduction in energy consumption resulting from the remodel in accordance with Table 305.2.5.1.~~

~~The reduction in energy consumption resulting from the remodel shall be based on the estimated annual energy cost savings, site energy savings, source energy savings, or carbon dioxide equivalent emissions (C02e) savings using methodology in ANSI/ASHRAE Standard 105 or IgCC or equivalent. The reduction shall be the percentage difference between the consumption per square foot before and after the remodel calculated as follows:~~

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

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

~~If a building can demonstrate through documentation approved by the Adopting Entity that the remodel activities started prior to project registration, the energy baseline (consumption per square foot before remodel) can be calculated based on data and building systems~~

Table 305.2.5~~.1~~
Energy ~~Reduction Level~~Compliance Thresholds

	Rating Level			
	BRONZE	SILVER	GOLD	EMERALD
Reduction in energy consumption	15%	25%	35%	45%
EPA ENERGY STAR Score	75-84	85-94	95+	N/A
Performance Path Points	30	45	60	70
Prescriptive Path Points	30	45	60	70
ERI Target Path Points	30	45	60	70
Tropical Zone Path Points	N/A	45	60	N/A

~~**Table 305.2.5.2**~~
~~**Energy Point Thresholds**~~

	~~Rating Level~~			
	~~BRONZE~~	~~SILVER~~	~~GOLD~~	~~EMERALD~~
~~Section 11.700 new construction equivalency thresholds~~	~~30~~	~~45~~	~~60~~	~~70~~
~~*Points from § 11.702 through § 11.706 shall not count towards the total points for § 305.2.7.*~~				

~~**Table 305.2.5.3**~~
~~**EPA ENERGY STAR Score**~~

	~~Rating Level~~			
	~~BRONZE~~	~~SILVER~~	~~GOLD~~	~~EMERALD~~
~~EPA ENERGY STAR Score~~	~~75-84~~	~~85-94~~	~~95+~~	~~N/A~~

~~that were existing in the building up to 3 years prior project registration.~~

~~**305.2.5.2 New Construction Energy Equivalency path.** The building shall comply with § 11.701 Minimum Energy Efficiency Requirements and Table 305.2.5.2 (Energy Point Thresholds). Any practice listed in either § 11.702 (Performance Path), § 11.703 (Prescriptive Path), or § 704 (ERI Target Path) shall be eligible for contributing points toward Table 305.2.5.2 (Energy Point Thresholds). The attributes of the existing building that were in compliance with § 11.702through § 11.704 prior to certification and remain in compliance when submitting for certification shall be eligible for contributing points to this section.~~

~~A building complying with § 305.2.5.2 New Construction Equivalency Path shall obtain not less than 30 points from § 11.702, § 11.703, or § 11.704 and include not less than two practices from § 11.705 or not less than one practice from § 11.705 and one practice from § 11.706.~~

~~Points earned in § 11.705 and § 11.706 contribute to the energy points in Table 305.2.5.2 and support earning a higher certification level. Points from § 11.702 through § 11.706 do not count towards the required points in Table 305.2.7.~~

~~**305.2.5.3 EPA ENERGY STAR Score.** The Multifamily or mixed-use property shall be scored in the EPA ENERGY STAR Portfolio Manager tool following EPA requirements and guidance or equivalent tool or program. This score is based on actual energy usage data. The last month in the 12-month energy data period for this energy score shall be within 6 months prior to acceptance by the Adopting Entity. Where total property energy data is not available, then the score can be generated with 100% actual common and non-residential area energy usage and not less than 80% of the actual resident energy meters which has been extrapolated to 100%. All energy data and extrapolation methods shall be reported. The level awarded for the energy chapter is based on Table 305.2.5.3.~~

~~Notwithstanding the above requirements, projects that have an energy score of 65-75 shall achieve Bronze-level certification by implementing energy efficiency measures (EEM) that will improve the energy score to a level above 75. All EEMs shall be completed and verified before submission to the Adopting Entity. All energy data, energy modeling, and the forecasted energy score shall be submitted to the Adopting Entity.~~

305.2.6 Water efficiency. The building shall comply with § 11.801.1 and the requirements of Table 305.2.6~~§ 305.2.6.1 or § 305.2.6.2 or § 305.2.6.3~~. The attributes of the existing building that were in compliance with § 11.802 through § 11.804 prior to certification and remain in compliance when submitting for certification shall be eligible for contributing points to this section.

~~**305.2.6.1 Water consumption reduction path.** The water efficiency rating level shall be based on the reduction in~~

Table 305.2.6.~~1~~
Water ~~Reduction Level~~Compliance Thresholds

	Rating Level			
	BRONZE	**SILVER**	**GOLD**	**EMERALD**
Reduction in water consumption	20%	30%	40%	50%
EPA Water Score	75-84	85-94	95+	N/A
Prescriptive Path Points	25	39	67	92
Performance Path – Water Rating Index Score	61-70	51-60	41-50	40 and below

~~**Table 305.2.6.2**~~
~~**Water Point Thresholds**~~

	~~Rating Level~~			
	~~**BRONZE**~~	~~**SILVER**~~	~~**GOLD**~~	~~**EMERALD**~~
~~Section 11.800 new construction equivalency thresholds~~	~~25~~	~~39~~	~~67~~	~~92~~
~~*Points from § 11.802 through § 11.804 shall not count toward the total points for § 305.2.7.*~~				

~~**Table 305.2.6.3**~~
~~**EPA Water Score**~~

	~~Rating Level~~			
	~~**BRONZE**~~	~~**SILVER**~~	~~**GOLD**~~	~~**EMERALD**~~
~~EPA Water Score~~	~~75-84~~	~~85-94~~	~~95+~~	~~N/A~~

~~water consumption resulting from the remodel in accordance with Table 305.2.6.1.~~

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

~~[(consumption per bedroom before remodel – consumption per bedroom after remodel)/consumption per bedroom before remodel]*100%~~

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

~~Where a building can demonstrate through documentation approved by the Adopting Entity that the remodel activities started prior to project registration, the water baseline (consumption before remodel) shall be calculated based on data and building systems that existed in the building up to 3 years prior project registration.~~

~~**305.2.6.2. New construction water equivalency path.** The building shall comply with New Construction Water Equivalency Table 305.2.6.2 (Water Point Thresholds). Any practice listed in either § 11.802 (Prescriptive Path) and § 11.803 (Innovative Practices), or § 804 (Performance Path) shall be eligible for contributing points toward Table 305.2.6.2 (Water Point Thresholds). The attributes of the existing building that were in compliance with § 11.802 through § 11.804 prior to certification and remain in compliance when submitting for certification shall be eligible for contributing points to this section.~~

~~A building complying with § 305.2.6.2 New Construction Water Equivalency Path shall obtain not less than 25 points from § 11.802 and § 11.803, or § 11.804.~~

~~Points from §11.802 through § 11.804 do not count towards the required points in Table 305.2.7.~~

~~**305.2.6.3 EPA water Score.** The Multifamily property shall be scored in the EPA ENERGY STAR Portfolio Manager tool following EPA requirements and guidance or equivalent tool or program. The last month in the 12-month water data period for this water score shall be within 6 months prior to acceptance by the Adopting Entity. Where total property water data is not available, then the score can be generated with 100% actual common and non-residential area water usage and not less than 80% of the actual tenant water meters, which has been extrapolated to 100%. All water data and extrapolation methods shall be reported. The level awarded for the Water Section shall be based on Table 305.2.6.3.~~

305.2.7 Prescriptive practices. The point thresholds for the environmental rating levels based on compliance with the Chapter 11 prescriptive practices shall be in accordance with Table 305.2.7. Any practice listed in Chapter 11, except for § 11.701 through § 11.706 and § 11.801 through § 11.803 shall be eligible for contributing points to the prescriptive threshold ratings. The attributes of the existing building that were in compliance with the prescriptive practices of Chapter 11 prior to the remodel and remain in compliance after the remodel shall be eligible for contributing points to the prescriptive threshold ratings.

305.3 Multifamily and mixed-use property level green certification

305.3.1 Multifamily and mixed-use ~~Properties~~ properties with multiple buildings shall qualify for a single property-level green certification by following the practices of 305.2.

Building Types: Property-wide certifications shall specify the buildings that are included in the certification. Multifamily and mixed-use amenity buildings, such as clubhouse, fitness center and leasing offices shall be included in the property wide certification. Garage-only structures and smaller unconditioned structures, such as, but not limited to, maintenance sheds, or mail kiosks, shall be excluded. Commercial or retail space is permitted to be included or excluded from the green certification. Where commercial space is to be included, it shall comply with the requirements from Chapter 13 relevant for existing buildings.

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

305.3.3 Mandatory practices. Additions, alterations, or repairs to any buildings, building system, or portion thereof shall comply with the Mandatory requirements of Chapter 11. Unaltered portions of the existing buildings shall not be required to comply with Mandatory requirements except where life, safety, or visible moisture issues exist.

305.3.4 Rating level. A rating level of Bronze or higher shall be achieved in each of the following categories: Energy efficiency (§ 305.2.5), Water efficiency (§ 305.2.6),

and Prescriptive practices (§ 305.2.7), as applied across all the buildings in the property. Practices related to 305.2.7 shall be awarded to all buildings on the property based on the lowest point level achieved by any one building. The property rating level shall be the lowest rating level achieved in § 305.2.5, § 305.2.6, or § 305.2.7.

306 GREEN ACCESSORY STRUCTURES

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

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

Table 305.2.7
Prescriptive Threshold Point Ratings

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

CHAPTER 4:
SITE DESIGN AND DEVELOPMENT

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/sleeping units. The rating earned under § 302 based on practices herein, applies only to the site as defined in Chapter 2. The buildings on the site achieve a separate rating level or designation by complying with the provisions of § 303, § 304, § 305, or § 306, as applicable.

401 SITE SELECTION

401.0 Intent. The site is selected to minimize environmental impact by one or more of the following:

401.1 Infill site. An infill site is selected. **7**

401.2 Greyfield site. A greyfield site is selected. **7**

401.3 Brownfield site. A brownfield site is selected. **8**

402 PROJECT TEAM, MISSION STATEMENT, AND GOALS

402.0 Intent. The site is designed and constructed by a team of qualified professionals trained in green development practices.

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

402.2 Training. Training is provided to on-site supervisors and team members regarding the green development practices to be used on the project. **3**

402.3 Project checklist. A checklist of green development practices to be used on the project is created, followed, and completed by the project team regarding the site..... **4 Mandatory**

402.4 Development agreements. Through a developer agreement or equivalent, the developer requires purchasers of lots to construct the buildings in compliance with this Standard (or equivalent) certified to a minimum Bronze rating level. **6**

403 SITE DESIGN

403.0 Intent. The project is designed to avoid detrimental environmental impacts, minimize any unavoidable impacts, and mitigate 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.

POINTS

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. ..... **5 Mandatory**

(2) A plan to protect and maintain priority natural resources/areas during construction is created. (Also see § 404 for guidance in forming the plan.) ..... **5 Mandatory**

(3) Member of builder's project team participates in a natural resources conservation program. **4**

(4) Streets, buildings, and other built features are located to conserve high priority vegetation. **5**

(5) Developer has a plan for removal or containment of invasive plants, as identified by a qualified professional, from the disturbed areas of the site. **3**

(6) Developer has a plan for removal or containment of invasive plants, as identified by a qualified professional, on the undisturbed areas of the site. **6**

403.2 Building orientation. Not less than 75% of the building sites are designed with the longer dimension of the structure to face within 20 degrees (0.35 radians) of south. **6**

403.3 Slope disturbance. Slope disturbance is minimized by one or more of the following:

(1) Hydrological/soil stability study is completed and used to guide the design of all buildings on the site. **5**

(2) All or a percentage of roads are aligned with natural topography to reduce cut and fill.

(a) greater than or equal to 10% to less than 25% **1**

(b) greater than or equal to 25% to less than 75% **4**

(c) greater than 75% **6**

(3) Long-term erosion effects are reduced by the use of clustering, terracing, retaining walls, landscaping, and restabilization techniques. **6**

403.4 Soil disturbance and erosion. A site Stormwater Pollution Prevention Plan (SWPPP) is developed in accordance with applicable stormwater Construction General Permits. The plan includes one or more of the following:

(1) Construction activities are scheduled to minimize length of time that soils are exposed. **4**

(2) Utilities are installed by alternate means such as directional boring in lieu of open-cut trenching. Shared easements or common utility trenches are utilized to minimize earth disturbance. Low ground pressure equipment or temporary matting is used to minimize excessive soil consolidation. **5**

(3) Limits of clearing and grading are demarcated. **4**

403.5 Stormwater management. The stormwater management system is designed to use low-impact development/green infrastructure practices to preserve, restore, or mitigate changes in site hydrology due to land disturbance and the construction of impermeable surfaces through the use of one or more of the following techniques:

(1) A site assessment is conducted and a plan prepared and implemented that identifies important existing permeable soils, natural drainage ways and other water features, e.g., depressional storage, onsite to be preserved in order to maintain site hydrology. **7**

(2) A hydrologic analysis is conducted that results in the design and installation of a stormwater management system that maintains the predevelopment (stable, natural) runoff hydrology of the site **10**

POINTS

through the development or redevelopment process. Ensure that post construction runoff rate, volume and duration do not exceed predevelopment rates, volume, and duration. .....

(3) Low-Impact Development/Green infrastructure stormwater management practices to promote infiltration and evapotranspiration are used to manage rainfall on the lot and prevent the off-lot discharge of runoff from all storms up to and including the volume of following storm events:

(a) 80th percentile storm event **5**

(b) 90th percentile storm event **8**

(c) 95th percentile storm event **10**

(4) Permeable materials are used for driveways, parking areas, walkways, and patios according to the following percentages:

Points for vegetative paving systems are only awarded for location, receiving more than 20 in. (51 cm) per year of annual average precipitation.

(a) greater than or equal to 10% to less than 25% (add 2 points for use of vegetative paving system) . **2**

(b) greater than or equal to 25 to less than 50% (add 4 points for use of vegetative paving system) **5**

(c) greater than or equal to 50% (add 6 points for use of vegetative paving system)..... **10**

403.6 Landscape plan. A landscape plan is developed to limit water and energy use in common areas while preserving or enhancing the natural environment utilizing one or more of the following:

(1) A plan is formulated to restore or enhance natural vegetation that is cleared during construction. Landscaping is phased to coincide with achievement of final grades to ensure denuded areas are quickly vegetated. **6**

(2) On-site native or regionally appropriate trees and shrubs are conserved, maintained, and reused for landscaping to the greatest extent possible. **6**

(3) Non–invasive vegetation that is native or regionally appropriate for local growing conditions is selected to promote biodiversity. **7**

(4) EPA WaterSense Water Budget Tool or equivalent is used when implementing the site vegetative design.. **10**

(5) Where turf is being planted, Turfgrass Water Conservation Alliance (TWCA) or equivalent as determined by the adopting entity third-party qualified water efficient grasses are used. **6**

(6) Synthetic Turf Council (STC) or equivalent industry association qualified artificial turf is installed in dry climate zones in accordance with table A200, instead of natural turf for recreation, sport, or play fields.....

(7) For landscaped vegetated areas, the maximum percentage of all turf areas is:

(a) 0% **10**

(b) greater than 0% to less than or equal to 20% **8**

(c) greater than 20% to less than or equal to 40% **6**

(d) greater than 40% to less than or equal to 60% **4**

POINTS

(8) For landscaped vegetated areas, the maximum percentage of all artificial turf areas is (only applicable in Dry climate zones in accordance with Table A200):

~~(a) 0%~~

(~~b~~a) greater than 0% to less than or equal to 20% 1

(~~c~~b) greater than 20% to less than or equal to 40% 2

(~~d~~c) greater than 40% to less than or equal to 60% 3

(9) To improve pollinator habitat, not less than 10% of planted areas are composed of flowering and nectar producing plant species. Invasive plant species shall not be utilized. 6

(10) Non-potable irrigation water is available to common areas 2

(11) Non-potable irrigation water is available to lots. 4

(12) Plants with similar watering needs are grouped (hydrozoning). 4

(13) Species and locations for tree planting are identified and utilized to increase summer shading of streets, parking areas, and buildings and to moderate temperatures. 5

(14) Vegetative wind breaks or channels are designed as appropriate to local conditions. 4

(15) On-site tree trimmings or stump grinding of regionally appropriate trees are used to provide protective mulch during construction or as base for walking trails, and cleared trees are recycled as sawn lumber or pulp wood 4

(16) An integrated common area pest management plan to minimize chemical use in pesticides and fertilizers is developed 4

(17) Plans for the common area landscape watering system include a weather-based or soil moisture-based controller. Required irrigation systems are designed in accordance with the IA Landscape Irrigation Best Management Practices 6

(18) Trees that might otherwise be lost due to site construction are transplanted to other areas on-site or off-site using tree-transplanting techniques to ensure a high rate of survival. 4

(19) Greywater irrigation systems are used to water common areas. Greywater used for irrigation conforms to all criteria of § 803.1. 7

(20) Cisterns, rain barrels, and similar tanks are designed to intercept and store runoff. These systems may be above or below ground, and they may drain by gravity or be pumped. Stored water may be slowly released to a pervious area, and/or used for irrigation of lawn, trees, and gardens located in common areas. 6

(21) Spray irrigation

(a) Is not present on slopes steeper than 25% (i.e., where the land rises more than 1 ft (0.3 m) vertically for every 4 ft (1.2 m) horizontally). 2

(b) Has been tested in accordance with the ASABE/ICC 802, “Landscape Irrigation Sprinkler and Emitter Standard” and there is documentation of the sprinklers achieving a lower quarter distribution uniformity of not less than 0.65. 2

POINTS

(c) Is installed to eliminate low head/point drainage and runoff. **2**

(d) Spray irrigation is not used **6**

403.7 Wildlife habitat.

(1) Measures are planned that will support wildlife habitat. **6**

(2) The site is adjacent to a wildlife corridor, fish and game park, or preserved areas and is designed with regard for this relationship. **3**

(3) Outdoor lighting techniques are utilized with regard for wildlife. **3**

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

403.9 Existing buildings. Following mitigation of any harmful materials, existing building(s) and structure(s) is/are preserved and reused, adapted, or disassembled for reuse or recycling of building materials.

(1) Building reuse or adaptation..... **12**

(2) Disassemble for reuse or recycling of building materials. **10**

403.10 Existing and recycled materials. Existing pavements, curbs, and aggregates are salvaged and reincorporated into the development or recycled asphalt or concrete materials are used as follows.
[Points awarded for every 10% of total materials used for pavement, curb, and aggregate that comply with the criteria of this practice. The percentage is consistently calculated on a weight, volume, or cost basis.]..... **15 max**

(1) Existing pavements, curbs, and aggregates are reincorporated into the development..... **3**

(2) Recycled asphalt or concrete with not less than 50% recycled content is utilized in the project. **2**

403.11 Demolition of existing building. A demolition waste management plan is developed, posted at the jobsite, and implemented to recycle and/or salvage for reuse not less than 50% of the nonhazardous demolition waste.
[1 additional point awarded for every 10% of nonhazardous demolition waste recycled and/or salvaged beyond 50%.] ..... **5 [10 max]**

403.12 Environmentally sensitive areas. Environmentally sensitive areas are as follows:

(1) Environmentally sensitive areas are avoided as follows:

(a) less than 25% of environmentally sensitive areas left undeveloped..... **2**

(b) greater than or equal to 25% to less than 75% of environmentally sensitive areas left undeveloped **4**

(c) greater than or equal to 75% of environmentally sensitive areas left undeveloped **7**

(2) Environmentally sensitive areas are permanently protected by a conservation easement or similar mechanism. **10**

POINTS

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 § 403.4) **5**

404.2 Trees and vegetation. Designated trees and vegetation are preserved by one or more of the following:

(1) Fencing or equivalent is installed to protect trees and other vegetation. **4**

(2) Trenching, significant changes in grade, compaction of soil, and other activities are avoided in critical root zones (canopy drip line) in "tree save" areas. **5**

(3) Damage to designated existing trees and vegetation is mitigated during construction through pruning, root pruning, fertilizing, and watering. **4**

404.3 Soil disturbance and erosion. On-site soil disturbance and erosion are minimized by implementation of one or more of the following:

(1) Limits of clearing and grading are staked out prior to construction. **5**

(2) "No disturbance" zones are created using fencing or flagging to protect vegetation and sensitive areas from construction vehicles, material storage, and washout. **4**

(3) Sediment and erosion controls are installed and maintained. **5**

(4) Topsoil is stockpiled and covered with tarps, straw, mulch, chipped wood, vegetative cover, or other means capable of protecting it from erosion for later use to establish landscape plantings. **5**

(5) Soil compaction from construction equipment is reduced by distributing the weight of the equipment over a larger area by laying lightweight geogrids, mulch, chipped wood, plywood, OSB (oriented strand board), metal plates, or other materials capable of weight distribution in the pathway of the equipment. **4**

(6) Disturbed areas are stabilized within the EPA-recommended 14-day period. **4**

(7) Soil is improved with organic amendments and mulch. **4**

404.4 Wildlife habitat. Measures are implemented to support wildlife habitat.

(1) Wildlife habitat is maintained. **5**

(2) Measures are instituted to establish or promote wildlife habitat. **5**

(3) Open space is preserved as part of a wildlife corridor. **6**

(4) Builder or member of builder's project team participates in a wildlife conservation program. **5**

POINTS

405 INNOVATIVE PRACTICES

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

405.1 Driveways and parking areas. Driveways and parking areas are minimized or mitigated by one or more of the following:

(1) Off-street parking areas are shared or driveways are shared; on-street parking is utilized; and alleys (shared common area driveways) are used for rear-loaded garages. **5**

(2) In multifamily and mixed-use projects, parking capacity is not to exceed the local minimum requirements. **5**

(3) Structured parking is utilized to reduce the footprint of surface parking areas.

(a) greater than or equal to 25% to less than 50% **3**

(b) greater than or equal to 50% to less than 75% **5**

(c) greater than 75% **8**

405.2 Street widths

(1) Street pavement widths are minimized in accordance with Table 405.2 and do not exceed local minimum requirements. **6**

Table 405.2
Maximum Street Widths

Facility Type	Maximum Width
Collector street with parking (one side only)	31 ft (9.4 m)
Collector street without parking	26 ft (7.9 m)
Local access with parking (one side only)	27 ft (8.2 m)
Local access street without parking	20 ft (6.1 m)
Queuing (one-lane) streets with parking	24 ft (7.3 m)
Alleys and queuing (one-lane) streets without parking	17 ft (5.2 m)

~~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. **8**

405.3 Cluster development. Cluster development enables and encourages flexibility of design and development of land in such a manner as to preserve the natural and scenic qualities of the site by utilizing an alternative method for the layout, configuration and design of lots, buildings and structures, roads, utility lines and other infrastructure, parks, and landscaping. **10**

405.4 Planning. Innovative planning techniques are implemented in accordance with the following:

(1) Innovative planning techniques are used or developed for permissible adjustments to population density, area, height, open space, mixed-use, or other provisions for the specific purpose of open space, natural resource preservation or protection and/or mass transit usage. Other innovative planning techniques may be considered on a case-by-case basis. **10**

POINTS

(2) Provide common or public spaces of not less than 1/6 acre (674 m^2) that are within 1/4 mile (0.4 km) walk to 80% of planned and existing units and entrances to non-residential buildings. Both existing and newly constructed squares, parks, paseos, plazas, and similar uses qualify under this criterion. **10**

405.5 Wetlands. Constructed wetlands or other natural innovative wastewater or stormwater treatment technologies are used. **8**

405.6 Multi-modal transportation. Multi-modal transportation access is provided in accordance with one or more of the following:

(1) A site is selected with a boundary within one-half mile (0.8~~05~~ km) of pedestrian access to a mass transit system or within five miles of a mass transit station with available parking. **5**

(2) A site is selected where all lots within the site are located within one-half mile (0.8~~05~~ km) of pedestrian access to a mass transit system. **7**

(3) A system of walkways, bikeways, street crossings, or pathways designed to promote connectivity to existing and planned community amenities are provided.

(a) Create a network of sidewalks and paths that provide a minimum level of connectivity of not less than 90 bikeway or pathway intersections per square mile (35 per square km). **5**

(b) Create a network of sidewalks and paths that provide a minimum level of connectivity of not less than 140 bikeway or pathway intersections per square mile (54 per square km). **10**

(4) Dedicated bicycle parking and racks are indicated on the site plan and not less than six spaces are constructed for, multifamily and mixed-use buildings, and/or each developed common area. *[1 point awarded for every 6 spaces]* ..... **1 [6 max]**

(5) The developer has a contract with a bike sharing program to install bike sharing facilities on or adjacent to the property~~Bike sharing programs participate with the developer and facilities for bike sharing are planned for and constructed~~. **5**

(6) Car sharing programs participate with the developer and facilities for car sharing are planned for and constructed. **5**

(7) A site is selected within a census block group that, compared to its region, has above-average transit access to employment as calculated using the Transit Access Measures within the EPA's Smart Location Database:

(a) Access is within the second quartile for the region **4**

(~~a~~b) Access is within the top quartile for the region **10**

~~(b) Access is within the second quartile for the region ..... **4**~~

(8) A site is selected within a census block group that, compared to its region, has above-average access to employment within a 45-minute drive as calculated using EPA's Smart Location Database:

(~~b~~a) Access is within the second quartile for the region **2**

(~~a~~b) Access is within the top quartile for the region **6**

~~(b) Access is within the second quartile for the region ..... **2**~~

405.7 Density. The average density on a net developable area basis is:

		POINTS
(1)	greater than or equal to 7 to less than 14 dwelling units/sleeping units per acre (0.4 ha~~,047 m²~~)	**5**
(2)	greater than or equal to 14 to less than 21 dwelling units/sleeping units per acre (0.4 ha~~,047 m²~~)	**7**
(3)	greater than or equal to 21 dwelling units/sleeping units per acre (0.4 ha~~,047 m²~~)	**10**

405.8 Mixed-use development. (1) Mixed-use development is incorporated; or (2) for single-use sites 20 acres (8.1 ha) or less in size, 80% of the units are within 1/2 mile (0.8 km) walk of 5 non-residential uses and where a system of walkways, bikeways, street crossings, or pathways is designed to promote connectivity to those uses. **9**

405.9 Open space. The community is situated within 1/2 mile (0.8 km) of an area of open space available to the public or a portion of the gross area of the community is set aside as open space. *[Points awarded for every 10% of the community set aside as open space. where open space outside of the community is included, a maximum of 3 points are awarded.]* **2**

405.10 Community garden(s). Local food production for residents or area consumers.

(a)	A portion of the site not less than 250 ft² (~~76.2~~23.2 m²) is established as a community garden(s) for the residents of the site. *[1 point awarded per 250 ft² (~~76.2~~23.2 m²)]*	**1 [3 max]**
(b)	Areas and physical provisions are provided for composting	**1**
(c)	Signs designating the garden are posted	**1**

405.11 Insect mitigation. The site is designed to mitigate hazards from insect born disease.

To acquire points, the site shall be documented to be at risk by an epidemiologist or qualified professional.

(a)	Dense plant beds, shrubbery and woody plants are not planted within 5 ft (1.5 m) of occupied buildings	**6**
(b)	Not less than a 5 ft (1.5 m) border of paving, mulch, bare earth, or turfgrass is provided between woods or weedy areas and people trafficked or occupied areas, including playgrounds and dog parks.	**5**
(c)	Vegetation that is attractive to deer, as documented by a qualified professional, is not planted within 20 ft (6.1 m) of buildings	**3**
(d)	Paths or trails maintained through natural or non-maintained areas are a minimum of 5 ft (1.5 m) wide ~~(1.5 m)~~.	**3**
(e)	Conditions that are favorable to mosquito breeding, such as standing water, are not present on site.	**2**

405.12 Smoking prohibitions. Signs are provided prohibiting smoking at the following locations:

(a)	Smoking is prohibited within 25 ft (7.6~~5~~ m) of all building exterior doors and operable windows or building air intakes within 15 vertical feet (4.6~~5~~ m) of grade or a walking surface.	**3**
(b)	Smoking is prohibited in common areas unless otherwise designated as smoking areas.	**3**

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CHAPTER 5:
LOT DESIGN, PREPARATION, AND DEVELOPMENT

POINTS

500 LOT DESIGN, PREPARATION, AND DEVELOPMENT

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

501 LOT SELECTION

501.1 Lot. Lot is selected in accordance with § 501.1(1) or § 501.1(2).

(1) A lot is selected within a site certified to this Standard or equivalent **15**

(2) A lot is selected to minimize environmental impact by one or more of the following:

(a) An infill lot is selected. **10**

(b) A lot is selected that is a greyfield. **10**

(c) An EPA-recognized brownfield lot is selected. **15**

501.2 Multi-modal transportation. A range of multi-modal transportation choices are promoted by one or more of the following:

(1) A lot is selected within one-half mile (0.8~~05~~ km) of pedestrian access to a mass transit system **6**

(2) A lot is selected within five miles (8~~,045~~ km) of a mass transit station with provisions for parking. **3**

(3) Walkways, street crossings, and entrances designed to promote pedestrian activity are provided. New buildings are connected to existing sidewalks and areas of development. **5**

(4) A lot is selected within one-half mile (0.8~~05~~ km) of six or more community resources. No more than two each of the following use category can be counted toward the total: Recreation, Retail, Civic, and Services. Examples of resources in each category include, but are not limited to the following:

Recreation: recreational facilities (such as pools, tennis courts, basketball courts), parks
Retail: grocery store, restaurant, retail store.
Civic: post office, place of worship, community center.
Services: bank, daycare center, school, medical/dental office, laundromat/dry cleaners. **4**

OR

A lot is selected within a census block group that, compared to its region, has above-average neighborhood walkability using an index within the EPA's Smart Location Database:

(a) Walkability is within the top quartile for the region. **5**

(b) Walkability is within the second quartile for the region..... **2**

POINTS

(5) Bicycle use is promoted by building on a lot located within a community that has rights-of-way specifically dedicated to bicycle use in the form of paved paths or bicycle lanes, or on an infill lot located within 1/2 mile (0.8 km) of a bicycle lane designated by the jurisdiction. **5**

(6) Dedicated bicycle parking and racks are indicated on the site plan and constructed for ~~mixed-use and~~ multifamily and mixed-use buildings:

(a) Not less than 1 bicycle parking space per 3 residential units..... **2**

(b) Not less than 1 bicycle parking space per 2 residential units..... **4**

(c) Not less than 1 bicycle parking space per 1 residential unit. **6**

(d) Bicycle enclosed storage is provided or parking spaces are covered or otherwise protected from the elements ..... **2 Additional**

(7) Select a lot in a community where there is access to shared vehicle usage such as carpool drop-off areas, car-share services, and shuttle services to mass transit. **5**

(8) Lot is within 1/2 mile (0.8 km) walking distance of where a bike sharing program is provided. **5**

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**

502.2 Environmental, social, and governance (ESG) plan. An ESG impact plan has been written for the project that utilizes NGBS compliance as the basis of the environmental section of the plan. **2**

503 LOT DESIGN

503.0 Intent. The lot is designed to avoid detrimental environmental impacts first, to minimize any unavoidable impacts, and to mitigate for those impacts that do occur. The project is designed to minimize environmental impacts and to protect, restore, and enhance the natural features and environmental quality of the lot. *[Points awarded only where the intent of the design is implemented.]*

503.1 Natural resources. Natural resources are conserved by one or more of the following:

(1) A natural resources inventory is completed under the direction of a qualified professional. **5**

(2) A plan is implemented to conserve the elements identified by the natural resource inventory as high-priority resources. **6**

(3) Items listed for protection in the natural resource inventory plan are protected under the direction of a qualified professional. **4**

(4) Basic training in tree or other natural resource protection is provided for the on-site supervisor. **4**

(5) All tree pruning on-site is conducted by a certified arborist or other qualified professional. **3**

(6) Ongoing maintenance of vegetation on the lot during construction is in accordance with TCIA A300 or locally accepted best practices. **4**

POINTS

(7) Where a lot adjoins a landscaped common area, a protection plan from construction activities next to the common area is implemented. **5**

(8) Developer has a plan to design and construct the lot in accordance with the International Wildland-Urban Interface Code (IWUIC). **6**

Only applicable where the AHJ has not declared a wildland-urban interface area, but a fire protection engineer, certified fire marshal, or other qualified party has determined and documented the site as hazarded in accordance with the IWUIC.

503.2 Slope disturbance. Slope disturbance is minimized by one or more of the following:

(1) The use of terrain adaptive architecture. **5**

(2) Hydrological/soil stability study is completed and used to guide the design of all buildings on the lot. . **5**

(3) All or a percentage of driveways and parking are aligned with natural topography to reduce cut and fill.

(a) greater than or equal to 10% to less than 25% **1**

(b) greater than or equal to 25% to less than 75% **4**

(c) greater than or equal to 75%..... **6**

(4) Long-term erosion effects are reduced through the design and implementation of clustering, terracing, retaining walls, landscaping, or restabilization techniques..... **6**

(5) Underground parking uses the natural slope for parking entrances..... **5**

503.3 Soil disturbance and erosion. Soil disturbance and erosion are minimized by one or more of the following: (also see § 504.3)

(1) Construction activities are scheduled such that disturbed soil that is to be left unworked for more than 21 days is stabilized within 14 days. **5**

(2) Not less than 75% of total length of the utilities on the lot are designed to use one or more alternative means:..... **5**

(a) tunneling instead of trenching.

(b) use of smaller (low ground pressure) equipment or geomats to spread the weight of construction equipment.

(c) shared utility trenches or easements.

(d) placement of utilities under paved surfaces instead of yards.

(3) Limits of clearing and grading are demarcated on the lot plan. **5**

503.4 Stormwater management. The stormwater management system is designed to use low-impact development/green infrastructure practices to preserve, restore or mitigate changes in site hydrology due to land disturbance and the construction of impermeable surfaces through the use of one or more of the following techniques:

(1) A site assessment is conducted and a plan prepared and implemented that identifies important existing permeable soils, natural drainage ways and other water features, e.g., depressional storage, onsite to be preserved in order to maintain site hydrology. **7**

POINTS

(2) A hydrologic analysis is conducted that results in the design of a stormwater management system that maintains the pre-development (stable, natural) runoff hydrology of the site through the development or redevelopment process. Ensure that post construction runoff rate, volume and duration do not exceed predevelopment rates, volume and duration. **10**

(3) Low-Impact Development/Green infrastructure stormwater management practices to promote infiltration and evapotranspiration are used to manage rainfall on the lot and prevent the off-lot discharge of runoff from all storms up to and including the volume of following storm events:

(a) 80th percentile storm event..... **5**

(b) 90th percentile storm event..... **8**

(c) 95th percentile storm event..... **10**

(4) Permeable materials are used for driveways, parking areas, walkways, patios, and recreational surfaces and the like according to the following percentages:

(a) greater than or equal to 10% to less than 25% (add 2 points for use of vegetative paving system) . **2**

(b) greater than or equal to 25% to less than 50% (add 4 points for use of vegetative paving system) . **5**

(c) greater than or equal to 50% (add 6 points for use of vegetative paving system) **10**

Points for vegetative paving systems are only awarded for locations receiving more than 20 in. (51 cm) per year of annual average precipitation.

(5) Complete gutter and downspout system directs stormwater away from foundation to vegetated landscape area, a raingarden, or catchment system that provides for water infiltration. **3**

503.5 Landscape plan. A plan for the lot is developed to limit water and energy use while preserving or enhancing the natural environment. *[Where "front" only or "rear" only plan is implemented, only half of the points (rounding down to a whole number) are awarded for Items (1)-(8)]*

(1) A plan is formulated and implemented that protects, restores, or enhances natural vegetation on the lot.

(a) greater than or equal to 12% to less than 25% of the natural area **1**

(b) greater than or equal to 25% to less than 50% of the natural area **2**

(c) greater than or equal to 50% to less than 100% of the natural area **3**

(d) 100% of the natural area **4**

(2) Non-invasive vegetation that is native or regionally appropriate for local growing conditions is selected to promote biodiversity. **7**

(3) To improve pollinator habitat, not less than 10% of planted areas are composed of native or regionally appropriate flowering and nectar producing plant species. Invasive plant species shall not be utilized. **3**

(4) EPA WaterSense Water Budget Tool or equivalent is used when implementing the site vegetative design. **5**

POINTS

(5) Where turf is being planted, Turfgrass Water Conservation Alliance (TWCA) or equivalent as determined by the adopting entity third-party qualified water efficient grasses are used. **3**

~~(6) Where artificial or synthetic turf is installed in Dry climate zones in accordance with Table A200, instead of natural turf for common recreation, sport, or play fields, Synthetic Turf Council (STC) or equivalent industry association qualified artificial turf is used. .....~~

(~~7~~6) For landscaped vegetated areas, the maximum percentage of turf area is:

(a) greater than 40% to less than or equal to 60% **2**

(b) greater than 20% to less than or equal to 40% **3**

(c) greater than 0% to less than or equal to 20% **4**

(d) 0% **5**

~~(8) For landscaped vegetated areas, the maximum percentage of all artificial turf areas is (only applicable in Dry climate zones in accordance with Table A200):~~

~~(a) greater than 40% to less than or equal to 60% .....~~

~~(b) greater than 20% to less than or equal to 40% .....~~

~~(c) greater than 0% to less than or equal to 20% .....~~

~~(d) 0% .....~~

(~~9~~7) Plants with similar watering needs are grouped (hydrozoning) and shown on the lot plan. **5**

(~~10~~8) Summer shading by planting installed to shade not less than 30% of building walls. To conform to summer shading, the effective shade coverage (five years after planting) is the arithmetic mean of the shade coverage calculated at 10 am for eastward facing walls, noon for southward facing walls, and 3 pm for westward facing walls on the summer solstice. **5**

(~~11~~9) Vegetative wind breaks or channels are designed to protect the lot and immediate surrounding lots as appropriate for local conditions. **5**

(6~~10~~) Where artificial or synthetic turf is installed in Dry climate zones in accordance with Table A200, instead of natural turf for common recreation, sport, or play fields, Synthetic Turf Council (STC) or equivalent industry association qualified artificial turf is used. .....

(8~~11~~) For landscaped vegetated areas, the maximum percentage of all artificial turf areas is (only applicable in Dry climate zones in accordance with Table A200):

(a) greater than 40% to less than or equal to 60% .....

(b) greater than 20% to less than or equal to 40% .....

(c) greater than 0% to less than or equal to 20% .....

(d) 0% .....

~~(12) Site or community generated tree trimmings or stump grinding of regionally appropriate trees are used on the lot to provide protective mulch during construction or for landscaping..... 3~~

POINTS

(~~13~~12) ..... An integrated pest management plan is developed to minimize chemical use in pesticides and fertilizers. **4**

(~~12~~13) ...Site or community generated tree trimmings or stump grinding of regionally appropriate trees are used on the lot to provide protective mulch during construction or for landscaping. **3**

(14) Developer has a plan for removal or containment of invasive plants from the disturbed areas of the site. **3**

(15) Developer implements a plan for removal or containment of invasive plants on the undisturbed areas of the site. **6**

503.6 Wildlife habitat. Measures are planned to support wildlife habitat and include at least two of the following:

(1) Plants and gardens that encourage wildlife, such as bird and butterfly gardens. **3**

(2) Inclusion of a certified "backyard wildlife" program. **3**

(3) The lot is adjacent to a wildlife corridor, fish and game park, or preserved areas and is designed with regard for this relationship. **3**

(4) Outdoor lighting techniques are utilized with regard for wildlife. **3**

503.7 Environmentally sensitive areas. The lot is in accordance with one or both of the following:

(1) The lot does not contain any environmentally sensitive areas that are disturbed by the construction.. **4**

(2) On lots with environmentally sensitive areas, mitigation and/or restoration is conducted to preserve ecosystem functions lost through development and construction activities. **4**

503.8 Demolition of existing building. A demolition waste management plan is developed, posted at the jobsite, and implemented to recycle and/or salvage with a goal of recycling or salvaging not less than 50% of the nonhazardous demolition waste. *[1 additional point awarded for every 10% of nonhazardous demolition waste recycled and/or salvaged beyond 50%.]* ..... **5 [10 max]**

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 are provided during on-the-lot clearing, grading, trenching, paving, and installation of utilities to ensure that specified green development practices are implemented. (also see § 503.3) **4**

504.2 Trees and vegetation. Designated trees and vegetation are preserved by one or more of the following:

(1) Fencing or equivalent is installed to protect trees and other vegetation. **3**

(2) Trenching, significant changes in grade, and compaction of soil and critical root zones in all "tree save" areas as shown on the lot plan are avoided. **5**

(3) Damage to designated existing trees and vegetation is mitigated during construction through pruning, root pruning, fertilizing, and watering. **4**

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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 § 503.3)

(1) Sediment and erosion controls are installed on the lot and maintained in accordance with the stormwater pollution prevention plan, where required..... **5**

(2) Limits of clearing and grading are staked out on the lot. **5**

(3) "No disturbance" zones are created using fencing or flagging to protect vegetation and sensitive areas on the lot from construction activity. **5**

(4) Topsoil from either the lot or the site development is stockpiled and stabilized for later use and used to establish landscape plantings on the lot. **5**

(5) Soil compaction from construction equipment is reduced by distributing the weight of the equipment over a larger area (laying lightweight geogrids, mulch, chipped wood, plywood, OSB, metal plates, or other materials capable of weight distribution in the pathway of the equipment)..... **4**

(6) Disturbed areas on the lot that are complete or to be left unworked for 21 days or more are stabilized within 14 days using methods as recommended by the EPA or in the approved SWPPP, where required. **3**

(7) Soil is improved with organic amendments or mulch. **3**

(8) Utilities on the lot are installed using one or more alternative means (e.g., tunneling instead of trenching, use of smaller equipment, use of low ground pressure equipment, use of geomats, shared utility trenches or easements). **5**

(9) Inspection reports of stormwater best management practices are available..... **3**

505 INNOVATIVE PRACTICES

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

505.1 Driveways and parking areas. Driveways and parking areas are minimized or mitigated by one or more of the following:

(1) Off-street parking areas or driveways are shared. Waivers or variances from local development regulations are obtained to implement such practices, where required. **5**

(2) In ~~a~~ multifamily and mixed-use projects, parking capacity does not exceed the local minimum requirements. **5**

(3) Structured parking is utilized to reduce the footprint of surface parking areas.

(a) greater than or equal to 25% to less than 50% **4**

(b) greater than or equal to 50% to less than 75% **5**

(c) greater than or equal to 75%..... **6**

505.2 Heat island mitigation. Heat island effect is mitigated by the following.

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(1) Hardscape: Not less than 50% of the surface area of the hardscape on the lot complies with one or a combination of the following methods. **5**

(a) Shading of hardscaping: Shade is provided from existing or new vegetation (within five years) or from trellises. Shade of hardscaping is to be measured on the summer solstice at noon.

(b) Light-colored hardscaping: Horizontal hardscaping materials are installed with a solar reflectance index (SRI) of 29 or greater. The SRI is calculated in accordance with ASTM E1980. A default SRI value of 35 for new concrete without added color pigment is permitted to be used instead of measurements.

(c) Permeable hardscaping: Permeable hardscaping materials are installed.

(2) Roofs: Not less than 75% of the exposed surface of the roof is vegetated using technology capable of withstanding the climate conditions of the jurisdiction and the microclimate conditions of the building lot. Invasive plant species are not permitted. **5**

505.3 Density. The average density on the lot on a net developable area basis is:

(1) greater than or equal to 7 to less than 14 dwelling units/sleeping units per acre (~~per~~ 0.4 ha~~,047 m²~~)... **4**

(2) greater than or equal to 14 to less than 21 dwelling units/sleeping units per acre (~~per~~ 0.4 ha~~,047 m²~~). **5**

(3) greater than or equal to 21 to less than 35 dwelling units/sleeping units per acre (~~per~~ 0.4 ha~~,047 m²~~). **6**

(4) greater than or equal to 35 to less than 70 dwelling units/sleeping units per acre (~~per~~ 0.4 ha~~,047 m²~~). **7**

(5) greater than or equal to 70 dwelling units/sleeping units per acre (~~per~~ 0.44 ha~~,047 m²~~) **8**

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

505.5 Multifamily or mixed-use community garden(s). Local food production to residents or area consumers. **3**

(a) A portion of the lot not less than 250 ft^2 (~~76.2~~ 23.2 m^2) is established as community garden(s) for the residents of the site. *[3 points awarded per 250 ft^2 (~~76.2~~23.2 m^2)]*..... **3 [9 max]**

(b) Locate the project within a 0.5-mile (0.8 km) walking distance of an existing or planned farmers market/ farm stand that is open or will operate not less than once a week for not less than five months of the year. **3**

(c) Areas and physical provisions are provided for composting. **1**

(d) Signs designating the garden area are posted. **1**

505.6 Multi-unit plug-in electric vehicle charging. Plug-in electric vehicle charging capability is provided for 5% or more of parking spaces.
[An additional 2 points can be earned for each percentage point above 5% for a maximum of 10 points] ..... **4 [10 max]**

Fractional values shall be rounded up to the nearest whole number. Electrical capacity in main electric panels supports Level 2 charging (208/240V- up to 80 amps or in accordance with SAE J1772). Each stall is provided with conduit and wiring infrastructure from the electric panel to support Level 2 charging (208/240V- up to 80 amps or in accordance with SAE J1772) service to the designated parking spaces, and parking spaces are equipped with either Level 2 charging AC grounded outlets (208/240V- up to 80 amps

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or in accordance with SAE J1772) or Level 2 charging stations (208/240V- up to 80 amps or in accordance with SAE J1772) by a third-party charging station.

505.7 Multi-unit residential CNG vehicle fueling. CNG vehicle residential fueling appliances are provided for not less than 1% of the parking spaces. The CNG fueling appliances shall be listed in accordance with ANSI/CSA NGV 5.1 and installed in accordance with the appliance manufacturer's installation instructions. **4**

505.8 Street network. Project is located in an area of high intersection density. **5**

505.9 Smoking prohibitions. Signs are provided on multifamily and mixed-use lots prohibiting smoking at the following locations:

(a) Smoking is prohibited within 25 ft (7.6~~5~~ m) of all building exterior doors and operable windows or building air intakes within 15 vertical feet (4.6~~5~~ m) of grade or a walking surface. **3**

(b) Smoking is prohibited on decks, balconies, patios and other occupied exterior spaces. **3**

(c) Smoking is prohibited at all parks, playgrounds, and community activity or recreational spaces. ... **3**

505.10 Exercise and recreational space. For multifamily and mixed-use buildings, on-site dedicated recreation space for exercise or play opportunities for adults and/or children open and accessible to residents is provided.

(a) A dedicated area not less than 400 ft^2 (37.16 m^2) is provided inside the building with adult exercise and/or children's play equipment. **3**

(b) A courtyard, garden, terrace, or roof space not less than 10% of the lot area that can serve as outdoor space for children's play and /or adult activities is provided. **3**

(c) Active play/recreation areas are illuminated at night to extend opportunities for physical activity into the evening. **3**

505.11 Light pollution reduction. Lighting for all exteriors of, and areas associated with the building complies with the vertical and horizontal illuminance and uniformity recommendations for the lighting zone as applicable to not less than one of the following:

(a) IES RP-33-14, IECC, or ANSI/ASHRAE/IESNA Standard 90.1. ..... **2**

(b) Exterior light fixtures are installed that comply with Backlight, Uplight, and Glare (BUG) ratings applicable to the site's lighting zone. Ratings are in accordance with IDA/IES Model Lighting Ordinance (MLO) 2011, Table C. **2**

(c) Exterior lighting is installed that does not emit light above a horizontal plane such as IES designated "Zero Uplight", or "fully shielded" fixtures. Uplighting that is shielded by architectural features is exempt. **2**

505.12 Wildfire resilience

(1) Defensible space is part of the construction site plan.

(a) Within 0 - 5 feet (0 - 1.5 m) of the building only hardscapes and succulents are used for landscaping. **1**

(b) Within 5 - 30 feet (1.5 - 9.1 m) of the building thin trees and shrubbery, and no undergrowth for vegetation and no accessory buildings are present. *[1 point for projects in WUI area]*. **1**

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(c) Non-combustible fencing is used. **1**

(2) Water sources (ponds, swimming pools, wells etc.) are available, readily accessible, and equipped for fire-fighting use. *[1 point for projects in a WUI area]*..... **1**

CHAPTER 6:
RESOURCE EFFICIENCY

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 or sleeping unit is limited. Finished floor area is calculated in accordance with ANSI Z765 for single family and ANSI/BOMA Z65.4 for multifamily and mixed-use buildings. Only the finished floor area for stories above grade plane is included in the calculation.
[For every 100 ft^2 (9.29 m^2) over 4,000 ft^2 (371.612 m^2), 1 point is to be added to rating level points shown in Table 303, Category 7 for each rating level.]

(1)	less than or equal to 700 ft^2 (65.03 m^2)	**14**
(2)	less than or equal to 1,000 ft^2 (92.93 m^2)	**12**
(3)	less than or equal to 1,500 ft^2 (139.4 m^2)	**9**
(4)	less than or equal to 2,000 ft^2 (185.816 m^2)	**6**
(5)	less than or equal to 2,500 ft^2 (232.3 m^2)	**3**
(6)	greater than 4,000 ft^2 (371.622 m^2)	**Mandatory**

***Multifamily and Mixed-Use Building Note**: For a multifamily and mixed-use buildings, a weighted average of the individual unit sizes is used for this practice.*

601.2 Material usage. Structural systems are designed, or construction techniques are implemented, to reduce and optimize material usage. ..... **9 max**

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

601.3 Building dimensions and layouts. Building dimensions and layouts are designed to reduce material cuts and waste. This practice is used for not less than of 80% of the following areas:

(1)	floor area	**3**
(2)	wall area	**3**
(3)	roof area	**3**
(4)	cladding or siding area	**3**

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(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 not less than of 90% for the following system or building:	**13 max**
(1) floor system	**4**
(2) wall system	**4**
(3) roof system	**4**
(4) modular construction for the entire building located above grade	**13**
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 not less than 50% of the area of the story below based on areas with a ceiling height not less than 7 ft (2~~,~~ 1~~34 m~~m).	**8 max**
(1) first stacked story	**4**
(2) for each additional stacked story	**2**
601.7 Prefinished materials. Prefinished building materials or assemblies listed below have no additional site-applied finishing material~~ are installed~~.	~~**12**~~ **6 max**
(a) interior trim not requiring paint or stain.	
(b) exterior trim not requiring paint or stain.	
(c) window, skylight, and door assemblies not requiring paint or stain on one of the following surfaces: i. exterior surfaces ii. interior surfaces	
(d) interior wall coverings or systems, floor systems, and/or ceiling systems not requiring paint or stain or other type of finishing application.	
(e) exterior wall coverings or systems, floor system, and/or ceiling systems not requiring paint or stain or other type of finishing application.	
(1) Percent of prefinished building materials or assemblies installed: *[Points awarded for each type of material or assembly.]*	
(a) greater than or equal to 35% to less than 50%	**1**
(b) greater than or equal to 50% to less than 90%	**2**
(c) greater than or equal to 90%	~~**5**~~**3**
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% or more of the building footprint.	**3**

	POINTS
601.9 Universal design elements. Dwelling incorporates one or more of the following universal design elements. Conventional industry construction tolerances are permitted	~~12~~ 6 **max**
(1) Any no-step entrance into the dwelling which 1) is accessible from a substantially level parking or drop-off area (no more than 2%) via an accessible path which has no individual change in elevation or other obstruction of more than 1-1/2 in. (3.8 cm) in height with the pitch not exceeding 1 in 12; and 2) provides not less than a 32-in. (81 cm) wide clearance into the dwelling.	~~3~~2
(2) Not less than a 36-in. (91 cm) 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 not less than a 32-in. (81 cm) clear door width and a 30-in. (76 cm) by 48-in. (122 cm) clear area inside the bathroom outside the door swing	~~3~~2
(3) Not less than a 36-in. (91 cm) wide accessible route from the no-step entrance into at least one bedroom which has not less than a 32-in. (81 cm) clear door width.	~~3~~2
(4) Blocking or equivalent installed in the accessible bathroom walls for future installation of grab bars at water closet and bathing fixture, where applicable.	**1**
(5) All interior and exterior door handles are levers rather than knobs.	**1**
(6) All sink, lavatory and showering controls comply with ICC A117.1	**1**
(7) Interior convenience Power receptacles, communication connections (for cable, phone, Ethernet, etc.) and switches are placed between 15 in. (38 cm) and 48 in. (122 cm) above the finished floor. Additional switches to control devices and systems (such as alarms, home theaters and other equipment) not required by the local building code may be installed as desired.	**1**
(8) All light switches are rocker-type switches or other similar switches that can be operated by pressing them (with assistive devices). Toggle-type switches may not be used	**1**
(9) Any of the following systems are automated and can be controlled with a wireless device or voice-activated device: HVAC, all permanently-installed lighting, alarm system, window treatments, or door locks. *[1 point awarded per system]*	**1 [5 max]**

602 ENHANCED DURABILITY AND REDUCED MAINTENANCE

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

602.1 Moisture management – building envelope

602.1.1 Capillary breaks

602.1.1.1 A capillary break and vapor retarder are installed at concrete slabs in accordance with Sections R506.2.2 and R506.2.3, or IBC Sections 1907 and 1805.4.1.	**Mandatory**
602.1.1.2 A capillary break between the footing and the foundation wall is provided to prevent moisture migration into the foundation wall.	~~3~~1
602.1.1.3 Not less than a 10-mil (254 µm) vapor retarder complying with ASTM E1745 is installed in accordance with ASTM E1643.	~~3~~1

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602.1.1.4 Not less than a 15-mil (381 µm) vapor retarder complying with ASTM E1745 with water vapor permeance rating below 0.01 ~~US~~ perms (0.572 ng/Pa • s • m²) ~~[grains/(ft²*hr*in-Hg)]~~ is installed in accordance with ASTM E1643.	~~6~~3
602.1.2 Foundation waterproofing. Enhanced foundation waterproofing is installed using one or both of the following:	**4**
(1) rubberized coating, or	
(2) drainage mat	
602.1.3 Foundation drainage	
602.1.3.1 Where required by the IRC or IBC for habitable and usable spaces below grade, exterior drain tile is installed.	**Mandatory**
602.1.3.2 Interior and exterior foundation perimeter drains are installed and sloped to discharge to daylight, dry well, or sump pit.	**4**
602.1.4 Crawlspaces	
602.1.4.1 Vapor retarder in unconditioned vented crawlspace is in accordance with the following, as applicable. Joints of vapor retarder overlap not less than 6 in. (15~~2 m~~cm) and are taped.	
(1) Walls. Dampproof walls are provided below finished grade.	**Mandatory**
(2) Floors. Class I vapor retarder installed on the crawlspace floor and extended not less than 6 in. (15 cm) up the wall and is attached and sealed to the wall.	**6**
(3) Floors. Class I vapor retarder which complies with ASTM E1745 installed on the crawlspace floor and extended not less than 6 in. (15 cm) up the wall and is attached and sealed to the wall.	**8**
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/sf (0.102 L/s/m²) ~~(.009 L/s) per ft²~~ of horizontal area and one of the following is implemented:	
(1) Class I vapor retarder installed in accordance with IRC Section R408.3.	**Mandatory**
(2) a concrete slab over Class I vapor retarder or vapor retarder in accordance with Section 602.1.1 installed in accordance with IRC Section R408.3 or Section R506.	**8**
(3) a vapor retarder which complies with ASTM E1745 and not less than 10-mil (254 µm) thick installed on the crawlspace floor and extended not less than 6 in. (15 cm) up the wall and is attached and sealed to the wall.	**8**
602.1.5 Termite barrier. Continuous physical foundation termite barrier provided:	
(1) In geographic areas that have moderate to heavy infestation potential in accordance with Figure 6(3), a no or low toxicity treatment is also installed.	**4**
(2) In geographic areas that have a very heavy infestation potential in accordance with Figure 6(3), in addition a low toxicity bait and kill termite treatment plan is selected and implemented.	**4**
602.1.6 Termite-resistant materials. In areas of termite infestation probability as defined by Figure 6(3), termite-resistant materials are used as follows:	

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(1) In areas of slight to moderate termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings within the first 2 ft (0.610 ~~m~~m) above the top of the foundation. **2**

(2) In areas of moderate to heavy termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings within the first 3 ft (0.914 ~~m~~m) above the top of the foundation. **4**

(3) In areas of very heavy termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings.. **6**

602.1.7 Moisture control measures

602.1.7.1 Moisture control measures are in accordance with the following:

(1) Building materials with visible mold are not installed or are cleaned or encapsulated prior to concealment and closing. **2**

(2) Insulation in cavities is dry in accordance with manufacturer's instructions when enclosed (e.g., with drywall)..... **2 Mandatory**

(3) The moisture content of lumber is sampled to ensure it does not exceed 19% prior to the surface and/or cavity enclosure. **4**

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

602.1.7.3 Building envelope assemblies are designed for moisture control based on documented hygrothermal simulation or field study analysis. Hygrothermal analysis shall comply with ASHRAE 160 or equivalent criteria and shall incorporate representative climatic conditions, interior conditions and include heating and cooling seasonal variation. **4**

602.1.8 Water-resistive barrier. Where required by the 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 as follows to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details are provided in the construction documents and are in accordance with the fenestration manufacturer's instructions, the flashing manufacturer's instructions, or as detailed by a registered design professional.

(1) Flashing is installed at all the following locations, as applicable:..... **Mandatory**

(a) around exterior fenestrations, skylights, and doors;

(b) at roof valleys;

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

(d) at roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets (e.g., kickout and step flashing);

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

(f) above projecting wood trim;

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(g) at built-in roof gutters;

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

(i) all window and door heads and jambs. ~~flashing; and~~

~~(j) roof kickout and step flashing.~~

(2) All window and door head and jamb flashing is either self-adhered flashing complying with AAMA 711 or liquid applied flashing complying with AAMA 714 and installed in accordance with fenestration or flashing manufacturer's installation instructions. ..... ~~2~~1

(3) Sill or pan flashing is installed at sills of all exterior windows and doors. ..... ~~3~~1

(4) Seamless, preformed kickout flashing or prefabricated metal with soldered seams is provided at all roof-to-wall intersections. The type and thickness of the material used for roof flashing including but not limited kickout and step flashing is commensurate with the anticipated service life of the roofing material. ..... ~~3~~1

(5) Through-wall flashing is installed at transitions between wall cladding materials or wall construction types. **2**

(6) Flashing is installed at expansion joints in stucco walls. **2**

602.1.10 Rainscreen systems. A rainscreen system as follows is used in exterior wall assemblies. ..... **4 max**

(1) A system designed with not less than a 3/16-in. (0.476 cm) ventilated and drained space exterior to the water-resistive barrier for buildings not greater than 3 stories or 3/8-in. (0.953 cm) ventilated and drained space exterior to the water-resistive barrier for buildings greater than 3 stories. The space shall allow for ventilation to the exterior at top and bottom of the wall, and shall be integrated with flashing details with a clear drainage path to the exterior; or **4**

(2) A cladding material or a water-resistive barrier with enhanced drainage, complying with 90% drainage efficiency determined in accordance with ASTM E2273 or Annex A2 of ASTM E2925. ..... **2**

602.1.11 Exterior doors. Entries at exterior door assemblies, inclusive of side lights (if any), are covered by one of the following methods to protect the building from the effects of precipitation and solar radiation. Either a storm door or a projection factor of not less than 0.375 is provided. Eastern- and western-facing entries in Climate Zones 1, 2, and 3, as determined in accordance with Figure 6(1) or Appendix A, have either a storm door or a projection factor of not less than 1.0, unless protected from direct solar radiation by other means (e.g., screen wall, vegetation). *[2 points awarded per exterior door]* ..... **2 [6 max]**

(a) installing a porch roof or awning.

(b) extending the roof overhang.

(c) recessing the exterior door.

(d) Installing a storm door.

602.1.12 Tile backing materials. Tile backing materials installed under tiled surfaces in wet areas are in accordance with ASTM C1178, C1278, C1288, or C1325. ..... **Mandatory**

602.1.13 Roof overhangs. Roof overhangs, in accordance with Table 602.1.13, are provided over not less than 90% of exterior wall area to protect the building envelope. **4**

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Table 602.1.13
Minimum Roof Overhang for One- & Two-Story Buildings

Inches of Rainfall [1]	Eave Overhang (In.)	Rake Overhang (In.)
≤40 (102 cm)	12 (30 cm)	12 (30 cm)
>401 and ≤70 (>102 and ≤ 178 cm)	18 (46 cm)	12 (30 cm)
>70 (178 cm)	24 (61 cm)	12 (30 cm)

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

For SI: 12 in. = 304.8 mm

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 IRC or IBC at roof eaves of pitched roofs and extends not less than 24 in. (610 mcm) inside the exterior wall line of the building..... **Mandatory**

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

(1) All horizontal ledgers are sloped away to provide gravity drainage as appropriate for the application..... **1 Mandatory**

(2) No roof configurations that create horizontal valleys in roof design..... **2**

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

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

(1) initial SRI of not less than 78 for low-sloped roof (a slope less than 2:12) and an initial SRI of not less than 29 for a steep-sloped roof (a slope equal to or greater than 2:12). The SRI is calculated in accordance with ASTM E1980 or roof . Roof products that are rated and labeled in accordance with the ANSI/CRRC S100 Program.

(2) a vegetated roof system.

602.3 Roof water discharge. A gutter and downspout system or splash blocks and effective grading are provided to carry water not less than 5 ft (1.524 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 not less than 6 in. (152 mcm) of fall within 10 ft (3048 mm) of the edge of the building. Where lot lines, walls, slopes, or other physical barriers prohibit 6 in. (152 mcm) of fall within 10 ft (3048 mm), the final grade is sloped away from the edge of the building at a slope not less than 2%. ..... **Mandatory**

602.4.2 The final grade is sloped away from the edge of the building at a slope not less than 5%..... **1**

602.4.3 Water is directed to drains or swales to ensure drainage away from the structure..... **1**

602.5 Kitchen and vanity cabinets. All kitchen and vanity cabinets are certified in accordance with the ANSI/KCMA A161.1 performance standard or equivalent. **2**

POINTS

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.~~
~~*[1 point awarded for every 200 ft² (18.58 m²) of floor area.]* ..... **1 [12 max]**~~

603.1 Reuse of existing building. Major components of the existing building structure are reused or deconstructed for later use. Points are awarded according to the below as a percentage of the reused floor area or surface area as applicable.

The reuse calculation is based on the percentage of the building reused, including both new and existing areas.

(a) 20% **6**

(b) 40% **8**

(c) 60% **10**

(d) 80% **12**

(e) 100% **14**

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% of the total construction cost.
[1 point awarded per 1% of salvaged materials used based on the total construction cost. Materials, elements, or components awarded points under § 603.1 shall not be awarded points under § 603.2.] ..... **1 [9 max]**

603.3 Scrap materials. Sorting and reuse of scrap building material is facilitated (e.g., a central storage area or dedicated bins are provided). **4**

604 RECYCLED-CONTENT BUILDING MATERIALS

604.1 Recycled content. Choose one of the following:

(1) Percentage of building materials with recycled content calculated by cost, weight, or volume are not less than the following:

Exception: Exclude mechanical, electrical, and plumbing materials from total material cost.

(a) 10% **2**

(b) 15% **3**

(c) 20% **4**

(d) 25% **5**

(e) Not less than 30% **6**

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(2) Building materials with not less than 20% pre- or post-consumer recycled content are used for at least 4 minor components or 2 major components. **1**

604.2 Cementitious ~~Concrete~~ materials

(1) Use supplementary cementitious materials instead of Portland cement ~~in concrete~~ with not less than the following:

(a) 20% supplementary cementitious material ..... **~~1~~3**

(b) 30% supplementary cementitious material ..... **~~3~~5**

(c) 40% supplementary cementitious material ..... **~~5~~7**

(2) Include recycled content aggregate for not less than 10% of aggregate material. ..... **~~1~~3**

[Points not awarded if points are taken for cementitious material under 604.1.]

605 RECYCLED CONSTRUCTION WASTE

605.0 Intent. Waste generated during construction is recycled.

605.1 Hazardous waste. The construction and waste management plan shall include information on the proper handling and disposal of hazardous waste. Hazardous waste is properly handled and disposed.... **Mandatory**

605.2 Construction waste management plan

(1) A construction waste management plan is developed, posted at the jobsite, and implemented, diverting through reuse, salvage, recycling, or manufacturer reclamation, not less than 30% (by weight) of nonhazardous construction and demolition waste from disposal. Materials used as alternative daily cover are considered construction waste and do not count toward recycling or salvaging. ..... **Mandatory**

(a) Divert not less than 50% of construction and demolition waste from disposal. **4**

(b) Divert not less than 70% of construction and demolition waste from disposal. **6**

Exceptions: 1) Waste materials generated from land clearing, soil and sub-grade excavation and vegetative debris shall not be in the calculations; and 2) a recycling or comingled recycling facility (traditional or E-Waste) offering material receipt documentation is not available within 50 miles (80 km) of the jobsite.

(2) Areas that don't have local construction waste recycling services per exception 2 develop and implement a plan that diverts or reduces waste generation for not less than 2 materials (e.g., cardboard, metals). **3**

(3) For buildings following the new construction path that also have a renovation component, the waste management plan includes the recycling of 95% of electronic waste components (such as printed circuit boards from computers, building automation systems, HVAC, and fire and security control boards) by an E-Waste recycling facility. **3**

605.3 On-site recycling. On-site recycling measures following applicable regulations and codes are implemented, such as the following: **7**

POINTS

(a) Materials are ground or otherwise safely applied on-site as soil amendment or fill. Not less than 50% (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 in accordance with § 901.2.1(2) will be available for on-site renewable energy.

605.4 Recycled construction materials. Construction materials (e.g., wood, cardboard, metals, drywall, plastic, asphalt roofing shingles, or concrete) are recycled offsite. ..... **6 max**

(1) Not less than two types of materials are recycled..... **3**

(2) for each additional recycled material type **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 max**

(a) certified solid wood in accordance with § 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) biobased materials that are USDA Biopreferred ~~qualified~~certified.

(i) other biobased materials with not less than 50% biobased content (by weight or volume). Biobased content originating from a *Mass Balance Approach* shall have external validation.

(1) Two types of biobased materials are used, each for more than 0.5% of the project's projected building material cost. **3**

(2) Two types of biobased materials are used, each for more than 1% of the project's projected building material cost. **6**

(3) For each additional biobased material used for more than 0.5% of the project's projected building material cost. ..... **1 [2 max]**

606.2 Wood-based products. Wood or wood-based products are certified to the requirements of one of the following:

(a) American Forest Foundation's *American Tree Farm System*® (ATFS).

POINTS

(b) Canadian Standards Association's *Sustainable Forest Management System Standards* (CSA Z809).

(c) *Forest Stewardship Council* (FSC).

(d) *Program for Endorsement of Forest Certification Systems* (PEFC).

(e) Sustainable Forestry Initiative® Program (SFI).

(f) National Wood Flooring Association's Responsible Procurement Program (RPP).

(g) other product programs mutually recognized by PEFC.

(h) A manufacturer's fiber procurement system that has been audited by an approved agency as compliant with the provisions of ASTM D7612 as a responsible or certified source. Government or tribal forestlands whose water protection programs have been evaluated by an approved agency as compliant with the responsible source designation of ASTM D7612 are exempt from auditing in the manufacturers' fiber procurement system.

