2017

District of Columbia
Green Construction Code

GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

dcra

ICC INTERNATIONAL CODE COUNCIL®

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PREFACE

Background

The 2017 *District of Columbia Construction Codes,* effective May 29, 2020, consist of the following 12 codes:

- 2017 *District of Columbia Building Code* [2015 edition of the *International Building Code*® published by the International Code Council (ICC) as amended by the *District of Columbia Construction Codes Supplement of 2017* (DCMR 12A, Building Code Supplement)].[1]
- 2017 *District of Columbia Residential Code* [2015 edition of the *International Residential Code*® published by the ICC as amended by the *District of Columbia Construction Codes Supplement of 2017* (DCMR 12B, Residential Code Supplement)].
- 2017 *District of Columbia Electrical* [2014 edition of the *National Electrical Code* published by the National Fire Protection Association (NFPA) as amended by the *District of Columbia Construction Codes Supplement of 2017* (DCMR 12C, Electrical Code Supplement)].
- 2017 *District of Columbia Fuel Gas Code* [2015 edition of the *International Fuel Gas Code*® published by the ICC as amended by the *District of Columbia Construction Codes Supplement of 2017* (DCMR 12D, Fuel Gas Code Supplement)].
- 2017 *District of Columbia Mechanical Code* [2015 edition of the *International Mechanical Code*® published by the ICC as amended by the *District of Columbia Construction Codes Supplement of 2017* (DCMR 12E, Mechanical Code Supplement)].
- 2017 *District of Columbia Plumbing Code* [2015 edition of the *International Plumbing Code*® published by the ICC as amended by the *District of Columbia Construction Codes Supplement of 2017* (DCMR 12F, Plumbing Code Supplement)].
- 2017 *District of Columbia Property Maintenance Code* [2015 edition of the *International Property Maintenance Code*® published by the ICC as amended by the *District of Columbia Construction Codes Supplement of 2017* (DCMR 12G, Property Maintenance Code Supplement)].
- 2017 *District of Columbia Fire Code* [2015 edition of the *International Fire Code*® published by the ICC as amended by the *District of Columbia Construction Codes Supplement of 2017* (DCMR 12H, Fire Code Supplement)].
- 2017 *District of Columbia Energy Conservation Code* [2013 edition of the Energy Standard for Buildings Except Low-Rise Residential Buildings (ANSI/ASHRAE/IES 90.1-2013) published by ASHRAE (formerly known as the American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc.) and the 2015 edition of the *International Energy Conservation Code*®—Residential Provisions published by the ICC as amended by the *District of Columbia Construction Codes Supplement of 2017* (DCMR 12I, Energy Conservation Code Supplement)].
- 2017 *District of Columbia Existing Building Code* [2015 edition of the *International Existing Building Code*® published by the ICC as amended by the *District of Columbia Construction Codes Supplement of 2017* (DCMR 12J, Existing Building Code Supplement)].
- 2017 *District of Columbia Green Construction Code* [2012 edition of the *International Green Construction Code*® published by the ICC as amended by the *District of Columbia Construction Codes Supplement of 2017* (DCMR 12K, Green Construction Code Supplement)].
- 2017 *District of Columbia Swimming Pool and Spa Code* [2015 edition of the *International Swimming Pool and Spa Code*® published by the ICC as amended by the *District of Columbia Construction Codes Supplement of 2017,* 12 DCMR L, Swimming Pool and Spa Code Supplement)].

1. The District of Columbia Municipal Regulations (DCMR) is the official compilation of rules and regulations issued by government agencies and the Council and is available online at: http://dcregs.dc.gov/.

The ICC, ASHRAE and NFPA Codes have been extensively amended by the District of Columbia to address specific District of Columbia policies and statutes, and unique characteristics of the District of Columbia.

The ICC and NFPA Codes provide a comprehensive, coordinated set of building safety and fire codes that have been adopted by 50 states and the District of Columbia at the jurisdictional or state level. The ICC's consensus-based code development process involves a broad range of stakeholders, including construction industry representatives and code regulators, to ensure that the model codes incorporate the latest technical advancements, while addressing industry and regulatory concerns. The ICC Codes also provide helpful resources, such as interpretive commentary and history of amendments, which provide a basis for interpreting the *District of Columbia Construction Codes*.

In 1791, President George Washington issued the first building guidelines in Washington, DC. These guidelines largely emphasized aesthetics in order to ensure that new buildings complemented Pierre L'Enfant's plan for the city. By 1872, during a period of rapid change and expansion after the Civil War, the District of Columbia adopted the first comprehensive set of building regulations focusing on health and safety concerns. The 1872 regulations, introduced by the Congressionally established Board of Public Works, required building permits for the first time. Nineteenth century building regulation also included The Height of Buildings Act, enacted by Congress in 1899 to address safety concerns about the use of steel framing. The greater building heights achieved by steel-framed structures raised concerns about the city's ability to extinguish fires, and the possibility of structural collapse.

Consistent with the growing national trend towards nationally-recognized model building codes, in 1986 the District of Columbia adopted five of the 1984 codes published by the Building Officials Code Administrators (BOCA) International along with model codes published by the Council of American Building Officials and the National Fire Protection Association. In 1994, after BOCA combined with other model code groups to establish the ICC with a common goal of developing a single coordinated set of national model building codes, the District of Columbia began transitioning to the ICC's International Codes® (I-Codes®). Beginning in 1999 the District of Columbia adopted the 1996 *International Mechanical Code* and 1995 *International Plumbing Code*, and completed the transition to the I-Codes in 2003, when nine of the 2000 edition of the I-Codes were adopted.

Following the 2008 update of the *District of Columbia Construction Codes*, and in recognition of the need for a more robust, responsive and ongoing code development process in the District of Columbia, a new Construction Codes Coordinating Board (CCCB) was created by Mayoral Order in March 2009 to replace the Building Code Advisory Committee.[2] The members of the CCCB are appointed by the Mayor (except for one member appointed by the DC Council) and represent various stakeholders in the code development process, including architects, engineers, government regulators, representatives of the construction and housing industries and city residents. The CCCB is supported administratively by the District of Columbia Department of Consumer and Regulatory Affairs (DCRA) and has been delegated authority by the Mayor to issue rules to amend the Construction Codes and to adopt the model codes pursuant to procedures set forth in the DC Official Code, §6-1409.

In considering adoption of the ICC, ASHRAE and NFPA codes and reviewing local code change proposals, the CCCB considers relevant criteria and policies including:

- Minimum performance standards and requirements for construction and construction materials, consistent with nationally accepted standards of engineering, fire, and life safety.
- Unique District of Columbia characteristics, policies or statutes.
- The use of modern technical methods, devices and improvements.
- Elimination of restrictive, obsolete, conflicting, duplicative, and unnecessary regulations and requirements.
- Standards to make buildings and facilities accessible to and usable by physically disabled persons.

2. Mayor's Order 2009-22 (February 25, 2009), as amended by Mayor's Order 2012-32 (February 29, 2012).

Consideration of the 2012 I-Codes and the 2011 *National Electrical Code* began in October 2011 at the direction of Mayor Vincent C. Gray who tasked the CCCB with meeting Mayor Gray's stated goal of making the District of Columbia the healthiest, greenest and most livable city in the United States. By adopting the 2012 *International Green Construction Code* and the 2012 *International Energy Conservation Code* as mandatory codes applicable to public and private sector buildings, the District of Columbia has taken a national leadership role in establishing a regulatory framework for fostering green building practices.

Development of the next update to the DC Construction Codes began in 2015 with a review of the 2015 I-Codes, 2013 *ANSI/ASHRAE/IES 90.1-2013* and 2014 *National Electrical Code*. Initiated by Mayor Muriel Bowser, the CCCB was tasked with simplifying the codes for both project teams and enforcement staff, while continuing to advance the District's energy efficiency goals embodied in the Sustainable DC plan.

The Code Development Process

Although administered by DCRA, the code development process reached well beyond the agency's corridors. In addition to the Board members who met frequently, often weekly, over a four year period, more than 100 individuals, including architects, engineers, contractors, property managers, real estate developers and government regulators, contributed countless hours attending technical advisory group meetings, as they pored over the model codes and developed code change amendments to reflect and incorporate local District of Columbia policies and concerns.

This process resulted in more than 500 code change proposals, incorporated into the 2017 *District of Columbia Construction Codes Supplement*. Two rounds of public comment were sought through a rulemaking process, consisting of a Notice of Proposed Rulemaking (65 DCR 40-Part 2, September 28, 2018) and a Second Notice of Proposed Rulemaking (66 DCR 31-Part 2, July 26, 2019).

Final recommendations were sent by DCRA to the Mayor and subsequently introduced to the District of Columbia Council on January 30, 2020. The Codes were passively approved by the Council on April 9, 2020 and became effective on May 29, 2020 when a Notice of Final Rulemaking was published in the DC Register (67 DCR 23-Part 2, May 29, 2020).

Structure of the 2017 District of Columbia Construction Codes

Since the District of Columbia Construction Codes consist of the ICC, ASHRAE and NFPA model codes as modified by the *District of Columbia Construction Codes Supplement*, the model codes and the local supplement must be consulted together to determine the complete text of the *District of Columbia Construction Codes*. The I-Codes are available on the ICC's website at http://publicecodes.cyberregs.com/icod. ASHRAE 90.1-2013 is available at https://www.techstreet.com/ashrae/standards/ashrae-90-1-2013-si?gateway_code=ashrae&product_id=1865967.

The *District of Columbia Construction Codes Supplement* contains the local District of Columbia amendments and modifications and is codified in Title 12 of the DCMR. Title 12 can be viewed online on the website hosted by the Office of Documents and Administrative Issuances (ODAI): http://www.dcregs.dc.gov [3]

To assist the public, three of the District of Columbia Construction Codes may also be viewed in an integrated version, published by the ICC, which consolidates the respective ICC codes, ANSI/ASHRAE/IES 90.1-2013 and the District of Columbia amendments. The three integrated codes are available to the public through a link on the DCRA website, which enables online reading and limited downloading. These codes are as follows:

- 2017 *District of Columbia Building Code*
- 2017 *District of Columbia Energy Conservation Code*
- 2017 *District of Columbia Green Construction Code*

3. Title 12 of the DCMR is also available on the DCRA website.

The integrated version of the 2017 *DC Green Construction Code* identifies changes to the 2012 IgCC model code as well as changes from the 2013 *DC Green Construction Code* to the 2017 *DC Green Construction Code*. A double vertical line in the margin indicate DC changes to the 2012 IgCC model code. A solid vertical line in the margin indicates DC updates from the 2013 *DC Green Construction Code* to the 2017 edition.

A deletion arrow (➡) is provided in the margin where an entire section, paragraph, exception or table has been deleted or an item in a list of items or a table has been deleted.

Consistent with prior practice in the District of Columbia, Chapter 1 of the *District of Columbia Building Code* contains administrative and enforcement provisions that apply to all the individual codes that comprise the District of Columbia Construction Codes, with the exception of the *Property Maintenance Code* and the *Fire Code*. Administrative and enforcement provisions for the *Property Maintenance Code* and the *Fire Code* are set forth in 12-G DCMR, Chapter 1, and 12-H DCMR, Chapter 1, respectively.

Effective Date

The 2017 *District of Columbia Construction Codes* became effective May 29, 2020, and apply to all new and existing construction and buildings in the District of Columbia, unless otherwise excepted or excluded, subject to the transition provisions set forth in Section 123 of the Building Code, which allows continued use of the 2013 *Construction Codes* under specified circumstances.

Citation

The *District of Columbia Construction Codes* should be cited by referencing the ICC, ASHRAE or NEC provision if applicable, or the local District of Columbia amendment set forth in 12 DCMR. Alternatively, a specific provision can be cited by referencing the applicable District of Columbia Construction Code, e.g., 2017 *District of Columbia Property Maintenance Code*, Section 404.1.

Codes Maintenance

At the national level, the model codes are kept current through the review of proposed changes submitted to the organizing body by code enforcement officials, industry representatives, design professionals and other interested parties. Proposed changes are considered through an open code development process in which all interested and affected parties may participate. New model codes are issued on a three-year cycle.

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OTHER DISTRICT OF COLUMBIA GOVERNMENT AGENCIES

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The code development process involved the work of hundreds of people. Every effort was made to include all who participated.

Any errors or omissions in the Acknowledgments are entirely unintended.

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CHAPTER 1

SCOPE AND ADMINISTRATION

SECTION 101
GENERAL

101.1 Scope and intent. Scope and intent of the *Green Construction Code* shall be governed by Chapter 1 of the *Building Code*, Title 12-A DCMR.

101.2 Administration and enforcement. Administration and enforcement of the *Green Construction Code* shall be governed by Chapter 1 of the *Building Code*, Title 12-A DCMR.

CHAPTER 2
DEFINITIONS

SECTION 201
GENERAL

201.1 Scope. Unless otherwise expressly stated, the following words and terms shall, for the purposes of this code, 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 codes. Where terms are not defined in this code and are defined in the *Building Code, Conservation Code*, *Fire Code, Fuel Gas Code*, *Mechanical Code*, *Plumbing Code* or *Residential Code*, such terms shall have the meanings ascribed to them as in those codes.

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

SECTION 202
DEFINITIONS

95th-PERCENTILE RAINFALL EVENT. The rainfall event having a precipitation total greater than or equal to 95 percent of all rainfall events during a 24-hour period on an annual basis.

A-WEIGHTED SOUND LEVEL. Sound pressure level in decibels measured with a sound level meter using an A-weighted network.

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

AIR CURTAIN. A device that generates and discharges a laminar air stream installed at the building entrance intended to prevent the infiltration of external, unconditioned air into the conditioned spaces, or the loss of interior, conditioned air to the outside.

ALTERATION. Any construction or renovation to an existing structure other than repair or addition.

ALTERNATE ON–SITE NONPOTABLE WATER. Nonpotable water from other than public utilities, onsite surface sources and subsurface natural freshwater sources. Examples of such water are graywater, onsite reclaimed water, collected rainwater, captured condensate, and rejected water from reverse osmosis systems.

APPROVED. Acceptable to the *code official* or authority having jurisdiction.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services or commissioning services, where such agency has been *approved*.

APPROVED SOURCE. An independent person, firm or corporation, *approved* by the *code official*, who is competent and experienced in the application of engineering principles to materials, methods or systems analyses.

AREA, TOTAL BUILDING FLOOR. The total of the *total floor areas* on all stories of the building.

AREA, TOTAL FLOOR. The total area of a story as measured from the interior side of the exterior walls.

ASBESTOS-CONTAINING PRODUCTS. Building materials containing one or more of the following mineral fibers in any detectable amount that have been intentionally added or are present as a contaminant: chrysotile, amosite, crocidolite, tremolite, actinolite, anthophyllite and any fibrous amphibole.

AUTOMATIC. Self-acting, operating by its own mechanism when actuated by some impersonal influence, such as a change in current strength, pressure, temperature or mechanical configuration (see "Manual").

AUTOMATIC TIME SWITCH CONTROL. A device or system that automatically controls lighting or other loads, including switching ON or OFF, based on time schedules.

BACKWATER VALVE. A device or valve installed in the system drain piping which prevents drainage or waste from backing up into the system and causing contamination or flooding.

BICYCLE PARKING, LONG TERM. Bicycle racks or storage lockers provided for bicycle riders including, but not limited to, employees and students, anticipated to be at a building site for four or more hours.

BICYCLE PARKING, SHORT TERM. Bicycle racks or storage lockers provided for bicycle riders including, but not limited to, customers, visitors, and event audiences, anticipated to be at a building site for less than four hours.

BIO-BASED MATERIAL. A commercial or industrial material or product, other than food or feed, that is composed of, or derived from, in whole or in significant part, biological products or renewable domestic agricultural materials, including plant, animal, and marine materials, or forestry materials.

BRANCH CIRCUIT. All circuit conductors between the final branch-circuit overcurrent device and the load.

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:

1. 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

2. Sites determined to be contaminated according to local or state regulation.

BTU. Abbreviation for British thermal unit, which is the quantity of heat required to raise the temperature of 1 pound (454 g) of water 1 °F (0.56 °C) (1 Btu = 1055 J).

BUFFER. The number of feet of setback from a wetland or water body determined by a jurisdiction to be necessary to protect a specific wetland or water body. The width of the buffer varies based on characteristics of the wetland and surrounding areas including, but not limited to, the type and function of the wetland, soils, slopes, land uses, habitats, and needs for wildlife or water quality protection.

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy, including the energy using systems and site subsystems powered through the building's electrical service.

BUILDING COMMISSIONING. See "Commissioning."

BUILDING SITE. A lot, or a combination of adjoining lots, that are being developed and maintained subject to the provisions of this code. A building site shall be permitted to include public ways, private roadways, bikeways and pedestrian ways that are developed as an element of the total development.

BUILDING THERMAL ENVELOPE. The basement walls, exterior walls, floor, roof, and any other building elements that enclose conditioned space. This boundary also includes the boundary between conditioned space and any exempt or unconditioned space.

CAPTIVE KEY CONTROL. An automatic control device or system that energizes circuits when the key that unlocks the sleeping unit is inserted into the device and that de-energizes those circuits when the key is removed.

CARBON DIOXIDE EQUIVALENT (CO_2e) EMISSIONS. A measure used to compare the emissions from various greenhouse gases based upon their 100-year time horizon global warming potential (GWP). CO_2e emissions from carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are included. The carbon dioxide equivalent for a gas is derived by multiplying the weight of the gas by the associated GWP.