(1) All tropical wood products used for major and minor components are responsibly sourced in accordance with ASTM D7612 or certified to one of the listed standards. ..... **Mandatory**

(2) Not less than 10% of permanently installed wood material, by cost, or area shall be certified to one of the standards listed. Alternatively, 1 major component or 2 minor components certified to a standard listed below comply. ..... ~~2~~4

(3) Not less than 30% of permanently installed wood material, by cost, or area shall be certified to one of the standards listed. Alternatively, 2 major components or 3 minor components certified to a standard listed below comply. ..... ~~3~~5

(4) Not less than 50% of permanently installed wood material, by cost, or area shall be certified to one of the standards listed below. Alternatively, 3 major components or 4 minor components certified to a standard listed comply..... ~~4~~6

606.3 Manufacturing energy. Materials manufactured using not less than 33% of the primary manufacturing process energy derived from (1) renewable sources, (2) combustible waste sources, or (3) renewable energy credits (RECs) are used for major components of the building.
[2 points awarded per material.]..... **2 [6 max]**

607 RECYCLING AND WASTE REDUCTION

607.1 Recycling and composting. Recycling and composting by the occupant are facilitated by one or more of the following methods:

(1) A readily accessible space(s) for recyclable material containers is provided and identified on the floorplan of the house or dwelling unit or a readily accessible area(s) outside the living space is provided for recyclable material containers and identified on the site plan for the house or building. The area outside the living space shall accommodate recycling bin(s) for recyclable materials accepted in local recycling programs. **2**

(2) Provide recycling storage in multifamily and mixed-use common areas including a central storage area to meet the anticipated recycling volume. **2**

POINTS

(3) A readily accessible space(s) for compostable material containers is provided and identified on the floorplan of the house or dwelling unit or a readily accessible area(s) outside the living space is provided for compostable material containers and identified on the site plan for the house or building. The area outside the living space shall accommodate composting container(s) for locally accepted materials, or, accommodate composting container(s) for on-site composting. **4**

607.2 Food waste disposers. Not less than one food waste disposer is installed at the primary kitchen sink. **1**

608 RESOURCE-EFFICIENT MATERIALS

608.1 Resource-efficient materials. Products containing fewer materials are used to achieve the same end-use requirements as conventional products, including but not limited to:
[3 points awarded per each material] ..... **3 [9 max]**

(1) lighter, thinner brick with bed depth less than 3 in. (7.6 cm) and/or brick with coring of more than 25%.

(2) engineered wood or engineered steel products.

(3) roof or floor trusses.

609 REGIONAL MATERIALS

609.1 Regional materials. Regional materials are used for major and/or minor components of the building. ..... ~~**10**~~ **8 max**

(1) Major component *[2 points awarded per each component]* **2**

(2) Minor component *[1 point awarded per each component]* **1**

For a component to comply with this practice, not less than 75% of all products in that component category shall be sourced regionally, e.g., stone veneer category – 75% or more of the stone veneer on a project shall be sourced regionally.

610 LIFE CYCLE ASSESSMENT

610.1 Life cycle assessment. A life cycle assessment (LCA) tool is used to select environmentally preferable products, assemblies, or entire building designs. Points are awarded in accordance with § 610.1.1 or § 610.1.2. Only one method of analysis or tool may be utilized. The reference service life for the building is 60 years for any life cycle analysis tool. Results of the LCA are reported in the manual required in § 1001.1 or § 1002.1(1) of this Standard in terms of the environmental impacts listed in this practice and it is stated if operating energy was included in the LCA. ..... **15 max**

610.1.1 Whole-building life cycle assessment. A whole-building LCA is performed in conformance with ASTM E2921, ISO 21931, EN 15978, or equivalent, while using ISO 14044 compliant life cycle assessment. ..... **15 max**

(1) Execute LCA at the whole building level through a comparative analysis between the final and reference building designs as set forth under Standard Practice, ASTM E2921. The assessment criteria includes the following environmental impact categories: **8**

POINTS

(a) Primary energy use.

(b) Global warming potential.

(c) Acidification potential.

(d) Eutrophication potential.

(e) Ozone depletion potential.

(f) Smog potential.

(2) Execute LCA on regulated loads throughout the building operations life cycle stage. Conduct simulated energy performance analyses in accordance with § 702.2.1 in establishing the comparative performance of final versus reference building designs. Primary energy use savings and global warming potential avoidance from simulation analyses results are determined using energy supplier, utility, or EPA electricity generation and other fuels energy conversion factors and electricity generation and other fuels emission rates for the locality or Sub-Region in which the building is located **5**

(3) Execute full LCA, including use-phase, through calculation of operating energy impacts (c) – (f) using local or regional emissions factors from energy supplier, utility, or EPA. **2**

610.1.2 Life cycle assessment for a permanently installed 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, ISO 14025, and ISO 21930 or other equivalent internationally recognized standards that compare the environmental impact of products or assemblies using an LCA methodology. ..... **10 max**

610.1.2.1 Product LCA. A product with improved environmental impact measures compared to another product(s) intended for the same use is selected. **per Table 610.1.2.1**

(1) All comparisons shall ensure the differences between products are significant and not due to the use of different assumptions, LCIs, LCA tools, LCIA methods, and/or database version(s). The environmental impact measures used in the assessment are selected from the following: **5 max**

(a) Primary energy use.

(b) Global warming potential.

(c) Acidification potential.

(d) Eutrophication potential.

(e) Ozone depletion potential.

(f) Smog potential.

(2) An additional point for each product/system comparison, if externally validated..... **5 max**

[Points are awarded for each product/system comparison where the optimized LCA results improved upon the global warming potential by at least 10% with the average of the other indicators not being worse than the baseline product/system. .]

Table 610.1.2.1
Product LCA

POINTS

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

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

(a) exterior walls.

(b) roof/ceiling.

(c) interior walls or ceilings.

(d) intermediate floors.

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

(a) Primary energy use.

(b) Global warming potential.

(c) Acidification potential.

(d) Eutrophication potential.

(e) Ozone depletion potential.

(f) Smog potential.

[Points are awarded based on the number of types of building assemblies that improve upon environmental impact measures by an average of 15%.]

Table 610.1.2.2
Building Assembly LCA

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

611 PRODUCT DECLARATIONS

611.1 Product declarations. Not less than 10 different products installed in the building project, at the time of certificate of occupancy, comply with one of the following sub-sections. Declarations, reports, and assessments are submitted and contain documentation of the critical peer review by an independent third party, results from the review, the reviewer's name, company name, contact information, and date of the review. **5**

POINTS

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

Each product complying with § 611.1.1 shall be counted as one product for compliance with § 611.1.

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

Each product complying with § 611.1.2 shall be counted as two products for compliance with § 611.1.

612 INNOVATIVE PRACTICES

612.1 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% or more of the estimated total building materials cost.
[1 point awarded per percent.]..... **1 [10 max]**

612.2 Sustainable products. One or more of the following products are used for not less than 30% of the floor or wall area of the entire dwelling unit or the sleeping unit, as applicable. Products are certified by a third-party agency accredited to ISO 17065. ..... **9 max**

(1) greater than or equal to 50% of carpet installed (by square feet) is certified to NSF 140 or equivalent..... **3**

(2) greater than or equal to 50% of resilient flooring installed (by square feet) is certified to NSF 332 or equivalent. **3**

(3) greater than or equal to 50% of the insulation installed (by square feet) is certified to UL 2985 or equivalent..... **3**

(4) greater than or equal to 50% of interior wall coverings installed (by square feet) is certified to NSF 342 or equivalent. **3**

(5) greater than or equal to 50% of the door leafs installed (by number of door leafs) is certified to UL 102 or equivalent. **3**

(6) greater than or equal to 50% of the tile installed (by square feet) is certified to TCNA A138.1 Specifications for Sustainable Ceramic Tiles, Glass Tiles and Tile Installation Materials or equivalent..... **3**

POINTS

613 RESILIENT CONSTRUCTION

613.1 Vulnerability assessment. An assessment of the property's risks to climate, seismic, and natural disasters is performed by an approved professional. Strategies are identified to enable the project to adapt to and mitigate hazard risks. The assessment is shared with the Building Owner. **4**

613.2 ~~HUD~~ Designing for Natural Hazards ~~Guides~~ series (~~Designing for Natural Hazards~~DNH Guides). Building incorporates resilient construction guidance from the ~~HUD~~ Designing for Natural Hazards ~~Guides~~ series (~~Designing for Natural Hazards~~DNH Guides). Select guidance from the hazards category identified from ~~a maximum of two hazard categories identified by~~ the vulnerability assessment in § 613.1.
[Points awarded only for buildings where 613.1 is also awarded] ..... **16 max**

613.2.1 Wind Resilience. Practices listed on the following one-pager titles of the ~~HUD~~ DNH Guides (Volume 1: Wind) are met. *[0.5 point awarded per practice, 2 points max per one-pager]* ..... **8 max**

613.2.2 Water Resilience. Practices listed on the following one-pager titles of the DNH ~~HUD~~ Guides (Volume 2: Water) are met. *[0.5 point per practice, 2 points max per one-pager]* ..... **8 max**

613.2.3 Fire Resilience. Practices listed on the following one-pager titles of the DNH ~~HUD~~ Guides (Volume 3: Fire) are met. *[0.5 point per practice, 2 points max per one-pager]* ..... **8 max**

613.2.4 Earth Resilience. Practices listed on the following one-pager titles of the DNH ~~HUD~~ Guides (Volume 4: Earth) are met. *[0.5 point per practice, 2 points max per one-pager]*
OR
Building is designed for maximum considered earthquake hazard by a Licensed Professional Engineer with 3rd party review and document including detailed Site-Specific Hazard report. ..... **8 max**

613.3 Resilient energy systems & passive survivability
[Points cannot be claimed for both (1) and (2)].

(1) On-site renewable energy systems with battery energy storage are designed and installed to provide emergency power for residents to safely shelter during power outages. **3**

(2) CARB compliant whole-building generators are designed and installed to provide emergency power for residents to safely shelter during power outages **1**

(3) Water storage and purifications systems are designed and installed to provide potable water during power outages. **4**

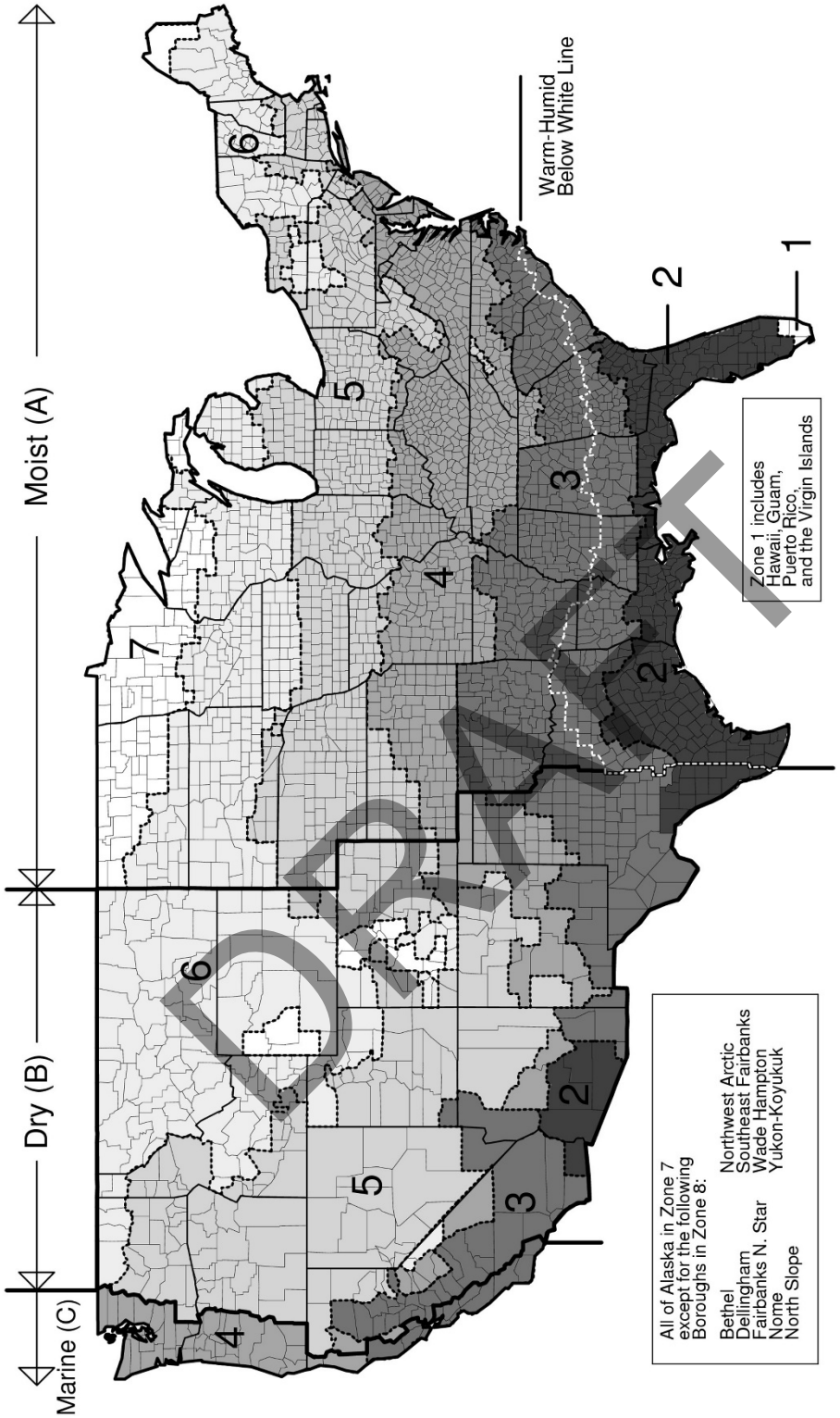

FIGURE 6(1)

CLIMATE ZONES

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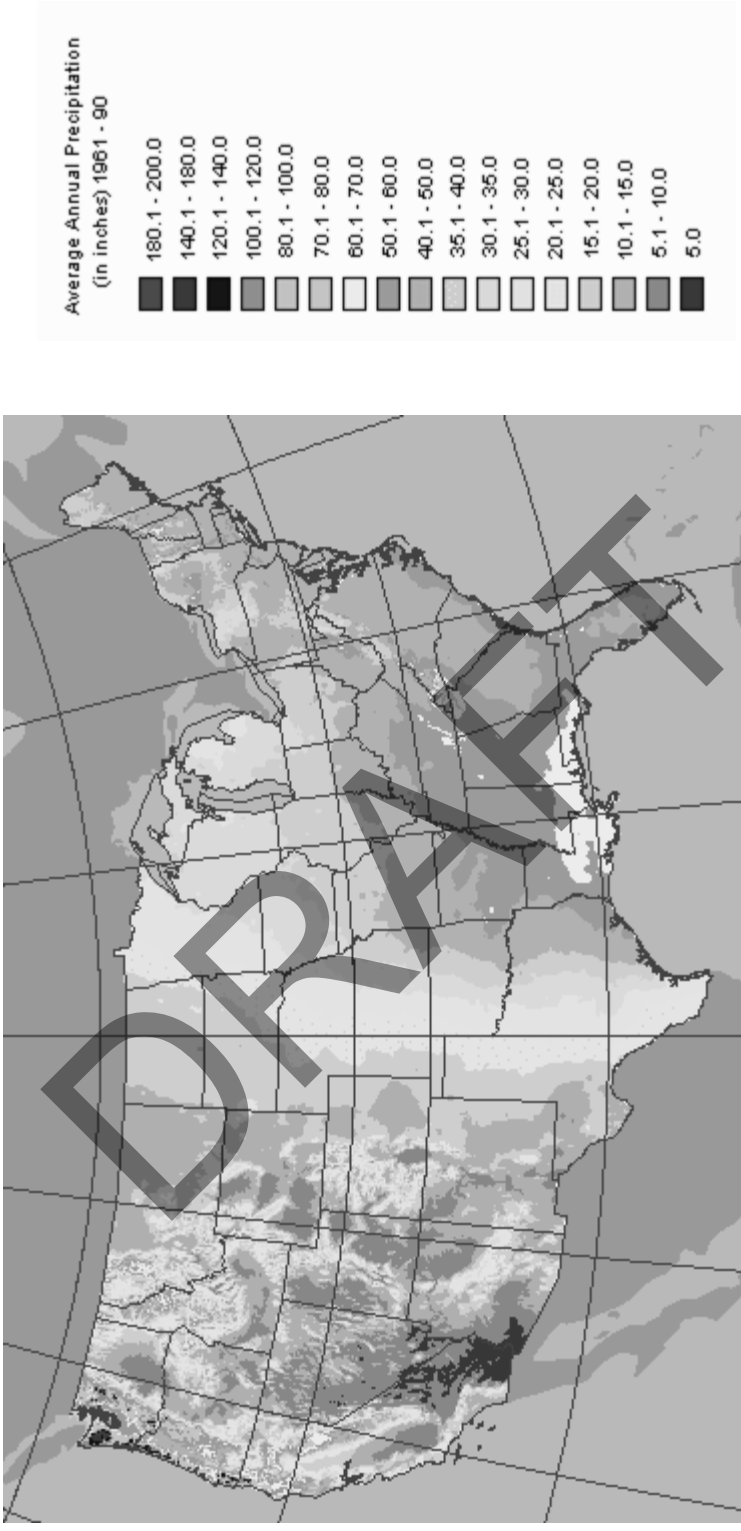

FIGURE 6(2)

AVERAGE ANNUAL PRECIPITATION (inches)

(Source: www.nationalatlas.gov)

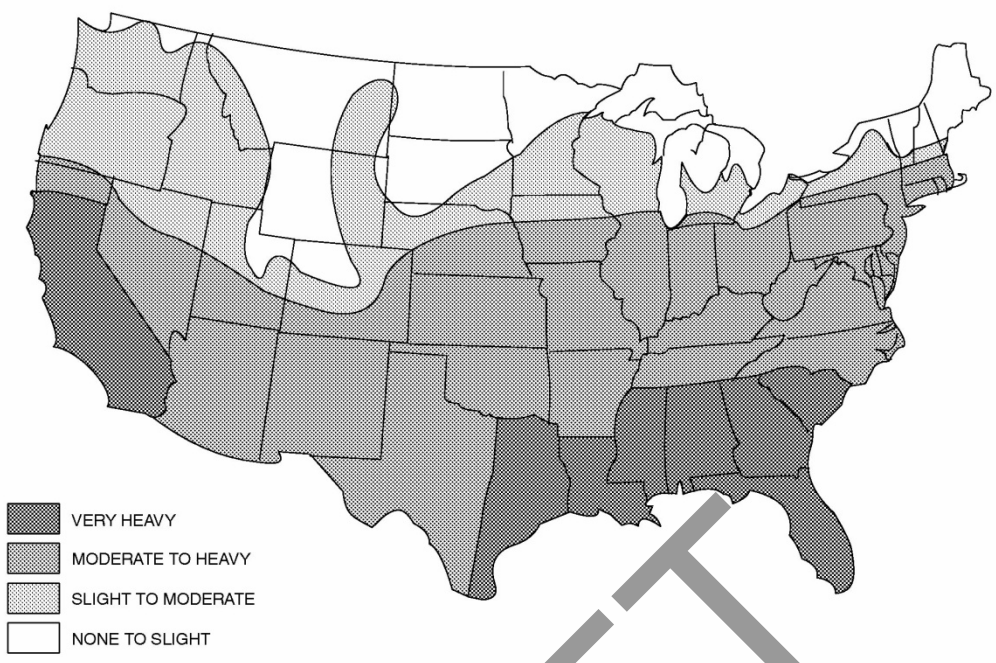

FIGURE 6(3)

TERMITE INFESTATION PROBABILITY MAP

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STAFF NOTE ON DRAFT STANDARD: This map has remained unchanged since the 2015 IRC. Permission was not sought to reprint the map from subsequent versions of the IRC due to lack of map modifications.

The 2024 IRC is not published yet. Home Innovation will seek approval should the map change.

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CHAPTER 7:
ENERGY EFFICIENCY

POINTS

701 MINIMUM ENERGY EFFICIENCY REQUIREMENTS

701.1 Mandatory requirements. The building shall comply with § 702 (Performance Path), § 703 (Prescriptive Path), § 704 (ERI Target Path), or one of the pathways in § 701.1.4 through § 701.1.8 (Alternative Paths). Items listed as "mandatory" in § 701.4 shall apply to § 702, § 703, and § 704 paths. Except where § 705 requirements are met, buildings in Tropical Climate Zone shall comply with IECC Climate Zone 1 requirements~~Except where otherwise noted, buildings in the Tropical Climate Zone shall comply with Climate Zone 1 requirements~~.

701.1.1 Minimum Performance Path requirements. A building complying with § 702 shall include not less than two practices from § 706, or not less than one practice from § 706 and not less than one practice from § 707.

701.1.2 Minimum Prescriptive Path requirements. A building complying with § 703 shall obtain not less than 30 points from § 703 and shall include not less than two practices from § 706, or not less than one practice from § 706 and not less than one practice from § 707.

701.1.3 ERI Target Path requirements. A building complying with § 704 shall obtain not less than 30 points from § 704 and shall include not less than two practices from § 706, or not less than one practice from § 706 and not less than one practice from § 707.

701.1.4 Alternative Bronze level compliance. Buildings that meet one of the following criteria:
[Points awarded shall not be combined with points from § 703 (Prescriptive Path), § 704 (ERI Target Path), or 701.1.4 through 701.1.8 (Alternative Paths)] **30**

(1) qualifies as an ENERGY STAR National Single Family New Homes Version 3.1 building;

(2) qualifies as an ENERGY STAR National Multifamily New Construction Version 1.1 building; or

(3) complies with the IECC.

701.1.5 Alternative Silver level compliance. Buildings that meet one of the following criteria:
[Points awarded shall not be combined with points from § 703 (Prescriptive Path), § 704 (ERI Target Path), or 701.1.4 through 701.1.8 (Alternative Paths)]: **45**

(1) qualifies as an ENERGY STAR National Single Family New Homes Version 3.2 building; or

(2) qualifies as an ENERGY STAR National Multifamily New Construction Version 1.2 building.

(3) complies with the 2024 IECC.

701.1.6 Alternative Gold level compliance. Buildings that meet one of the following criteria:
[Points awarded shall not be combined with points from § 703 (Prescriptive Path), § 704 (ERI Target Path), or 701.1.4 through 701.1.8 (Alternative Paths)]: **60**

(1) complies with Chapter 7 of the IgCC, additionally, measured compartmentalization shall be no greater than 0.2 CFM50/sf (1 L/s/m^2) of dwelling unit enclosure area, tested in accordance with ANSI/RESNET/ICC 380, ASTM E779, ASTM E1827, or ASTM E3158;

POINTS

(2) qualifies as a DOE Zero Energy Ready Homes Single Family;

(3) qualifies as a DOE Zero Energy Ready Homes CA Single Family Version 2;

(4) qualifies as a DOE Zero Energy Ready Multifamily; or

(5) qualifies as a DOE Zero Energy Ready Homes CA Multifamily Version 2.

701.1.7 Alternative Emerald level compliance. Buildings that meet one of the following criteria:
[Points awarded shall not be combined with points from § 703 (Prescriptive Path), § 704 (ERI Target Path), or 701.1.4 through 701.1.8 (Alternative Paths)]: **70**

(1) demonstrated to be net zero energy based on modeled site or source energy analysis;

(2) complies with the IECC Appendix CC Zero Energy Commercial Building provisions;

(3) complies with the IECC Appendix RC Zero Energy Residential Building provisions; or

(4) certified to PHIUS CORE or PHIUS ZERO.

701.1.8 Alternative Silver or Gold level compliance for Tropical Zones (§ 705). For buildings in the Tropical Zone, where more than 50 percent of the occupied space is not air conditioned and 100 percent of the occupied space is not heated. The building shall be awarded in accordance with the following~~, and comply with one of the following~~:
~~*[Points awarded shall not be combined with points from § 703 (Prescriptive Path), § 704 (ERI Target Path), or 701.1.4 through 701.1.8 (Alternative Paths)]*~~

(1) § 705.1 mandatory practices and § 705.2 Additional Tropical Zone practices – Silver **45**

(2) IECC Section R401.2.4 (Tropical Zone). Buildings without heating and 50% or less air-conditioned space in the Tropical Zone are eligible to earn Silver even if they are located above the IECC elevation limit – Silver **45**

(3) § 705.1 mandatory practices and § 705.3 Additional Tropical Zone practices – Gold **60**

[Points awarded shall not be combined with points from § 703 (Prescriptive Path), § 704 (ERI Target Path), or § 701.1.4 through § 701.1.8 (Alternative Paths)]

701.2 Emerald level points. The Performance Path (§ 702), the ERI Target Path (§ 704), or the Alternative Emerald level compliance (§ 701.1.7) 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, installed, and documented, using industry-approved guidelines and standards (e.g., ACCA Manual J, AHRI I=B=R, ACCA 5 QI, or an accredited design professional's and manufacturer's recommendation). ..... **Mandatory**

POINTS

701.4.2 Duct systems

701.4.2.1 Duct air sealing and testing. Ducts are air sealed and tested. ..... **Mandatory**

(1) All duct sealing materials are in conformance with UL 181A or UL 181B specifications and are installed in accordance with manufacturer's instructions.

(2) **Testing.** Dwelling unit total duct leakage testing is conducted following procedures in ANSI/RESNET/ICC Std. 380 or ASTM E1554 with a pressure differential of 0.1 in. w.g. (25 Pa) across the entire system and demonstrating compliance with one of the following leakage rates:

Exception: Testing is not Mandatory for multifamily and mixed-use structures 4 or more stories in height and in compliance with IECC Section C 403.2.9.

(a) At rough-in test with air handler installed or at post construction, leakage shall be no greater than 4.0 CFM (~~113.3 L/min~~1.9 L/s) per 100 ft^2 (9.29 m^2) of conditioned floor area (CFM/100 cfa) or 40 CFM (18.9 L/s), whichever is greater; OR

(b) At rough-in testing without the air handler installed, leakage shall be no greater than 3 CFM/100 cfa (1.4 L/s~~85 L/min~~/9.29 m^2) or 30 CFM (14.2 L/s), whichever is greater; OR

(c) For ducts entirely within the thermal envelope, leakage shall be no greater than 8 CFM ~~(226.6 L/min)~~ /100 cfa (3.8 L/s/9.29 m^2) or 80 CFM (37.8 L/s), whichever is greater.

701.4.2.2 Ducts and Plenums. Building framing cavities are not used as ducts or plenums. ..... **Mandatory**

701.4.2.3 Duct system sizing. Duct system is sized and designed in accordance with ACCA Manual D or equivalent. ..... **Mandatory**

701.4.2.4 Duct insulation. Supply and return located outside conditioned space shall be insulated to an R-value of not less than R-8 for ducts 3 in. (~~76~~ 7.6 ~~m~~cm) in diameter and larger and not less than R-6 (1.1 (m^2•K)/W) for ducts smaller than 3 in. (~~76~~7.6 ~~m~~cm) in diameter. ..... **Mandatory**

701.4.3 Insulation and air sealing

701.4.3.1 Building thermal envelope air sealing. The building thermal envelope is durably sealed to limit infiltration. The sealing methods between dissimilar materials allow for differential expansion and contraction. The following are caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material, suitable film, or solid material: ..... **Mandatory**

(a) All joints, seams and penetrations.

(b) Site-built windows, doors, and skylights.

(c) Openings between window and door assemblies and their respective jambs and framing.

(d) Utility penetrations.

(e) Dropped ceilings or chases adjacent to the thermal envelope.

(f) Knee walls.

(g) Walls, ceilings, and floors separating conditioned spaces from unconditioned spaces.

(h) Behind tubs and showers on exterior walls.

POINTS

(i) Common walls between dwelling units or sleeping units.

(j) Attic access openings.

(k) Joints of framing members at rim joists.

(l) Top and bottom plates.

(m) Other sources of infiltration.

701.4.3.2 Air barrier, air sealing, building envelope testing, and insulation. Building envelope air barrier, air sealing envelope tightness, and insulation installation is verified to be in accordance with this Section and § 701.4.3.2(1). Insulation installation other than Grade 1 is not permitted. ..... **Mandatory**

(1) **Testing.** Conduct airtightness testing in accordance with procedures in ANSI/RESNET/ICC Std. 380, ASTM E779, ASTM E1827, or ASTM E3158 demonstrating compliance with the following leakage rates, as applicable to the type of home or dwelling unit:

(a) For detached homes ≥ 1,500 ft^2 (139.4 m^2), measured airtightness shall be no greater than 5 ACH50.

(b) For all other homes or dwelling units, the weighted average of the unguarded compartmentalization testing shall be no greater than 0.30 CFM50 per square foot (1.5 L/s/m^2) of dwelling unit enclosure area.

Testing shall be conducted after rough-in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances. Testing is conducted under the following conditions:

(a) exterior windows and doors, fireplace and stove doors are closed, but not sealed;

(b) dampers are closed, but not sealed, including exhaust, intake, make-up air, backdraft and flue dampers;

(c) interior doors are open;

(d) exterior openings for continuous ventilation systems and heat recovery ventilators are closed and sealed;

(e) heating and cooling systems are turned off;

(f) HVAC duct terminations are not sealed; and

(g) supply and return registers are not sealed.

Multifamily and Mixed-Use Building Note: *Testing by dwelling units, sleeping units, groups of dwelling units, groups of sleeping units, or the building as a whole is acceptable.*

(23) **Visual inspection.** The air barrier and insulation items listed in Table 701.4.3.2(2) are field verified by visual inspection.

Table 701.4.3.2(2)
Air Barrier, Air Sealing and Insulation Installation[a]

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building thermal envelope.	Air-permeable insulation shall not be used as a sealing material.

		POINTS
	Breaks or joints in the air barrier shall be sealed. Air-permeable insulation shall not be used a s sealing material.	
Ceiling/attic	The air barrier in any dropped ceiling or soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within comers and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance, *R*-value, of not less than R-3 per inch (0.209 (m^2•K)/W per cm). Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between framing and skylights, and the jambs of windows and doors shall be sealed.	
Rim joists	Rim joists shall include an exterior air barrier.[b] The junctions of the rim board to the sill plate and the rim board and the subfloor shall be air sealed.	Rim joists shall be insulated so that the insulation maintains permanent contact with the exterior rim board.[b]
Floors including cantilevered floors and floors above garages	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking. Alternatively, floor framing cavity insulation shall be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extending from the bottom to the top of all perimeter floor framing members.
Basement crawl space and slab foundations	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder/air barrier in accordance with Section R402.2.10. Penetrations through concrete foundation walls and slabs shall be air sealed. Class 1 vapor retarders shall not be used as an air barrier on below-grade walls and shall be installed in accordance with Section R702.7 of the *International Residential Code*.	Crawl space insulation, where provided instead of floor insulation, shall be installed in accordance with Section R402.2.10. Conditioned basement foundation wall insulation shall be installed in accordance with Section R402.2.8.1. Slab-on-grade floor insulation shall be installed in accordance with Section R402.2.10.
Shafts, penetrations	Duct and flue shafts and other similar penetrations exterior or unconditioned space shall be sealed to allow for expansion, contraction and mechanical vibration. Utility penetrations of the air barrier shall be caulked, gasketed or otherwise sealed and shall allow for expansion, contraction of materials and mechanical vibration.	Insulation shall be fitted tightly around utilities passing through shafts and penetrations in the building thermal envelope to maintain required *R*-value.
Narrow cavities	Narrow cavities of 1 inch (2.5 cm) or less that are not able to be insulated shall be air sealed.	Batts to be installed in narrow cavities shall be cut to fit or narrow cavities shall be filled with insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	Insulated portions of the garage separation assembly shall be installed in accordance with Sections R303 and R402.2.7.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be air sealed in accordance with Section R402.4.5.	Recessed light fixtures installed in the building thermal envelope shall be airtight and IC rated, and shall be buried or surrounded with insulation.
Plumbing wiring or other obstructions	All holes created by wiring, plumbing or other obstructions in the air barrier assembly shall be air sealed.	Insulation shall be installed to fill the available space and surround wiring, plumbing, or other obstructions, unless the required R-value can be met by installing insulation and air barrier systems completely to the exterior side of the obstructions.
Shower/tub on exterior wall	The air barrier shall be installed at exterior walls adjacent to showers and tubs shall separate the wall from the shower or tub.	Exterior walls adjacent to showers and tubs shall be insulated.

		POINTS
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical and communication boxes. Alternatively, air-sealed boxes shall be installed.	
HVAC register boots	HVAC and supply and return register boots that penetrate building thermal envelope shall be sealed to the subfloor, wall covering or ceiling penetrated by the boot.	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.
b. Insulation fully enclosed by an air barrier is not required in unconditioned/ventilated attic spaces and at rim joists.

701.4.3.2.1 Grade I insulation installation. Field-installed insulation products to ceilings, walls, floors, band joists, rim joists, conditioned attics, basements, and crawlspaces, except as specifically noted, are verified by a third-party as Grade I in accordance with the following:..... **Mandatory**

(1) Inspection is conducted before insulation is covered.

(2) Air-permeable insulation is enclosed on all six sides and is in substantial contact with the sheathing material on one or more sides (interior or exterior) of the cavity. Air permeable insulation in ceilings is not required to be enclosed when the insulation is installed in substantial contact with the surfaces it is intended to insulate.

(3) Cavity insulation uniformly fills each cavity side-to-side and top-to-bottom, without substantial gaps or voids around obstructions (such as blocking or bridging).

(4) Cavity insulation compression or incomplete fill amounts to 2% or less, presuming the compressed or incomplete areas are not less than 70% of the intended fill thickness; occasional small gaps are acceptable.

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

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

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

(8) Faced batt insulation is permitted to have side-stapled tabs, provided 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.

(9) Where properly installed, ICFs, SIPs, and other wall systems that provide integral insulation are deemed in compliance with this section.

(10) Thin film products, including but not limited to radiant barrier film, that are designed to be installed with an air spaced to achieve their designated R-value shall be installed in accordance with manufacturer's instructions.

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/sf ~~per ft²~~ (1.5 L/s/m^2)~~1.5 L/s/m²~~), and swinging doors no more than 0.5 cfm/sf ~~per ft²~~ (2.5 L/s/m^2)~~2.6 L/s/m²~~), when tested in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled. For site-built fenestration, a test report by an accredited, independent laboratory verifying compliance with the applicable infiltration rate shall be **Mandatory**

	POINTS
submitted to demonstrate compliance with this practice. This practice does not apply to field-fabricated fenestration products.	
Exception: For Tropical Zones Only, Jalousie windows are permitted to be used as a conditioned space boundary and shall have an air infiltration rate of not more than 1.3 cfm/sf (6.6 L/s/m^2) ~~per ft^2~~	
701.4.3.4 Lighting in building thermal envelope. Luminaires installed in the building thermal envelope which penetrate the air barrier are sealed to limit air leakage between conditioned and unconditioned spaces. All luminaires installed in the building thermal envelope which penetrate the air barrier are IC-rated and labeled as complying with ASTM E283 when tested at 1.57 psf (75.2 Pa) pressure differential with no more than 2.0 cfm (~~0.944 L/s~~0.94 L/s) of air movement from the conditioned space to the ceiling cavity. All luminaires installed in the building thermal envelope which penetrate the air barrier are sealed with a gasket or caulk between the housing and the interior of the wall or ceiling covering.	**Mandatory**
701.4.4 High-efficacy lighting. Lighting efficacy in dwelling units or sleeping units is in accordance with one of the following:	**Mandatory**
(1) All permanently installed lighting fixtures, excluding kitchen appliance lighting fixtures, shall contain only high-efficacy lighting sources.	
(2) Lighting power density~~, measured in watts/square foot,~~ shall be 0.45 watts/ft^2 (4.84 watts/m^2) or less.	
701.4.5 Boiler piping. Boiler piping in unconditioned space supplying and returning heated water or steam is insulated.	**Mandatory**

702 PERFORMANCE PATH

702.1 Point allocation. Points from § 702 (Performance Path) shall not be combined with points from § 703 (Prescriptive Path), § 704 (ERI Target Path), or § 701.1.4 through § 701.1.8 (Alternative Paths).	**Mandatory for § 702**
702.2 Energy performance levels	
702.2.1 IECC equivalency analysis. Energy efficiency features are implemented to achieve energy cost, or site energy, source energy, or carbon dioxide equivalent emissions (CO2e) performance that complies with the IECC thresholds (or equivalents thereof). When using equivalents to code thresholds, employ the methodology in ANSI/ASHRAE Standard 105-2021 or the IgCC.	**Mandatory for § 702**
702.2.2 Minimum energy performance analysis. Energy efficiency features are implemented to achieve energy cost, or site energy, or source energy, or CO2e performance that complies with the applicable minimum energy performance threshold in § 702.2.2.1 or § 702.2.2.2.	**Mandatory for § 702**
702.2.2.1 Residential buildings. A documented analysis that either demonstrates compliance with IECC using software in accordance with IECC Section R405 applied as defined in the IECC, or that demonstrates performance at least as good as the NGBS Reference Home values in Table 702.2.2.1 using software approved by and applied as defined by the Adopting Entity, is required.	
702.2.2.2 Commercial buildings. A documented analysis that demonstrates compliance with the IECC using software in accordance with IECC Section C407 or ASHRAE 90.1 Appendix G or Energy Cost Budget simulation general requirements, is required.	

POINTS

Table 702.2.2.1
NGBS Reference Home Values
(Single-Family & Low-Rise Multifamily and Mixed-Use Modeling)

CATEGORY	REFERENCE
Building Envelope	**NGBS**
Slab	IECC Table R402.1.3
Floor	IECC Table R405.4.2(1)
Ceiling	IECC Table R405.4.2(1)
Door	IECC Table R405.4.2(1)
Insulation Rim/Band	IECC Table R405.4.2(1)
Insulation Walls	IECC Table R405.4.2(1)
Windows	IECC Table R405.4.2(1)
Air Infiltration	IECC Table R405.4.2(1)
Heating System Efficiency	10 CFR 430.32 (e) Furnaces and boilers
Cooling System Efficiency	10 CFR 430.32(c) Central air conditioners and heat pumps
Ventilation System Efficiency	
Energy Use of Ventilation Equipment	IECC Table R405.4.2(1)
Duct Sealing	
Duct Air Leakage Testing	IECC Table R405.4.2(1)
Water Heating System Efficiencies	10 CFR 430.32(d) Water heaters
Lighting	Default lighting and appliance values from ANSI/RESNET 301
Appliances	Default lighting and appliance values from ANSI/RESNET 301

702.2.3 Energy performance analysis. Energy savings levels above the 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, appliances, and on-site renewable energy. Points are assigned using the following formula:

Points = 30 + (percent above threshold identified in § 702.2.1.1. or § 702.2.1.2) * 2

Multifamily and Mixed-Use Building Note: *Modeling is completed building-wide using one of the following methods: whole building energy modeling, a unit-by-unit approach, or a building average of a unit-by-unit approach.*

702.2.4 Tropical standard reference design. For the Tropical Climate Zone, the standard reference design shall use the specifications in IECC Section R401.2.4 (Tropical Zone).

703 PRESCRIPTIVE PATH

703.1 Mandatory practices **30**

703.1.1 Building thermal envelope compliance. For conditioned spaces, the building thermal envelope is in compliance with § 703.1.1.1 or § 703.1.1.2. ..... **Mandatory for § 703**

703.1.1.1 Maximum UA and SHGC. For IECC residential buildings, the total building UA is less than or equal to the total maximum UA as computed by IECC Section R402.1.5. The SHGC requirements for fenestration in Table R402.1.2 are also met. For IECC commercial buildings, the total UA is less than or equal to the sum of the UA for IECC Tables C402.1.4 and C402.4, including the U-factor times the area and C-factor or F-factor times the perimeter. The SHGC requirements for fenestration in Table C402.4 are also met. The total UA proposed and baseline calculations are documented. REScheck or COMcheck is deemed to provide UA calculation documentation.

POINTS

703.1.1.2 Prescriptive R-values and fenestration requirements. The building thermal envelope is in accordance with the thermal requirements of IECC Table R402.13 or Table C402.1.3, as applicable. The fenestration U-factors and SHGC's are in accordance with IECC Table R402.1.2 or C402.4, as applicable. Unconditioned buildings 3 stories or less in height located in the Tropical Zone are exempt from this practice if the building has a roof SRI of not less than 0.85, and a wall reflectivity of not less than 0.39.

703.1.2 Building envelope leakage. The building thermal envelope is in accordance with IECC R402.4 or C402.5 , as applicable. ..... **Mandatory for § 703**

Exception: Section 703.1.2 is not required for Tropical Climate Zone.

703.1.3 Duct testing. The duct system is in accordance with IECC R403.3 as applicable. ..... **Mandatory for § 703**

703.2 Building envelope

703.2.1 UA improvement. The total building thermal envelope UA is less than or equal to the baseline total UA resulting from the U-factors provided in Table 703.2.1(a) or IECC Tables ~~C402.1.4~~R402.1.2 and C402.4, as applicable. Where insulation is used to achieve the UA improvement, the insulation installation is in accordance with Grade 1 complying with § 701.4.3.2.1 as verified by a third-party. Total UA is documented using a REScheck, COMcheck, or equivalent report to verify the baseline and the UA improvement. ..... **Per Table 703.2.1(b)**

~~**Table 703.2.1(a)**~~
~~**Baseline U-Factors[a]**~~

~~Climate Zone~~	~~Fenestration U-Factor~~	~~Skylight U-Factor~~	~~Ceiling U-Factor~~	~~Frame Wall U-Factor~~	~~Mass Wall U-Factor[b]~~	~~Floor U-Factor~~	~~Basement Wall U-Factor~~	~~Crawlspace Wall U-Factor[c]~~
~~1~~	~~0.50~~	~~0.75~~	~~0.035~~	~~0.084~~	~~0.197~~	~~0.064~~	~~0.360~~	~~0.477~~
~~2~~	~~0.40~~	~~0.65~~	~~0.026~~	~~0.084~~	~~0.165~~	~~0.064~~	~~0.360~~	~~0.477~~
~~3~~	~~0.30~~	~~0.55~~	~~0.026~~	~~0.060~~	~~0.098~~	~~0.047~~	~~0.091[C]~~	~~0.136~~
~~4 except Marine~~	~~0.30~~	~~0.55~~	~~0.024~~	~~0.045~~	~~0.098~~	~~0.047~~	~~0.059~~	~~0.065~~
~~5 and Marine 4~~	~~0.30~~	~~0.55~~	~~0.024~~	~~0.045~~	~~0.082~~	~~0.033~~	~~0.050~~	~~0.055~~
~~6~~	~~0.30~~	~~0.55~~	~~0.024~~	~~0.045~~	~~0.060~~	~~0.033~~	~~0.050~~	~~0.055~~
~~7 and 8~~	~~0.30~~	~~0.55~~	~~0.024~~	~~0.045~~	~~0.057~~	~~0.028~~	~~0.050~~	~~0.055~~

~~a. Non-fenestration U-factors shall be obtained from measurement, calculation, or an approved source.~~
~~b. Where more the half the insulation is on the interior, the mass wall U-factors is not greater than 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.~~
~~Basement wall U-factor of 0.360 in warm-humid locations.~~
~~c. Note: See Appendix E for SI units.~~

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

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWLSPACE[c] WALL *R*-VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0

POINTS

3	0.35	0.55	0.25	38	20 or 13+5[h]	8/13	19	5/13[f]	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5[h]	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5[h]	13/17	30[g]	15/19	10, 2 ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10[h]	15/20	30[g]	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10[h]	19/21	38[g]	15/19	10, 4 ft	15/19

a. R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.
b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration. Exception: Skylights may be excluded from glazed fenestration SHGC requirements in climate zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.
c. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
d. R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Climate Zones 1 through 3 for heated slabs.
e. There are no SHGC requirements in the Marine Zone.
f. Basement wall insulation is not required in warm-humid locations as defined by IECC Figure R301.1 and Table R301.1.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. The first value is cavity insulation, the second value is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 continuous insulation.
i. The second R-value applies when more than half the insulation is on the interior of the mass wall.

Note: See Appendix E for SI units.

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

Minimum UA Improvement	Climate Zone							
	1[a]	2	3	4	5	6	7	8
	POINTS							
0 to <5%	~~0~~0	~~0~~0	~~0~~0	~~0~~0	~~0~~0	~~0~~0	~~0~~0	~~0~~0
5% to <10%	~~0~~2	~~1~~3	~~1~~3	~~1~~3	~~0~~3	~~0~~3	~~0~~3	~~0~~3
10% to <15%	~~1~~3	~~5~~6	~~5~~5	~~4~~6	~~3~~6	~~3~~6	~~3~~5	~~6~~7
15% to <20%	~~4~~5	~~8~~9	~~9~~8	~~7~~9	~~6~~9	~~6~~9	~~7~~8	~~12~~10
20% to <25%	~~7~~6	~~12~~12	~~13~~10	~~11~~12	~~9~~12	~~10~~12	~~11~~11	~~19~~13
25% to <30%	~~10~~8	~~15~~15	~~16~~13	~~15~~16	~~13~~14	~~14~~15	~~15~~14	~~26~~17
30% to <35%	~~13~~10	~~19~~18	~~20~~16	~~19~~19	~~17~~17	~~18~~18	~~20~~16	~~32~~20
≥35%	~~16~~11	~~23~~21	~~23~~18	~~22~~22	~~20~~20	~~21~~21	~~25~~19	~~38~~23

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

Exception: For the Tropical Climate Zone, crawl space, basement, and floor u-factors are excluded from the total building thermal envelope UA improvement calculation.

703.2.2 Mass walls. More than 75% of the above-grade exterior opaque wall area of the building is mass walls. ..... **Per Table 703.2.2**

Table 703.2.2
Exterior Mass Walls

Mass thickness	Climate Zone			
	1-4	5	6	7-8

POINTS

	POINTS			
≥3 in. to <6 in. (≥7.6 to < 15.2 cm)	**1**	**0**	**0**	**0**
>6 in. (15.2 cm)	**3**	**2**	**2**	**0**

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

Table 703.2.3
Radiant Barriers

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

[In climate zones 1-3, 1 point maximum for multifamily and mixed-use buildings four or more stories in height.]

703.2.4 Building or dwelling unit envelope leakage. The maximum building or dwelling unit envelope leakage rate is in accordance with Table 703.2.4~~(a) or Table 703.2.4(b)~~ and whole building ventilation is provided in accordance with § 902.2.1. ..... **Per Table 703.2.4~~(a) or 703.2.4(b)~~**

Table 703.2.4~~(a)~~
Building Envelope Leakage

Max Envelope Leakage Rate ~~(ACH50)~~	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
4 ACH50 or 0.28 ELR50	~~**11**~~	~~**12**~~	~~**0**~~	~~**0**~~	~~**0**~~	~~**0**~~	~~**0**~~	~~**0**~~
3 ACH50 or 0.23 ELR50	~~**12**~~	~~**14**~~	~~**0**~~	~~**0**~~	~~**0**~~	~~**0**~~	~~**0**~~	~~**0**~~
2 ACH50 or 0.18 ELR50	~~**23**~~	~~**25**~~	~~**23**~~	~~**34**~~	~~**44**~~	~~**56**~~	~~**118**~~	~~**87**~~
1 ACH50 or 0.13 ELR50	~~**24**~~	~~**37**~~	~~**35**~~	~~**57**~~	~~**77**~~	~~**810**~~	~~**2115**~~	~~**1611**~~
Where ELR50 = CFM50 / *Building Thermal Envelope* Area CFM50 = cubic feet per minute at 50 Pa								

~~**Table 703.2.4(b)**~~
~~**Building Envelope Leakage**~~

~~Max Envelope Leakage Rate (ELR50)~~	~~Climate Zone~~							
	~~1~~	~~2~~	~~3~~	~~4~~	~~5~~	~~6~~	~~7~~	~~8~~
	~~POINTS~~							
~~0.28~~	~~**1**~~	~~**2**~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~0.23~~	~~**2**~~	~~**4**~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~0.18~~	~~**3**~~	~~**5**~~	~~**3**~~	~~**4**~~	~~**4**~~	~~**6**~~	~~**8**~~	~~**7**~~
~~0.13~~	~~**4**~~	~~**7**~~	~~**5**~~	~~**7**~~	~~**7**~~	~~**10**~~	~~**15**~~	~~**11**~~
~~Where ELR50 = CFM50 / *Building Thermal Envelope* Area~~ ~~CFM50 = cubic feet per minute at 50 Pa~~								

Points not awarded if points are taken under § 705.6.2.1.

703.2.5 Fenestration

POINTS

703.2.5.1 NFRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) on an area-weighted average basis do not exceed the values in IECC Table R402.1.2 or Table C402.4, as applicable. Area weighted averages are calculated separately for the categories of 1) windows and exterior doors and 2) skylights and tubular daylighting devices (TDDs). Decorative fenestration elements with a combined total area not greater than 15 ft^2 (1.~~39~~ 4 m^2) or 10% of the total glazing area, whichever is less, are not required to comply with this practice. Unconditioned buildings 3 stories or less in height located in the Tropical Zone are exempt from this practice if the building has a roof SRI of not less than 0.85, and a wall reflectivity of not less than 0.39. ..... **Mandatory for § 703**

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

703.2.5.2 The NFRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with Table 703.2.5.2(a), (b), or (c). Decorative fenestration elements with a combined total area not greater than 15 ft^2 (1.~~394~~ m^2) or 10% of the total glazing area, whichever is less, are not required to comply with this practice. **Per Table 703.2.5.2(a), or 703.2.5.2(b), or 703.2.5.2(c)**

Table 703.2.5.2(a)
Enhanced Fenestration Specifications

CLIMATE ZONE	WINDOWS & EXTERIOR DOORS		SKYLIGHTS & TDDS		POINTS
	U-FACTOR (Btu/h·ft2·F)	SHGC	U-FACTOR (Btu/h·ft2·F)	SHGC	
1	0.~~40~~35	0.25	0.60	0.28	**1**
2	0.~~40~~35	0.25	0.60	0.28	**~~1~~2**
3	0.~~27~~28	0.25	0.50	0.28	**2**
4	0.~~27~~28	0.40	0.50	0.35	**~~3~~2**
5	0.27	Any	0.50	Any	**3**
6	0.27	Any	0.50	Any	**4**
7	0.27	Any	0.50	Any	**4**
8	0.27	Any	0.50	Any	**~~4~~5**

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

Table 703.2.5.2(b)
Enhanced Fenestration Specifications

CLIMATE ZONE	WINDOWS & EXTERIOR DOORS		SKYLIGHTS & TDDS		POINTS
	U-FACTOR (Btu/h·ft2·F)	SHGC	U-FACTOR (Btu/h·ft2·F)	SHGC	
1	0.~~38~~32	0.~~25~~23	0.55	0.28	**~~2~~4**
2	0.~~38~~32	0.~~25~~23	0.53	0.28	**~~3~~5**
3	0.~~30~~27	0.~~25~~23	0.50	0.28	**~~4~~3**
4	0.~~28~~25	0.40	0.50	0.35	**~~4~~5**
5	0.25	Any	0.48	Any	**~~4~~5**
6	0.25	Any	0.48	Any	**~~5~~6**
7	0.25	Any	0.46	Any	**~~5~~6**

					POINTS
8	0.25	Any	0.46	Any	~~4~~8
Exception: For Sun-tempered designs complying with the requirements of § 703.7.1, the SHGC is permitted to be 0.40 or higher on south facing glass.					

Table 703.2.5.2(c)
Enhanced Fenestration Specifications

CLIMATE ZONE	WINDOWS & EXTERIOR DOORS		SKYLIGHTS & TDDS		POINTS
	U-FACTOR (Btu/h·ft2·F)	SHGC	U-FACTOR (Btu/h·ft2·F)	SHGC	
4	0.~~25~~22	0.40	0.45	0.40	~~6~~8
5~~-8~~	0.22	Any	0.42	Any	~~6~~9
6	0.22	Any	0.42	Any	9
7	0.22	Any	0.42	Any	10
8	0.22	Any	0.42	Any	12

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

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

703.3 HVAC equipment efficiency

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

Weighted Average = $[(E_{unit\ 1}*C_{unit\ 1})+(E_{unit\ 2}*C_{unit\ 2})+\ldots+(E_{unit\ n}*C_{unit\ n})] / (C_{unit\ 1}+C_{unit\ 2}+\ldots+C_{unit\ n})$

where:

E = Rated AHRI efficiency for unit

C = Rated heating or cooling capacity for unit

n = Unit count

703.3.1 Combination space heating and water heating system (combo system) is installed using either a coil from the water heater connected to an air handler to provide heat for the building, dwelling unit or sleeping unit, or a space heating boiler using an indirect-fired water heater.

(a) Devices have a combined annual efficiency of not less than 0.80 and a water heating recovery efficiency of not less than 0.87. ..... **4**

(b) Devices have a combined annual efficiency of not less than 0.94 and a water heating recovery efficiency of not less than 0.95. ..... **6**

POINTS

(c) Devices have a combined annual efficiency of not less than 1.15 and a water heating recovery efficiency of not less than 1.20..... **10**

(d) Devices have a combined annual efficiency of not less than 1.15 and a water heating recovery efficiency of not less than 1.20 and serves a third building load (e.g., pool heating). **12**

Items (b)-(d) are not available if points are awarded in § 703.3.3 through § 703.3.6 or § 703.5.

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

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

Table 703.3.2(1)(a)
Gas and Propane Heating Systems

AFUE / COP	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥90% AFUE	0	2	5	7	9	10	12	13
≥92% AFUE	0	2	6	8	10	12	14	16
≥94% AFUE	0	3	6	9	12	13	16	18
≥96% AFUE	0	3	7	10	13	15	18	20
≥98% AFUE	0	3	8	11	14	17	19	22
≥1.2 COP[a]	1	4	9	16	18	23	26	30
≥1.4 COP[a]	1	5	11	19	21	26	30	35

a. This requirement is used for gas-fired heat pump systems.

Table 703.3.2(1)(b)
Gas and Propane Heating Systems
for Multifamily and Mixed-Use Buildings Four or More Stories in Height

AFUE / COP	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥90% AFUE	0	4	4	8	8	10	11	13
≥92% AFUE	0	4	4	9	10	11	12	14
≥94% AFUE	0	5	5	10	11	12	14	16
≥96% AFUE	0	5	5	12	12	13	15	17
≥98% AFUE	0	6	6	13	13	14	16	18
≥1.2 COP[a]	0	8	8	18	18	18	21	23
≥1.4 COP[a]	0	9	9	21	21	21	24	26

a. This requirement is used for gas-fired heat pump systems.

(2) Oil furnace: **Per Table 703.3.2(2)**

Table 703.3.2(2)
Oil Furnace

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8

POINTS

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

(3) Gas boiler:

Per Table 703.3.2(3)

Table 703.3.2(3)
Gas Boiler

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥85% AFUE	~~0~~0	~~0~~1	~~0~~1	~~1~~2	~~1~~3	~~1~~4	~~1~~4	~~1~~4
≥90% AFUE	~~0~~0	~~1~~1	~~2~~2	~~4~~4	~~5~~6	~~6~~7	~~7~~8	~~7~~6
≥94% AFUE	~~0~~0	~~2~~2	~~4~~3	~~6~~5	~~8~~8	~~9~~9	~~11~~10	~~11~~8
≥96% AFUE	~~0~~0	~~2~~2	~~5~~4	~~7~~6	~~9~~9	~~10~~11	~~12~~12	~~13~~10

(4) Oil boiler:

Per Table 703.3.2(4)

Table 703.3.2(4)
Oil Boiler

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥90% AFUE	**0**	**2**	**3**	**5**	**6**	**7**	**9**	**10**
≥95% AFUE	**0**	**2**	**3**	**6**	**6**	**9**	**10**	**12**

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

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

Table 703.3.3(1)
Electric Heat Pump Heating

Efficiency	Climate Zone							
	1	2	3	4	5	6-~~8~~[a]	7	8
	POINTS							
≥~~8.5~~7.2HSPF2 (~~11.5~~10.9 EER2)	~~0~~0	~~0~~1	~~0~~1	~~0~~2	~~0~~2	~~0~~2	0	0
≥~~9.0~~7.7 HSPF2 (~~12.5~~11.9 EER2)	~~0~~0	~~1~~2	~~1~~4	~~2~~5	~~2~~6	~~1~~10	1	1
≥~~9.5~~8.1 HSPF2	~~0~~0	~~2~~3	~~4~~7	~~5~~7	~~5~~11	~~5~~18	4	3
≥~~10.0~~8.5 HSPF2	~~0~~1	~~3~~5	~~6~~10	~~8~~10	~~10~~15	~~11~~26	12	8
≥~~12.0~~10.2 HSPF2	~~1~~1	~~7~~6	~~14~~11	~~18~~11	~~23~~17	~~24~~28	24	20

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

Efficiency	Climate Zone					
	1	2	3	4	5	6-8[a]
	POINTS					

						POINTS
≥~~8.5~~7.2 HSPF2 (~~11.5~~10.9 EER2)	**0**	**3**	**4**	**8**	**11**	**13**

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

Efficiency	**Climate Zone**					
	1	2	3	4	5	6-8
	POINTS					
≥1.3 COP at 47°F (8.3°C)	**2**	**7**	**11**	**14**	**16**	**18**

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

Per Table 703.3.4(1) or 703.3.4(2)

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

Efficiency	**Climate Zone**							
	1	2	3	4	5	6	7	8
	POINTS							
≥~~15~~ 14.3 SEER2 (~~12.5~~11.9 EER2)	**~~0~~6**	**~~0~~4**	**~~0~~2**	**~~0~~1**	**~~0~~1**	**~~0~~1**	**~~0~~1**	**~~0~~0**
≥~~17~~ 16.2 SEER2 (~~12.5~~11.9 EER2)	**~~9~~11**	**~~6~~9**	**~~3~~7**	**~~2~~3**	**~~2~~3**	**~~1~~2**	**~~0~~2**	**~~0~~0**
≥~~19~~ 18.1 SEER2 (~~12.5~~11.9 EER2)	**~~16~~1 ~~9~~**	**~~12~~1 ~~2~~**	**~~6~~10**	**~~4~~6**	**~~2~~4**	**~~2~~4**	**~~0~~4**	**~~0~~0**
≥~~21~~ 20 SEER2	**~~22~~2 ~~6~~**	**~~16~~1 ~~5~~**	**~~8~~14**	**~~6~~8**	**~~3~~6**	**~~2~~6**	**~~0~~5**	**~~0~~0**
≥~~25~~ 23.8 SEER2	**~~27~~2 ~~9~~**	**~~17~~1 ~~8~~**	**~~11~~1 ~~7~~**	**~~8~~10**	**~~4~~8**	**~~3~~8**	**~~1~~6**	**~~0~~0**

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

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

Efficiency	**Climate Zone**					
	1	2	3	4	5	6-8
	POINTS					
>1.2 COP at 95°F (35°C)	**3**	**6**	**3**	**1**	**1**	**0**

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

Per Table 703.3.5

Table 703.3.5
Water Source Cooling and Heating

Efficiency	**Climate Zone**							
	1	2	3	4	5	6~~-8~~	7	8
	POINTS							
≥~~15~~ 14.3 EER2, ≥4.0 COP	**~~6~~14**	**~~9~~18**	**16~~2~~2**	**21~~3~~0**	**32~~3~~7**	**39~~3~~7**	**49**	**60**

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

Per Table 703.3.6

POINTS

Table 703.3.6
Ground Source Heat Pump[a]

Efficiency	Climate Zone							
	1	2	3	4	5~~-8~~	6	7	8
	POINTS							
≥~~16.0~~15.2 EER2, ≥3.6 COP	~~14~~1	~~15~~1	~~19~~2	~~23~~16	~~33~~22	40	50	61
≥~~24.0~~22.8 EER2, ≥4.3 COP	~~41~~24	~~35~~29	~~33~~22	~~36~~31	~~44~~35	50	58	68
≥~~28.0~~26.6 EER2, ≥4.8 COP	~~48~~42	~~42~~46	~~39~~35	~~42~~42	~~49~~44	55	63	72

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

703.3.7 ENERGY STAR, or equivalent, ceiling fans are installed. *[Points awarded per building.]* **1**

[For Tropical Climate Zone and Climate Zones 2B, 3B, and 4B: points awarded per fan where AC is not installed in the dwelling unit or sleeping unit (Max 8 points)]

Where points are awarded in § 703.3.8 for these specific climate zones, points shall not be awarded in § 703.3.7.

703.3.8 Whole-building or whole-dwelling unit or whole-sleeping unit fan(s) with insulated louvers and a sealed enclosure is installed. *[Points awarded per building.]* **Per Table 703.3.8**

Table 703.3.8
Whole Dwelling Unit Fan

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

703.4 Duct systems

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

Table 703.4.1
Ductless Heating System

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

[No points awarded for multifamily and mixed-use buildings four or more stories in height.]

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

Table 703.4.2
Ductless Cooling System

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

POINTS

[No points awarded for multifamily and mixed-use buildings four or more stories in height.]

~~**703.4.3** Ductwork is in accordance with all of the following:~~ ~~**Per Table 703.4.3**~~

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

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

~~(3) Ductwork is not installed in exterior walls.~~

~~**Table 703.4.3**~~
~~**Ducts**~~

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

~~*[No points awarded for multifamily buildings four or more stories in height.]*~~

703.4.4 Duct Leakage. The entire central HVAC duct system, including air handlers and register boots, is tested by a third party for total leakage at a pressure differential of 0.1 in. w.g. (25 Pa) and maximum air leakage is equal to or less than 6% of the system design flow rate or 4 ~~cu ft per minute~~ CFM (1.9 L/s) per 100 ft^2 (9.29 m^2) of conditioned floor area. Ductwork is in accordance with all of the following: **Per Table 703.4.34**

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

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

(3) Ductwork is not installed in exterior walls.

Table 703.4.34
Duct Leakage, where ≤4 cfm25/100SFcfa

Ductwork location	**Climate Zone**							
	1	2	3	4	5	6~~-8~~	7	8
	POINTS							
~~ductwork *entirely outside* the building's thermal envelope~~	~~**4**~~	~~**5**~~	~~**4**~~	~~**3**~~	~~**2**~~	~~**1**~~		
ductwork *entirely inside* the building's thermal envelope	**14~~1~~**	**13~~1~~**	**12~~1~~**	**9~~1~~**	**6~~1~~**	**7~~1~~**	**9**	**9**
not more than 10 linear feet of ductwork is ~~ductwork *inside and* outside~~ the building's thermal envelope	**12~~3~~**	**11~~4~~**	**9~~3~~**	**6~~2~~**	**2~~1~~**	**2~~1~~**	**2**	**2**

Points not awarded if points are taken under § 706.6.2.3.

703.5 Water heating systems

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

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

POINTS

Water heater design is based on only 1 (one) water heater per dwelling unit, based on approved methods from IPC, ASPE, or manufacturer specifications. All table values are based on water heaters with medium water draws as defined by the DOE test procedures (55 gallons per day).

(1) Gas water heating

Per Tables 703.5.1(1)(a) through 703.5.1(1)(e)

Table 703.5.1(1)(a)
Gas Water Heating
Storage Water Heater, Rated Storage Volume > 20 Gallons (76 liters) and ≤ 55 Gallons (208 liters), Medium Water Draw

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
0.65 to <0.78	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**
≥0.78	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**

Table 703.5.1(1)(b)
Gas Water Heating
Storage Water Heater, Rated Storage Volume > 55 Gallons (208 liters) and ≤ 100 Gallons (379 liters), Medium Water Draw

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥0.78	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

Table 703.5.1(1)(c)
Gas Water Heating
Storage Water Heater with Input Rate Greater than 75,000 Btu/h (21.98 kw) (Commercial)

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

Table 703.5.1(1)(d)
Gas Water Heating
Storage Water Heater with Input Rate Greater than 75,000 Btu/h (21.98 kw) (Commercial), In Buildings with High-Capacity Service Water-Heating Systems (1,000,000 Btu/h or Greater) (29.31 kw)

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

Table 703.5.1(1)(e)
Gas Water Heating
Instantaneous Water Heater, Rated Storage Volume < 2 Gallons and Input Rate of > 50,000 Btu/h (21.98 kw), Medium Water Draw

Uniform Energy Factor	Climate Zone

POINTS

	1	2	3	4	5	6	7	8
	POINTS							
0.89 to < 0.94	2	2	2	1	1	1	1	1
≥0.94	3	3	2	2	2	2	2	1

(2) Electric water heating

Per Tables 703.5.1(2)(a) through 703.5.1(2)(f)

Table 703.5.1(2)(a)
Storage Water Heater, Rated Storage Volume ≥ 20 Gallons (76 liters) and ≤ 55 Gallons (208 liters), Medium Water Draw

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
0.94 to <1.0	~~21~~	~~21~~	~~11~~	~~11~~	~~11~~	~~01~~	~~01~~	~~01~~
1.0 to <1.5	4	2	2	2	1	1	1	1
1.5 to <2.0	7	4	3	2	2	2	1	1
2.0 to <2.2	14	8	7	5	4	4	2	2
2.2 to <2.5	~~13~~17	~~13~~9	~~14~~8	~~12~~6	~~8~~5	~~6~~4	~~4~~3	~~3~~3
2.5 to <3.0	~~14~~18	~~15~~12	~~15~~10	~~13~~8	~~9~~6	~~7~~6	~~4~~3	~~3~~3
≥3.0	~~16~~22	~~16~~16	~~17~~13	~~14~~11	~~10~~8	~~7~~8	~~5~~4	~~4~~3

Table 703.5.1(2)(b)
Storage Water Heater, Rated Storage Volume ≥ 55 Gallons (208 liters) and ≤ 120 Gallons (454 liters), Medium Water Draw

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
2.2 to <2.5	6	4	3	3	2	2	1	1
2.5 to <3.0	7	5	4	3	3	3	2	2
3.0 to <3.5	8	5	5	4	3	3	3	2
≥3.5	9	6	6	5	4	4	3	2

Table 703.5.1(2)(c)
Storage Water Heater, Rated Storage Volume > 120 Gallons (454 liters), Medium Water Draw

Coefficient of Performance	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
2.5 to <3.0	~~13~~14	~~14~~8	~~15~~7	~~13~~5	~~9~~4	~~7~~4	~~4~~2	~~3~~2
3.0 to <3.5	~~15~~17	~~16~~9	~~16~~8	~~14~~6	~~10~~5	~~7~~4	~~5~~3	~~4~~3
3.5 to <4.0	~~16~~18	~~17~~12	~~18~~10	~~15~~8	~~11~~6	~~8~~6	~~5~~3	~~4~~3
≥4.0	~~17~~22	~~18~~16	~~18~~13	~~16~~11	~~11~~8	~~8~~8	~~5~~4	~~4~~3

Credits are only available for central systems that provide not less than 80% of total system volume in the building.

Table 703.5.1(2)(d)
Electric Tabletop Water Heating
(Tabletop Water Heater, Rated Storage Volume ≥ 20 Gallons (76 liters) and ≤ 120 Gallons (454 liters), Medium Water Draw)

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8

POINTS

	POINTS							
≥0.91	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

Table 703.5.1(2)(e)
Electric Instantaneous Water Heating[a]
(Instantaneous Electric Water Heater, Rated Storage Volume < 2 Gallons (7.6 liters), Medium Water Draw)

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

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

Table 703.5.1(2)(f)
Electric Grid Enabled Water Heating
(Grid Enabled Storage Water Heater, Rated Storage Volume ≥ 75 Gallons (284 liters), Medium Water Draw)

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

(3) Oil water heating — **Per Table 703.5.1(3)**

Table 703.5.1(3)
Oil Water Heating
(Oil Water Heating, < 50 Gallons (189 liters), Medium Water Draw)

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥0.62	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

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

Table 703.5.2
Desuperheater

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

703.5.3 Drain-water heat recovery system is installed. *[Points awarded per building.]*..... **2**

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

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

POINTS

Table 703.5.5(a)
Storage Water Heater, Rated Storage Volume of Backup Water Heater is ≥ 0.1 Gallon (0.38 liters) and ≤ 55 Gallons (208 gallons), Medium Water Draw

SEF	Climate Zone						
	Tropical & 1	2	3	4	5	6	7-8
	POINTS						
SEF ≥ 1.3	**1**	**2**	**3**	**5**	**6**	**7**	**6**
SEF ≥ 1.51	**2**	**2**	**4**	**6**	**9**	**10**	**10**
SEF ≥ 1.81	**2**	**3**	**5**	**9**	**13**	**14**	**14**
SEF ≥ 2.31	**4**	**5**	**8**	**14**	**19**	**21**	**20**
SEF ≥ 3.01	**5**	**7**	**11**	**21**	**27**	**31**	**30**

Table 703.5.5(b)
Storage Water Heater, Rated Storage Volume of Backup Water Heater is >55 Gallons (208 liters), Medium Water Draw

SEF	Climate Zone						
	Tropical & 1	2	3	4	5	6	7-8
	POINTS						
SEF ≥ 1.3	**1**	**1**	**2**	**3**	**4**	**5**	**4**
SEF ≥ 1.51	**1**	**1**	**2**	**4**	**6**	**7**	**7**
SEF ≥ 1.81	**1**	**2**	**4**	**6**	**8**	**10**	**9**
SEF ≥ 2.31	**2**	**3**	**5**	**10**	**13**	**14**	**13**
SEF ≥ 3.01	**4**	**5**	**7**	**14**	**18**	**20**	**20**

703.6 Lighting and appliances

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

(1) Not less than 95% of the total hard-wired interior luminaires or lamps comply with following efficacy levels (lumens per watt):

(a) 80 lumens per watt **3**

(b) 100 lumens per watt **5**

(2) Lighting power densities (LPD) in common areas of multi-dwelling or multi-sleeping unit buildings shall be less than:

(a) 0.40 Watts per square foot **3**

(b) 0.35 Watts per square foot **5**

POINTS

703.6.2 Exterior hard-wired lighting. Not less than 80% of the exterior lighting has a efficacy of not less than 100 lumens per watt or is solar-powered. **3**

703.6.3 Appliances

(1) ENERGY STAR or equivalent appliance(s) are installed:

(a) Refrigerator **1**

(b) Dishwasher **1**

(c) Clothes washer **4**

(d) Clothes dryer **1**

(2) Install Consortium for Energy Efficiency (CEE) Tier 2 or higher tier appliances for the below types of appliances:

(a) Refrigerator **3**

(b) Dishwasher **2**

(c) Clothes washer **5**

(d) Clothes dryer **3**

703.7 Passive solar design

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

(1) The long side (or one side if of equal length) of the building faces within 20 degrees (0.349 radians) of true south.

(2) Vertical glazing area on the south face is between 5% and 7% of the gross conditioned floor area [also see § 703.7.1(8)], and glazing U-factors complying with Table 703.2.5.2(a).

(3) Vertical glazing area on the west face is less than 2% of the gross conditioned floor area, and glazing complies with Table 703.2.5.2(a).

(4) Vertical glazing area on the east face is less than 4% of the gross conditioned floor area, and glazing complies with Table 703.2.5.2(a).

(5) Vertical glazing area on the north face is less than 8% of the gross conditioned floor area, and glazing complies with Table 703.2.5.2(a).

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

(a) shades and insulated wells are used, and all glazing complies with Table 703.2.5.2(a).

(b) horizontal skylights are less than 0.5% of finished ceiling area.

(c) sloped skylights on slopes facing within 45 degrees (0.785 radian) of true south, east, or west are less than 1.5% of the finished ceiling area.

(7) Overhangs, adjustable canopies, awnings, or trellises provide shading on south-facing glass for the appropriate climate zone in accordance with Table 703.7.1(7):

POINTS

Table 703.7.1(7)
South-Facing Window Overhang Depth

		Vertical distance between bottom of overhang and top of window sill				
		≤7' 4" (2.24 m)	≤6' 4" (1.93 m)	≤5' 4" (1.63 m)	≤4' 4" (1.32 m)	≤3' 4" (1.02 m)
Climate Zone	1 & 2 & 3	2' 8" (0.81 m)	2' 8" (0.81 m)	2' 4" (0.71 m)	2' 0" (0.61 m)	2' 0" (0.61 m)
	4 & 5 & 6	2' 4" (0.71 m)	2' 4" (0.71 m)	2' 0" (0.61 m)	2' 0" (0.61 m)	1' 8" (0.51 m)
	7 & 8	2' 0" (0.61 m)	1' 8" (0.51 m)	1' 8" (0.51 m)	1' 4" (0.41 m)	1' 0" (0.3 m)

~~For SI: 1 in. = 25.4 mm~~

(8) The south facing windows have an SHGC of 0.40 or higher.

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

***Multifamily and Mixed-Use Building Note**: The site is designed such that not less than 40% of the multifamily and mixed-use dwelling or sleeping units have one south facing wall (within 15 degrees (0.262 radians)) containing not less than 50% of glazing for entire unit, Effective shading is required for passive solar control on all south facing glazing. The floor area of not less than 15 ft (4.6 m) from the south facing perimeter glazing is massive and exposed to capture solar heat during the day and reradiate at night.*

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

703.7.3 Passive cooling design. Passive cooling design features are in accordance with at least three of the following: *[1 additional point awarded for each additional item.]* ..... **3 [6 max]**

(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 by not less than 1 ft (~~305 mm~~0.3 m) 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 § 703.7.1(7).

Points not awarded if points are taken under § 703.7.1.

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

POINTS

(5) Internal exposed thermal mass is not less than 3 in. (~~76 mm~~7.6 cm) in thickness. Thermal mass consists of concrete, brick, and/or tile fully adhered to a masonry base or other masonry material in accordance with one or a combination of the following:

(a) Not less than 1 ft^2 (0.093 m^2) of exposed thermal mass of floor per 3 ft^2 (~~2.8~~0.28 m^2) of gross finished floor area.

(b) Not less than 3 ft^2 (~~2.8~~0.28 m^2) of exposed thermal mass in interior walls or elements per ft^2 (0.09 m^2) of gross finished floor area.

(6) Roofing material is installed with not less than a 0.75 in. (~~19 mm~~1.91 cm) continuous air space offset from the roof deck from eave to ridge.

703.7.4 Passive solar heating design. In addition to the sun-tempered design features in § 703.7.1, all of the following are implemented: *[Points shall not be awarded in the Tropical Climate Zone]*..... **4**

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

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

(a) Thermal mass is solid and not less than 3 in. (~~76~~ 7.6~~m~~cm) 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 ft^2 (0.46~~5~~ m^2) of thermal mass for every 1 ft^2 (0.093 m^2) of south-facing glazing.

(ii) Latitude 30 degrees to 35 degrees: 5.5 ft^2 (0.511 m^2) of thermal mass for every 1 ft^2 (0.093 m^2) of south-facing glazing.

(iii) Latitude 25 degrees to 30 degrees: 6 ft^2 (0.56~~57~~ m^2) of thermal mass for every 1 ft^2 (0.093 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 § 703.7.4(2) based on a ratio of 40 ft^2 (3.72 m^2) of thermal mass for every 1 ft^2 (0.093 m^2) of south-facing glazing.

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

704 ERI TARGET PATH

704.1 ERI target compliance. Compliance shall be determined in accordance with ANSI/RESNET/ICC 301. Points from § 704 (ERI Target) shall not be combined with points from § 702 (Performance Path), § 703 (Prescriptive Path), or 701.1.4 through 701.1.8 (Alternative Paths).

Dwelling ratings shall be submitted to a Rating Certification Body approved by the Adopting Entity for calculating points under this section.

POINTS

704.2 Point calculation. Points for § 704 shall be computed individually for each building as follows:

Points = 40 + (Applicable Energy Rating Index from Table 704.2) * 2

Table 704.2
Energy Rating Index of the Rated Design

Climate Zone							
0-1	2	3	4	5	6	7	8
ENERGY RATING INDEX							
52	**52**	**51**	**54**	**55**	**54**	**53**	**53**

***Multifamily and Mixed-Use Building Note**: Modeling is completed building-wide using either a unit-by-unit approach, or a building average of a unit-by-unit approach.*

705 ALTERNATIVE COMPLIANCE FOR TROPICAL ZONES

705.1 Mandatory practices

705.1.1 High-efficacy lighting. All permanently installed lighting fixtures, excluding appliance lighting fixtures, shall contain only high-efficacy lighting sources.

705.1.2 Attics. Attics above the insulation are vented and attics below the insulation are unvented.

705.1.3 Roofs. Roof surfaces have a slope of not less than 1/4 unit vertical in 12 units horizontal (2.0-percent slope). The roof does not have water accumulation areas.

705.1.4 Operable fenestration

705.1.4.1 Ventilation area. Operable fenestration provides an openable area of not less than 10 percent of the floor area of the living space.

705.1.4.2 Bedroom exterior walls. Bedrooms with exterior walls facing two or more directions have operable fenestration on exterior walls facing not less than two directions.

705.1.4.3 Glazing in conditioned spaces. Glazing in conditioned spaces has a solar heat gain coefficient (SHGC), in accordance with § 705.2.2 or § 705.3.2, or has an overhang with a projection factor equal to or greater than 0.30 and a solar heat gain coefficient of no greater than 0.30.

Exception: jalousie windows.

705.1.5 Interior doors. Bedroom doors are capable of being secured in an open position.

705.2 Additional Tropical Zone practices - Silver

705.2.1 Water Heater. A renewable energy source provides not less than 80% of annual service water heating needs.

705.2.2 Glazing. Glazing in conditioned space has a Solar Heat Gain Coefficient (SHGC) ~~between 0.26 and~~not greater than 0.30.

705.2.3 Exterior Walls. Exterior walls comply with not less than one of the following:

(1) Walls have insulation with an R-value of R-13 (2.3 (m^2•K)/W)) or greater.

POINTS

(2) Wall products have a minimal initial solar reflectance of not less than 0.64. Wall products shall be tested in accordance with Chapter 3 testing requirements of CRRC-2.

705.2.4 Roof. The exterior roof surface complies with not less than one of the following:

(1) Not less than an initial solar reflectance of 0.75 and emittance of 0.75.

(2) Not less than an initial solar reflectance index of 75 and thermal emittance of 0.75. Roof products are tested in accordance with the ANSI/CRRC S100.

(3) Roof or ceiling insulation with R-Value of R-13 (2.3 (m^2•K)/W)) or greater.

(4) Radiant barrier installed.

705.2.5 Ceiling fans. A ceiling fan rough-in is provided for bedrooms and the largest living space that is not used as a bedroom.

705.2.6 Electric vehicle charging. Wiring sufficient for a Level 2 (208/240V 32-80 amp) electric vehicle charging station is installed on the building site.

705.3 Additional Tropical Zone practices - Gold

705.3.1 Water Heater. A renewable energy source provides not less than 90% of annual service water heating needs.

705.3.2 Glazing. Glazing in conditioned space has a Solar Heat Gain Coefficient (SHGC) not ~~less~~ greater than 0.25.

705.3.3 Exterior Walls. Exterior walls comply with the following:

(1) Walls have insulation with an R-value of R-13 (2.3 (m^2•K)/W)) or greater.

(2) Wall products have a minimal initial solar reflectance of not less than 0.64. Wall products shall be tested in accordance with Chapter 3 testing requirements of CRRC-2.

705.3.4 Roof. The exterior roof surface complies with not less than two of the following:

(1) Not less than an initial solar reflectance of 0.75 and emittance of 0.75.

(2) Not less than an initial solar reflectance index of 0.75 and thermal emittance of 0.75. Roof products are tested in accordance with the ANSI/CRRC S100.

(3) Roof or ceiling insulation with R-Value of R-13 (2.3 (m^2•K)/W)) or greater.

(4) Radiant barrier installed.

705.3.5 Ceiling fans. A ceiling fan is provided for bedrooms and the largest living space that is not used as a bedroom.

705.3.6 Air conditioning. All installed air conditioners have a rating of not less than ~~18~~ 17.1 SEER2.....

705.3.7 Renewable energy system. For each dwelling unit, the building or lot is served by not less than 2kW renewable energy system and not less than 6kWh of energy storage.....

705.3.8 Electric vehicle charging. A Level 2 (208/240V 32-80 amp) electric vehicle charging station is installed on the building site.

POINTS

706 ADDITIONAL PRACTICES

706.1 Application of additional practice points. Points from § 706 can be added to points earned in § 702 (Performance Path), § 703 (Prescriptive Path), § 704 (ERI Target Path), or § 701.1.4 through § 701.1.8 (Alternative Paths).

706.2 Lighting

706.2.1 Lighting controls

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

706.2.1.1 Interior lighting. In dwelling units or sleeping units, permanently installed interior lighting fixtures are controlled with an occupancy sensor, or dimmer:

(1) greater than or equal to 50% to less than 75% of lighting fixtures. **1**

(2) not less than 75% of lighting fixtures. **2**

706.2.1.2 Exterior lighting. Photo or motion sensors are installed on 75% of outdoor lighting fixtures to control lighting.
[Percentages for point thresholds do not include lighting equipped with photovoltaics.]..... **1**

706.2.1.3 Multifamily and mixed-use common areas

(1) In ~~a~~ multifamily and mixed-use buildings, occupancy sensors, or dimmers are installed in common areas (except corridors and stairwells).

(a) greater than or equal to 50% to less than 75% of lighting fixtures. **1**

(b) not less than 75% of lighting fixtures. **2**

(2) In ~~a~~ multifamily and mixed-use buildings, occupancy controls are installed to automatically reduce light levels in interior corridors and exit stairwells when the space is unoccupied. Light levels are reduced by:

(a) greater than or equal to 50% to less than 75% or to local minimum requirements **2**

(b) not less than 75% **3**

706.2.1.4 In ~~a~~ multifamily and mixed-use buildings, occupancy controls are installed to automatically reduce light levels in garages and parking structures when the space is unoccupied. Light levels are reduced by:

(1) greater than or equal to 50% to less than 75% or to local minimum requirements **2**

(2) not less than 75%..... **3**

706.2.2 TDDs and skylights. A tubular daylighting device (TDD) or a skylight that complies with the requirements of Table 703.2.5.2(a) is installed in rooms without windows. *[Points awarded per building.]* **2**

706.2.3 Lighting outlets. Occupancy sensors are installed for not less than 80% of hard-wired lighting outlets in the interior living space. **1**

POINTS

706.2.4 Recessed luminaires. The number of recessed luminaires that penetrate the thermal envelope is less than 1 per 400 ft^2 (37.16 m^2) of total conditioned floor area and they are in accordance with § 701.4.3.5. ..... **1**

706.3 Induction cooktop. Induction cooktop is installed..... **1**

706.4 Return ducts and transfer grilles. Return ducts or transfer grilles are installed in every room with a door. Return ducts or transfer grilles are not required for bathrooms, kitchens, closets, pantries, and laundry rooms. **2**

706.5 HVAC design and installation

706.5.1 Comply with at least one of the following:

(1) HVAC contractor is certified by the Air Conditioning Contractors of America's Quality Assured Program (ACCA/QA), an EPA-recognized HVAC Quality Installation Training Oversight Organization (H-QUITO), the Associated Air Balance Council (AABC) Test and Balance Technician or Engineer programs, the National Environmental Balancing Bureau (NEBB) Personnel Certification program, or Testing, Adjusting, and Balance Bureau (TABB) technician certification program. **1**

(2) HVAC installation technician(s) is certified by North American Technician Excellence, Inc. (NATE) or equivalent. **2**

706.5.2 Performance of the heating and/or cooling system is verified by the HVAC contractor in accordance with all of the following:..... **3**

(1) Start-up procedure is performed in accordance with the manufacturer's instructions.

(2) Refrigerant charge is verified by super-heat and/or sub-cooling method.

(3) Burner is set to fire at input level listed on nameplate.

(4) Air handler setting/fan speed is set in accordance with manufacturer's instructions.

(5) Total airflow is within 10% of design flow.

(6) Total external system static does not exceed equipment capability at rated airflow.

706.5.3 HVAC Design is verified by 3rd party as follows:

(1) The ENERGY STAR HVAC Design and Rater Design Review Checklists are completed and correct. **3**

(2) HVAC Installation is inspected and conforms to HVAC design documents and plans. **3**

706.6 Installation and performance verification

706.6.1 Third-party on-site inspection is conducted to verify compliance with all of the following, as applicable. Not less than two inspections are performed: one inspection after insulation is installed and prior to covering, and another inspection upon completion of the building. Where multiple buildings or dwelling units of the same model or sleeping units of the same model are built by the same builder, a representative sample inspection of not less than 15% of the buildings or dwelling units or sleeping units is permitted. **3**

(1) Ducts are installed in accordance with the IRC or IMC and ducts are sealed.

(2) Building envelope air sealing is installed.

POINTS

(3) Insulation is installed in accordance with § 701.4.3.2.1.

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

706.6.2 Testing. Testing is conducted to verify performance.

706.6.2.1 Air leakage validation of building or dwelling units or sleeping units. A visual inspection is performed as described in § 701.4.3.2(2) and air leakage testing is performed in accordance with ANSI/RESNET/ICC 380, ASTM E779, ASTM E1827, or ASTM E3158.

[Points awarded only for buildings where building envelope leakage testing is not required by IECC.] [Points not awarded if points are taken under § 703.2.4.]

(1) A blower door test. **3**

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

706.6.2.2 HVAC airflow testing. Balanced HVAC airflows are demonstrated by flow hood or other acceptable flow measurement tool by a third party. Test results are in accordance with the following:

(1) Measured flow at each supply and return register complies with or exceeds the requirements in ACCA 5 QI Section 5.2. ..... **5**

(2) Total airflow complies with or exceeds the requirements in ACCA 5 QI Section 5.2. ..... **3**

706.6.2.3 HVAC duct leakage testing. One of the following is achieved:

[Points awarded only for buildings where duct leakage testing is not required by IECC.]
[Points not awarded if points are taken under § 703.4.43.]

(1) Duct leakage is in accordance with IECC R403.3.5 and R403.3.6. ..... **3**

(2) Duct leakage is in accordance with IECC R403.3.5 and R403.3.6, and testing is conducted by an independent third party. **5**

706.6.3 Insulating hot water pipes. Insulation with thermal resistance (R-value) not less than R-3 (0.53 (m^2•K)/W) is applied to the following, as applicable:
[Points awarded only where these practices are not required by IECC.] **1**

(a) piping 3/4-in. (1.91 cm) and larger in outside diameter.

(b) piping serving more than one dwelling unit or sleeping unit.

(c) piping located outside the conditioned space.

(d) piping from the water heater to a distribution manifold.

(e) piping located under a floor slab.

(f) buried piping.

(g) supply and return piping in recirculation systems other than demand recirculation systems.

706.6.4 Potable hot water demand re-circulation system.

706.6.4.1 Potable hot water demand re-circulation system is installed in a single-family unit. **1**

POINTS

706.6.4.2 Potable hot water demand re-circulation system(s) that serves every unit in ~~a~~ multifamily and mixed-use buildings is installed in place of a standard circulation pump and control. **2**

706.7 Submetering system. In multifamily and mixed-use buildings, an advanced electric and fossil fuel submetering system is installed to monitor electricity and fossil fuel consumption for each unit. The device provides consumption information on a monthly or near real-time basis. The information is available to the occupants no less than on a monthly basis. **1**

707 INNOVATIVE PRACTICES

707.1 Energy consumption control. A whole-building, whole-dwelling unit, or whole-sleeping unit device or system is installed that controls or monitors energy consumption. ..... **3 max**

(1) programmable communicating thermostat with the capability to be controlled remotely..... **1**

(2) energy-monitoring device or system **1**

(3) energy management control system **3**

(4) programmable thermostat with control capability based on occupant presence or usage pattern..... **1**

(5) lighting control system..... **1**

707.2 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, or purchases renewable energy certificates (RECs) from a third-party provider to cover electricity used. The builder's local administrative office has renewable energy service or has otherwise been paired with RECs. Green-e Certified or equivalent is required for renewable electricity purchases. **1**

(2) The buyer of the building selects one of the following renewable energy service plans provided by the utility prior to occupancy of the building with no less than a two-year commitment or buys RECs from a third-party provider to match the estimated projected electricity use for the building for two years. Green-e Certified (or equivalent) is required for renewable electricity purchases.

(a) less than 50% of the building common area has a projected electricity and gas use that is provided by renewable energy. **1**

(b) greater than or equal to 50% of the building common area has a projected electricity and gas use that is provided by renewable energy **2**

(c) the entire building (all units and common areas included) has a projected electricity and gas use that is provided by renewable energy. **5**

707.3 Smart appliances and systems. Smart appliances and systems are installed as follows:
[1 point awarded where at least 3 smart appliances are installed; 1 additional point awarded for 6 or more.]
..... **1 [2 max]**

(1) Refrigerator

(2) Freezer

(3) Dishwasher

POINTS

(4) Clothes Dryer

(5) Clothes Washer

(6) Room Air Conditioner

(7) HVAC Systems

(8) Service Hot Water Heating Systems

[Items (7) and (8) are permitted to count as two appliances each for the purpose of awarding points.]

Where points awarded in § 707.3, points shall not be awarded in § 707.7 and § 707.10.

707.4 Pumps

707.4.1 Pool or spa equipped with filtration pumps that are ENERGY STAR certified or equivalent are installed.

(1) Pool is equipped with ENERGY STAR certified or equivalent filtration pump(s). **3**

(2) Spa is equipped with ENERGY STAR certified or equivalent filtration pump(s)..... **1**

707.4.2 All sump pump(s) with electronically commutated motors (ECMs) are installed..... **1**

707.5 On-site renewable energy system. One of the following options is implemented:

(1) Building is Solar-Ready in compliance with IECC Appendix RB or CB Solar-Ready Provisions, as applicable..... **1**

(2) An on-site renewable energy system(s) is installed on the property. ..... **2 per kW**

(3) An on-site renewable energy system(s) and a battery energy storage system are installed on the property.
[2 points awarded per kW or renewable energy system plus 1 per each 2 kWh or battery energy storage system] ..... **2 per kW**

Points awarded shall not be combined with points for renewable energy in another section of this chapter. Points shall not be awarded for solar thermal or geothermal systems that provide space heating, space cooling, or water heating, points for these systems are awarded in § 703. Where on-site renewable energy is included in § 702 Performance Path or 704 ERI Target Path, § 707.5 shall not be awarded. The solar-ready zone roof area in item (1) is area per dwelling unit. Points in item (2) and (3) shall be divided by the number of dwelling units.

Multifamily and Mixed-Use Building Note: *Conditioned common area and non-residential space is excluded for the purpose of calculating number of units.*

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

707.7 Grid-interactive electric thermal storage system. A grid-interactive electric thermal storage system is installed.

(1) Grid-Interactive Water Heating System **1**

(2) Grid-Interactive Space Heating and Cooling System **1**

	POINTS
Where points are awarded in § 707.7, points shall not be awarded in § 707.3 and § 707.10.	
707.8 Electrical vehicle chargers. A Level 2 (208/240V 40-80 amp) or Level 3 electric vehicle charging station:	
(1) is installed on the building site. (Note: Charging station shall not be included in the building energy consumption.)	**2**
(2) is ENERGY STAR certified or equivalent)	**1 Additional**
707.9 CNG vehicle fueling station. A CNG vehicle residential fueling appliance is installed on the building site. The CNG fueling appliances shall be listed in accordance with ANSI/CSA NGV 5.1 and installed in accordance to the appliance manufacturer's installation instructions. (Note: The fueling appliance shall not be included in the building energy consumption.)	**1**
707.10 Automatic demand response. Automatic demand response system is installed that curtails energy usage upon a signal from the utility or an energy service provider is installed.	**1**
Where points are awarded in § 707.10, points shall not be awarded in § 707.3 and § 707.7.	
707.11 Grid-interactive battery storage system. A grid-interactive battery storage system of no less than 6 kWh of available capacity is installed.	**2**
707.12 Smart ventilation	
(1) A whole-building ventilation system is installed with automatic ventilation controls to limit ventilation during periods of extreme temperature, extreme humidity, and/or during times of peak utility loads and is in accordance with the specifications of ASHRAE Standard 62.2 Section 4.	**1**
(2) Install a demand-controlled ventilation system to reduce outside air ventilation rates that is in accordance with specifications of ASHRAE Standard 62.2 Section 4	**1**
707.13 Alternative refrigerant. Use of the following in mechanical space cooling systems for dwellings.	
(1) Use alternative refrigerant with a GWP less than 1,000	**1**
(2) Do not use refrigerants	**2**
707.14 Third-party utility benchmarking service	
(1) For ~~a~~ multifamily and mixed-use buildings, the owner has contracted with a third-party utility benchmarking service with not less than five (5) years of experience in utility data management and analysis to perform a monthly analysis of whole-building energy and water consumption for not less than one (1) year.	**3**
(2) The building owner commits to reporting energy data using EPA's ENERGY STAR Portfolio Manager for not less than three (3) years.	**1**
707.15 Entryway air seal. For multifamily and mixed-use buildings, where not required by the building or energy code, to slow the movement of unconditioned air from outdoors to indoors at the main building entrance, the following is installed:	
(1) Building entry vestibule.	**2**
(2) Revolving entrance doors.	**2**

CHAPTER 8:
WATER EFFICIENCY

POINTS

801 INDOOR AND OUTDOOR WATER USE

801.0 Intent. Implement measures that reduce indoor and outdoor water usage. Implement measures that include collection and use of alternative sources of water. Implement measures that treat water on site.

801.1 Mandatory requirements. The building shall comply with § 802 (Prescriptive Path) and § 803 (Innovative Practices) or § 804 (Performance Path). Points from § 804 (Performance Path) shall not be combined with points from § 802 (Prescriptive Path) or § 803 (Innovative Practices). The mandatory provisions of § 802 (Prescriptive Path) are required when using the Water Rating Index of § 804 (Performance Path) for Chapter 8 Water Efficiency compliance.

801.1.1 Minimum prescriptive path requirements. A building complying with § 802 (Prescriptive Path) shall obtain not less than 8 points in practices § 802.4 through § 802.6 and not less than 4 points in practice § 802.7.

802 PRESCRIPTIVE PATH

802.1 Indoor hot water usage. Indoor hot water supply system is in accordance with one of the practices listed in items (1) through (5). The maximum water volume from the source of hot water to the termination of the fixture supply is determined in accordance with Tables 802.1(1) or 802.1(2). The maximum pipe length from the source of hot water to the termination of the fixture supply is 50 ft (15.2- m).

Where more than one water heater or where more than one type of hot water supply system, including multiple circulation loops, is used, points are awarded only for the system that qualifies for the minimum number of points. Systems with circulation loops are eligible for points only where pumps are demand controlled. Circulation systems with timers or aquastats and constant-on circulation systems are not eligible to receive points. Points awarded only where the pipes are insulated in accordance with § 706.6.3.

(1) The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 128 ounces (1 gallon or 3.798 liters)..... **8**

(2) The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 64 ounces (0.5 gallon or 1.89 liters)..... **12**

(3) The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 32 ounces (0.25 gallon or 0.9465 liters)..... **20**

(4) A demand controlled hot water priming pump is installed on the main supply pipe of the circulation loop and the maximum volume from this supply pipe to the furthest fixture is 24 ounces (0.19 gallons or 0.719 liters)..... **24**

(a) The volume in the circulation loop (supply) from the water heater or boiler to the branch for the furthest fixture is no more than 128 ounces (1 gallon or 3.798 liters)..... **4 Additional**

(5) A central hot water recirculation system is implemented in multifamily and mixed-use buildings in which the hot water line distance from the recirculating loop to the engineered parallel piping **9**

POINTS

system (i.e., manifold system) is less than 30 ft (~~9,144~~9.1 ~~m~~m) and the parallel piping to the fixture fittings contains a maximum of 64 ounces (0.5 gallons or 1.89 liters) ~~(115.50 cubic in.) (0.50 gallons)~~...

(6) Tankless water heater(s) with not less than 0.5 gallon (1.89 liters) of storage are installed, or a tankless water heater that ramps up to not less than 110°F (43.3 °C) within 5 seconds is installed. The storage may be internal or external to the tankless water heater..... **1 Additional**

Table 802.1(1)
Maximum Pipe Length Conversion Table[a]

Nominal Pipe Size (in.)	Liquid Ounces per Foot of Length	Main, Branch, and Fixture Supply System Volume Category			Branch and Fixture Supply Volume from Circulation Loop
		128 ounces (1 gallons) [per 802.1(1)]	64 ounces (0.5 gallon) [per 802.1(2)]	32 ounces (0.25 gallon) [per 802.1(3)]	24 ounces (0.19 gallon) [per 802.1(4)]
		Maximum Pipe Length (feet)			
1/4[b]	0.33	50	50	50	50
5/16[b]	0.5	50	50	50	48
3/8[b]	0.75	50	50	43	32
1/2	1.5	50	43	21	16
5/8	2	50	32	16	12
3/4	3	43	21	11	8
7/8	4	32	16	8	6
1	5	26	13	6	5
1 1/4	8	16	8	4	3
1 1/2	11	12	6	3	2
2	18	7	4	2	1

a. Maximum pipe length figures apply when the entire pipe run is one nominal diameter only. Where multiple pipe diameters are used, the combined volume shall not exceed the volume limitation in § 802.1.

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

Table 802.1(2)
Common Hot Water Pipe Internal Volumes

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

POINTS

802.2 Water-conserving appliances. ENERGY STAR or equivalent water-conserving appliances are installed.

(1) dishwasher **2**

(2) clothes washer, or **6**

(3) clothes washer with an Integrated Water Factor of 3.8 or less **12**

***Multifamily and Mixed-Use Building Note**: Washing machines are installed in individual units or provided in common areas of multifamily and mixed-use buildings.*

802.3 Water usage metering. Water meters are installed complying with the following: ..... **14 max**

~~(1) Single-family buildings: water usage metering: .....~~

(~~a~~1) Where not otherwise required by the local AHJ, installation of a meter for water consumed from any source associated with the building or building site except for pools and spas. (Dwelling unit domestic cold water sub-meters can only be counted once per building.) ..... **2 per unique use meter**

(~~b~~2) Each water meter shall be capable of communicating water consumption data remotely for the dwelling unit occupant and be capable of providing daily data with electronic data storage and reporting capability that can produce reports for daily, monthly, and yearly water consumption. (Fire sprinkler systems are not required to be metered.) ..... **2 per sensor package**

~~(2) Multifamily buildings: water usage metering:~~

~~(a) Where not otherwise required by the local AHJ, installation of a meter for water consumed from any source associated with the building or building site except for pools and spas. ..... **2 per unique use meter**~~

~~(b) Each water meter shall be capable of communicating water consumption data remotely for the dwelling unit occupant and be capable of providing daily data with electronic data storage and reporting capability that can produce reports for daily, monthly, and yearly water consumption. (Fire sprinkler systems are not required to be metered). ..... **2 per sensor package**~~

~~*Points earned in § 802.3(2) shall not exceed 50% of the total points earned for Chapter 8.*~~

802.4 Showerheads. Showerheads are in accordance with the following:

(1) A 2.0 GPM (7.57 L/min) limit shall apply to cumulative flow of all devices located less than 96 in. (244 cm) apart in individual/two-person shower compartments or 35 in. (89 cm) apart in gang or group showers (as measured horizontally). Showerheads shall comply with ASME A112.18.1/CSA B125.1 and shall comply with the performance criteria of the EPA WaterSense Specification for showerheads. Showerheads shall be served by an automatic compensating valve that complies with ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and is specifically designed to provide thermal shock and scald protection at the flow rate of the showerhead.
[4 points awarded for first compartment; 1 point for each additional compartment in dwelling] ..... **2 [7 max]**

Points awarded per shower compartment. In multifamily and mixed-use buildings, the average of the points assigned to individual dwelling units or sleeping units may be used as the number of points awarded for this practice, rounded to the nearest whole number.

(2) All shower compartments in the dwelling unit(s) or sleeping unit(s) and common areas comply with the requirements of 802.4(1) and all showerheads are in accordance with one of the following:

POINTS

(a) maximum of 1.8 gpm (6.8 L/min) ..... **6 Additional**

(b) maximum of 1.5 gpm (5.7 L/min) ..... **10 Additional**

(3) Any shower control that can shut off water flow without affecting temperature is installed. *[1 Point awarded per shower control]* ..... **1 [3 max]**

~~For SI: 1 gallon per minute = 3.785 L/m~~

802.5 Faucets

802.5.1 Install water-efficient lavatory faucets with flow rates not more than 1.5 gpm (5.7~~68~~ L/min), tested in compliance with ASME A112.18.1/CSA B125.1 and complying with the performance criteria of the EPA WaterSense High-Efficiency Lavatory Faucet Specification:

(1) Flow rate ≤ 1.5 gpm (5.7 L/min) ~~[Faucets in all residential bathrooms are in compliance]~~ ..... **1 [3 max]**

***Multifamily and Mixed-Use Building Note**: In multifamily and mixed-use buildings, the average number of bathrooms per unit may be used as the number of points awarded for this practice, rounded to the nearest whole number.*

(2) Flow rate ≤ 1.2 gpm (4.5 L/min) ~~[Faucets in all residential bathrooms are in compliance]~~ ..... **2 [6 max]**

***Multifamily and Mixed-Use Building Note**: In multifamily and mixed-use buildings, the average number of bathrooms per unit may be used as the number of points awarded for this practice, rounded to the nearest whole number.*

(3) Flow rate ≤ 1.5 gpm for all lavatory faucets in the dwelling unit(s) or sleeping unit(s) ..... **6 Additional**

(4) Flow rate ≤ 1.5 gpm for all lavatory faucets in the dwelling unit(s) or sleeping unit(s), and not less than one bathroom has faucet(s) with flow rate(s) ≤ 1.2 gpm ..... **8 Additional**

(5) Flow rate ≤ 1.2 gpm for all lavatory faucets in the dwelling unit(s) or sleeping unit(s) ..... **12 Additional**

802.5.2 Water-efficient residential kitchen faucets are installed in accordance with ASME A112.18.1/CSA B125.1. Residential kitchen faucets may temporarily increase the flow above the maximum rate but not to exceed 2.2 gpm (8.3 L/min).

(1) All residential kitchen faucets have a maximum flow rate of 1.8 gpm (6.8 L/min). **3**

(2) All residential kitchen faucets have a maximum flow rate of 1.5 gpm (5.7 L/min). ..... **1 Additional**

802.5.3 Self-closing valve, motion sensor, metering, or pedal-activated faucet is installed to enable intermittent on/off operation. *[1 point awarded per fixture.]* ..... **1 [3 max]**

802.6 Water closets and urinals. Water closets and urinals are in accordance with the following:

~~*Points awarded for § 802.6(2) or § 802.6(3), not both.*~~

(1) Gold and Emerald levels: All water closets and urinals are in accordance with § 802.6 ..... **Mandatory**

(2) All water closets ~~is~~ are installed with an effective flush volume of 1.28 gallons (4.85 ~~l~~L) or less in accordance with ASME A112.19.2/CSA B45.1 or ASME A112.19.14 as applicable. Tank-type water closets shall be in accordance with the performance criteria of the EPA WaterSense Specification for Tank-Type Toilets.
~~*[Points awarded per fixture. In multifamily buildings, the average of the points assigned to individual*~~ ~~**2 [12 max]**~~**21**

POINTS

~~*dwelling units or sleeping units may be used as the number of points awarded for this practice, rounded to the nearest whole number.]*~~ .....

~~(3) All water closets are in accordance with § 802.6(2).~~ ..... ~~**8**~~

(~~4~~3) All water closets are in accordance with § 802.6(2) **and** one or more of the following are met:

(a) Water closets that have an *effective flush volume* in accordance with one of the following: ~~*[Points awarded per toilet. In multifamily buildings, the average of the points assigned to individual dwelling units or sleeping units may be used as the number of points awarded for this practice, rounded to the nearest whole number.]*~~

(i) between and including 0.9 and 1.2 gallons (3.4 and 4.5 L); ..... **2 Additional**

(ii) less than 0.9 gallons (3.4 L)..... **4 Additional**

(b) One or more urinals are in installed in accordance with the following:~~with a flush volume of 0.5 gallons (1.9 L) or less when tested in accordance with ASME A112.19.2/CSA B45.1.~~..... ~~**2 Additional**~~

(i) a flush volume of 0.5 gallons (1.9L) or less when tested in accordance with ASME A112.19.2/CSA B45.1; ..... **2 Additional**

(ii) composting or non-flushing toilets or non-flushing urinals. Non-flushing toilets and urinals shall be tested in accordance with ASME A112.19.2/CSA B45.1. ..... **12 Additional**

~~(c) One or more composting or non-flushing toilets or non-flushing urinals. Non-flushing toilets and urinals shall be tested in accordance with ASME A112.19.2/CSA B45.1.~~ ..... ~~**12 Additional**~~

802.7 Irrigation systems

802.7.1 Where an irrigation system is installed, an irrigation plan and implementation are executed by a qualified professional or equivalent..... **Mandatory**

802.7.2 Irrigation sprinkler nozzles shall be tested according to ANSI standard ASABE/ICC 802 Landscape Irrigation Sprinkler and Emitter Standard by an accredited third-party laboratory..... **6**

802.7.3 Drip irrigation is installed. ..... **13 max**

(1) Drip irrigation is installed for all landscape beds. **4**

(2) Subsurface drip is installed for all turf grass areas. **4**

(3) Drip irrigation zones specifications show plant type by name and water use/need for each emitter *[Points awarded only if specifications are implemented.]* **5**

802.7.4 The irrigation system(s) is controlled by a smart controller or no irrigation is installed. *[Points are not additive.]*

(1) Irrigation controllers shall be in accordance with the performance criteria of the EPA WaterSense program **10**

(2) No irrigation is installed and a minimum of 5 points from 503.5(1-9) is earned~~a landscape plan is developed in accordance with § 503.5, as applicable~~. **15**

(3) No irrigation is installed and there is ~~plan of~~ no ~~landscaping~~landscape area..... **15**

POINTS

802.7.5 Commissioning and water use reduction for irrigation systems.
[Points are not additive per each section.]

(1) All irrigation zones utilize pressure regulation so emission devices (sprinklers and drip emitters) operate at manufacturer's recommended operating pressure. **3**

(2) Where dripline tubing is installed, a filter with mesh size in accordance with the manufacturer's recommendation is installed on all drip zones. **3**

(3) Utilize spray bodies that incorporate an in-stem or external flow shut-off device. **3**

(4) For irrigation systems installed on sloped sites, either an in-stem or external check valve is utilized for each spray body. **3**

(5) Where an irrigation system is installed, a flow sensing device is installed to monitor and alert the controller when flows are outside design range. **3**

802.8 Rainwater collection and distribution. Rainwater collection and distribution is provided.

802.8.1 Rainwater is used for irrigation in accordance with one of the following:

(1) Rainwater is diverted for landscape irrigation without impermeable water storage **5**

(2) Rainwater is diverted for landscape irrigation with impermeable water storage in accordance with one of the following:

(a) 50 – to less than ~~499~~500 gallon (189 to less than 1893 L) storage capacity **5**

(b) 500 – to less than ~~2,499~~2500 gallon (1893 to less than 9464 L) storage capacity **10**

(c) 2,500 gallon (9464 l) or larger storage capacity (system is designed by a professional certified by the ARCSA or equivalent) **15**

(d) All irrigation demands are met by rainwater capture (documentation demonstrating the water needs of the landscape are provided and the system is designed by a professional certified by the ARCSA or equivalent). **30**

802.8.2 Rainwater is used for indoor domestic demand as follows. The system is designed by a professional certified by the ARCSA or equivalent.

(1) Rainwater is used to supply an indoor appliance or fixture for any locally approved use. *[Points awarded per appliance or fixture.]* ..... **5 [15 max]**

(2) Rainwater provides for total domestic demand. **46**

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

802.10 Water treatment devices

802.10.1 Water softeners shall not be installed where the supplied water hardness is less than 8.0 grains per gallon measured as total calcium carbonate equivalents. Water softeners shall be listed to NSF 44 and a rated salt efficiency of 3,400 grains of total hardness per 1.0 pound of salt based on sodium chloride equivalency. Devices shall not discharge more than 4.0 gallons of water per 1,000 grains of hardness removed during the service or recharge cycle.

	POINTS
(1) No water softener.	**5**
(2) Water softener installed to supply softened water only to domestic water heater.	**2**

802.10.2 Reverse Osmosis (R/O) water treatment systems shall be listed to NSF 58 and shall include automatic shut-off valve to prevent water discharge when storage tank is full.

(1) No R/O system.	**3**
(2) Combined capacity of all R/O systems does not exceed 0.75 gallons (2.84 L).	**1**

802.11 Pools and spas

802.11.1 Pools and Spas with water surface area greater than 36 ft^2 and connected to a water supply shall have a dedicated meter capable of tracking water supplied to the pool(s) and/or spa(s) to measure the amount of water supplied to the pool(s) or spa(s). **Mandatory**

802.11.2 Non-permeable pool cover is installed and extends across the entire pool~~An motorized non-permeable pool cover is installed and extends across the entire pool surface~~. ..... **~~10~~**

(1) Non-motorized.	**5**
(2) Motorized	**10**

803 INNOVATIVE PRACTICES

803.1 Reclaimed, grey, or recycled water. Reclaimed, grey, or recycled water is used as permitted by applicable code.

Points awarded for either § 803.1(1) or § 803.1(2), not both.
Points awarded for either § 803.6 or § 803.1, not both.

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

803.2 Reclaimed water, greywater, or rainwater pre-piping. Reclaimed, greywater, or rainwater systems are rough plumbed (and permanently marked, tagged or labeled) into buildings for future use. **3 per roughed in system**

803.3 Automatic leak detection and control devices. One of the following devices is installed. Where a fire sprinkler system is present, ensure the device will be installed to not interfere with the operation of the fire sprinkler system. **2**

(1) automatic water leak detection and control devices.

(2) automatic water leak detection and shutoff devices.

803.4 Engineered biological system or intensive bioremediation system. An engineered biological system or intensive bioremediation system is installed and the treated water is used on site. Design and implementation are approved by appropriate regional authority. **20**

803.5 Recirculating humidifier. Where a humidifier is required, a recirculating humidifier is used in lieu of a traditional "flow through" type. **1**

POINTS

803.6 Advanced wastewater treatment system. Advanced wastewater (aerobic) treatment system is installed and treated water is used on site. *[Points awarded for either § 803.6 or § 803.1, not both.]* **20**

804 PERFORMANCE PATH

804.1 Performance Path. The index score for the Performance Path shall be calculated in accordance with Appendix D Water Rating Index (WRI) or equivalent methodology.

804.2 Water efficiency rating levels. In lieu of threshold levels for Chapter 8 in Table 303, rating levels for § 804.1 are in accordance with Table 804.2.

Table 804.2
Maximum WRI Scores for NGBS Certification in Chapter 8

BRONZE	SILVER	GOLD	EMERALD
70	60	50	40

804.3 Water efficiency NGBS points equivalency. The additional points for use with Table 303 from the Chapter 8 Water Efficiency Category are determined in accordance with Equation 804.3.

Equation 804.3
NGBS = WRI x (-2.29) + 181.7

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CHAPTER 9:
INDOOR ENVIRONMENTAL QUALITY

POINTS

901 POLLUTANT SOURCE CONTROL

901.0 Intent. Pollutant sources are controlled.

901.1 Space and water heating options

901.1.1 Natural draft furnaces, boilers, or water heaters are not located in conditioned spaces, including conditioned crawlspaces, unless located in a mechanical room that has an outdoor air source and is sealed and insulated to separate it from the conditioned space(s). **5**

Points are awarded only for buildings that use natural draft combustion space or water heating equipment.

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 Space conditioning equipment. All space conditioning equipment installed within conditioned space complies with one of the following:

(1) power vent **3**

(2) direct vent **5**

(3) electric **8**

901.1.4 water heating equipment. All water heating equipment installed within conditioned space complies with one of the following:

(1) power vent **3**

(2) direct vent **5**

(3) electric **8**

901.1.5 Gas-fired fireplaces and direct heating equipment is listed and is installed in accordance with the NFPA 54, IFGC, or the applicable local gas appliance installation code. Gas-fired fireplaces within dwelling units or sleeping units and direct heating equipment are vented to the outdoors. Alcohol burning devices and kerosene heaters are vented to the outdoors. ..... **Mandatory**

901.1.6 Natural gas and propane fireplaces are direct vented, have permanently fixed glass fronts or gasketed doors, and comply with CSA/AM ANSI Z21.88/CSA 2.33 or CSA/AM ANSI Z21.50/CSA 2.22. ..... **7**

901.1.7 Heat pump air handler is installed in unconditioned space.~~The following electric equipment is installed:~~ **2**

~~(1) heat pump air handler in unconditioned space ..... **2**~~

~~(2) heat pump air handler in conditioned space ..... **5**~~

901.2 Solid fuel-burning appliances

	POINTS
901.2.1 Solid fuel-burning fireplaces, inserts, stoves and heaters inside thermal envelope or pressure boundary are in accordance with the following requirements:	**Mandatory**
(1) Site-built masonry wood-burning fireplaces use outside combustion air and include a means of sealing the flue and the combustion air outlets to minimize interior air (heat) loss when not in operation.	**4**
(2) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are an EPA Phase 2 Emission Level Qualified Model.	**6**
(3) Wood stove and fireplace inserts, as defined in UL 1482 Section 3.8, are in accordance with the certification requirements of UL 1482 and are in accordance with the emission requirements of the EPA Certification and the State of Washington WAC 173-433-100(3).	**6**
(4) Pellet (biomass) stoves and furnaces are in accordance with ASTM E1509 or are EPA certified.	**6**
(5) Masonry heaters are in accordance with the definitions in ASTM E1602 and IBC Section 2112.1.	**6**
901.2.2 Solid fuel-burning fireplaces, woodstoves, pellet stoves, or masonry heaters are not installed or are installed outside the thermal envelope or pressure boundary.	**6**
901.3 All electric building. Building is all-electric or has no combustion appliances, equipment, or fixtures inside the building thermal envelope or pressure boundary.	**6**
901.4 Garages. Garages are in accordance with the following:	
(1) Attached garage	
(a) Doors installed in the common wall between the attached garage and conditioned space are tightly sealed and gasketed.	**2 Mandatory**
(b) A continuous air barrier is provided separating the garage space from the conditioned living spaces.	**2 Mandatory**
(c) For one- and two-family dwelling units, a 100 cfm (47.2 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 not less than 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 ASHRAE Standard 62.2-2019 Section 7.3.	**8**
(2) A carport is installed, the garage is detached from the building, or no garage is installed.	**10**
901.5 Wood materials. Not less than 85% of material within a product group (i.e., wood structural panels, countertops, composite trim/doors, custom woodwork, and/or component closet shelving) is manufactured in accordance with the following:	**10 max**
(1) Structural plywood used for floor, wall, and/or roof sheathing is compliant with DOC PS 1 and/or DOC PS 2. OSB used for floor, wall, and/or roof sheathing is compliant with DOC PS 2. The panels are made with moisture-resistant adhesives. The trademark indicates these adhesives as follows: Exposure 1 or Exterior for plywood, and Exposure 1 for OSB.	**Mandatory**
(2) Particleboard and MDF (medium density fiberboard) is manufactured and labeled in accordance with CPA A208.1 and CPA A208.2, respectively. *[Points awarded per product group.]*	**2**
(3) Hardwood plywood in accordance with HPVA HP-1. *[Points awarded per product group.]*	**2**

POINTS

(4) Particleboard, MDF, or hardwood plywood is in accordance with CPA 4.
[Points awarded per product group.] **3**

(5) Composite wood or agrifiber panel products contain no added urea-formaldehyde or are in accordance with the CARB Composite Wood Air Toxic Contaminant Measure Standard.
[Points awarded per product group.] ..... **Mandatory~~4~~**

(6) Non-emitting products. *[Points awarded per product group.]* **4**

901.6 Cabinets. Not less than 85% of installed cabinets are in accordance with one or both of the following: *[Where both of the following practices are used, only 3 points are awarded.]*

(1) All parts of the cabinet are made of solid wood or non-formaldehyde emitting materials such as metal or glass. **5**

(2) The composite wood used in wood cabinets is in accordance with CARB Composite Wood Air Toxic Contaminant Measure Standard or equivalent as certified by a third-party program such as, but not limited to, those in Appendix B. **3**

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

901.8 Floor materials. The following types of finished flooring materials are used. The materials have emission levels in accordance with CDPH/EHLB Standard Method v1.1. Product is tested by a laboratory with the CDPH/EHLB Standard Method v1.1 within the laboratory scope of accreditation to ISO/IEC 17025 and certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix B.
[1 point awarded for every 10% of conditioned floor space using one of the below materials.
When carpet cushion complying with the emission limits of the practice is also installed, the percentage of compliant carpet area is calculated at 1.33 times the actual installed area.] ..... **1 [8 max]**

(1) Hard-surface flooring: Prefinished installed hard-surface flooring is installed. Where post-manufacture coatings or surface applications have not been applied, the following hard surface flooring types are deemed to comply with the emission requirements of this practice:

(a) Ceramic tile flooring

(b) Organic-free, mineral-based flooring

(c) Clay masonry flooring

(d) Concrete masonry flooring

(e) Concrete flooring

(f) Metal flooring

(2) Carpet and carpet cushion are installed.

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

POINTS

901.10 Interior architectural coatings. Not less than 85% of the interior architectural coatings are in accordance with either § 901.10.1 or § 901.10.3, not both. Not less than 85% of architectural colorants are in accordance with § 901.10.2.

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

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

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

(2) CARB *Suggested Control Measure for Architectural Coatings* (see Table 901.10.1)

Table 901.10.1
VOC Content Limits For Architectural Coatings[a,b,c]

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

POINTS

Specialty Primers, Sealers, and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Tub and Tile Refinish Coatings	420
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350
Zinc-Rich Primers	340

a. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.

b. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008.

c. Table 901.10.1 architectural coating regulatory category and VOC content compliance determination shall conform to the California Air Resources Board Suggested Control Measure for Architectural Coatings dated February 1, 2008.

d. Limits are expressed as VOC Regulatory (except as noted), thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.

e. Limit is expressed as VOC actual.

901.10.2 Architectural coating colorant additive VOC content is in accordance with Table 901.10.2.
[Points for § 901.10.2 are awarded only where base architectural coating is in accordance with § 901.10.1.] **1**

Table 901.10.2
VOC Content Limits for Colorants

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

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

901.11 Interior adhesives and sealants. Not less than 85% of site-applied adhesives and sealants located inside the waterproofing envelope are in accordance with one of the following, as applicable.

(1) The emission levels are in accordance with CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix B. **8**

(2) SCAQMD Rule 1168 in accordance with Table 901.11(3), excluding products that are sold in 16-ounce (473 ml) containers or less and are regulated by the California Air Resources Board (CARB) Consumer Products Regulations. **5**

901.12 Insulation. Emissions of 85% of wall, ceiling, and floor insulation materials are in accordance with the emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. Insulation is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix B. **4**

POINTS

901.13 Furniture and furnishings. In ~~a~~ multifamily and mixed-use buildings, all furniture in common areas shall have VOC emission levels in accordance with ANSI/BIFMA e3-Furniture Sustainability Standard Sections 7.6.1 and 7.6.2, tested in accordance with ANSI/BIFMA Standard Method M7.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the ANSI/BIFMA Standard Method M7.1 is in its scope of accreditation. Furniture and Furnishings are certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix B. **2**

901.14 Carbon monoxide (CO) alarms. A carbon monoxide (CO) alarm is provided in accordance with IRC Section R315 or IBC Section 915, as applicable. ..... **Mandatory**

901.15 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**

Table 901.11(3)
Site Applied Adhesive and Sealants VOC Limits[a,b]

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

a. VOC limit less water and less exempt compounds in grams/liter

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

POINTS

901.16 Non-smoking areas. Environmental tobacco and other smoke from controlled substances is minimized by one of the following:

(1) All interior common areas are designated as non-smoking areas with posted signage..... **1**

(2) Exterior smoking areas of a building are designated with posted signage and located not less than 25 ft (7.6 m) from entries, outdoor air intakes, and operable windows. **1**

(3) The entire site is designated as non-smoking with posted signage and restrictions in the leases..... **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 ventilation rate is no less than 50 cfm (23.6 L/s) for intermittent operation or 25 cfm (11.8 L/s) for continuous operation in bathrooms. *[1 point awarded only where a window complying with IRC Section R303.3 is provided in addition to mechanical ventilation.]*..... **Mandatory [1 max]**

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

(3) Kitchen exhaust is in accordance with the specifications of at least one of the following as applicable: **Mandatory**

(a) International Residential Code

(b) International Mechanical Code

(c) ASHRAE 62.2

902.1.2 Bathroom and/or laundry exhaust fan is provided with an automatic timer and/or humidistat:..... **11 max**

(1) for first device **5**

(2) for each additional device..... **2**

902.1.3 Where installed, kitchen, bathroom, and laundry area exhausts are tested in accordance with BSR/RESNET/ICC 380 to the design rate(s)..... **Mandatory**

Exception: The requirements of Table 902.1.3 shall be permitted in place of a measurement. When using Table 902.1.3, the airflow rating shall comply with or exceed a static pressure of 0.25 in. of water column (62.2 Pa).

Use of Table 902.1.3 is limited to one or more of the following:

(a) Duct system not exceeding 25 ft (7.6 m) in length;

(b) Duct system with no more than three (3) elbows; or

(c) Duct system with exterior termination fittings having a hydraulic diameter greater than or equal to the minimum duct diameter not less than the hydraulic diameter of the fan outlet.

POINTS

Table 902.1.3
Prescriptive Duct Sizing

	Fan Airflow Rating (CFM), at minimum static pressure of 0.25 in. of water												
	≤ 50	≤ 80	≤ 100	≤ 125	≤ 150	≤ 175	≤ 200	≤ 250	≤ 350	≤ 400	≤ 450	≤ 70	≤ 800
Duct Type	Minimum Duct Diameter, In.[a,b]												
Rigid Duct	4[e]	5	5	6	6	7	7	8	9	10	10	12	12[d]
Flex Duct[c]	4	5	6	6	7	7	8	8	9	10	NP	NP	NP

a. For noncircular ducts, calculate the diameter as four times the cross-sectional area divided by the perimeter.
b. NP = application of the prescriptive table is not permitted for this scenario.
c. Use of this table for verification of flex duct systems requires flex duct to be fully extended and any flex duct elbows to have a minimum bend radius to duct diameter ratio of 1.0.
d. For this scenario, use of elbows is not permitted.
e. For this scenario, 4 in. (10~~0 mc~~m) oval duct shall be permitted, provided the minor axis of the oval is greater than or equal to 3 in. (~~75~~ 7.6 ~~mc~~m)

902.1.4 Exhaust fans comply with ENERGY STAR, or either IECC R403.6.2 or C403.8.5, as applicable. ..... **Mandatory**

(1) Fans operating at or below 1 sone *[Points awarded per fan.]* ..... **3 [12 max]**

902.1.5 Fenestration in spaces other than those identified in § 902.1.1 through § 902.1.4 are designed for stack effect or cross-ventilation in accordance with all of the following:..... **3**

(1) Operable windows, operable skylights, or sliding glass doors with a total area of not less than 15% of the total conditioned floor area are provided.

(2) Insect screens are provided for all operable windows, operable skylights, and sliding glass doors.

(3) Not less than two operable windows or sliding glass doors are placed in adjacent or opposite walls. where there is only one wall surface in that space exposed to the exterior, the minimum windows or sliding glass doors may be on the same wall.

902.1.6 Ventilation for Multifamily and Mixed-Use Common Spaces. Systems are implemented and are in accordance with the specifications of ASHRAE 62.1 or IMC Chapter 4 and an explanation of the operation and importance of the ventilation system is included in § 1002.1 and § 1002.2 of this Standard. ..... **Mandatory**

902.2 Building ventilation systems

902.2.1 Whole building ventilation systems implemented in the dwelling units are in accordance with the specifications of at least one of the following, as applicable:..... **Mandatory**

(a) ASHRAE 62.2-2019

(b) 2021 International Mechanical Code

(c) 2021 International Residential Code

One of the following whole building ventilation systems is implemented in the dwelling units and an explanation of the operation and importance of the ventilation system is included in either § 1001.1 or § 1002.2.

(1) Exhaust or supply fan(s) ready for continuous operation and with appropriately labeled controls..... **3**

(2) Balanced exhaust and supply fans with supply intakes located in accordance with the manufacturer's guidelines so as to not introduce polluted air back into the building **6**

		POINTS
(3)	Heat-recovery ventilator	**7**
(4)	Energy-recovery ventilator	**8**
(5)	Ventilation air is preconditioned by a system not specified above	**10**

902.2.2 For single-family houses and multifamily and mixed-use structures of three (3) stories or fewer above grade, ventilation airflow is tested and verified to provide the minimum ventilation flow rates in accordance with ANSI/RESNET/ICC 380 and § 902.2.1. ..... **Mandatory**

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 the filter ~~used~~installed. ..... **Mandatory**

902.2.4 MERV filters 10-12 are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of the filter installed~~used~~. **1**

902.2.5 MERV filters 13-15 are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of the filter installed~~used~~. **2**

902.2.6 MERV filters 16 or greater are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of the filter installed~~used~~. **3**

902.2.7 Enhanced air filtration. Air filtration systems meets all of the following: **2**

(1) Design for and install a secondary filter rack space for activated carbon filters.

(2) Provide the manufacturer's recommended filter maintenance schedule to the homeowner or building manager.

902.3 Radon testing and mitigation. Radon Zones are identified by the AHJ or, where the zone is not identified by the AHJ, as defined in Figure 9(1).
~~*[Mandatory except for an existing building that has been tested for radon and is in accordance with federal and local acceptable limits.]*~~ ..... **Mandatory**

902.3.1 Radon testing. Radon testing is mandatory for Zone 1.

Exceptions: 1) Testing is not mandatory where the authority having jurisdiction has defined the radon zone as Zone 2 and 3; and 2) testing is not mandatory where the occupied space is located above an unenclosed open space or concrete podiums.

(1) Single-family testing specifications. Single-family testing is performed as specified in (a) through (j). Testing of a representative sample shall be permitted for multifamily and mixed-use buildings only.... **8**

(a) Testing is performed after the residence passes its airtightness test.

(b) Testing is performed after the radon control system installation is complete. If the system has an active fan, the residence shall be tested with the fan operating.

(c) Testing is performed at the lowest level within a dwelling unit which will be occupied, even if the space is not finished.

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(d) Testing is not performed in a closet, hallway, stairway, laundry room, furnace room, kitchen, or bathroom.

(e) Testing is performed with a commercially available test kit or with a continuous radon monitor that can be calibrated. Testing shall be in accordance with the testing device manufacturer's instructions.

(f) Testing shall be performed by the builder, a registered design professional, or an approved third party.

(g) Testing shall extend not less than 48 hours or to the minimum specified by the manufacturer, whichever is longer.

(h) Written radon test results shall be provided by the test lab or testing party. Written test results shall be included with construction documents.

(i) An additional pre-paid test kit shall be provided for the homeowner to use when they choose. The test kit shall include mailing or emailing the results from the testing lab to the homeowner.

(j) Where the radon test result is 4 pCi/L or greater, the fan for the radon vent pipe shall be installed. The system shall be modified and retested until the test result is less than 4 pCi/L.

(2) Multifamily and mixed-use testing specifications. Multifamily and mixed-use testing is performed as specified in (a) through (i). ~~.....~~ ~~8~~

(i) testing of 100% of ground-contact units/areas..... 8

(ii) for Zones 2 and 3, sampling of not less than 25% ground contact units/areas 6

(a) ~~For Zone 1,~~ Each ground-contact dwelling or living sleeping unit, a test is performed in the lowest level that serves or could serve as a living area, sleeping quarters, office, playroom or otherwise be occupied for residential use at some time in the future. ~~Apply a 25% sampling of units or at least one of each unit type, whichever is greater, for Zone 2 buildings.~~ There should be representative samples across the footprint of the building.

(b) For ~~non-residential~~ ground-contact ~~locations~~amenity areas, a test is performed in all ~~ground-contact rooms, offices, classrooms and other general use~~ areas that are occupied or intended to be occupied. ~~Apply a 25% sampling of spaces for Zone 2 buildings.~~ There should be representative samples across the footprint of the building.

(c) On each upper floor, testing is performed in at least one, and not less than 10%, of all dwellings and nonresidential rooms that are occupied or intended to be occupied. These measurements shall be in addition to tests performed in ground-contact locations and rooms or dwellings that adjoin immediately above untested ground-contact locations.

(d) Testing is not performed in hallways, closets, and bathroom orshower areas unless they are open to other rooms that are occupied for other purposes.

(e) Testing is performed with a commercially available test kit or with a continuous radon monitor that can be calibrated. Testing shall be in accordance with the testing device manufacturer's instructions.

(f) Testing shall be performed by the builder, a registered design professional, or an approved third party.

POINTS

(g) Testing shall extend not less than 48 hours or to the minimum specified by the manufacturer, whichever is longer.

(h) Written radon test results shall be provided by the test lab or testing party. Written test results shall be included with construction documents.

(i) Where any radon test result is 4 pCi/L or greater, fan(s) for the radon vent pipe shall be installed. The system shall be modified, and the entire building retested until the test result is less than 4 pCi/L.

(3) Testing results. A radon test done in accordance with 902.3.1(1) or 902.3.1(2) and completed before occupancy receives a result of 2 pCi/L or less..... **6**

902.3.2 Radon reduction measures. Radon reduction measures are in accordance with IRC Appendix AF Radon Control Methods, ANSI/AARST MA-MFLB, or § 902.3.1.

(1) Buildings located in Zone 1

(a) a passive radon system is installed..... **Mandatory**

Mandatory for existing building with conditioned space over a new ground supported slab. An existing building that has been tested for radon and is less than 4 pCi/L would be exempted from this requirement.

(b) an active radon system is installed..... **12**

(2) Buildings located in Zone 2 or Zone 3

(a) a passive radon system is installed..... **6**

(b) an active radon system is installed..... **12**

902.3.3 Radon reduction option. This option requires § 902.3.3.1 through § 902.3.3.7.
[Mandatory when selected for compliance]..... **Mandatory***

902.3.3.1 Soil gas barriers and base course. A base course in accordance with IRC Appendix F Section 103.2 shall be installed below slabs and foundations. There shall be a continuous gas-permeable base course under each soil-gas retarder that is separated by foundation walls or footings. Between slabs and the base course, install a soil-gas retarder compliant with § 602.1.1.1 and IRC Appendix F Section 103.

902.3.3.2 Soil gas collection. There shall be an unobstructed path for soil gas flow between the void space installed in the base course and the vent through the roof. Soil gases below the foundation shall be collected by a perforated pipe with a diameter of not less than 4 in. (10 cm) and not less than 5 ft (1.5 m) in total length. A tee fitting or equivalent method shall provide two horizontal openings to the radon collection. The tee fitting shall be designed to prevent clogging of the radon collection path. Alternately the soil gas collection shall be by approved radon collection mats or an equivalent approved method.

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902.3.3.3 Soil gas entry routes. Openings in slabs, soil-gas retarders, and joints such as, but not limited to, plumbing, ground water control systems, soil-gas vent pipes, piping and structural supports, shall be sealed against air leakage at the penetrations. The sealant shall be a polyurethane caulk, expanding foam or other approved method. Foundation walls shall comply with IRC Section 103.2.3. Sumps shall be sealed in accordance with IRC Section 103.2.2. Sump pits and sump lids intended for ground water control shall not be connected to the sub-slab soil-gas exhaust system.

902.3.3.4 Soil gas vent. A gas-tight pipe vent shall extend from the soil gas permeable layer through the roof. The vent pipe size shall not be reduced at any location as it goes from gas collection to the roof. Exposed and visible interior vent pipes shall be identified with not less than one label reading "Radon Reduction System" on each floor and in habitable attics.

902.3.3.5 Vent pipe diameter. The minimum vent pipe diameter shall be as specified in Table 902.3.2.5.

Table 902.3.3.5
Maximum Vented Foundation Area

Maximum area vented	Nominal pipe diameter
2,500 ft^2 (232.3 m^2)	3 in. (7.6 cm)
4,000 ft^2 (371.612 m^2)	4 in. (10 cm)
Unlimited	6 in. (15.2 cm)

902.3.3.6 Multiple vented areas. In dwellings where interior footings or other barriers separate the soil-gas permeable layer, each area shall be fitted with an individual vent pipe. Vent pipes shall connect to a single vent that terminates above the roof or each individual vent pipe shall terminate separately above the roof.

902.3.3.7 Fan. Each sub-slab soil-gas exhaust system shall include a fan, or dedicated space for the post-construction installation of a fan. The electrical supply for the fan shall be located within 6 ft (1.8 m) of the fan. Fan is not required to be on a dedicated circuit.

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.

(3) If HVAC systems are to be operated, during construction, all return grilles have a temporary MERV 8 or higher filter installed in a manner ensuring no leakage around the filter.

902.5 Central vacuum systems. Central vacuum system is installed and vented to the outside. **3**

902.6 Living space contaminants. The living space is sealed in accordance with § 701.4.3.1 to prevent unwanted contaminants. ..... **Mandatory**

POINTS

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 not less than R-4 (0.7 (m^2•K)/W)) 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. Ducts are in accordance with one of the following.

(1) All HVAC ducts, plenums, and trunks are located in conditioned space. **1**

(2) All HVAC ducts, plenums, and trunks are located in conditioned space and all HVAC ducts are insulated to not less than R-4 (0.7 (m^2•K)/W)). **3**

903.3 Relative humidity. In climate zones 1A, 2A, 3A, 4A, and 5A as defined by Figure 6(1), equipment is installed to maintain relative humidity (RH) at or below 60% using one of the following:
[Points not awarded in other climate zones.] **7**

(1) additional dehumidification system(s)

(2) central HVAC system equipped with additional controls to operate in dehumidification mode

904 INDOOR AIR QUALITY

904.0 Intent. IAQ is protected by best practices to monitor and control ventilation, moisture, pollutant sources and sanitation.

904.1 Indoor air quality (IAQ) during construction. Wood is dry before close-in (§ 602.1.7.1(3)), materials comply with emission criteria (§ 901.4-901.11), sources of water infiltration or condensation observed during construction have been eliminated, accessible interior surfaces are dry and free of visible suspect growth (per ASTM D7338 Section 6.3), and water damage (per ASTM D7338 Section 7.4.3). **2**

904.2 Indoor air quality (IAQ) post completion. Verify there are no moisture, mold, and dust issues in accordance with § 602.1.7.1(3), § 901.4 - 901.11, ASTM D7338 Section 6.3, and ASTM D7338 Section 7.4.3. **3**

904.3 Microbial growth & moisture inspection and remediation. A visual inspection is performed to confirm the following:

(1) Verify that no visible signs of discoloration and microbial growth on ceilings, walls or floors, or other building assemblies; or where minor microbial growth is observed (less than within a total area of 25 ft^2 (2.3 m^2)) in homes or multifamily and mixed-use buildings, reference EPA Document 402-K-02-003 (A Brief Guide to Mold, Moisture, and Your Home) for guidance on how to properly remediate the issue. where microbial growth is observed, on a larger scale in homes or multifamily and mixed-use buildings (greater than 25 ft^2 (2.3 m^2)), reference EPA Document 402-K-01-001 (Mold Remediation in Schools and Commercial Buildings) for guidance on how to properly remediate the issue. ..... **Mandatory**

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(2) Verify that there are no visible signs of water damage or pooling. Where signs of water damage or pooling are observed, verify that the source of the leak has been repaired, and that damaged materials are either properly dried or replaced as needed. ..... **Mandatory**

904.4 Indoor air quality (IAQ) monitoring

904.4.1 Humidity monitoring. A humidity monitoring system is installed with a mobile base unit that displays readings of temperature and relative humidity. The system has not less than two remote sensor units. One remote sensor unit is placed permanently inside the conditioned space in a central location, excluding attachment to exterior walls, and another remote sensor unit is placed permanently outside of the conditioned space. **2**

904.4.2 Airborne pollutant monitoring. Indoor air quality sensors designed for continuous monitoring of PM2.5, TVOC, and CO2 are installed. Instantaneous and trending data are accessible via website or mobile application in near-real-time.