CHANGE OF OCCUPANCY. A change in the purpose or level of activity within a building that involves a change in application of the requirements of this code.

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

COLLECTION PIPING. Unpressurized piping used within the collection system that drains rainwater or graywater to the storage tank by gravity.

COMBINATION OVEN/STEAMER. A chamber designed for heating, roasting, or baking food by a combination of conduction, convection, radiation, electromagnetic energy or steam.

COMMISSIONING. A process that verifies and documents that the selected building and site systems have been designed, installed, and function in accordance with the owner's project requirements and construction documents, and minimum code requirements.

COMPOSITE WOOD PRODUCTS. Hardwood plywood, particleboard, and medium-density fiberboard.

Composite wood products do not include the following:

1. Hardboard and structural plywood as specified in DOC PS-1;
2. Structural panels as specified in DOC PS-2;
3. Structural composite lumber as specified in ASTM D5456;
4. Oriented strand board and glued laminated timber as specified in ANSI A190.1;
5. Prefabricated wood I-joists as specified in ASTM D5055; and
6. Finger-jointed lumber.

CONSERVATION AREA. Land designated by the jurisdiction or by state or federal government, as appropriate for conservation from development because of the land possessing natural values important to the community including, but not limited to, wildlife habitat, forest or other significant vegetation, steep slopes, ground water recharge area, riparian corridor or wetland.

CONSTRUCTION-COMPACTED SUBSOIL. Subsoils that are compacted through any of the following: clearing, grading, smearing and topsoil removal such that the infiltrative capacity of the soils or the bulk density of the soils is significantly altered in comparison to the reference soil properties.

CONSTRUCTION DOCUMENTS. Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit.

CONTROL. A specialized automatic or manual device or system used to regulate the operation of lighting, equipment or appliances.

CO_2e. Weight of each gas emitted when consuming a specific energy type in the building per unit of the specific energy type provided to the building at the utility meter multiplied by the global warming potential (GWP) of the specific gas, and then summed over all three gases emitted.

where:

GWP (CO_2) = 1

GWP (CH_4) = 25

GWP (N_2O) = 298.

COURT. An open, uncovered space, unobstructed to the sky, bounded on three or more sides by exterior building walls or other enclosing devices.

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

DAYLIGHT SATURATION. The percentage of daylight hours throughout the year when not less than 28 foot candles (300 lux) of natural light is provided at a height of 30 inches (760 mm) above the floor. ⬅

DECIBELS (dB). Term used to identify ten times the common logarithm of the ratio of two like quantities proportional to the power of energy.

DECONSTRUCTION. The process of systematically disassembling a building, structure, or portion thereof, so that the materials, products, components, assemblies and modules can be salvaged for repurpose, reuse or recycling.

DEMAND LIMIT. The shedding of loads when pre-determined peak demand limits are about to be exceeded.

DEMAND RESPONSE (DR). The ability of a building system to reduce the energy consumption for a specified time period after receipt of demand response signal typically from the power company or demand response provider. Signals requesting demand response are activated at times of peak usage or when power reliability is at risk.

DEMAND RESPONSE, AUTOMATED (AUTO-DR). Fully automated demand response initiated by a signal from a utility or other appropriate entity, providing fully automated connectivity to customer energy end-use control strategies.

DEMAND RESPONSE AUTOMATION INTERNET SOFTWARE. Software that resides in a building energy management control system that can receive a demand response signal and automatically reduce heating, ventilation, air-conditioning (HVAC) and lighting system loads.

DEMOLITION. The process of razing, relocation, or removal of an existing building or structure, or a portion thereof.

DETENTION. The short-term storage of stormwater on a site in order to regulate the runoff from a given rainfall event and to control discharge rates to reduce the impact on downstream stormwater systems.

DISHWASHER.

Dishwasher, door type. A machine designed to clean and sanitize plates, glasses, cups, bowls, utensils, and trays by applying sprays of detergent solution and a sanitizing final rinse, that is designed to accept a standard 20-inch by 20-inch (508 mm by 508 mm) dish rack which requires the raising of a door to place the rack into the wash/rinse chamber.

Dishwasher, multiple tank conveyor. A machine designed to clean and sanitize plates, glasses, cups, bowls, utensils, and trays by applying sprays of detergent solution and a sanitizing final rinse, using a conveyor or similar mechanism to carry dishes through a series of wash and rinse sprays utilizing one or more tanks within the machine. This type of machine may include a prewashing section before the washing section and an auxiliary rinse section between the power rinse and final rinse section.

Dishwasher, pot pan and utensil. A machine designed to clean and sanitize pots, pans, and kitchen utensils by applying sprays of detergent solutions and a sanitizing final rinse.

Dishwasher, rackless conveyor. A machine designed to clean and sanitize plates, glasses, cups, bowls, utensils, and trays by applying sprays of detergent solution and a sanitizing final rinse, using a conveyor or similar mechanism to carry dishes through a series of wash and rinse sprays within the machine. Rackless conveyor machines utilize permanently installed, vertical pegs to carry dishware through the wash and rinse cycles.

Dishwasher, single tank conveyor. A machine designed to clean and sanitize plates, glasses, cups, bowls, utensils, and trays by applying sprays of detergent solution and a sanitizing final rinse, using a conveyor or similar mechanism to carry dishes through a series of wash and rinse sprays within the machine. This type of machine does not have a pumped rinse tank but may include a prewashing section ahead of the washing section.

Dishwasher, under counter. A machine designed to clean and sanitize plates, glasses, cups, bowls, utensils, and trays by applying sprays of detergent solution and a sanitizing final rinse, that has an overall height 38 inches (965 mm) or less, designed to be installed under food preparation workspaces.

DISTRIBUTION PIPE. Pressurized or nonpressure piping used within the plumbing system.

DISTRICT FINANCED. District financed is one of the following:

1. Financing of a project or contract where funds or resources to be used for construction and development costs, excluding ongoing operational costs, are received from the District, or funds or resources which, in accordance with a federal grant or otherwise, the District administers, including a contract, grant, loan, tax abatement or exemption, land transfer, land disposition and development agreement, or tax increment financing, or any combination thereof, provided, that federal funds may be applied to the financing percentage only if permitted by federal law and grant conditions.
2. Financing whose stated purpose is, in whole or in part, to provide for the new construction or substantial rehabilitation of affordable housing.

DISTRICT INSTRUMENTALITY FINANCED. See "District financed."

DIVERSE USE CATEGORIES. Categories of occupancies and land uses which are designated as either community, retail or service facilities:

Community facilities. The community facilities category includes: child care; civic or community center; a building containing a place of worship; police or fire station; post office, public library, public park, school, senior care facility, homeless shelter, and similar social services facilities.

Retail uses. The retail use category includes: convenience store, florist, hardware store, pharmacy, grocery or supermarket and similar retail uses.

Service uses. The service use category includes: bank, coffee shop or restaurant; hair care; health club or fitness center; laundry or dry cleaner, medical or dental office and similar service uses.

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.

ELECTRIC VEHICLE. An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood *electric vehicles*, electric motorcycles and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current. Plug-in hybrid electric vehicles (PHEV) are considered *electric vehicles*.

ELECTRIC VEHICLE CONNECTOR. A device that, by insertion into an *electric vehicle* inlet, establishes an electrical connection to the *electric vehicle* for the purpose of power transfer and information exchange.

ELECTRIC VEHICLE SUPPLY EQUIPMENT. The conductors, including the ungrounded, grounded, and equipment grounding conductors and the *electric vehicle connectors*, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the *electric vehicle*.

ENERGY MANAGEMENT AND CONTROL SYSTEM, BUILDING (EMCS). A computerized, intelligent network of electronic devices, designed to automatically monitor and control the energy using systems in a building.

ENERGY STAR. A joint program of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) designed to identify and promote energy-efficient products and practices.

ENERGY STAR QUALIFIED. Appliances or equipment that have been found to comply with ENERGY STAR requirements by a third-party organization recognized by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE).

EQUIPMENT. All piping, ducts, vents, control devices and other components of systems other than appliances which are permanently installed and integrated to provide control of environmental conditions for buildings. This definition shall also include other systems specifically regulated in this code.

EVAPORATIVE COOLING SYSTEM. A system for cooling the air in a building or space by removing heat from the outdoor air by means of the evaporation of water. The system forces air through wet porous pads, causing the latent heat of evaporation to cool the air. Water is continuously circulated over the pads to replenish the evaporated water. Where the cooled air is sent directly into the building, the system is referred to as "direct evaporative cooling." Where the cooled air is sent through heat exchangers re-circulating indoor air, the system is referred to as "indirect evaporative cooling."

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

EXISTING STRUCTURE. A structure erected prior to the date of adoption of the appropriate code, or one for which a legal building permit has been issued.

EXTERIOR WALL, OBSTRUCTED. That portion of an exterior wall with limited access to natural light due to shading from buildings, structures, or geological formations,

FACILITY OPERATIONS. A facility is operational during the time when the primary activity that facility is designed for is taking place. For Group A and Group M occupancies, this is the time during which the facility is open to the public.

FAN EFFICIENCY GRADE (FEG). A numerical rating identifier that specifies the fan's aerodynamic ability to convert shaft power, or impeller power in the case of a direct driven fan, to air power. FEGs are based on fan peak (optimum) energy efficiency that indicates the quality of the fan energy usage and the potential for minimizing the fan energy usage.

FARMLAND.

Farmlands of statewide significance. Land, in addition to prime and unique farmlands, that is of statewide importance for the production of food, feed, fiber, forage and oil seed crops. Criteria for delineating this land is determined by the appropriate state agency.

Prime farmland. Land that has the best combination of physical and chemical characteristics for producing food, fiber, feed, forage, and oil seed crops and that is also available for these uses, including cropland, pastureland, forest land, range land and similar lands which are not water areas or urban or built-up land areas.

Unique farmland. Land other than prime farmland that is used for the production of specific high-value food or fiber crops. The land has the special combination of soil quality, location, growing season and moisture supply needed to economically produce sustained high-quality crops or high yields of a specific crop where the lands are treated and managed according to acceptable farming methods.

FEEDER CONDUCTORS. The circuit conductors between the service equipment, the source of a separately derived system, or other power supply source and the final branch-circuit overcurrent device.

FENESTRATION. Skylights, roof windows, vertical windows (fixed or moveable), opaque doors, glazed doors, glazed block, and combination opaque/glazed doors. Fenestration includes products with glass and nonglass glazing materials.

FIBER PROCUREMENT SYSTEM. A system that ensures that fiber procured for the manufacture of wood and wood-based products comes from responsible or certified sources in accordance with ASTM D7612.

FIREPLACE. An assembly consisting of a hearth and fire chamber of noncombustible material and provided with a chimney for use with solid fuels.

Factory-built fireplace. A listed and labeled fireplace and chimney system composed of factory-made components, and assembled in the field in accordance with the manufacturer's instructions and the conditions of the listing.

Masonry fireplace. A field-constructed fireplace composed of solid masonry units, bricks, stones or concrete.

FLOOD HAZARD AREA. The greater of the following two areas:

1. The area within a *floodplain* subject to a 1-percent or greater chance of flooding in any given year;
2. The area designated as a *flood hazard area* on a community's flood hazard map, or otherwise legally designated.

FLOOD OR FLOODING. A general and temporary condition of partial or complete inundation of normally dry land from:

1. The overflow of inland or tidal waters.
2. The unusual and rapid accumulation of runoff of surface waters from any source.

FLOODPLAIN. An area of land at risk of being inundated with water during high flows. *Floodplains* are associated with both water courses, such as rivers and streams, and bodies of water, such as oceans and lakes.

FLOOR AREA, GROSS (For Section 302). *Gross floor area* shall have the same meaning ascribed to it in the *Zoning Regulations*, Title 11 DCMR, and as interpreted by the Zoning Administrator.

FLOOR AREA, NET. The actual occupied area not including unoccupied accessory areas such as corridors, stairways, toilet rooms, mechanical rooms and closets.

FREEZER. Equipment designed to enclose a space of mechanically cooled and temperature-controlled air used to maintain prescribed frozen food holding temperatures.

FRYER, DEEP FAT. A unit with a width between 12 and 18 inches (305 and 457 mm) that cooks food by immersion in a tank of oil or fat more than 25 pounds (11 kg) and less than 50 pounds (23 kg).

FRYER, LARGE VAT. A unit with a width greater than 18 inches (457 mm) that cooks food by immersion in a tank of oil or fat more than 50 pounds (23 kg).

GLOBAL WARMING POTENTIAL (GWP). The cumulative radiative forcing effects of a gas over a 100-year time horizon resulting from the emission of a unit mass of gas relative to a reference gas. The GWP-weighted emissions of direct greenhouse gases in the U.S. Inventory are presented in terms of equivalent emissions of carbon dioxide (CO_2), using units of teragrams of carbon dioxide equivalents ($TgCO_2$ Eq.). conversion: $Tg=10^9$ kg = 10^6 metric tons = 1 million metric tons.

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

GREENFIELD. Land that has not been previously developed or has a history of only agricultural use.

GREENHOUSE GAS. A gas in the atmosphere that absorbs and emits radiation within the thermal infrared range.

GRIDDLE, DOUBLE-SIDED. Equipment used to cook food between flat, smooth, or grooved horizontal plates heated from above and underneath.

GRIDDLE, SINGLE-SIDED. Equipment used to cook food directly on a flat, smooth, or grooved horizontal plate heated from underneath.

GROSS FLOOR AREA (For Section 302). See *Floor area, gross*.

GROUND SOURCE OR GEOEXCHANGE. Where the earth is used as a heat sink in air conditioning or heat pump island systems. This also applies to systems utilizing subsurface water. Ground source heating and cooling uses the relatively constant temperature of the earth below the frost line. This steady temperature profile allows the earth to be used as a heat source in the winter and as a heat sink in the summer.

HARDSCAPE. Areas of a building site covered by man-made materials.

HIGH-OCCUPANCY VEHICLE. A vehicle which is occupied by two or more people, including carpools, vanpools, and buses.

HISTORIC BUILDINGS. Buildings that are listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law.

ICE MACHINE.

Ice machine, ice-making head. A factory-made assembly consisting of a condensing unit and ice-making section operating as an integrated unit, with means for making and harvesting ice, that combines the ice-making mechanism and the condensing unit in a single package, but requires a separate ice storage bin.

Ice machine, remote-condensing unit. A factory-made assembly consisting of a condensing unit and ice-making section operating as an integrated unit, with means for making and harvesting ice, where the ice-making mechanism and condenser or condensing unit are in separate sections.

Ice machine, self-contained unit. A factory-made assembly consisting of a condensing unit and ice-making section operating as an integrated unit, with means for making and harvesting ice and where the ice-making mechanism and storage compartment are combined into an integral cabinet.

IMPERVIOUS SURFACE. Paved concrete or asphalt and other similar surfaces that readily accommodate the flow of water with relatively little absorption, as typically used at exterior horizontal areas including, but not limited to, parking lots, bikeways, walkways, plazas and fire lanes.

INDEPENDENT SYSTEM OPERATOR (ISO). The electric system's operator.

INFEASIBLE. An alteration of a building, site feature, or system that has little likelihood of being accomplished because existing physical or site constraints prohibit modification or addition of elements, spaces or features which are in full and strict compliance with the minimum requirements for new construction.

INFRASTRUCTURE. Facilities within a jurisdiction that provide community services and networks for travel and communication including: transportation services such as, but not limited to roads, bikeways and pedestrian ways and tran-

sit services; utility systems such as, but not limited to, water, sanitary sewage, stormwater management, telecommunications, power distribution and waste management; and community services such as, but not limited to, public safety, parks, schools and libraries.

INFRASTRUCTURE, ADEQUATE. The capacity of infrastructure systems, as determined by the jurisdiction, to serve the demands imposed by a new development on building sites without negatively impacting services to existing users of the infrastructure and without negatively impacting the overall functionality of the infrastructure. Adequacy can be determined based on existing infrastructure or on the infrastructure as augmented by a development project.

INVASIVE PLANT SPECIES. Species that 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, defined by using the best scientific knowledge of that region. Consideration for inclusion as an invasive species shall include, but shall not be limited to, those species identified on:

1. *Approved* city, county or regional lists.
2. State noxious weeds laws,
3. Federal noxious weeds laws.

JURISDICTION. The governmental unit that has adopted this code under due legislative authority.

LABEL. An identification applied on a product by the manufacturer that contains the name of the manufacturer, the function and performance characteristics of the product or material, and the name and identification of an approved agency and that indicates that the representative sample of the product or material has been tested and evaluated by an approved agency.

LABELED. Equipment, materials or products to which has been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

LIFE CYCLE ASSESSMENT (LCA). A technique to evaluate the relevant energy and material consumed and environmental emissions associated with the entire life of a building, product, process, material, component, assembly, activity or service.

LIGHTING BOUNDARY. Where the lot line abuts a public walkway, bikeway, plaza, or parking lot, the *lighting boundary* shall be a line 5 feet (1524 mm) from the lot line and located on the public property. Where the lot line abuts a public roadway or public transit corridor, the *lighting boundary* shall be the centerline of the public roadway or public transit corridor. In all other circumstances, the *lighting boundary* shall be at the lot line.

LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the *code official* and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

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

LOT LINE. A line dividing one lot from another, or from a street or any public place.

LOW EMISSION, HYBRID AND ELECTRIC VEHICLE. Vehicles that achieve EPA Tier 2, California LEV-II, or a minimum of EPA LEV standards, whether by means of hybrid, alternative fuel, or electric power.