(1) Sensors are installed within the kitchen area of each dwelling unit. **4**

(2) Sensors are installed within each bedroom. **4**

(3) Sensors are installed within multifamily and mixed-use amenity areas. Not less than one sensor is installed per 5,000 ft^2 (464.52 m^2) of common area space. **2**

(4) Installed devices are also capable of monitoring and providing trending data for not less than two of the following: air pressure, radon, CO, NO2, Methane, Ozone, Formaldehyde. ..... **1 Additional**

904.5 Indoor air quality (IAQ) remediation. A ventilation device is installed that automatically removes, inhibits, or reduces PM2.5, TVOC and CO2 within the conditioned space when identified by installed devices in accordance with § 904.4.2. ..... **8**

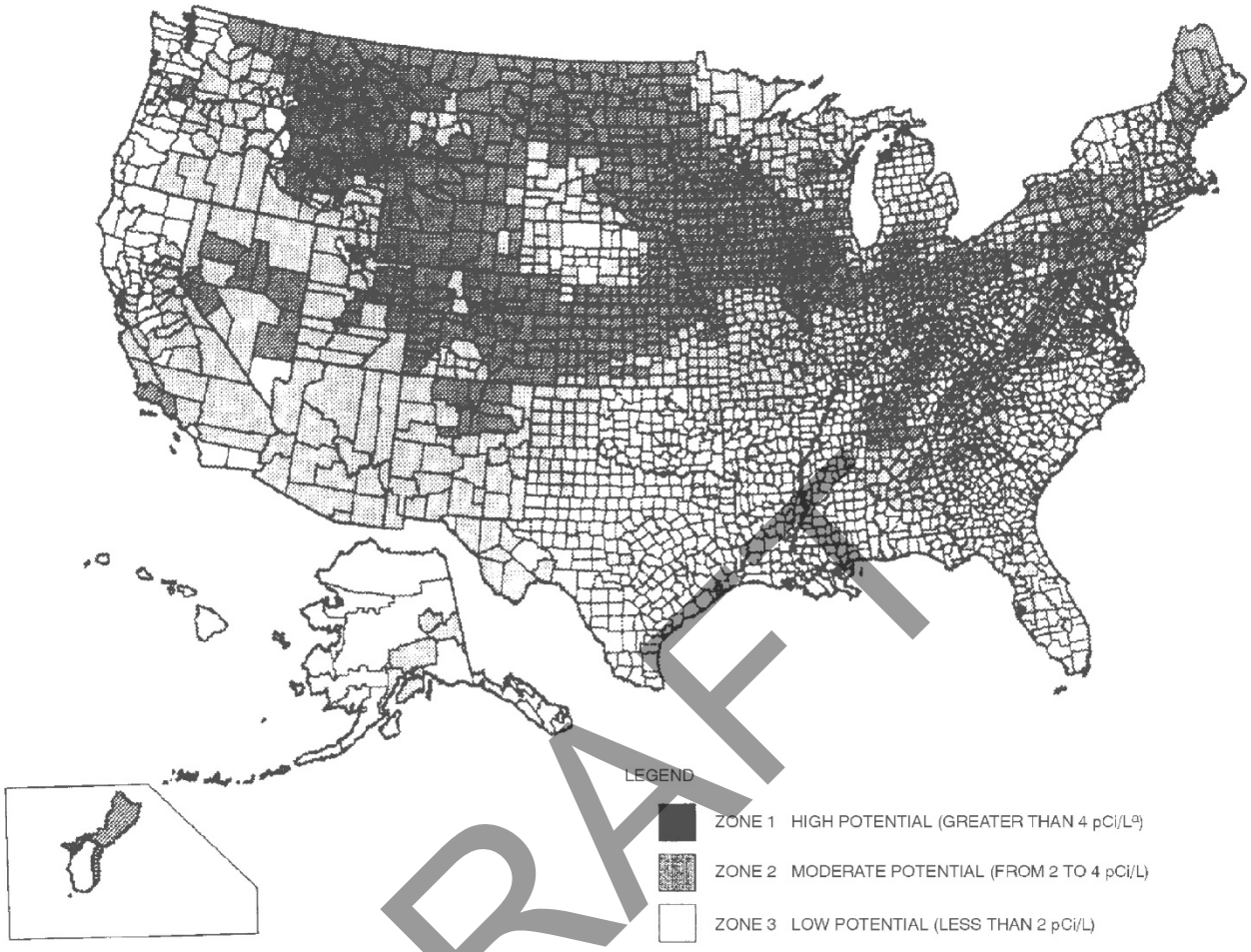
904.6 Humidity remediation. A humidity control device is installed that automatically alters the relative humidity by humidifying or dehumidifying the conditioned space when identified by installed devices in accordance with § 904.4.1. ..... **8**

905 INNOVATIVE PRACTICES

905.1 Sound barrier. Provide room-to-room privacy between bedrooms and adjacent living spaces within dwelling units or homes by achieving an STC greater than 52 in accordance with the criteria below. ..... **1 SF / 4 MF**

STC greater than 55 (NIC greater than 47) = Articulation Index 0 to 0.05
STC 52 to 55 (NIC 44 to 47) = Articulation Index 0.05 to 0.15

905.2 Evaporative coil mold prevention. For buildings with a mechanical system for cooling, ultraviolet lamps are installed on the cooling coils and drain pans of the mechanical system supplies. Lamps produce ultraviolet radiation at a wavelength of 254 nm so as not to generate ozone. Lamps have ballasts housed in a NEMA-rated enclosure. **2**



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

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

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

FIGURE 9(1)
EPA MAP OF RADON ZONES

CHAPTER 10:
OPERATION, MAINTENANCE, AND BUILDING OWNER EDUCATION

POINTS

1001 HOMEOWNER'S MANUAL AND TRAINING GUIDELINES FOR ONE- AND TWO-FAMILY DWELLINGS

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

1001.1 Homeowner's manual. A homeowner's manual is provided and stored in a permanent location in the dwelling that includes the following, as available and applicable.
[1 point awarded per two items. Points awarded for non-mandatory items.]..... **1 [8 max]**

(1) A National Green Building Standard certificate with a web link and completion document. ..... **Mandatory**

(2) List of green building features (can include the National Green Building Standard checklist). ..... **Mandatory**

(3) Product manufacturer's manuals or product data sheet for installed major equipment, fixtures, and appliances. If product data sheet is in the building owners' manual, manufacturer's manual may be attached to the appliance in lieu of inclusion in the building owners' manual. ..... **Mandatory**

(4) Maintenance checklist.

(5) Information on local recycling and composting programs.

(6) Information on available local utility programs that purchase a portion of energy from renewable energy providers.

(7) Explanation of the benefits of using energy-efficient lighting systems [e.g., compact fluorescent light bulbs, light emitting diode (LED)] in high-usage areas.

(8) A list of practices to conserve water and energy.

(9) Information on the importance and operation of the home's fresh air ventilation system.

(10) Local public transportation options.

(11) A diagram showing the location of safety valves and controls for major building systems.

(12) Where frost-protected shallow foundations are used, owner is informed of precautions including:

  (a) instructions to not remove or damage insulation when modifying landscaping.

  (b) providing heat to the building as required by the IRC or IBC.

  (c) keeping base materials beneath and around the building free from moisture caused by broken water pipes or other water sources.

(13) A list of local service providers that offer regularly scheduled service and maintenance contracts to ensure proper performance of equipment and the structure (e.g., HVAC, water-heating equipment, sealants, caulks, gutter and downspout system, shower and/or tub surrounds, irrigation system).

(14) A photo record of framing with utilities installed. Photos are taken prior to installing insulation, clearly labeled, and included as part of the building owners' manual.

POINTS

(15) List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials.

(16) Information on organic pest control, fertilizers, deicers, and cleaning products.

(17) Information on native landscape materials and/or those that have low water requirements.

(18) Information on methods of maintaining the building's relative humidity in the range of 30% to 60%.

(19) Instructions for inspecting the building for termite infestation.

(20) Instructions for maintaining gutters and downspouts and importance of diverting water not less than 5 ft (1.5 m) away from foundation.

(21) A narrative detailing the importance of maintenance and operation in retaining the attributes of a green-built building.

(22) Where stormwater management measures are installed on the lot, information on the location, purpose, and upkeep of these measures.

(23) Explanation of and benefits from green cleaning in the home.

(24) Retrofit energy calculator that provides baseline for future energy retrofits.

(25) A list of site, building, and/or interior features that contribute to the health and well-being of the occupants.

(26) A list of practices to maintain the health and wellness attributes of the building.

(27) For homes in areas designated as a wildland – urban interface or other wildfire-prone areas, information is included on how the home and its defensible space is maintained to help the home be resilient to wildfires.

1001.2 Training of initial homeowners. Initial homeowners are familiarized with the role of occupants in achieving green goals. Training is provided to the responsible party(ies) regarding equipment operation and maintenance, control systems, and occupant actions that will improve the environmental performance of the building. These include: ..... **8 Mandatory**

(1) HVAC filters.

(2) Thermostat operation and programming.

(3) Lighting controls.

(4) Appliances operation.

(5) Water heater settings and hot water use.

(6) Fan controls.

(7) Recycling and composting practices.

(8) Whole-dwelling mechanical ventilation systems.

POINTS

1002 CONSTRUCTION, OPERATION, AND MAINTENANCE MANUALS AND TRAINING FOR MULTIFAMILY AND MIXED-USE BUILDINGS

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

1002.1 Building construction manual. A building construction manual, including five or more of the following, is compiled and distributed in accordance with § 1002.0.
[Points awarded for non-mandatory items.] ..... **1 per 2 items**

(1) A narrative detailing the importance of constructing a green building, including a list of green building attributes included in the building. This narrative is included in all responsible parties' manuals. ..... **Mandatory**

(2) A local green building program certificate as well as a copy of the *National Green Building Standard*®, as adopted by the Adopting Entity, and the individual measures achieved by the building. ..... **Mandatory**

(3) Warranty, operation, and maintenance instructions for all equipment, fixtures, appliances, and finishes... **Mandatory**

(4) Record drawings of the building.

(5) A record drawing of the site including stormwater management plans, utility lines, landscaping with common name and genus/species of plantings.

(6) A diagram showing the location of safety valves and controls for major building systems.

(7) A list of the type and wattage of light bulbs installed in light fixtures.

(8) A photo record of framing with utilities installed. Photos are taken prior to installing insulation and clearly labeled.

1002.2 Operations manual. Operations manuals are created and distributed to the responsible parties in accordance with § 1002.0. Between all of the operation manuals, five or more of the following options are included. *[Points awarded for non-mandatory items.]* ..... **1 per 2 items**

(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% to 60%.

(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, where applicable, building recycling and hazardous waste handling and disposal procedures.

(6) Local public transportation options.

POINTS

(7) Explanation of the benefits of using compact fluorescent light bulbs, LEDs, or other high-efficiency lighting.

(8) Information on native landscape materials and/or those that have low water requirements.

(9) Information on the radon mitigation system, where applicable.

(10) A procedure for educating tenants in rental properties on the proper use, benefits, and maintenance of green building systems including a maintenance staff notification process for improperly functioning equipment.

(11) Information on the importance and operation of the building's fresh air ventilation system.

1002.3 Maintenance manual. Maintenance manuals are created and distributed to the responsible parties in accordance with § 1002.0. Between all of the maintenance manuals, five or more of the following options are included. *[Points awarded for non-mandatory items.]*..... **1 per 2 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 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 not less than 5 ft away from foundation.

(7) Instructions for inspecting the building for termite infestation.

(8) A procedure for rental tenant occupancy turnover that preserves the green features.

(9) An outline of a formal green building training program for maintenance staff.

(10) A green cleaning plan which includes guidance on sustainable cleaning products.

(11) A maintenance plan for active recreation and play spaces (e.g., playgrounds, ground markings, exercise equipment.

POINTS

(12) A list of site, building, and/or interior features that contribute to the health and well-being of the building workers and occupants.

(13) A list of practices to maintain the health and wellness attributes of the building.

(14) A maintenance plan to preserve the building and its defensible space for wildfire resilience (only allowable when points for 505.12 Wildfire resilience are claimed).

1002.4 Training of building owners. Building owners are familiarized with the role of occupants in achieving green goals. On-site training is provided to the responsible party(ies) regarding equipment operation and maintenance, control systems, and occupant actions that will improve the environmental performance of the building. These include:..... **8 Mandatory**

(1) HVAC filters

(2) thermostat operation and programming

(3) lighting controls

(4) appliances operation

(5) water heater settings and hot water use

(6) fan controls

(7) recycling and composting practices

(8) Whole-dwelling mechanical ventilation systems

1002.5 Multifamily and mixed-use occupant manual. An occupant manual is compiled and distributed in accordance with § 1002.0. *[Points awarded for non-mandatory items.]*..... **1 per 2 items**

(1) NGBS certificate..... **Mandatory**

(2) List of green building features..... **Mandatory**

(3) Operations manuals for all appliances and occupant operated equipment including lighting and ventilation controls, thermostats, etc. ..... **Mandatory**

(4) Information on recycling and composting programs.

(5) Information on purchasing renewable energy from utility.

(6) Information on energy efficient replacement lamps.

(7) List of practices to save water and energy.

(8) Local public transportation options.

(9) Explanation of benefits of green cleaning.

(10) A list of site, building, and/or interior features that contribute to the health and well-being of the occupants.

(11) A list of practices to maintain the health and wellness attributes of the building.

POINTS

1002.6 Training of multifamily and mixed-use occupants. Prepare a training outline, video or website that familiarizes occupants with their role in maintaining the green goals of the project. Include all equipment that the occupant(s) is expected to operate, including but not limited to: ..... **1 per 2 items**

(1) Lighting controls

(2) Ventilation controls

(3) Thermostat operation and programming

(4) Appliances operation

(5) Recycling and composting

(6) HVAC filters

(7) Water heater setting and hot water use

1003 PUBLIC EDUCATION

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

1003.1 Public education. One or more of the following is implemented: ..... **2 max**

(1) **Signage.** Signs showing the project is designed and built in accordance with the NGBS are posted on the construction site. **1**

(2) **Certification Plaques.** NGBS certification plaques with rating level attainted are placed in a conspicuous location near the utility area of the home or, in a conspicuous location near the main entrance of ~~a~~ multifamily and mixed-use buildings. **1**

(3) **Education.** A URL for the NGBS is included on site signage, builder website (or property website for multifamily and mixed-use buildings), and marketing materials for homes certified under the NGBS. ... **1**

1004 POST OCCUPANCY PERFORMANCE ASSESSMENT

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

1004.1 Verification system. A verification plan is provided in the building owner's manual (§ 1001 or § 1002). The verification system provides methods for measuring energy and/or water consumption starting after the building reaches 80% or more occupancy.

(1) Verification plan is developed to monitor post-occupancy energy and/or water use and is provided in the building owner's manual.

(a) Plan to monitor energy consumption. **1**

(b) Plan to monitor water consumption. **1**

(c) Plan to report energy and/or water consumption to a national benchmarking system. **1**

POINTS

(2) Verification system is installed in the building to monitor post-occupancy energy and water use.

(a) System is installed to monitor energy consumption. **2**

(b) System is installed to monitor water consumption. **2**

(c) System is installed to report energy and/or water consumption to a national benchmarking system. **2**

(3) Verification system that is compliant with national/international ESG benchmarking system is installed in the building to monitor post-occupancy energy and water use.

(a) System is installed to monitor energy consumption. **3**

(b) System is installed to monitor water consumption. **3**

(c) System is installed to report energy and/or water consumption to a national benchmarking system. **3**

1005 INNOVATIVE PRACTICES

1005.1 Appraisals. One or more of the following is implemented:

(1) Energy rating or projected usage data is posted in an appropriate location in the home, or public posting so that an appraiser can access the energy data for an energy efficiency property valuation. .. **2**

(2) An Appraisal Institute Form 820.05 "Residential Green and Energy Addendum" or Form 821 "Commercial Green and energy Efficient Addendum" that consider NGBS, LEED, ENERGY STAR certifications and equivalent programs, is completed for the appraiser by a qualified professional or builder to use in performing the valuation of the property. **2**

(3) NGBS certification information or one of the Appraisal Institute Forms cited in § 1005.1(2) is uploaded to a multiple listing service (MLS) or equivalent database so that appraisers can access it to compare property valuations..... **2**

1005.2 Indoor Air Quality Display and Communication. Data from indoor air quality monitoring in accordance with § 904.4.1 or § 904.4.2 is made available to occupants. Data is either visually displayed in an area of the building that is accessible by residents or accessible via website or a mobile application. **2**

1005.3 Health and Wellness Professional. A member of the project team is a qualified health and wellness professional in residential design and construction and, for at least one of the following groups, will either conduct training or ensure that a relevant training course is completed: **3 max**

(1) Other project team members with regards to resource, product, and material selections, practices and uses in the project..... **1**

(2) Building operations and maintenance staff. **1**

(3) Building occupants or homeowners. **1**

1005.4 Tenant Energy and Water Consumption Data Release Form.
[Points only available for buildings with separately metered utilities.]

Develop and provide an operational plan, including a sample data release form that would allow residents to release ~~for residents to allow~~ energy and water consumption data ~~release~~:

		POINTS
(1)	For energy consumption.....	**2**
(2)	For water consumption.	**2**

CHAPTER 11:
EXISTING BUILDINGS

POINTS

Note: Where applicable, section numbering in Chapter 11 parallels a corresponding practice in a previous chapter.

11.500 LOT DESIGN, PREPARATION, AND DEVELOPMENT

11.500.0 Intent. This section applies to the lot and changes to the lot due to remodeling of an existing building.

11.501 LOT SELECTION

11.501.2 Multi-modal transportation. A range of multi-modal transportation choices are promoted by one or more of the following:

(1) The building is located within one-half mile (~~805~~ 0.8 km) of pedestrian access to a mass transit system. **6**

(2) The building is located within five miles (8~~,046~~ km) of a mass transit station with provisions for parking.. **3**

(3) The building is located within one-half mile (~~805~~ 0.8 km) of six or more community resources. No more than two each of the following use category can be counted toward the total: Recreation, Retail, Civic, and Services. Examples of resources in each category include, but are not limited to the following: **4**

Recreation: recreational facilities (such as pools, tennis courts, basketball courts), parks.
Retail: grocery store, restaurant, retail store.
Civic: post office, place of worship, community center.
Services: bank, daycare center, school, medical/dental office, Laundromat/dry cleaners.

OR

A lot is selected within a census block group that, compared to its region, has above-average neighborhood walkability using an index within the EPA's Smart Location Database:

(a) Walkability is within the top quartile for the region. **5**

(b) Walkability is within the second quartile for the region..... **2**

(4) The building is on a lot located within a community that has rights-of-way specifically dedicated to bicycle use in the form of paved paths or bicycle lanes, or is on an infill lot located within 1/2 mile (0.8 km) of a bicycle lane designated by the jurisdiction..... **5**

(5) Dedicated bicycle parking and racks are constructed for ~~mixed-use and~~ multifamily and mixed-use buildings:

(a) Not less than 1 bicycle parking space per 3 residential units **2**

(b) Not less than 1 bicycle parking space per 2 residential units **4**

(c) Not less than 1 bicycle parking space per 1 residential unit..... **6**

POINTS

(d) Bicycle enclosed storage is provided or parking spaces are covered or otherwise protected from the elements ..... **2 Additional**

(6) The remodel includes the new development and implementation of a community scale bike sharing. . **3**

(7) The remodel includes the new development and implementation of a community scale motorized vehicle sharing program. **5**

11.502 PROJECT TEAM, MISSION STATEMENT, AND GOALS

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

11.502.2 Environmental, social, and governance (ESG) plan. An ESG impact plan has been written for the project that utilizes NGBS compliance as the basis of the environmental section of the plan. **2**

11.503 LOT DESIGN

11.503.0 Intent. The lot is designed to avoid detrimental environmental impacts first, to minimize any unavoidable impacts, and to mitigate for those impacts that do occur. The project is designed to minimize environmental impacts and to protect, restore, and enhance the natural features and environmental quality of the lot. *[Points awarded only where the intent of the design is implemented.]*

11.503.1 Natural resources. Natural resources are conserved by one or more of the following:

(1) A natural resources inventory is completed under the direction of a qualified professional. **5**

(2) A plan is implemented to conserve the elements identified by the natural resource inventory as high-priority resources. **6**

(3) Items listed for protection in the natural resource inventory plan are protected under the direction of a qualified professional. **4**

(4) Basic training in tree or other natural resource protection is provided for the on-site supervisor. **4**

(5) All tree pruning on-site is conducted by a certified arborist or other qualified professional. **3**

(6) Ongoing maintenance of vegetation on the lot during construction is in accordance with TCIA A300 or locally accepted best practices. **4**

(7) Where a lot adjoins a landscaped common area, a protection plan from the remodeling construction activities next to the common area is implemented. **5**

(8) Developer has a plan to design and construct the lot in accordance with the International Wildland-Urban Interface Code (IWUIC). *[Only applicable where the AHJ has not declared a wildland-urban interface area, but a fire protection engineer, certified fire marshal, or other qualified party has determined and documented the site as hazarded in accordance with the IWUIC.]*..... **6**

11.503.2 Slope disturbance. Slope disturbance is minimized by one or more of the following:

(1) The use of terrain-adaptive architecture. **5**

POINTS

(2) Hydrological/soil stability study is completed and used to guide the design of any additions to buildings on the lot. **5**

(3) All or a percentage of new driveways and parking are aligned with natural topography to reduce cut and fill.

(a) greater than or equal to 10% to less than 25% **1**

(b) greater than or equal to 25% to less than 75% **4**

(c) greater than or equal to 75%..... **6**

(4) Long-term erosion effects are reduced through the design and implementation of clustering, terracing, retaining walls, landscaping, or restabilization techniques..... **6**

(5) Underground parking uses the natural slope for parking entrances. **5**

11.503.3 Soil disturbance and erosion. Soil disturbance and erosion are minimized by one or more of the following: (also see § 11.504.3)

(1) Remodeling construction activities are scheduled such that disturbed soil that is to be left unworked for more than 21 days is stabilized within 14 days. **2**

(2) The new utilities on the lot are designed to use one or more alternative means:..... **2**

(a) tunneling instead of trenching.

(b) use of smaller (low ground pressure) equipment or geomats to spread the weight of construction equipment.

(c) shared utility trenches or easements.

(d) placement of utilities under paved surfaces instead of yards.

(3) Limits of new clearing and grading are demarcated on the lot plan. **5**

11.503.4 Stormwater Management. The stormwater management system is designed to use low-impact development/green infrastructure practices to preserve, restore or mitigate changes in site hydrology due to land disturbance and the construction of impermeable surfaces through the use of one or more of the following techniques:

(1) A site assessment is conducted and a plan prepared and implemented that identifies important existing permeable soils, natural drainage ways and other water features, e.g., depressional storage, onsite to be preserved in order to maintain site hydrology. **7**

(2) Low-Impact Development/Green infrastructure stormwater management practices to promote infiltration and evapotranspiration are used to manage rainfall on the lot and prevent the off-lot discharge of runoff from all storms up to and including the volume of following storm events:

(a) 80th percentile storm event **5**

(b) 90th percentile storm event **8**

(c) 95th percentile storm event **10**

POINTS

(3) Permeable materials are used for driveways, parking areas, walkways, patios, and recreational surfaces and the like according to the following percentages:

(a) greater than or equal to 10% to less than 25% (add 2 points for use of vegetative paving system) . **2**

(b) greater than or equal to 25% to less than 50% (add 4 points for use of vegetative paving system) . **5**

(c) greater than or equal to 50% (add 6 points for use of vegetative paving system) **10**

[Points for vegetative paving systems are only awarded for locations receiving more than 20 in. (51 cm) per year of annual average precipitation.]

(4) Complete gutter and downspout system directs stormwater away from foundation to vegetated landscape area, a raingarden, or catchment system that provides for water infiltration. **8**

11.503.5 Landscape plan. A plan for the lot is developed to limit water and energy use while preserving or enhancing the natural environment. *[Where "front" only or "rear" only plan is implemented, only half of the points (rounding down to a whole number) are awarded for Items (1)-(8)]*

(1) A plan is formulated and implemented that protects, restores, or enhances natural vegetation on the lot.

(a) greater than or equal to 12% to less than 25% of the natural area **1**

(b) greater than or equal to 25% to less than 50% of the natural area **2**

(c) greater than or equal to 50% to less than 100% of the natural area **3**

(d) 100% of the natural area **4**

(2) Non-invasive vegetation that is native or regionally appropriate for local growing conditions is selected to promote biodiversity. **4**

(3) To improve pollinator habitat, not less than 10% of planted areas are composed of native or regionally appropriate flowering and nectar producing plant species. Invasive plant species shall not be utilized. **3**

(4) EPA WaterSense Water Budget Tool or equivalent is used when implementing the site vegetative design. **5**

(5) Where turf is being planted, Turfgrass Water Conservation Alliance (TWCA) or equivalent as determined by the adopting entity third-party qualified water efficient grasses are used. **3**

~~(6) Where artificial or synthetic turf is installed in Dry climate zones in accordance with Table A200, instead of natural turf for common recreation, sport or play fields, Synthetic Turf Council (STC) or equivalent industry association qualified artificial turf is used. ....~~

(~~7~~6) For landscaped vegetated areas, the maximum percentage of all turf areas is:

(a) greater than 40% to less than or equal to 60% **2**

(b) greater than 20% to less than or equal to 40% **3**

(c) greater than 0% to less than or equal to 20% **4**

(d) 0% **5**

POINTS

~~(8) For landscaped vegetated areas, the maximum percentage of all artificial turf areas is (only applicable in Dry climate zones in accordance with Table A200):~~

~~(a) greater than 40% to less than or equal to 60% ..... 2~~

~~(b) greater than 20% to less than or equal to 40% ..... 3~~

~~(c) greater than 0% to less than or equal to 20% ..... 4~~

~~(d) 0% ..... 5~~

(~~9~~7) Plants with similar watering needs are grouped (hydrozoning) and shown on the lot plan. **5**

(~~10~~8) Summer shading by planting installed to shade not less than 30% of building walls. To conform to summer shading, the effective shade coverage (five years after planting) is the arithmetic mean of the shade coverage calculated at 10 am for eastward facing walls, noon for southward facing walls, and 3 pm for westward facing walls on the summer solstice. **5**

(~~11~~9) Vegetative wind breaks or channels are designed to protect the lot and immediate surrounding lots as appropriate for local conditions. **4**

(~~6~~10) Where artificial or synthetic turf is installed in Dry climate zones in accordance with Table A200, instead of natural turf for common recreation, sport or play fields, Synthetic Turf Council (STC) or equivalent industry association qualified artificial turf is used. .....

(~~8~~11) For landscaped vegetated areas, the maximum percentage of all artificial turf areas is (only applicable in Dry climate zones in accordance with Table A200):

(a) greater than 40% to less than or equal to 60% .....

(b) greater than 20% to less than or equal to 40% .....

(c) greater than 0% to less than or equal to 20% .....

(d) 0% .....

~~(12) 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~~

(13~~) An integrated pest management plan is developed to minimize chemical use in pesticides and~~12 fertilizers. **4**

(~~12~~13) . 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**

(14) Developer has a plan for removal or containment of invasive plants from the disturbed areas of the site. **3**

(15) Developer implements a plan for removal or containment of invasive plants on the undisturbed areas of the site. **6**

11.503.6 Wildlife habitat. Measures are planned to support wildlife habitat and include at least two of the following:

(1) Plants and gardens that encourage wildlife, such as bird and butterfly gardens. **3**

POINTS

(2) Inclusion of a certified "backyard wildlife" program. **3**

(3) The lot is adjacent to a wildlife corridor, fish and game park, or preserved areas and is designed with regard for this relationship. **3**

(4) Outdoor lighting techniques are utilized with regard for wildlife. **3**

11.503.7 Environmentally sensitive areas. The lot is in accordance with one or both of the following:

(1) The lot does not contain any environmentally sensitive areas that are disturbed during remodeling. ... **4**

(2) On lots with environmentally sensitive areas, mitigation and/or restoration is conducted to preserve ecosystem functions lost through remodeling activities. **4**

11.504 LOT CONSTRUCTION

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

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

11.504.2 Trees and vegetation. Designated trees and vegetation are preserved by one or more of the following:

(1) Fencing or equivalent is installed to protect trees and other vegetation. **3**

(2) Trenching, significant changes in grade, and compaction of soil and critical root zones in all "tree save" areas as shown on the lot plan are avoided. **5**

(3) Damage to designated existing trees and vegetation is mitigated during construction through pruning, root pruning, fertilizing, and watering. **4**

11.504.3 Soil disturbance and erosion implementation. On-site soil disturbance and erosion during remodeling are minimized by one or more of the following in accordance with the SWPPP or applicable plan: (also see § 11.503.3)

(1) Sediment and erosion controls are installed on the lot and maintained in accordance with the stormwater pollution prevention plan, where required. **5**

(2) Limits of clearing and grading are staked out on the lot. **5**

(3) "No disturbance" zones are created using fencing or flagging to protect vegetation and sensitive areas on the lot from construction activity. **5**

(4) Topsoil from either the lot or the site development is stockpiled and stabilized for later use and used to establish landscape plantings on the lot. **5**

(5) Soil compaction from construction equipment is reduced by distributing the weight of the equipment over a larger area (laying lightweight geogrids, mulch, chipped wood, plywood, OSB, metal plates, or other materials capable of weight distribution in the pathway of the equipment). **4**

POINTS

(6) Disturbed areas on the lot that are complete or to be left unworked for 21 days or more are stabilized within 14 days using methods as recommended by the EPA, or in the approved SWPPP, where required. **3**

(7) Soil is improved with organic amendments and mulch. **3**

(8) Newly installed utilities on the lot are installed using one or more alternative means (e.g., tunneling instead of trenching, use of smaller equipment, use of low ground pressure equipment, use of geomats, shared utility trenches or easements). **5**

11.505 INNOVATIVE PRACTICES

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

11.505.1 Driveways and parking areas. Driveways and parking areas are minimized or mitigated by one or more of the following:

(1) Off-street parking areas or driveways are shared. Waivers or variances from local development regulations are obtained to implement such practices, where required. **5**

(2) In ~~a~~ multifamily and mixed-use projects, parking capacity does not exceed the local minimum requirements. **5**

(3) Structured parking is utilized to reduce the footprint of surface parking areas.

(a) greater than or equal to 25% to less than 50% **4**

(b) greater than or equal to 50% to less than 75% **5**

(c) greater than or equal to 75% **6**

11.505.2 Heat island mitigation. Heat island effect is mitigated by one or both of the following. **4**

(1) Hardscape: Not less than 50% of the surface area of the hardscape on the lot complies with one or a combination of the following methods. **5**

(a) Shading of hardscaping: Shade is provided from existing or new vegetation (within five years) or from trellises. Shade of hardscaping is to be measured on the summer solstice at noon.

(b) Light-colored hardscaping: Horizontal hardscaping materials are installed with a solar reflectance index (SRI) of 29 or greater. The SRI is calculated in accordance with ASTM E1980. A default SRI value of 35 for new concrete without added color pigment is permitted to be used instead of measurements.

(c) Permeable hardscaping: Permeable hardscaping materials are installed.

(2) Roofs: Not less than 75% of the exposed surface of the roof is vegetated using technology capable of withstanding the climate conditions of the jurisdiction and the microclimate of the building lot. Invasive plant species are not permitted. **5**

11.505.3 Density. The average density on the lot on a net developable area basis is:

(1) greater than or equal to 7 to less than 14 dwelling units/sleeping units per acre (~~per~~ 0.4 ha~~, 047 m²~~) ... **4**

	POINTS
(2) greater than or equal to 14 to less than 21 dwelling units/sleeping units per acre (~~per~~ 0.4 ha~~,047 m²~~)	5
(3) greater than or equal to 21 to less than 35 dwelling units/sleeping units per acre (~~per~~ 0.4 ha~~,047 m²~~)	6
(4) greater than or equal to 35 to less than 70 dwelling units/sleeping units per acre (~~per~~ 0.4 ha~~,047 m²~~)	7
(5) greater than or equal to 70 dwelling units/sleeping units per acre (~~per~~ 0.4 ha~~,047 m²~~)	8
11.505.4 Mixed-use building	8
(1) The lot contains a mixed-use building.	5
11.505.5 Multifamily or mixed-use community garden(s). Local food production to residents or area consumers.	3
(a) A portion of the lot not less than 250 ft² (23.2 m²) is established as community garden(s) for the residents of the site. *[3 points awarded per 250 ft² (23.2 m²)]*	3 [9 max]
(b) Locate the project within a 0.5-mile (0.8 km) walking distance of an existing or planned farmers market/ farm stand that is open or will operate not less than once a week for not less than five months of the year.	3
(c) Areas and physical provisions are provided for composting.	1
(d) Signs designating the garden area are posted.	1
11.505.6 Multi-unit plug-in electric vehicle charging. Plug-in electric vehicle charging capability is provided for 5% or more of parking spaces. *[An additional 4 points can be earned for each percentage point above 5% for a maximum of 20 points]*	4 [20 max]

Fractional values shall be rounded up to the nearest whole number. Electrical capacity in main electric panels supports Level 2 charging (208/240V – up to 80 amps or in accordance with SAE J1772). Each stall is provided with conduit and wiring infrastructure from the electric panel to support Level 2 charging (208/240V – up to 80 amps or in accordance with SAE J1772) service to the designated parking spaces, and parking spaces are equipped with either Level 2 charging AC grounded outlets (208/240V – up to 80 amps or in accordance with SAE J1772) or Level 2 charging stations (208-240V – up to 80 amps or in accordance with SAE J1772) by a third-party charging station.

11.505.6.1 Multi-family and mixed-use residence plug-in electric vehicle charging. Plug-in electric vehicle charger is provided for 2% or more of parking spaces~~stalls~~. *[An additional 4 points can be earned for each percentage point above 2% for a maximum of 20 points]*	4 [20 max]

Fractional values shall be rounded up to the nearest whole number. Electrical capacity in main electric panels supports Level 2 charging (208/240V – up to 80 amps or in accordance with SAE J1772). Each stall is provided with conduit and wiring infrastructure from the electric panel to support Level 2 charging (208/240V – up to 80 amps or in accordance with SAE J1772) service to the designated stalls, and stalls are equipped with either Level 2 charging AC grounded outlets (208/240V – up to 80 amps or in accordance with SAE J1772) or Level 2 charging stations (208-240V – up to 80 amps or in accordance with SAE J1772) by a third-party charging station.

11.505.6.2 Multi-family and mixed-use residence plug-in electric vehicle charging capability. Plug-in *electric vehicle charging capability* is provided for 2% or more of parking spaces~~stalls~~. *[An additional 2 points can be earned for each percentage point above 2% for a maximum of 10 points]*	2 [10 max]

Where points are awarded in § 11.505.6.1 or § 11.505.6.2, points shall not be awarded in § 11.707.8.

POINTS

11.505.7 Multifamily and mixed-use residential CNG vehicle fueling. CNG vehicle residential fueling appliances are provided for not less than 1% of the parking spaces. The CNG fueling appliances shall be listed in accordance with ANSI/CSA NGV 5.1 and installed according to the appliance manufacturer's installation instructions. **4**

11.505.8 Street network. Project is located in an area of high intersection density..... **5**

11.505.9 Smoking prohibitions. Signs are provided on multifamily and mixed-use lots prohibiting smoking at the following locations:

(a) Smoking is prohibited within 25 ft (7.6~~5~~ m) of all building exterior doors and operable windows or building air intakes within 15 vertical feet (4.6~~5~~ m) of grade or a walking surface. **3**

(b) Smoking is prohibited on decks, balconies, patios and other occupied exterior spaces. **3**

(c) Smoking is prohibited at all parks, playgrounds, and community activity or recreational spaces. ... **3**

11.505.10 Exercise and recreational space. For multifamily and mixed-use buildings, on-site dedicated recreation space for exercise or play opportunities for adults and/or children open and accessible to residents is provided.

(a) A dedicated area not less than 400 ft^2 (37.16 m^2) is provided inside the building with adult exercise and/or children's play equipment. **3**

(b) A courtyard, garden, terrace, or roof space not less than 10% of the lot area that can serve as outdoor space for children's play and /or adult activities is provided. **3**

(c) Active play/recreation areas are illuminated at night to extend opportunities for physical activity into the evening. **3**

11.505.11 Light pollution reduction. Lighting for all exteriors of, and areas associated with the building complies with the vertical and horizontal illuminance and uniformity recommendations for the lighting zone as applicable to not less than one of the following:

(a) IES RP-33-14, IECC, or ANSI/ASHRAE/IESNA Standard 90.1..... **2**

(b) Exterior light fixtures are installed that comply with Backlight, Uplight, and Glare (BUG) ratings applicable to the site's lighting zone. Ratings are in accordance with IDA/IES Model Lighting Ordinance (MLO) 2011, Table C. **2**

(c) Exterior lighting is installed that does not emit light above a horizontal plane such as IES designated "Zero Uplight", or "fully shielded" fixtures. Uplighting that is shielded by architectural features is exempt. **2**

11.505.12 Wildfire resilience

(1) Defensible space is part of the construction site plan.

(a) Within 0 - 5 feet (0-1.5 m) of the building only hardscapes and succulents are used for landscaping. **1**

(b) Within 5 - 30 feet (1.5 - 9.1 m) of the building thin trees and shrubbery, and no undergrowth for vegetation and no accessory buildings are present. *[1 point for projects in WUI area]*..... **1**

(c) Non-combustible fencing is used. **1**

POINTS

(2) Water sources (ponds, swimming pools, wells etc.) are available, readily accessible, and equipped for fire-fighting use. *[1 point for projects in a WUI area].* **1**

11.505.13 Battery storage system. A battery storage system of not less than 6 kWh of available capacity is installed that stores electric energy from an on-site renewable electric generation system or is grid-interactive or can perform both functions. **2**

11.601 QUALITY OF CONSTRUCTION MATERIALS AND WASTE

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

11.601.1 Conditioned floor area. Finished floor area of a dwelling unit or sleeping unit after the remodeling is limited. Finished floor area is calculated in accordance with ANSI Z765 for single family and ANSI/BOMA Z65.4 for multifamily and mixed-use buildings. Only the finished floor area for stories above grade plane is included in the calculation.
[For every 100 ft² (9.29 m²) over 4,000 ft² (37~~2~~1.61 m²), 1 point is to be added the threshold points shown in Table 305.3.7 for each rating level.]

(1) less than or equal to 700 ft² (65.03 m²) **14**

(2) less than or equal to 1,000 ft² (92.9~~3~~ m²) **12**

(3) less than or equal to 1,500 ft² (139.4 m²) **9**

(4) less than or equal to 2,000 ft² (185.81~~6~~ m²) **6**

(5) less than or equal to 2,500 ft² (232.2 m²) **3**

(6) greater than 4,000 ft² (371.62~~2~~ m²) ..... **Mandatory**

***Multifamily and Mixed-Use Building Note**: For ~~a~~ multifamily and mixed-use buildings, a weighted average of the individual unit sizes is used for this practice.*

11.601.2 Material usage. Newly installed structural systems are designed, or construction techniques are implemented, to reduce and optimize material usage.
[Points awarded only when the newly installed portion of each structural system comprises not less than 25% of the total area of that structural system after the remodel] ..... **9 max**

(1) Minimum structural member or element sizes necessary for strength and stiffness in accordance with advanced framing techniques or structural design standards are selected. **3**

(2) Higher-grade or higher-strength of the same materials than commonly specified for structural elements and components in the building are used and element or component sizes are reduced accordingly. **3**

(3) Performance-based structural design is used to optimize lateral force-resisting systems. **3**

11.601.3 Building dimensions and layouts. Building dimensions and layouts are designed to reduce material cuts and waste. This practice is used for not less than 80% of the newly installed areas:
[Points awarded only when the newly installed area of the building comprises not less than 25% of the total area of that element of the building after the remodel]

(1) floor area **3**

POINTS

(2) wall area **3**

(3) roof area **3**

(4) cladding or siding area **3**

(5) penetrations or trim area **1**

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

11.601.5 Prefabricated components. Precut or preassembled components, or panelized or precast assemblies are utilized for not less than 90% for the following system or building:
[Points awarded only when the newly installed system comprises not less than 25% of the total area of that system of the building after the remodel] ..... **13 max**

(1) floor system **4**

(2) wall system **4**

(3) roof system **4**

(4) modular construction for any new construction located above grade **13**

11.601.6 Stacked stories. Stories above grade are stacked, such as in 1½-story, 2-story, or greater structures. The area of the upper story is not less than 50% of the area of the story below, based on areas with a ceiling height not less than 7 ft (~~2,134 m~~2.1 m). ..... **8 max**

(1) first stacked story **4**

(2) for each additional stacked story **2**

11.601.7 Prefinished materials. Prefinished building materials or assemblies listed below have no additional site-applied finishing material are installed. ..... ~~**12**~~ **6 max**

(a) interior trim not requiring paint or stain.

(b) exterior trim not requiring paint or stain.

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

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

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

(1) Percent of prefinished building materials or assemblies installed:
[Points awarded for each type of material or assembly.]

(a) greater than or equal to 35% to less than 50% (after the remodel) **1**

(b) greater than or equal to 50% to less than 90% (after the remodel) **2**

POINTS

(c) greater than or equal to 90% (after the remodel) ..... ~~5~~3

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

11.601.9 Universal design elements. Dwelling incorporates one or more of the following universal design elements. Conventional industry tolerances are permitted. ..... ~~12~~ 6 **max**

(1) Any no-step entrance into the dwelling which 1) is accessible from a substantially level parking or drop-off area (no more than 2%) via an accessible path which has no individual change in elevation or other obstruction of more than 1-1/2 in. (3.8 cm) in height with the pitch not exceeding 1 in 12; and 2) provides not less than a 32-in. (81 cm) wide clearance into the dwelling. ..... ~~3~~2

(2) Not less than a 36-in. (91 cm) 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 not less than a 32-in. (81 cm) clear door width and a 30-in. (76 cm) by 48-in. (122 cm) clear area inside the bathroom outside the door swing. ..... ~~3~~2

(3) Not less than36-in. (91 cm) wide accessible route from the no-step entrance into at least one bedroom which has no less than a 32-in. (81 cm) clear door width. ..... ~~3~~2

(4) Blocking or equivalent installed in the accessible bathroom walls for future installation of grab bars at water closet and bathing fixture, where applicable. **1**

(5) All interior and exterior door handles are levers rather than knobs. **1**

(6) All sink, lavatory and showering controls comply with ICC A117.1. ..... **1**

(7) Interior convenience power receptacles, communication connections (for cable, phone, Ethernet, etc.) and switches are placed between 15 in. (38 cm) and 48 in. (122 cm) above the finished floor. Additional switches to control devices and systems (such as alarms, home theaters and other equipment) not required by the local building code may be installed as desired. **1**

(8) All light switches are rocker-type switches or other similar switches that can be operated by pressing them (with assistive devices) – no toggle-type switches may be used. **1**

(9) Anyone of the following systems are automated and can be controlled with a wireless device or voice-activated device: HVAC, all permanently installed lighting, alarm system, window treatments, or door locks. *[1 point awarded per system]* ..... **1 [5 max]**

11.602 ENHANCED DURABILITY AND REDUCED MAINTENANCE

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

11.602.1 Moisture management – building envelope

11.602.1.1 Capillary breaks

11.602.1.1.1 A capillary break and vapor retarder are installed at concrete slabs in accordance with IRC Sections R506.2.2 and R506.2.3, or IBC Sections 1907 and 1805.4.1.
*[*This practice is not mandatory for existing slabs without apparent moisture problem.]* ..... **Mandatory ***

	POINTS
11.602.1.1.2 A capillary break to prevent moisture migration into foundation wall is provided between the footing and the foundation wall on all new foundations, and on not less than 25% of the total length of the foundation after the remodel.....	~~3~~1
11.602.1.1.3 No less than a 10-mil (254 µm) vapor retarder complying with ASTM E1745 is installed in accordance with ASTM E1643.	~~3~~1
11.602.1.1.4 No less than a 15-mil (381 µm) vapor retarder complying with ASTM E1745 with water vapor permeance rating below 0.01 US perms (0.572 ng/Pa • s • m²)~~[grains/(ft²*hr*in-Hg)]~~ is installed in accordance with ASTM E1643.	~~6~~3
~~**11.602.1.1.2** A capillary break to prevent moisture migration into foundation wall is provided between the footing and the foundation wall on all new foundations, and on not less than 25% of the total length of the foundation after the remodel.....~~	~~3~~
11.602.1.2 Foundation waterproofing. Enhanced foundation waterproofing is installed on all new foundations, and on not less than 25% of the total length of the foundation after the remodel using one or both of the following:	**4**
(1) rubberized coating, or	
(2) drainage mat	
11.602.1.3 Foundation drainage	
11.602.1.3.1 Where required by the IRC or IBC for habitable and usable spaces below grade, exterior drain tile is installed. *[*This practice is not mandatory for existing slabs without apparent moisture problem.]*.....	**Mandatory ***
11.602.1.3.2 Interior and exterior foundation perimeter drains are installed and sloped to discharge to daylight, dry well, or sump pit on all new foundations and not less than 25% of the total length of the foundation after the remodel.....	**4**
11.602.1.4 Crawlspaces	
11.602.1.4.1 Vapor retarder for all new unconditioned vented crawlspace foundations and not less than 25% of the total area after the remodel is in accordance with the following, as applicable. Joints of vapor retarder overlap not less than 6 in. (15~~2 mc~~m) and are taped.	
(1) Walls. Dampproof walls are provided below finished grade. *[*This practice is not mandatory for existing walls without apparent moisture problem.]*.....	**Mandatory ***
(2) Floors. Class I vapor retarder installed on the crawlspace floor and extended not less than 6 in. (15 cm) up the wall and is attached and sealed to the wall.....	**6**
(3) Floors. Class I vapor retarder which complies with ASTM E1745 installed on the crawlspace floor and extended not less than 6 in. (15 cm) up the wall and is attached and sealed to the wall.	**8**
11.602.1.4.2 For all new foundations and not less than 25% of the total area of the crawlspace after the remodel, crawlspace that is built as a conditioned area is sealed to prevent outside air infiltration and provided with conditioned air at a rate not less than 0.02 cfm/sf (0.102 L/s/m²) ~~(.009 L/s) per ft²~~ of horizontal area and one of the following is implemented:	
(1) Class I vapor retarder installed in accordance with IRC Section R408.3. *[*This practice is not mandatory for existing foundations without apparent moisture problem.]*.....	**Mandatory ***

POINTS

(2) a concrete slab over 6 mil (152 µm) polyethylene sheeting or other Class I vapor retarder installed in accordance with IRC Section R408.3 or Section R506. ..... **8**

(3) a vapor retarder which complies with ASTM E1745 and is not less than 10-mil (254 µm) thick installed on the crawlspace floor and extended not less than 6 in. (15 cm) up the wall and is attached and sealed to the wall. **8**

11.602.1.5 Termite barrier. Continuous physical foundation termite barrier provided:

(1) In geographic areas that have moderate to heavy infestation potential in accordance with Figure 6(3), a no or low toxicity treatment is also installed. **4**

(2) In geographic areas that have a very heavy infestation potential in accordance with Figure 6(3), in addition a low toxicity bait and kill termite treatment plan is selected and implemented. **4**

11.602.1.6 Termite-resistant materials. In areas of termite infestation probability as defined by Figure 6(3), termite-resistant materials are used as follows:

(1) In areas of slight to moderate termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings within the first 2 ft (0.610 ~~m~~m) above the top of the foundation. **2**

(2) In areas of moderate to heavy termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings within the first 3 ft (0.914 ~~m~~m) above the top of the foundation. **4**

(3) In areas of very heavy termite infestation probability: for the foundation, all structural walls, floors, concealed roof spaces not accessible for inspection, exterior decks, and exterior claddings. **6**

11.602.1.7 Moisture control measures

11.602.1.7.1 Moisture control measures are in accordance with the following:

(1) Building materials with visible mold are not installed or are cleaned or encapsulated prior to concealment and closing. **2**

(2) Insulation in cavities is dry in accordance with manufacturer's instructions when enclosed (e.g., with drywall). ..... **2 Mandatory**

(3) The moisture content of lumber is sampled to ensure it does not exceed 19% prior to the surface and/or cavity enclosure. **4**

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

11.602.1.7.3 Building envelope assemblies that are designed for moisture control based on documented hygrothermal simulation or field study analysis. Hygrothermal analysis shall comply with ASHRAE 160 or equivalent criteria and shall incorporate representative climatic conditions, interior conditions and include heating and cooling seasonal variation. **4**

11.602.1.8 Water-resistive barrier. Where required by the IRC or IBC, a water-resistive barrier and/or drainage plane system is installed behind newly installed exterior veneer and/or siding and where there is evidence of a moisture problem. ..... **Mandatory**

POINTS

11.602.1.9 Flashing. Flashing is provided as follows to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details are provided in the construction documents and are in accordance with the fenestration manufacturer's instructions, the flashing manufacturer's instructions, or as detailed by a registered design professional.

[Points awarded only when practices (2)-(7) are implemented in all newly installed construction and not less than 25% of the applicable building elements for the entire building after the remodel.]

(1) Flashing is installed at all the following locations, as applicable:
*[*These practices are not mandatory for existing building elements without apparent moisture problem.]*..... **Mandatory ***

(a) around exterior fenestrations, skylights and doors;

(b) at roof valleys;

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

(d) at roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets (e.g., kickout and step flashing);

(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 eave and rake edges; and

(i) all window and door heads and jambs ~~flashing.; and~~

~~(j) roof kickout and step flashing.~~

(2) All window and door head and jamb flashing is either self-adhered flashing complying with AAMA 711 or liquid applied flashing complying with AAMA 714 and installed in accordance with flashing fenestration or manufacturer's installation instructions..... ~~2~~1

(3) Sill or pan flashing is installed at sills of all exterior windows and doors ..... ~~3~~1

(4) Seamless, preformed kickout flashing, or prefabricated metal with soldered seams is provided at all roof-to-wall intersections. The type and thickness of the material used for roof flashing including but not limited kickout and step flashing is commensurate with the anticipated service life of the roofing material..... ~~3~~1

(5) Through-wall flashing is installed at transitions between wall cladding materials, or wall construction types..... **2**

(6) Flashing is installed at expansion joints in stucco walls..... **2**

11.602.1.10 Rainscreen systems. A rainscreen system as follows is used in exterior wall assemblies. ..... **4 max**

(1) A system designed with not less than a 3/16-in. (0.476 cm) ventilated and drained space exterior to the water-resistive barrier for buildings not greater than 3 stories or 3/8-in. (0.953 cm) ventilated and drained space exterior to the water-resistive barrier for buildings greater than 3 stories. The space shall allow for ventilation to the exterior at top and bottom of the wall, and shall be integrated with flashing details with a clear drainage path to the exterior; or..... **4**

POINTS

(2) A cladding material or a water-resistive barrier with enhanced drainage, complying with 90% drainage efficiency determined in accordance with ASTM E2273 or Annex A2 of ASTM E2925. ..... **2**

11.602.1.11 Exterior doors. Entries at exterior door assemblies, inclusive of side lights (if any), are covered by one of the following methods to protect the building from the effects of precipitation and solar radiation. Either a storm door or a projection factor of not less than 0.375 is provided. Eastern- and western-facing entries in Climate Zones 1, 2, and 3, as determined in accordance with Figure 6(1) or Appendix A, have either a storm door or a projection factor of not less than 1.0 , unless protected from direct solar radiation by other means (e.g., screen wall, vegetation).
[2 points awarded per exterior door] ..... **2 [6 max]**

(a) installing a porch roof or awning

(b) extending the roof overhang

(c) recessing the exterior door

(d) Installing a storm door

11.602.1.12 Tile backing materials. Tile backing materials installed under tiled surfaces in wet areas are in accordance with ASTM C1178, C1278, C1288, or C1325.
*[*This practice is not mandatory for existing tile surfaces without apparent moisture problem.]* ..... **Mandatory ***

11.602.1.13 Roof overhangs. Roof overhangs, in accordance with Table 11.602.1.13, are provided over not less than 90% of exterior wall area to protect the building envelope. **4**

Table 11.602.1.13

Minimum Roof Overhang for One- & Two-Story Buildings		
Inches of Rainfall [(1)]	Eave Overhang (In.)	**Rake Overhang (In.)**
≤40 (102 cm)	12 (30 cm)	12 (30 cm)
>40~~1~~ and ≤70 (>102 and ≤ 178 cm)	18 (46 cm)	12 (30 cm)
>70 (178 cm)	24 (61 cm)	12 (30 cm)

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

11.602.1.14 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 IRC or IBC at roof eaves of pitched roofs and extends not less than 24 in. (61~~0 mc~~m) inside the exterior wall line of the building. ..... **Mandatory**

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

(1) All horizontal ledgers are sloped away to provide gravity drainage as appropriate for the application. . **1 Mandatory**

(2) No roof configurations that create horizontal valleys in roof design. **2**

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

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

POINTS

(1) An initial SRI of not less than 78 for low-sloped roof (a slope less than 2:12) and an initial SRI of not less than 29 for a steep-sloped roof (a slope equal to or greater than 2:12). The SRI is calculated in accordance with ASTM E1980 or roof products that are rated and labeled in accordance with the ANSI/CRRC S100 Program.

(2) a vegetated roof system

11.602.3 Roof water discharge. A gutter and downspout system or splash blocks and effective grading are provided to carry water not less than 5 ft (1.5~~24 m~~m) away from perimeter foundation walls. **4**

11.602.4 Finished grade

11.602.4.1 Finished grade at all sides of a building is sloped to provide not less than 6 in. (15~~2 m~~cm) of fall within 10 ft (3~~048 m~~m) of the edge of the building. Where lot lines, walls, slopes, or other physical barriers prohibit 6 in. (15~~2 m~~cm) of fall within 10 ft (3~~048 m~~m), the final grade is sloped away from the edge of the building at a slope no less than 2%. ..... **Mandatory**

11.602.4.2 The final grade is sloped away from the edge of the building at a slope no less than 5%. **1**

11.602.4.3 Water is directed to drains or swales to ensure drainage away from the structure. **1**

11.602.5 Kitchen and vanity cabinets. All kitchen and vanity cabinets are certified in accordance with the ANSI/KCMA A161.1 performance standard or equivalent. **2**

11.603 REUSED OR SALVAGED MATERIALS

11.603.0 Intent. Practices that reuse or modify existing structures, salvage materials for other uses, or use salvaged materials in the building's construction are implemented.

~~**11.603.1 Reuse of existing building.** Major elements or components of existing buildings and structures are reused, modified, or deconstructed for later use.~~
~~*[1 Point awarded for every 200 ft² (18.58 m²) of floor area.]* ..... **1 [12 max]**~~

11.603.1 Reuse of existing building. Major components of the existing building structure are reused or deconstructed for later use. Points are awarded according to the below as a percentage of the reused floor area or surface area as applicable.

The reuse calculation is based on the percentage of the building reused, including both new and existing areas.

(a) 20% **2**

(b) 40% **3**

(c) 60% **4**

(d) 80% **5**

(e) 100% **6**

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% of the total construction cost. *[1 Point awarded per 1% of salvaged materials used based on the total construction cost. Materials, elements, or components awarded points under § 11.603.1 shall not be awarded points under § 11.603.2.]* .... **1 [9 max]**

POINTS

11.603.3 Scrap materials. Sorting and reuse of scrap building material is facilitated (e.g., a central storage area or dedicated bins are provided)..... **4**

11.604 RECYCLED-CONTENT BUILDING MATERIALS

11.604.1 Recycled content

(1) Percentage of building materials with recycled content calculated by cost, weight, or volume are not less than the following:

Exception: Exclude mechanical, electrical, and plumbing materials from total material cost.

(a) 10%..... **2**

(b) 15%..... **3**

(c) 20%..... **4**

(d) 25%..... **5**

(e) 30%..... **6**

(2) Building materials with not less than 20% pre- or post- consumer recycled content are used for at least 4 minor components or 2 major components..... **1**

11.604.2 Cementitious~~Concrete~~ materials

(1) Use supplementary cementitious materials instead of Portland cement ~~in concrete~~ with not less than the following:

(a) 20% supplementary cementitious material ..... **~~1~~3**

(b) 30% supplementary cementitious material ..... **~~3~~5**

(c) 40% supplementary cementitious material ..... **~~5~~7**

(2) Include recycled content aggregate for not less than 10% of aggregate material..... **~~1~~3**

[Points not awarded if points are taken for cementitious material under 11.604.1.]

11.605 RECYCLED CONSTRUCTION WASTE

11.605.0 Intent. Waste generated during construction is recycled.

11.605.1 Hazardous waste. The construction waste management plan shall include information on the proper handling and disposal of hazardous waste. Hazardous waste is properly handled and disposed..... **Mandatory**

11.605.2 Construction waste management plan

(1) A construction waste management plan is developed, posted at the jobsite, and implemented, diverting through methods such as reuse, salvage, recycling, or manufacturer reclamation, not less than 30% (by weight) of nonhazardous construction and demolition waste from disposal. For this practice, land-clearing debris is not considered a construction waste. Materials used as alternative daily cover are considered construction waste and do not count toward recycling or salvaging..... **Mandatory**

POINTS

(a) Divert not less than 50% of construction and demolition waste from disposal. **4**

(b) Divert not less than 50% of construction and demolition waste from disposal. **6**

Exceptions: 1) Waste materials generated from land clearing, soil and sub-grade excavation and vegetative debris shall not be in the calculations; and 2) a recycling or comingled recycling facility (traditional or E-Waste) offering material receipt documentation is not available within 50 miles (80 km) of the jobsite.

(2) Areas that don't have local construction waste recycling services per exception 2 develop and implement a plan that diverts or reduces waste generation for not less than 2 materials (e.g., cardboard, metals). **3**

(3) For remodeling projects or demolition of an existing facility, the waste management plan includes the recycling of 95% of electronic waste components (such as printed circuit boards from computers, building automation systems, HVAC, and fire and security control boards), by an E-Waste recycling facility. **3**

11.605.3 On-site recycling. On-site recycling measures following applicable regulations and codes are implemented, such as the following: **7**

(a) Materials are ground or otherwise safely applied on-site as soil amendment or fill. Not less than 50% (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 in accordance with § 11.901.2.1(2) will be available for on-site renewable energy.

11.605.4 Recycled construction materials. Construction materials (e.g., wood, cardboard, metals, drywall, plastic, asphalt roofing shingles, or concrete) are recycled offsite. ..... **6 max**

(1) not less than two types of materials are recycled **3**

(2) for each additional recycled material type **1**

11.606 RENEWABLE MATERIALS

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

11.606.1 Biobased products. The following biobased products are used: ..... **8 max**

(a) certified solid wood in accordance with § 11.606.2.

(b) engineered wood.

(c) bamboo.

(d) cotton.

(e) cork.

(f) straw.

POINTS

(g) natural fiber products made from crops (soy-based, corn-based).

(h) biobased materials that are USDA Biopreferred certified~~qualified~~.

(i) other biobased materials with not less than 50% biobased content (by weight or volume). Biobased content originating from a *Mass Balance Approach* shall have external validation.

(1) Two types of biobased materials are used, each for more than 0.5% of the project's projected building material cost. **3**

(2) Two types of biobased materials are used, each for more than 1% of the project's projected building material cost. **6**

(3) For each additional biobased material used for more than 0.5% of the project's projected building material cost. ..... **1 [2 max]**

11.606.2 Wood-based products. Wood or wood-based products are certified to the requirements of one of the following recognized product programs:

(a) American Forest Foundation's American *Tree Farm System*® (ATFS).

(b) Canadian Standards Association's *Sustainable Forest Management System Standards* (CSA Z809).

(c) *Forest Stewardship Council* (FSC).

(d) *Program for Endorsement of Forest Certification Systems* (PEFC).

(e) *Sustainable Forestry Initiative® Program* (SFI).

(f) *National Wood Flooring Association's Responsible Procurement Program* (RPP).

(g) other product programs mutually recognized by PEFC.

(h) A manufacturer's fiber procurement system that has been audited by an approved agency as compliant with the provisions of ASTM D7612 as a responsible or certified source. Government or tribal forestlands whose water protection programs have been evaluated by an approved agency as compliant with the responsible source designation of ASTM D7612 are exempt from auditing in the manufacturer's fiber procurement system.

(1) All tropical wood products used for major and minor components are responsibly sourced in accordance with ASTM D7612 or certified to one of the listed standards. ..... **Mandatory**

(2) Not less than 10% of permanently installed wood material, by cost, or area shall be certified to one of the standards listed. Alternatively, 1 major component or 2 minor components certified to a standard listed below comply. ..... **~~2~~4**

(3) Not less than 30% of permanently installed wood material, by cost, or area shall be certified to one of the standards listed. Alternatively, 2 major components or 3 minor components certified to a standard listed below comply. ..... **~~3~~5**

(4) Not less than 50% of permanently installed wood material, by cost, or area shall be certified to one of the standards listed. Alternatively, 3 major components or 4 minor components certified to a standard listed below comply. ..... **~~4~~6**

11.606.3 Manufacturing energy. Materials are used for major components of the building that are manufactured using not less than 33% of the primary manufacturing process energy derived from **2 [6 max]**

POINTS

renewable sources, combustible waste sources, or renewable energy credits (RECs).
[2 points awarded per material].....

11.607 RECYCLING AND WASTE REDUCTION

11.607.1 Recycling and composting. Recycling and composting by the occupant are facilitated by one or more of the following methods:

(1) A readily accessible space(s) for recyclable material containers is provided and identified on the floorplan of the house or dwelling unitor a readily accessible area(s) outside the living space is provided for recyclable material containers and identified on the site plan for the house or building. The area outside the living space shall accommodate recycling bin(s) for recyclable materials accepted in local recycling programs..... **3**

(2) Provide recycling storage in multifamily and mixed-use common areas including a central storage area to meet the anticipated recycling volume. **2**

(3) A readily accessible space(s) for compostable material containers is provided and identified on the floorplan of the house or dwelling unit or a readily accessible area(s) outside the living space is provided for compostable material containers and identified on the site plan for the house or building. The area outside the living space shall accommodate composting container(s) for locally accepted materials, or, accommodate composting container(s) for on-site composting. **4**

11.607.2 Food waste disposers. Not less than one food waste disposer is installed at the primary kitchen sink. **1**

11.608 RESOURCE-EFFICIENT MATERIALS

11.608.1 Resource-efficient materials. Products containing fewer materials are used to achieve the same end-use requirements as conventional products, including but not limited to:
[3 points awarded per each material]..... **3 [9 max]**

(1) lighter, thinner brick with bed depth less than 3 in. (7.6 cm) and/or brick with coring of more than 25%.

(2) engineered wood or engineered steel products.

(3) roof or floor trusses.

11.609 REGIONAL MATERIALS

11.609.1 Regional materials. Regional materials are used for major and/or minor components of the building. *[2 points awarded per each major component and 1 per each minor component]* ..... **~~10~~ 8 max**

(1) Major component *[2 points awarded per each component]*..... **2**

(2) Minor component *[1 point awarded per each component]* **1**

For a component to comply with this practice, not less than 75% of all products in that component category shall be sourced regionally, e.g., stone veneer category – 75% or more of the stone veneer on a project shall be sourced regionally.

POINTS

11.610 LIFE CYCLE ASSESSMENT

11.610.1 Life cycle assessment. A life cycle assessment (LCA) tool is used to select environmentally preferable products, assemblies, or, entire building designs. Points are awarded in accordance with § 11.610.1.1 or § 11.610.1.2. Only one method of analysis or tool may be utilized. A reference service life for the building is 60 years for any life cycle analysis tool. Results of the LCA are reported in the manual required in § 11.1001.1 or § 11.1002.1(1) of this Standard in terms of the environmental impacts listed in this practice and it is stated if operating energy was included in the LCA..... **15 max**

11.610.1.1 Whole-building life cycle assessment. A whole-building LCA is performed in conformance with ASTM E2921, ISO 21931, EN 15978, or equivalent, while using ISO 14044 compliant life cycle assessment. .. **15 max**

(1) Execute LCA at the whole building level through a comparative analysis between the final and reference building designs as set forth under Standard Practice, ASTM E2921. The assessment criteria includes the following environmental impact categories: **8**

   (a) Primary energy use

   (b) Global warming potential

   (c) Acidification potential

   (d) Eutrophication potential

   (e) Ozone depletion potential

   (f) Smog potential

(2) Execute LCA on regulated loads throughout the building operations life cycle stage. Conduct simulated energy performance analyses in accordance with § 11.702.2.1 in establishing the comparative performance of final versus reference building designs. Primary energy use savings and global warming potential avoidance from simulation analyses results are determined using energy supplier, utility, or EPA electricity generation and other fuels energy conversion factors and electricity generation and other fuels emission rates for the locality or Sub-Region in which the building is located..... **5**

(3) Execute full LCA, including use-phase, through calculation of operating energy impacts (c) – (f) using local or regional emissions factors from energy supplier, utility, or EPA..... **2**

11.610.1.2 Life cycle assessment for a permanently installed 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, ISO 14025, and ISO 21930 or other equivalent internationally recognized standards that compare the environmental impact of products or assemblies using an LCA methodology..... **10 max**

11.610.1.2.1 Product LCA. A product with improved environmental impact measures compared to another product(s) intended for the same use is selected. **Per Table 11.610.1.2.1**

(1) All comparisons shall ensure the differences between products are significant and not due to the use of different assumptions, LCIs, LCA tools, LCIA methods, and/or database version(s). The environmental impact measures used in the assessment are selected from the following:..... **5 max**

   (a) Primary energy use

   (b) Global warming potential

POINTS

(c) Acidification potential

(d) Eutrophication potential

(e) Ozone depletion potential

(f) Smog potential

(2) An additional point for each product/system comparison, if externally validated. ..... **5 max**

[Points awarded for each product/system comparison where the optimized LCA results improved upon the global warming potential by at least 10% with the average of the other indicators not being worse than the baseline product/system.]

Table 11.610.1.2.1
Product LCA

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

11.610.1.2.2 Assembly LCA. An assembly with improved environmental impact measures compared to a functionally comparable assembly is selected. The full life cycle, from resource extraction to demolition and disposal (including but not limited to on-site construction, maintenance and replacement, material and product embodied acquisition, and process and transportation energy), is assessed. The assessment does not include electrical and mechanical equipment and controls, plumbing products, fire detection and alarm systems, elevators, and conveying systems. The following functional building elements are eligible for points under this practice: **Per Table 11.610.1.2.2 [10 max]**

(a) exterior walls

(b) roof/ceiling

(c) interior walls or ceilings

(d) intermediate floors

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

(a) Primary energy use

(b) Global warming potential

(c) Acidification potential

(d) Eutrophication potential

(e) Ozone depletion potential

(f) Smog potential

[Points are awarded based on the number of functional building elements that improve upon environmental impact measures by an average of 15%.]

Table 11.610.1.2.2
Assembly LCA

POINTS

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

11.611 PRODUCT DECLARATIONS

11.611.1 Product declarations. Not less than 10 different products installed in the building project, at the time of certificate of occupancy, comply with one of the following sub-sections. Declarations, reports, and assessments are submitted and contain documentation of the critical peer review by an independent third party, results from the review, the reviewer's name, company name, contact information, and date of the review. **5**

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

[Each product complying with § 11. 611.1.1 shall be counted as one product for compliance with § 611.1]

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

[Each product complying with § 11. 611.1.2 shall be counted as two products for compliance with § 611.1]

11.612 INNOVATIVE PRACTICES

11.612.1 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% or more of the estimated total building materials cost. *[1 point awarded per percent]*..... **1 [10 max]**

11.612.2 Sustainable products. One or more of the following products are used for not less than 30% of the floor or wall area of the entire dwelling unit or sleeping unit, as applicable. Products are certified by a third-party agency accredited to ISO 17065. ..... **9 max**

(1) greater than or equal to 50% of carpet installed (by square feet) is certified to NSF 140 or equivalent.. **3**

(2) greater than or equal to 50% of resilient flooring installed (by square feet) is certified to NSF 332 or equivalent. **3**

(3) greater than or equal to 50% of the insulation installed (by square feet) is certified to UL 2985 or equivalent. **3**

POINTS

(4) greater than or equal to 50% of interior wall coverings installed (by square feet) is certified to NSF 342 or equivalent. **3**

(5) greater than or equal to 50% of the door leafs installed (by number of door leafs) is certified to UL 102 or equivalent. **3**

(6) greater than or equal to 50% of the tile installed (by square feet) is certified to TCNA A138.1 Specifications for Sustainable Ceramic Tiles, Glass Tiles and Tile Installation Materials or equivalent. .. **3**

11.613 RESILIENT CONSTRUCTION

11.613.1 Vulnerability assessment. An assessment of the property's risks to climate, seismic, and natural disasters is performed by an approved professional. Strategies are identified to enable the project to adapt to and mitigate hazard risks. The assessment is shared with the Building Owner. **4**

11.613.2 ~~HUD~~ Designing for Natural Hazards series~~Guides~~ (~~Designing for Natural Hazards~~DNH). Building incorporates resilient construction guidance from the Designing for Natural Hazards series~~HUD Guides~~ (DNH Guides ~~Designing for Natural Hazards~~). Select guidance from the hazards category identified from ~~a maximum of two hazard categories identified by~~ the vulnerability assessment in § 11.613.1.
[Points awarded only for buildings where 11.613.1 is also awarded] ..... **16 max**

11.613.2.1 Wind Resilience. Practices listed on the following one-pager titles of the DNH ~~HUD~~ Guides (Volume 1: Wind) are met. *[0.5 point awarded per practice, 2 points max per one-pager]* ..... **8 max**

11.613.2.2 Water Resilience. Practices listed on the following one-pager titles of the DNH ~~HUD~~ Guides (Volume 2: Water) are met. *[0.5 point per practice, 2 points max per one-pager]* ..... **8 max**

11.613.2.3 Fire Resilience. Practices listed on the following one-pager titles of the DNH ~~HUD~~ Guides (Volume 3: Fire) are met. *[0.5 point per practice, 2 points max per one-pager]* ..... **8 max**

11.613.2.4 Earth Resilience. Practices listed on the following one-pager titles of the DNH ~~HUD~~ Guides (Volume 4: Earth) are met. *[0.5 point per practice, 2 points max per one-pager]*
OR
Building is designed for maximum considered earthquake hazard by a Licensed Professional Engineer with 3rd party review and document including detailed Site-Specific Hazard report ..... **8 max**

11.613.3 Resilient energy systems & passive survivability
[Points cannot be claimed for both (1) and (2)]

(1) On-site renewable energy systems with battery energy storage are designed and installed to provide emergency power for residents to safely shelter during power outages. **3**

(2) CARB compliant whole-building generators are designed and installed to provide emergency power for residents to safely shelter during power outages. **1**

(3) Water storage and purifications systems are designed and installed to provide potable water during power outages. **4**

POINTS

11.701 MINIMUM ENERGY EFFICIENCY REQUIREMENTS

11.701.1 Mandatory requirements. The building shall comply with § 11.702 (Performance Path), § 11.703 (Prescriptive Path), § 11.704 (ERI Target Path), or one of the pathways in § 11.701.1.4 through § 11.701.1.8 (Alternative Paths).

(1) § 11.701.1.1 Energy Consumption Reduction Path;

(2) § 11.701.1.2 Performance Path (§ 11.702);

(3) § 11.701.1.3 Prescriptive Path (§ 11.703);

(4) § 11.701.1.4 ERI Target Path (§ 11.704);

(5) § 11.701.1.5 Tropical Zone (§ 11.705); or

(6) § 11.701.1.6 EPA ENERGY STAR Score.

Items listed as "mandatory" in § 11.701.4 shall apply to § 11.702, § 11.703, and § 11.704 paths. Except where § 11.705 requirements are met, buildings in Tropical Climate shall comply with IECC Climate Zone 1 requirements~~Except where otherwise noted, buildings in the Tropical Climate Zone shall comply with Climate Zone 1 requirements~~.

11.701.1.1 Energy consumption reduction path. The energy efficiency rating level shall be based on the reduction in energy consumption resulting from the remodel in accordance with Table 305.2.5.1.

The reduction in energy consumption resulting from the remodel shall be based on the estimated annual energy cost savings, site energy savings, source energy savings, or carbon dioxide equivalent emissions (C02e) savings using methodology in ANSI/ASHRAE Standard 105 or IgCC or equivalent. The reduction shall be the percentage difference between the consumption per square foot before and after the remodel calculated as follows:

$$[(\text{consumption per square foot before remodel} - \text{consumption per square foot after remodel}) / \text{consumption per square foot before remodel}] * 100$$

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

If a building can demonstrate through documentation approved by the Adopting Entity that the remodel activities started prior to project registration, the energy baseline (consumption per square foot before remodel) can be calculated based on data and building systems that were existing in the building up to 3 years prior project registration.

11.701.1.~~1~~ 2 Minimum Performance Path requirements. A building complying with § 11.702 shall include not less than two practices from § 11.706, or not less than one practice from § 11.706 and not less than one practice from § 11.707.

11.701.1.~~2~~ 3 Minimum Prescriptive Path requirements. A building complying with § 11.703 shall obtain not less than 30 points from § 11.703 and shall include not less than two practices from § 11.706, or not less than one practice from § 11.706 and not less than one practice from § 11.707.

POINTS

11.701.1.~~3~~ 4 ERI Target Path requirements. A building complying with § 11.704 shall obtain not less than 30 points from § 11.704 and shall include not less than two practices from § 11.706, or not less than one practice from § 11.706 and not less than one practice from § 11.707.

11.701.1.5 Alternative Silver or Gold level compliance for Tropical Zones (§ 11.705). For buildings in the Tropical Zone, where more than 50 percent of the occupied space is not air conditioned and 100 percent of the occupied space is not heated. The building shall be awarded in accordance with the following:

(1) § 11.705.1 mandatory practices and § 11.705.2 Additional Tropical Zone practices – Silver **45**

(2) IECC Section R401.2.4 (Tropical Zone). Buildings without heating and 50% or less air-conditioned space in the Tropical Zone are eligible to earn Silver even if they are located above the IECC elevation limit – Silver **45**

(3) § 11.705.1 mandatory practices and § 11.705.3 Additional Tropical Zone practices – Gold..... **60**

[Points awarded shall not be combined with points from § 11.703 (Prescriptive Path), § 11.704 (ERI Target Path), or § 11.701.1.4 through § 11.701.1.8 (Alternative Paths)]

~~305.2.5.3~~11.701.1.6 EPA ENERGY STAR Score. The Multifamily or mixed-use property shall be scored in the EPA ENERGY STAR Portfolio Manager tool following EPA requirements and guidance or equivalent tool or program. This score is based on actual energy usage data. The last month in the 12-month energy data period for this energy score shall be within 6 months prior to acceptance by the Adopting Entity. Where total property energy data is not available, then the score can be generated with 100% actual common and non-residential area energy usage and not less than 80% of the actual resident energy meters which has been extrapolated to 100%. All energy data and extrapolation methods shall be reported. The level awarded for the energy chapter is based on Table 305.2.5.~~3~~.

Notwithstanding the above requirements, projects that have an energy score of 65-~~75~~74 shall achieve Bronze-level certification by implementing energy efficiency measures (EEM) that will improve the energy score to a level ~~above~~at least 75. ~~All~~ EEMs shall be completed and verified before submission to the Adopting Entity. All energy data, energy modeling, and the forecasted energy score shall be submitted to the Adopting Entity.

~~**11.701.1.4 Alternative Bronze level compliance**. Buildings that meet one of the following criteria:~~
~~*[Points awarded shall not be combined with points from § 11.703 (Prescriptive Path), § 11.704 (ERI Target Path), or 11.701.1.4 through 11.701.1.8 (Alternative Paths)]*~~ ..... ~~**30**~~

~~(1) qualifies as an ENERGY STAR National Single Family New Homes Version 3.1 building;~~

~~(2) qualifies as an ENERGY STAR National Multifamily New Construction Version 1.1 building; or~~

~~(3) complies with the IECC.~~

~~**11.701.1.5 Alternative Silver level compliance**. Buildings that meet one of the following criteria:~~
~~*[Points awarded shall not be combined with points from § 11.703 (Prescriptive Path), § 11.704 (ERI Target Path), or 11.701.1.4 through 11.701.1.8 (Alternative Paths)]*~~: ..... ~~**45**~~

~~(1) qualifies as an ENERGY STAR National Single Family New Homes Version 3.2 building; or~~

~~(2) qualifies as an ENERGY STAR National Multifamily New Construction Version 1.2 building.~~

~~(3) complies with the 2024 IECC.~~

POINTS

~~**11.701.1.6 Alternative Gold level compliance**. Buildings that meet one of the following criteria:~~
~~*[Points awarded shall not be combined with points from § 11.703 (Prescriptive Path), § 11.704 (ERI Target Path), or 11.701.1.4 through 11.701.1.8 (Alternative Paths)]*: ..... **60**~~

~~(1) complies with Chapter 7 of the IgCC, additionally, measured compartmentalization shall be no greater than 0.2 CFM50/sf (1 L/s/m²) of dwelling unit enclosure area, tested in accordance with ANSI/RESNET/ICC 380, ASTM E779, ASTM E1827, or ASTM E3158;~~

~~(2) qualifies as a DOE Zero Energy Ready Homes Single Family;~~

~~(3) qualifies as a DOE Zero Energy Ready Homes CA Single Family Version 2;~~

~~(4) qualifies as a DOE Zero Energy Ready Multifamily; or~~

~~(5) qualifies as a DOE Zero Energy Ready Homes CA Multifamily Version 2.~~

~~**11.701.1.7 Alternative Emerald level compliance.** Buildings that meet one of the following criteria:~~
~~*[Points awarded shall not be combined with points from § 703 (Prescriptive Path), § 11.704 (ERI Target Path), or 11.701.1.4 through 11.701.1.8 (Alternative Paths)]*: ..... **70**~~

~~(1) demonstrated to be net zero energy based on modeled site or source energy analysis;~~

~~(2) complies with the IECC Appendix CC Zero Energy Commercial Building provisions;~~

~~(3) complies with the IECC Appendix RC Zero Energy Residential Building provisions; or~~

~~(4) certified to PHIUS CORE or PHIUS ZERO.~~

~~**11.701.1.8 Alternative Silver or Gold level compliance for Tropical Zones (§ 11.705)**. For buildings in the Tropical Zone, where more than 50 percent of the occupied space is not air conditioned and 100 percent of the occupied space is not heated, and comply with one of the following:~~
~~*[Points awarded shall not be combined with points from § 11.703 (Prescriptive Path), § 11.704 (ERI Target Path), or 11.701.1.4 through 11.701.1.8 (Alternative Paths)]*~~

~~(1) § 11.705.1 mandatory practices and § 11.705.2 Additional Tropical Zone practices – Silver ..... **45**~~

~~(2) IECC Section R401.2.4 (Tropical Zone). Buildings without heating and 50% or less air-conditioned space in the Tropical Zone are eligible to earn Silver even if they are located above the IECC elevation limit – Silver ..... **45**~~

~~(3) § 11.705.1 mandatory practices and § 11.705.3 Additional Tropical Zone practices – Gold ..... **60**~~

11.701.2 Emerald level points. The Performance Path (§ 11.702), the ERI Target Path (§ 11.704), or the Alternative Emerald level compliance (§ 11.701.1.7) shall be used to achieve the Emerald level.

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

11.701.4 Mandatory practices

11.701.4.0 Minimum energy efficiency requirements. Additions, alterations, or renovations to an existing building, building system or portion thereof shall comply with the provisions of the IECC as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with the IECC. An addition complies with the IECC if the addition complies or if the existing building and addition comply with the IECC as a single building. ..... **Mandatory**

POINTS

11.701.4.1 HVAC systems

11.701.4.1.1 HVAC system sizing. Newly installed or modified space heating and cooling system is sized according to heating and cooling loads calculated using ACCA Manual J, or equivalent. New equipment is selected using ACCA Manual S or equivalent. ..... **Mandatory**

11.701.4.1.2 Radiant and hydronic space heating. Where installed as a primary heat source in the building, new radiant or hydronic space heating system is designed, installed, and documented, using industry-approved guidelines and standards (e.g., ACCA Manual J, AHRI I=B=R, ANSI/ACCA 5 QI, or an accredited design professional's and manufacturer's recommendation). ..... **Mandatory**

11.701.4.2 Duct systems

11.701.4.2.1 Duct air sealing and testing. Ducts that are newly installed, modified, or are exposed during the remodel are air sealed and tested. All duct sealing materials are in conformance with UL 181A or UL 181B specifications and are installed in accordance with manufacturer's instructions. ..... **Mandatory**

(1) All duct sealing materials are in conformance with UL 181A or UL 181B specifications and are installed in accordance with manufacturer's instructions.

(2) **Testing.** Dwelling unit total duct leakage testing shall be required for single-family houses and multifamily and mixed-use structures of three stories or fewer above grade. Testing is conducted following procedures in ANSI/RESNET/ICC Std. 380 or ASTM E1554 with a pressure differential of 0.1 in. w.g. (25 Pa) across the entire system and demonstrating compliance with one of the following leakage rates:

Exception: Testing is not Mandatory for multifamily and mixed-use structures 4 or more stories in height and in compliance with IECC Section C 403.2.9.

(a) At rough-in test with air handler installed or at post construction, leakage shall be no greater than 4.0 CFM (~~113.3 L/min~~1.9 L/s) per 100 ft^2 (9.29 m^2) of conditioned floor area (CFM/100 cfa) or 40 CFM (18.9 L/s), whichever is greater; OR

(b) At rough-in testing without the air handler installed, leakage shall be no greater than 3 CFM/100 cfa (~~85 L/min~~1.4 L/s/9.29 m^2) or 30 CFM (14.2 L/s), whichever is greater; OR

(c) For ducts entirely within the thermal envelope, leakage shall be no greater than 8 CFM ~~(226.6 L/min)~~ /100 cfa (3.8 L/s/9.29 m^2) or 80 CFM (37.8 L/s), whichever is greater.

11.701.4.2.2 Ducts and plenums. Building framing cavities are not used as ducts or plenums. Existing building cavities currently used as supply ducts exposed during the remodel are lined. ..... **Mandatory**

11.701.4.2.3 Duct system sizing. New or modified duct system is sized and designed in accordance with ACCA Manual D or equivalent. ..... **Mandatory**

11.701.4.2.4 Duct insulation. Supply and return located outside conditioned space shall be insulated to an R-value of not less than R-8 for ducts 3 in. (~~76 mm~~7.6 cm) in diameter and larger and not less than R-6 (1.1 (m^2•K)/W) for ducts smaller than 3 in. (7.6 ~~m~~cm) in diameter. ..... **Mandatory**

11.701.4.3 Insulation and air sealing

11.701.4.3.1 Building thermal envelope air sealing. The building thermal envelope exposed or created during the remodel is durably sealed to limit infiltration. The sealing methods between dissimilar materials allow for differential expansion and contraction. The following are caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material, suitable film or solid material: ..... **Mandatory**

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(a) All joints, seams and penetrations.

(b) Site-built windows, doors and skylights.

(c) Openings between window and door assemblies and their respective jambs and framing.

(d) Utility penetrations.

(e) Dropped ceilings or chases adjacent to the thermal envelope.

(f) Knee walls.

(g) Walls, ceilings, and floors separating conditioned spaces from unconditioned spaces.

(h) Behind tubs and showers on exterior walls.

(i) Common walls between dwelling units or sleeping units.

(j) Attic access openings.

(k) Joints of framing members at rim joists.

(l) Top and bottom plates.

(m) Other sources of infiltration.

11.701.4.3.2 Air barrier, air sealing, building envelope testing and insulation. For portions of the building envelope that are exposed or created during the remodel, building envelope air tightness and insulation installation is verified to be in accordance with this Section and § 11.701.4.3.2(1). Insulation installation other than Grade 1 is not permitted. ..... **Mandatory**

(1) **Testing.** Where more than 50% of the building envelope is exposed or created during the remodel, conduct airtightness testing in accordance with procedures in ANSI/RESNET/ICC Std. 380, ASTM E779, ASTM 1827, or ASTM E3158.

(2) **Gold or Emerald levels.** Demonstrate compliance with one of the following air filtration targets in accordance with § 11.701.4.3.2(1). Projects with more than one dwelling unit are permitted to use a combination of these targets to demonstrate compliance.

(a) Measured airtightness shall be no greater than 6 ACH50.

(b) Unguarded compartmentalization testing shall be no greater than 0.40 CFM50 per square foot (2 $L/s/m^2$)of dwelling unit enclosure area.

(c) Twenty percent improvement of ACH50 or CFM50 per square foot compared to pre-remodeling tested conditions.

Testing shall be conducted after rough-in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances. Testing is conducted under the following conditions:

(a) exterior windows and doors, fireplace and stove doors are closed, but not sealed;

(b) dampers are closed, but not sealed, including exhaust, intake, make-up air, backdraft and flue dampers;

(c) interior doors are open;

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(d) exterior openings for continuous ventilation systems and heat recovery ventilators are closed and sealed;

(e) heating and cooling systems are turned off;

(f) HVAC duct terminations are not sealed; and

(g) supply and return registers are not sealed.

Multifamily and Mixed-Use Building Note: *Testing by dwelling units, sleeping units, groups of dwelling units, groups of sleeping units, or the building as a whole is acceptable.*

(3) **Visual inspection.** The air barrier and insulation items listed in Table 11.701.4.3.2(2) are field verified by visual inspection.

Table 11.701.4.3.2(2)
Air Barrier, Air Sealing and Insulation Installation[a]

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building thermal envelope. Breaks or joints in the air barrier shall be sealed. Air-permeable insulation shall not be used a s sealing material.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling or soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within comers and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance, *R*-value, of not less than R-3 per inch (0.209 (m^2•K)/W per cm). Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between framing and skylights, and the jambs of windows and doors shall be sealed.	
Rim joists	Rim joists shall include an exterior air barrier.[b] The junctions of the rim board to the sill plate and the rim board and the subfloor shall be air sealed.	Rim joists shall be insulated so that the insulation maintains permanent contact with the exterior rim board.[b]
Floors including cantilevered floors and floors above garages	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking. Alternatively, floor framing cavity insulation shall be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extending from the bottom to the top of all perimeter floor framing members.
Basement crawl space and slab foundations	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder/air barrier in accordance with Section R402.2.10. Penetrations through concrete foundation walls and slabs shall be air sealed. Class 1 vapor retarders shall not be used as an air barrier on below-grade walls and shall be installed in accordance with Section R702.7 of the *International Residential Code*.	Crawl space insulation, where provided instead of floor insulation, shall be installed in accordance with Section R402.2.10. Conditioned basement foundation wall insulation shall be installed in accordance with Section R402.2.8.1. Slab-on-grade floor insulation shall be installed in accordance with Section R402.2.10.

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Shafts, penetrations	Duct and flue shafts and other similar penetrations exterior or unconditioned space shall be sealed to allow for expansion, contraction and mechanical vibration. Utility penetrations of the air barrier shall be caulked, gasketed or otherwise sealed and shall allow for expansion, contraction of materials and mechanical vibration.	Insulation shall be fitted tightly around utilities passing through shafts and penetrations in the building thermal envelope to maintain required *R*-value.
Narrow cavities	Narrow cavities of 1 inch (2.5 cm) or less that are not able to be insulated shall be air sealed.	Batts to be installed in narrow cavities shall be cut to fit or narrow cavities shall be filled with insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	Insulated portions of the garage separation assembly shall be installed in accordance with Sections R303 and R402.2.7.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be air sealed in accordance with Section R402.4.5.	Recessed light fixtures installed in the building thermal envelope shall be airtight and IC rated rated, and shall be buried or surrounded with insulation.
Plumbing wiring or other obstructions	All holes created by wiring, plumbing or other obstructions in the air barrier assembly shall be air sealed.	Insulation shall be installed to fill the available space and surround wiring, plumbing, or other obstructions, unless the required R-value can be met by installing insulation and air barrier systems completely to the exterior side of the obstructions.
Shower/tub on exterior wall	The air barrier shall be installed at exterior walls adjacent to showers and tubs shall separate the wall from the shower or tub.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical and communication boxes. Alternatively, air-sealed boxes shall be installed.	
HVAC register boots	HVAC and supply and return register boots that penetrate building thermal envelope shall be sealed to the subfloor, wall covering or ceiling penetrated by the boot.	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.
b. Insulation fully enclosed by an air barrier is not required in unconditioned/ventilated attic spaces and at rim joists.

11.701.4.3.2.1 Grade I insulation installation. Field-installed insulation products to ceilings, walls, floors, band joists, rim joists, conditioned attics, basements, and crawlspaces, except as specifically noted, are verified by a third-party as Grade I in accordance with the following:..... **Mandatory**

(1) Inspection is conducted before insulation is covered.

(2) Air-permeable insulation is enclosed on all six sides and is in substantial contact with the sheathing material on one or more sides (interior or exterior) of the cavity. Air permeable insulation in ceilings is not required to be enclosed when the insulation is installed in substantial contact with the surfaces it is intended to insulate.

(3) Cavity insulation uniformly fills each cavity side-to-side and top-to-bottom, without substantial gaps or voids around obstructions (such as blocking or bridging).

(4) Cavity insulation compression or incomplete fill amounts to 2% or less, presuming the compressed or incomplete areas are not less than 70% of the intended fill thickness; occasional small gaps are acceptable.

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

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

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

(8) Faced batt insulation is permitted to have side-stapled tabs, provided 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.

(9) Where properly installed, ICFs, SIPs, and other wall systems that provide integral insulation are deemed in compliance with this section.

(10) Thin film products, including but not limited to radiant barrier film, that are designed to be installed with an air spaced to achieve their designated R-value shall be installed in accordance with manufacturer's instructions.

11.701.4.3.3 Fenestration air leakage. Newly installed Windows, skylights and sliding glass doors have an air infiltration rate of no more than 0.3 cfm per ft^2 (1.5 L/s/m^2), and swinging doors no more than 0.5 cfm per ft^2 (2.5~~6~~ L/s/m^2), when tested in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled. For site-built fenestration, a test report by an accredited, independent laboratory verifying compliance with the applicable infiltration rate shall be submitted to demonstrate compliance with this practice. This practice does not apply to field-fabricated fenestration products. ..... **Mandatory**

Exception: For Tropical Zones only, jalousie windows are permitted to be used as a conditioned space boundary and shall have an air infiltration rate of not more than 1.3 cfm per ft^2 (6.6 L/s/m^2).

11.701.4.3.4 Lighting and building thermal envelope. Newly installed luminaires installed in the building thermal envelope which penetrate the air barrier are sealed to limit air leakage between conditioned and unconditioned spaces. All luminaires are IC-rated and labeled as complying with ASTM E283 when tested at 1.57 psf (75.2 Pa) pressure differential with no more than 2.0 cfm (0.94~~4~~ L/s) of air movement from the conditioned space to the ceiling cavity. All luminaires installed in the building thermal envelope which penetrate the air barrier are sealed with a gasket or caulk between the housing and the interior of the wall or ceiling covering. ..... **Mandatory**

11.701.4.4 High-efficacy lighting. Lighting efficacy in dwelling units or sleeping units is in accordance with one of the following: ..... **Mandatory**

(1) All permanently installed lighting fixtures, excluding kitchen appliance lighting fixtures, shall contain only high-efficacy lighting sources.

(2) Lighting power density~~, measured in watts/square foot,~~ shall be 0.45 watts/ft^2 (4.84 watts/m^2) or less.

11.701.4.5 Boiler piping. Boiler piping in unconditioned space supplying and returning heated water or steam that is accessible during the remodel is insulated. Exception: where condensing boilers are installed, insulation is not required for return piping ..... **Mandatory**

11.701.4.6 Fenestration specifications. The NFRC-certified U-factor and SHGC of newly installed windows, exterior doors, skylights, and tubular daylighting devices (TDDs) do not exceed the values in Table 11.703.2.5.1. ..... **Mandatory**

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11.701.4.7 Replacement fenestration. Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the NFRC-certified U-factor and SHGC of the replacement fenestration unit do not exceed the values in Table 11.703.2.5.1.	**Mandatory**

11.702 PERFORMANCE PATH

11.702.1 Point allocation. Points from § 11.702 (Performance Path) shall not be combined with points from § 11.703 (Prescriptive Path), § 11.704 (ERI Target Path), or § 11.701.1.4 through § 11.701.1.8 (Alternative Paths).	**Mandatory for § 702**

11.702.2 Energy performance levels

11.702.2.1 IECC equivalency analysis. Energy efficiency features are implemented to achieve energy cost, or site energy, source energy, or carbon dioxide equivalent emissions (CO_2e) performance that complies with the IECC thresholds (or equivalents thereof). When using equivalents to code thresholds, employ the methodology in ANSI/ASHRAE Standard 105-2021 or the IgCC.....	**Mandatory for § 702**
11.702.2.2 Minimum energy performance analysis. Energy efficiency features are implemented to achieve energy cost, or site energy, or source energy, or CO_2e performance that complies with the applicable minimum energy performance threshold in § 11.702.2.2.1 or § 11.702.2.2.2.	**Mandatory for § 702**

11.702.2.2.1 Residential buildings. A documented analysis that either demonstrates compliance with IECC using software in accordance with IECC Section R405 applied as defined in the IECC, or that demonstrates performance at least as good as the NGBS Reference Home values in Table 11.702.2.2.1 using software approved by and applied as defined by the Adopting Entity, is required.

11.702.2.2.2 Commercial buildings. A documented analysis that demonstrates compliance with the IECC using software in accordance with IECC Section C407 or ASHRAE 90.1 Appendix G or Energy Cost Budget simulation general requirements, is required.

POINTS

Table 11.702.2.2.1
NGBS Reference Home Values
(Single-Family & Low-Rise Multifamily and Mixed-Use Modeling)

CATEGORY	REFERENCE
Building Envelope	**NGBS**
Slab	IECC Table R402.1.3
Floor	IECC Table R405.4.2(1)
Ceiling	IECC Table R405.4.2(1)
Door	IECC Table R405.4.2(1)
Insulation Rim/Band	IECC Table R405.4.2(1)
Insulation Walls	IECC Table R405.4.2(1)
Windows	IECC Table R405.4.2(1)
Air Infiltration	IECC Table R405.4.2(1)
Heating System Efficiency	10 CFR 430.32 (e) Furnaces and boilers
Cooling System Efficiency	10 CFR 430.32(c) Central air conditioners and heat pumps
Ventilation System Efficiency	
Energy Use of Ventilation Equipment	IECC Table R405.4.2(1)
Duct Sealing	
Duct Air Leakage Testing	IECC Table R405.4.2(1)
Water Heating System Efficiencies	10 CFR 430.32(d) Water heaters
Lighting	Default lighting and appliance values from ANSI/RESNET 301
Appliances	Default lighting and appliance values from ANSI/RESNET 301

11.702.2.3 Energy performance analysis. Energy savings levels above the 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, appliances, and on-site renewable energy. Points are assigned using the following formula:

Points = 30 + (percent above threshold identified in § 11.702.2.1.1. or § 11.702.2.1.2) * 2

Multifamily and Mixed-Use Building Note: *Modeling is completed building-wide using one of the following methods: whole building energy modeling, a unit-by-unit approach, or a building average of a unit-by-unit approach.*

11.702.2.4 Tropical standard reference design. For the Tropical Climate Zone, the standard reference design shall use the specifications in IECC Section R401.2.4 (Tropical Zone).

11.703 PRESCRIPTIVE PATH

11.703.1 Mandatory practices..... **30**

In accordance with § 305.2.3, mandatory practices are not required where not applicable.
Where § 11.703.1 practices are out of scope of work, 30 points shall be achieved elsewhere from § 11.703.

11.703.1.1 Building thermal envelope compliance. For conditioned spaces, the building thermal envelope is in compliance with § 11.703.1.1.1 or § 11.703.1.1.2..... **Mandatory for § 11.703**

11.703.1.1.1 Maximum UA. For ICC IECC residential, the total building UA is less than or equal to the total maximum UA as computed by IECC Section R402.1.5. For IECC commercial, the total UA is less than or equal to the sum of the UA for IECC Tables C402.1.4 and C402.4, including the U-factor times the area and C-factor

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or F-factor times the perimeter. The total UA proposed and baseline calculations are documented. REScheck or COMcheck is deemed to provide UA calculation documentation.

11.703.1.1.2 Prescriptive R-value and fenestration requirements. The building thermal envelope is in accordance with the thermal requirements of IECC Table R402.1.3 or Table C402.1.3, as applicable. The fenestration U-factors and SHGC's are in accordance with IECC Table R402.1.2 or C402.4, as applicable. Unconditioned buildings 3 stories or less in height located in the Tropical Zone are exempt from this practice if the building has a roof SRI of not less than 0.85, and a wall reflectivity of not less than 0.39.

11.703.1.2 Building envelope leakage. New or altered portions of the ~~The~~ building thermal envelope ~~is~~ are in accordance with IECC R501 or C501~~IECC R502.1.1.1 or R503.1.1,~~ as applicable. ..... **Mandatory for § 11.703**

Exception: Section 11.703.1.2 is not required for Tropical Climate Zone.

11.703.1.3 Duct testing. The duct system is in accordance with IECC R403.3 as applicable..... **Mandatory for § 11.703**

11.703.2 Building envelope

11.703.2.1 UA improvement. The total building thermal envelope UA is less than or equal to the baseline total UA resulting from the U-factors provided in Table 11.703.2.1(a) or IECC Tables ~~C402.1.4~~R402.1.2 and C402.4, as applicable. Where insulation is used to achieve the UA improvement, the insulation installation is in accordance with Grade 1 complying with § 11.701.4.3.2.1 as verified by a third-party. Total UA is documented using a REScheck, COMcheck, or equivalent report to verify the baseline and the UA improvement. **Per Table 11.703.2.1(b)**

~~**Table 11.703.2.1(a)**~~
~~**Baseline U-Factors**~~[a]

~~Climate Zone~~	~~Fenestration U-Factor~~	~~Skylight U-Factor~~	~~Ceiling U-Factor~~	~~Frame Wall U-Factor~~	~~Mass Wall U-Factor~~[b]	~~Floor U-Factor~~	~~Basement Wall U-Factor~~	~~Crawlspace Wall U-Factor~~[c]
~~1~~	~~0.50~~	~~0.75~~	~~0.035~~	~~0.084~~	~~0.197~~	~~0.064~~	~~0.360~~	~~0.477~~
~~2~~	~~0.40~~	~~0.65~~	~~0.026~~	~~0.084~~	~~0.165~~	~~0.064~~	~~0.360~~	~~0.477~~
~~3~~	~~0.30~~	~~0.55~~	~~0.026~~	~~0.060~~	~~0.098~~	~~0.047~~	~~0.091~~[C]	~~0.136~~
~~4 except Marine~~	~~0.30~~	~~0.55~~	~~0.024~~	~~0.045~~	~~0.098~~	~~0.047~~	~~0.059~~	~~0.065~~
~~5 and Marine 4~~	~~0.30~~	~~0.55~~	~~0.024~~	~~0.045~~	~~0.082~~	~~0.033~~	~~0.050~~	~~0.055~~
~~6~~	~~0.30~~	~~0.55~~	~~0.024~~	~~0.045~~	~~0.060~~	~~0.033~~	~~0.050~~	~~0.055~~
~~7 and 8~~	~~0.30~~	~~0.55~~	~~0.024~~	~~0.045~~	~~0.057~~	~~0.028~~	~~0.050~~	~~0.055~~

~~a. Non-fenestration U-factors shall be obtained from measurement, calculation, or an approved source.~~
~~b. Where more the half the insulation is on the interior, the mass wall U-factors is a not greater than 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 11.703.2.1(a)
Baseline U-Factors[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWLSPACE[c] WALL *R*-VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0

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2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	20 or 13+5[h]	8/13	19	5/13[f]	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5[h]	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5[h]	13/17	30[g]	15/19	10, 2 ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10[h]	15/20	30[g]	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10[h]	19/21	38[g]	15/19	10, 4 ft	15/19

j. R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.
k. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration. Exception: Skylights may be excluded from glazed fenestration SHGC requirements in climate zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.
l. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
m. R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Climate Zones 1 through 3 for heated slabs.
n. There are no SHGC requirements in the Marine Zone.
o. Basement wall insulation is not required in warm-humid locations as defined by IECC Figure R301.1 and Table R301.1.
p. Or insulation sufficient to fill the framing cavity, R-19 minimum.
q. The first value is cavity insulation, the second value is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 continuous insulation.
r. The second R-value applies when more than half the insulation is on the interior of the mass wall.

Note: See Appendix E for SI units.

Table 11.703.2.1(b)
Points for Improvement in Total Building Thermal Envelope UA Compared to Baseline UA

Minimum UA Improvement	Climate Zone							
	1[a]	2	3	4	5	6	7	8
	POINTS							
0 to <5%	~~0~~0	~~0~~0	~~0~~0	~~0~~0	~~0~~0	~~0~~0	~~0~~0	~~0~~0
5% to <10%	~~0~~2	~~1~~3	~~1~~3	~~1~~3	~~0~~3	~~0~~3	~~0~~3	~~0~~3
10% to <15%	~~1~~3	~~5~~6	~~5~~5	~~4~~6	~~3~~6	~~3~~6	~~3~~5	~~6~~7
15% to <20%	~~4~~5	~~8~~9	~~9~~8	~~7~~9	~~6~~9	~~6~~9	~~7~~8	~~12~~10
20% to <25%	~~7~~6	~~12~~12	~~13~~10	~~11~~12	~~9~~12	~~10~~12	~~11~~11	~~19~~13
25% to <30%	~~10~~8	~~15~~15	~~16~~13	~~15~~16	~~13~~14	~~14~~15	~~15~~14	~~26~~17
30% to <35%	~~13~~10	~~19~~18	~~20~~16	~~19~~19	~~17~~17	~~18~~18	~~20~~16	~~32~~20
≥35%	~~16~~11	~~23~~21	~~23~~18	~~22~~22	~~20~~20	~~21~~21	~~25~~19	~~38~~23

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

Exception: For the Tropical Climate Zone, crawl space, basement, and floor u-factors are excluded from the total building thermal envelope UA improvement calculation.

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

Per Table 11.703.2.2

Table 11.703.2.2
Exterior Mass Walls

POINTS

Mass thickness	Climate Zone			
	1-4	5	6	7-8
	POINTS			
≥3 in. to <6 in. (≥7.6 to < 15.2 cm)	**1**	**0**	**0**	**0**
>6 in. (15.2 cm)	**3**	**2**	**2**	**0**

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

Per Table 11.703.2.3

Table 11.703.2.3
Radiant Barriers

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

[In climate zones 1-3, 1 point maximum for multifamily and mixed-use buildings four or more stories in height.]

11.703.2.4 Building or dwelling unit envelope leakage. The maximum building or dwelling unit envelope leakage rate is in accordance with Table 11.703.2.4~~(a) or Table 11.703.2.4(b)~~ and whole building ventilation is provided in accordance with § 11.902.2.1.

Per Table 11.703.2.4~~(a) or 11.703.2.4(b)~~

Table 11.703.2.4(a)
Building Envelope Leakage

Max Envelope Leakage Rate ~~(ACH50)~~	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
4 ACH50 or 0.28 ELR50	~~**1**~~	~~**1**~~**2**	~~**0**~~	~~**0**~~	~~**0**~~	~~**0**~~	~~**0**~~	~~**0**~~
3 ACH50 or 0.23 ELR50	~~**1**~~**2**	~~**1**~~**4**	~~**0**~~	~~**0**~~	~~**0**~~	~~**0**~~	~~**0**~~	~~**0**~~
2 ACH50 or 0.18 ELR50	~~**2**~~**3**	~~**2**~~**5**	~~**2**~~**3**	~~**3**~~**4**	~~**4**~~	~~**5**~~**6**	~~**1**~~**8**	~~**8**~~**7**
1 ACH50 or 0.13 ELR50	~~**2**~~**4**	~~**3**~~**7**	~~**3**~~**5**	~~**5**~~**7**	~~**7**~~	~~**8**~~**10**	~~**21**~~**15**	~~**16**~~**11**
Where ELR50 = CFM50 / *Building Thermal Envelope* Area CFM50 = cubic feet per minute at 50 Pa								

~~**Table 11.703.2.4(b)**~~
~~**Building Envelope Leakage**~~

~~Max Envelope Leakage Rate (ELR50)~~	~~Climate Zone~~							
	~~1~~	~~2~~	~~3~~	~~4~~	~~5~~	~~6~~	~~7~~	~~8~~
	~~POINTS~~							
~~0.28~~	~~**1**~~	~~**2**~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~0.23~~	~~**2**~~	~~**4**~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~
~~0.18~~	~~**3**~~	~~**5**~~	~~**3**~~	~~**4**~~	~~**4**~~	~~**6**~~	~~**8**~~	~~**7**~~
~~0.13~~	~~**4**~~	~~**7**~~	~~**5**~~	~~**7**~~	~~**7**~~	~~**10**~~	~~**15**~~	~~**11**~~
~~Where ELR50 = CFM50 / *Building Thermal Envelope* Area~~ ~~CFM50 = cubic feet per minute at 50 Pa~~								

[Points not awarded if points are taken under § 11.705.6.2.1.]

POINTS

11.703.2.5 Fenestration

11.703.2.5.1 NFRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) on an area-weighted average basis do not exceed the values in IECC Table R402.1.2 or Table C402.4, as applicable. Area weighted averages are calculated separately for the categories of 1) windows and exterior doors and 2) skylights and tubular daylighting devices (TDDs). Decorative fenestration elements with a combined total area not greater than 15 ft^2 (1.~~394~~ m^2) or 10% of the total glazing area, whichever is less, are not required to comply with this practice. Unconditioned buildings 3 stories or less in height located in the Tropical Zone are exempt from this practice if the building has a roof SRI of not less than 0.85, and a wall reflectivity of not less than 0.39. ..... **Mandatory for § 11.703**

11.703.2.5.1.1 Dynamic glazing. Dynamic glazing is permitted to satisfy the SHGC requirements of Table 11.703.2.5.1 provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4 and the dynamic glazing is automatically controlled to modulate the amount of solar gain into the space in multiple steps. Fenestration with dynamic glazing is considered separately from other fenestration and area-weighted averaging with fenestration that does not use dynamic glazing is not permitted. Dynamic glazing is not required to be automatically controlled or comply with minimum SHGC ratio when both the lower and higher labeled SHGC already comply with the requirements of Table 11.703.2.5.1.

11.703.2.5.2 The NFRC-certified (or equivalent) U-factor and SHGC of windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with Table 11.703.2.5.2(a), (b), or (c). Decorative fenestration elements with a combined total area not greater than 15 ft^2 (1.~~439~~ m^2) or 10% of the total glazing area, whichever is less, are not required to comply with this practice. **Per Table 11.703.2.5.2(a), or 11.703.2.5.2 (b), or 11.703.2.5.2 (c)**

Table 11.703.2.5.2(a)
Enhanced Fenestration Specifications

CLIMATE ZONE	WINDOWS & EXTERIOR DOORS		SKYLIGHTS & TDDS		POINTS
	U-FACTOR (Btu/h·ft2·F)	SHGC	U-FACTOR (Btu/h·ft2·F)	SHGC	
1	0.~~40~~35	0.25	0.60	0.28	**1**
2	0.~~40~~35	0.25	0.60	0.28	**~~1~~2**
3	0.~~27~~28	0.25	0.50	0.28	**2**
4	0.~~27~~28	0.40	0.50	0.35	**~~3~~2**
5	0.27	Any	0.50	Any	**3**
6	0.27	Any	0.50	Any	**4**
7	0.27	Any	0.50	Any	**4**
8	0.27	Any	0.50	Any	**~~4~~5**

Exception: For Sun-tempered designs complying with the requirements of § 11.703.7.1, the SHGC is permitted to be 0.40 or higher on south facing glass.

Table 11.703.2.5.2(b)
Enhanced Fenestration Specifications

CLIMATE ZONE	WINDOWS & EXTERIOR DOORS		SKYLIGHTS & TDDS		POINTS
	U-FACTOR (Btu/h·ft2·F)	SHGC	U-FACTOR (Btu/h·ft2·F)	SHGC	
1	0.~~38~~32	0.~~25~~23	0.55	0.28	**~~2~~4**
2	0.~~38~~32	0.~~25~~23	0.53	0.28	**~~3~~5**
3	0.~~30~~27	0.~~25~~23	0.50	0.28	**~~4~~3**
4	0.~~28~~25	0.40	0.50	0.35	**~~4~~5**
5	0.25	Any	0.48	Any	**~~4~~5**
6	0.25	Any	0.48	Any	**~~5~~6**

					POINTS
7	0.25	Any	0.46	Any	~~5~~6
8	0.25	Any	0.46	Any	~~4~~8
Exception: For Sun-tempered designs complying with the requirements of § 11.703.7.1, the SHGC is permitted to be 0.40 or higher on south facing glass.					

Table 11.703.2.5.2(c)
Enhanced Fenestration Specifications

CLIMATE ZONE	WINDOWS & EXTERIOR DOORS		SKYLIGHTS & TDDS		POINTS
	U-FACTOR (Btu/h·ft2·F)	SHGC	U-FACTOR (Btu/h·ft2·F)	SHGC	
4	0.~~25~~22	0.40	0.45	0.40	~~6~~8
5~~-8~~	0.22	Any	0.42	Any	~~6~~9
6	0.22	Any	0.42	Any	9
7	0.22	Any	0.42	Any	10
8	0.22	Any	0.42	Any	12

[Points for multifamily or mixed-use buildings four or more stories in height are awarded at 3 times the point value listed in Table 11.703.2.5.2(c)]

11.703.2.5.2.1 Dynamic glazing. Dynamic glazing is permitted to satisfy the SHGC requirements of Tables 11.703.2.5.2(a), 11.703.2.5.2(b), and 11.703.2.5.2(c) provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4, and the dynamic glazing is automatically controlled to modulate the amount of solar gain into the space in multiple steps. Fenestration with dynamic glazing is considered separately from other fenestration, and area-weighted averaging with fenestration that does not use dynamic glazing is not permitted. Dynamic glazing is not required to be automatically controlled or comply with minimum SHGC ratio when both the lower and higher labeled SHGC already comply with the requirements of Tables 11.703.2.5.2(a), 11.703.2.5.2(b), and 11.703.2.5.2(c).

11.703.3 HVAC equipment efficiency

11.703.3.0 Multiple heating and cooling systems. For multiple heating or cooling systems in one home, practices § 11.703.3.1 through § 11.703.3.6 apply to the system that supplies 80% or more of the total installed heating or cooling capacity. Where multiple systems each serve less than 80% of the total installed heating or cooling capacity, points under § 11.703.3.1 through § 11.703.3.6 are awarded either for the system eligible for the fewest points or the weighted average of the systems. The weighted average shall be calculated in accordance with the following equation and be based upon the efficiency and capacity of the equipment as selected in accordance with ACCA Manual S with it loads calculated in accordance with ACCA Manual J.

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

11.703.3.1 Combination space heating and water heating system (combo system) is installed using either a coil from the water heater connected to an air handler to provide heat for the building, dwelling unit or sleeping unit, or a space heating boiler using an indirect-fired water heater.

(a) Devices have a combined annual efficiency of not less than 0.80 and a water heating recovery efficiency of not less than 0.87..... **4**

POINTS

(b) Devices have a combined annual efficiency of not less than 0.94 and a water heating recovery efficiency of not less than 0.95 ..... **6**

(c) Devices have a combined annual efficiency of not less than 1.15 and a water heating recovery efficiency of not less than 1.20. ..... **10**

(d) Devices have a combined annual efficiency of not less than 1.15 and a water heating recovery efficiency of not less than 1.20 and serves a third building load (e.g., pool heating). **12**

Items (b)-(d) are not available if points are awarded in 11.703.3.3 through 11.703.3.6 or 11.703.5.

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

(1) Gas and propane heaters:

Per Table 11.703.3.2(1)(a) or 11.703.3.2(1)(b)

Table 11.703.3.2(1)(a)
Gas and Propane Heating Systems

AFUE / COP	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥90% AFUE	0	2	5	7	9	10	12	13
≥92% AFUE	0	2	6	8	10	12	14	16
≥94% AFUE	0	3	6	9	12	13	16	18
≥96% AFUE	0	3	7	10	13	15	18	20
≥98% AFUE	0	3	8	11	14	17	19	22
≥1.2 COP[a]	**1**	**4**	**9**	**16**	**18**	**23**	**26**	**30**
≥1.4 COP[a]	**1**	**5**	**11**	**19**	**21**	**26**	**30**	**35**

a. This requirement is used for gas-fired heat pump systems.

Table 11.703.3.2(1)(b)
Gas and Propane Heating Systems
for Multifamily and Mixed-Use Buildings Four or More Stories in Height

AFUE / COP	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥90% AFUE	**0**	**4**	**4**	**8**	**8**	**10**	**11**	**13**
≥92% AFUE	**0**	**4**	**4**	**9**	**10**	**11**	**12**	**14**
≥94% AFUE	**0**	**5**	**5**	**10**	**11**	**12**	**14**	**16**
≥96% AFUE	**0**	**5**	**5**	**12**	**12**	**13**	**15**	**17**
≥98% AFUE	**0**	**6**	**6**	**13**	**13**	**14**	**16**	**18**
≥1.2 COP[a]	**0**	**8**	**8**	**18**	**18**	**18**	**21**	**23**
≥1.4 COP[a]	**0**	**9**	**9**	**21**	**21**	**21**	**24**	**26**

a. This requirement is used for gas-fired heat pump systems.

(2) Oil furnace:

POINTS

Table 11.703.3.2(2)
Oil Furnace

Per Table 11.703.3.2(2)

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

(3) Gas boiler:

Per Table 11.703.3.2(3)

Table 11.703.3.2(3)
Gas Boiler

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥85% AFUE	0~~0~~	0~~1~~	0~~1~~	1~~2~~	1~~3~~	1~~4~~	1~~4~~	1~~4~~
≥90% AFUE	0~~0~~	1~~1~~	2~~2~~	4~~4~~	5~~6~~	6~~7~~	7~~8~~	7~~6~~
≥94% AFUE	0~~0~~	2~~2~~	4~~3~~	6~~5~~	8~~8~~	9~~9~~	11~~10~~	11~~8~~
≥96% AFUE	0~~0~~	2~~2~~	5~~4~~	7~~6~~	9~~9~~	10~~11~~	12~~12~~	13~~10~~

(4) Oil boiler:

Per Table 11.703.3.2(4)

Table 11.703.3.2(4)
Oil Boiler

AFUE	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥90% AFUE	**0**	**2**	**3**	**5**	**6**	**7**	**9**	**10**
≥95% AFUE	**0**	**2**	**3**	**6**	**6**	**9**	**10**	**12**

11.703.3.3 Heat pump heating efficiency is in accordance with Table 11.703.3.3(1) or Table 11.703.3.3(2) or Table 11.703.3.3(3). Refrigerant charge is verified for compliance with manufacturer's instructions utilizing a method in ACCA 5 QI Section 4.3.

Per Table 11.703.3.3(1) or 11.703.3.3(2) or 11.703.3.3(3)

Table 11.703.3.3(1)
Electric Heat Pump Heating

Efficiency	Climate Zone							
	1	2	3	4	5	6-~~8~~[a]	7	8
	POINTS							
≥~~8.5~~7.2 HSPF2 (~~11.5~~10.9 EER2)	0~~0~~	0~~1~~	0~~1~~	0~~2~~	0~~2~~	0~~2~~	0	0
≥~~9.0~~7.7 HSPF2 (~~12.5~~11.9 EER2)	0~~0~~	1~~2~~	1~~4~~	2~~5~~	2~~6~~	1~~10~~	1	1
≥~~9.5~~8.1 HSPF2	0~~0~~	2~~3~~	4~~7~~	5~~7~~	5~~11~~	5~~18~~	4	3
≥~~10.0~~8.5 HSPF2	0~~1~~	3~~5~~	6~~10~~	8~~10~~	10~~15~~	11~~26~~	12	8
≥~~12.0~~10.2 HSPF2	1~~1~~	7~~6~~	14~~11~~	18~~11~~	23~~17~~	24~~28~~	24	20

Table 11.703.3.3(2)
Electric Heat Pump Heating
for Multifamily and Mixed-Use Buildings Four or More Stories in Height

Efficiency	Climate Zone

POINTS

	1	2	3	4	5	6-8[a]
	POINTS					
≥~~8.5~~7.2 HSPF2 (~~11.5~~10.9 EER2)	**0**	**3**	**4**	**8**	**11**	**13**

Table 11.703.3.3(3)
Gas Engine-Driven Heat Pump Heating

Efficiency	**Climate Zone**					
	1	2	3	4	5	6-8
	POINTS					
≥1.3 COP at 47°F (8.3°C)	**2**	**7**	**11**	**14**	**16**	**18**

11.703.3.4 Cooling efficiency is in accordance with Table 11.703.3.4(1) or Table 11.703.3.4(2). Refrigerant charge is verified for compliance with manufacturer's instructions utilizing a method in ACCA 5 QI Section 4.3.

Per Table 11.703.3.4(1) or 11.703.3.4(2)

Table 11.703.3.4(1)
Electric Air Conditioner and Heat Pump Cooling[a]

Efficiency	**Climate Zone**							
	1	2	3	4	5	6	7	8
	POINTS							
≥~~15~~ 14.3 SEER2 (~~12.5~~11.9 EER2)	~~0~~6	~~0~~4	~~0~~2	~~0~~1	~~0~~1	~~0~~1	~~0~~1	~~0~~0
≥~~17~~ 16.2 SEER2 (~~12.5~~11.9 EER2)	~~9~~11	~~6~~9	~~3~~7	~~2~~3	~~2~~3	~~1~~2	~~0~~2	~~0~~0
≥~~19~~ 18.1 SEER2 (~~12.5~~11.9 EER2)	~~16~~19	~~12~~12	~~6~~10	~~4~~6	24	24	~~0~~4	~~0~~0
≥~~21~~ 20 SEER2	~~22~~26	~~16~~15	~~8~~14	~~6~~8	~~3~~6	~~2~~6	~~0~~5	~~0~~0
≥~~25~~ 23.8 SEER2	~~27~~29	~~17~~18	~~11~~17	~~8~~10	~~4~~8	~~3~~8	~~1~~6	~~0~~0

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

Table 11.703.3.4(2)
Gas Engine-Driven Heat Pump Cooling

Efficiency	**Climate Zone**					
	1	2	3	4	5	6-8
	POINTS					
>1.2 COP at 95°F (35°C)	**3**	**6**	**3**	**1**	**1**	**0**

11.703.3.5 Water source cooling and heating efficiency is in accordance with Table 11.703.3.5. Refrigerant charge is verified for compliance with manufacturer's instructions utilizing a method in ACCA 5 QI Section 4.3.

Per Table 11.703.3.5

Table 11.703.3.5
Water Source Cooling and Heating

Efficiency	**Climate Zone**							
	1	2	3	4	5	6-~~8~~	7	8
	POINTS							
≥~~15~~ 14.3 EER2, ≥4.0 COP	~~6~~14	~~9~~18	~~16~~22	~~21~~30	~~32~~37	~~39~~37	49	60

POINTS

11.703.3.6 Ground source heat pump is installed by a Certified Geothermal Service Contractor in accordance with Table 11.703.3.6. Refrigerant charge is verified for compliance with manufacturer's instructions utilizing a method in ACCA 5 QI Section 4.3. **Per Table 11.703.3.6**

Table 11.703.3.6
Ground Source Heat Pump[a]

Efficiency	Climate Zone							
	1	2	3	4	5-8			
	POINTS							
≥~~16.0~~15.2 EER2, ≥3.6 COP	~~14~~1	~~15~~1	~~19~~2	~~23~~16	~~33~~22	40	50	61
≥~~24.0~~22.8 EER2, ≥4.3 COP	~~41~~24	~~35~~29	~~33~~22	~~36~~31	~~44~~35	50	58	68
≥~~28.0~~26.6 EER2, ≥4.8 COP	~~48~~42	~~42~~46	~~39~~35	~~42~~42	~~49~~44	55	63	72

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

11.703.3.7 ENERGY STAR, or equivalent, ceiling fans are installed. *[Points awarded per building.]*..... **1**

[For Tropical Climate Zone and Climate Zones 2B, 3B, and 4B: points awarded per fan where AC is not installed in the dwelling unit or sleeping unit (Max 8 points), and where points awarded in § 11.703.3.8 for these specific climate zones, points shall not be awarded in § 11.703.3.7.]

11.703.3.8 Whole-building or whole-dwelling unit or whole-sleeping unit fan(s) with insulated louvers and a sealed enclosure is installed. *[Points awarded per building.]* **Per Table 11.703.3.8**

Table 11.703.3.8
Whole Dwelling Unit Fan

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

11.703.4 Duct systems

11.703.4.1 All space heating is provided by a system(s) that does not include air ducts. **Per Table 11.703.4.1**

Table 11.703.4.1
Ductless Heating System

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

11.703.4.2 All space cooling is provided by a system(s) that does not include air ducts. **Per Table 11.703.4.2**

Table 11.703.4.2
Ductless Cooling System

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

~~**11.703.4.3** Ductwork is in accordance with all of the following:~~ ~~**Per Table 11.703.4.3**~~

POINTS

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

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

~~(3) Ductwork is not installed in exterior walls.~~

~~**Table 11.703.4.3**~~
~~**Ducts**~~

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

11.703.4.4 Duct Leakage. The entire central HVAC duct system, including air handlers and register boots, is tested by a third party for total leakage at a pressure differential of 0.1 in. w.g. (25 Pa) and maximum air leakage is equal to or less than 6% of the system design flow rate or 4 cfm (1.9 L/s) ~~cu-ft per minute~~ per 100 ft^2 (9.29 m^2)of conditioned floor area. Ductwork is in accordance with all of the following: **Per Table 11.703.4.34**

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

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

(3) Ductwork is not installed in exterior walls.

Table 11.703.4.34
Duct Leakage, where ≤4 cfm25/100SFcfa

Ductwork location	**Climate Zone**							
	1	2	3	4	5	6-8	7	8
	POINTS							
~~ductwork *entirely outside* the building's thermal envelope~~	~~**4**~~	~~**5**~~	~~**4**~~	~~**3**~~	~~**2**~~	~~**1**~~		
ductwork *entirely inside* the building's thermal envelope	~~**14**~~	~~**13**~~	~~**12**~~	~~**9**~~	~~**6**~~	~~**7**~~	**9**	**9**
not more than 10 linear feet of ductwork is ~~ductwork *inside and*~~ *outside* the building's thermal envelope	~~**12**~~	~~**11**~~	~~**9**~~	~~**6**~~	~~**2**~~	~~**2**~~	**2**	**2**

Points not awarded if points are taken under § 11.706.6.2.3.

11.703.5 Water heating system

11.703.5.1 Water heater Uniform Energy Factor (UEF) is in accordance with the following:

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

Water heater design is based on only 1 (one) water heater per dwelling unit, based on approved methods from IPC, ASPE, or manufacturer specifications. All table values are based on water heaters with medium water draws as defined by the DOE test procedures (55 gallons (208 L) per day).

(1) Gas water heating

POINTS

Per Table 11.703.5.1(1)(a) through 11.703.5.1(1)(e)

Table 11.703.5.1(1)(a)
Gas Water Heating
Storage Water Heater, Rated Storage Volume > 20 Gallons and ≤ 55 Gallons, Medium Water Draw

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
0.65 to <0.78	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**
≥0.78	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**

Table 11.703.5.1(1)(b)
Gas Water Heating
Storage Water Heater, Rated Storage Volume > 55 Gallons and ≤ 100 Gallons, Medium Water Draw

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥0.78	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

Table 11.703.5.1(1)(c)
Gas Water Heating
Storage Water Heater with Input Rate Greater than 75,000 Btu/h (Commercial)

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

Table 11.703.5.1(1)(d)
Gas Water Heating
Storage Water Heater with Input Rate Greater than 75,000 Btu/h (Commercial), In Buildings with High-Capacity Service Water-Heating Systems (1,000,000 Btu/h or Greater)

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

Table 11.703.5.1(1)(e)
Gas Water Heating
Instantaneous Water Heater, Rated Storage Volume < 2 Gallons and Input Rate of > 50,000 Btu/h, Medium Water Draw

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
0.89 to < 0.94	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**1**
≥0.94	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**1**

(2) Electric water heating

POINTS

Table 11.703.5.1(2)(a)
Storage Water Heater, Rated Storage Volume ≥ 20 Gallons and ≤ 55 Gallons, Medium Water Draw

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
0.94 to <1.0	~~2~~1	~~2~~1	~~1~~1	~~1~~1	~~1~~1	~~0~~1	~~0~~1	~~0~~1
1.0 to <1.5	4	2	2	2	1	1	1	1
1.5 to <2.0	7	4	3	2	2	2	1	1
2.0 to <2.2	14	8	7	5	4	4	2	2
2.2 to <2.5	13~~17~~	13~~9~~	14~~8~~	12~~6~~	~~8~~5	~~6~~4	~~4~~3	~~3~~3
2.5 to <3.0	14~~18~~	15~~12~~	15~~10~~	13~~8~~	~~9~~6	~~7~~6	~~4~~3	~~3~~3
≥3.0	16~~22~~	16~~16~~	17~~13~~	14~~11~~	10~~8~~	~~7~~8	~~5~~4	~~4~~3

Per Table 11.703.5.1(2)(a) through 11.703.5.1(2)(e)

Table 11.703.5.1(2)(b)
Storage Water Heater, Rated Storage Volume ≥ 55 Gallons and ≤ 120 Gallons, Medium Water Draw

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
2.2 to <2.5	6	4	3	3	2	2	1	1
2.5 to <3.0	7	5	4	3	3	3	2	2
3.0 to <3.5	8	5	5	4	3	3	3	2
≥3.5	9	6	6	5	4	4	3	2

Table 11.703.5.1(2)(c)
Storage Water Heater, Rated Storage Volume > 120 Gallons, Medium Water Draw

Coefficient of Performance	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
2.5 to <3.0	13~~14~~	~~14~~8	~~15~~7	13~~5~~	~~9~~4	~~7~~4	~~4~~2	~~3~~2
3.0 to <3.5	15~~17~~	~~16~~9	~~16~~8	~~14~~6	10~~5~~	~~7~~4	~~5~~3	~~4~~3
3.5 to <4.0	16~~18~~	17~~12~~	18~~10~~	~~15~~8	11~~6~~	~~8~~6	~~5~~3	~~4~~3
≥4.0	17~~22~~	18~~16~~	18~~13~~	16~~11~~	11~~8~~	~~8~~8	~~5~~4	~~4~~3

Credits are only available for central systems that provide not less than 80% of total system volume in the building.

Table 11.703.5.1(2)(d)
Electric Tabletop Water Heating
(Tabletop Water Heater, Rated Storage Volume ≥ 20 Gallons and ≤ 120 Gallons, Medium Water Draw)

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥0.91	1	1	1	1	1	1	1	1

Table 11.703.5.1(2)(e)
Electric Instantaneous Water Heating[a]

POINTS

(Instantaneous Electric Water Heater, Rated Storage Volume < 2 Gallons, Medium Water Draw)

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

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

Table 11.703.5.1(2)(f)
Electric Grid Enabled Water Heating
(Grid Enabled Storage Water Heater, Rated Storage Volume ≥ 75 Gallons, Medium Water Draw)

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

(3) Oil water heating — **Per Table 11.703.5.1(3)**

Table 11.703.5.1(3)
Oil Water Heating
(Oil Water Heating, < 50 Gallons, Medium Water Draw)

Uniform Energy Factor	Climate Zone							
	1	2	3	4	5	6	7	8
	POINTS							
≥0.62	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

11.703.5.2 Desuperheater is installed by a qualified installer or is pre-installed in the factory. — **Per Table 11.703.5.2**

Table 11.703.5.2
Desuperheater

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

11.703.5.3 Drain-water heat recovery system is installed. *[Points awarded per building.]* **2**

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

11.703.5.5 Solar water heater. SRCC (Solar Rating & Certification Corporation) OG 300 rated, or equivalent, solar domestic water heating system is installed. Solar Energy Factor (SEF) as defined by SRCC is in accordance with Table 11.703.5.5(a) and Table 11.703.5.5(b). — **Per Table 11.703.5.5(a) or 11.703.5.5(b)**

Table 11.703.5.5(a)
Storage Water Heater, Rated Storage Volume of Backup Water Heater is ≥ 0.1 Gallon and ≤ 55 Gallons, Medium Water Draw

SEF	Climate Zone						
	Tropical &1	2	3	4	5	6	7-8
	POINTS						

							POINTS
SEF ≥ 1.3	**1**	**2**	**3**	**5**	**6**	**7**	**6**
SEF ≥ 1.51	**2**	**2**	**4**	**6**	**9**	**10**	**10**
SEF ≥ 1.81	**2**	**3**	**5**	**9**	**13**	**14**	**14**
SEF ≥ 2.31	**4**	**5**	**8**	**14**	**19**	**21**	**20**
SEF ≥ 3.01	**5**	**7**	**11**	**21**	**27**	**31**	**30**

Table 11.703.5.5(b)
Storage Water Heater, Rated Storage Volume of Backup Water Heater is >55 Gallons, Medium Water Draw

SEF	**Climate Zone**						
	Tropical &1	2	3	4	5	6	7-8
	POINTS						
SEF ≥ 1.3	**1**	**1**	**2**	**3**	**4**	**5**	**4**
SEF ≥ 1.51	**1**	**1**	**2**	**4**	**6**	**7**	**7**
SEF ≥ 1.81	**1**	**2**	**4**	**6**	**8**	**10**	**9**
SEF ≥ 2.31	**2**	**3**	**5**	**10**	**13**	**14**	**13**
SEF ≥ 3.01	**4**	**5**	**7**	**14**	**18**	**20**	**20**

11.703.6 Lighting and appliances

11.703.6.1 Interior hard-wired lighting. Interior hard-wired lighting is in accordance with one of the following:

(1) Not less than 95% of the total hard-wired interior luminaires or lamps comply with the following efficacy levels (lumens per watt):

(a) 80 lumens per watt **3**

(b) 100 lumens per watt **5**

(2) Lighting power densities (LPD) in common areas of multi-dwelling or multi-sleeping unit buildings shall be less than:

(a) 0.40 Watts per square foot **3**

(b) 0.35 Watts per square foot **5**

11.703.6.2 Exterior hard-wired lighting. Not less than 80% of the exterior lighting has a efficacy of not less than 100 lumens per watt or is solar-powered. **3**

11.703.6.3 Appliances.

(1) ENERGY STAR or equivalent appliance(s) are installed:

(a) Refrigerator **1**

(b) Dishwasher **1**

(c) Clothes washer **4**

(d) Clothes dryer **1**

(2) Install Consortium for Energy Efficiency (CEE) Tier 2 or higher tier appliances for the below types of appliances:

POINTS

(a) Refrigerator **3**

(b) Dishwasher **2**

(c) Clothes dryer **5**

(bd) Clothes dryer **3**

11.703.7 Passive solar design

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

(1) The long side (or one side if of equal length) of the building faces within 20 degrees (0.349 radians) of true south.

(2) Vertical glazing area on the south face is between 5% and 7% of the gross conditioned floor area [also see § 11.703.7.1(8)], and glazing U-factors complying with Table 11.703.2.5.2(a).

(3) Vertical glazing area on the west face is less than 2% of the gross conditioned floor area, and glazing complies with Table 11.703.2.5.2(a).

(4) Vertical glazing area on the east face is less than 4% of the gross conditioned floor area, and glazing complies with Table 11.703.2.5.2(a).

(5) Vertical glazing area on the north face is less than 8% of the gross conditioned floor area, and glazing complies with Table 11.703.2.5.2(a).

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

(a) shades and insulated wells are used, and all glazing complies with Table 11.703.2.5.2(a).

(b) horizontal skylights are less than 0.5% of finished ceiling area.

(c) sloped skylights on slopes facing within 45 degrees (0.785 radians) of true south, east, or west are less than 1.5% of the finished ceiling area.

(7) Overhangs, adjustable canopies, awnings, or trellises provide shading on south-facing glass for the appropriate climate zone in accordance with Table 11.703.7.1(7):

Table 11.703.7.1(7)
South-Facing Window Overhang Depth

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

For SI: 1 in. = 25.4 mm

(8) The south facing windows have an SHGC of 0.40 or higher.

(9) Return air or transfer grilles/ducts are in accordance with § 11.705.4.

POINTS

***Multifamily and Mixed-Use Building Note**: The site is designed such that not less than 40% of the multifamily and mixed-use dwelling or sleeping units have one south facing wall (within 15 degrees (0.262 radians)) containing not less than 50% of glazing for entire unit, Effective shading is required for passive solar control on all south facing glazing. The floor area of not less than 15 ft (4.6 m) from the south facing perimeter glazing is massive and exposed to capture solar heat during the day and reradiate at night.*

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

11.703.7.3 Passive cooling design. Passive cooling design features are in accordance with at least three of the following: *[1 additional point awarded for each additional item.]* ..... **3 [6 max]**

(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 by not less than 1 ft (0.3~~05 m~~m) 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 § 11.703.7.1(7).

Points not awarded if points are taken under § 11.703.7.1.

(3) Windows and/or venting skylights are located to facilitate cross and stack effect 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 not less than 3 in. (7.6~~76 mc~~m) in thickness. Thermal mass consists of concrete, brick, and/or tile fully adhered to a masonry base or other masonry material in accordance with one or a combination of the following:

(a) Not less than 1 ft^2 (0.093 m^2) of exposed thermal mass of floor per 3 ft^2 (~~2.8~~0.28 m^2) of gross finished floor area.

(b) Not less than 3 ft^2 (~~2.8~~0.28 m^2) of exposed thermal mass in interior walls or elements per ft^2 (0.093 m^2) of gross finished floor area.

(6) Roofing material is installed with not less than a 0.75 in. (~~19~~ 1.91 ~~mc~~m) continuous air space offset from the roof deck from eave to ridge.

11.703.7.4 Passive solar heating design. In addition to the sun-tempered design features in § 11.703.7.1, all of the following are implemented: *[Points shall not be awarded in the Tropical Climate Zone]*..... **4**

(1) Additional glazing, no greater than 12%, is permitted on the south wall. This additional glazing is in accordance with the requirements of § 11.703.7.1.

POINTS

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

(a) Thermal mass is solid and not less than 3 in. (7.6 ~~m~~cm) 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 ft^2 (0.46~~5~~ m^2) of thermal mass for every 1 ft^2 (0.093 m^2) of south-facing glazing.

(ii) Latitude 30 degrees to 35 degrees: 5.5 ft^2 (0.511 m^2) of thermal mass for every 1 ft^2 (0.093 m^2) of south-facing glazing.

(iii) Latitude 25 degrees to 30 degrees: 6 ft^2 (0.56~~57~~ m^2) of thermal mass for every 1 ft^2 (0.093 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 § 11.703.7.4(2) based on a ratio of 40 ft^2 (3.72 m^2) of thermal mass for every 1 ft^2 (0.093 m^2) of south-facing glazing.

(3) In addition to return air or transfer grilles/ducts required by § 11.703.7.1(9), provisions for forced airflow to adjoining areas are implemented as needed.

11.704 ERI TARGET PATH

11.704.1 ERI target compliance. Compliance shall be determined in accordance with ANSI/RESNET/ICC 301. Points from § 11.704 (ERI Target) shall not be combined with points from § 11.702 (Performance Path), § 11.703 (Prescriptive Path), or 11.701.1.4 through 11.701.1.8 (Alternative Paths).

Dwelling ratings shall be submitted to a Rating Certification Body approved by the Adopting Entity for calculating points under this section.

11.704.2 Point calculation. Points for § 11.704 shall be computed individually for each building as follows:

Points = 40 + (Applicable Energy Rating Index from Table 11.704.2) * 2

Table 11.704.2
Energy Rating Index of the Rated Design

Climate Zone							
0-1	2	3	4	5	6	7	8
ENERGY RATING INDEX							
52	**52**	**51**	**54**	**55**	**54**	**53**	**53**

***Multifamily and Mixed-Use Building Note**: Modeling is completed building-wide using either a unit-by-unit approach, or a building average of a unit-by-unit approach.*

11.705 ALTERNATIVE COMPLIANCE FOR TROPICAL ZONES

11.705.1 Mandatory practices

POINTS

11.705.1.1 High-efficacy lighting. All permanently installed lighting fixtures, excluding appliance lighting fixtures, shall contain only high-efficacy lighting sources.

11.705.1.2 Attics. Attics above the insulation are vented and attics below the insulation are unvented.

11.705.1.3 Roofs. Roof surfaces have a slope of not less than 1/4 unit vertical in 12 units horizontal (2.0-percent slope). The roof does not have water accumulation areas.

11.705.1.4 Operable fenestration

11.705.1.4.1 Ventilation area. Operable fenestration provides an openable area of not less than 10 percent of the floor area of the living space.

11.705.1.4.2 Bedroom exterior walls. Bedrooms with exterior walls facing two or more directions have operable fenestration on exterior walls facing not less than two directions.

11.705.1.4.3 Glazing in conditioned spaces. Glazing in conditioned spaces has a solar heat gain coefficient (SHGC), in accordance with § 11.705.2.2 or § 11.705.3.2, or has an overhang with a projection factor equal to or greater than 0.30 and a solar heat gain coefficient of no greater than 0.30.

Exception: jalousie windows.