LOW VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMER. A NEMA 'Class 1' transformer that is air-cooled, does not use oil as a coolant, has an input voltage ≤ 600 volts, and is rated for operation at a frequency of 60 hertz.

MANUAL. Capable of being operated by personal intervention (see "Automatic").

MINIMUM EFFICIENCY REPORTING VALUE (MERV). Minimum efficiency-rated value for the effectiveness of air filters.

METER. A measuring device used to collect data and indicate usage.

MODIFIED ENERGY FACTOR (MEF). The capacity in cubic feet of the clothes container of a clothes washing machine, C, divided by the clothes washing total energy consumption in kWh per cycle. Total energy consumption per cycle is the sum of the machine electrical energy consumption per cycle, M; the hot water energy consumption per cycle, E; and the energy required for removal of the remaining moisture in the wash load per cycle, D. The equation is:

$$MEF = C/(M + E + D)$$

MUNICIPAL RECLAIMED WATER. Reclaimed water treated by a municipality.

NATIVE PLANT SPECIES. Species that are native to the ecosystem under consideration, defined by using the best scientific knowledge of that region. Consideration for inclusion as a native species shall include, but is not limited to, those species identified in any of the following:

1. *Approved* city, county and regional lists.
2. State laws.
3. Federal laws.

NEW CONSTRUCTION (For Section 302). The construction of any building or structure whether as a stand-alone, or an addition to, a building or structure. The term "new construction" includes new buildings and additions or enlargements of existing buildings, exclusive of any *alterations* or repairs to any existing portion of a building.

NONPOTABLE WATER. Water not safe for drinking, personal or culinary utilization.

OCCUPANT LOAD. The occupant load as calculated in accordance with the requirements of Chapter 10 of the *Building Code*.

OCCUPANT SENSOR CONTROL. A device or system that detects the presence or absence of people within an area and causes lighting, equipment, or appliances to be regulated accordingly.

ONCE-THROUGH COOLING. The use of water as a cooling medium where the water is passed through a heat exchanger one time and then discharged to the drainage system. This also includes the use of water to reduce the temperature of condensate or process water before discharging it to the drainage system.

ORGANIC MATTER. Carbon-containing material composed of both living organisms and formerly living, decomposing plant and animal matter. Soil organic matter content is either naturally occurring or is a result of supplementation with compost or other partially decomposed plant and animal material.

OUTDOOR ORNAMENTAL FOUNTAIN. An outdoor fixture whose dominant use is aesthetic consisting of a catch basin, reservoir or chamber from which one or more jets or streams of water is emitted.

OVEN, CONVECTION. A chamber designed for heating, roasting, or baking food by conduction, convection, radiation, and/or electromagnetic energy.

PERMIT. An official document or certificate issued by the jurisdiction which authorizes performance of a specified activity.

PERVIOUS CONCRETE. Hydraulic cement concrete with distributed, interconnected macroscopic voids that allows water to pass through the material with little resistance.

POST-CONSUMER RECYCLED CONTENT. The 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.

POTABLE WATER. Water free from impurities present in amounts sufficient to cause disease or harmful physiological effects and conforming to the bacteriological and chemical quality requirements of the Public Health Service Drinking Water Standards or the regulations of the public health authority having jurisdiction.

POWER CONVERSION SYSTEM. The equipment used to convert incoming electrical power, to the force causing vertical motion of the elevator. In a traction system, this would include the electrical drive, motor, and transmission.

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

PRIMARY ENERGY USE. The total fuel-cycle energy embedded within building materials and all forms of energy required for building operation. Units of energy are reported in total Btu's for building materials and total Btu's per unit of energy (e.g., kWh, therms and gallons) consumed in the operation of building mechanical systems (HVAC and lighting). Total fuel-cycle energy includes energy required from the point of initial extraction, through processing and delivery to the final point of consumption into building materials or building operation.

PROCESS LOADS. Building energy loads that are not related to building space conditioning, lighting, service water heating or ventilation for human comfort.

PROJECT (For Section 302). Construction that is all or a part of one development scheme, built at one time or in phases.

PROJECTION FACTOR. A ratio that describes the geometry of a horizontal projection, as determined in accordance with Equation 4-2 of Section C402.3.3 of the *Energy Conservation Code—Commercial Provisions.*

PROPOSED DESIGN. A description of the proposed building used to estimate annual energy use for determining compliance based on total building performance including improvements in design such as the use of passive solar energy design concepts and technologies, improved *building thermal envelope* strategies, increased equipment and systems efficiency, increased use of daylighting, improved control strategies and improved lighting sources that will result in a decrease in annual energy.

R-VALUE (THERMAL RESISTANCE). The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area ($h \times ft^2 \times °F/Btu$) [$(m^2 \times K)/W$].

RAINWATER. Water from natural precipitation.

RAINWATER COLLECTION AND CONVEYANCE SYSTEM. Rainwater collection system components extending between the collection surface and the storage tank that convey collected rainwater, usually through a gravity system.

REBOUND AVOIDANCE, EXTENDED AUTO-DR CONTROL. The rebound avoidance, extended Auto-DR control strategy is essentially an extension of the rebound avoidance, slow recovery strategy. Although a slow recovery strategy is critical to maximize the benefit of an Auto-DR strategy, the building energy management and control system (EMCS) programming for just such a strategy can be very complex or might not be possible for many conventional EMCS's. A rebound avoidance, extended Auto-DR control strategy also includes logic and controls for avoiding a rebound peak when the control signal is stopped.

REBOUND AVOIDANCE, SEQUENTIAL EQUIPMENT RECOVERY. Sequential equipment recovery that disperses short duration equipment start up spikes gradually, thereby avoiding a larger whole building demand spike.

REBOUND AVOIDANCE, SLOW RECOVERY. Slow recovery strategies slowly recover the target parameter that was controlled in the demand response strategy. Where this strategy is applied, the zone setpoints are gradually restored to the normal setpoints. Where air moving systems are targeted, a limit strategy is applied to the adjustable speed drives; fan adjustable speed drive limits are gradually shifted up.

RECEIVING WATERS. Groundwater, creeks, streams, rivers, lakes or other water bodies that receive treated or untreated waste water or stormwater, including water from combined sewer systems and stormwater drains.

RECLAIMED WATER. Nonpotable water that has been derived from the treatment of waste water by a facility or system licensed or permitted to produce water meeting the jurisdiction's water requirements for its intended uses. Also known as "Recycled Water."

RECYCLABILITY. Ability of a material or product to be captured and separated from a waste stream for conversion, reprocessing or reuse.

REFRIGERATOR. Equipment designed to enclose a space of mechanically cooled and temperature-controlled air used to maintain prescribed cold food holding temperatures.

REGISTERED DESIGN PROFESSIONAL. An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A *registered design professional* engaged by the owner to review and coordinate certain aspects of the project, as determined by the building official, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

RELOCATABLE (RELOCATED) MODULAR BUILDING. A partially or completely assembled building using a modular construction process and designed to be reused or repurposed multiple times and transported to different building sites.

RENEWABLE ENERGY CREDIT (REC). An REC represents the property rights to the environmental, social, and other nonpower qualities of renewable electricity generation. An REC, and its associated attributes and benefits, is sold separately from the underlying physical electricity associated with an onsite renewable energy source. REC's allow organizations to support renewable energy development and protect the environment where renewable power products are not locally available. There are two approaches to verifying REC ownership and the right to make environmental claims: (1) REC contracts from a list of *approved* providers, including an audit of the chain of custody; and (2) REC tracking systems.

RENEWABLE ENERGY SOURCE, ONSITE. Energy derived from solar radiation, wind, waves, tides, biogas, biomass, or geothermal energy. The energy system providing onsite renewable energy is located on or adjacent to the building site, and generate energy for use on the building site or to send back to the energy supply system.

REPAIR. The reconstruction or renewal of any part of an existing building or building site for the purpose of its maintenance.

RESIDENTIAL OCCUPANCIES (For Section 302). Residential Group R-2, R-3 or R-4 occupancies, and buildings regulated by the *Residential Code*.

RETENTION (STORMWATER). The permanent holding of stormwater on a site, preventing the water from leaving the site as surface drainage and allowing for use of the water on site, or loss of the water through percolation, evaporation or absorption by vegetation.

REUSE. To divert a material, product, component, module, or a building from the waste stream in order to use it again.

ROOF COVERING. The covering applied to the roof deck for weather resistance, fire classification or appearance.

ROOF REPLACEMENT. The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.

ROOF WASHER. A device or method for removal of sediment and debris from collection surface by diverting initial rainfall from entry into the storage tank. Also referred to as a First Flush Device.

SEQUENCE OF OPERATIONS (HVAC). A fully descriptive detailed account of the intended operation of HVAC systems covering the operation of systems in narrative terms, accounting for all of the equipment that makes up the systems, how the systems are designed to operate, and how they are to be controlled.

SITE DISTURBANCE. Site preparation or construction which negatively affects the native soils, native vegetation, or native animal life of the site.

SKYLIGHTS AND SLOPED GLAZING. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal. Glazing material in skylights, including unit skylights, tubular daylighting devices, solariums, sunrooms, roofs and sloped walls, are included in this definition.

SKYLIGHT, UNIT. A factory-assembled, glazed fenestration unit, containing one panel of glazing material that allows for natural lighting through an opening in the roof assembly while preserving the weather-resistant barrier of the roof.

SLEEPING UNIT. A room or space in which people sleep, that 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.

SOLAR HEAT GAIN COEFFICIENT (SHGC). 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.

SOLAR PHOTOVOLTAIC SYSTEM. Devices such as photovoltaic (PV) modules and inverters that are used to transform solar radiation into energy.

SOLAR REFLECTANCE. A measure of the ability of a surface material to reflect sunlight. It is the fraction of incident sunlight reflected by a surface, expressed on a scale of 0 to 1. Solar reflectance is also referred to as "albedo."

SOLAR REFLECTANCE INDEX (SRI). A value that incorporates both solar reflectance and thermal emittance in a single measure to represent a surface's relative temperature in

the sun. SRI compares a surface's temperature to those of standard black and standard white surfaces. It typically ranges from 0 for standard black to 100 for standard white, but can be less than 0 or greater than 100.

SOLAR THERMAL EQUIPMENT. A device that uses solar radiation to heat water or air for use within the facility for service water heating, process heat, space heating or space cooling.

STANDARD REFERENCE DESIGN. A building design that meets the minimum requirements of the *Energy Conservation Code* and the additional requirements of Section 602.2.

STANDBY MODE (ELEVATOR). An operating mode during periods of inactivity in which electrical loads are reduced to conserve energy. For elevators, standby mode begins up to 5 minutes after an elevator is unoccupied and has parked and completed its last run and ends when the doors are re-opened. For escalators and moving walkways, standby mode begins after traffic has been absent for up to 5 minutes and ends when the next passenger arrives.

STEAM COOKER. Equipment in which potable steam is used for heating, cooking, and reconstituting food.

STORAGE TANK (GRAYWATER OR RAINWATER). A fixed container for holding water at atmospheric pressure for subsequent use as part of a plumbing or irrigation system.

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. It is measured as the vertical distance from top to top of two successive tiers of beams or finished floor surfaces and, for the topmost story, from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.

STRUCTURE. That which is built or constructed.

SUBSTANTIAL IMPROVEMENT. Any repair, reconstruction, rehabilitation, addition or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started. If the structure has sustained substantial damage, any repairs are considered *substantial improvement* regardless of the actual repair work performed. The term does not include either of the following:

1. Any project for improvement of a building required to correct existing health, sanitary or safety code violations identified by the *code official* and that are the minimum necessary to assure safe living conditions.
2. Any alteration of a historic structure provided that the alteration will not preclude the structure's continued designation as a historic structure.

SUBSTANTIAL IMPROVEMENT (For Section 302). Any repair, *alteration*, or addition of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the building or structure before the repair, *alteration*, or addition is started.

THERMAL EMITTANCE. The ratio of radiative power emitted by a sample to that emitted by a black body radiator at the same temperature.

TOPSOIL. The upper, outmost layer of soil having the highest concentration of organic matter and microorganisms and where the majority of biological soil activity occurs.

TRACTION ELEVATOR. An elevator system in which the cars are suspended by ropes wrapped around a sheave that is driven by an electric motor.

TRANSIT SERVICE. A service that a public transit agency serving the area has committed to provide including, but not limited to, bus, streetcar, light or heavy rail, passenger ferry or tram service.

TUBULAR DAYLIGHTING DEVICE (TDD). A nonoperable fenestration unit primarily designed to transmit daylight from a roof surface to an interior space via a tubular conduit. The basic unit consists of an exterior glazed weathering surface, a light-transmitting tube with a reflective interior surface, and an interior-sealing device such as a translucent panel. The unit is either factory assembled, or field assembled from a manufacturing kit.

***U*-FACTOR (THERMAL TRANSMITTANCE).** The coefficient of heat transmission (air to air) through a building 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)].

VEGETATIVE ROOF. An assembly of interacting components designed to waterproof and normally insulate a building's top surface that includes, by design, vegetation and related landscaping elements.

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

VISIBLE TRANSMITTANCE (VT). The ratio of visible light entering the space through the fenestration product assembly to the incident visible light. VT includes the effects of glazing material and frame and is expressed as a number between 0 and 1.

VOLATILE ORGANIC COMPOUND (VOC). A volatile chemical compound based on carbon chains or rings that typically contain hydrogen and sometimes contain oxygen, nitrogen and other elements, and that has a vapor pressure of greater than 0.1 mm of mercury at room temperature.

VOLTAGE DROP. A decrease in voltage caused by losses in the circuit conductors connecting the power source to the load.

WATER FACTOR (WF). 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 FEATURE. An outdoor open water installation or natural open water way within a built landscape to retain water supplied from source other than rainwater naturally flowing into the feature.

WATERSENSE. A program of the U.S. Environmental Protection Agency (EPA) designed to identify and promote water-efficient products and practices.

WETLAND. Areas that are inundated or saturated by 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.

ZERO ENERGY PERFORMANCE INDEX (zEPI). A scalar representing the ratio of energy performance of the proposed design compared to the average energy performance of buildings relative to a benchmark year.

CHAPTER 3
GREEN BUILDING ACT

SECTION 301
GENERAL

301.1 General. The scope of the *Green Construction Code*, and alternative paths for complying with the *Green Construction Code*, are set forth in 12-A DCMR § 101.4.9. This chapter applies only to projects subject to the Green Building Act of 2006, effective March 8, 2007 [D.C. Law 16-234; D.C. Official Code §§ 6-1451.01 *et seq*. (2018 Repl.)], as amended ("Green Building Act" or "GBA").

SECTION 302
GREEN BUILDING ACT REQUIREMENTS

302.1 Green Building Act of 2006 requirements. An applicant for permits subject to Section 302.2 or Section 302.3 shall comply with Sections 302.4 through 302.12 and the Green Building Act. Other components of the Green Building Act are administered by other District of Columbia agencies. The applicant shall have the option of requesting a Green Building Act Preliminary Design Review Meeting ("GBA PDRM") with the Department, at the discretion of the applicant.

302.2 Publicly-owned or publicly financed projects. This section shall apply to each *project* that is new construction or a *substantial improvement*; and, is either:

1. A District-owned or District instrumentality-owned *project*; or
2. A *District financed* or *District instrumentality financed project*, where the financing represents at least 15 percent of the *project's* total cost.

302.2.1 Energy Star Target Finder Tool. Each *project* of 10,000 square feet (929 m^2) or more of *gross floor area* shall be designed and constructed to achieve a minimum score of seventy-five points on the Energy Star Target Finder Tool. The applicant shall provide plans and supporting documents in sufficient detail and clarity to enable the *code official* to verify compliance with this section.

Exceptions:

1. Building occupancies for which the Energy Star tool is not available.
2. *Alterations*.

302.2.2 Non-residential projects. A *project* which does not contain *residential occupancies* that equal or exceed 50 percent of the gross floor area of the *project*, including allocable area of common space, shall be deemed a non-residential project and shall be designed and constructed so as to achieve no less than the applicable LEED standard listed in Section 302.4, at the Silver level or higher. The applicant shall provide plans and supporting documents in sufficient detail and clarity to enable the *code official* to verify compliance with this section.

Exceptions:

1. Educational Group E (covered by Section 302.2.3).
2. Space designed and occupied for *residential occupancies* in a non-residential *project* (covered by Section 302.2.4).
3. Space designed and occupied for non-residential uses located in a residential *project* (covered by Section 302.2.5).
4. Space designed and occupied for non-residential uses located in a District-owned or a District instrumentality-owned building (covered by either Section 302.2.6 or Section 302.2.7, as applicable).

302.2.3 Educational Group E. A *project* of Educational Group E shall be designed and constructed to meet the LEED standard for Schools, at the Gold level or higher. The applicant shall provide plans and supporting documents in sufficient detail and clarity to enable the *code official* to verify compliance with this section. This section shall apply only to the following: (1) schools owned, operated or maintained by the District of Columbia Public Schools (DCPS); and (2) District of Columbia public charter schools.

Exceptions:

1. Where sufficient funding is not available to meet the applicable LEED standard for Schools at the Gold level, then the *project* shall meet the LEED standard for Schools at no less than the Certified Level of the LEED standard for Schools. Prior to submitting a permit application under this exception, the applicant shall obtain an exemption based on insufficient funding from DDOE pursuant to Section 302.12.
2. Where a *project* for Educational Group E occupancy is located in only a portion of a building, then only that portion of the building that is the subject of the *project* shall comply with this Section 302.2.3.