11.705.1.5 Interior doors. Bedroom doors are capable of being secured in an open position.

11.705.2 Additional Tropical Zone practices - Silver

11.705.2.1 Water Heater. A renewable energy source provides not less than 80% of annual service water heating needs.

11.705.2.2 Glazing. Glazing in conditioned space has a Solar Heat Gain Coefficient (SHGC) ~~between 0.26 and~~not greater than 0.30.

11.705.2.3 Exterior Walls. Exterior walls comply with not less than one of the following:

(1) Walls have insulation with an R-value of R-13 (2.3 (m^2•K)/W) or greater.

(2) Wall products have a minimal initial solar reflectance of not less than 0.64. Wall products shall be tested in accordance with Chapter 3 testing requirements of CRRC-2.

11.705.2.4 Roof. The exterior roof surface complies with not less than one of the following:

(1) Not less than an initial solar reflectance of 0.75 and emittance of 0.75.

(2) Not less than an initial solar reflectance index of 75 and thermal emittance of 0.75. Roof products are tested in accordance with the ANSI/CRRC S100.

(3) Roof or ceiling insulation with R-Value of R-13 (2.3 (m^2•K)/W) or greater.

(4) Radiant barrier installed.

11.705.2.5 Ceiling fans. A ceiling fan rough-in is provided for bedrooms and the largest living space that is not used as a bedroom.

11.705.2.6 Electric vehicle charging. Wiring sufficient for a Level 2 (208/240V 32-80 amp) electric vehicle charging station is installed on the building site.

11.705.3 Additional Tropical Zone practices - Gold

POINTS

11.705.3.1 Water Heater. A renewable energy source provides not less than 90% of annual service water heating needs.

11.705.3.2 Glazing. Glazing in conditioned space has a Solar Heat Gain Coefficient (SHGC) not ~~less~~ greater than 0.25.

11.705.3.3 Exterior Walls. Exterior walls comply with the following:

(1) Walls have insulation with an R-value of R-13 (2.3 (m^2•K)/W) or greater.

(2) Wall products have a minimal initial solar reflectance of not less than 0.64. Wall products shall be tested in accordance with Chapter 3 testing requirements of CRRC-2.

11.705.3.4 Roof. The exterior roof surface complies with not less than two of the following:

(1) Not less than an initial solar reflectance of 0.75 and emittance of 0.75.

(2) Not less than an initial solar reflectance index of 0.75 and thermal emittance of 0.75. Roof products are tested in accordance with the ANSI/CRRC S100.

(3) Roof or ceiling insulation with R-Value of R-13 (2.3 (m^2•K)/W)) or greater.

(4) Radiant barrier installed.

11.705.3.5 Ceiling fans. A ceiling fan is provided for bedrooms and the largest living space that is not used as a bedroom.

11.705.3.6 Air conditioning. All installed air conditioners have a rating of not less than ~~18~~ 17.1 SEER2. .....

11.705.3.7 Renewable energy system. For each dwelling unit, the building or lot is served by not less than 2kW renewable energy system and not less than 6kWh of energy storage. .....

11.705.3.8 Electric vehicle charging. A Level 2 (208/240V 32-80 amp) electric vehicle charging station is installed on the building site.

11.706 ADDITIONAL PRACTICES

11.706.1 Application of additional practice points. Points from § 11.706 can be added to points earned in § 11.703 (Prescriptive Path), § 11.703 (Prescriptive Path), § 11.704 (ERI Target Path), or § 11.701.1.4 through § 11.701.1.8 (Alternative Paths)..

11.706.2 Lighting

11.706.2.1 Lighting controls

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

11.706.2.1.1 Interior lighting. In dwelling units or sleeping units, permanently installed interior lighting fixtures are controlled with an occupancy sensor, or dimmer:

(1) greater than 50% to less than 75% of lighting fixtures..... **1**

(2) not less than 75% of lighting fixtures. **2**

POINTS

11.706.2.1.2 Exterior lighting. Photo or motion sensors are installed on 75% of outdoor lighting fixtures to control lighting.
[Percentages for point thresholds do not include lighting equipped with photovoltaics.] **1**

11.706.2.1.3 Multifamily and mixed-use common areas

(1) In ~~a~~ multifamily and mixed-use buildings, occupancy sensors, or dimmers are installed in common areas (except corridors and stairwells).

(a) greater than 50% to less than 75% of lighting fixtures. **1**

(b) not less than 75% of lighting fixtures..... **2**

(2) In ~~a~~ multifamily and mixed-use buildings, occupancy controls are installed to automatically reduce light levels in interior corridors and exit stairwells when the space is unoccupied. Light levels are reduced by:

(a) greater than 50% to less than 75% or to local minimum requirements..... **2**

(b) not less than 75% **3**

11.706.2.1.4 In ~~a~~ multifamily and mixed-use buildings, occupancy controls are installed to automatically reduce light levels in garages and parking structures when the space is unoccupied. Light levels are reduced by:

(1) greater than 50% to less than 75% or to local minimum requirements..... **2**

(2) not less than 75%..... **3**

11.706.2.2 TDDs and skylights. A tubular daylighting device (TDD) or a skylight that complies with the requirements of Table 11.703.2.5.2(a) is installed in rooms without windows.
[Points awarded per building.] **2**

11.706.2.3 Lighting outlets. Occupancy sensors are installed for not less than 80% of hard-wired lighting outlets in the interior living space. **1**

11.706.2.4 Recessed luminaires. The number of recessed luminaires that penetrate the thermal envelope is less than 1 per 400 ft^2 (37.16 m^2) of total conditioned floor area and they are in accordance with § 11.701.4.3.5. ..... **1**

11.706.3 Induction cooktop. Induction cooktop is installed. **1**

11.706.4 Return ducts and transfer grilles. Return ducts or transfer grilles are installed in every room with a door. Return ducts or transfer grilles are not required for bathrooms, kitchens, closets, pantries, and laundry rooms. **2**

11.706.5 HVAC design and installation

11.706.5.1 Comply with at least one of the following:

(1) HVAC contractor is certified by the Air Conditioning Contractors of America's Quality Assured Program (ACCA/QA), an EPA-recognized HVAC Quality Installation Training Oversight Organization (H-QUITO) , the Associated Air Balance Council (AABC) Test and Balance Technician or Engineer programs, the National Environmental Balancing Bureau (NEBB) Personnel Certification program, or Testing, Adjusting, and Balance Bureau (TABB) technician certification program. **1**

POINTS

(2) HVAC installation technician(s) is certified by North American Technician Excellence, Inc. (NATE) or equivalent. **2**

11.706.5.2 Performance of the heating and/or cooling system is verified by the HVAC contractor in accordance with all of the following: **3**

(1) Start-up procedure is performed in accordance with the manufacturer's instructions.

(2) Refrigerant charge is verified by super-heat and/or sub-cooling method.

(3) Burner is set to fire at input level listed on nameplate.

(4) Air handler setting/fan speed is set in accordance with manufacturer's instructions.

(5) Total airflow is within 10% of design flow.

(6) Total external system static does not exceed equipment capability at rated airflow.

11.706.5.3 HVAC Design is verified by 3rd party as follows:

(1) The ENERGY STAR HVAC Design and Rater Design Review Checklists are completed and correct. **3**

(2) HVAC Installation is inspected and conforms to HVAC design documents and plans. **3**

11.706.6 Installation and performance verification

11.706.6.1 Third-party on-site inspection is conducted to verify compliance with all of the following, as applicable. No less than two inspections are performed: one inspection after insulation is installed and prior to covering, and another inspection upon completion of the building. Where multiple buildings or dwelling units of the same model or sleeping units of the same model are built by the same builder, a representative sample inspection of not less than 15% of the buildings or dwelling units or sleeping units is permitted. **3**

(1) Ducts are installed in accordance with the IRC or IMC and ducts are sealed.

(2) Building envelope air sealing is installed.

(3) Insulation is installed in accordance with § 11.701.4.3.2.1.

(4) Windows, skylights, and doors are flashed, caulked, and sealed in accordance with manufacturer's instructions and in accordance with § 11.701.4.3.

11.706.6.2 Testing. Testing is conducted to verify performance.

11.706.6.2.1 Air leakage validation of building or dwelling units or sleeping units. A visual inspection is performed as described in § 11.701.4.3.2(2) and air leakage testing is performed in accordance with ANSI/RESNET/ICC 380, ASTM E779, ASTM E1827, or ASTM E3158.
[Points awarded only for buildings where building envelope leakage testing is not required by the IECC.]
[Points not awarded if points are taken under § 11.703.2.4.]

(1) A blower door test. **3**

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

11.706.6.2.2 HVAC airflow testing. Balanced HVAC airflows are demonstrated by flow hood or other acceptable flow measurement tool by a third party. Test results are in accordance with the following:

POINTS

(1) Measured flow at each supply and return register complies with or exceeds the requirements in ACCA 5 QI Section 5.2. ..... **5**

(2) Total airflow complies with or exceeds the requirements in ACCA 5 QI Section 5.2..... **3**

11.706.6.2.3 HVAC duct leakage testing. One of the following is achieved:
[Points awarded only for buildings where duct leakage testing is not required by IECC.]
[Points not awarded if points are taken under § 11.703.4.43.]

(1) Duct leakage is in accordance with IECC R403.3.5 and R403.3.6..... **3**

(2) Duct leakage is in accordance with IECC R403.3.5 and R403.3.6, and testing is conducted by an independent third party..... **5**

11.706.6.3 Insulating hot water pipes. Insulation with a thermal resistance (R-value) of not less than R-3 (0.53 (m^2•K)/W) is applied to the following, as applicable:
[Points awarded only where these practices are not required by IECC.] **1**

(a) piping 3/4-in. (1.91 cm) and larger in outside diameter.

(b) piping serving more than one dwelling unit or sleeping unit.

(c) piping located outside the conditioned space.

(d) piping from the water heater to a distribution manifold.

(e) piping located under a floor slab.

(f) buried piping.

(g) supply and return piping in recirculation systems other than demand recirculation systems.

11.706.6.4 Potable hot water demand re-circulation system

11.706.6.4.1 Potable hot water demand re-circulation system is installed in a single-family unit. **1**

11.706.6.4.2 Potable hot water demand re-circulation system(s) that serves every unit in ~~a~~ multifamily and mixed-use buildings is installed in place of a standard circulation pump and control. **2**

11.706.7 Submetering system. In multifamily and mixed-use buildings, an advanced electric and fossil fuel submetering system is installed to monitor electricity and fossil fuel consumption for each unit. The device provides consumption information on a monthly or near real-time basis. The information is available to the occupants not less than on a monthly basis. **1**

11.707 INNOVATIVE PRACTICES

11.707.1 Energy consumption control. A whole-building, whole-dwelling unit, or whole-sleeping unit device or system is installed that controls or monitors energy consumption. ..... **3 max**

(1) programmable communicating thermostat with the capability to be controlled remotely **1**

(2) energy-monitoring device or system **1**

(3) energy management control system **3**

(4) programmable thermostat with control capability based on occupant presence or usage pattern..... **1**

POINTS

(5) lighting control system **1**

11.707.2 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, or purchases renewable energy certificates (RECs) from a third-party provider to cover electricity used. The builder's local administrative office has renewable energy service or has otherwise been paired with RECs. Green-e Certified or equivalent is required for renewable electricity purchases. **1**

(2) The buyer of the building selects one of the following renewable energy service plans provided by the utility prior to occupancy of the building with no less than a two-year commitment or buys RECs from a third-party provider to match the estimated projected electricity use for the building for two years. Green-e Certified (or equivalent) is required for renewable electricity purchases.

(a) less than 50% of the building common area has a projected electricity and gas use that is provided by renewable energy **1**

(b) greater than or equal to 50% of the building common area has a projected electricity and gas use that is provided by renewable energy **2**

(c) the entire building (all units and common areas included) has a projected electricity and gas use that is provided by renewable energy **5**

11.707.3 Smart appliances and systems. Smart appliances and systems are installed as follows:
[1 point awarded where at least 3 smart appliances are installed; 1 additional point awarded for 6 or more.] ..... **1 [2 max]**

(1) Refrigerator

(2) Freezer

(3) Dishwasher

(4) Clothes Dryer

(5) Clothes Washer

(6) Room Air Conditioner

(7) HVAC Systems

(8) Service Hot Water Heating Systems

[Items (7) and (8) are permitted to count as two appliances each for the purpose of awarding points.]

Where points awarded in § 11.707.3, points shall not be awarded in § 11.707.7 and § 11.707.10.

11.707.4 Pumps

11.707.4.1 Pool or spa equipped with filtration pumps that are ENERGY STAR certified or equivalent are installed.

(1) Pool is equipped with ENERGY STAR certified or equivalent filtration pump(s). **3**

(2) Spa is equipped with ENERGY STAR certified or equivalent filtration pump(s). **1**

POINTS

11.707.4.2 All sump pump(s) with electronically commutated motors (ECMs) are installed. **1**

11.707.5 On-site renewable energy system. One of the following options is implemented:

(1) Building is Solar-Ready in compliance with IECC Appendix RB or CB Solar-Ready Provisions, as applicable. **1**

(2) An on-site renewable energy system(s) is installed on the property. ..... **2 per kW**

(3) An on-site renewable energy system(s) and a battery energy storage system are installed on the property.
[2 points awarded per kW or renewable energy system plus 1 per each 2 kWh or battery energy storage system] ..... **2 per kW**

Points shall not be awarded in this section for solar thermal or geothermal systems that provide space heating, space cooling, or water heating, points for these systems are awarded in § 11.703. Points awarded in this section shall not be combined with points for renewable energy in another section of this chapter. The solar-ready zone roof area in item (1) is area per dwelling unit. Points in item (2) and (3) shall be divided by the number of dwelling units.

Multifamily and Mixed-Use Building Note: *Conditioned common area and non-residential space is excluded for the purpose of calculating number of units.*

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

11.707.7 Grid-interactive electric thermal storage system. A grid-interactive electric thermal storage system is installed.

(1) Grid-Interactive Water Heating System **1**

(2) Grid-Interactive Space Heating and Cooling System **1**

Where points are awarded in § 11.707.7, points shall not be awarded in § 11.707.3 and § 11.707.10.

11.707.8 Single-family residence electrical vehicle chargers. A Level 2 (208/240V 40-80 amp) or Level 3 electric vehicle charging station:

(1) is installed on the building site. (Note: Charging station shall not be included in the building energy consumption.) **2**

(2) is ENERGY STAR certified or equivalent. ..... **1 Additional**

11.707.9 Single-family residence CNG vehicle fueling station. A CNG vehicle residential fueling appliance is installed on the building site. The CNG fueling appliances shall be listed in accordance with ANSI/CSA NGV 5.1 and installed in accordance to the appliance manufacturer's installation instructions. (Note: The fueling appliance shall not be included in the building energy consumption.) **1**

11.707.10 Automatic demand response. Automatic demand response system is installed that curtails energy usage upon a signal from the utility or an energy service provider is installed. **1**

Where points are awarded in § 11.707.10, points shall not be awarded in § 11.707.3 and § 11.707.7.

~~**11.707.11 Grid-interactive battery storage system.** A grid-interactive battery storage system of no less than 6 kWh of available capacity is installed. ..... **2**~~

POINTS

11.707.12 Smart ventilation

(1) A whole-building ventilation system is installed with automatic ventilation controls to limit ventilation during periods of extreme temperature, extreme humidity, and/or during times of peak utility loads and is in accordance with the specifications of ASHRAE Standard 62.2 Section 4 ..... **1**

(2) Install a demand-controlled ventilation system to reduce outside air ventilation rates that is in accordance with specifications of ASHRAE Standard 62.2 Section 4 ..... **1**

11.707.13 Alternative refrigerant. Use of the following in mechanical space cooling systems for dwellings.

(1) Use alternative refrigerant with a GWP less than 1,000 ..... **1**

(2) Do not use refrigerants..... **2**

11.707.14 Third-party utility benchmarking service

(1) For ~~a~~ multifamily and mixed-use buildings, the owner has contracted with a third-party utility benchmarking service with not less than five (5) years of experience in utility data management and analysis to perform a monthly analysis of whole-building energy and water consumption for not less than one (1) year. **3**

(2) The building owner commits to reporting energy data using EPA's ENERGY STAR Portfolio Manager for not less than three (3) years. **1**

11.707.15 Entryway air seal. For multifamily and mixed-use buildings, where not required by the building or energy code, to slow the movement of unconditioned air from outdoors to indoors at the main building entrance, the following is installed:

(1) Building entry vestibule. **2**

(2) Revolving entrance doors. **2**

11.801 INDOOR AND OUTDOOR WATER USE

11.801.0 Intent. Implement measures that reduce indoor and outdoor water usage. Implement measures that include collection and use of alternative sources of water. Implement measures that treat water on site.

11.801.1 Mandatory requirements. The building shall comply with one of the following: ~~§ 11.802 (Prescriptive Path) and § 11.803 (Innovative Practices). Points from § 11.804 (Performance Path) shall not be combined with points from § 11.802 (Prescriptive Path) or § 11.803 (Innovative Practices). The mandatory provisions of § 802 (Prescriptive Path) are required when using the Water Rating Index of § 804 (Performance Path) for Chapter 8 Water Efficiency compliance.~~

(1) § 11.801.1.1 Water Consumption Reduction Path;

(2) § 11.801.1.2 EPA Water Score Path;

(3) § 11.801.1.3 Prescriptive Path (§11.802 and §11.803); or

(4) § 11.801.1.4 Performance Path (11.804)

11.801.1.1~~305.2.6~~ Water consumption reduction path. The water efficiency rating level shall be based on the reduction in water consumption resulting from the remodel in accordance with Table 305.2.6.1.

POINTS

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

$$[(\text{consumption per bedroom before remodel} - \text{consumption per bedroom after remodel})/\text{consumption per bedroom before remodel}] * 100\%$$

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

Where a building can demonstrate through documentation approved by the Adopting Entity that the remodel activities started prior to project registration, the water baseline (consumption per unit before remodel) shall be calculated based on data and building systems that existed in the building up to 3 years prior project registration. Remodeling activities conducted during the 3-year lookback period that will be included as part of the consumption reduction analysis are subject to all applicable NGBS mandatory practices.

11.801.1.2 EPA water score path. Multifamily and mixed-use properties shall be scored in the EPA ENERGY STAR Portfolio Manager tool following EPA requirements and guidance or equivalent tool or program. The last month in the 12-month water data period for this water score shall be within 9 months prior to acceptance by the Adopting Entity. Where total property water data is not available, then the score can be generated with 100% actual common and non-residential area water usage and not less than 80% of the actual tenant water meters, which has been extrapolated to 100%. All water data and extrapolation methods shall be reported. The level awarded for the Water Section shall be based on Table 305.2.6.3.

11.801.1.3 Prescriptive path. A building complying with § 11.802 (Prescriptive Path) shall obtain not less than 8 points in practices § 11.802.4 through § 11.802.6 and not less than 4 points in practice § 11.802.7. Points from § 11.804 (Performance Path) shall not be combined with points from § 11.802 (Prescriptive Path) or § 11.803 (Innovative Practices).

11.801.1.4 Performance path. The mandatory provisions of § 11.802 (Prescriptive Path) are required when using the Water Rating Index of § 804 (Performance Path) for Chapter 118 Water Efficiency compliance. Points from § 11.804 (Performance Path) shall not be combined with points from § 11.802 (Prescriptive Path) or § 11.803 (Innovative Practices).

~~**11.801.1.1 Minimum prescriptive path requirements.** A building complying with § 11.802 (Prescriptive Path) shall obtain not less than 8 points in practices § 11.802.4 through § 11.802.6 and not less than 4 points in practice § 11.802.7.~~

11.802 PRESCRIPTIVE PATH

11.802.1 Indoor hot water usage. Indoor hot water supply system is in accordance with one of the practices listed in items (1) through (5). The maximum water volume from the source of hot water to the termination of the fixture supply is determined in accordance with Tables 11.802.1(1) or 11.8021.1(2). The maximum pipe length from the source of hot water to the termination of the fixture supply is 50 ft (15.2 m).

Where more than one water heater or where more than one type of hot water supply system, including multiple circulation loops, is used, points are awarded only for the system that qualifies for the minimum number of points. Systems with circulation loops are eligible for points only where pumps are demand

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controlled. Circulation systems with timers or aquastats and constant-on circulation systems are not eligible to receive points. Points awarded only where the pipes are insulated in accordance with § 11.705.6.3.

(1) The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 128 ounces (1 gallon or 3.78 liters). **8**

(2) The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 64 ounces (0.5 gallon or 1.89 liters). **12**

(3) The maximum volume from the water heater to the termination of the fixture supply at furthest fixture is 32 ounces (0.25 gallon or 0.9465 liters). **20**

(4) A demand controlled hot water priming pump is installed on the main supply pipe of the circulation loop and the maximum volume from this supply pipe to the furthest fixture is 24 ounces (0.19 gallons or 0.719 liters). **24**

(a) The volume in the circulation loop (supply) from the water heater or boiler to the branch for the furthest fixture is no more than 128 ounces (1 gallon or 3.78 liters). ..... **4 Additional**

(5) A central hot water recirculation system is implemented in multifamily and mixed-use 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 ft (9~~,~~ 144 ~~m~~m) and the parallel piping to the fixture fittings contains a maximum of 64 ounces (~~1.89 liters) (115.50 cubic in.) (~~0.50 gallons or 1.89 liters). ... **9**

(6) Tankless water heater(s) with not less than 0.5 gallon (1.89 liters) of storage are installed, or a tankless water heater that ramps up to not less than 110°F (43.3°C) within 5 seconds is installed. The storage may be internal or external to the tankless water heater..... **1 Additional**

Table 11.802.1(1)
Maximum Pipe Length Conversion Table[a]

Nominal Pipe Size (in.)	Liquid Ounces per Foot of Length	Main, Branch, and Fixture Supply System Volume Category			Branch and Fixture Supply Volume from Circulation Loop
		128 ounces (1 gallons) [per 11.802.1(1)]	64 ounces (0.5 gallon) [per 11.802.1(2)]	32 ounces (0.25 gallon) [per 11.802.1(3)]	24 ounces (0.19 gallon) [per 11.802.1(4)]
		Maximum Pipe Length (feet)			
1/4[b]	0.33	50	50	50	50
5/16[b]	0.5	50	50	50	48
3/8[b]	0.75	50	50	43	32
1/2	1.5	50	43	21	16
5/8	2	50	32	16	12
3/4	3	43	21	11	8
7/8	4	32	16	8	6
1	5	26	13	6	5
1 1/4	8	16	8	4	3
1 1/2	11	12	6	3	2
2	18	7	4	2	1

a. Maximum pipe length figures apply when the entire pipe run is one nominal diameter only. Where multiple pipe diameters are used, the combined volume shall not exceed the volume limitation in § 11.801.1.

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

Table 11.802.1(2)
Common Hot Water Pipe Internal Volumes

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

11.802.2 Water-conserving appliances. ENERGY STAR or equivalent water-conserving appliances are installed.

(1) dishwasher **2**

(2) clothes washer, or **6**

(3) clothes washer with an Integrated Water Factor of 3.8 or less **12**

***Multifamily and Mixed-Use Building Note**: Washing machines are installed in individual units or provided in common areas of multifamily and mixed-use buildings.*

11.802.3 Water usage metering. Water meters are installed complying with the following: ..... **14 max**

~~(1) Single-family buildings: water usage metering: .....~~

(~~a~~1) Where not otherwise required by the local AHJ, installation of a meter for water consumed from any source associated with the building or building site except for pools and spas. (Dwelling unit domestic cold water sub-meters can only be counted once per building.) ..... **2 per unique meter**

(~~b~~2) Each water meter shall be capable of communicating water consumption data remotely for the dwelling unit occupant and be capable of providing daily data with electronic data storage and reporting capability that can produce reports for daily, monthly, and yearly water consumption. (Fire sprinkler systems are not required to be metered.) ..... **2 per sensor package**

~~(2) Multifamily buildings: water usage metering: .....~~

~~(a) Where not otherwise required by the local AHJ, installation of a meter for water consumed from any source associated with the building or building site except for pools and spas. ..... **2 per unique use meter**~~

~~(b) Each water meter shall be capable of communicating water consumption data remotely for the dwelling unit occupant and be capable of providing daily data with electronic data storage and reporting capability that can produce reports for daily, monthly, and yearly water consumption. (Fire sprinkler systems are not required to be metered). ..... **2 per sensor package**~~

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~~*[Points earned in § 11.802.3(2) shall not exceed 50% of the total points earned for the Indoor and Outdoor Water Use Category]*~~

11.802.4 Showerheads. Showerheads are in accordance with the following:

(1) A 2.0 GPM (7.57 L/min) limit shall apply to cumulative flow of all devices located less than 96 in. apart in individual/two-person shower compartments or 35 in. (89 cm)apart in gang or group showers (as measured horizontally). Showerheads shall comply with ASME A112.18.1/CSA B125.1 and shall comply with the performance criteria of the EPA WaterSense Specification for showerheads. Showerheads shall be served by an automatic compensating valve that complies with ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and is specifically designed to provide thermal shock and scald protection at the flow rate of the showerhead.
[4 points awarded for first compartment; 1 point for each additional compartment in dwelling] ..... **2 [7 max]**

Points awarded per shower compartment. In multifamily and mixed-use buildings, the average of the points assigned to individual dwelling units or sleeping units may be used as the number of points awarded for this practice, rounded to the nearest whole number.

(2) All shower compartments in the dwelling unit(s) or sleeping unit(s) and common areas meet the requirements of § 11.802.4(1) and all showerheads are in accordance with one of the following:

(a) maximum of 1.8 gpm (6.8 L/min) ..... **6 Additional**

(b) maximum of 1.5 gpm (5.7 L/min) ..... **10 Additional**

(3) Any shower control that can shut off water flow without affecting temperature is installed.
[1 point awarded per shower control] ..... **1 [3 max]**

~~For SI: 1 gallon per minute = 3.785 L/m~~

11.802.5 Faucets

11.802.5.1 Install water-efficient lavatory faucets with flow rates not more than 1.5 gpm (5.7~~68~~ L/min), tested in compliance with ASME A112.18.1/CSA B125.1 and complying with the performance criteria of the EPA WaterSense High-Efficiency Lavatory Faucet Specification:

(1) Flow rate ≤ 1.5 gpm (5.7 L/min) ~~[Faucets in all residential bathrooms are in compliance]~~ ..... **1 [3 max]**

***Multifamily and Mixed-Use Building Note**: In multifamily and mixed-use buildings, the average number of bathrooms per unit may be used as the number of points awarded for this practice, rounded to the nearest whole number.*

(2) Flow rate ≤ 1.20 gpm (4.5 L/min) ~~[Faucets in all residential bathrooms are in compliance]~~ ..... **2 [6 max]**

***Multifamily and Mixed-Use Building Note**: In multifamily and mixed-use buildings, the average number of bathrooms per unit may be used as the number of points awarded for this practice, rounded to the nearest whole number.*

(3) Flow rate ≤ 1.5 gpm for all lavatory faucets in the dwelling unit(s) or sleeping unit(s) ..... **6 Additional**

(4) Flow rate ≤ 1.5 gpm for all lavatory faucets in the dwelling unit(s) or sleeping unit(s), and not less than one bathroom has faucet(s) with flow rate(s) ≤ 1.2 gpm ..... **8 Additional**

(5) Flow rate ≤ 1.2 gpm for all lavatory faucets in the dwelling unit(s) or sleeping unit(s) ..... **12 Additional**

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11.802.5.2 Water-efficient residential kitchen faucets are installed in accordance with ASME A112.18.1/CSA B125.1. Residential kitchen faucets may temporarily increase the flow above the maximum rate but not to exceed 2.2 gpm (8.3 L/min).

(1) All residential kitchen faucets have a maximum flow rate of 1.8 gpm (6.8 L/min). **3**

(2) All residential kitchen faucets have a maximum flow rate of 1.5 gpm (5.7 L/min). ..... **1 Additional**

11.802.5.3 Self-closing valve, motion sensor, metering, or pedal-activated faucet is installed to enable intermittent on/off operation. *[1 point awarded per fixture]* ..... **1 [3 max]**

11.802.6 Water closets and urinals. Water closets and urinals are in accordance with the following:

~~*Points awarded for § 11.803.6(2) or § 11.802.6(3), not both.*~~

(1) Gold and Emerald levels: All water closets and urinals are in accordance with § 11.802.6. ..... **Mandatory**

(2) All water closets ~~is~~ are installed with an effective flush volume of 1.28 gallons (4.85 L) or less in accordance with ASME A112.19.2/CSA B45.1 or ASME A112.19.14 as applicable. Tank-type water closets shall be in accordance with the performance criteria of the EPA WaterSense Specification for Tank-Type Toilets ..... ~~**2 [12 max]**~~**21**

~~*[Points awarded per fixture. In multifamily buildings, the average of the points assigned to individual dwelling units or sleeping units may be used as the number of points awarded for this practice, rounded to the nearest whole number.]*~~

~~(3) All water closets are in accordance with § 11.802.6(2). ..... **8**~~

(~~4~~3) All water closets are in accordance with § 11.802.6(2) **and** one or more of the following are met:

(a) Water closets that have an *effective flush volume* in accordance with one of the following:
~~*[Points awarded per toilet. In multifamily buildings, the average of the points assigned to individual dwelling units or sleeping units may be used as the number of points awarded for this practice, rounded to the nearest whole number.]*~~

(i) between and including 0.9 and 1.2 gallons (3.4 and 4.5 L);~~.~~ ..... **2 Additional**

(ii) less than 0.9 gallons (3.4 L). ..... **4 Additional**

(b) One or more urinals are in installed in accordance with the following:~~with a flush volume of 0.5 gallons (1.9 L) or less when tested in accordance with ASME A112.19.2/CSA B45.1.~~ ..... ~~**2 Additional**~~

(i) a flush volume of 0.5 gallons (1.9L) or less when tested in accordance with ASME A112.19.2/CSA B45.1; ..... **2 Additional**

(ii) composting or non-flushing toilets or non-flushing urinals. Non-flushing toilets and urinals shall be tested in accordance with ASME A112.19.2/CSA B45.1. ..... **12 Additional**

~~(c) One or more composting or non-flushing toilets or non-flushing urinals. Non-flushing toilets and urinals shall be tested in accordance with ASME A112.19.2/CSA B45.1. ..... **12 Additional**~~

11.802.7 Irrigation systems

11.802.7.1 Where an irrigation system is installed, an irrigation plan and implementation are executed by a qualified professional or equivalent. ..... **Mandatory**

POINTS

11.802.7.2 Irrigation sprinkler nozzles shall be tested according to ANSI standard ASABE/ICC 802 Landscape Irrigation Sprinkler and Emitter Standard by an accredited third-party laboratory. **6**

11.802.7.3 Drip irrigation is installed. ..... **13 max**

(1) Drip irrigation is installed for all landscape beds. **4**

(2) Subsurface drip is installed for all turf grass areas. **4**

(3) Drip irrigation zones specifications show plant type by name and water use/need for each emitter *[Points awarded only where specifications are implemented.]* **5**

11.802.7.4 The irrigation system(s) is controlled by a smart controller or no irrigation is installed. *[Points are not additive.]*

(1) Irrigation controllers shall be in accordance with the performance criteria of the EPA WaterSense program **10**

(2) No irrigation is installed and a minimum of 5 points from 503.5(1-9) is earneda minimum of 5 points from 503.5(1-9) is earned. **15**

(~~2~~3) No irrigation is installed and there is ~~plan of no landscaping~~no landscape area. **15**

11.802.7.5 Commissioning and water use reduction for irrigation systems. *[Points are not additive per each section.]*

(1) All irrigation zones utilize pressure regulation so emission devices (sprinklers and drip emitters) operate at manufacturer's recommended operating pressure. **3**

(2) Where dripline tubing is installed, a filter with mesh size in accordance with the manufacturer's recommendation is installed on all drip zones. **3**

(3) Utilize spray bodies that incorporate an in-stem or external flow shut-off device. **3**

(4) For irrigation systems installed on sloped sites, either an in-stem or external check valve is utilized for each spray body. **3**

(5) Where an irrigation system is installed, a flow sensing device is installed to monitor and alert the controller when flows are outside design range. **3**

11.802.8 Rainwater collection and distribution. Rainwater collection and distribution is provided.

11.802.8.1 Rainwater is used for irrigation in accordance with one of the following:

(1) Rainwater is diverted for landscape irrigation without impermeable water storage **5**

(2) Rainwater is diverted for landscape irrigation with impermeable water storage in accordance with one of the following:

(a) 50 ~~–499~~to less than 500 gallon (189 to less than 1893 L) storage capacity **5**

(b) 500 ~~–~~to less than 2500~~2,499~~ gallon (1893 to less than 9464 L) storage capacity **10**

(c) 2,500 gallon (9464 L) or larger storage capacity (system is designed by a professional certified by the ARCSA or equivalent) **15**

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(d) All irrigation demands are met by rainwater capture (documentation demonstrating the water needs of the landscape are provided and the system is designed by a professional certified by the ARCSA or equivalent)..... **30**

11.802.8.2 Rainwater is used for indoor domestic demand as follows. The system is designed by a professional certified by the ARCSA or equivalent.

(1) Rainwater is used to supply an indoor appliance or fixture for any locally approved use. *[Points awarded per appliance or fixture.]* ..... **5 [15 max]**

(2) Rainwater provides for total domestic demand. Where rainwater is used as potable water the potable rainwater system shall comply with the requirements of IRC Sections P2906 and Section P2912. ..... **46**

The following shall also apply:

(a) The following roof materials shall not be used to collect rainwater: shingles with fire retardant, copper, and materials that contain asbestos. Materials that contain lead, including but not limited to flashings and roof jacks, shall be prohibited.

(b) Potable water supplies shall be protected against cross connection with rainwater as specified in IRC Section P2902.1.

(c) Disinfection shall be provided by at least one of the following:

(i) Ultraviolet (UV) light providing not less than 40 mJ/cm2 at 254 nm for the highest water flow rate. A UV sensor with visible alarm, audible alarm, or water shutoff shall be triggered when the UV light is below the minimum at the sensor. In addition, filtration no greater than 5 µm shall be located upstream of the UV light or

(ii) filtration no greater than 0.2 µm, or

(iii) other approved disinfection

(d) Materials and systems that collect, convey, pump, or store rainwater for potable rainwater systems shall comply with NSF 53, NSF 61 or equivalent.

(e) The quality of the water at the point of use shall be verified in accordance with the requirements of the jurisdiction.

(f) The rainwater storage shall not admit sunlight.

(g) Potable rainwater pipe shall not be required to be purple after the point that the water is disinfected.

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

11.802.10 Water treatment devices

11.802.10.1 Water Softeners shall not be installed where the supplied water hardness is less than 8.0 grains per gallon measured as total calcium carbonate equivalents. Water softeners shall be listed to NSF 44 and a rated salt efficiency of 3,400 grains of total hardness per 1.0 pound of salt based on sodium chloride equivalency. Devices shall not discharge more than 4.0 gallons of water per 1,000 grains of hardness removed during the service or recharge cycle.

	POINTS
(1) No water softener.	**5**
(2) Water softener installed to supply softened water only to domestic water heater.	**2**

11.802.10.2 Reverse Osmosis (R/O) water treatment systems shall be listed to NSF 58 and shall include automatic shut-off valve to prevent water discharge when storage tank is full.

(1) No R/O system.	**3**
(2) Combined capacity of all R/O systems does not exceed 0.75 gallons (2.84 L).	**1**

11.802.11 Pools and spas

11.802.11.1 Non-permeable pool cover is installed and extends across the entire pool~~An motorized non-permeable pool cover is installed and extends across the entire pool surface~~.	~~**10**~~
(1) Non-motorized	**5**
(2) Motorized	**10**

11.803 INNOVATIVE PRACTICES

11.803.1 Reclaimed, grey, or recycled water. Reclaimed, grey, or recycled water is used as permitted by applicable code.

Points awarded for either § 11.803.1(1) or § 11.803.1(2), not both.
Points awarded for either § 11. 803.6 or § 11.803.1, not both.

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

11.803.2 Reclaimed water, greywater, or rainwater pre-piping. Reclaimed, greywater, or rainwater systems are rough plumbed (and permanently marked, tagged or labeled) into buildings for future use.	**3 per roughed in system**

11.803.3 Automatic leak detection and control devices. One of the following devices is installed. Where a fire sprinkler system is present, ensure the device will be installed to not interfere with the operation of the fire sprinkler system.	**2**
(1) automatic water leak detection and control devices	
(2) automatic water leak detection and shutoff devices	
11.803.4 Engineered biological system or intensive bioremediation system. An engineered biological system or intensive bioremediation system is installed and the treated water is used on site. Design and implementation are approved by appropriate regional authority.	**20**
11.803.5 Recirculating humidifier. Where a humidifier is required, a recirculating humidifier is used in lieu of a traditional “flow through” type.	**1**
11.803.6 Advanced wastewater treatment system. Advanced wastewater (aerobic) treatment system is installed and treated water is used on site.	**20**

Points awarded for either § 11.803.6 or § 11.803.1, not both.

POINTS

11.804 PERFORMANCE PATH

11.804.1 Performance Path. The index score for the Performance Path shall be calculated in accordance with Appendix D Water Rating Index (WRI) or equivalent methodology.

11.804.2 Water efficiency rating levels. In lieu of threshold levels for Chapter ~~8~~ 11 in Table 303, rating levels for § 11.804.1 are in accordance with Table 11.804.2.

Table 11.804.2
Maximum WRI Scores for NGBS Certification in Chapter 8

BRONZE	SILVER	GOLD	EMERALD
~~70~~100	~~60~~90	~~50~~80	~~40~~70

11.804.3 Water efficiency NGBS points equivalency. The additional points for use with Table 305.2.6.2 from the Chapter ~~8~~ 11 Water Efficiency Category are determined in accordance with Equation 11.804.3.

Equation 11.804.3
NGBS = WRI x (-2.29) + 181.7

11.901 POLLUTANT SOURCE CONTROL

11.901.0 Intent. Pollutant sources are controlled.

11.901.1 Space and water heating options

11.901.1.1 Natural draft furnaces, boilers, or water heaters are not located in conditioned spaces, including conditioned crawlspaces, unless located in a mechanical room that has an outdoor air source, and is sealed and insulated to separate it from the conditioned space(s).
[Points are awarded only for buildings that use natural draft combustion space or water heating equipment.]... **5**

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 Space conditioning equipment. All space conditioning equipment installed within conditioned space complies with one of the following:

(1) power vent **3**

(2) direct vent **5**

(3) electric **8**

11.901.1.3 water heating equipment. All water heating equipment installed within conditioned space complies with one of the following:

(1) power vent **3**

(2) direct vent **5**

(3) electric **8**

11.901.1.5 Newly installed gas-fired fireplaces and direct heating equipment is listed and is installed in accordance with the NFPA 54, IFGC, or the applicable local gas appliance installation code. Gas-fired **Mandatory**

POINTS

fireplaces within dwelling units or sleeping units and direct heating equipment are vented to the outdoors. Alcohol burning devices and kerosene heaters are vented to the outdoors. .....

11.901.1.6 Natural gas and propane fireplaces are direct vented, have permanently fixed glass fronts or gasketed doors, and comply with CSA/AM ANSI Z21.88/CSA 2.33 or CSA/AM ANSI Z21.50/CSA 2.22. ..... **7**

11.901.1.7 Heat pump air handler is installed in unconditioned space.~~The following electric equipment is installed:~~ **2**

~~(1) heat pump air handler in unconditioned space ..... 2~~

~~(2) heat pump air handler in conditioned space..... 5~~

11.901.2 Solid fuel-burning appliances

11.901.2.1 Newly installed solid fuel-burning fireplaces, inserts, stoves and heaters inside thermal envelope or pressure boundary are in accordance with the following requirements: ..... **Mandatory**

(1) Site-built masonry wood-burning fireplaces are equipped with outside combustion air and a means of sealing the flue and the combustion air outlets to minimize interior air (heat) loss when not in operation.

(2) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are an EPA Phase 2 Emission Level Qualified Model.

(3) Wood stove and fireplace inserts, as defined in UL 1482 Section 3.8, are in accordance with the certification requirements of UL 1482 and are in accordance with the emission requirements of the EPA Certification and the State of Washington WAC 173-433-100(3).

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

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

(6) Removal of or rendering unusable an existing fireplace or fuel burning appliance that is not in accordance with § 11.901.2.1 or replacement of each fireplace or appliance that is not in accordance with § 11.901.2.1 with a compliant appliance.

11.901.2.2 Where installed, Solid fuel-burning fireplaces, woodstoves, pellet stoves, or masonry heaters are not installed or are installed outside the thermal envelope or pressure boundary. **6**

11.901.3 All electric building. Building is all-electric or has no combustion appliances, equipment, or fixtures inside the building thermal envelope or pressure boundary..... **6**

11.901.4 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. ..... **2 Mandatory**

(b) A continuous air barrier is provided between walls and ceilings separating the garage space from the conditioned living spaces. ..... **2 Mandatory**

(c) For one- and two-family dwelling units, a 100 cfm (47.2 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 **8**

POINTS

installed for continuous operation, or has controls (e.g., motion detectors, pressure switches) that activate operation for not less than 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 ASHRAE Standard 62.2-2019 Section 7.3. .....

(2) A carport is installed, the garage is detached from the building, or no garage is installed. **10**

11.901.5 Wood materials. Not less than 85% of newly installed material within a product group (i.e., wood structural panels, countertops, composite trim/doors, custom woodwork, and/or component closet shelving) is manufactured in accordance with the following: ..... **10 max**

(1) Structural plywood used for floor, wall, and/or roof sheathing is compliant with DOC PS 1 and/or DOC PS 2. OSB used for floor, wall, and/or roof sheathing is compliant with DOC PS 2. The panels are made with moisture-resistant adhesives. The trademark indicates these adhesives as follows: Exposure 1 or Exterior for plywood, and Exposure 1 for OSB..... **Mandatory**

(2) Particleboard and MDF (medium density fiberboard) is manufactured and labeled in accordance with CPA A208.1 and CPA A208.2, respectively. *[Points awarded per product group.]* **2**

(3) Hardwood plywood in accordance with HPVA HP-1. *[Points awarded per product group.]* **2**

(4) Particleboard, MDF, or hardwood plywood is in accordance with CPA 4. *[Points awarded per product group.]*..... **3**

(5) Composite wood or agrifiber panel products contain no added urea-formaldehyde or are in accordance with the *CARB Composite Wood Air Toxic Contaminant Measure Standard*. *[Points awarded per product group.]*..... **Mandatory4**

(6) Non-emitting products. *[Points awarded per product group.]* **4**

11.901.6 Cabinets. Not less than 85% of newly installed cabinets are in accordance with one or both of the following: *[Where both of the following practices are used, only three points are awarded.]*

(1) All parts of the cabinet are made of solid wood or non-formaldehyde emitting materials such as metal or glass. **5**

(2) The composite wood used in wood cabinets are in accordance with CARB Composite Wood Air Toxic Contaminant Measure Standard or equivalent as certified by a program such as but not limited to, those in Appendix B. **3**

11.901.7 Carpets. Carpets are in accordance with the following:

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

11.901.8 Floor materials. The following types of finished flooring materials are used. The materials have emission levels in accordance with CDPH/EHLB Standard Method v1.1. Product is tested by a laboratory with the CDPH/EHLB Standard Method v1.1 within the laboratory scope of accreditation to ISO/IEC 17025 and certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix B. *[1 point awarded for every 10% of conditioned floor space using one of the below materials.*
When carpet cushion complying with the emission limits of the practice is also installed, the percentage of compliant carpet area is calculated at 1.33 times the actual installed area.]..... **1 [8 max]**

(1) Hard-surface flooring: Prefinished installed hard-surface flooring is installed. Where post-manufacture coatings or surface applications have not been applied, the following hard surface flooring types are deemed to comply with the emission requirements of this practice:

POINTS

(a) Ceramic tile flooring

(b) Organic-free, mineral-based flooring

(c) Clay masonry flooring

(d) Concrete masonry flooring

(e) Concrete flooring

(f) Metal flooring

(g) Glass

(2) Carpet and carpet cushion are installed.

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

11.901.10 Interior architectural coatings. Not less than 85% of newly applied interior architectural coatings are in accordance with either § 11.901.9.1 or § 11.901.9.3, not both. Not less than 85% of architectural colorants are in accordance with § 11.901.9.2.

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

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

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

(2) *CARB Suggested Control Measure for Architectural Coatings* (see Table 11.901.10.1)

Table 11.901.10.1
VOC Content Limits For Architectural Coatings[a,b,c]

Coating Category	LIMIT[d] (g/l)
Flat Coatings	50
Non-flat Coatings	100
Non-flat High-Gloss Coatings	150
Specialty Coatings:	
Aluminum Roof Coatings	400
Basement Specialty Coatings	400
Bituminous Roof Coatings	50
Bituminous Roof Primers	350
Bond Breakers	350
Concrete Curing Compounds	350
Concrete/Masonry Sealers	100
Driveway Sealers	50
Dry Fog Coatings	150
Faux Finishing Coatings	350
Fire Resistive Coatings	350

POINTS

Floor Coatings	100
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High Temperature Coatings	420
Industrial Maintenance Coatings	250
Low Solids Coatings	120[e]
Magnesite Cement Coatings	450
Mastic Texture Coatings	100
Metallic Pigmented Coatings	500
Multi-Color Coatings	250
Pre-Treatment Wash Primers	420
Primers, Sealers, and Undercoaters	100
Reactive Penetrating Sealers	350
Recycled Coatings	250
Roof Coatings	50
Rust Preventative Coatings	250
Shellacs, Clear	730
Shellacs, Opaque	550
Specialty Primers, Sealers, and Undercoaters	100
Stains	250
Stone Consolidants	450
Swimming Pool Coatings	340
Traffic Marking Coatings	100
Tub and Tile Refinish Coatings	420
Waterproofing Membranes	250
Wood Coatings	275
Wood Preservatives	350
Zinc-Rich Primers	340

a. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.

b. Values in this table are derived from those specified by the California Air Resources Board, Architectural Coatings Suggested Control Measure, February 1, 2008.

c. Table 11.901.10.1 architectural coating regulatory category and VOC content compliance determination shall conform to the California Air Resources Board Suggested Control Measure for Architectural Coatings dated February 1, 2008.

d. Limits are expressed as VOC Regulatory (except as noted), thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.

e. Limit is expressed as VOC actual.

11.901.9.2 Architectural coating colorant additive VOC content is in accordance with Table 11.901.10.2. *[Points for § 11.901.10.2 are awarded only where base architectural coating is in accordance with § 11.901.10.1.]* **1**

Table 11.901.10.2
VOC Content Limits for Colorants

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

11.901.10.3 Site-applied interior architectural coatings, which are inside the waterproofing envelope, are in accordance with the emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of **8**

POINTS

accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix B. .....

11.901.10.4 When the building is occupied during the remodel, not less than 85% of the newly applied interior architectural coatings are in accordance with either § 11.901.10.1 or § 11.901.10.3. ..... **Mandatory**

11.901.11 Interior adhesives and sealants. Interior low-VOC adhesives and sealants located inside the water proofing envelope: Not less than 85% of newly applied site-applied products used within the interior of the building are in accordance with one of the following, as applicable.

(1) The emission levels of CDPH/EHLB Standard Method v1.1. Emission levels are determined when tested by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those found in Appendix B. **8**

(2) SCAQMD Rule 1168 in accordance with Table 11.901.11(3), excluding products that are sold in 16-ounce containers or less and are regulated by the California Air Resources Board (CARB) Consumer Products Regulation. **5**

11.901.12 Insulation. Emissions of 85% of newly installed wall, ceiling, and floor insulation materials are in accordance with the emission levels of CDPH/EHLB. Standard Method v1.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the CDPH/EHLB Standard Method v1.1 is in its scope of accreditation. The product is certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix B. **4**

11.901.13 Furniture and Furnishings. In ~~a~~ multifamily and mixed-use buildings, all furniture in common areas shall have VOC emission levels in accordance with ANSI/BIFMA e3-Furniture Sustainability Standard Sections 7.6.1 and 7.6.2, tested in accordance with ANSI/BIFMA Standard Method M7.1. Emission levels are determined by a laboratory accredited to ISO/IEC 17025 and the ANSI/BIFMA Standard Method M7.1 is in its scope of accreditation. Furniture and Furnishings are certified by a third-party program accredited to ISO 17065, such as, but not limited to, those in Appendix B. **2**

11.901.14 Carbon monoxide (CO) alarms. A carbon monoxide (CO) alarm is provided in accordance with IRC Section R315 or IBC Section 915, as applicable. ..... **Mandatory**

Table 11.901.11(3)
Site Applied Adhesive and Sealants VOC Limits[a,b]

ADHESIVE OR SEALANT	VOC LIMIT (g/l)
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250

POINTS

Architectural sealants	250
Architectural sealant primer Non-porous Porous	 250 775
Modified bituminous sealant primer	500
Other sealant primers	750
CPVC solvent cement	490
PVC solvent cement	510
ABS solvent cement	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140

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

11.901.15 Building entrance pollutants control. Pollutants are controlled at all main building entrances by one of the following methods:

(1) Exterior grilles or mats are installed in a fixed manner and may be removable for cleaning. **1**

(2) Interior grilles or mats are installed in a fixed manner and may be removable for cleaning. **1**

11.901.16 Non-smoking areas. Environmental tobacco and other smoke from controlledis minimized by one of the following:

(1) All interior common areas of ~~a~~ multifamily and mixed-use buildings are designated as non-smoking areas with posted signage. **1**

(2) Exterior smoking areas of ~~a~~ multifamily and mixed-use buildings are designated with posted signage and located not less than 25 ft from entries, outdoor air intakes, and operable windows. **1**

(3) The entire multifamily and mixed-use building and site is designated as non-smoking with posted signage and restrictions in the leases. .....

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

11.902 POLLUTANT CONTROL

11.902.0 Intent. Pollutants generated in the building are controlled.

11.902.1 Spot ventilation

11.902.1.1 Spot ventilation is in accordance with the following:

(1) Bathrooms are vented to the outdoors. The ventilation rate is not less than 50 cfm (23.6 L/s) for intermittent operation or 25 cfm (11.8 L/s) for continuous operation in bathrooms. **Mandatory [1 max]**

POINTS

[1 point awarded only where a window complying with IRC Section R303.3 is provided in addition to mechanical ventilation.] .....

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

(3) Kitchen exhaust is in accordance with the specifications of at least one of the following as applicable:..... **8**

(a) International Residential Code

(b) International Mechanical Code

(c) ASHRAE 62.2

11.902.1.2 Bathroom and/or laundry exhaust fan is provided with an automatic timer and/or humidistat: .. **11 max**

(1) for first device..... **5**

(2) for each additional device **2**

11.902.1.3 Where installed, kitchen, bathroom, and laundry area exhausts are tested in accordance with BSR/RESNET/ICC 380 to the design rate(s). **8**

Exception: The requirements of Table 11.902.1.3 shall be permitted in place of a measurement. When using Table 11.902.1.3, the airflow rating shall comply with or exceed a static pressure of 0.25 in. of water column.

Use of Table 902.1.3 is limited to one or more of the following:

(a) Duct system not exceeding 25 ft in length;

(b) Duct system with no more than three (3) elbows; or

(c) Duct system with exterior termination fittings having a hydraulic diameter greater than or equal to the minimum duct diameter not less than the hydraulic diameter of the fan outlet.

Table 11.902.1.3
Prescriptive Duct Sizing

	Fan Airflow Rating (CFM), at minimum static pressure of 0.25 in. of water												
	≤ 50	≤ 80	≤ 100	≤ 125	≤ 150	≤ 175	≤ 200	≤ 250	≤ 350	≤ 400	≤ 450	≤ 70	≤ 800
Duct Type	Minimum Duct Diameter, In.[a,b]												
Rigid Duct	4[e]	5	5	6	6	7	7	8	9	10	10	12	12[d]
Flex Duct[c]	4	5	6	6	7	7	8	8	9	10	NP	NP	NP

a. For noncircular ducts, calculate the diameter as four times the cross-sectional area divided by the perimeter.
b. NP = application of the prescriptive table is not permitted for this scenario.
c. Use of this table for verification of flex duct systems requires flex duct to be fully extended and any flex duct elbows to have a minimum bend radius to duct diameter ratio of 1.0.
d. For this scenario, use of elbows is not permitted.
e. For this scenario, 4 in. (10~~0~~ ~~mc~~m) oval duct shall be permitted, provided the minor axis of the oval is greater than or equal to 3 in. (~~75~~ 7.6 ~~mc~~m)

11.902.1.4 Exhaust fans comply with ENERGY STAR, or either IECC R403.6.2 or C403.8.5, as applicable. ..... **Mandatory**

(1) Fans operating at or below 1 sone *[Points awarded per fan.]*..... **3 [12 max]**

11.902.1.5 Fenestration in spaces other than those identified in 11.902.1.1 through 11.902.1.4 are designed for stack effect or cross-ventilation in accordance with all of the following:..... **3**

POINTS

(1) Operable windows, operable skylights, or sliding glass doors with a total area of not less than 15% of the total conditioned floor area are provided.

(2) Insect screens are provided for all operable windows, operable skylights, and sliding glass doors.

(3) Not less than two operable windows or sliding glass doors are placed in adjacent or opposite walls. where there is only one wall surface in that space exposed to the exterior, the minimum windows or sliding glass doors may be on the same wall.

11.902.1.6 Ventilation for Multifamily and Mixed-Use Common Spaces. Systems are implemented and are in accordance with the specifications of ASHRAE 62.1 or IMC Chapter 4 and an explanation of the operation and importance of the ventilation system is included in § 11.1002.1 and § 11.1002.2. ..... **Mandatory**

11.902.2 Building ventilation systems

11.902.2.1 Whole building ventilation systems implemented in the dwelling units are in accordance with the specifications of at least one of the following, as applicable: **Mandatory**

(a) ASHRAE 62.2-2019

(b) 2021 International Mechanical Code

(c) 2021 International Residential Code

One of the following whole building ventilation systems is implemented in the dwelling units and an explanation of the operation and importance of the ventilation system is included in either 11.1001.1 or § 11.1002.2.

(1) exhaust or supply fan(s) ready for continuous operation and with appropriately labeled controls **3**

(2) balanced exhaust and supply fans with supply intakes located in accordance with the manufacturer's guidelines so as to not introduce polluted air back into the building..... **6**

(3) heat-recovery ventilator **7**

(4) energy-recovery ventilator **8**

(5) Ventilation air is preconditioned by a system not specified above **10**

11.902.2.2 Where implemented, ventilation airflow is tested and verified to provide the minimum ventilation flow rates in accordance with ANSI/RESNET/ICC 380 and § 11.902.2.1. ..... **4**

11.902.2.3 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 the filter ~~used~~installed. ..... **Mandatory**

11.902.2.4 MERV filters 10-12 are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of the filter ~~used~~installed. **1**

11.902.2.5 MERV filters 13-15 are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of the filter ~~used~~installed. **2**

POINTS

11.902.2.6 MERV filters 16 or greater are installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of the filter ~~used~~installed. **3**

11.902.2.7 Enhanced air filtration. Air filtration systems meets all of the following: **2**

(1) Design for and install a secondary filter rack space for activated carbon filters.

(2) Provide the manufacturer's recommended filter maintenance schedule to the homeowner or building manager.

11.902.2.7 All HVAC filter locations are designed such that they are readily accessible to the occupant. **3**

11.902.3 Radon testing and mitigation. Radon Zones are identified by the AHJ or, where the zone is not identified by the AHJ, as defined in Figure 9(1).
~~*[Mandatory except for an existing building that has been tested for radon and is in accordance with federal and local acceptable limits.]*~~..... **Mandatory**

11.902.3.1 Radon testing. Radon testing is mandatory for Zone 1.

Exceptions: 1) Testing is not mandatory where the authority having jurisdiction has defined the radon zone as Zone 2 and 3; and 2) testing is not mandatory where the occupied space is located above an unenclosed open space or concrete podiums.

(1) Single-family testing specifications. Single-family testing is performed as specified in (a) through (j). Testing of a representative sample shall be permitted for multifamily and mixed-use buildings only. ... **8**

(a) Testing is performed after the residence passes its airtightness test.

(b) Testing is performed after the radon control system installation is complete. where the system has an active fan, the residence shall be tested with the fan operating.

(c) Testing is performed at the lowest level within a dwelling unit which will be occupied, even if the space is not finished.

(d) Testing is not performed in a closet, hallway, stairway, laundry room, furnace room, kitchen, or bathroom.

(e) Testing is performed with a commercially available test kit or with a continuous radon monitor that can be calibrated. Testing shall be in accordance with the testing device manufacturer's instructions.

(f) Testing shall be performed by the builder, a registered design professional, or an approved third party.

(g) Testing shall extend not less than 48 hours or to the minimum specified by the manufacturer, whichever is longer.

(h) Written radon test results shall be provided by the test lab or testing party. Written test results shall be included with construction documents.

(i) An additional pre-paid test kit shall be provided for the homeowner to use when they choose. The test kit shall include mailing or emailing the results from the testing lab to the homeowner.

POINTS

(j) Where the radon test result is 4 pCi/L or greater, ~~the fan for the radon vent pipe~~a radon mitigation system shall be installed. The system shall be modified and retested until the test result is less than 4 pCi/L.

(2) Multifamily and mixed-use testing specifications. Multifamily and mixed-use testing is performed as specified in (a) through (i). ..... ~~8~~

(i) testing of 100% of ground-contact units/areas 8

(ii) for Zones 2 and 3, sampling of not less than 25% ground contact units/areas 6

(a) ~~For Zone 1,~~ Each ground-contact dwelling or living sleeping unit, a test is performed in the lowest level that serves or could serve as a living area, sleeping quarters, office, playroom or otherwise be occupied for residential use at some time in the future. ~~Apply a 25% sampling of units or at least one of each unit type- whichever is greater, for Zone 2 buildings.~~ There should be representative samples across the footprint of the building.

(b) For ~~non-residential~~ ground-contact ~~locations~~amenity areas, a test is performed in all ~~ground-contact rooms, offices, classrooms and other general use~~ areas that are occupied or intended to be occupied. ~~Apply a 25% sampling of spaces for Zone 2 buildings.~~ There should be representative samples across the footprint of the building.

(c) On each upper floor, testing is performed in at least one, and not less than 10%, of all dwellings and nonresidential rooms that are occupied or intended to be occupied. These measurements shall be in addition to tests performed in ground-contact locations and rooms or dwellings that adjoin immediately above untested ground-contact locations.

(d) Testing is not performed in hallways, closets, and bathroom or shower areas unless they are open to other rooms that are occupied for other purposes.

(e) Testing is performed with a commercially available test kit or with a continuous radon monitor that can be calibrated. Testing shall be in accordance with the testing device manufacturer's instructions.

(f) Testing shall be performed by the builder, a registered design professional, or an approved third party.

(g) Testing shall extend not less than 48 hours or to the minimum specified by the manufacturer, whichever is longer.

(h) Written radon test results shall be provided by the test lab or testing party. Written test results shall be included with construction documents.

(i) Where any radon test result is 4 pCi/L or greater, fan(s) for the radon vent pipe shall be installed. The system shall be modified, and the entire building retested until the test result is less than 4 pCi/L.

(3) Testing results. A radon test done in accordance with § 11.902.3.1(1) or 902.3.1(2) and completed before occupancy receives a result of 2 pCi/L or less. 6

11.902.3.2 Radon reduction measures. Radon reduction measures are in accordance with IRC Appendix AF Radon Control Methods, ANSI/AARST SGM-MFLB, or § 11.902.3.1.

(1) Buildings located in Zone 1

		POINTS
(a)	a passive radon system is installed	**Mandatory**
	Mandatory for existing building with conditioned space over a new ground supported slab. An existing building that has been tested for radon and is less than 4 pCi/L would be exempted from this requirement.	
(b)	an active radon system is installed	**12**
(2)	Buildings located in Zone 2 or Zone 3	
(a)	a passive or active radon system is installed	**6**
(b)	an active radon system is installed	**12**

11.902.3.3 Radon reduction option. This option requires § 11.902.3.3.2 through § 11.902.3.3.7.

11.902.3.3.2 Soil gas collection. There shall be an unobstructed path for soil gas flow between the void space installed in the base course and the vent through the roof. Soil gases below the foundation shall be collected by a perforated pipe with a diameter of not less than 4 in. (10 cm) and not less than 5 ft (1.5 m) in total length. A tee fitting or equivalent method shall provide two horizontal openings to the radon collection. The tee fitting shall be designed to prevent clogging of the radon collection path. Alternately the soil gas collection shall be by approved radon collection mats or an equivalent approved method.

11.902.3.3.3 Soil gas entry routes. Openings in slabs, soil-gas retarders, and joints such as, but not limited to, plumbing, ground water control systems, soil-gas vent pipes, piping and structural supports, shall be sealed against air leakage at the penetrations. The sealant shall be a polyurethane caulk, expanding foam or other approved method. Foundation walls shall comply with IRC Section 103.2.3. Sumps shall be sealed in accordance with IRC Section 103.2.2. Sump pits and sump lids intended for ground water control shall not be connected to the sub-slab soil-gas exhaust system.

11.902.3.3.4 Soil gas vent. A gas-tight pipe vent shall extend from the soil gas permeable layer through the roof. The vent pipe size shall not be reduced at any location as it goes from gas collection to the roof. Exposed and visible interior vent pipes shall be identified with not less than one label reading “Radon Reduction System” on each floor and in habitable attics.

11.902.3.3.5 Vent pipe diameter. The minimum vent pipe diameter shall be as specified in Table 11.902.3.2.5.

Table 11.902.3.3.5
Maximum Vented Foundation Area

Maximum area vented	Nominal pipe diameter
2,500 ft^2 (232 m^2)	3 in. (7.6 cm)
4,000 ft^2 (372 m^2)	4 in. (10 cm)
Unlimited	6 in. (15.2 cm)

11.902.3.3.6 Multiple vented areas. In dwellings where interior footings or other barriers separate the soil-gas permeable layer, each area shall be fitted with an individual vent pipe. Vent pipes shall connect to a single vent that terminates above the roof or each individual vent pipe shall terminate separately above the roof.

11.902.3.3.7 Fan. Each sub-slab soil-gas exhaust system shall include a fan, or dedicated space for the post-construction installation of a fan. The electrical supply for the fan shall be located within 6 ft (1.8 m) of the fan. Fan is not required to be on a dedicated circuit.

POINTS

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.

(3) If HVAC systems are to be operated, during construction, all return grilles have a temporary MERV 8 or higher filter installed in a manner ensuring no leakage around the filter.

11.902.5 Central vacuum systems. Central vacuum system is installed and vented to the outside..... **3**

11.902.6 Living space contaminants. The living space is sealed in accordance with § 11.701.4.3.1 to prevent unwanted contaminants..... **Mandatory**

11.903 MOISTURE MANAGEMENT: VAPOR, RAINWATER, PLUMBING, HVAC

11.903.0 Intent. Moisture and moisture effects are controlled.

11.903.1 Plumbing

11.903.1.1 Cold water pipes in unconditioned spaces are insulated to not less than R-4 with pipe insulation or other covering that adequately prevents condensation..... **2**

11.903.1.2 Plumbing is not installed in unconditioned spaces. **5**

11.903.2 Duct insulation. Ducts are in accordance with one of the following:

(1) All HVAC ducts, plenums, and trunks are located in conditioned space. **1**

(2) All HVAC ducts, plenums, and trunks are located in conditioned space and all HVAC ducts are insulated to not less than R4. ..... **3**

11.903.3 Relative humidity. In climate zones 1A, 2A, 3A, 4A, and 5A as defined by Figure 6(1), equipment is installed to maintain relative humidity (RH) at or below 60% using one of the following:
[Points not awarded in other climate zones.]..... **7**

(1) additional dehumidification system(s)

(2) central HVAC system equipped with additional controls to operate in dehumidification mode

11.904 INDOOR AIR QUALITY

11.904.0 Intent. IAQ is protected by best practices to control ventilation, moisture, pollutant sources and sanitation.

11.904.1 Indoor air quality (IAQ) during construction. Wood is dry before close-in (§ 11.602.1.7.1(3)), materials comply with emission criteria (§ 11.901.4 - § 11.901.11), sources of water infiltration or condensation observed during construction have been eliminated, accessible interior surfaces are dry and free of visible suspect growth (per ASTM D7338 Section 6.3), and water damage (per ASTM D7338 Section 7.4.3)..... **2**

POINTS

11.904.2 Indoor air quality (IAQ) post completion. Verify there are no moisture, mold, and dust issues in accordance with § 11.602.1.7.1(3), § 11.901.4 - § 11.901.11, ASTM D7338 Section 6.3, and ASTM D7338 Section 7.4.3. ..... **3**

11.904.3 Microbial growth & moisture inspection and remediation. A visual inspection is performed to confirm the following:

(1) Verify that no visible signs of discoloration and microbial growth on ceilings, walls or floors, or other building assemblies; or where minor microbial growth is observed (less than within a total area of 25 ft^2 (2.3 m^2)) in homes or multifamily and mixed-use buildings, reference EPA Document 402-K-02-003 (A Brief Guide to Mold, Moisture, and Your Home) for guidance on how to properly remediate the issue. where microbial growth is observed, on a larger scale in homes or multifamily and mixed-use buildings (greater than 25 ft^2 (2.3 m^2)), reference EPA Document 402-K-01-001 (Mold Remediation in Schools and Commercial Buildings) for guidance on how to properly remediate the issue. ..... **Mandatory**

(2) Verify that there are no visible signs of water damage or pooling. Where signs of water damage or pooling are observed, verify that the source of the leak has been repaired, and that damaged materials are either properly dried or replaced as needed. ..... **Mandatory**

11.904.4 Indoor air quality (IAQ) monitoring

11.904.4.1 Humidity monitoring. A humidity monitoring system is installed with a mobile base unit that displays readings of temperature and relative humidity. The system has not less than two remote sensor units. One remote unit is placed permanently inside the conditioned space in a central location, excluding attachment to exterior walls, and another remote sensor unit is placed permanently outside of the conditioned space. **2**

11.904.4.2 Airborne pollutant monitoring. Indoor air quality sensors designed for continuous monitoring of PM2.5, TVOC, and CO2 are installed. Instantaneous and trending data are accessible via website or mobile application in near-real-time.

(1) Sensors are installed within the kitchen area of each dwelling unit. **4**

(2) Sensors are installed within each bedroom. **4**

(3) Sensors are installed within multifamily and mixed-use amenity areas. Not less than one sensor is installed per 5,000 ft^2 of common area space. **2**

(4) Installed devices are also capable of monitoring and providing trending data for at least two of the following: air pressure, radon, CO, NO2, Methane, Ozone, Formaldehyde. ..... **1 Additional**

11.904.5 Indoor air quality (IAQ) remediation. A ventilation device is installed that automatically removes, inhibits, or reduces PM2.5, TVOC and CO2 within the conditioned space when identified by installed devices in accordance with § 11.904.4.2. ..... **8**

11.904.6 Humidity remediation. A humidity control device is installed that automatically alters the relative humidity by humidifying or dehumidifying the conditioned space when identified by installed devices in accordance with § 11.904.4.1. ..... **8**

11.905 INNOVATIVE PRACTICES

POINTS

11.905.1 Sound barrier. Provide room-to-room privacy between bedrooms and adjacent living spaces within dwelling units or homes by achieving an STC greater than 52 in accordance with the criteria below. . **1 SF / 4 MF**

STC greater than 55 (NIC greater than 47) = Articulation Index 0 to 0.05
STC 52 – 55 (NIC 44 – 47) = Articulation Index 0.05 to 0.15

11.905.2 Evaporative coil mold prevention. For buildings with a mechanical system for cooling, ultraviolet lamps are installed on the cooling coils and drain pans of the mechanical system supplies. Lamps produce ultraviolet radiation at a wavelength of 254 nm so as not to generate ozone. Lamps have ballasts housed in a NEMA-rated enclosure. **2**

11.905.3 Isolation of areas to be remodeled. To protect unrenovated spaces, comply with one of the following: **3 max**

(1) Remodeled space is isolated from unrenovated space by masking of openings and HVAC returns and providing strip doors. **1**

(2) Remodeled space is isolated from unrenovated space by masking of openings and HVAC returns, providing strip doors, and the space is negatively pressurized by ducting exhaust to the exterior. **3**

(2) Remodeled space is isolated from unrenovated space by masking of openings and HVAC returns, providing strip doors, and a dedicated HEPA filtration system is installed. **3**

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

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

11.1001.1 Homeowner's manual. A homeowner's manual is provided and stored in a permanent location in the dwelling that includes the following, as available and applicable.
[1 Point awarded per two items. Points awarded for non-mandatory items.] ..... **1 [8 max]**

(1) A National Green Building Standard certificate with web link and completion document. ..... **Mandatory**

(2) List of green building features (can include the national green building checklist). ..... **Mandatory**

(3) Product manufacturer's manuals or product data sheet for newly installed major equipment, fixtures, and appliances including product model numbers and serial numbers. If product data sheet is in the building owners' manual, manufacturer's manual may be attached to the appliance in lieu of inclusion in the building owners' manual. ..... **Mandatory**

(4) Maintenance checklist.