302.2.4 Project containing residential occupancies. Where a *project* contains 10,000 square feet (929 m^2) or more of *gross floor area* for *residential occupancies* including the allocable area of common space, then the *residential occupancies* of the *project* shall be designed and constructed to meet or exceed the Enterprise Green Communities Criteria, or a substantially equivalent standard as determined by the *code official*. The applicant shall provide plans and supporting documents in sufficient

detail and clarity to enable the *code official* to verify compliance with this section. A self-certification checklist shall be submitted to the *code official* with the application for the certificate of occupancy of the residential component of the *project*. The residential component of the project shall not be required to meet a LEED standard.

302.2.5 Interior construction of a mixed use space in a residential project. Where *residential occupancies* exceed 50 percent of the *gross floor area* of the *project*, including allocable area of common space, and the *project* contains at least 50,000 contiguous square feet (4645 m^2) of *gross floor area*, exclusive of common space of the non-residential occupancies, then the space designated for non-residential occupancies shall be designed and constructed to meet or exceed one or more of the applicable LEED standards listed in Section 302.4 at the Certified Level. The applicant shall provide plans and supporting documents in sufficient detail and clarity to enable the *code official* to verify compliance with this section.

302.2.6 Interior tenant fit-out alteration in a District-owned or a District instrumentality-owned project. Where a *project* in a District-owned or a District instrumentality-owned building involves the *alteration* of 30,000 square feet (2787 m^2) or more of *gross floor area* for a single non-residential occupancy, exclusive of common space, for which space a certificate of occupancy for non-residential use has been or would be issued, then the portion of the project subject to *alteration* shall be designed and constructed to meet or exceed one or more of the LEED standards listed in Section 302.4 at the Certified Level. The applicant shall provide plans and supporting documents in sufficient detail and clarity to enable the *code official* to verify compliance with this section.

302.2.7 Interior tenant fit-out in new construction. Where a *project* in a District-owned or a District-instrumentality-owned building involves the fit-out for tenant occupancy of shell space or spaces of 30,000 square feet (2787 m^2) or more of *gross floor area*, exclusive of common space, for a single non-residential occupancy, for which space a certificate of occupancy would be issued, the portion of the *project* subject to tenant fit-out shall be designed and constructed to meet or exceed one or more of the applicable LEED standards listed in Section 302.4 at the Certified Level. The applicant shall provide plans and supporting documents in sufficient detail and clarity to enable the *code official* to verify compliance with this section.

302.3 Privately-owned projects. All privately-owned *projects* that are (a) new construction or *substantial improvement*; and (b) 50,000 square feet (4645 m^2) or more of *gross floor area* shall comply with Section 302.3. Privately-owned *projects* shall mean *projects* owned or developed by a non-governmental *person* which are not within the scope of Section 302.2. This category shall also include, but shall not be limited to, *projects* involving the following District of Columbia participation:

1. Improved and unimproved real property acquired by sale from the District or a District instrumentality to a private entity;
2. Unimproved real property leased from the District or a District instrumentality to a private entity: and
3. Any *project* where some portion but less than 15 percent of the *project's* total *project* cost is *District financed* or *District instrumentality financed*. Privately-owned *projects* receiving 15 or greater of the *project's* cost from the District or a District instrumentality shall comply with Section 302.2.

302.3.1 Energy Star Target Finder Tool. Each *project* of 50,000 square feet (4645 m^2) or more of *gross floor area* shall estimate the project's energy performance using the Energy Star Target Finder Tool and submit this data to the *code official* with the permit application.

Exception: Building occupancies for which the Energy Star tool is not available.

302.3.2 Privately-owned non-residential projects. In addition to compliance with Section 302.3.1, each non-residential *project* of 50,000 square feet (4645 m^2) or more of *gross floor area* shall be designed and constructed to meet or exceed one or more of the LEED standards listed in Section 302.4 at the Certified Level. A "non-residential project" shall mean a *project* where 50 percent or more of the *gross floor area*, including allocable area of common space, is occupied or intended for occupancy for uses that are not *residential occupancies*. The applicant shall provide plans and supporting documents in sufficient detail and clarity to enable the *code official* to verify compliance with this section.

302.3.3 Interior construction of mixed use space in a residential project. Where *residential occupancies* exceed 50 percent of the *gross floor area* of the *project,* including allocable area of common space, and the *project* contains at least 50,000 contiguous square feet (4645 m^2) of *gross floor area*, exclusive of common space of the non-residential occupancies, then the space designated for non-residential occupancies shall be designed and constructed to meet or exceed one or more of the applicable LEED standards listed in Section 302.4 at the Certified Level. The applicant shall provide plans and supporting documents in sufficient detail and clarity to enable the *code official* to verify compliance with this section.

302.3.4 Educational Group E. A project of Educational Group E occupancy shall be designed and constructed to meet the LEED standard for Schools, at the Gold level or higher. The applicant shall provide plans and supporting documents in sufficient detail and clarity to enable the *code official* to verify compliance with this section. This section shall apply only to the following: (1) schools

owned, operated or maintained by the District of Columbia Public Schools (DCPS); and (2) District of Columbia public charter schools.

Exceptions:

1. Where sufficient funding is not available to meet the applicable LEED standard for Schools at the Gold level, then the *project* shall meet the LEED standard for Schools at no less than the Certified Level of the LEED standard for Schools. Prior to submitting a permit application under this exception, the applicant shall obtain an exemption based on insufficient funding from DDOE pursuant to Section 302.12.
2. Where a *project* for Educational Group E occupancy is located in only a portion of a building, then only that portion of the building that is the subject of the *project* shall comply with this Section 302.3.4.

302.3.5 Terminology. Where the term "gross floor space" is used in the Green Building Act, the term shall mean *gross floor area*.

302.4 LEED standards. Applicants, in consultation with the U.S. Green Building Council (USGBC) listed in Chapter 12, shall utilize one or more of the following LEED standards listed in Chapter 12, as appropriate for the type of *project* or occupancy.

1. Building Design and Construction.
2. Interior Design and Construction.
3. Homes.

302.4.1 LEED version. An applicant for permits subject to Sections 302.2.2 through 302.2.7 (excluding residential *projects* subject to Section 302.2.4) or Section 302.3.2 through 302.3.4 shall either register the *project* with the USGBC or shall meet the LEED requirements without USGBC registration and provide verification of compliance in accordance with alternatives 2 or 3 of Section 302.5.1.

302.4.1.1 LEED version applicable to certain projects.

302.4.1.1.1 Prior USGBC registration. Where an applicant has registered a *project* with the USGBC using an earlier version of the LEED standards listed in Section 302.4 and Chapter 12, then the applicant may elect to have verification of the *project* based upon such earlier LEED version, provided that the USGBC will continue the certification process under the earlier version.

302.4.1.1.2 Verification of compliance without USGBC registration. Where an applicant elects to meet the LEED requirements without USGBC registration, the applicant shall use the LEED standards listed in Section 302.4.

Exception: Where the applicant has engaged in at least one of the following interactions with the District of Columbia, then the applicant may elect to have verification of the *project* based upon an earlier LEED version, provided that the earliest version of the appropriate LEED standard that shall be used is the version in effect one year prior to whichever of the interactions of the applicant with the District of Columbia came first:

1. The approval of a land disposition agreement;
2. The submission of an application to the Board of Zoning Adjustment for a variance or special exception relief;
3. The submission of an application to the Zoning Commission for a planned unit development or other approval requiring Zoning Commission action;
4. The submission of an application to the Historic Preservation Review Board or Mayor's Agent for the Historic Preservation Review Board;
5. The filing of a building permit application for the primary scope of work of *project*, but not applications for other types of permits, including, but not limited to, applications for raze permits, trade permits, foundation and earthwork permits or miscellaneous; or
6. Other substantial land-use interactions with the District as determined by the *code official*.

302.4.1.2 Enterprise Green Communities version. An applicant for permits subject to Section 302.2.4 shall register the *project* with Enterprise Green Communities or with the entity that certifies compliance with an *approved* substantially equivalent standard; or, the applicant shall meet the applicable standard without registration of the *project* and provide verification of compliance in accordance with alternatives 2 or 3 of Section 302.5.1.

302.4.1.2.1 Prior registration. Where an applicant has registered a *project* with Enterprise Green Communities or with an entity that certifies compliance with an *approved* substantially equivalent standard, using an earlier version of the applicable standards than listed in Chapter 12, then the applicant may elect to have verification of the *project* based upon such earlier version, provided that the certifying organization will continue the certification process under the earlier version.

302.4.1.2.2 Verification of compliance without registration. Where an applicant elects to meet the Enterprise Green Communities Criteria (or an *approved* substantially equivalent standard) without registration, the applicant shall use the Enterprise Green Communities Criteria listed in Chapter 12 or, if applicable, the *approved* substantially equivalent standard.

Exception: Where the applicant has engaged in at least one of the interactions with the District of

Columbia listed in Section 302.4.1.1.2, then the applicant may elect to have verification of the *project* based upon an earlier version of the appropriate standard; provided, that the earliest version of the appropriate standard that shall be used is the version in effect one year prior to whichever of the interactions of the applicant with the District of Columbia listed in Section 302.4.1.1.2 came first.

302.5 Verification. Evidence that a *project* meets or exceeds the LEED standard required by Sections 302.2.2 through 302.2.7 or Sections 302.3.2 through 302.3.43, or the Enterprise Green Communities Criteria (or *approved* substantially equivalent standard) required by Section 302.2.4, shall be submitted to the *code official* within 24 calendar months after the *project's* receipt of the first certificate of occupancy issued for occupiable space in a *story above grade plane*.

302.5.1 Evidence required. For purposes of this section, verification of compliance shall be established by the following:

1. A certification by the USGBC that the *project* meets or exceeds the applicable LEED standard required by Sections 302.2.2 through 302.2.7 or Sections 302.3.2 through 302.3.43, or, if applicable, a certification by Enterprise Green Communities (or entity that certifies an *approved* substantially equivalent standard) that the *project* meets or exceeds the applicable standard required by Section 302.2.4; or
2. A determination by the *code official* that the *project* meets or exceeds the LEED standard required by Sections 302.2.2 through 302.2.7 or Section 302.3.2 through 302.3.4, or the Enterprise Green Communities Criteria (or *approved* substantially equivalent standard) required by Section 302.2.4; or
3. A certification by an *approved agency* or *approved source* that the *project* meets or exceeds the LEED standard required by Sections 302.2.2 through 302.2.7 or Section 302.3.2 through 302.3.4, or the Enterprise Green Communities Criteria (or *approved* substantially equivalent standard) required by Section 302.2.4.

302.5.2 Extension. The *code official*, for good cause and upon written request, is authorized to extend the period for verification of compliance for up to three consecutive one-year periods.

302.6 Financial security. Before issuance of the first certificate of occupancy for occupiable space in a *story above grade plane* of a privately-owned project subject to the provisions of Sections 302.3.2 through 302.3.4, the applicant shall provide to the *code official* evidence of financial security to cover the amount of fine that would be imposed under the Green Building Act for non-compliance with the provisions of Sections 302.3.2 through 302.3.4.

302.6.1 Amount of financial security. The amount of the potential fine on a project, and thus the amount of financial security, shall be as follows:

1. $7.50 per square foot of *gross floor area* of construction if the *project* is less than 100,000 square feet (9290 m^2) of *gross floor area* of the *project*.
2. $10.00 per square foot of *gross floor area* of construction if the *project* is equal to or greater than 100,000 square feet (9290 m^2) of *gross floor area* of the *project*.

The amount of a fine for non-compliance under this sub-section, and thus the amount of security, shall not exceed three million dollars ($3,000,000). When applying the provisions of this Section 302.6 to interior construction of a mixed use space in a residential project covered by Section 302.3.3, the *gross floor area* of the *project* shall be deemed to mean the contiguous *gross floor area*, exclusive of common space, of the non-residential occupancies. The amount of this fine shall be subject to modification based upon the form of security for performance as provided for in Sections 302.6.2.1 through 302.6.2.3.

302.6.2 Security for performance/form of delivery. The financial security requirement shall be met through one of the following four methods:

302.6.2.1 Cash. If this option is elected, cash shall be deposited in an escrow account in a financial institution in the District in the names of the *applicant* and the District. A copy of a binding escrow agreement of the financial institution shall be submitted to the *code official* in a form satisfactory to the Office of the Attorney General, which provides that the funds can be released upon direction of the District where remitted pursuant to Section 302.7. If cash is used as the financial security, the amount of the financial security posted shall be discounted by 20 percent.

302.6.2.2 Irrevocable letter of credit. If this option is elected, an irrevocable letter of credit benefitting the District shall be submitted to the *code official* in a form satisfactory to the Office of the Attorney General from a financial institution authorized to do business in the District. The irrevocable letter of credit, issued by the financial institution, shall comply with applicable regulatory requirements. If an irrevocable letter of credit is used as the financial security, the amount of the financial security posted shall be discounted by 20 percent.

302.6.2.3 Bond. If this option is elected, a bond benefitting the District, which complies with applicable regulatory requirements, shall be submitted to the *code official* in a form satisfactory to the Office of the Attorney General. If a bond is used as the financial security, the amount of the financial security posted shall be discounted by 20 percent.

302.6.2.4 Binding pledge. If this option is elected, a binding pledge shall be submitted to the *code official* in a form approved by the Office of the Attorney General. The binding pledge shall be recorded as a covenant in the land records of the District against legal title to the land in which the *project* is located and shall bind the *owner* and any successors in title to pay any fines levied under Section 302.7.1.

302.7 Enforcement. Where a *project* fails to provide pursuant to Section 302.5 satisfactory verification of the *project's* compliance with the requirements of Sections 302.3.2 through 302.3.43 within the prescribed time frame and any extensions thereof granted by the *code official* pursuant to Section 302.5.2, the *code official* is authorized to draw down on the financial security submitted as cash, irrevocable letter of credit or bond, by submission by the District of the original security documentation, provided that where a binding pledge has been provided, to enforce such pledge agreement pursuant to its terms. The amounts thus drawn down from the financial security shall be deposited in the Green Building Fund set up under the Green Building Act.

302.7.1 Financial security drawdowns. If a *project* fails to provide satisfactory verification of compliance, the drawdowns of the financial security in the form of cash, irrevocable letter of credit, or bond shall be as follows:

1. Failure to provide proof of compliance within 24 calendar months after the *project's* receipt of the first certificate of occupancy for occupiable space in a *story above grade plane*: 100 percent drawdown; or
2. Miss up to three LEED points in the applicable LEED standard: 50 percent drawdown; or
3. Miss more than three LEED points in the applicable LEED standard: 100 percent drawdown.

302.7.2 Binding pledge fines. If a *project* fails to provide satisfactory verification of compliance within 24 calendar months after the *project's* receipt of the first certificate of occupancy for occupiable space in a *story above grade plane* and a binding pledge is used as the form of financial security, one or more fines shall be due and payable per the amounts set out in Section 302.6.1 as may be modified pursuant to Section 302.7.1.

302.8 Release of financial security. If, within 24 calendar months following the issuance of the first certificate of occupancy for occupiable space in a *story above grade plane*, the *project* fulfills the requirements of Section 302.5, the financial security shall be released by the District of Columbia and, as applicable, returned.

302.9 Remediation. If within 24 months after receipt of the first certificate of occupancy for occupiable space in a *story above grade plane*, or within the extension periods granted to the project per Section 302.5.2, the project does not meet the requirements of Section 302.5, the project *owner* shall, at its own cost, design and renovate the *existing building* to meet or exceed the current edition of the LEED standard for Existing Buildings: Building Operations and Maintenance at the Certified Level. The *project owner* shall submit sufficient data to the *code official* to verify compliance with this section. The *project owner* shall provide to the *code official* certification, by the *owner's registered design professional* or an *approved agency or an approved source* that the *project* complies with this section.

302.10 Additional fine. If within 48 calendar months after receipt of the first certificate of occupancy for occupiable space in a *story above grade plane*, a *project* subject to Section 302.34 fails to provide satisfactory verification in accordance with the provisions of Section 302.5 or Section 302.9, the *project owner* shall pay a monthly fine of $0.02 per square foot of *gross floor area* of the *project* to the District of Columbia. The fine shall be a civil penalty, due and payable annually. The fine shall be in addition to any fines issued under Section 302.7 and shall not be subject to the $3,000,000 limit under Section 302.6.1.

302.11 Appeals. Determinations made by the *code official* under Sections 302.2 through 302.10 may be appealed pursuant to Section 112 of the *Building Code*.

302.12 Exemptions. A request for an exemption from application of the Green Building Act, or the implementing regulations set forth in Section 302, to any *project* may be made to DDOE pursuant to the provisions of 20 DCMR Chapter 35 and D.C. Official Code § 6-1451.10 (2018 Repl.).

CHAPTER 4

SITE DEVELOPMENT AND LAND USE

SECTION 401
GENERAL

401.1 Scope and intent. This chapter provides requirements for the development and maintenance of building and building sites to minimize negative environmental impacts and to protect, restore and enhance the natural features and environmental quality of the site.

401.2 Predesign site inventory and assessment. An inventory and assessment of the natural resources and baseline conditions of the building site shall be submitted with the *construction documents*. The inventory and assessment shall:

1. Identify how soils will be prepared, amended and placed in a manner that establishes or restores the ability of the soil to support the vegetation that has been protected and that will be planted;
2. Identify *invasive plant species* on the site for removal; and
3. Identify *native plant species* on the site.