(5) Information on local recycling and composting programs.

(6) Information on available local utility programs that purchase a portion of energy from renewable energy providers.

(7) Explanation of the benefits of using energy-efficient lighting systems [e.g., compact fluorescent light bulbs, light emitting diode (LED)] in high-usage areas.

(8) A list of practices to conserve water and energy.

(9) Information on the importance and operation of the home's fresh air ventilation system.

POINTS

(10) Local public transportation options.

(11) A diagram showing the location of safety valves and controls for major building systems.

(12) Where frost-protected shallow foundations are used, owner is informed of precautions including:

(a) instructions to not remove or damage insulation when modifying landscaping.

(b) providing heat to the building as required by the IRC or IBC.

(c) keeping base materials beneath and around the building free from moisture caused by broken water pipes or other water sources.

(13) A list of local service providers that offer regularly scheduled service and maintenance contracts to ensure proper performance of equipment and the structure (e.g., HVAC, water-heating equipment, sealants, caulks, gutter and downspout system, shower and/or tub surrounds, irrigation system).

(14) A photo record of framing with utilities installed. Photos are taken prior to installing insulation, clearly labeled, and included as part of the building owners' manual.

(15) List of common hazardous materials often used around the building and instructions for proper handling and disposal of these materials.

(16) Information on organic pest control, fertilizers, deicers, and cleaning products.

(17) Information on native landscape materials and/or those that have low-water requirements.

(18) Information on methods of maintaining the building's relative humidity in the range of 30% to 60%.

(19) Instructions for inspecting the building for termite infestation.

(20) Instructions for maintaining gutters and downspouts and importance of diverting water not less than 5 ft away from foundation.

(21) A narrative detailing the importance of maintenance and operation in retaining the attributes of a green-built building.

(22) Where stormwater management measures are installed on the lot, information on the location, purpose, and upkeep of these measures.

(23) Explanation of and benefits from green cleaning in the home.

(24) Retrofit energy calculator that provides baseline for future energy retrofits.

(25) A list of site, building, and/or interior features that contribute to the health and well-being of the occupants.

(26) A list of practices to maintain the health and wellness attributes of the building.

(27) For homes in areas designated as a wildland – urban interface or other wildfire-prone areas, information is included on how the home and its defensible space is maintained to help the home be resilient to wildfires.

(28) 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".

POINTS

11.1001.2 Training of initial building owners. Initial building owners are familiarized with the role of occupants in achieving green goals. Training is provided to the responsible party(ies) regarding newly installed equipment operation and maintenance, control systems, and occupant actions that will improve the environmental performance of the building. These include:..... **8 Mandatory**

(1) HVAC filters

(2) thermostat operation and programming

(3) lighting controls

(4) appliances operation

(5) water heater settings and hot water use

(6) fan controls

(7) Recycling and composting practices

(8) Whole-dwelling mechanical ventilation systems

11.1002 CONSTRUCTION, OPERATION, AND MAINTENANCE MANUALS AND TRAINING FOR MULTIFAMILY AND MIXED-USE BUILDINGS

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

11.1002.1 Building construction manual. A building construction manual, including five or more of the following, is compiled and distributed in accordance with § 11.1002.0.
[Points awarded per two items. Points awarded for non-mandatory items.]..... **1**

(1) A narrative detailing the importance of constructing a green building, including a list of green building attributes included in the building. This narrative is included in all responsible parties' manuals..... **Mandatory**

(2) A local green building program certificate as well as a copy of the *National Green Building Standard*, as adopted by the Adopting Entity, and the individual measures achieved by the building..... **Mandatory**

(3) Warranty, operation, and maintenance instructions for all equipment, fixtures, appliances, and finishes..... **Mandatory**

(4) Record drawings of the building.

(5) A record drawing of the site including stormwater management plans, utility lines, landscaping with common name and genus/species of plantings.

(6) A diagram showing the location of safety valves and controls for major building systems.

(7) A list of the type and wattage of light bulbs installed in light fixtures.

(8) A photo record of framing with utilities installed. Photos are taken prior to installing insulation and clearly labeled.

POINTS

11.1002.2 Operations manual. Operations manuals are created and distributed to the responsible parties in accordance with § 11.1002.0. Among all of the operation manuals, five or more of the following options are included. *[Points awarded per two items. Points awarded for non-mandatory items.]*..... **1**

(1) A narrative detailing the importance of operating and living in a green building. This narrative is included in all responsible parties' manuals..... **Mandatory**

(2) A list of practices to conserve water and energy (e.g., turning off lights when not in use, switching the rotation of ceiling fans in changing seasons, purchasing ENERGY STAR appliances and electronics). ..... **Mandatory**

(3) Information on methods of maintaining the building's relative humidity in the range of 30% to 60%.

(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, where applicable, building recycling and hazardous waste handling and disposal procedures.

(6) Local public transportation options.

(7) Explanation of the benefits of using compact fluorescent light bulbs, LEDs, or other high-efficiency lighting.

(8) Information on native landscape materials and/or those that have low water requirements.

(9) Information on the radon mitigation system, where applicable.

(10) A procedure for educating tenants in rental properties on the proper use, benefits, and maintenance of green building systems including a maintenance staff notification process for improperly functioning equipment.

(11) Information on the importance and operation of the building's fresh air ventilation system.

11.1002.3 Maintenance manual. Maintenance manuals are created and distributed to the responsible parties in accordance with § 11.1002.0. Between all of the maintenance manuals, five or more of the following options are included. *[Points awarded for non-mandatory items.]*..... **1 per 2 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 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

POINTS

(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 not less than 5 ft away from foundation.

(7) Instructions for inspecting the building for termite infestation.

(8) A procedure for rental tenant occupancy turnover that preserves the green features.

(9) An outline of a formal green building training program for maintenance staff.

(10) A green cleaning plan which includes guidance on sustainable cleaning products.

(11) A maintenance plan for active recreation and play spaces (e.g., playgrounds, ground markings, exercise equipment.

(12) A list of site, building, and/or interior features that contribute to the health and well-being of the building workers and occupants.

(13) A list of practices to maintain the health and wellness attributes of the building.

(14) A maintenance plan to preserve the building and its defensible space for wildfire resilience (only allowable when points for 11.505.12 Wildfire resilience are claimed).

11.1002.4 Training of building owners. Building owners are familiarized with the role of occupants in achieving green goals. On-site training is provided to the responsible party(ies) regarding newly installed equipment operation and maintenance, control systems, and occupant actions that will improve the environmental performance of the building. ..... **8 Mandatory**

These include:

(1) HVAC filters

(2) thermostat operation and programming

(3) lighting controls

(4) appliances operation

(5) water heater settings and hot water use

(6) fan controls

(7) recycling and composting practices

(8) Whole-dwelling mechanical ventilation system

11.1002.5 Multifamily and mixed-use occupant manual. An occupant manual is compiled and distributed in accordance with § 11.1002.0. *[Points awarded for non-mandatory items.]* ..... **1 per 2 items**

(1) NGBS certificate ..... **Mandatory**

		POINTS
(2)	List of green building features	**Mandatory**
(3)	Operations manuals for all appliances and occupant operated equipment including lighting and ventilation controls, thermostats, etc.	**Mandatory**
(4)	Information on recycling and composting programs.	
(5)	Information on purchasing renewable energy from utility.	
(6)	Information on energy efficient replacement lamps.	
(7)	List of practices to save water and energy.	
(8)	Local public transportation options.	
(9)	Explanation of benefits of green cleaning.	
(10)	A list of site, building, and/or interior features that contribute to the health and well-being of the occupants.	
(11)	A list of practices to maintain the health and wellness attributes of the building.	

11.1002.6 Training of multifamily and mixed-use occupants. Prepare a training outline, video or website that familiarizes occupants with their role in maintaining the green goals of the project. Include all equipment that the occupant(s) is expected to operate including but not limited to: ..... **1 per 2 items**

(1) Lighting controls

(2) Ventilation controls

(3) Thermostat operation and programming

(4) Appliances operation

(5) Recycling and composting

(6) HVAC filters

(7) Water heater setting and hot water use

11.1003 PUBLIC EDUCATION

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

11.1003.1 Public Education. One or more of the following is implemented: ..... **2 max**

(1) **Signage.** Signs showing the project is designed and built in accordance with the NGBS are posted on the construction site..... **1**

(2) **Certification Plaques.** NGBS certification plaques with rating level attainted are placed in a conspicuous location near the utility area of the home or, in a conspicuous location near the main entrance of ~~a~~ multifamily and mixed-use buildings. **1**

(3) **Education.** A URL for the NGBS is included on site signage, builder website (or property website for multifamily and mixed-use buildings), and marketing materials for homes certified under the NGBS.... **1**

POINTS

11.1004 POST OCCUPANCY PERFORMANCE ASSESSMENT

11.1004.0 Intent. A verification system for post occupancy assessment of the building is intended to be a management tool for the building owner to determine if energy or water usage have deviated from expected levels so that inspection and correction action can be taken.

11.1004.1 Verification system. A verification plan is provided in the building owner's manual (§ 11.1001 or § 11.1002). The verification system provides methods for measuring energy and/or water consumption starting after the building reaches 80% or more occupancy.

(1) Verification plan is developed to monitor post-occupancy energy and/or water use and is provided in the building owner's manual.

(a) Plan to monitor energy consumption. **1**

(b) Plan to monitor water consumption..... **1**

(c) Plan to report energy and/or water consumption to a national benchmarking system. **1**

(2) Verification system is installed in the building to monitor post-occupancy energy and water use.

(a) System is installed to monitor energy consumption. **4**

(b) System is installed to monitor water consumption. **4**

(c) System is installed to report energy and/or water consumption to a national benchmarking system. **4**

(3) Verification system that is compliant with national/international ESG benchmarking system is installed in the building to monitor post-occupancy energy and water use.

(a) System is installed to monitor energy consumption. **3**

(b) System is installed to monitor water consumption. **3**

(c) System is installed to report energy and/or water consumption to a national benchmarking system. **3**

11.1005 INNOVATIVE PRACTICES

11.1005.1 Appraisals. One or more of the following is implemented:

(1) Energy rating or projected usage data is posted in an appropriate location in the home, or public posting so that an appraiser can access the energy data for an energy efficiency property valuation. .. **2**

(2) An Appraisal Institute Form 820.05 "Residential Green and Energy Addendum" or Form 821 "Commercial Green and energy Efficient Addendum" that consider NGBS, LEED, ENERGY STAR certifications and equivalent programs, is completed for the appraiser by a qualified professional or builder to use in performing the valuation of the property. **2**

(3) NGBS certification information or one of the Appraisal Institute Forms cited in § 11.1005.1(2) is uploaded to a multiple listing service (MLS) or equivalent database so that appraisers can access it to compare property valuations..... **2**

POINTS

11.1005.2 Indoor Air Quality Display and Communication. Data from indoor air quality monitoring in accordance with § 11.904.4.1 or § 11.904.4.2 is made available to occupants. Data is either visually displayed in an area of the building that is accessible by residents or accessible via website or a mobile application..... **2**

11.1005.3 Health and Wellness Professional. A member of the project team is a qualified health and wellness professional in residential design and construction and, for at least on of the following groups, will either conduct training or ensure that a relevant training course is completed: **3 max**

(1) Other project team members with regards to resource, product, and material selections, practices and uses in the project. **1**

(2) Building operations and maintenance staff. **1**

(3) Building occupants or homeowners. **1**

11.1005.4 Tenant Energy and Water Consumption Data Release Form.
[Points only available for buildings with separately metered utilities.]

Develop and provide an operational plan, including a sample data release form that would allow residents to release ~~for residents to allow~~ energy and water consumption data ~~release~~:

(1) For energy consumption..... **2**

(2) For water consumption. **2**

INTENTIONALLY LEFT BLANK.

CHAPTER 12:
CERTIFIED COMPLIANCE PATH FOR SINGLE-FAMILY HOMES, TOWNHOMES, AND DUPLEXES

1200 Substitution of practices. The adopting entity shall be permitted to substitute one or more practices with alternatives that achieve the overall intent of this standard. The determination of intent and equivalency is in the purview of the adopting entity.

1201 LOT DEVELOPMENT

1201.1 Floodplain. Construction shall not occur in a floodplain or construction shall be elevated above the floodplain.

1201.2 Lot slope. Finished grade at all sides of a building shall be sloped to provide not less than 6 in. (152 mm) of fall within 10 ft (3048 mm) of the edge of the building. Where lot lines, walls, slopes, or other physical barriers prohibit 6 in. (152 mm) of fall within 10 ft (3048 mm), the final grade shall be sloped away from the edge of the building at a slope not less than 2%.

1201.3 Soil preparation for new plants. Soil shall be tilled or new soil shall be added down 6 in. for new plants and 12 in. for new trees. Soil shall be amended with organic matter, such as mulch or compost, as needed. Long acting sources of nutrients shall be added if the soil is deficient. Alternately, the landscaping plan shall incorporate the jurisdictional Department of Transportation (DOT) specifications (or equal) for soil preparation and amendment for landscape planning. Other approved sources such as University or County agricultural extension services shall be permitted for use.

1201.4 Regionally appropriate vegetation. When an Agency that has jurisdiction has developed a specification for planting, including non-invasive vegetation that is native or appropriate for local growing conditions, vegetation from that specification is selected for the landscaping plan and that landscaping is installed.

1201.5 Protection of natural resources. Any trees or other natural resources that do not conflict with the home construction or finished grading and drainage of the lot and adjacent lots shall be properly protected during construction and all controls shall be removed following construction. The landscape plan shall contain details for the protection and instructions for incorporation of the trees/areas into the final landscape plan.

1202 RESOURCE EFFICIENCY (DURABILITY)

1202.1 Capillary break. A capillary break and vapor retarder shall be installed at concrete slabs in accordance with IRC Sections R506.2.2 and R506.2.3.

1202.2 Foundation drainage. Where required by the IRC for habitable and usable spaces below grade, exterior drain tile shall be installed.

1202.3 Dampproof walls. Dampproof walls shall be provided below finished grade.

1202.4 Sealed crawlspace. 6-mil polyethylene sheeting, or other Class I vapor retarder shall be installed in accordance with or IRC Section 408.3 or 506.

1202.5 Dry Insulation. Insulation in cavities shall be dry in accordance with manufacturer's instructions before enclosing (e.g., with drywall).

1202.6 Water-resistive barrier. A water-resistive barrier and/or drainage plane system shall be installed in accordance with IRC requirements behind exterior veneer and/or siding.

1202.7 Flashing. Flashing shall be provided as follows to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details shall be provided in the construction documents and shall be in accordance with the fenestration manufacturer's instructions, the flashing manufacturer's instructions, or as detailed by a registered design professional.

Flashing shall be installed at the following locations, as applicable:

(1) around exterior fenestrations, skylights, and doors

(2) at roof valleys

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

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

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

(6) above projecting wood trim

(7) at built-in roof gutters

(8) drip edge shall be installed at eave and rake edges

(9) window and door head and jamb flashing is either self-adhered flashing complying with AAMA 711 or liquid applied flashing complying with AAMA 714 and installed in accordance with flashing fenestration or manufacturer's installation instructions.

(10) pan flashing is installed at sills of all exterior windows and doors.

(11) 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.

(12) through-wall flashing is installed at transitions between wall cladding materials, or wall construction types

1202.8 Tile backing materials. Tile backing materials installed under tiled surfaces in wet areas shall be in accordance with ASTM C1178, C1278, C1288, or C1325. Tile shall not be installed over paper-faced drywall in wet areas.

1202.9 Ice and water shield. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier shall be installed in accordance with the IRC at roof eaves of pitched roofs and shall extend not less than 24 in. (610 mm) inside the exterior wall line of the building.

1202.10 Architectural features. Horizontal ledgers shall be sloped away to provide gravity drainage as appropriate for the application.

1202.11 Visible suspect fungal growth. Building materials with visible suspect fungal growth shall not be installed or shall be addressed in accordance with industry recognized guidelines such as ANSI/IICRC S520 Mold Remediation or EPA 402-K-01-001 Table 2: Mold Remediation Guidelines, prior to concealment and closing. Porous and semi-porous building materials should be stored in such a manner as to prevent excessive moisture content prior to installation or use. Relative humidity within the structure shall be controlled during construction to minimize the potential for microbial growth.

1202.12 Exterior doors. Not less than one entry at an exterior door assembly, inclusive of side lights (if any), are covered by one of the following methods to protect the building from the effects of precipitation and solar radiation. Either a storm door or a projection factor of not less than 0.375 is provided. Eastern- and western-facing entries in Climate Zones 1, 2, and 3, as determined in accordance with Figure 6(1) or Appendix A, have either a storm door or a projection factor of not less than 1.0, unless 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

(d) installing a storm door

1202.13 Roof Water discharge. Each downspout shall discharge 5 ft from building, onto impervious surfaces, into areas designed to infiltrate drainage into the ground, to water vegetation, or into a rain collection system.

1203 ENERGY EFFICIENCY

1203.1 Mandatory requirements. The building shall comply with § 1203.1 through § 1203.9 in addition to one of the following: § 1203.10 (Energy Performance Path); § 1203.11 through § 1203.14 (Energy Prescriptive Path); or § 1203.15 (ERI Target Path). Sampling shall not be permitted for this alternative compliance path.

1203.2 Adopting entity review. A review by the Adopting Entity or approved third party shall be conducted to verify design and compliance with these energy requirements.

1203.3 Duct testing. Ducts shall be pressure tested to determine air leakage by one of the following methods:

(1) Rough-in test: Total leakage shall be measured with a pressure differential of 0.1 in. w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. Registers shall be taped or otherwise sealed during the test.

(2) Post-construction test: Total leakage shall be measured with a pressure differential of 0.1 in. w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. Registers shall be taped or otherwise sealed during the test.

Exceptions: 1) A duct air-leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope; and 2) A duct air-leakage test shall not be required for ducts serving heat or energy recovery ventilators that are not integrated with ducts serving heating or cooling systems.

A written report of the results of the test shall be signed by the party conducting the test and provided to the code official.

1203.4 Radiant and hydronic space heating. Where installed as a primary heat source in the building, radiant or hydronic space heating system is designed, installed, and documented, using industry-approved guidelines and standards (e.g., ACCA Manual J, AHRI I=B=R, ACCA 5 QI, or an accredited design professional's and manufacturer's recommendations).

1203.5 Building thermal envelope air sealing. The building thermal envelope is durably sealed to limit infiltration. The sealing methods between dissimilar materials allow for differential expansion and contraction. The following are caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material, suitable film, or solid material:

(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.

1203.6 Air sealing and insulation. Insulation shall be installed to Grade I. Grade II and Grade III insulation shall not be permitted. Building envelope air tightness and insulation installation shall be verified to be in accordance with the following.

(A) Testing is conducted in accordance with ASTM E 779 using a blower door at a pressure of 1.04 psf (50 pa). Testing is conducted after rough-in and installation of penetrations in the building envelope, including but not limited to penetrations for utilities, electrical, plumbing, ventilation and combustion appliances. Testing is to be conducted under the following conditions:

(a) Exterior windows and doors, fireplace and stove doors are closed, but not sealed;

(b) Dampers are closed, but not sealed, including exhaust, intake, make-up air, backdraft and flue dampers;

(c) Interior doors are open;

(d) Exterior openings for continuous ventilation systems and heat recovery ventilators are closed and sealed;

(e) Heating, cooling, and ventilation systems are turned off;

(f) HVAC duct terminations are not sealed; and

(g) Supply and return registers are not sealed.

(B) Visual inspection. The air barrier and insulation items listed in Table 701.4.3.2(2) shall be field verified by visual inspection.

1203.7 Appliances. where installed, refrigerator, dishwasher, clothes washer, and clothes dryer shall be ENERGY STAR or equivalent.

Exception: Where all four appliances are installed, only three must be ENERGY STAR or equivalent.

1203.8 Clothes washers. Where installed, clothes washers rated with an IWF (integrated water factor), MEF (modified energy factor), or IMEF (integrated modified energy factor), shall be rated as follows:

(1) Residential Clothes Washers, Front-loading, greater than 2.5 cu-ft IWF not greater than 3.2, IMEF not less than 2.76

(2) Residential Clothes Washers, Top-loading, greater than 2.5 cu-ft IWF not greater than 4.3, IMEF not less than 2.06

(3) Residential Clothes Washers, less than or equal to 2.5 cu-ft IWF not greater than 4.2, IMEF not less than 2.07

1203.9 Energy performance pathway.

1203.9.1 IECC analysis. Energy efficiency features are implemented to achieve energy cost, site energy, source energy, or carbon performance that exceeds the IECC by 7.5%. A documented analysis using software in accordance with IECC Section R405 is required.

1203.9.2 Energy performance analysis. Energy savings levels above the 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.

1203.10 Energy prescriptive pathway

1203.10.1 Building envelope. The building thermal envelope complies with § 1203.10.1.1 or § 1203.10.1.2.

Exception: Section 1203.10.1.1 and § 1203.10.1.2 are not required for Tropical Climate Zone.

1203.10.1.1 Insulation and fenestration requirements. The building thermal envelope shall comply with the requirements of Table 1203.10.1.1 and 1203.10.1.2.

1203.10.1.2 The total UA proposed and baseline calculations are documented where the total proposed building thermal envelope UA is less than or equal to the total baseline UA resulting from multiplying the U-factors in Table 1203.10.1.2 by the same assembly area as in the proposed building. REScheck is deemed to provide UA calculation documentation. SHGC requirements of Table 1203.10.1.1 shall be met.

Table 1203.10.1.1
Insulation and Fenestration Requirements by Component[a]

Climate Zone	Fenestration[b] U-Factor	Skylight[b] U-Factor	Glazed Fenestration SHGC[b,e]	Ceiling R-Value[i]	Wood Frame Wall R-Value	Mass Wall R-Value[i]	Floor R-Value	Basement[c] Wall R-Value	Slab[d] R-Value & Depth	Crawlspace[c] Wall R-Value
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.32	0.55	0.25	38	20 OR 13+5[h]	8/13	19	5/13[f]	0	5/13
4 except Marine	0.32	0.55	0.40	49	20 OR 13+5h	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.30	0.55	NR	49	20 OR 13+5[h]	13/17	30[g]	15/19	10, 2 ft	15/19
6	0.30	0.55	NR	49	20+5h OR 13+10[h]	15/20	30[g]	15/19	10, 4 ft	15/19
7 and 8	0.30	0.55	NR	49	20+5h OR 13+10[h]	19/21	38[g]	15/19	10, 4 ft	15/19

NR = Not Required
For SI: 1 foot = 304.8 mm.

a. R-values are minimums. U-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed R-value of the insulation shall be not less than the R-value specified in the table.
b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
Exception: In Climate Zones 1 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.
c. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation on the interior of the basement wall. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. Alternatively, compliance with "15/19" shall be R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home.
d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs. as indicated in the table. The slab edge insulation for heated slabs shall not be required to extend below the slab.
e. There are no SHGC requirements in the Marine Zone.
f. Basement wall insulation is not required in warm-humid locations as defined by IECC Figure R301.1 and IECC Table R301.1.
g. Alternatively, insulation sufficient to fill the framing cavity and providing not less than an R-value of R-19.
h. The first value is cavity insulation, the second value is continuous insulation. Therefore, as an example, "13+5" means R-13 cavity insulation plus R-5 continuous insulation.
i. Mass walls shall be in accordance with IECC Section R402.2.5. The second R-value applies where more than half of the insulation is on the interior of the mass wall.

Table 1203.10.1.2
Equivalent U-Factors[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawlspace Wall U-Factor
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.32	0.55	0.030	0.060	0.098	0.047	0.091[C]	0.136
4 except Marine	0.32	0.55	0.026	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.30	0.55	0.026	0.060	0.082	0.033	0.050	0.055
6	0.30	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.30	0.55	0.026	0.045	0.057	0.028	0.050	0.055

a. Non-fenestration *U*-factors shall be obtained from measurement, calculation, or an approved source.
b. Mass walls shall be in accordance with Section R402.2.5. Where more than half the insulation is on the interior, the mass wall *U*-factors shall not exceed 0.17 in Climate Zone 1, 0.14 in Climate Zone 2, 0.12 in Climate Zone 3, 0.087 in Climate Zone 4 except Marine, 0.065 in Climate Zone 5 and Marine 4, and 0.57 in Climate Zones 6 through 8.

1203.11 Space heating and cooling and water heating system efficiencies. The Space Heating and Cooling and Water Heating systems are in accordance with Table 1203.11.

Table 1203.11
Space Heating and Cooling and Water Heating System Efficiencies

Climate Zone	Space Cooling System	Space Heating System - select 1 option from below				Water Heating System - select 1 option from below		
	AC	Gas Furnace	Gas Boiler	ASHP	GSHP or WSHP	Gas Tank WH	Gas Tankless WH	Elec Tank WH
	Min. Req.	Min. Req.	Min. Req.	Min. Req.	Min. Req.	Min. UEF Req.	Min. UEF Req.	Min. UEF Req.
1	~~15~~ 14.3 SEER2[b]	NR	85%	NR	Any	0.78	>.93	>.92
2	~~15~~ 14.3 SEER2[b]	NR	85%	NR	Any	0.78	>.93	>.92
3	~~15~~ 14.3 SEER2[b]	92%	85%	≥ ~~8.5~~7.2 HSPF2[a]	Any	0.78	>.93	>.92
4	~~15~~ 14.3 SEER2[b]	92%	85%	≥ ~~8.5~~7.2 HSPF2[a]	Any	0.78	>.93	>.92
5	~~14~~ 13.3 SEER2	95%	85%	≥ ~~8.5~~7.2 HSPF2[a]	Any	0.78	>.93	>.92
6	~~14~~ 13.3 SEER2	95%	85%	≥ ~~8.5~~7.2 HSPF2[a]	Any	0.78	>.93	>.92
7	~~14~~ 13.3 SEER2	95%	85%	≥ ~~8.5~~7.2 HSPF2[a]	Any	0.78	>.93	>.92
8	~~14~~ 13.3 SEER2	95%	85%	≥ ~~8.5~~7.2 HSPF2[a]	Any	0.78	>.93	>.92

[a] ≥ ~~8.2~~6.9 HSPF2 for single package
[b] zones 1-4 ≥~~12.5~~11.9 EER2 for split; ≥~~12~~ 11.4 EER2 for single package
NR = No requirement

1203.12 Duct leakage. The total leakage of the ducts, where measured in accordance with Section R403.3.3, shall be as follows:

(1) Rough-in test: The total leakage shall be less than or equal to 4 cubic feet per minute (113.3 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area where the air handler is installed at the time of the test. Where the air handler is not installed at the time of the test, the total leakage shall be less than or equal to 3 cubic feet per minute (85 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area.

(2) Postconstruction test: Total leakage shall be less than or equal to 4 cubic feet per minute (113.3 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area.

1203.13 Building envelope leakage. The building thermal envelope is in accordance with IECC R402.4. ~~The air leakage rate of the dwelling unit tested in accordance with ANSI/RESNET/ICC Std. 380, ASTM E779, or ASTM E1827 shall not be greater than the following:~~

~~(a) climate zones 0-2: 5.0 ACH, 0.33 ELR50, or 0.28 cfm50 per square foot (1.42 L/s/m^2) of enclosure area;~~

~~(b) climate zones 3-8: 3.0 ACH, 0.23 ELR50, or 0.23 cfm50 per square foot (1.42 L/s/m^2) of enclosure area.~~

Exception: Unconditioned and low energy buildings.

1203.14 High-efficacy lighting. All permanently installed lighting fixtures, excluding kitchen appliance fixtures, shall contain only high-efficacy lighting sources.

1203.15 Hazardous waste. A hazardous waste plan ~~for any hazardous waste~~ shall be prepared that includes information on the proper handling and disposal of hazardous waste. Hazardous waste is properly handled and disposed.

1203.~~15~~ 16 ERI target pathway

1203.~~15~~16.1 ERI target compliance. Compliance shall be determined in accordance with ANSI/RESNET/ICC 301. Energy efficiency features are implemented to achieve an ERI value that is at or below the maximum value in Table 704.2. Dwelling ratings shall be submitted to a Rating Certification Body approved by the Adopting Entity.~~Energy efficiency features are implemented to achieve an ERI performance that is 8 points less than the EPA National ERI Target Procedure for ENERGY STAR Certified Homes version 3.0 as computed based on Step 1 of the EPA National ERI Target Procedure. Dwelling ratings shall be submitted to a quality control registry approved by the Adopting Entity for calculating points under this section.~~

1204 WATER EFFICIENCY

1204.1 Mandatory requirements. The building shall comply with 1204.2 Prescriptive Path or 1204.3 Performance Path.

1204.2 Prescriptive path.

1204.2.1 Lavatory faucets. Water-efficient lavatory faucets in bathrooms shall have a maximum flow rate of 1.5 gpm (5.68 L/min), tested at 60 psi (414 kPa) in accordance with ASME A112.18.1/CSA B125.1 and complies with the performance criteria of the EPA WaterSense High-Efficiency Lavatory Faucet Specification.

1204.2.2 Water closets. Water closets shall have an effective flush volume of 1.28 gallons or less and shall be in accordance with the performance criteria of the EPA WaterSense Specification for tank-type toilets.

1204.2.3 Irrigation systems. Where an irrigation system is installed, one of the following is met:

(1) Drip irrigation is installed for all landscape beds and/or subsurface drip irrigation is installed for all turf grass areas.

(2) Irrigation zones are organized by plant water needs.

(3) The irrigation system(s) is controlled by a climate-based controller or soil moisture controller.

(4) No irrigation is installed.

1204.3 Performance path. A Water Rating Index (WRI) of 70 or lower is achieved.

1205 INDOOR ENVIRONMENTAL QUALITY

1205.1 Gas-fired fireplaces and direct heating equipment. Gas-fired fireplaces and direct heating equipment is listed and is installed in accordance with the NFPA 54, IFGC, or the applicable local gas appliance installation code. Gas-fired fireplaces within dwelling units and direct heating equipment are vented to the outdoors.

1205.2 Solid fuel-burning fireplaces, inserts, stoves and heaters. Solid fuel-burning fireplaces, inserts, stoves and heaters are code compliant and are in accordance with one or more of the following requirements:

(1) Site-built masonry wood-burning fireplaces use outside combustion air and include a means of sealing the flue and the combustion air outlets to minimize interior air (heat) loss when not in operation.

(2) Factory-built, wood-burning fireplaces are in accordance with the certification requirements of UL 127 and are EPA Phase 2 Emission Level Qualified Model~~certified or Phase 2 Qualified~~.

(3) Wood stove and fireplace inserts, as defined in UL 1482 Section 3.8, are in accordance with the certification requirements of UL 1482 and are in accordance with the emission requirements of the EPA Certification and the State of Washington WAC 173-433-100(3).

(4) Pellet (biomass) stoves and furnaces are in accordance with ASTM E1509 or are EPA certified.

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

(6) Fireplaces, woodstoves, pellet stoves, or masonry heaters are not installed.

1205.3 Garages. Garages shall be in accordance with "a" or "b":

(a) Attached garage

(1) Doors installed in the common wall between the attached garage and conditioned space are tightly sealed and gasketed; and

(2) A continuous air barrier is provided separating the garage space from the conditioned living spaces.

(b) A carport is installed, the garage is detached from the building, or no garage is installed.

1205.4 Carpets. Wall-to-wall carpeting shall not be installed adjacent to

(a) water closets and bathing fixtures, and

(b) exterior doors.

1205.5 Carbon monoxide (CO) alarms. A carbon monoxide (CO) alarm shall be provided in accordance with IRC Section R315 in any dwelling unit with a combustion fueled appliance or an attached garage with an opening that communicates with the dwelling unit.

1205.6 Interior architectural coatings. Not less than 85% of the interior architectural coatings are in accordance with one or more of the following:

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

~~(2) Green Seal GS-11~~

(~~3~~2) CARB Suggested Control Measure for Architectural Coatings (see Table 901.10.1).

1205.7 Local ventilation. Kitchen, bathroom, and laundry area exhaust ventilation rates are designed in accordance with the IRC. Exhaust fans are ENERGY STAR, or equivalent.

Exemption: Section 1205.7 is not required for the Tropical Zone Climate if the openable window area is not less than 14% of the Bathroom floor area.

1205.7.1 Where installed, kitchen, bathroom, and laundry area exhausts are tested in accordance with BSR/RESNET/ICC 380 to the design rate(s).

Exception: The requirements of Table 1205.7.1 shall be permitted in place of a measurement. When using Table 1205.7.1, the airflow rating shall comply with or exceed a static pressure of 0.25 in. of water column.

Use of Table 1205.7.1 is limited to one or more of the following:

(a) Duct system not exceeding 25 ft in length;

(b) Duct system with no more than three (3) elbows; or

(c) Duct system with exterior termination fittings having a hydraulic diameter greater than or equal to the minimum duct diameter not less than the hydraulic diameter of the fan outlet.

Table 1205.7.1
Prescriptive Duct Sizing

	Fan Airflow Rating (CFM), at minimum static pressure of 0.25 in. of water												
	≤ 50	≤ 80	≤ 100	≤ 125	≤ 150	≤ 175	≤ 200	≤ 250	≤ 350	≤ 400	≤ 450	≤ 70	≤ 800
Duct Type	Minimum Duct Diameter, In.[a,b]												
Rigid Duct	4[e]	5	5	6	6	7	7	8	9	10	10	12	12[d]
Flex Duct[c]	4	5	6	6	7	7	8	8	9	10	NP	NP	NP

a. For noncircular ducts, calculate the diameter as four times the cross-sectional area divided by the perimeter.
b. NP = application of the prescriptive table is not permitted for this scenario.
c. Use of this table for verification of flex duct systems requires flex duct to be fully extended and any flex duct elbows to have a minimum bend radius to duct diameter ratio of 1.0.
d. For this scenario, use of elbows is not permitted.
e. For this scenario, 4 in. (100 mm) oval duct shall be permitted, provided the minor axis of the oval is greater than or equal to 3 in. (~~75~~ 7.6 ~~m~~cm)

1205.8 Whole dwelling ventilation. Whole building ventilation systems implemented in the dwelling units are in accordance with the specifications of at least one of the following, as applicable:

(a) 2021 International Residential Code

(b) ASHRAE 62.2-2019

One of the following whole building ventilation systems is implemented in the dwelling units and an explanation of the operation and importance of the ventilation system is included in § 1206.1.

Exception: Unconditioned and low energy buildings in the Tropical Zone.

(1) exhaust air ventilation system equipped with outdoor air ducts and intake(s) for ventilation air.

(2) exhaust air ventilation system equipped with outdoor air ducts and intake(s) for ventilation air and with automatic ventilation controls to limit ventilation air during periods of extreme temperature, extreme humidity and/or during times of peak utility loads.

(3) supply air ventilation system.

(4) supply air ventilation system equipped with automatic ventilation controls to limit ventilation air during periods of extreme temperature, extreme humidity and/or during times of peak utility loads.

(5) balanced air ventilation system with exhaust and supply fan(s) with supply intakes located in accordance with the manufacturer's guidelines to not introduce polluted air back into the building.

(6) heat-recovery ventilator.

(7) balanced air ventilation system with exhaust and supply fan(s) with automatic ventilation controls to limit ventilation air during periods of extreme temperature, extreme humidity and/or during times of peak utility loads, and with intakes located in accordance with the manufacturer's guidelines to not introduce polluted air back into the building.

(8) energy-recovery ventilator

1205.9 Whole dwelling ventilation testing. Ventilation airflow is tested and verified to provide the minimum ventilation flow rates in accordance with ANSI/RESNET/ICC 380 and § 1208.

1205.10 Radon control. In EPA Radon Zone 1, a passive or active system is installed.

1205.11 Kitchen exhaust. where a kitchen exhaust unit(s) that equals or exceeds 400 cfm (188.8~~9~~ L/s) is installed, make-up air shall be provided.

1205.12 MERV filters. Not less than 8 MERV filters shall be installed on central forced air systems and are accessible. Designer or installer is to verify that the HVAC equipment is able to accommodate the greater pressure drop of the filter installed.

1205.13 HVAC system protection. One of the following HVAC system protection measures shall be performed.

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

(b) 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 where necessary.

1206 HOMEOWNER OPERATION AND MAINTAINANCE

1206.1 Homeowner's manual. A homeowner's manual shall be provided. The homeowner's manual shall include all items below:

(1) A National Green Building Standard certificate with a web link and completion document.

(2) List of green building features (can include the National Green Building Standard checklist).

(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.

(4) Maintenance checklist.

(5) Information on the importance and operation of the home's fresh air ventilation system.

(6) Provide information on regionally appropriate vegetation.

(7) A narrative detailing the importance of maintenance and operation of the green building features from the National Green Building Standard checklist in retaining the attributes of a green-built home.

(8) Where stormwater management measures are installed on the lot, information on the location, purpose, and upkeep of these measures.

1206.2 Training of initial homeowners. Initial homeowners shall be familiarized with the role of occupants in achieving green goals. Training is provided to the responsible party(ies) regarding equipment operation and maintenance, control systems, and occupant role. These include:

(1) HVAC filters.

(2) Water heater settings.

(3) Whole-house ventilation systems.

(4) Operation of household equipment.

CHAPTER 13:
COMMERCIAL SPACES

STAFF NOTE: Chapter 13 was renumbered to reflect the same numbering scheme as the rest of the NGBS.

1301 INTENT AND SCOPE

1301.1 Intent. This chapter shall provide green requirements for the non-residential portion(s) of a mixed-use building.

1301.2 Scope. The provisions of this Chapter shall apply to the design, construction, addition, and alteration of non-residential portion(s) of a mixed-use building.

1302 COMPLIANCE

1302.1 Compliance. The non-residential portion(s) of a mixed-use building shall comply with all provisions of this chapter as applicable. The provisions of this Chapter are mandatory.

1302.2 Core and shell compliance. The exterior air barrier, insulation, air sealing, fenestration, resource efficiency measures, and any other products or systems that are installed at the time of certification are verified to the requirements of this chapter at the time of certification.

1302.3 Full mixed-use building compliance. Residential and non-residential spaces are verified to the requirements of this standard at the time of certification. The residential portions of the building are verified to the requirements of Chapters 5 through 10, or Chapter 11, of this Standard. The non-residential portion(s) of the building shall comply with the requirements of this chapter.

1302.4 Additions and alterations. The provisions of this Chapter shall only apply to areas of the building that are exposed or created during the remodel of mixed-use building(s) complying with § 305, Green Remodeling.

1302.5 Alternate compliance. Non-residential portions of a building shall comply with IgCC Section 501.3.7.2 and Chapters 6 through 10.

Exception: Section 6.01.1 of the IgCC.

1303 CORE AND SHELL COMPLIANCE

1303.1 Core and shell material selection. The core and shell of the non-residential portion of the building shall contain similar green material selections of the residential portion of the building and shall comply with the additional provisions of this section.

1303.2 Building thermal envelope insulation and fenestration. Comply with one of the following:

(1) The requirements of IECC Sections C402.1 through C402.4 or R402.1 through R402.3 including Table R402.4.1.1, as applicable, and § 13.103.3.

(2) The entire building thermal envelope, including both residential and non-residential, comply with total IECC Section C402.1.5 or R402.1.5, as applicable.

(3) The entire building complies with the IECC as demonstrated with a whole building energy model in accordance with IECC Section C407.

(4) The entire building complies with ASHRAE 90.1 Section 4.2.1.1.c Appendix G.

1303.3 Insulation installation. Insulation installed in the thermal envelope shall be visually inspected for compliance with Grade I installation. Grade II insulation is only permitted where exterior continuous insulation is installed. Grade III insulation installation is not permitted.

1303.4 Building thermal envelope air sealing. The building thermal envelope is durably sealed to limit infiltration. The sealing methods between dissimilar materials allow for differential expansion and contraction. The following are caulked, gasketed, weather-stripped, or otherwise sealed with an air barrier material, suitable film, or solid material:

(1) All joints, seams, and penetrations

(2) Utility penetrations

(3) Dropped ceilings or chases adjacent to the thermal envelope

(4) Knee walls

(5) Walls and ceilings separating the garage from conditioned spaces

(6) Attic access openings

(7) Other sources of infiltration

For existing buildings and where not renovated, modified, or newly installed, the following locations are permitted to be exempted from the requirement:

(8) Site-built windows, doors, and skylights

(9) Openings between window and door assemblies and their respective jambs and framing

(10) Behind tubs and showers on exterior walls

(11) Cantilevers

(12) Rim joists junction

1303.5 Air barrier verification. If not previously verified, the air barrier shall be visually inspected to demonstrate compliance with Table 701.4.3.2(2) and shall comply with the requirements of IECC C402.5.

1303.6 Enhanced durability. For existing spaces, a visual inspection of interior surfaces shall be performed. Where moisture is evident, the source, such as, but not limited to leaks around windows, doors, wall penetrations, roofs, flashing, foundations, and plumbing, shall be identified and remediated.

1303.6.1 Capillary break. A capillary break and vapor retarder shall be installed under newly installed concrete slabs in accordance with IBC Sections 1907, excluding exception #3 and 1805.2.1.

1303.6.2 Foundation drainage. Where required by the IBC, for newly constructed habitable and usable spaces below grade, exterior drain tile is installed.

1303.6.3 Dampproof walls. Newly installed walls that retain earth and encloses interior spaces, are required to be dampproofed in accordance with IBC Section 1805.

1303.6.4 Water-resistive barrier. Where required by the IBC, a water-resistive barrier and/or drainage plane system is installed behind newly installed exterior cladding.

1303.6.5 Flashing. Flashing is provided as follows to minimize water entry into wall and roof assemblies and to direct water to exterior surfaces or exterior water-resistive barriers for drainage. Flashing details are provided in the construction documents and are in accordance with the fenestration manufacturer's instructions, the flashing manufacturer's instructions, or as detailed by a registered design professional.

Flashing is installed at the following newly installed assembly locations, as applicable unless in conflict with manufacturer's installation instructions:

(1) Around exterior fenestrations, skylights, and doors;

(2) At roof valleys;

(3) At all building-to-deck, -balcony, -porch, and -stair intersections;

(4) At roof-to-wall intersections, at roof-to-chimney intersections, at wall-to-chimney intersections, and at parapets;

(5) At ends of and under masonry, wood, or metal copings and sills;

(6) Above projecting wood trim;

(7) At built-in roof gutters;

(8) Drip edge is installed at eave and rake edges;

(9) Window and door head and jamb flashing is either self-adhered or liquid applied;

(10) Flashing is installed at exterior windows and doors;

(11) Through-wall flashing is installed at transitions between wall cladding materials or wall construction types; and

(12) Flashing is installed at the expansion joint in stucco walls.

1303.6.6 Tile backing materials. Tile backing materials installed under newly tiled surfaces in wet areas are in accordance with ASTM C1178, C1278, C1288, or C1325. Tile shall not be installed over paper-faced gypsum board in wet areas.

1303.6.7 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 IBC at roof eaves of pitched roofs and extends not less than 24 in. (610 mm) inside the exterior wall line of the building.

1303.6.8 Architectural features. Architectural features that increase the potential for water intrusion are avoided, and shall comply with the following:

(1) Newly installed horizontal ledgers are sloped away to provide gravity drainage as appropriate for the application.

(2) No roof configurations that create horizontal valleys in roof design, unless directed to a drain on a flat roof.

(3) No newly installed recessed windows and architectural features that trap water on horizontal surfaces

1304 FULL MIXED-USE BUILDING COMPLIANCE

1304.1 Bicycle parking. Bicycle parking shall comply with § 1304.1.1 through § 1304.1.2.

1304.1.1 Minimum number of spaces. The minimum number of required bicycle parking spaces shall be 4 parking spaces.

Exceptions: 1) The number of bicycle parking spaces shall be allowed to be reduced subject to Adopting Entity approval; 2) bicycle parking shall not be required where the total non-residential conditioned space in the building is less than 1,000 ft^2; and 3) The minimum number of spaces shall be permitted to be reduced by the authority having jurisdiction based on the occupants expected use of public transit or walking to the building.

1304.1.2 Location. The bicycle parking shall be located on the same building site or within the building. It shall be located within 100 ft of, and visible from, the main entrance.

1304.2 Resource efficiency

1304.2.1 Moisture control measures. Moisture control measures for newly installed materials are in accordance with the following:

(1) Building materials with visible mold are not installed or are cleaned or encapsulated prior to concealment and closing

(2) Insulation in cavities is dry in accordance with manufacturer's installation instructions when enclosed (e.g., with drywall)

1304.2.2 Construction material and waste management plan. A written construction waste management plan is posted at the jobsite and implemented.

1304.2.3 Material selection. Not less than six of the following Chapter 6 items shall be met where certifying to § 13.104 (Full Mixed-Use Building Compliance).

(1) § 603.2 Salvaged materials

(2) § 604.1 Recycled content

(3) § 606.1 Biobased products

(4) § 606.2 Wood-based products

(5) § 606.3 Manufacturing energy

(6) § 608.1 Resource-efficient materials

(7) § 609.1 Regional materials

(8) § 610.1.2.1 Product LCA

(9) § 610.1.2.2 Building assembly LCA

(10) § 611.1.1 and § 611.1.2 Product declarations

(11) § 612.1 Manufacturer's environmental management system concepts

(12) § 612.2 Sustainable products

1304.2.4 Recycling and composting. A readily accessible space(s) adequate to accommodate the recycling and composting containers for materials accepted in local recycling/composting programs is provided and identified on the floorplan.

1304.3 Energy efficiency

1304.3.1 Energy metering. Energy metering, or monitoring device, shall be provided for each tenant space individually for the non-residential portions of the building.

Exception: non-residential spaces under 10,000 ft^2

1304.3.2 Efficiency of HVAC equipment. HVAC equipment shall comply with the minimum efficiency requirements listed in IECC Tables C403.3.2(1) through C403.3.2(7).

1304.3.3 Efficiency of Service Water Heating equipment. Service Water Heating equipment shall comply with the minimum efficiency requirements listed in IECC Table C404.2.

1304.3.4 Lighting. The total interior lighting power allowance shall be less than the total lighting power allowance in accordance with IECC Section C405.3.2.

1304.3.5 Commissioning

1304.3.5.1 Mechanical and service water heating systems. Mechanical and service water heating systems shall comply with IECC Section C408.2.

1304.3.6 Calculation of heating and cooling loads. Design loads associated with heating, ventilating and air conditioning of the building shall be determined in accordance with ASHRAE/ACCA Standard 183 or by an approved equivalent computational procedure and using the design parameters specified in IECC Chapter 3 or R3, as applicable. Heating and cooling loads shall be adjusted to account for load reductions that are achieved where energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE HVAC Systems and Equipment Handbook or an approved equivalent computational procedure.

1304.3.7 Duct air sealing. Ductwork shall be constructed in accordance with the IMC.

1304.3.8 Heated-water circulation and temperature maintenance. Where installed, heated-water circulation systems shall be in accordance with § 1304.3.8.1. Heat trace temperature maintenance systems shall be in accordance with § 1304.3.8.2. Controls for hot water storage shall be in accordance with § 1304.3.8.3. Automatic controls, temperature sensors, and pumps shall be in a location that is accessible. Manual controls shall be in a location with ready access.

1304.3.8.1 Circulation systems. Heated-water circulation systems shall be provided with a circulation pump. The system return pipe shall be a dedicated return pipe, or a cold water supply pipe. Gravity and thermos-syphon circulation systems shall be prohibited. Controls for circulation hot water system pumps shall start the pump based on the identification of a demand for hot water. The controls shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is not a demand for hot water.

1304.3.8.2 Heat trace systems. Electric heat trace systems shall comply with IECC. Controls for such systems shall be able to automatically adjust the energy input to the heat tracing to maintain the desired water temperature in the piping in accordance with the times when heated water is used in the occupancy. Heat trace shall be arranged to be turned off automatically when there is not a demand for hot water.

1304.3.8.3 Controls for hot water storage. The controls on pumps that circulate water between a water heater and a heated water storage tank shall limit the operation of the pump from the heating cycle startup to not greater than 5 minutes after the end of the cycle.

1304.4 Water efficiency and conservation

1304.4.1 Fitting and fixture consumption. Plumbing fixtures and fixture fittings shall comply with the maximum flow rates specified in Table 1304.4.1 and, where applicable, comply with the performance criteria of the WaterSense Specification. Plumbing fixtures and fixture fittings in Table 1304.4.1 shall have a manufacturer's designation for flow rate.

Exceptions: The following fixtures and devices shall not be required to comply with the reduced flow rates in Table 1304.4.1: 1) Clinical sinks having a maximum water consumption of 4.5 gallons (17 L) per flush; 2) service sinks faucets, tub fillers, pot fillers, laboratory faucets, utility faucets, and other fittings designed primarily for filling operations; and 3) Fixtures, fittings, and devices whose primary purpose is safety.

TABLE 1304.4.1
MAXIMUM FLOW RATES AND FLUSH VOLUMES FOR IXTURES AND FIXTURES FITTING

FIXTURE OR FIXTURE FITTING TYPE	MAXIMUM FLOW RATE OR FLUSH VOLUME & CERTIFICATION REQUIREMENTS
Showerhead[a]	2.0 gpm at 80 psi & WaterSense labeled or equivalent performance criteria
Lavatory faucet and bar sink-private	1.5 gpm at 60 psi & WaterSense labeled or equivalent performance criteria
Lavatory faucet-public (metering)	0.25 gpc[bd]
Lavatory faucet-public (non-metering)	0.5 gpm[e]
Kitchen faucet-private[d]	1.8 gpm[e]

Kitchen and bar sink faucets in other than dwelling units and guest rooms	2.2 gpm[e]
Urinal	0.5 gpf & WaterSense labeled or equivalent performance standard or nonwater urinal
Water closet	1.28 gpf[e] & WaterSense labeled or equivalent performance standard
Prerinse spray valves	1.3 gpm
Drinking fountains (manual)	0.7 gpm[d]
Drinking fountains (metered)	0.25 gpc[c]

a. Includes hand showers, body sprays, and rainfall panels. 2.0 GPM limit shall apply to cumulative flow of all devices located less than 96 in. apart in individual/two-person shower compartments or 35 in. apart in gang or group showers (as measured horizontally)
b. Gallons per cycle.
c. Bottle filling stations associated with drinking fountains shall not have limitations for flow rate.
d. Kitchen faucets may temporarily increase the flow above the maximum rate but not to exceed 2.2 gpm.
e. Shall comply with ASME/CSA A112.18.1 or equivalent standard as determined by the Adopting Entity.

1304.4.2 Once-through cooling for appliances and equipment. Once-through or single-pass cooling with potable or municipal reclaimed water is prohibited.

1304.4.3 Clothes washers. Clothes washers rated with an IWF (integrated water factor), MEF (modified energy factor), or IMEF (integrated modified energy factor), shall be rated as follows:

(1) Residential Clothes Washers, Front-loading, greater than 2.5 cu-ft IWF not greater than 3.2 IMEF not less than 2.76

(2) Residential Clothes Washers, Top-loading, greater than 2.5 cu-ft IWF not greater than 4.3, IMEF not less than 2.06

(3) Residential Clothes Washers, less than or equal to 2.5 cu-ft IWF not greater than 4.2, IMEF not less than 2.07

(4) Commercial Clothes Washers, IWF not greater than 4.0, MEF not less than 2.20

1304.4.4 Food Service

1304.4.4.1 Dipper wells. The water supply to a dipper well shall have a shutoff valve and flow control valve. The maximum flow shall not exceed 1 gpm (3.78 lpm) at a supply pressure of 60 psi (413.7 kPa). The dipper well shall have a manufacturer's designation of flow rate.

1304.4.4.2 Food waste disposal. The disposal of food wastes that are collected as part of preparing ware for one or more of the following shall accomplish washing:

(1) A food strainer (scrapper) basket that is emptied into a trash can.

(2) A garbage grinder where the water flow into the food waste disposer is controlled by a load sensing device such that the water flow does not exceed 1 gpm under no-load operating conditions and 8 gpm under full-load operating conditions.

(3) A pulper or mechanical strainer that uses no more than 2 gpm of potable water.

1304.4.4.3 Pre-rinse spray heads. Food service pre-rinse spray heads shall shut off *automatically* when released.

1304.4.4.4 Hand washing faucets. Faucets for hand washing sinks in food service preparation and serving areas shall be self-closing.

1304.4.5 Water softeners. Water softeners shall comply with § 1304.4.5.1 through § 1304.4.5.3.

1304.4.5.1 Demand initiated regeneration. Water softeners shall be equipped with demand-initiated regeneration control systems. Such control systems shall automatically initiate the regeneration cycle after determining the depletion, or impending depletion of softening capacity.

1304.4.5.2 Water consumption. Water softeners shall have a water consumption during regeneration of not greater than 5 gal (18.9 L) per 1000 grains of hardness removed as measured in accordance with NSF 44.

1304.4.5.3 Waste connections. Wastewater from water softener regeneration shall not discharge to reclaimed, greywater or rainwater water collection systems and shall discharge in accordance with the IPC.

1304.4.6 Heat exchangers. Once-through or single-pass cooling with potable or municipal reclaimed water is prohibited.

1304.5 Indoor air quality

1304.5.1 Carpets. Carpeting is not installed adjacent to water closets and bathing and or shower fixtures.

1304.5.1.1 Entry. The primary entryway from the outdoors shall include one of the following:

(1) Permanent walk-off mat that allows access for cleaning (e.g., grating with catch basin); or

(2) Roll-out mat that will be maintained on a weekly basis by a contracted service.

1304.5.2 Prohibited materials. The use of the following materials shall be prohibited:

(1) Asbestos-containing materials

(2) Urea-formaldehyde foam insulation

1304.5.3 Product emissions. At least five types of the following product categories shall comply with their respective section of the Standard referenced below:

(1) Wood materials § 901.5

(2) Cabinets § 901.6

(3) Floor materials § 901.8

(4) Wall coverings § 901.9

(5) Interior architectural coatings § 901.10

(6) Interior adhesives and sealants § 901.11

(7) Insulation § 901.12

1304.5.4 Fireplaces and appliances. Where located within buildings, fireplaces, solid fuel-burning appliances, vented decorative gas appliances, vented gas fireplace heaters and decorative gas appliances for installation in fireplaces shall comply with § 1304.5.4.1 through § 1304.5.4.5.

1304.5.4.1 Venting and combustion air. Fireplaces and fuel-burning appliances shall be vented to the outdoors and shall be provided with combustion air provided from the outdoors in accordance with the International Mechanical Code and the International Fuel Gas Code. Solid-fuel-burning fireplaces shall be provided with a means to tightly close off the chimney flue and combustion air openings when the fireplace is not in use.

1304.5.4.2 Wood-fired appliances. Wood stoves and wood-burning fireplace inserts shall be listed and, additionally, shall be labeled in accordance with the applicable requirement.

(1) Site-built masonry wood-burning fireplaces use outside combustion air and include a means of sealing the flue and the combustion air outlets to minimize interior air (heat) loss when not in operation.

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

(3) Wood stove and fireplace inserts, as defined in UL 1482 Section 3.8, are in accordance with the certification requirements of UL 1482.

1304.5.4.3 Biomass appliances. Biomass fireplaces, stoves and inserts shall be listed and labeled in accordance with ASTM E 1509 or UL 1482. Biomass furnaces shall be listed and labeled in accordance with CSA B366.1 or UL 391. Biomass boilers shall be listed and labeled in accordance with CSA B366.1 or UL 2523.

1304.5.4.4 Gas-fireplaces. Gas-fired fireplaces and direct heating equipment is listed and is installed in accordance with the NFPA 54, IFGC, or the applicable local gas appliance installation code. Gas-fired fireplaces within dwelling units and direct heating equipment are vented to the outdoors.

1304.5.4.5 Unvented heaters and appliances. Unvented room heaters and unvented decorative appliances, including alcohol burning, shall be prohibited.

1304.5.5 Protection of HVAC system openings. HVAC supply and return duct and equipment openings shall be protected during dust-producing operations of construction or inspected and verified to be free from dust and debris after dust-producing activities are completed and prior to owner occupancy.

1304.5.6 Garages. Attached garages are in accordance with the following:

(1) Doors installed in the common wall between the attached garage and conditioned space are tightly sealed and gasketed.

(2) A continuous air barrier is provided separating the garage space from the conditioned spaces.

1304.5.7 Spot Ventilation. Exhaust systems shall be provided in accordance with IMC Chapter 5 or ASHRAE 62.1.

1304.5.8 Building Ventilation Systems

1304.5.8.1 Building Ventilation. Ventilation shall be provided to non-residential spaces in accordance with IMC Chapter 4 or ASHRAE 62.1.

1304.5.8.2 Air filters. Air filters with a MERV rating of not less than 13 are installed on new central forced air systems and are readily accessible for maintenance.

Note: Central forced air ducted systems should be designed to accommodate the pressure drop from a MERV 13 filter.

1304.5.9 Radon system. Commercial spaces in building located in Zone 1 shall comply with § 902.3.

1304.6 Operation, maintenance, and building owner education

1304.6.1 Tenant finish out manual. Manuals are provided to the tenants of the core and shell spaces prior to the start of construction regarding the design and construction of the non-residential portion of the building. Paper or digital format manuals are to include information regarding those aspects of the design and construction that are within the area of responsibilities of the respective tenant. One or more responsible parties are to receive a copy of all documentation for archival purposes.

(1) Provisions of this Chapter verified and NOT verified at the time of building Certification for the non-residential space(s) that should be included as part of the Tenant Finish Out.

(2) A list of green building material specifications that are recommended to be included in the Tenant Finish Out Construction Documents based on the materials that were installed in the residential portion of the building.

1304.6.2 Operation and maintenance manuals for tenants. Manuals are available to the future tenants of core and shell spaces and non-residential spaces of a full mixed-use building regarding the operation and maintenance of their respective

portions of the building. Paper or digital format manuals are to include information regarding those aspects of the building's maintenance and operation that are within the area of responsibilities of the respective tenant. One or more responsible parties are to receive a copy of all documentation for archival purposes.

(1) A narrative detailing the importance of operating in a green building. This narrative is included in all responsible parties' manuals.

(2) A list of practices to conserve water and energy which require maintenance.

(3) Information on opportunities to purchase renewable energy from local utilities or national green power providers.

(4) Information on local and on-site recycling and hazardous waste disposal programs.

(5) Local public transportation options for employees.

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CHAPTER 14:
REFERENCED DOCUMENTS

1401 GENERAL

1401.1 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 indicate 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.

1401.2 The application of the referenced documents shall be as specified in § 102.2.

1402 REFERENCED DOCUMENTS

AARST – AARST Consortium on National Radon Standards | www.aarst.org

DOCUMENT	DATE	TITLE	SECTION
ANSI/ AARST MA-MFLB	2023	*Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily, School, Commercial and Mixed-Use Buildings*	902.3.3
ANSI/ AARST SGM-MFLB	2023	*Soil Gas Mitigation Standards for Existing Multifamily, School, Commercial and Mixed-Use Building*	11.902.3.3
ANSI/ AARST SGM-SF	2023	*Soil Gas Mitigation Standards for Existing Homes*	11.902.3.2

ACCA – Air Conditioning Contractors of America | www.acca.org

DOCUMENT	DATE	TITLE	SECTION
Manual D	2016	*Residential Duct Systems*	701.4.2.3, 11.701.4.2.3,
Manual J	2016	*Residential Load Calculation, Eighth Edition, Version 2.1*	701.4.1.1, 701.4.1.2, 703.3.0, 11.701.4.1.1, 11.701.4.1.2, 11.703.3.0, 1203.4
Manual S	2014	*Residential Equipment Selection*	701.4.1.1, 703.3.0, 11.701.4.1.1, 11.703.3.0
5 QI	2015	*HVAC Quality Installation Specification*	701.4.1.2, 703.3.3, 703.3.4, 703.3.5, 703.3.6, 705.6.2.2(1), 705.6.2.2(2), 11.701.4.1.2, 11.703.3.3,

			11.703.3.4, 11.703.3.5, 11.703.3.6, 11.705.6.2.2(1), 11.705.6.2.2(2), 1203.4

AFF – American Forest Foundation, Inc. | www.forestfoundation.org

DOCUMENT	DATE	TITLE	SECTION
2010-2015 AFF Standards	2010	*American Tree Farm System Standards for Sustainability for Forest Certification, including Performance Measures and Field Indicators*	606.2(a), 11.606.2(a),

AAMA – American Architectural Manufacturers Association | www.aamanet.org

DOCUMENT	DATE	TITLE	SECTION
711	2013	*The Voluntary Specification for Self-Adhering Flashing Used for Installation of Exterior Wall Fenestration Products*	602.1.9(2), 11.602.1.9(2), 1202.7(9)
714	2015	*Voluntary Specification for Liquid Applied Flashing Used to Create a Water-Resistive Seal around Exterior Wall Openings in Buildings*	602.1.9(2), 11.602.1.9(2), 1202.7(9)
AAMA/WDMA/CSA 101/I.S.2/A440 UP3	2008		701.4.3.3, 11.701.4.3.3

AHRI – Air-Conditioning, Heating, and Refrigeration Institute | www.ahrinet.org

DOCUMENT	DATE	TITLE	SECTION
I=B=R	2009	*Heat Loss Calculation Guide*	701.4.1.2, 11.701.4.1.2, 1203.4

ASABEE – American Society of Agricultural and Biological Engineers | www.asabe.org

DOCUMENT	DATE	TITLE	SECTION
ASABE/ICC 802	2020	*Landscape Irrigation Sprinkler and Emitter Standard*	403.6(19b), 802.7.2, 11.802.7.2

ASCE – American Society of Civil Engineers | www.asce.org

DOCUMENT	DATE	TITLE	SECTION
32-01	2001	*Design and Construction of Frost-Protected Shallow Foundations*	202

ASHRAE – American Society of Heating, Refrigeration, Air-conditioning Engineers| www.ashrae.org

DOCUMENT	DATE	TITLE	SECTION
ASHRAE 62.1	2022	*Ventilation for Acceptable Indoor Air Quality*	706.12(1), 706.12(2) 902.1.6,

			11.706.12, 11.706.12(2), 11.902.1.6, 13.107.1.7, 13.107.1.8.1
ASHRAE 62.2	2019	*Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*	902.1.1(3), 902.2.1(a), 901.4, 11.902.1.1(3), 11.902.2.1(a), 11.901.4, 1205.8
105	2021	*Standard Methods of Determining, Expressing and Comparing Building Energy Performance and Greenhouse Gas Emissions*	702.2.1
160	2021	*Criteria for Moisture-Control Design Analysis in Buildings*	602.1.7.3, 11.602.1.7.3
ASHRAE/ACCA 183	2007 (RA 2017)	*Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential*	13.105.9

ASME – American Society of Mechanical Engineers | www.asme.org

DOCUMENT	DATE	TITLE	SECTION
A112.18.1/CSA B125.1	2012	*Plumbing Supply Fittings*	802.4(1), 802.5.1, 802.5.2, 11.802.4(1), 11.802.5.1, 11.802.5.2, 1204.2.1
A112.19.2/CSA B45.1	2013	*Vitreous China Plumbing Fixtures and Hydraulic Requirements for Water Closets and Urinals*	802.6(2), 802.6(4)(c), 802.6(4)(d), 11.802.6(2), 11.802.6(4)(c), 11.802.6(4)(d)
A112.19.14	2013	*Six-Liter Water Closets Equipped with a Dual Flushing Device*	802.6(2), 11.802.6(2)

ASSE – American Society of Sanitary Engineering | www.asse-plumbing.org

DOCUMENT	DATE	TITLE	SECTION
1016/ASME A112.1016/CSA B125.16	2011	*Automatic Compensation Valves for Individual Showers and Tub/Shower Combinations*	802.4(1), 11.802.4(1)

ASTM – ASTM International, Inc. | www.astm.org

DOCUMENT	DATE	TITLE	SECTION
C1178	2018	*Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel*	602.1.11, 11.602.1.11, 1202.8, 13.103.6.6
C1278 – / 1278M	2018	*Standard Specification for Fiber-Reinforced Gypsum Panel*	602.1.11, 11.602.1.11, 1202.8, 13.103.6.6
C1288	2017	*Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets*	602.1.11, 11.602.1.11, 1202.8, 13.103.6.6
C1325	2022	*Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units*	602.1.11, 11.602.1.11, 1202.8, 13.103.6.6
C1371-15	2022	*Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers*	703.2.3, 11.703.2.3
D7338	2023	*Standard Guide for Assessment of Fungal Growth in Buildings*	904.1, 904.2, 11.904.1, 11.904.2

ASTM – ASTM International, Inc. | www.astm.org (Continued)

DOCUMENT	DATE	TITLE	SECTION
D7612	2021	*Standard Practice for Categorizing Wood and Wood-Based Products According to Their Fiber Sources*	606.2(h), 11.606.2(h)
E283	2019	*Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen*	701.4.3.5, 11.701.4.3.5,
E779	2019	*Standard Test Method for Determining Air Leakage Rate by Fan Pressurization*	701.1.5, 701.4.3.2(1), 705.6.2.1, 11.701.4.3.2(1), 11.705.6.2.1, 1203.13
E1509	2022	*Standard Specification for Room Heaters, Pellet Fuel-Burning Type*	901.2.1(4), 11.901.2.1(4), 1205.2(4)
E1554	2018	*Standard Test Methods for Determining Air Leakage of Air Distribution Systems by Fan Pressurization*	701.4.2.1(1) 11.704.2.1(1)
E1602-03	2017	*Standard Guide for Construction of Solid Fuel Burning Masonry Heaters*	901.2.1(5), 11.901.2.1(5), 1205.2(4)

E1643	2018a	*Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs*	602.1.1.3, 602.1.1.4, 11.602.1.1.3, 11.602.1.1.4
E1745	2023	*Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs*	602.1.1.3, 602.1.1.4, 602.1.4.1(3), 11.602.1.1.3, 11.602.1.1.4, 11.602.1.4.1(3)
E1827	2022	*Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door*	701.1.5, 705.6.2.1, 11.701.4.3.2(1) 11.705.6.2.1, 1203.13
E1980-11	2019	*Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low Sloped Opaque Surfaces*	505.2(1)(b), 602.2(3), 11.505.2(1)(b), 11.602.2(3)
E2273	2018	*Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies*	602.1.10, 11.602.1.10
E2921	2022	*Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes and Rating Systems*	610.1.1, 610.1.1(1), 11.610.1.1, 11.610.1.1(1),
E3158	2018	*Standard Test Method for Measuring the Air Leakage Rate of a Large or Multizone Building*	701.1.5, 705.6.2.1 11.705.6.2.1

BIFMA – Business + Institutional Furniture Manufacturers Association | www.bifma.org

DOCUMENT	DATE	TITLE	SECTION
ANSI/BIFMA e3	2019	*Furniture Sustainability Standard*	901.13, 11.901.13
ANSI/BIFMA M7.1	2021	*Standard Test Method for Determining VOC Emissions from Office Furniture Systems, Components, and Seating*	901.13, 11.901.13

BOMA – Building Owners and Managers Association International | www.boma.org

DOCUMENT	DATE	TITLE	SECTION
Z65.4	2010	*Multi-Unit Residential Buildings: Standard Methods of Measurement*	601.1, 11.601.1

CARB – California Air Resources Board | www.arb.ca.gov

DOCUMENT	DATE	TITLE	SECTION
	2007	*Composite Wood Air Toxic Contaminant Measure Standard*	901.5(5), 901.6(2), 11.901.5(5), 11.901.6(2)

	2020	*Suggested Control Measure for Architectural Coatings*	901.10.1(3), 11.901.10.1(3), 1205.6(3)
	2011	*The California Consumer Products Regulations*	901.11(3), 11.901.11(3)

CDPH – California Department of Public Health | www.cdarb.ca.gov

DOCUMENT	DATE	TITLE	SECTION
	2017	*Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2.*	901.8, 901.9, 901.10.3, 901.11(1), 901.12, 11.901.8, 11.901.9, 11.901.10.3, 11.901.11(1), 11.901.12, 12.1.901.7, 12.1.901.8, 12.1.901.9.2, 12.11.901.10(1)

CPA – Composite Panel Association | www.pbmdf.com

DOCUMENT	DATE	TITLE	SECTION
A208.1	2022	*Particleboard Standard*	901.5(2), 11.901.5(2)
A208.2	2022	*MDF Standard*	901.5(2), 11.901.5(2)
CPA 4	2019	*The Eco-Certified Composite™ (ECC) Standard*	901.5(4), 11.901.5(4)

CRRC – Cool Roof Rating Council | www.coolroofs.org

DOCUMENT	DATE	TITLE	SECTION
CRRC-2	2023	*Wall Product Rating Program Manual*	705.2.3(2) 705.3.3 (2)
ANSI/CRRC S100	2021	*Standard Test Methods for Determining Radiative Properties of Materials*	602.2(1) 705.2.4(2) 705.3.4(2) 11.602.2(2)

CSA – CSA International | www.csa-international.org

DOCUMENT	DATE	TITLE	SECTION
6.19	2011	*Residential Carbon Monoxide Alarming Devices*	
CSA/AM ANSI Z21.50/CSA 2.22	2019	*Vented Decorative Gas Fireplaces*	901.1.6, 11.901.1.6
CSA/AM ANSI Z21.88/CSA 2.33	2019	*Vented Gas Fireplace Heaters*	901.1.6, 11.901.1.6

Z809	2016	*Sustainable Forest Management Requirements and Guidance (SFM)*	606.2(b), 11.606.2(b)
B366.1	2007	*Solid-Fuel-Fired Central Heating Appliances*	13.107.1.4.3

DOC/NIST – United States Department of Commerce / National Institute of Standards and Technology | www.nist.gov

DOCUMENT	DATE	TITLE	SECTION
PS 1-09	2010	*Construction and Industrial Plywood*	901.5(1), 11.901.5(1)
PS 2-10	2011	*Performance Standard for Wood-based Structural-use Panels*	901.5(1), 11.901.5(1)

DOE – U.S. Department of Energy | www.energy.gov

DOCUMENT	DATE	TITLE	SECTION
v. 4.6.1	2015	*REScheck*	703.1.1.1, 703.2.1, 11.703.1.1.1, 11.703.2.1, 1203.11.1.2,
v. 4.4.0	2015	*COMcheck*	703.1.1.1, 703.2.1, 11.703.1.1.1, 11.703.2.1, 1203.11.1.2,
Version 2		*DOE Zero Energy Ready Homes [National]*	701.1.6
Version 2		*DOE Zero Energy Ready Homes [California Single-Family]*	701.1.6
Version 2		*DOE Zero Energy Ready Multifamily [National]*	701.1.6
Version 2		*DOE Zero Energy Ready Multifamily [California Multifamily]*	701.1.6

EPA – Environmental Protection Agency | www.epa.gov

DOCUMENT	DATE	TITLE	SECTION
Burn Wise	2012	*EPA Qualified Wood-Burning Fireplace Program Partnership Agreement*	901.2(2), 11.901.2(2)
EPA 402-K-01-001	2008	*Mold Remediation in Schools and Commercial Buildings*	904.3(1), 11.904.3(1), 1202.11
EPA 402-K-02-003	2012	*A Brief Guide to Mold, Moisture and Your Home*	904.3(1), 11.904.3(1)
EPA 747-K-97-001	1997	*Reducing Lead Hazards When Remodeling Your Home*	11.1001.1(23)
Method 24	2020	*Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings*	901.10.1(1), 11.901.10.1(1), 1205.6(1)
	1990	*Asbestos in the Home: A Homeowner's Guide*	11.1001.1(23)
	2013	*Smart Location Database, NGBS: Points for Smart Location Practices*	405.6(7), 405.6(8),

		https://epa.maps.arcgis.com/home/item.html?id=9508f9295c144b9fb392d33b18b569e3	501.2(4), 11.501.2(3)

ENERGY STAR® Documents

DOCUMENT	DATE	TITLE	SECTION
	September 1, 2018	*National ERI Target Procedure, ENERGY STAR Certified Homes, Version 3 (Rev. 09)*	701.1, 701.1.3, 704.1, 704.2, 1203.16.1
	September 1, 2018	*National Program Requirements ENERGY STAR Certified Homes, Version 3 (Rev. 09)*	701.1.4
	September 1, 2018	*National Program Requirements ENERGY STAR Certified Homes, Version 3.1 (Rev. 09)*	701.1.4
	January 1, 2015	*ENERGY STAR Multifamily High Rise Version 1 (Rev 03)*	701.1.4

EPA – Environmental Protection Agency | www.epa.gov (continued)

ENERGY STAR® Documents (Continued)

DOCUMENT	DATE	TITLE	SECTION
	January 1, 2014	*ENERGY STAR Program Requirements for Clothes Washers, Version 7.0*	703.6.2(3), 802.2(2), 11.703.6.2(3), 11.802.2(3)
	January 20, 2013	*ENERGY STAR Program Requirements for Dishwashers, Version 5.2*	703.6.2(2), 802.2(1), 11.703.6.2(2), 11.802.2(1)
	December 1, 2009	*ENERGY STAR Program Requirements for Geothermal Heat Pumps – Eligibility Criteria Version 3.1*	703.3.6, 11.703.3.6
	April 1, 2012	*ENERGY STAR Program Requirements for Luminaires, Version 1.2*	703.6.1(1), 11.703.6.1(1)
	April 28, 2014	*ENERGY STAR Program Eligibility Criteria for Residential Refrigerators and/or Freezers, Version 5*	703.6.2(1), 11.703.6.2(1)
	April 1, 2012	*ENERGY STAR Program Requirements for Residential Ceiling Fans – Eligibility Criteria Version 3.0*	703.3.7, 11.703.3.7, 1205.7
	October 1, 2015	*ENERGY STAR Program Requirements for Residential Ventilating Fans – Eligibility Criteria Version 4.1*	902.1.4(2), 11.902.1.4(2)
	January 17, 2014	*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Eligibility Criteria Version 6.0*	703.2.5.2.1, 11.703.2.5.2.1

WaterSense Documents

DOCUMENT	DATE	TITLE	SECTION
	May 20, 2014	*WaterSense Specification for Tank-Type Toilets, Version 1.2*	802.6(2), 11.802.6(2) 12.3.801.6

	November 3, 2011	*WaterSense Specification for Weather-Based Irrigation Controllers, Version 1.0*	802.6.4(1), 11.802.6.4(1)
	December 9, 2014	*WaterSense Water Budget Approach Version 1.02*	403.6(4), 503.5(4), 11.503.5(4)
	October 1, 2007	*WaterSense High-Efficiency Lavatory Faucet Specification Version 1.0*	802.5.1, 11.802.5.1, 1204.2.1
	March 4, 2010	*WaterSense Specification for Showerheads Version 1.0*	802.4(1), 11.802.4(1)

FSA – Forest Stewardship Council | www.fsc.org

DOCUMENT	DATE	TITLE	SECTION
FSC-STD-01-001 (Version 4-0) EN	2013	FSC Principles and Criteria for Forest Stewardship v5	606.2(c), 11.606.2(c)

GS – Green Seal | www.greenseal.org

DOCUMENT	DATE	TITLE	SECTION
GS-11	2021	*Paints and Coatings 4.0*	901.10.1(2), 11.901.10.1(2), 1205.6(2)
GS-36	2013	*Adhesives for Commercial Use 2.1*	901.10(2), 11.901.10(2),

HPVA – Hardwood Plywood Veneer Association | www.hpva.org

DOCUMENT	DATE	TITLE	SECTION
ANSI/HPVA HP-1	2020	*American National Standard for Hardwood and Decorative Plywood*	901.5(3), 11.901.5(3)

HUD – U.S. Department of Housing and Urban Development | www.hud.gov

DOCUMENT	DATE	TITLE	SECTION
24 CFR, Part 3280	2014	*Manufactured Home Construction and Safety Standards*	202
	2023	*Designing for Natural Hazards - Volume 1: Wind, Volume 2: Water, Volume 3: Fire, Volume 4: Earth*	613.2, 11.613.2

ICC – International Code Council | www.iccsafe.org

DOCUMENT	DATE	TITLE	SECTION
A117.1	2017	*Accessible and Usable Buildings and Facilities*	611.3
IBC	2024	*International Building Code*	202, 602.1.3.1, 602.1.8, 602.1.13, 613.2, 901.2.1(5), 1001.1(12)(b), 11.602.1.3.1, 11.602.1.8,

			11.602.1.13, 11.613.2, 11.901.2.1(5), 11.1001.1(12)(b), 1205.2(5), 13.104.1.1, 13.104.1.2, 13.104.1.3, 13.104.1.4, 13.104.1.6
IBC	2024	*International Building Code*	602.1.1.1, 901.14, 11.602.1.1.1, 11.901.14

ICC – International Code Council | www.iccsafe.org (Continued)

DOCUMENT	DATE	TITLE	SECTION
ICC-400	2022	*Standard on the Design and Construction of Log Structures*	Table 701.4.3.2(2)

IECC	2021	*International Energy Conservation Code*	610.1.1(2), 701.1.4, 701.1.6(1), 701.1.6(6)(a), 702.2.1, 702.2.2, 702.2.3, 703.1.1.1, 703.1.1.2, 703.1.2, 703.1.3, 703.2.1, 705.6.2.1, 705.6.2.3(1), 705.6.2.3(2), 705.6.3, 706.5(1), 902.1.4 11.610.1.1(2), 11.701.4.0, 11.703.1.1.1, 11.703.1.1.2, 11.703.1.2, 11.703.1.3, 11.703.2.1, 11.705.6.2.1, 11.705.6.2.3(1), 11.705.6.2.3(2), 11.705.6.3, 11.706.5(1), 11.902.1.4 1203.9.1, 1203.9.2, 13.105.1, 13.105.3.1, 13.105.5, 13.105.6, 13.105.7, 13.105.8.1, 13.105.9, 13.105.11.2, 13.105.12.1, 13.105.12.3
IFGC	2024	*International Fuel Gas Code*	901.1.4, 11.901.1.4, 1205.1, 13.107.4.4

ICC – International Code Council | www.iccsafe.org (Continued)

DOCUMENT	DATE	TITLE	SECTION
IgCC	2024	*International Green Construction Code*	301.1.1, 304.2,

			701.1.5, 13.102.1.4
IMC	2024	*International Mechanical Code*	705.6.1(1), 902.1.1(3), 902.1.6 902.2.1(b), 11.705.6.1(1), 11.902.1.1(3), 11.902.1.6, 11.902.2.1(b), 13.105.10, 13.107.7, 13.107.8.1
IRC	2024 references to 2024 IRC do not include Chapter 11.	*International Residential Code*	202, 602.1.3.1, 602.1.8, 602.1.13, 705.6.1(1), 902.1.1(1), 902.1.1(3) 902.2.1(c), 902.3.3, 1001.1(12)(b), 11.602.1.3.1, 11.602.1.8, 11.602.1.13, 11.705.6.1, 11.902.1.1(1), 11.902.1.1(3) 11.902.2.1(c), 11.902.3.3, 11.1001.1(12)(b), 1202.1, 1202.4, 1205.8
IRC	2024	*International Residential Code*	602.1.1.1, 602.1.4.2(1), 602.1.4.2(2), 901.14, 11.602.1.1.1, 11.602.1.4.2(1), 11.602.1.4.2(2), 11.901.14
IPC	2024	*International Plumbing Code*	703.5.1, 11.703.5.1, 13.106.5.3
IWUIC	2024	*International Wildlife Urban Interface Code*	503.1(8), 11.503.1(8)

IA – Irrigation Association & American Society of Irrigation Consultants | www.irrigation.com

DOCUMENT	DATE	TITLE	SECTION
http://www.solar-rating.org/ratings/OG300DIRECTORIES/OG300DIRFULL_20070131.pdf	2014	*Landscape Irrigation Best Management Practices*	403.6(15)

ISO – International Organization for Standardization | www.iso.org

DOCUMENT	DATE	TITLE	SECTION
14025http://www.solar-rating.org/ratings/OG300DIRECTORIES/OG300DIRFULL_20070131.pdf	2006	*Environmental labels and declarations – Type III environmental declarations – Principles and procedures*	611.1.1, 611.1.2, 11.611.1.1, 11.611.1.2
14044http://www.solar-rating.org/ratings/OG300DIRECTORIES/OG300DIRFULL_20070131.pdf	2006	*Environmental management – Life cycle assessment – Requirements and guidelines*	610.1.1, 610.1.2, 11.610.1.1, 11.610.1.2,
14001http://www.solar-rating.org/ratings/OG300DIRECTORIES/OG300DIRFULL_20070131.pdf	2015	*Environmental management systems – Requirements with guidance for use*	612.1, 11.612.1
16000-23	2018	*Indoor air – Part 23: Performance test for evaluating the reduction of formaldehyde and other carbonyl concentrations by sorptive building materials*	901.10, 11.901.10
17025	2017	*General requirements for the competence of testing and calibration laboratories*	901.8, 901.9, 901.10.3, 901.11(1), 901.12, 901.12 11.901.8, 11.901.9, 11.901.10.3, 11.901.11(1), 11.901.12, 11.901.12

17065	2012	*Conformity assessment – Requirements for bodies certifying products, processes and services*	612.2, 901.8, 901.9, 901.10.3, 901.11(1), 901.12, 901.13, 11.612.2, 11.901.7, 11.901.9, 11.901.10.3, 11.901.11(1), 11.901.12, 11.901.13
21930	2017	*Sustainability in building and civil engineering works – Core rules for environmental declarations of construction products and services*	611.1.1, 611.1.2, 11.611.1.1, 11.611.1.2

Home Innovation | Home Innovation Research Labs | www.HomeInnovation.com

DOCUMENT	DATE	TITLE	SECTION
Z765	2020	*Single-Family Residential Buildings - Square Footage - Method for Calculating*	601.1, 11.601.1

KCMA – Kitchen Cabinet Manufacturers Association | www.kcma.org

DOCUMENT	DATE	TITLE	SECTION
ANSI/KCMA A161.1	2020	*Performance and Construction Standard for Kitchen and Vanity Cabinets*	602.1.15, 11.602.1.15

NFPA – National Fire Protection Association | www.nfpa.org

DOCUMENT	DATE	TITLE	SECTION
54	2021	*National Fuel Gas Code*	901.1.4, 11.901.1.4, 1205.1, 13.107.4.4

NFRC – National Fenestration Rating Council | www.nfrc.org

DOCUMENT	DATE	TITLE	SECTION
400	2010	*Procedure for Determining Fenestration Product Air Leakage*	701.4.3.3, 11.701.4.3.3

NSF – NSF International | www.nsf.org

DOCUMENT	DATE	TITLE	SECTION
NSF/ANSI 140	2019	*Sustainable Carpet Assessment*	612.2(1), 11.612.2(1)
NSF/ANSI 332	2015	*Sustainability Assessment for Resilient Floor Coverings*	612.2(2), 11.612.2(2)
NSF/ANSI 342	2019	*Sustainability Assessment for Wallcovering Products*	612.2(4), 11.612.2(4)

NWFA – National Wood Flooring Association | www.nwfa.org

DOCUMENT	DATE	TITLE	SECTION
	2019	*Responsible Procurement Program*	606.2(f), 11.606.2(f)

Passive House Institute US (PHIUS) | www.phius.org

DOCUMENT	DATE	TITLE	SECTION
V3.1	2021	*PHIUS CORE*	701.1.7
	2021	*PHIUS ZERO*	701.1.7

PEFC – Pan European Forest Council | www.pefc.org

DOCUMENT	DATE	TITLE	SECTION
GL 2	2011	*PEFC Council Minimum Requirements Checklist*	606.2(d) & (g), 11.606.2(d) & (g)

RESNET – Residential Energy Services Network| www.resnet.us

DOCUMENT	DATE	TITLE	SECTION
ANSI/RESNET/ICC 380	2019 2022	*Standard for Testing Airtightness of Building, Dwelling Unit and Sleeping Unit Enclosures; Airtightness of Heating and Cooling Air Distribution Systems; and Airflow of Mechanical Ventilation Systems*	701.1.5, 902.1.3 902.2.2, 701.4.2.1(1) 701.4.3.2(1), 704.1, 705.6.2.1, 11.701.4.2.1(1) 11.701.4.3.2(1), 11.705.6.2.1, 11.902.1.3, 11.902.2.2, 1203.13, 1205.7.1

SAE – SAE International | https://www.sae.org

DOCUMENT	DATE	TITLE	SECTION
J1772_201001	2010	*Electric Vehicle and Plug in Hybrid Vehicle Conductive Charge Coupler*	505.6, 11.505.6

SCAQMD – South Coast Air Quality Management District | www.aqmd.gov

DOCUMENT	DATE	TITLE	SECTION
Rule 1168	2017	*Adhesive and Sealant Applications*	901.10(3), 11.901.10(3)

SRCC – Solar Rating and Certification Corporation | www.solar-rating.org

DOCUMENT	DATE	TITLE	SECTION
OG 300	2014	*Operating Guidelines and Minimum Standards for Certifying Solar Water Heating Systems*	703.5.5, 11.703.5.5

SFI – Sustainable Forestry Initiative, Inc. | www.sfiprogram.org

DOCUMENT	DATE	TITLE	SECTION
2015-2019 Standard	2015	*Sustainable Forestry Initiative Standard (SFIS)*	606.2(e), 11.606.2(e)

TCIA – Tree Care Industry Association | www.tcia.org

DOCUMENT	DATE	TITLE	SECTION
A300	2001	*Standards for Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices*	503.1(6), 11.503.1(6)

TCNA – Tile Council of North America | www.tileusa.com

DOCUMENT	DATE	TITLE	SECTION
A138.1	2011	*Green Squared: American National Standard Specifications for Sustainable Ceramic Tiles, Glass Tiles, and Tile Installation Materials*	612.2(7), 11.612.2(7)

UL – Underwriters Laboratories Inc. | www.ul.com

DOCUMENT	DATE	TITLE	SECTION
127	2020	*Factory-Built Fireplaces*	901.2.1(2), 11.901.2.1(2)
181	2013	*The Standard for Safety for Factory-Made Air Ducts and Air Connectors*	701.4.2.1, 11.701.4.2.1
1482	2022	*Solid-Fuel Type Room Heaters*	901.2.1(3), 11.901.2.1(3), 1205.2(3), 13.107.4.2(3)
2985	2015	*Sustainability Outline for Thermal Insulation*	612.2(3), 11.612.2(3)
391	2010	*Standard for Solid-Fuel and Combination Fuel Central and Supplementary Furnaces*	13.107.4.3
2523	2009	*Standard for Solid Fuel-Fired Hydronic Heating Appliances, Water Heaters, and Boilers*	13.107.4.3

USDA – U.S. Department of Agriculture | www.usda.gov

DOCUMENT	DATE	TITLE	SECTION
7 CFR Part 2902	2014	*Designation of Biobased Items for Federal Procurement; Final Rule*	606.1(h)

WSL – Washington State Legislature | www.leg.wa.gov

DOCUMENT	DATE	TITLE	SECTION
WAC 173-433-100(3)	2014	*Solid Fuel Burning Devices - Emission Performance Standards*	901.2.1(3), 11.901.2.1(3), 1205.2(3)

APPENDIX A:
CLIMATE ZONES

A100 SCOPE AND APPLICABILITY

A101.1 Applicability of Appendix A. Appendix A is part of this Standard. Text identified as "User Note" is not considered part of this Standard.

A101.2 Scope. The provisions contained in Appendix A provide the criteria necessary for complying with the climate-specific provisions of this Standard.

A200 CLIMATE ZONES

TABLE A200
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

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

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

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

ARKANSAS
3A Arkansas
3A Ashley
4A Baxter
4A Benton
4A Boone
3A Bradley
3A Calhoun

(continued)

TABLE A200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

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

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

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

CONNECTICUT
5A (all)

DELAWARE
4A (all)

DISTRICT OF COLUMBIA
4A (all)

FLORIDA
2A Alachua*
2A Baker*
2A Bay*
2A Bradford*
2A Brevard*
1A Broward*
2A Calhoun*
2A Charlotte*
2A Citrus*
2A Clay*
2A Collier*
2A Columbia*
2A DeSoto*
2A Dixie*
2A Duval*
2A Escambia*
2A Flagler*
2A Franklin*
2A Gadsden*
2A Gilchrist*
2A Glades*

(continued)

TABLE A200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

2A Gulf*
2A Hamilton*
2A Hardee*
2A Hendry*
2A Hernando*
2A Highlands*
2A Hillsborough*
2A Holmes*
2A Indian River*
2A Jackson*
2A Jefferson*
2A Lafayette*
2A Lake*
2A Lee*
2A Leon*
2A Levy*
2A Liberty*
2A Madison*
2A Manatee*
2A Marion*
2A Martin*
1A Miami-Dade*
1A Monroe*
2A Nassau*
2A Okaloosa*
2A Okeechobee*
2A Orange*
2A Osceola*
2A Palm Beach*
2A Pasco*
2A Pinellas*
2A Polk*
2A Putnam*
2A Santa Rosa*
2A Sarasota*
2A Seminole*
2A St. Johns*
2A St. Lucie*
2A Sumter*
2A Suwannee*
2A Taylor*
2A Union*
2A Volusia*
2A Wakulla*
2A Walton*
2A Washington*

GEORGIA

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

HAWAII

1A (all)*

IDAHO

5B Ada
6B Adams
6B Bannock
6B Bear Lake
5B Benewah
6B Bingham
6B Blaine
6B Boise
6B Bonner
6B Bonneville
6B Boundary
6B Butte
6B Camas

(continued)

TABLE A200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

5B Canyon
6B Caribou
5B Cassia
6B Clark
5B Clearwater
6B Custer
5B Elmore
6B Franklin
6B Fremont
5B Gem
5B Gooding
5B Idaho
6B Jefferson
5B Jerome
5B Kootenai
5B Latah
6B Lemhi
5B Lewis
5B Lincoln
6B Madison
5B Minidoka
5B Nez Perce
6B Oneida
5B Owyhee
5B Payette
5B Power
5B Shoshone
6B Teton
5B Twin Falls
6B Valley
5B Washington

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

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

(continued)

TABLE A200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

5A Wells
5A White
5A Whitley

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

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

KENTUCKY
4A (all)

LOUISIANA
2A Acadia*
2A Allen*
2A Ascension*
2A Assumption*
2A Avoyelles*
2A Beauregard*
3A Bienville*
3A Bossier*
3A Caddo*

(continued)

TABLE A200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

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

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

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

MASSACHUSETTS
5A (all)

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

MINNESOTA
7 Aitkin
6A Anoka
7 Becker
7 Beltrami
6A Benton
6A Big Stone
6A Blue Earth
6A Brown
7 Carlton
6A Carver
7 Cass
6A Chippewa
6A Chisago
7 Clay
7 Clearwater
7 Cook
6A Cottonwood
7 Crow Wing
6A Dakota
6A Dodge
6A Douglas
6A Faribault
6A Fillmore
6A Freeborn
6A Goodhue
7 Grant
6A Hennepin
6A Houston
7 Hubbard
6A Isanti
7 Itasca
6A Jackson
7 Kanabec
6A Kandiyohi

(continued)

TABLE A200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

7 Kittson
7 Koochiching
6A Lac qui Parle
7 Lake
7 Lake of the Woods
6A Le Sueur
6A Lincoln
6A Lyon
7 Mahnomen
7 Marshall
6A Martin
6A McLeod
6A Meeker
7 Mille Lacs
6A Morrison
6A Mower
6A Murray
6A Nicollet
6A Nobles
7 Norman
6A Olmsted
7 Otter Tail
7 Pennington
7 Pine
6A Pipestone
7 Polk
6A Pope
6A Ramsey
7 Red Lake
6A Redwood
6A Renville
6A Rice
6A Rock
7 Roseau
6A Scott
6A Sherburne
6A Sibley
6A Stearns
6A Steele
6A Stevens
7 St. Louis
6A Swift
6A Todd
6A Traverse
6A Wabasha
7 Wadena
6A Waseca
6A Washington
6A Watonwan
7 Wilkin
6A Winona
6A Wright
6A Yellow Medicine

MISSISSIPPI

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

MISSOURI

5A Adair
5A Andrew
5A Atchison
4A Audrain
4A Barry
4A Barton
4A Bates
4A Benton
4A Bollinger
4A Boone
5A Buchanan
4A Butler
5A Caldwell
4A Callaway
4A Camden
4A Cape Girardeau
4A Carroll
4A Carter
4A Cass
4A Cedar
5A Chariton
4A Christian
5A Clark
4A Clay
5A Clinton
4A Cole
4A Cooper
4A Crawford
4A Dade
4A Dallas
5A Daviess
5A DeKalb
4A Dent
4A Douglas
4A Dunklin
4A Franklin
4A Gasconade
5A Gentry
4A Greene
5A Grundy
5A Harrison
4A Henry
4A Hickory
5A Holt
4A Howard
4A Howell
4A Iron
4A Jackson
4A Jasper
4A Jefferson
4A Johnson
5A Knox
4A Laclede
4A Lafayette
4A Lawrence
5A Lewis
4A Lincoln
5A Linn
5A Livingston
5A Macon
4A Madison
4A Maries
5A Marion
4A McDonald
5A Mercer
4A Miller
4A Mississippi
4A Moniteau
4A Monroe
4A Montgomery
4A Morgan
4A New Madrid
4A Newton
5A Nodaway
4A Oregon
4A Osage
4A Ozark
4A Pemiscot
4A Perry
4A Pettis
4A Phelps
5A Pike
4A Platte
4A Polk
4A Pulaski
5A Putnam

(continued)

TABLE A200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

5A Ralls
4A Randolph
4A Ray
4A Reynolds
4A Ripley
4A Saline
5A Schuyler
5A Scotland
4A Scott
4A Shannon
5A Shelby
4A St. Charles
4A St. Clair
4A Ste. Genevieve
4A St. Francois
4A St. Louis
4A St. Louis (city)
4A Stoddard
4A Stone
5A Sullivan
4A Taney
4A Texas
4A Vernon
4A Warren
4A Washington
4A Wayne
4A Webster
5A Worth
4A Wright

MONTANA
6B (all)

NEBRASKA
5A (all)

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

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

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

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

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

NORTH CAROLINA
4A Alamance
4A Alexander
5A Alleghany
3A Anson
5A Ashe
5A Avery
3A Beaufort
4A Bertie
3A Bladen
3A Brunswick*
4A Buncombe
4A Burke
3A Cabarrus
4A Caldwell
3A Camden
3A Carteret*
4A Caswell
4A Catawba
4A Chatham
4A Cherokee
3A Chowan
4A Clay
4A Cleveland
3A Columbus*
3A Craven
3A Cumberland
3A Currituck
3A Dare
3A Davidson
4A Davie
3A Duplin
4A Durham
3A Edgecombe
4A Forsyth

(continued)

TABLE A200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

4A Franklin
3A Gaston
4A Gates
4A Graham
4A Granville
3A Greene
4A Guilford
4A Halifax
4A Harnett
4A Haywood
4A Henderson
4A Hertford
3A Hoke
3A Hyde
4A Iredell
4A Jackson
3A Johnston
3A Jones
4A Lee
3A Lenoir
4A Lincoln
4A Macon
4A Madison
3A Martin
4A McDowell
3A Mecklenburg
5A Mitchell
3A Montgomery
3A Moore
4A Nash
3A New Hanover*
4A Northampton
3A Onslow*
4A Orange
3A Pamlico
3A Pasquotank
3A Pender*
3A Perquimans
4A Person
3A Pitt
4A Polk
3A Randolph
3A Richmond
3A Robeson
4A Rockingham
3A Rowan
4A Rutherford
3A Sampson
3A Scotland
3A Stanly
4A Stokes
4A Surry
4A Swain
4A Transylvania
3A Tyrrell
3A Union
4A Vance
4A Wake
4A Warren
3A Washington
5A Watauga
3A Wayne
4A Wilkes
3A Wilson
4A Yadkin
5A Yancey

NORTH DAKOTA

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

OHIO

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

OKLAHOMA

3A Adair
3A Alfalfa
3A Atoka
4B Beaver
3A Beckham
3A Blaine
3A Bryan
3A Caddo
3A Canadian
3A Carter
3A Cherokee
3A Choctaw

(continued)

TABLE A200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

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

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

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

RHODE ISLAND
5A (all)

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

(continued)

TABLE A200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

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

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

TEXAS
2A Anderson*
3B Andrews
2A Angelina*
2A Aransas*
3A Archer
4B Armstrong
2A Atascosa*
2A Austin*
4B Bailey
2B Bandera
2A Bastrop*
3B Baylor
2A Bee*
2A Bell*
2A Bexar*
3A Blanco*
3B Borden
2A Bosque*
3A Bowie*
2A Brazoria*
2A Brazos*
3B Brewster
4B Briscoe
2A Brooks*
3A Brown*
2A Burleson*
3A Burnet*
2A Caldwell*
2A Calhoun*
3B Callahan
2A Cameron*
3A Camp*
4B Carson
3A Cass*
4B Castro
2A Chambers*
2A Cherokee*
3B Childress
3A Clay
4B Cochran
3B Coke
3B Coleman
3A Collin*
3B Collingsworth
2A Colorado*
2A Comal*
3A Comanche*
3B Concho
3A Cooke
2A Coryell*
3B Cottle
3B Crane
3B Crockett
3B Crosby
3B Culberson
4B Dallam
3A Dallas*
3B Dawson
4B Deaf Smith

(continued)

TABLE A200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

3A Delta
3A Denton*
2A DeWitt*
3B Dickens
2B Dimmit
4B Donley
2A Duval*
3A Eastland
3B Ector
2B Edwards
3A Ellis*
3B El Paso
3A Erath*
2A Falls*
3A Fannin
2A Fayette*
3B Fisher
4B Floyd
3B Foard
2A Fort Bend*
3A Franklin*
2A Freestone*
2B Frio
3B Gaines
2A Galveston*
3B Garza
3A Gillespie*
3B Glasscock
2A Goliad*
2A Gonzales*
4B Gray
3A Grayson
3A Gregg*
2A Grimes*
2A Guadalupe*
4B Hale
3B Hall
3A Hamilton*
4B Hansford
3B Hardeman
2A Hardin*
2A Harris*
3A Harrison*
4B Hartley
3B Haskell
2A Hays*
3B Hemphill
3A Henderson*
2A Hidalgo*
2A Hill*
4B Hockley
3A Hood*
3A Hopkins*
2A Houston*
3B Howard
3B Hudspeth
3A Hunt*
4B Hutchinson
3B Irion
3A Jack
2A Jackson*
2A Jasper*
3B Jeff Davis
2A Jefferson*
2A Jim Hogg*
2A Jim Wells*
3A Johnson*
3B Jones
2A Karnes*
3A Kaufman*
3A Kendall*
2A Kenedy*
3B Kent
3B Kerr
3B Kimble
3B King
2B Kinney
2A Kleberg*
3B Knox
3A Lamar*
4B Lamb
3A Lampasas*
2B La Salle
2A Lavaca*
2A Lee*
2A Leon*
2A Liberty*
2A Limestone*
4B Lipscomb
2A Live Oak*
3A Llano*
3B Loving
3B Lubbock
3B Lynn
2A Madison*
3A Marion*
3B Martin
3B Mason
2A Matagorda*
2B Maverick
3B McCulloch
2A McLennan*
2A McMullen*
2B Medina
3B Menard
3B Midland
2A Milam*
3A Mills*
3B Mitchell
3A Montague
2A Montgomery*
4B Moore
3A Morris*
3B Motley
3A Nacogdoches*
3A Navarro*
2A Newton*
3B Nolan
2A Nueces*
4B Ochiltree
4B Oldham
2A Orange*
3A Palo Pinto*
3A Panola*
3A Parker*
4B Parmer
3B Pecos
2A Polk*
4B Potter
3B Presidio
3A Rains*
4B Randall
3B Reagan
2B Real
3A Red River*
3B Reeves
2A Refugio*
4B Roberts
2A Robertson*
3A Rockwall*
3B Runnels
3A Rusk*
3A Sabine*
3A San Augustine*
2A San Jacinto*
2A San Patricio*
3A San Saba*
3B Schleicher
3B Scurry
3B Shackelford
3A Shelby*
4B Sherman
3A Smith*
3A Somervell*
2A Starr*
3A Stephens
3B Sterling
3B Stonewall
3B Sutton
4B Swisher
3A Tarrant*
3B Taylor
3B Terrell
3B Terry
3B Throckmorton
3A Titus*
3B Tom Green
2A Travis*
2A Trinity*
2A Tyler*
3A Upshur*
3B Upton
2B Uvalde
2B Val Verde
3A Van Zandt*
2A Victoria*
2A Walker*
2A Waller*
3B Ward
2A Washington*
2B Webb
2A Wharton*
3B Wheeler
3A Wichita
3B Wilbarger
2A Willacy*
2A Williamson*
2A Wilson*
3B Winkler
3A Wise
3A Wood*
4B Yoakum
3A Young
2B Zapata
2B Zavala

UTAH

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

(continued)

TABLE A200 – Continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm-humid location.

5B Weber

VERMONT
6A (all)

VIRGINIA
4A (all)

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

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

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

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

U.S. TERRITORIES

AMERICAN SAMOA
1A (all)*

GUAM
1A (all)*

NORTHERN MARIANA ISLANDS
1A (all)*

PUERTO RICO
1A (all)*

VIRGIN ISLANDS
1A (all)*

A201.1 Tropical climate zone. The tropical climate zone shall be defined as:

(1) Hawaii, Puerto Rico, Guam, American Samoa, U.S. Virgin Islands, Commonwealth of Northern Mariana Islands; and

(2) Islands in the area between the Tropic of Cancer and the Tropic of Capricorn.

A300 INTERNATIONAL CLIMATE ZONES

A301 International climate zones. The climate *zone* for any location outside the United States shall be determined by applying Table C301(1) and then Table C301(2).

TABLE A301(1)
INTERNATIONAL CLIMATE ZONE DEFINITIONS

MAJOR CLIMATE TYPE DEFINITIONS
Marine (C) Definition – Locations complying with 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 complying with the following criteria: Not marine and P_{in} <0.44 × (*TF* - 19.5) [P_{cm}<2.0 × (*TC* + 7) in SI units] where: P_{in} = Annual precipitation in inches (cm) T = Annual mean temperature in °F (°C)
Moist (A) Definition – Locations that are not marine and not dry.
Warm-humid Definition – Moist (A) locations where either of the following wet-bulb temperature conditions shall occur during the warmest six consecutive months of the year: 1. 67°F (19.4°C) or higher for 3,000 or more hours; or 2. 73°F (22.8°C) or higher for 1,500 or more hours

For SI: °C = [(°F)-32]/1.8; 1 in. = 2.54 cm.

TABLE A301(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 B:
EXAMPLES OF THIRD-PARTY PROGRAMS AND ACCREDITATION

B100 SCOPE AND APPLICABILITY

B101.1 Applicability of Appendix B. Appendix B is not part of this Standard.

B101.2 Scope. Appendix B provides examples of third-party programs and accreditation not explicitly identified quality that could be used to demonstrate compliance with the applicable provisions of this Standard.

B200 CONFORMANCE

TABLE B200(1)
Examples of Third-party Certification Programs and Accreditations

Related Section of Standard	Examples of Third-party Certification Programs Compliant with the Corresponding Section
403.1 (3) Natural resources	USDA Natural Resource Conservation Service (NRCS) Conservation programs
404.4 (4) Wildlife habitat	Wildlife Conservation Land Program (WCLP)
	USDA Wildlife Habitat Management Programs
503.6 (2)/11.503.6 (2) Wildlife habitat	Garden for Wildlife, National Wildlife Federation (NWR) Wild Acres, MD Department of Natural Resources
602.1.7.2/11.602.1.7.2 Moisture control measures	Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program
	UL GREENGUARD Gold
	Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program
602.1.15/11.602.1.15 Kitchen and vanity cabinets	Kitchen Cabinet Manufacturers Association (KCMA) Environmental Stewardship Program (ESP)
602.2 (3)/11.602.2 (3) Roof surfaces	Cool Roof Rating Council (CRRC)
606.1 Biobased products (g/h) 11.606.1 Biobased products (g/h)	Forest Stewardship Council (FSC)
	United States Department of Agriculture (USDA) Biopreferred
606.2/11.606.2 Wood-based products	Forest Stewardship Council (FSC)
612.2/11.612.2 Sustainable products	Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program
	UL GREENGUARD Gold
	Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program
802.6.2/11.802.6.2 Irrigation systems	UL SPLASH Field Sample Sprinkler Testing
901.5 Cabinets	Kitchen Cabinet Manufacturers Association (KCMA) Environmental Stewardship Program (ESP)
901.6 Cabinets 11.901.6 Cabinets	Kitchen Cabinet Manufacturers Association (KCMA) Environmental Stewardship Program (ESP)

	EC118 - The ICC-ES Environmental Criteria for Safe and Sustainable Cabinetry (SASC)
901.8 (1) Hard-surface flooring 11.901.8 (1) Hard-surface flooring	UL GREENGUARD Gold Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program
	Carpet and Rug Institue's (CRI) Label Plus Indoor Air Quality Program
901.8 (2) Carpet and carpet cushion 11.901.8 (2) Carpet and carpet cushion	Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program
901.9 Wall coverings 11.901.9 Wall coverings	UL GREENGUARD Gold
	Scientific Certification Systems (SCS) Indoor Advantage Gold Program
901.10 Interior architectural coatings 11.901.10 Interior architectural coatings	UL GREENGUARD Gold
	Scientific Certification Systems (SCS) Indoor Advantage Gold Program
	UL 2768
901.11 Interior adhesives and sealants 11.901.11 Interior adhesives and sealants	UL GREENGUARD
	Scientific Certifications Systems (SCS) Indoor Advantage Gold Program
	Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program
	Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program
901.12 Insulation 11.901.12 Insulation	UL GREENGUARD Gold Scientific Certifications Systems (SCS) Indoor Advantage Gold Program
901.13 Furniture and furnishings 11.901.13 Furniture and furnishings	UL GREENGUARD Gold Scientific Certifications Systems (SCS) Indoor Advantage Gold Program BIFMA level certification where 7.6.1 and 7.6.2 are proven to be achieved

TABLE B200(2)
Contact Information for the Example Third-party Certification Programs

Third-party Certification Program	Contact Information for the Program Administrator
Kitchen Cabinet Manufacturers Association (KCMA) Environmental Stewardship Program (ESP)	*Kitchen Cabinet Manufacturers Association* *1899 Preston White Drive* *Reston, VA 20191* *www.kcma.org* *(703) 264-1690*
Carpet and Rug Institute's (CRI) Green Label Plus Indoor Air Quality Program	*Carpet and Rug Institute* *730 College Drive* *Dalton, Georgia 30720* *United States of America* *http://www.carpet-rug.org* *(706) 278-3176*
UL GREENGUARD Gold	*Underwriters Laboratories Inc. 333 Pfingsten Road* *Northbrook, IL 60062-2096* *www.ul.com* *(877) 854-3577*
Resilient Floor Covering Institute's FloorScore Indoor Air Certification Program	*Resilient Floor Covering Institute* *115 Broad Street, Suite 201* *LaGrange, Georgia 30240* *http://www.rfci.com*
Scientific Certification Systems (SCS) Indoor Advantage Gold Program	*Scientific Certification Systems* *2000 Powell Street, Suite 600* *Emeryville, California 94608* *http://www.scscertified.com* *(510) 452-8000*
Green Seal-11 Standard for Paints and Coatings	*Green Seal* *1001 Connecticut Avenue, NW, Suite 827* *Washington, DC 20036-5525* *http://www.greenseal.org/* *(202) 872-6400*
UL 2768	*Underwriters Laboratories Inc.* *333 Pfingsten Road* *Northbrook, IL 60062-2096* *www.ul.com* *(877) 854-3577*
UL SPLASH Field Sample Sprinkler Testing	*Underwriters Laboratories Inc. 333 Pfingsten Road* *Northbrook, IL 60062-2096* *www.ul.com* *(877) 854-3577*
USDA Natural Resource Conservation Service (NRCS) Conservation programs	*United Stated Department of Agricultre 1400 Independence Ave SW, Washington, DC 20250* *https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/* *(202) 720-7246*

USDA Wildlife Habitat Management Programs	*United Stated Department of Agricultre 1400 Independence Ave SW, Washington, DC 20250* *https://www.usda.gov/topics/conservation/wildlife* *(202) 720-7246*
Garden for Wildlife, National Wildlife Federation (NWR)	*National Wildlife Federation* *Mid-Atlantic Regional Center* *20 Ridgely Avenue, Suite 203* *Annapolis, MD 21401* *http://www.nwf.org/Mid-Atlantic/MidAtlantic@nwf.org* *(443)-759-3400*
Cool Roof Rating Council (CRRC)	*Cool Roof Rating Council* *2435 N. Lombard St.* *Portland, OR 97217* *https://coolroofs.org/programs/roof-rating-program* *(866) 465-2523*
Forest Stewardship Council (FSC)	*Forest Stewardship Council* *708 First Street North, Suite 235* *Minneapolis, MN 55401* *https://us.fsc.org/en-us/certification* *(612) 353 4511*

APPENDIX C:
ACCESSORY STRUCTURES

C100 SCOPE AND APPLICABILITY

C101.1 Applicability of Appendix C. Appendix C is part of this Standard. Text identified as "User Note" is not considered part of this Standard.

C101.2 Scope. The provisions contained in Appendix C provide the criteria necessary for complying with § 306 for accessory structures.

C201 CONFORMANCE

C201.1 Conformance. Accessory structures complying with all applicable requirements of Appendix C shall be designated as *conforming*. The *conforming* designation for the accessory structure is separate from the rating achieved by the residential buildings located on the same site or lot. Where residential buildings located on the same lot have not achieved a rating in accordance with this Standard, the accessory structures shall not be eligible for designation under this Appendix. Each accessory structure shall seek a separate designation of *conforming* based on the rules established by the Adopting Entity in accordance with § C202. The residential building shall not receive points for any practices implemented only for the accessory structure.

C202 CONFORMANCE CRITERIA

C202 Conformance Criteria. Accessory structures shall implement practices from Sections 5 through 11 or Section 13, as applicable, in accordance with Sections C202.1 through C202.7. Where applying Section 13 criteria, total accessory structure area shall be equal to or less than 50% of the gross floor area of the entire project.

C202.1 The practices that are mandatory for the residential building shall also be mandatory for the accessory structure unless these practices are exempt under Sections C202.5 or C202.7.

C202.2 All land development practices associated with construction of the accessory structure shall comply with the land development practices for the residential building located on the same lot.

C202.3 For the accessory structures that use the same basic construction and mechanical systems as the residential buildings, the design and construction of the accessory structures shall comply with the practices, or the intent of the practices, implemented to achieve compliance for the residential building located on the same site or lot.

C202.4 For the accessory structures that use basic construction or mechanical systems that are different from the residential buildings, the design and construction of the accessory structures shall comply with the intent of the practice implemented to achieve compliance for the residential building located on the same site or lot.

C202.5 Where the residential buildings located on the same site or lot include construction methods or systems that do not have functionally-equivalent methods or systems as part of the accessory structure, the accessory structure does not need to comply with any of the practices implemented for the residential building with regard to such construction methods or systems.

User note: Examples of the practices that may be exempt from implementation in accessory structures include, but are not limited to:

1) *Section 601.1 Conditioned floor area.*

2) *Section 601.5 Prefabricated components – accessory structure is not required to be modular if the residential building is modular.*

3) *Section 601.6 Stacked stories – accessory structures are not required to have more than one story if the residential building is more than one story.*

4) *Section 602.2 Roof surfaces – where the residential building has a landscaped roof, the accessory structure is not required to have a landscaped roof.*

5) *Chapter 7 Energy efficiency – unconditioned spaces in the accessory structure are not required to comply with Chapter 7.*

6) *Section 902.3 Radon control except for habitable space.*

C202.6 Where the accessory structure includes construction methods or systems that do not have functionally-equivalent counterparts as part of the residential buildings located on the same site or lot, the Adopting Entity shall review such construction methods and systems and shall establish an approach for complying with the overall intent of the Standard with regard to the minimum acceptable threshold.

C202.7 Where the use of the accessory structure does not necessitate the implementation of a specific practice in the same manner as the practice applies to the residential building, such practice for the accessory structure may be exempted by the Adopting Entity.

User note: Examples of the practices that may be exempted from implementation in accessory structures include, but are not limited to:

1) *Section 602.1.14 Ice barrier – if the accessory structure does not contain conditioned space, ice barrier is not required.*

APPENDIX D:
WATER RATING INDEX

D101.1 Intent. Provide a flexible method to quantify home water use efficiency as a single number.

D101.2 Scope. The Water Rating Index (WRI) is a performance calculation for water use efficiency, including both indoor and outdoor water use.

D101.3 Capabilities. The WRI calculation shall include the following capabilities

D101.3.1 The WRI addresses single-family homes, townhouses, multifamily buildings, and the residential portions of mixed-use buildings.

D101.3.2 Multifamily buildings are evaluated as a whole; WRI scores are not available for individual dwelling or sleeping units.:

D101.3.3 The WRI calculator cannot be used to evaluate the water use of commercial spaces.

D101.3.4 Building water use shall be reduced based on the water capture and reuse. Where a specific type of water capture and reuse would violate local laws or ordnances, the amount of water capture and reuse for that specific type shall be zero.

(1) The water types for capture and reuse shall be:

   (a) Rainwater, which is natural precipitation that falls on a structure.

   (b) Sitewater, which is natural precipitation that falls on the ground, softscapes, and hardscapes.

   (c) Greywater, which is untreated wastewater that has not come into contact with toilet waste, kitchen sink waste, dishwasher waste or similarly contaminated sources:

      (i) Only wastewater from bathtubs, showers, lavatories, and clothes washers shall be used in the greywater offset calculation.

      (ii) If no filtration/purification system and properly sized tank is present, then greywater shall only be used outdoors as subsurface irrigation.

(2) Water offset credit for rainwater, sitewater, and greywater use indoors shall require filtration, purification and properly sized tanks. Blackwater shall not offset indoor water.

D101.4 Process. The following shall be required as part of a WRI implementation:

D101.4.1 Trained WRI Verifiers shall provide field verifications, ratings and the associated reports.

D101.4.2 At minimum training shall include:

(1) Confirmation of contract documents including building drawings, site drawings, landscape drawings, specifications, cut sheets, and approved final submittals.

(2) Visual confirmation of installed site material, fixtures, and equipment.

(3) Physical field testing of installed fixtures and equipment.

(4) Ability to utilize a tool that incorporates this WRI calculation.

D101.5 Overall Water Rating Index (WRI) Calculation. The WRI is an overall rating for the home on an annual basis. The WRI shall be computed as a percentage of the combined indoor and outdoor water use in relation to the combined indoor and outdoor water baseline.

WRI = 100 * (IndoorUseUnits + IndoorUseCommon + OutdoorUse) /
(IndoorBaseline + IndoorBaselineCommon + OutdoorBaseline)

This Appendix species which parameters input to the WRI shall be verified from plans and/or field inspection. Variables with the subscript "verified" shall be verified.

D101.6 Indoor Water for Units.

D101.6.1 Indoor water calculations for annual Baseline and annual Use shall be as follows:

IndoorBaseline = [$\text{ToiletWater}_{(\text{baseline})}$ + $\text{ShowerWater}_{(\text{baseline})}$ + $\text{BathtubWater}_{(\text{baseline})}$ + $\text{LavatoryWater}_{(\text{baseline})}$ + $\text{FaucetWater}_{(\text{baseline})}$ + $\text{DishWasherWater}_{(\text{baseline})}$ + $\text{ClothesWasherWater}_{(\text{baseline})}$ + $\text{StructuralWasteWater}_{(\text{baseline})}$ + $\text{OtherWaterUse}_{(\text{baseline})}$] * 365 days/year

IndoorUse = [$\text{ToiletWater}_{(\text{verified})}$ + $\text{ShowerWater}_{(\text{verified})}$ + $\text{BathtubWater}_{(\text{verified})}$ + $\text{LavatoryWater}_{(\text{verified})}$ + $\text{FaucetWater}_{(\text{verified})}$ + $\text{DishWasherWater}_{(\text{verified})}$ + $\text{ClothesWasherWater}_{(\text{verified})}$ + $\text{StructuralWasteWater}_{(\text{verified})}$ + $\text{OtherWaterUse}_{(\text{verified})}$ - $\text{IndoorWaterReuseCredit}_{(\text{verified})}$] * 365 days/year

D101.6.2 NumOccupants = bedrooms + 1

(1) For multifamily, user should enter the total number of 0/1-bedroom, 2-bedroom, 3-bedroom, and 4-bedroom units. The Number of Occupants should be calculated based on those inputs.

(2) For group living, users should enter a bedroom value based on the total expected number of occupants to per unit. For example, a 2-bedroom unit planned to house 4 individuals would be entered as a 3-bedrooom unit.

(3) In case of places like dormitories, student housing or places that don't have a defined bedroom, the number of occupants can be calculated based on the number of expected occupants. For such places, we can project the expected number of occupants using previous data.

D101.6.3 Baseline water for each device in Table D101.6.3 shall be:

(1) $\text{Baseline}_{(\text{device})}$ = $\text{VolumePerOccupant}_{(\text{device})}$ * NumOccupants

(2) For dishwasher and clothes washer, where it is verified that there is no hookup $\text{Baseline}_{(\text{device})}$ = 0

TABLE D101.6.3
WATER USE FOR BASELINE AND VERIFIED DEVICES

Device	Baseline Volume Per Occupant gallons / day / occupant	Uses for Verified Devices and units
Toilet	8	5 uses / day / occupant
Shower	13.455	5.382 or 4.7035 with TSVs minutes / day / occupant at device flow rate
Bathtub	1.414	same as the baseline gallons / day / occupant
Lavatory	2.75	1.25 minutes / day / occupant at device flow rate
Faucet	8.8	4 minutes / day / occupant at device flow rate
Dishwasher	1.3	(0.26 uses / day / occupant) * GPC
Clothes Washer	20.28	(0.78 uses / day / occupant) * IWF * CF

D101.6.4 Verified use for each device in Table D101.6.3 shall be:

(1) Verified $_{(device)}$ = VerifiedFlowRate $_{(device)}$ * UseFactor * NumOccupants

(2) A thermostatic control value (TSV) on all showerheads shall be verified, otherwise the shower shall assume no TSV for all showerheads

(3) For bathtub, dishwasher and clothes washer, if it is verified that there is no hookup
Verified $_{(device)}$ = 0

D101.6.5 Structural waste, which is the water volume in the pipe between the hot water source and the plumbing fixture or appliance plus the extra volume needed to heat the pipe as hot water is delivered to its use.

(1) VerifiedStructuralWaste (gallons), shall be field measured as the water volume collected until the temperature of the water equals 100°F at the furthest fixture for a domestic hot water system.

(a) This test shall be performed before any other tests in order to avoid preheating the pipes. This test shall use an apparatus with a thermometer and water container.

(b) If there is more than one domestic hot water system, all systems shall be tested for structural waste with the worst performing system entered into the calculation.

(2) BaselineStructuralWaste (gallons/day) is approximated based on the house size and configuration. The pipe length is estimated as a horizontal length plus a vertical length.

(a) EstimatedHorizontalPipe = SQRT(HouseFootprint) * 2
which is the pipe length estimated as the distance between two opposite corners of square with same area as house, assuming the pipe went along the length and width of the square.

(b) EstimatedVerticalPipe = NumberOfFloors * FloorHeight

(c) EstimatedTotalPipe = EstimatedHorizontalPipe + EstimatedVerticalPipe

(d) BaselineStructuralWaste = EstimatedTotalPipe * WaterVolumePerPipeLength

Variables

(i) HouseFootprint - sf of the exterior conditioned space on the ground floor

Exception: the attached garage's sf shall be included if a water heater is located in the garage

(ii) FloorToFloorHeight, average floor to floor height (ft) WaterVolumePerPipeLength is gallons per ft pipe from Table D101.6.5, based on the predominate type of pipe. For existing homes, the value of 0.025 shall be used when the predominant type of pipe is not known

TABLE D101.6.5
GALLONS OF WATER PER FOOT OF PIPE

Pipe Material	3/8"	1/2"	3/4"	1"
K (fat wall copper)	0.007	0.011	0.023	0.040
L (medium wall copper)	0.008	0.012	0.025	0.043
M (skinny wall copper)	0.008	0.013	0.027	0.045
CPVC	N/A	0.010	0.021	0.035
PEX	0.005	0.009	0.019	0.031

(3) PreliminaryStructuralWaste (gallons) is the estimated structural waste volume for a building when there is no built construction to verify but a preliminary estimate is necessary to create a comparison to the baseline. This estimate shall be the same as BaselineStructuralWaste, except that the EstimatetedHorizonatalPipe shall be replaced with the PreliminaryHorizontalPipe computed as:

PreliminaryHorizontalPipe = horizontal measurement of the straight-line distance from the water heater to the furthest hot-water-using fixture on the plans

D101.6.6 Other types of water use. OtherWaterUse (gallons/day) - other water fixture use for fixtures verified to be present

(1) The baseline is zero, when device is not present

(2) OtherWaterUse sums the water use for fixtures that are present

(3) OtherWaterUse includes:

(a) Water use per manufacturer (gallons/day)

(i) Water softeners

(ii) Humidifiers

(iii) Evaporative coolers

(iv) Water filters, except reverse osmosis

(b) Reverse osmosis water use shall be as specified by the manufacturer or shall default to a water waste of 4 times the water consumption

(c) Fountains and spas – water loss (gallons/day) = (annual pan evaporation rate * area) / 365

Pan Evaporation Rate: value derived by dividing the volume of liquid that evaporated from the amount of time that it took to evaporate.

(d) Verify leaks are not present.

(e) Where there are multiple fixtures or appliances of the same type, the baseline fixtures and appliances shall be assumed to all be of the same type, flow rate and water use rate.

D101.6.7 Master bath adjustment: adjustment of indoor water use based on expected use of a separate master bathroom. This item shall apply where there is a master bath. where the flow rate of the individual toilet, lavatory, or shower devices varies, then water use in the master bath and outside the master bath shall be computed separately.

(1) For each device type, average the device-type flow rates. Compute two separate device-type-averages, one average for the master bath and one average for outside the master bath.

(2) Device-type uses are divided as follows:

(a) For each device the total number of uses shall be as given in Table D101.6.3, with the uses divided between the master bath and outside the master bath.

(b) For master bath toilets and lavatories assume 2 uses each for 2 occupants, for a total of 4 uses per day. For master bath showers assume 1 use each for 2 occupants for a total of 2 uses per day.

(c) Assume the remaining uses in Table D101.6.3 are outside the master bath.

(3) For both the master bath and outside the master bath compute water use as the device-type average times the number of uses.

(4) Add the device water use to ToiletWater, LavatoryWater, and ShowerWater, as appropriate, in the IndoorUse equation in § D106.1.

D101.6.8 Other appliances. For other appliances: If there is more than one of a specific type of appliance, then the worst-case appliance water use shall be used in the ApplianceFlowRate $_{(device)}$.

Defaults - where cut sheets or internet information is available for either dishwashers or clothes washers, that information shall supersede these defaults.

TABLE D101.6.8
DEFAULTS FOR CLOTHES WASHERS AND DISHWASHERS

Clothes Washer	6.5 IWF, 4 CF (ft^2)
Dishwasher	5 gallon/cycle

D101.7 Indoor Water of Common Areas – Calculation.

D101.7.1 Indoor water calculations for annual Baseline and annual Use shall be as follows:

IndoorBaseline = [$ToiletWater_{(baseline)}$ + $UrinalWater_{(baseline)}$ + $ShowerWater_{(baseline)}$ + $LavatoryWater_{(baseline)}$ + $FaucetWater_{(baseline)}$ + $DishWasherWater_{(baseline)}$ + $ClothesWasherWater_{(baseline)}$ + $StructuralWasteWater_{(baseline)}$ + $OtherWaterUse_{(baseline)}$] * 365 days/year

IndoorUse = [$ToiletWater_{(verified)}$ + $UrinalWater_{(verified)}$ + $ShowerWater_{(verified)}$ + $LavatoryWater_{(verified)}$ + $FaucetWater_{(verified)}$ + $DishWasherWater_{(verified)}$ + $ClothesWasherWater_{(verified)}$ + $StructuralWasteWater_{(verified)}$ + $OtherWaterUse_{(verified)}$] - $IndoorWaterReuseCredit_{(verified)}$ * 365 days/year

D101.7.2 Baseline water use for common area devices.

Baseline $_{(device)}$ = Planned Maximum Capacity for Amenity Area(s) x Use Factor x Baseline Water Volume Per Use
Use factors for water devices are as follows:

TABLE D101.7.2
BASELINE WATER USES & VOLUME FOR COMMON AREA DEVICES

Device	Baseline VolumePerUser (gallons/day/user)	Use Factor(s)

Toilet	3.2	2 uses / day / user
Urinal	1.6	1 use / day / user
Shower	9.01	5.3 minutes / day / user
Lavatory	4	4 minutes / day / user
Faucet	6.8	4 minutes / day / user
Dishwasher	0.45	0.1 loads / day / user
Clothes Washer (residential style)	22.3	0.37 loads / day / user
Clothes Washer (commercial style)	3.256 per cubic foot for Top Loading / 1.517 per CF for Front-Loading (Integrated Water Factors of 8.8 for Top-Loading and 4.1 for Front-Loading)	0.37 loads / day / user

D101.7.3 Verified water use for common area devices.

D101.7.3.1 Verified use for each device in Table D101.7.2 shall be:

$Verified_{(device)}$ = Planned Capacity for Amenity Area(s) x Use Factor x VerifiedFlowRate

D101.7.4 Structural waste in common areas (verified).

D101.7.4.1 Structural waste, which is the water volume in the pipe between the hot water source and the plumbing fixture or appliance plus the extra volume needed to heat the pipe as hot water is delivered to its use.

(1) VerifiedStructuralWaste (gallons), shall be field measured as the water volume collected until the temperature of the water equals 100°F at the furthest fixture for a domestic hot water system.

(a) This test shall be performed before any other tests in order to avoid preheating the pipes. This test shall use an apparatus with a thermometer and water container.

(b) If there is more than one hot water system serving multifamily amenity areas, all systems shall be tested for structural waste with the worst performing system entered into the calculation.

D101.7.5 Structural waste in common areas (baseline).

D101.7.5.1 BaselineStructuralWaste (gallons/day) is approximated based on the amenity area size and configuration. The pipe length is estimated as a horizontal length plus a vertical length.
For Common Areas, the calculation is as follows:

(1) Baseline Structural Waste = Estimated Total Pipe x Pipe Volume (see Table D101.6.5).

Estimated Total Pipe is the sum of Estimated Horizontal Pipe and Estimated Vertical Pipe

(a) Estimated Horizontal Pipe = Total Footprint of All Amenity Areas x 2.

(c) Estimated Vertical Pipe = Floor Height of Amenity Areas.

D101.8 Water Capture for Potential Reuse. This calculates the water available for reuse for each month.

D101.8.1 RainwaterCapture and GreywaterCapture shall be computed for each month.
For multifamily buildings with common areas, capture water is applied toward in-unit water use first, then to common area uses. Structural waste can be offset as well, when the user identifies that all water is from captured water sources.

TABLE D101.8.1
CAPTURED WATER APPLICATIONS

CAPTURE TYPE	USES
Rainwater	Toilet

	Urinal Shower Bathtub Lavatory Faucet Dishwasher Clothes Washer Pools/Spas Irrigation Other Uses as approved by the Authority Having Jurisdiction (AHJ)
Greywater	Toilet Urinal Irrigation Other Uses as approved by the Authority Having Jurisdiction (AHJ)

(1) RainwaterCapture$_{(month)}$ - gallons/month, includes roofwater and sitewater.

= [(RoofwaterArea * RoofSurfaceCapture) + (SitewaterArea * SiteSurfaceCapture)] * 0.623 (gallons/sq ft of 1 in of rain) * DaysInMonth$_{(month)}$

(a) RainwaterArea$_{(roof)}$ and RainwaterArea$_{(site)}$ – Verified Rainwater capture areas for the roof and site in sq ft Where there is no rainwater capture, these areas shall be zero

(b) SiteSufaceCapture – Site surface affects water capture as specified in Table D101.8.1(1)(b). Site surface shall be verified. Where there are multiple site surface types, the area-weighted average shall be used.

TABLE D101.8.1(1)(b)
SITE SURFACE FRACTION CAPTURED

Surface	Capture
Asphalt	0.83
Concrete	0.88
Brick	0.78
Patios, stone, or other pavers	0.88
Unknown (also default)	0.50

(c) RoofSurfaceCapture – Roof surface affects water capture as specified in Table D101.8.1(1)(c). Roof surface shall be verified. Where there are multiple roof surface types, the area-weighted average shall be used.

TABLE D101.8.1(1)(c)
ROOF SURFACE FRACTION CAPTURED

Surface	Capture
Asphalt/sloped	0.90
Concrete or Tile/sloped	0.90
Metal/sloped	0.95
Tar & Gravel/sloped	0.80
Membrane/sloped	0.90
Concrete or Tile/flat	0.81
Foam & Gravel/flat	0.62
Foam/flat	0.90
Membrane/flate	0.90
Uknown (also default)	0.50

(2) GreywaterCapture$_{(month)}$ - in gallons/month

= (ShowerWater$_{(verified)}$ + BathtubWater$_{(verified)}$ + LavatoryWater$_{(verified)}$ + ClothesWasherWater$_{(verified)}$) * DaysInMonth$_{(month)}$

(3) To get credit for reuse of captured rainwater and greywater:

(a) Tank size shall be 90% of nominal size to provide a safety factor.

(b) Capture systems shall include filtration and purification for reuse indoors or above ground irrigation.

(c) Capture water credit for each month shall be no more than the tank size or the captured water available – whichever is less.

(d) Any remaining unused captured water can be carried over to the following month but not in excess of the tank size.

(e) Reuse of rainwater and greywater shall not receive credit in violation of ordinances or other regulations.

D101.9 Outdoor Calculations. The annual outdoor water use shall be calculated as follows:

OutdoorUse = (LandscapeWaterUse + NonLandscapeWaterUse) ~~/ (Number of dwelling units)~~

OutdoorBaseline$_{(month)}$ = (Evapotranspiration$_{(month)}$ * LandscapeWaterArea$_{(total)}$ * 0.623 (gallons/sq ft of 1 in of rain)) ~~/ (Number of dwelling units)~~ where LandscapeWaterArea$_{(total)}$ is the total of all the areas that are planted, irrigated, hand-watered or have a water feature like a pool.

OutdoorBaseline: baseline outdoor water demand based on outdoor area and evapotranspiration rates.

Evapotranspiration: sum of evaporation from soil evaporation from the capillary fringe of the groundwater table, and evaporation from water bodies on land, as well as transpiration from plants.

D101.9.1 LandscapeWaterUse – Is the annual outdoor water use for landscaping. It sums the monthly water use for each landscape zone into the LandscapeWaterUse

(1) Water use shall be increased for an IrrigationEfficiency of less than 1, as specified in Table 8

(2) Water use shall be adjusted based on the irrigation controller, as some controllers conserve water by adjusting for weather or soil conditions

LandscapeWaterUse = For each month that is a water month and for each landscape zone sum

([Evapotranspiration$_{(month)}$ * PlantFractionEvapotranspiration$_{(zone)}$] - EffectiveRainfall$_{(month)}$) * LandscapeArea$_{(zone)}$ * ([1 - IrrigationControllerReduction)$_{(zone)}$] / IrrigationEfficiency$_{(zone)}$) * 0.623 (gallons/sq ft of 1 in of water)

Effective Rainfall: amount of precipitation added and stored in the soil.
EffectiveRainfall = 25% of total rainfall.

(3) Multiple physical zones with the same values for Evapotranspiration, IrrigationEfficiency and IrrigationControllerReduction shall be permitted to be combined into one zone with LandscapeArea being the sum of the areas of those zones

D101.9.2 Months shall be water-months as follows based on approved long-term climate data which includes frost days and average last frost

(1) Water Months = (Number of Non-Frost Days in a year / 30), rounded to the nearest whole month

(2) The month with the average last frost is the beginning of the watering months

D101.9.3 where an irrigation system is installed, the verifiers shall verify that the irrigation emitters and zones are operational

D101.9.4 Variables:

(1) LandscapeArea$_{(zone)}$ - verified landscape zone(s) with specific verified area

(2) Defaults – where the landscaping cannot be verified then the verifier shall use an automatic minimum of 10% of the LandscapeWaterArea$_{(total)}$. Where the plants cannot be verified, the verifier shall assume plants with the highest water requirements and no irrigation

(3) IrrigationEfficiency$_{(zone)}$ – The efficiency of a specific type of irrigation, a number between 0 and 1

TABLE D101.9.4(3)
IRRIGATION EFFICIENCY

Only hand irrigation	1
Drip	.9
Fixed spray (from below – ground emitters)	.65
Micro spray (at base of trees and shrubs)	.85
Rotor	.7
Spray	.55
Flood	.5
Direct injection/root	1

(4) IrrigationControllerReduction$_{(zone)}$ is irrigation water reduction based on a verified irrigation controller:

(a) An irrigation controller that integrates rain sensors shall be a 10% IrrigationControllerReduction

(b) A WaterSense labeled irrigation controller or equivalent, in efficiency and performance criteria to the EPA WaterSense Specification for Irrigation Controllers, shall be a 10% IrrigationControllerReduction

(c) Both i and ii, which shall be a 20% IrrigationControllerReduction

D101.9.5 Evapotranspiration(month) - Monthly evapotranspiration (ETo)

(1) Approved long-term evapotranspiration data with a least a monthly resolution shall be used to define monthly evapotranspiration rates for specific locations

(2) PlantFractionEvapotranspiration(zone) – which is from the highest water using plant in that zone

(3) For purposes of identifying plant water demand, an approved resource shall be used to identify plant type

TABLE D101.9.5
RELATIVE WATER USE BY PLANT TYPE

Plant Type	Plant Fraction of Evapotranspiration
Turf, cool season grasses adapted to temperatures from 65° to 75°F.	0.8
Turf, warm season grasses adapted to temperatures from 80° to 95°F	0.6
Annual flowers	0.8
Woody plants and herbaceous perennials, wet plants adapted to ≥20 in. of annual precipitation	0.7
Woody plants and herbaceous perennials, dry plants adapted to 10 to 20 in. of annual precipitation	0.5
Desert plants adapted to <10 in. of annual precipitation	0.3
Home food crops	1.0

D101.9.6 NonLandscapeWaterUse shall be the sum of outdoor exposed pools, spas, and fountains, if any

(1) The water requirement for outdoor uncovered pools, spas, or fountains is 70% of the evapotranspiration (ETo). The water demand is the same covered or uncovered.

Exception: Pools with motorized covers shall use 40% of the evapotranspiration.

(2) The baseline assumes uncovered pools, spas, or fountains only if present for the proposed.

NonLandscapeWaterUseBaseline = (Evapotranspiration(in)$_{(annual)}$ * Pool/Spa/Fountain Area (square feet) * 0.623 (gallons/sq ft of 1 in of water)

NonLandscapeWaterUseVerified = (Evapotranspiration(in)$_{(annual)}$ * CoverFactor) * Pool/Spa/Fountain Area (square feet) * 0.623 (gallons/sq ft of 1 in of water)

Where CoverFactor = 0.40 if an motorized pool cover is installed.

D101.10 Water Cost Calculations. Where water costs are calculated, the water cost shall be obtained from the authority having jurisdiction.

D101.10.1 All indoor and outdoor water use shall be included in the water cost calculation. This includes items for which there is no industry accepted baseline efficiency as specified in the Indoor Calculations section of this appendix.

APPENDIX D REFERENCES

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