SECTION 402
[RESERVED]

SECTION 403
[RESERVED]

SECTION 404
LANDSCAPE IRRIGATION AND OUTDOOR FOUNTAINS

404.1 Landscape irrigation systems. Irrigation of exterior landscaping shall comply with Sections 404.1.1 and 404.1.2.

Exception: Projects under the jurisdiction of the *Residential Code*.

404.1.1 Water for outdoor landscape irrigation. Outdoor landscape irrigation systems shall be designed and installed to reduce potable water use by 50 percent through plant selection, water efficient irrigation technology, the elimination of a permanently installed irrigation system, and/or, where permitted by District regulation or ordinances, with *alternate onsite nonpotable water* complying with Section 1115 of the *Plumbing Code* and local regulations. Designers shall use the EPA Water Sense Interactive Water Budget Tool to determine whether the design meets the 50 percent reduction threshold.

Exceptions: *Potable* water is permitted to be used as follows:

1. During the establishment phase of newly planted landscaping and during periods of drought in excess of 30 days.
2. To irrigate food production.
3. To supplement *nonpotable* water irrigation of shade trees provided in accordance with Section 408.2.3 of the *Green Construction Code*.

404.1.2 Irrigation system design and installation. Where in-ground irrigation systems are provided, the systems shall comply with all of the following:

1. The design and installation of outdoor irrigation systems shall be under the supervision of an irrigation professional accredited or certified by an appropriate local or national body.
2. Landscape irrigation systems shall not direct water onto building exterior surfaces, foundations or exterior paved surfaces. Systems shall not generate runoff.
3. Where an irrigation control system is used, the system shall be one that regulates irrigation based on weather, climate or soil moisture data, or time of day. The controller shall have integrated or separate sensors to suspend irrigation events during rainfall.
4. Irrigation zones shall be based on plant water needs with plants of similar need grouped together. Turfgrass shall not be grouped with other plantings on the same zone.

404.2 [Reserved]

SECTION 405
MANAGEMENT OF VEGETATION, SOILS AND EROSION CONTROL

405.1 Soil and water quality protection. Soil and water quality shall be protected in accordance with Sections 405.1.1 and 405.1.4.

405.1.1 Soil and water quality protection plan. A soil and water quality protection plan shall be submitted by the owner or the owner's authorized agent and *approved* prior to construction. The protection plan shall address the following:

1. A soils map, site plan, or grading plan that indicates designated soil management areas for all site soils, including, but not limited to:
    1.1. Soils that will be retained in place and designated as vegetation and soil protection areas.
    1.2. Topsoils that will be stockpiled for future reuse and the locations for the stockpiles.
    1.3. Soils that will be disturbed during construction and plans to restore disturbed soils and underlying subsoils to soil reference conditions.

1.4. Soils that will be restored and re-vegetated.

1.5. Locations for all laydown and storage areas, parking areas, haul roads and construction vehicle access, temporary utilities and construction trailer locations.

1.6. Treatment details for each zone of soil that will be restored, including the type, source and expected volume of materials, including compost amendments, mulch and topsoil.

1.7. A narrative of the measures to be taken to ensure that areas not to be disturbed and areas of restored soils are protected from compaction by vehicle traffic or storage, erosion, and contamination until project completion.

2. A written periodic maintenance protocol for landscaping, including, but not limited to:

2.1. A schedule for periodic watering of new planting that reflects different water needs during the establishment phase of new plantings as well as after establishment. Where development of the building site changed the amount of water reaching the preserved natural resource areas, include appropriate measures for maintaining the natural areas.

2.2. A schedule for the use of fertilizers appropriate to the plants species, local climate and the pre-establishment and post-establishment needs of the installed landscaping. Nonorganic fertilizers shall be discontinued following plant establishment.

405.1.2 [Reserved]

405.1.3 [Reserved]

405.1.4 Soil reuse and restoration. Soils that are being placed or replaced on a *building site* shall be prepared, amended and placed in a manner that establishes or restores the ability of the soil to support the vegetation that has been protected and that will be planted. Soil reuse and restoration shall be in accordance with Sections 405.1.4.1 and 405.1.4.2.

405.1.4.1 Preparation. Before placing stockpiled or imported topsoils, compliance with all of the following shall occur:

1. Areas shall be cleared of debris including, but not limited to, *building* materials, plaster, paints, road base type materials, petroleum based chemicals, and other harmful materials;
2. Areas of construction-compacted subsoil shall be scarified; and
3. The first lift of replaced soil shall be mixed into this scarification zone to improve the transition between the subsoil and overlying soil horizons.

Exceptions: Scarification is prohibited in all of the following locations:

1. Where scarification would damage existing tree roots.
2. On inaccessible slopes.
3. On or adjacent to trenching and drainage installations.
4. On areas intended by the design to be compacted such as abutments, footings, and inslopes.
5. *Brownfields*.
6. Other locations where scarification would damage existing structures, utilities and vegetation being preserved.

405.1.4.2 Restoration. Soils disturbed during construction shall be restored in areas that will not be covered by buildings, structures or hardscapes. Soil restoration shall comply with Items 1 and 2:

1. **Organic matter.** To provide appropriate organic matter for plant growth and for water storage and infiltration, soils shall be amended with a mature, stable compost material so that not less than the top 12 inches (305 mm) of soil contains not less than 3 percent organic matter. Sphagnum peat or organic amendments that contain sphagnum peat shall not be used. Soil organic matter shall be determined in accordance with ASTM D2974. Organic materials selected for onsite amendment or for blending of imported soils shall be renewable within a 50-year cycle.

Exception: Where the reference soil for a building site has an organic level depth other than 12 inches (305 mm), soils shall be amended to organic matter levels and organic matter depth that are comparable to the site's reference soil.

2. **Additional soil restoration criteria.** In addition to compliance with Item 1 Organic Matter, soil restoration shall comply with not less than three of the following criteria:

2.1. **Compaction.** Bulk densities within the root zone shall not exceed the densities specified in Table 405.1.4 and shall be measured using a soil cone penetrometer in accordance with ASAE S313.3. The root zone shall be not less than 12 inches (305 mm), nor less than the site's reference soil, whichever results in the greater depth of measurement. Data derived from

a soil cone penetrometer shall be reported in accordance with ASAE EP542.

2.2. **Infiltration rates.** Infiltration rates or saturated hydraulic conductivity of the restored soils shall be comparable to the site's reference soil. Infiltration rates shall be determined in accordance with ASTM D3385 or ASTM D5093. For sloped areas where the methods provided in the referenced standards cannot be used successfully, alternative methods *approved* by the *code official* shall be permitted provided that the same method is used to test both reference soil and onsite soil.

2.3. **Soil biological function.** Where remediated soils are used, the biological function of the soils' mineralizable nitrogen shall be permitted as a proxy assessment of biological activity.

2.4. **Soil chemical characteristics.** Soil chemical characteristics appropriate for plant growth shall be restored. The pH, cation exchange capacity and nutrient profiles of the original undisturbed soil or the site's reference soil shall be similar in restored soils. Salinity suitable for regionally appropriate vegetation shall be established. Soil amendments and fertilizers shall be selected from those which minimize nutrient loading to waterways or groundwater.

TABLE 405.1.4
MAXIMUM CONE PENETROMETER READINGS

SURFACE RESISTANCE (PSI)		SUBSURFACE RESISTANCE (PSI)	
All Textures Sand	Sand (includes loamy sand, sandy loam, sandy clay loam, and sandy clay)	Silt (includes loam, silt loam, silty clay loam, and silty clay)	Clay (includes clay loam)
110	260	260	225

405.1.5 [Reserved]

405.1.6 [Reserved]

405.2 Invasive plant species. *Invasive plant species* shall not be planted on a building site. Containment or removal of any *invasive plant species* currently on the site is required.

405.3 Native plant landscaping. Where new landscaping is installed as part of a site plan or within the building site, not less than 50 percent of the newly landscaped area shall be planted with native plant species.

Exceptions:

1. Locations where non-native plant species are required by laws or regulations of the District of Columbia;
2. Vegetative roofs for buildings or structures; or
3. Trees.

SECTION 406
BUILDING SITE WASTE MANAGEMENT

406.1 Building site waste management requirements. Not less than 75 percent of the land-clearing debris from a building site shall be diverted from landfills. Land-clearing debris includes rock, trees, stumps and associated vegetation. The building site development shall comply with the following additional requirements:

1. The effective destruction and disposal of *invasive plant species*.
2. Where the site is located in a federal or state designated quarantine zone for invasive insect species, building site vegetation management shall comply with the quarantine rules.
3. Receipts or other documentation related to diversion shall be maintained through the course of construction. When requested by the *code official*, evidence of diversion shall be provided.

406.2 Construction waste. Construction materials and waste and hardscape materials removed during site preparation shall be managed in accordance with Section 503.

406.3 Verification. Prior to issuance of the first certificate of occupancy for occupiable space in a *story above grade plane*, or prior to final inspection, if a new certificate of occupancy is not required, the *Department* is authorized to require the *owner*, contractor or an *approved agency* to provide verification of the project's compliance with Section 406.1.

SECTION 407
TRANSPORTATION IMPACT

407.1 [Reserved]

407.2 [Reserved]

407.3 [Reserved]

407.4 Preferred vehicle parking. Preferred parking spaces required by this section shall be those in the parking facility that are located on the shortest route of travel from the parking facility to a building entrance, but shall not take precedence over parking spaces that are required to be accessible in accordance with the *Building Code*. Where buildings have multiple entrances with adjacent parking, parking spaces required by this section shall be dispersed and located near the entrances. Such parking spaces shall be provided with approved signage that specifies the permitted usage. Parking spaces equipped with *electric vehicle supply equipment* will be considered preferred vehicle parking locations for purposes of this requirement.

407.4.1 Low-emission, hybrid, and electric vehicle parking. Where parking is provided for a building that has a total building floor area greater than 10,000 square feet (929 m^2) and that has a building occupant load greater than 300, at least 5 percent of the parking spaces provided, but

not less than two spaces, shall be designated as preferred parking for low emission, hybrid, and *electric vehicles*.

SECTION 408
HEAT ISLAND MITIGATION

408.1 General. The heat island effect of building and building site development shall be mitigated in accordance with Sections 408.2.

408.2 Site hardscape. In climate zones 1 through 6, as established in the *Energy Conservation Code*, not less than 50 percent of the site hardscape shall be provided with one or any combination of options described in Sections 408.2.1 through 408.2.4. For the purposes of this section, site hardscape shall not include areas of the site covered by solar photovoltaic arrays or solar thermal collectors.

408.2.1 Site hardscape materials. Hardscape materials shall have an initial solar reflectance value of not less than 0.30 in accordance with ASTM E1918 or ASTM C1549.

Exception: The following materials shall be deemed to comply with this section and need not be tested:

1. Pervious and permeable concrete pavements.
2. Concrete paving without added color or stain.

408.2.2 Shading by structures. Where shading is provided by a building or structure or a building element or component, such building, structure, component or element shall comply with all of the following:

1. Where open trellis-type, free-standing structures such as, but not limited to, covered walkways, and trellises or pergolas, are covered with native plantings, the plantings shall be designed to achieve mature coverage within 5 years; and
2. Shade provided onto the hardscape by an adjacent building or structure located on the same lot shall be calculated and credited toward compliance with this section based on the projected peak sun angle on the summer solstice.

408.2.3 Shading by trees. Where shading is provided by trees, such trees shall be selected and placed in accordance with all of the following:

1. Trees selected shall be those that are native or adaptive to, the region and climate zone in which the project site is located. *Invasive plant species* shall not be selected. Plantings shall be selected and sited to produce a hardy and drought resistant vegetated area;
2. Construction documents shall be submitted that show the planting location and anticipated ten year canopy growth of trees and that show the contributions of existing tree canopies; and
3. Shading calculations shall be shown on the construction documents demonstrating compliance with this section and shall include only those hardscape areas directly beneath the trees based on a ten year growth canopy. Duplicate shading credit shall not be granted for those areas where multiple trees shade the same hardscape.

408.2.4 Pervious and permeable pavement. Pervious and permeable pavements including open grid paving systems and open-graded aggregate systems shall have a percolation rate not less than 2 gallons per minute per square foot (100 L/min × m^2). Pervious and permeable pavement shall be permitted where the use of these types of hardscapes does not interfere with fire and emergency apparatus or vehicle or personnel access and egress, utilities, or telecommunications lines. Aggregate used shall be of uniform size.

408.3 [Reserved]

SECTION 409
SITE LIGHTING

409.1 Light pollution control. Uplight, light trespass, glare, and color temperature shall be limited for all exterior lighting equipment as described in Sections 409.2, 409.3, and 409.4. The provisions of this section shall only apply to new construction and Level 3 *alterations* complying with the applicable requirements of the *Existing Building Code*.

Exceptions: Lighting used for the following exterior applications is exempt where equipped with a control device independent of the control of the non-exempt lighting:

1. Specialized signal, directional signage, and marker lighting associated with transportation or premises way-finding.
2. Signage that complies with lighting requirements set forth in regulations adopted pursuant to the *Sign Legislation*.
3. Lighting integral to equipment or instrumentation and installed by its manufacturer.
4. Theatrical purposes, including performance, stage, film production, and video production.
5. Athletic playing areas where lighting is equipped with hoods or louvers for glare control, provided that they are fully shielded and emit no light above the horizontal plane of the hood.
6. Temporary lighting.
7. Lighting for industrial production, material handling, transportation sites, and associated storage areas where lighting is equipped with hoods or louvers for glare control, provided that they are fully shielded and emit no light above the horizontal plane of the hood.
8. Theme elements in theme and amusement parks.
9. Roadway lighting required by governmental authorities.
10. Lighting used to highlight features of public monuments and registered landmark structures.
11. Lighting classified for and used in hazardous areas.

12. Lighting for swimming pools and water features.
13. Lighting for the national flag in lighting zones 2, 3 and 4.
14. Required exit signs and exterior means of egress illumination.

409.1.1 Exterior lighting zones. The lighting zone for the building site shall be determined from Table 409.1.1 as clarified by *Administrative Bulletins*.

[E] TABLE 409.1.1
EXTERIOR LIGHTING ZONES

LIGHTING ZONE	DESCRIPTION
1	Developed areas of national parks, state parks, forest land and rural areas
2	Areas predominantly consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use and residential mixed use areas
3	All other areas (not included in other zones)
4	High-activity commercial districts

409.2 Uplight. Exterior lighting shall comply with the requirements of Table 409.2 for the exterior lighting zones (LZ) appropriate to the *building site*.

Exception: Lighting used for the following exterior applications shall be exempt from the requirements of Table 409.2.

1. Lighting for *building* façades, landscape features, and public monuments in exterior lighting zones 3 and 4.
2. Lighting for *building* façades in exterior lighting zone 2.
3. Lighting installed below canopies.
4. Lighting for flag poles.

TABLE 409.2
UPLIGHT RATINGS[a, b]

	LIGHTING ZONE (LZ)			
	1	2	3	4
Maximum luminaire uplight rating	U0	U1	U2	U3

a. Uplight ratings (U) are defined by IESNA TM-15-07 Addendum A.
b. The rating shall be determined by the actual photometric geometry in the specified mounting orientation.

409.3 Light trespass and glare. Where luminaires are mounted on buildings with their backlight oriented towards the building, such luminaires shall not exceed the applicable glare ratings specified in Table 409.3(1). Other exterior luminaires shall not exceed the applicable backlight and glare ratings specified in Table 409.3(2).

Table 409.3(1)
MAXIMUM GLARE RATINGS FOR BUILDING MOUNTED LUMINAIRES WITH THE BACKLIGHT ORIENTED TOWARDS THE BUILDING[a, b]

HORIZONTAL DISTANCE TO LIGHTING BOUNDARY (H_{LB})	LIGHTING ZONE (LZ)			
	1	2	3	4
$H_{LB} > 2\ h_m$	G1	G2	G3	G4
$h_m < H_{LB} \le 2\ h_m$	G0	G1	G1	G2
$0.5\ h_m \le H_{LB} \le h_m$	G0	G0	G1	G1
$H_{LB} < 0.5\ h_m$	G0	G0	G0	G1

h_m = Mounting height: The distance above finished grade at which a luminaire is mounted, measured to the midpoint of the luminaire.
a. Glare (G) ratings are defined by IESNA TM-15-07 Addendum A.
b. The rating shall be determined by the actual photometric geometry in the specified mounting orientation.

Table 409.3(2)
MAXIMUM ALLOWABLE BACKLIGHT AND GLARE RATINGS[a, b, c]

HORIZONTAL DISTANCE TO LIGHTING BOUNDARY (H_{LB})	LIGHTING ZONE (LZ)			
	1	2	3	4
$H_{LB} > 2\ h_m$	B3 G1	B4 G2	B5 G3	B5 G4
$h_m < H_{LB} \le 2\ h_m$	B2 G1	B3 G2	B4 G3	B4 G4
$0.5\ h_m \le H_{LB} \le h_m$	B1 G1	B2 G2	B3 G3	B3 G4
$H_{LB} < 0.5\ h_m$	B0 G1	B0 G2	B1 G3	B2 G4

h_m = Mounting height: The distance above finished grade at which a luminaire is mounted, measured to the midpoint of the luminaire.
a. Backlight (B) and glare (G) ratings are defined by IESNA TM-15-07 Addendum A.
b. Luminaires located two mounting heights or less from the *lighting boundary* shall be installed with backlight towards the nearest *lighting boundary*, unless lighting a roadway, bikeway or walkway that intersects a public roadway.
c. The rating shall be determined by the actual photometric geometry in the specified mounting orientation.

409.4 Color temperature. Maximum color temperature for lights complying with Section 409 shall be 3000 degrees Kelvin or lower.

CHAPTER 5

MATERIAL RESOURCE CONSERVATION AND EFFICIENCY

SECTION 501
GENERAL

501.1 Scope. The provisions of this chapter shall govern matters related to building material conservation, resource efficiency and environmental performance.

SECTION 502
CONSTRUCTION MATERIAL MANAGEMENT

502.1 Construction material management. Construction material management shall comply with Sections 502.1.1 and 502.1.2.

502.1.1 Storage and handling of materials. Materials stored and handled onsite during construction phases shall comply with the applicable manufacturer's printed instructions. Where manufacturer's printed instructions are not available, *approved* standards or guidelines shall be followed.

502.1.2 Construction phase moisture control. Porous or fibrous materials and other materials subject to moisture damage shall be protected from moisture during the construction phase. Material damaged by moisture or that are visibly colonized by fungi either prior to delivery or during the construction phase shall be cleaned and dried or, where damage cannot be corrected by such means, shall be removed and replaced.

SECTION 503
CONSTRUCTION WASTE MANAGEMENT

503.1 Construction material and waste management requirements. Not less than 50 percent of nonhazardous construction waste shall be diverted from disposal, by recycling or salvage of construction materials and waste.

The *owner*, contractor or *approved agency* shall maintain receipts and other documentation through the course of construction relating to diversion. The percentage of materials diverted shall be calculated by weight or volume, but not both. For the purposes of this section, construction materials and waste shall include, but are not limited to (1) all materials delivered to the site and intended for installation prior to the issuance of the certificate of occupancy, including related packaging; and (2) construction materials and waste removed during *demolition* or *razing*. Construction and waste materials shall not include land-clearing debris. Land-clearing debris shall include trees, stumps, rocks, and vegetation and shall be managed in accordance with Section 406.1.

503.2 Verification. Prior to issuance of the first certificate of certificate of occupancy for occupiable space in a *story above grade plane*, or prior to final inspection, if a new certificate of occupancy is not required, the *Department* is authorized to require the *owner*, contractor or an *approved agency* to provide verification of the project's compliance with Section 503.1. When requested by the *code official*, evidence of diversion shall be provided, which may include, but is not limited to, hauling receipts.

SECTION 504
[RESERVED]

SECTION 505
MATERIAL SELECTION

505.1 Material selection and properties. For projects that are 25,000 square feet (2323 m^2) and larger, building materials shall conform to Section 505.2, 505.3 or 505.4.

Exception: Electrical, mechanical, plumbing, security and fire detection, and alarm equipment and controls, automatic fire sprinkler systems, elevators and conveying systems shall not be required to comply.

505.2 Reduced impact materials. The *building project* shall comply with any two of the following: Section 505.2.1, 505.2.2, or 505.2.3. Calculations shall only include materials *permanently installed* in the project. A value of 45 percent of the total construction cost shall be permitted to be used in lieu of the actual total cost of materials.

505.2.1 Recycled content and salvaged material content. The sum of the *recycled content* and the *salvaged material* content shall constitute a minimum of 30 percent, based on cost, of the total materials in the *building project*.

505.2.1.1 Recycled content. The *recycled content* of a material shall be the *postconsumer recycled content* plus one-half of the *preconsumer recycled content*, determined by weight (mass). The recycled fraction of the material in a product or an assembly shall then be multiplied by the cost of the product or assembly to determine its contribution to the requirement.

The annual average industry values, by country of production, for the *recycled content* of steel products manufactured in basic oxygen furnaces and electric arc furnaces shall be permitted to be used as the *recycled content* of the steel. For the purpose of calculating the *recycled content* contribution of concrete, the constituent materials in concrete (e.g., the cementitious materials, aggregates, and water) shall be permitted to be treated as separate components and calculated separately.

505.2.1.2 Salvaged material content. The *salvaged material* content shall be determined based on the actual cost of the *salvaged material* or the cost of a comparable alternative component material.

505.2.2 Regional materials. A minimum of 40 percent of building materials or products used, based on cost, shall be regionally extracted/harvested/recovered and manufactured within a radius of 500 miles (800 km) of the project *site*. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.

Exception: For building materials or products shipped in part by rail or water, the total distance to the project shall be determined by weighted average, whereby that portion of the distance shipped by rail or water shall be multiplied by 0.25 and added to that portion not shipped by rail or water, provided that the total does not exceed 500 miles (800 km).

505.2.3 Biobased products. A minimum of 5 percent of building materials used, based on cost, shall be *biobased* products. *Biobased products* shall:

1. Comply with the minimum biobased contents of the USDA's BioPreferred Program;
2. Contain the "USDA Certified *Biobased Product*" label; or
3. Be composed of solid wood, engineered wood, bamboo, wool, cotton, cork, agricultural fibers, or other biobased materials with at least 50 percent biobased content.

505.2.3.1 Wood building components. Wood building components, including but not limited to structural framing, sheathing, flooring, subflooring, wood window sash and frames, doors, and architectural millwork, used to comply with this requirement shall contain not less than 60 percent certified wood content tracked through a chain of custody process, either by physical separation or percentage-based approaches, or wood that qualifies as a *salvaged material*. Certified wood content shall be certified by the Forest Stewardship Council. Wood building components from a *vendor* shall be permitted to comply when the annual average amount of certified wood products purchased by the *vendor*, for which they have chain of custody *verification* not older than two years, is 60 percent or greater of their total annual wood products purchased.

505.3 Whole building life cycle assessment. Life cycle assessment shall conform to the requirements of ASTM E2921. The requirements for the execution of a whole building life cycle assessment shall be performed in accordance with the following:

1. The assessment shall demonstrate that the building project achieves not less than a 20 percent improvement in environmental performance for global warming potential and at least two (2) of the following impact measures, as compared to a reference design of similar usable floor area, function and configuration that meets the minimum energy requirements of this code and the structural requirements of the *Building Code*. For relocatable buildings, the reference design shall be comprised of the number of reference buildings equal to the estimated number of uses of the relocatable building.
   1.1. Primary energy use.
   1.2. Acidification potential.
   1.3. Eutrophication potential.
   1.4. Ozone depletion potential.
   1.5. Smog potential.
2. The life cycle assessment tool shall be *approved* by the *code official*.
3. Building operational energy shall be included. For relocatable buildings, an average building operational energy shall be estimated to reflect potential changes in location, siting, and configuration by adding or subtracting modules, or function.
4. For relocatable buildings, average transportation energy, material and waste generation associated with reuse of relocatable buildings shall be included in the assessment.

505.4 Multi-attribute material declaration and certification. Not less than 25 percent of the total building materials used in the project, based on cost, shall comply with Section 505.4.1 or 505.4.2. Where a material complies with both Sections 505.4.1 and 505.4.2, the material value shall be multiplied by two.

505.4.1 Environmental product declaration. A building material with a Type III environmental product declaration that is verified by a program operator. The environmental product declaration shall comply with the provisions of ISO 14025 and ISO 21930 and be externally verified.

505.4.2 Multi-attribute standard. A material specific assessment that is verified by an approved agency shall be submitted for each product in accordance with the following standards, as applicable. The assessment shall be verified as meeting the minimum performance level specified in each standard, which focuses on the life-cycle stages from development to end of life. These stages shall include material selection, energy and water use during development, performance, human and environmental impact, and end of life.

1. NSF/ANSI 140 for carpet.
2. NSF/ANSI 332 for resilient floor coverings.
3. NSF/ANSI 336 for commercial furnishings fabric.
4. NSF/ANSI 342 for wall coverings.
5. NSF/ANSI 347 for single-ply roofing membranes.
6. NSC 373 for natural dimension stone.
7. TCNA ANSI/A138.1 for ceramic tiles, glass tiles, and tile installation materials.
8. UL 100 for gypsum boards and panels.
9. UL 102 for door leafs.

SECTION 506
LAMPS

506.1 Low mercury lamps. The mercury content in lamps shall comply with Section 506.2 or 506.3.

Exception: Appliance, black light, bug, colored, germicidal, plant, shatter-resistant/shatterproof/shatterprotected, showcase, UV, T-8 and T-12 lamps with a color rendering index of 87 or higher, lamps with RDC bases, and lamps used for special-needs lighting for individuals with exceptional needs.

506.2 Straight fluorescent lamps. Straight, double-ended fluorescent lamps less than 6 feet (1829 mm) in nominal length and with bi-pin bases shall contain not more than 5 milligrams of mercury per lamp.

Exception: Lamps with a rated lifetime greater than 22,000 hours at 3 hours per start operated on an ANSI reference ballast shall not exceed 8 milligrams of mercury per lamp.

506.3 Compact fluorescent lamps. Single-ended pin-base and screw-base compact fluorescent lamps shall contain not more than 5 milligrams of mercury per lamp, and shall be listed and labeled in accordance with UL 1993.

Exception: Lamps rated at 25 watts or greater shall contain not more than 6 milligrams of mercury per lamp.

SECTION 507
[RESERVED]

CHAPTER 6

[RESERVED]

CHAPTER 7

WATER RESOURCE CONSERVATION, QUALITY AND EFFICIENCY

SECTION 701
GENERAL

701.1 Scope. The provisions of this chapter shall establish the means of conserving water, protecting water quality and providing for safe water consumption.

SECTION 702
FIXTURES, FITTINGS, EQUIPMENT AND APPLIANCES

702.1 Fitting and fixture consumption. Fixtures shall comply with Table 702.1.

TABLE 702.1
MAXIMUM FIXTURE AND FITTING FLOW RATES FOR REDUCED WATER CONSUMPTION

FIXTURE OR FIXTURE FITTING TYPE	MAXIMUM FLOW RATE
Showerhead[a]	2.0 gpm and WaterSense labeled
Lavatory faucet and bar sink—private	1.5 gpm and WaterSense labeled
Lavatory faucet—public (metered)	0.25 gpc[b]
Lavatory faucet—public (nonmetered)	0.5 gpm
Kitchen faucet—private	1.8 gpm
Kitchen and bar sink faucets in other than dwelling units and guestrooms	1.8 gpm
Urinal	0.5 gpf and WaterSense labeled or nonwater urinal
Water closet—public	1.28 gpf average[c]
Water closet—tank type, private	1.28 gpf and WaterSense labeled[c]
Water closet—flushometer type, private	1.28 gpf
Prerinse spray valves	1.3 gpm and WaterSense labeled
Drinking fountains (manual)	0.7 gpm
Drinking fountains (metered)	0.25 gpc[b]

For SI: 1 foot = 304.8 mm, 1 gallon per cycle (gpc) = 3.8 Lpc, 1 gallon per flush (gpf) = 3.8 Lpf, 1 gallon per minute (gpm) = 3.8 Lpm.

a. Includes hand showers, body sprays, rainfall panels and jets. Showerheads shall be supplied by automatic compensating valves that comply with ASSE 1016 or ASME A112.18.1/CSA B125.1 and that are specifically designed to function at the flow rate of the showerheads being used.

b. Gallons per cycle of water volume discharged from each activation of a metered faucet.

c. The effective flush volume for a dual-flush water closet is defined as the composite, average flush volume of two reduced flushes and one full flush.

702.2 Combination tub and shower valves. Tub spout leakage from combination tub and shower valves that occurs when the outlet flow is diverted to the shower shall not exceed 0.1 gpm, measured in accordance with the requirements of ASME A112.18.1/CSA B125.1.

702.3 Food establishment prerinse spray valves. Food establishment prerinse spray valves shall have a maximum flow rate in accordance with Table 702.1 and shall shut off automatically when released.

702.4 Drinking fountain controls. Drinking fountains equipped with manually controlled valves shall shut off automatically upon the release of the valve. Metered drinking fountains shall comply with the flow volume specified in Table 702.1.

702.5 Nonwater urinal connection. The fixture drain for nonwater urinals shall connect to a branch drain that serves one or more lavatories, water closets or water-using urinals that discharge upstream of such urinals.

702.6 Appliances. Sections 702.6.1 through 702.6.4 shall regulate appliances that are not related to space conditioning.

702.6.1 Clothes washers. Clothes washers of the type in the ENERGY STAR program as defined in "ENERGY STAR® Program Requirements, Product Specification for Clothes Washers, Eligibility Criteria," shall have a water factor (WF) not exceeding 6.0 and a *modified energy factor* (MEF) of not less than 2.0.

702.6.2 Ice makers. Ice makers producing cubed-type ice shall be ENERGY STAR qualified as commercial ice machines. Ice makers of a type not currently ENERGY STAR qualified, such as flake, nugget or continuous-type ice makers, shall not exceed the total water use of 25 gallons per 100 pounds (208 L per 100 kg) of ice produced.

Exception: Under counter ice makers.

702.6.3 Steam cookers. Steam cookers with drain connections shall consume no more than 5 gal (18.9 L)/hour/pan, and those without drain connections shall consume no more than 2 gal (7.6 L)/hour/pan.

702.6.4 Dishwashers. Dishwashers shall be ENERGY STAR qualified where an ENERGY STAR category exists for the specific dishwasher type. Where an ENERGY STAR category does not exist, the dishwasher shall be in accordance with Table 702.6.4.

TABLE 702.6.4
MAXIMUM WATER CONSUMPTION FOR COMMERCIAL DISHWASHERS

DISHWASHER TYPE	MAXIMUM WATER CONSUMPTION
Rackless conveyor	2.2 gallons per minute
Utensil washer	2.2 gallons per rack

For SI: 1 gallon per minute = 3.785 Lpm.

702.7 [Reserved]

702.8 Efficient hot and tempered water distribution. Hot and tempered water distribution shall comply with either the maximum pipe length or maximum pipe volume limits in this section. Hot and tempered water shall be delivered to the outlets of individual showers, combination tub-showers, sinks,

lavatories, dishwashers, washing machines and hot water hose bibbs in accordance with Section 702.8.1 or Section 702.8.2. For purposes of this section, references to pipe shall include tubing. For purposes of this section, the source of hot or tempered water shall be considered to be a water heater, boiler, circulation loop piping or electrically heat-traced piping.

702.8.1 Maximum allowable pipe length method. The maximum allowable pipe length from the source of hot or tempered water to the termination of the fixture supply pipe shall be in accordance with the maximum pipe length columns in Table 702.8.2. Where the length contains more than one size of pipe, the largest size shall be used for determining the maximum allowable length of the pipe in Table 702.8.2.

702.8.2 Maximum allowable pipe volume method. The water volume in the piping shall be calculated in accordance with Section 702.8.2.1. The maximum volume of hot or tempered water in the piping to public lavatory faucets, metering or nonmetering, shall be 2 ounces (0.06 L). For fixtures other than public lavatory faucets, the maximum volume shall be 64 ounces (1.89 L) for hot or tempered water from a water heater or boiler; and 24 ounces (0.7 L) for hot or tempered water from a circulation loop pipe or an electrically heat-traced pipe.

702.8.2.1 Water volume determination. The volume shall be the sum of the internal volumes of pipe, fittings, valves, meters and manifolds between the source of hot water and the termination of the fixture supply pipe. The volume shall be determined from the liquid ounces per foot column of Table 702.8.2. The volume contained within fixture shutoff valves, flexible water supply connectors to a fixture fitting, or within a fixture fitting shall not be included in the water volume determination. Where hot or tempered water is supplied by a circulation loop pipe or an electrically heat-traced pipe, the volume shall include the portion of the fitting on the source pipe that supplies water to the fixture.

702.9 [Reserved]

702.10 Water-powered pumps. Water-powered pumps shall not be used as the primary means of removing ground water from sumps. Where used as an emergency backup pump for the primary pump, the primary pump shall be an electrically powered pump and the water-powered pump shall be equipped with an auditory alarm that indicates when the water-powered pump is operating. The alarm shall have a minimum sound pressure level rating of 85 dB measured at a distance of 10 feet (3048 mm). Where water-powered pumps are used, they shall have a water-efficiency factor of pumping not less than 2 gallons (7.6 L) of water to a height of 8 feet (2438 mm) for every 1 gallon (3.8 L) of water used to operate the pump, measured at a water pressure of 60 psi (413.7 kPa). Pumps shall be clearly marked as to the gallons (liters) of water pumped per gallon (liters) of potable water consumed.

702.11 [Reserved]

702.12 Dipper wells. The water supply to a dipper well shall have a shutoff valve and flow control valve. Water flow into a dipper well shall not exceed 1 gpm (3.78 Lpm) at a supply pressure of 60 psi (413.7 kPa).

702.13 Automated vehicle wash facilities. Not less than 50 percent of the water used for the rinsing phase of the wash cycle at automated vehicle wash facilities shall be collected to be reused for the washing phase. Towel and chamois washing machines shall have high-level water cutoffs.

702.13.1 Nonpotable water use. Except for water recirculated within the facility, potable and nonpotable water use for automobile washing shall not exceed 40 gallons (151 L) per vehicle for in-bay automatic washing, and 35 gallons (132.5 L) per vehicle for conveyor and express type car washing.

Exception: Bus and large commercial vehicle washing facilities.

TABLE 702.8.2
MAXIMUM LENGTH OF PIPE OR TUBE

NOMINAL PIPE OR TUBE SIZE (inch)	LIQUID OUNCES PER FOOT OF LENGTH	MAXIMUM PIPE OR TUBE LENGTH		
		System without a circulation loop or heat-traced line (feet)	System with a circulation loop or heat-traced line (feet)	Lavatory faucets – public (metering and nonmetering) (feet)
1/4[a]	0.33	50	16	6
5/16[a]	0.5	50	16	4
3/8[a]	0.75	50	16	3
1/2	1.5	43	16	2
5/8	2	32	12	1
3/4	3	21	8	0.5
7/8	4	16	6	0.5
1	5	13	5	0.5
1 1/4	8	8	3	0.5
1 1/2	11	6	2	0.5
2 or larger	18	4	1	0.5

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m, 1 ounce = 29.6 ml.

a. The flow rate for 1/4-inch size pipe or tube is limited to 0.5 gallons per minute; for 5/16-inch size, it is limited to 1 gpm; for 3/8-inch size, it is limited to 1.5 gpm.

702.14 Self-service vehicle wash facilities. Spray wand nozzles used at self-service vehicle wash facilities shall discharge not more than 3 gpm (11.4 Lpm). Faucets for chamois wringer sinks shall be of the self-closing type.

702.15 Vehicle washing facilities. Waste water from reverse osmosis water treatment systems installed in vehicle washing facilities shall discharge to the washing phase water holding tank.

702.16 Food waste disposers. The water flow into a commercial food waste disposer in a food establishment shall be controlled by a load-sensing device such that the water flow does not exceed 1 gpm (3.78 Lpm) under no-load operating conditions and 8 gpm (30.2 Lpm) under full-load operating conditions.

702.17 [Reserved]

702.18 [Reserved]

702.19 [Reserved]

702.20 [Reserved]

SECTION 703
HVAC SYSTEMS AND EQUIPMENT

703.1 [Reserved]

703.2 [Reserved]

703.3 [Reserved]

703.4 Condensate drainage recovery. For new construction and Level 3 *alteration* projects with individual HVAC equipment that is 20 tons or larger, and where a water reclamation system is being installed or already in place to collect and reuse condensate, condensate shall be collected and reused onsite for applications such as, but not limited to, water features, fountains, green roofs, graywater collection systems and rainwater collection systems

703.5 Heat exchangers. Once-through cooling shall be prohibited. Heat exchangers shall be connected to a recirculating water system such as a chilled water loop, cooling tower loop or similar recirculating system.

703.6 [Reserved]

703.7 Cooling towers, evaporative condensers and fluid coolers. Cooling towers, evaporative condensers, and fluid coolers shall be installed in accordance with the requirements of Section 908 of the *Mechanical Code*.

703.7.1 Location. Cooling towers, evaporative condensers and fluid coolers shall be located on the property as required for buildings in accordance with the *Building Code* and shall be located so as to prevent the discharge vapor plumes from entering occupied spaces. Plume discharges shall be not less than 5 feet (1524 mm) above and 20 feet (6096 mm) away from any ventilation inlet to a building.

703.7.2 Once-through cooling. The use of potable water for once-through or single-pass cooling operations is prohibited.

703.7.3 Metering. The metering of mechanical systems, system components, equipment and appliances shall be conducted in accordance with Section 705.1.

703.7.4 Controllers and alarms. Cooling towers, evaporative condensers, and fluid coolers shall be equipped with conductivity controllers and overflow alarms.

703.7.5 [Reserved]

703.7.6 Water quality. Where nonpotable water is used within cooling towers, evaporative condensers and fluid coolers, it shall conform to the water quality and treatment requirements of the jurisdiction having authority and the water chemistry guidelines recommended by the equipment manufacturers.

703.7.7 Discharge. The discharge water from cooling towers used for air-conditioning systems shall be in compliance with Table 703.7.7. Where the discharge water is not captured for reuse, it shall be discharged and treated in accordance with jurisdictional requirements, if applicable.

Exception: Discharge water with total dissolved solids in excess of 1,500 ppm (1,500 mg/L), or silica in excess of 120 ppm (120 mg/L) measured as silicon dioxide shall not be required to meet the minimum parameters specified in Table 703.7.7.

TABLE 703.7.7
MINIMUM CYCLES OF CONCENTRATION FOR DISCHARGE WATER

MAKEUP WATER TOTAL HARDNESS (mg/L)[a]	MINIMUM CYCLES OF CONCENTRATION
< 200	5
≥ 200	3.5

a. Total hardness concentration expressed as calcium carbonate.

703.8 [Reserved]

703.9 Evaporative cooling. Evaporative cooling systems shall use less than 4 gallons of water per ton-hour (12 L per kWh) of cooling capacity when system controls are set to the maximum water use. The amount of water use shall be expressed in maximum water use per ton-hour (kWh) of cooling capacity and shall be marked on the equipment, included in product user manuals, included in product information literature and included in manufacturer's instructions. Water use information shall be readily available at the time of code compliance inspection.

703.9.1 Overflow alarm. Cooling systems shall be equipped with an overflow alarm to alert building owners, tenants or maintenance personnel when the water refill valve continues to allow water to flow into the reservoir when the reservoir is full. The alarm shall have a minimum sound pressure level rating of 85 dB measured at a distance of 10 feet (3048 mm).

703.9.2 Automatic pump shutoff. Cooling systems shall automatically cease pumping water to the evaporation pads when sensible heat reduction is not needed.

703.9.3 Cooler reservoir discharge. A water quality management system such as a timer or water quality sensor shall be required. Where timers are used, the time

interval between the discharge events of the water reservoir shall be set to 6 hours or greater of cooler operation. Continuous discharge or continuous bleed systems shall be prohibited.

703.9.4 Discharge water reuse. Discharge water shall be reused where appropriate applications exist on site. Where a nonpotable water source system exists on site, evaporative cooler discharge water shall be collected and discharged to such collection system.

Exception: Where the reservoir water will adversely affect the quality of the nonpotable water supply making the nonpotable water unusable for its intended purposes.

703.9.5 Discharge water to drain. Where discharge water is not required to be recovered for reuse, the sump overflow pipe shall not directly connect to a drain. Where the discharge water is discharged into a sanitary drain, an air gap of not less than 6 inches (150 mm) shall be required between the termination of the discharge pipe and the drain opening. The discharge pipe shall terminate in a location that is readily visible to the building owners, tenants or maintenance personnel.

SECTION 704
WATER TREATMENT DEVICES AND EQUIPMENT

704.1 Water softeners. Water softeners shall comply with Sections 704.1.1 through 704.1.4.

704.1.1 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.

704.1.2 Water consumption. Water softeners shall have a maximum water consumption during regeneration of 5 gallons (18.9 L) per 1000 grains (17.1 g/L) of hardness removed as measured in accordance with NSF 44.

704.1.3 Waste connections. Waste water from water softener regeneration shall not discharge to reclaimed water collection systems and shall discharge in accordance with the *Plumbing Code*.

704.1.4 Efficiency and listing. Water softeners that regenerate in place, that are connected to the water system they serve by piping not exceeding $1^1/_4$ inches (31.8 mm) in diameter, or that have a volume of 3 cubic feet (0.085 m^3) or more of cation exchange media shall have a rated salt efficiency of not less than 4,000 grains of total hardness exchange per pound of salt (571 g of total hardness exchange per kg of salt), based on sodium chloride equivalency and shall be listed and labeled in accordance with NSF 44. All other water softeners shall have a rated salt efficiency of not less than 3,000 grains of total hardness exchange per pound of salt (429 g of total hardness exchange per kg of salt), based on sodium chloride equivalency.

704.2 Reverse osmosis water treatment systems. Point-of-use reverse osmosis treatment systems shall be listed and labeled in accordance with NSF 58. Point-of-use reverse osmosis systems shall be equipped with an automatic shutoff valve that prevents the production of reject water when there is no demand for treated water.

704.3 Onsite reclaimed water treatment systems. Onsite reclaimed water treatment systems shall be listed and labeled to NSF 350. These systems shall include gray water, rainwater, and other nonpotable water reuse treatment systems and waste water treatment systems used to produce nonpotable water for water closet and urinal flushing, surface irrigation and similar applications.

SECTION 705
METERING

705.1 Metering. Water consumed from any source associated with the building or building site shall be metered. Each potable and reclaimed source of water, and each onsite nonpotable water source, shall be metered separately. Meters shall be installed in accordance with the requirements of the *Plumbing Code*. For the purposes of Section 705.1.1, each meter identified in Table 705.1.1 shall be capable of communicating water consumption data remotely and at a minimum, be capable of providing daily data with electronic data storage and reporting capability that can produce reports that show daily, monthly, and annual water consumption.

705.1.1 Metering. All potable and nonpotable water supplied to the applications listed in Table 705.1.1 shall be individually metered in accordance with the requirements indicated in Table 705.1.1. Similar appliances and equipment shall be permitted to be grouped and supplied from piping connected to a single meter.

SECTION 706
[RESERVED]

SECTION 707
[RESERVED]

SECTION 708
[RESERVED]

SECTION 709
[RESERVED]

SECTION 710
[RESERVED]

TABLE 705.1.1
METERING REQUIREMENTS

APPLICATION	REQUIREMENTS
Irrigation	Irrigation systems that are automatically controlled shall be metered.
Tenant spaces	Tenant spaces that are estimated to consume over 1000 gallons of water per day shall be metered individually.
Onsite water collection systems	The makeup water lines supplying onsite water collection systems shall be metered.
Ornamental water features	Ornamental water features with a permanently installed water supply shall be required to utilize a meter on makeup water supply lines.
Pools and in-ground spas	Indoor and outdoor pools and in-ground spas shall be required to utilize a meter on makeup water supply lines.
Cooling towers	Cooling towers of 100 tons capacity or greater or groups of towers shall be required to utilize a meter on makeup water and blow-down water supply lines.
Steam boilers	The makeup water supply line to steam boilers anticipated to draw more than 100,000 gallons annually or having a rating of 500,000 Btu/h or greater shall be metered.
Industrial processes	Industrial processes consuming more than 1,000 gallons per day on average shall be metered individually.
Evaporative coolers	Evaporative coolers supplying in excess of 0.6 gpm, on average, makeup water shall be metered.
Fluid coolers and chillers	Water-cooled fluid coolers and chillers that do not utilize closed-loop recirculation shall be metered.
Roof spray systems	Roof spray systems for irrigating vegetated roofs or thermal conditioning shall be metered.

For SI: 1 gallon = 3.8 L, 1 gallon per minute = 3.8 Lpm, 1 ton = 12,000 Btu, 1 British thermal unit per hour = 0.00029 kWh.

CHAPTER 8

INDOOR ENVIRONMENTAL QUALITY AND COMFORT

SECTION 801
GENERAL

801.1 Scope and intent. The provisions of this chapter are intended to provide an interior environment that is conducive to the health of building occupants.

801.2 Demolition and construction phase indoor air quality management plan required. An indoor air quality management plan shall be developed and submitted with permit application materials. Such plan shall address the methods and procedures to be used during design and construction to obtain compliance with Sections 802 through 805.

SECTION 802
BUILDING CONSTRUCTION FEATURES, OPERATIONS AND MAINTENANCE FACILITATION

802.1 Scope. To facilitate the operation and maintenance of the completed building, the building and its systems shall comply with the requirements of Sections 802.2 and 802.3.

802.2 Air-handling system access. The arrangement and location of air-handling system components including, but not limited to, ducts, air handler units, fans, coils and condensate pans, shall allow access for cleaning and repair of the air-handling surfaces of such components. Access ports shall be installed in the air-handling system to permit such cleaning and repairs. Piping, conduits, and other building components shall not be located so as to obstruct the required access ports.

802.3 Air-handling system filters. Filter racks shall be designed to prevent airflow from bypassing filters. Access doors and panels provided for filter replacement shall be fitted with flexible seals to provide an effective seal between the doors and panels and the mating filter rack surfaces. Filter access panels and doors shall not be obstructed.

SECTION 803
HVAC SYSTEMS

803.1 Construction phase requirements. The ventilation of buildings during the construction phase shall be in accordance with Sections 803.1.1 through 803.1.3.

803.1.1 Duct openings. Duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal or shall be closed by an *approved* method to reduce the amount of dust and debris that collects in the system from the time of rough-in installation and until startup of the heating and cooling equipment. Dust and debris shall be cleaned from duct openings prior to system flush out and building occupancy.

803.1.2 Indoor air quality during construction. Temporary ventilation during construction shall be provided in accordance with Sections 803.1.2.1 through 803.1.2.3.

803.1.2.1 Ventilation. Ventilation during construction shall be achieved through openings in the building envelope using one or more of the following methods:

1. Natural ventilation in accordance with the provisions of the *Building Code* or the *Mechanical Code*.
2. Fans that produce a minimum of three air changes per hour.
3. Exhaust in the work area at a rate of not less than 0.05 cfm/ft2 (0.24 L/s/in2) and not less than 10 percent greater than the supply air rate so as to maintain negative pressurization of the space.

Exception: For interior tenant alterations that cannot meet ventilation requirements, other air quality measures shall be used to control emissions sources and improve air quality. Measures are allowed to include portable filtration units, sweeping compounds, point source filtration at cutting and grinding operations, vacuum drywall sanding, low-dust drywall compounds, and other measures acceptable to the *code official* and as outlined in the Construction Phase Indoor Air Quality Management Plan.

803.1.2.2 Protection of HVAC system openings. HVAC supply and return duct and equipment openings shall be protected during dust-producing operations.

803.1.2.3 Return air filters. Where a forced air HVAC system is used during construction, new return air filters shall be installed prior to system flush out and building occupancy.

803.1.3 Construction phase ductless system or filter. Where spaces are conditioned during the construction phase, space conditioning systems shall be of the ductless variety, or filters for ducted systems shall be rated at MERV 8 or higher in accordance with ASHRAE 52.2, and system equipment shall be designed to be compatible. Duct system design shall account for pressure drop across the filter.

803.2 [Reserved]

803.3 [Reserved]

803.4 Isolation of pollutant sources. The isolation of pollutant sources related to print, copy and janitorial rooms shall be in accordance with Section 803.4.1.

803.4.1 Printer, copier and janitorial rooms. Enclosed rooms or spaces that are used primarily as a print or copy

facility containing five or more printers, copy machines, scanners, facsimile machines, 3D printers, or similar machines in any combination, and rooms used primarily as janitorial rooms or closets where the use or storage of chemicals occurs, shall comply with all of the following:

1. The enclosing walls shall extend from the floor surface to the underside of the floor, roof deck or solid ceiling above and shall be constructed to resist the passage of airborne chemical pollutants and shall be constructed and sealed as required for 1-hour fire-resistance-rated construction assemblies. Alternatively, for janitorial rooms and closets, all chemicals shall be stored in *approved* chemical safety storage cabinets.
2. Doors in the enclosing walls shall be automatic or self-closing.
3. An HVAC system shall be provided that:
   - 3.1 Provides exhaust airflow to the outdoors at a rate of not less than 0.50 cfm per square foot (2.4 L/s/m^2);
   - 3.2 Maintains a negative pressure of not less than 7 Pa (0.146 Psf) within the room; and
   - 3.3 Prohibits the recirculation of air from the room to other portions of the building.

803.5 Filters. Filters for air conditioning systems that serve occupied spaces and handle a component of outdoor air shall be rated at MERV 11 or higher, in accordance with ASHRAE Standard 52.2, and system equipment shall be designed to be compatible. The air handling system design shall account for pressure drop across the filter. Filter performance shall be shown on the filter manufacturer's data sheet.

SECTION 804
SPECIFIC INDOOR AIR QUALITY AND POLLUTANT CONTROL MEASURES

804.1 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 Sections 804.1.1 through 804.1.3. Unvented room heaters and unvented decorative appliances, including alcohol burning, shall be prohibited.

804.1.1 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 *Mechanical Code* and the *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.

804.1.2 Wood-fired appliances. Wood stoves and wood-burning fireplace inserts shall be listed and, additionally, shall be labeled in accordance with the requirements of the EPA Standards of Performance for New Residential Wood Heaters, 40 CFR Part 60, subpart AAA.

804.1.3 Biomass appliances. Biomass fireplaces, stoves and inserts shall be listed and labeled in accordance with ASTM E1509 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.

804.2 [Reserved]

SECTION 805
PROHIBITED MATERIALS

805.1 Scope. The use of the following materials shall be prohibited:

1. Asbestos-containing materials.
2. Urea-formaldehyde foam insulation.

SECTION 806
MATERIAL EMISSIONS AND POLLUTANT CONTROL

806.1 Scope. To facilitate better indoor air quality for building occupants, projects shall comply either with Section 806.1.1 or with Sections 806.1.2 through 806.1.7.

If complying with Section 806.1 by meeting the requirements of Section 806.1.1, all testing results shall be submitted to the code official prior to the final inspection.

If complying with Section 806.1 by meeting the requirements of Sections 806.1.2 through 806.1.7, a log of all materials used covered by those sections, showing the allowable limits and the actual product concentrations utilized in the project, shall be submitted prior to the final inspection. For compliance using Sections 806.1.2 through 806.1.7, project teams shall maintain all spec sheets for relevant materials, and shall make them available to the code official upon request.

806.1.1 Post-construction, pre-occupancy baseline IAQ testing. After all interior finishes are installed, the building shall be tested for indoor air quality and the testing results shall indicate that the levels of VOCs meet the levels detailed in Table 806.1.1 using testing protocols in accordance with ASTM D5197, ASTM D5466, ASTM D6196, ASTM D6345, and ISO 7708. Test samples shall be taken in not less than one location in each 25,000 square feet (1860 m^2) of floor area or in each contiguous floor area.

TABLE 806.1.1
MAXIMUM CONCENTRATION OF AIR POLLUTANTS

MAXIMUM CONCENTRATION OF AIR POLLUTANTS RELEVANT TO IAQ	MAXIMUM CONCENTRATION, µg/m³ (unless otherwise noted)
1-Methyl-2-pyrrolidinone[a]	160
1,1,1-Trichloroethane	1000
1,3-Butadiene	20
1,4-Dichlorobenzene	800
1,4-Dioxane	3000
2-Ethylhexanoic acid[a]	25
2-Propanol	7000
4-Phenylcyclohexene (4-PCH)[a]	2.5
Acetaldehyde	140
Acrylonitrile	5
Benzene	60
t-Butyl methyl ether	8000
Caprolactam[a]	100
Carbon disulfide	800
Carbon monoxide	9 ppm and no greater than 2 ppm above outdoor levels
Carbon tetrachloride	40
Chlorobenzene	1000
Chloroform	300
Dichloromethane	400
Ethylbenzene	2000
Ethylene glycol	400
Formaldehyde	27
n-Hexane	7000
Naphthalene	9
Nonanal[a]	13
Octanal[a]	7.2
Particulates (PM 2.5)	35 (24-hr)
Particulates (PM 10)	150 (24-hr)
Phenol	200
Styrene	900
Tetrachloroethene	35
Toluene	300
Total volatile organic compounds (TVOC)	500
Trichloroethene	600
Xylene isomers	700

a. This chemical has a limit only where carpets and fabrics with styrene butadiene rubber (SBR) latex backing material are installed as part of the base building systems.

806.1.2 Emissions from composite wood products. Composite wood products used interior to the *approved* weather covering of the building shall comply with the emission limits cited in Table 806.1.2. Compliance with emission limits shall be demonstrated following the requirements of Section 93120 of Title 17, *California Code of Regulations*.

Exceptions:

1. Composite wood products that are made using adhesives that do not contain urea-formaldehyde (UF) resins.
2. Composite wood products that are sealed with an impermeable material on all sides and edges.
3. Composite wood products that are used to make elements considered to be furniture, fixtures and equipment (FF&E) that are not permanently installed.

TABLE 806.1.2
COMPOSITE PRODUCTS EMISSIONS

PRODUCT	FORMALDEHYDE LIMIT[b] (ppm)
Hardwood plywood	0.05
Particle board	0.09
Medium-density fiberboard	0.11
Thin medium-density fiberboard[a]	0.13

For SI: 1 inch = 25.4 mm.

a. Maximum thickness of $^{5}/_{16}$ inch (8 mm).

b. Phase 2 Formaldehyde Emissions Standards, Table 1, Section 93120, Title 17, *California Code of Regulations*; compliance shall be demonstrated in accordance with ASTM D6007 or ASTM E1333.

806.1.3 Adhesives and sealants. A minimum of 85 percent by weight or volume, of specific categories of site-applied adhesives and sealants used on the interior side of the building envelope, shall comply with the VOC content limits in Table 806.1.3(1) or alternative VOC emission limits in Table 806.1.3(2). The VOC content shall be determined in accordance with the appropriate standard being either U.S. EPA Method 24 or SCAQMD Method 304, 316A or 316B. The exempt compound content shall be determined by either SCAQMD Methods 302 and 303 or ASTM D3960. Table 806.1.3(1) adhesives and sealants regulatory category and VOC content compliance determination shall conform to the SCAQMD Rule 1168. The provisions of this section shall not apply to adhesives and sealants subject to state or federal consumer product VOC regulations. HVAC duct sealants shall be classified as "Other" category within the SCAQMD Rule 1168 sealants table.

Exception: HVAC air duct sealants are not required to meet the emissions or the VOC content requirements when the air temperature in which they are applied is less than 40°F (4.5°C).

Table 806.1.3(2) adhesive alternative emissions standards compliance shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/Standard Method V.1.1. The alternative emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

TABLE 806.1.3(1)
SITE-APPLIED ADHESIVE AND SEALANT VOC LIMITS

ADHESIVE	VOC LIMIT[a, b]
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesive	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Dry wall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single-ply roof membrane adhesives	250
Architectural sealants	250
Architectural sealant primer	
Nonporous	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 SCAQMD 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 SCAQMD Rule 1168.

TABLE 806.1.3(2)
VOC EMISSION LIMITS

VOC	LIMIT
Individual VOCs	$\leq {}^{1}/_{2}$ CA chronic REL[a]
Formaldehyde	$\leq 16.5\ \mu g/m^3$ or ≤ 13.5 ppb[b, c]

a. CDPH/EHLB/Standard Method V.1.1 Chronic Reference Exposure Level (CREL).

b. Effective January 1, 2012, limit became less than or equal to the CDPH/EHLB/Standard Method V.1.1 CREL ($\leq 9\ \mu g/m^3$ or ≤ 7 ppb)

c. Formaldehyde emission levels need not be reported for materials where formaldehyde is not added by the manufacturer of the material.

806.1.4 Architectural paints and coatings. A minimum of 85 percent by weight or volume, of site-applied interior architectural coatings shall comply with VOC content limits in Table 806.1.4(1) or the alternate emissions limits in Table 806.1.4(2). The exempt compound content shall be determined by ASTM D3960.

TABLE 806.1.4(1)
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[c, d, e]

CATEGORY	Effective: January 1, 2010	Effective: January 1, 2012
	LIMIT[a] g/l	LIMIT[a] g/l
Flat coatings	50	—
Nonflat coatings	100	—
Nonflat – High-gloss coatings	150	—
Specialty coatings:		
Aluminum roof coatings	400	—
Basement specialty coatings	400	—
Bituminous roof coatings	50	—
Bituminous roof primers	350	—
Bond breakers	350	—
Concrete curing compounds	350	—
Concrete/masonry sealers	100	—
Driveway sealers	50	—
Dry fog coatings	150	—
Faux finishing coatings	350	—
Fire-resistive coatings	350	—
Floor coatings	100	—
Form-release compounds	250	—
Graphic arts coatings (Sign paints)	500	—
High-temperature coatings	420	—
Industrial maintenance coatings	250	—
Low solids coatings	120[b]	—
Magnesite cement coatings	450	—
Mastic texture coatings	100	—
Metallic pigmented coatings	500	—
Multi-color coatings	250	—
Pretreatment wash primers	420	—
Primers, sealers, and undercoaters	100	—
Reactive penetrating sealers	350	—
Recycled coatings	250	—
Roof coatings	50	—
Rust-preventative coatings	400	250
Shellacs, clear	730	—
Shellacs, opaque	550	—
Specialty primers, sealers, and undercoaters	350	100
Stains	250	—
Stone consolidants	450	—
Swimming pool coatings	340	—
Traffic marking coatings	100	—
Tub and tile refinish coatings	420	—
Waterproofing membranes	250	—
Wood coatings	275	—
Wood preservatives	350	—
Zinc-rich primers	340	—

a. Limits are expressed as VOC Regulatory (except as noted), thinned to the manufacturer's maximum thinning recommendation, excluding any colorant added to tint bases.

b. Limit is expressed as VOC actual.

c. The specified limits remain in effect unless revised limits are listed in subsequent columns in the table.

(continued)

TABLE 806.4(1)—continued
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[c, d, e]

d. Values in this table are derived from those specified by the California Air Resources Board *Suggested Control Measure for Architectural Coatings*, dated February 1, 2008.

e. Table 806.4(1) architectural coating regulatory category and VOC content compliance determination shall conform to the California Air Resources Board *Suggested Control Measure for Architectural Coatings*.

Table 806.1.4(2) architectural coating alternate emissions standards compliance shall be determined utilizing test methodology incorporated by reference in the CDPH/EHLB/ Standard Method V.1.1. The alternative emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

TABLE 806.1.4(2)
ARCHITECTURAL COATINGS VOC EMISSION LIMITS

VOC	LIMIT
Individual	≤ $^1/_2$ CA chronic REL[a]
Formaldehyde	≤ 16.5 µg/m^3 or ≤ 13.5 ppb[b]

a. CA Chronic Reference Exposure Level (CREL).

b. Formaldehyde emission levels need not be reported for materials where formaldehyde is not added by the manufacturer of the material.

806.1.5 Flooring. A minimum of 85 percent of the total area of flooring installed within the interior of the building shall comply with the requirements of Table 806.1.5(2). Where flooring with more than one distinct product layer is installed, the emissions from each layer shall comply with these requirements. The test methodology used to determine compliance shall be from CDPH/EHLB/Standard Method V.1.1. The emissions testing shall be performed by a laboratory that has the CDPH/EHLB/ Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

Where post-manufacture coatings or surface applications have not been applied, the flooring listed in Table 806.1.5(1) shall be deemed to comply with the requirements of Table 806.1.5(2).

TABLE 806.1.5(1)
FLOORING DEEMED TO COMPLY WITH VOC EMISSION LIMITS

Ceramic and concrete tile
Organic-free, mineral-based
Clay pavers
Concrete pavers
Concrete
Metal

TABLE 806.1.5(2)
FLOORING VOC EMISSION LIMITS

VOC	LIMIT
Individual	≤ $^1/_2$ CA chronic REL[a]
Formaldehyde	≤ 16.5 µg/m^3 or ≤ 13.5 ppb

a. CA Chronic Reference Exposure Level (CREL).

806.1.6 Acoustical ceiling tiles and wall systems. A minimum of 85 percent of acoustical ceiling tiles and wall systems, by area, shall comply with the requirements of Table 806.6(2). Where ceiling and wall systems with more than one distinct product layer are installed, the emissions from each layer shall comply with these requirements. The test methodology used to determine compliance shall be from CDPH/EHLB/Standard Method V.1.1. The emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

Where post-manufacture coatings or surface applications have not been applied, the ceiling or wall systems listed in Table 806.6(1) shall be deemed to comply with the requirements of Table 806.6(2).

TABLE 806.6(1)
CEILING AND WALL SYSTEMS DEEMED TO COMPLY WITH VOC EMISSION LIMITS

Ceramic and concrete tile
Organic-free, mineral-based
Gypsum plaster
Clay masonry
Concrete masonry
Concrete
Metal

TABLE 806.6(2)
ACOUSTICAL CEILING TILES AND WALL SYSTEMS VOC EMISSION LIMITS

VOC	LIMIT
Individual	≤ $^1/_2$ CA chronic REL[a]
Formaldehyde	≤ 16.5 µg/m^3 or ≤ 13.5 ppb

a. CA Chronic Reference Exposure Level (CREL).

806.1.7 Insulation. A minimum of 85 percent of insulation shall comply with the requirements of Table 806.7(1) or Table 806.7(2). The test methodology used to determine compliance shall be from CDPH/EHLB/Standard Method V.1.1. The emissions testing shall be performed by a laboratory that has the CDPH/EHLB/Standard Method V.1.1 test methodology in the scope of its ISO 17025 Accreditation.

TABLE 806.7(1)
INSULATION VOC EMISSION LIMITS

VOC	LIMIT
Individual	≤ $^1/_2$ CA chronic REL[a]
Formaldehyde	≤ 16.5 µg/m^3 or ≤ 13.5 ppb

a. CA Chronic Reference Exposure Level (CREL).

TABLE 806.7(2)
INSULATION MANUFACTURED WITHOUT FORMALDEHYDE VOC EMISSION LIMITS

VOC	LIMIT
Individual	≤ $^1/_2$ CA chronic REL[a]

a. CA Chronic Reference Exposure Level (CREL).

SECTION 807
[RESERVED]

SECTION 808
[RESERVED]

CHAPTER 9

[RESERVED]

CHAPTER 10

[RESERVED]

CHAPTER 11

[RESERVED]

CHAPTER 12

REFERENCED STANDARDS

This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard.

AITC

American Institute of Timber Construction
7012 South Revere Parkway, Suite 140
Englewood, CO 80112

Standard reference number	Title	Referenced in code section number
ANSI/AITC 190.1—2007	Structural Glued Laminated Timber	202

ANSI

American National Standards Institute
25 West 43rd Street, Fourth Floor
New York, NY 10036

Standard reference number	Title	Referenced in code section number
Z21.50/CSA 2.22.2007	Vented Gas Fireplaces	804.1.3
Z21.88a/CSA 2.33a—09	ANSI/CSA Standard for Vented Gas Fireplace Heaters	804.1.3

ARB

California Air Resource Board
1001 "I" Street, P. O. Box 2815
Sacramento, CA 95812

Standard reference number	Title	Referenced in code section number
February 1, 2008	California Air Resources Board, Architectural Coatings Suggested Control Measures February 1, 2008	Table 806.3(1)

ASABE

American Society of Agricultural and Biological Engineers
2950 Niles Road
St. Joseph, MI 49085

Standard reference number	Title	Referenced in code section number
S313.3-99 (R2009)	Soil Cone Penetrometer	405.1.4.2
EP542-99 (R2009)	Procedures for Using and Reporting Data Obtained with the Soil Cone Penetrometer	405.1.4.2

ASHRAE

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
1791 Tullie Circle
Atlanta, GA 30329-2305

Standard reference number	Title	Referenced in code section number
52.2—2007	Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size	803.1.3, 803.5
189.1—2011	Standard for the Design of High-performance Green Buildings, Except Low-rise Residential Buildings	301.1.1

ASME

American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

Standard reference number	Title	Referenced in code section number
A112.18.1/ CSA B125.1—2010	Plumbing Supply Fittings	Table 702.1, 702.2

ASSE

American Society of Sanitary Engineering
901 Canterbury Road, Suite A
Westlake, OH 44145

Standard reference number	Title	Referenced in code section number
1016—2010	Performance Requirements for Automatic Compensating, Valves for Individual Showers and Tub/Shower Combinations	Table 702.1

ASTM

ASTM International
100 Barr Harbor
West Conshohocken, PA 19428-2959

Standard reference number	Title	Referenced in code section number
C1549—09	Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer	408.2.1
D2974—07a	Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and other Organic Soils	405.1.4.2
D3385—09	Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer	405.1.4.2
D3960—05	Standard Practice of Determining Volatile Organic Compound (VOC) Content of Paints & Related Coatings	806.2, 806.3
D5055—10	Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists	202
D5093—02 (2008)	Standard Test Method for Field Measurement of Infiltration Rate Using Double-Ring Infiltrometer With Sealed-Inner Ring	405.1.4.2
D5197—09	Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology)	804.3
D5456—10	Standard Specification for Evaluation of Structural Composite Lumber Products	202
D6007—02 (2008)	Standard Test Method for Determining Formaldehyde Concentrations in Air from Wood Products Using a Small-Scale Chamber	Table 806.1
D6196—03 (2009)	Standard Practice for Selection of Sorbents, Sampling, and Thermal Desorption Analysis Procedures for Volatile Organic Compounds in Air	804.3
D6345—10	Standard Guide for Selection of Methods for Active, Integrative Sampling of Volatile Organic Compounds in Air	804.3
D6866—11	Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis	505.2.4
D7612—10	Standard Practice in Categorizing Wood and Wood-Based Products according to their Fiber Sources	202
E90—04	Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements	809.2, 809.3
E1333—10	Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber	Table 806.1
E1509—04	Standard Specification for Room Heaters, Pellet Fuel-Burning Type	804.1.6
E1918—06	Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field	408.2.1
E2921—13	Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes and Rating Systems	505.3

CAN/CGSB

Standards Council of Canada
600-55 Metcalfe Street
Ottawa, ON K1P 6L5
Canada

Standard reference number	Title	Referenced in code section number
CAN/CGSB 149.10—M86	Determination of the Airtightness of Building Envelopes by the Fan Depressurization Method	A106.11
CAN/CGSB 149.15—96	Determination of the Overall Envelope Airtightness of Buildings by the Fan Pressurization Method Using the Building's Air Handling Systems	A106.11

CCR

California Code of Regulations
Department of Industrial Relations
Office of the Director
455 Golden Gate Avenue
San Francisco, CA 94102

Standard reference number	Title	Referenced in code section number
Section 93120—Title 17	California Code Regulations, Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products	806.1

CDPH

California Department of Public Health
1615 Capitol Avenue
Sacramento, CA 95814

Standard reference number	Title	Referenced in code section number
CDPH Section 01350	EHLB Standard Method for Testing VOC Emissions From Indoor Sources	806.2

CEE

Consortium for Energy Efficiency
98 North Washington Street, Suite 101
Boston, MA 02114-1918

Standard reference number	Title	Referenced in code section number
CEE Tier 1, Tier 2, and Tier 3	CEE Directory of Efficient Products	A106.15

CRRC

Cool Roof Rating Council
1610 Harrison Street
Oakland, CA 94612

Standard reference number	Title	Referenced in code section number
CRRC—1 2010	Cool Roof Rating Council, CRRC-1 Standard	404.3.1.1

CSA

Canadian Standards Association
5060 Spectrum Way
Mississauga, Ontario, Canada L4N 5N6

Standard reference number	Title	Referenced in code section number
CAN/CSA B366.1—2009	Solid-Fuel-Fired Central Heating Appliances	804.1.6
CSA Z21.50/CSA 2.22—07	Vented Gas Fireplaces	804.1.3
CSA Z21.88a/CSA 2.33a—09	ANSI/CSA Standard for Vented Gas Fireplace Heaters	804.1.3

DCHS

California Department of Health Services
Office of Regulations
P.O. Box 997413, MS 0015
Sacramento, CA 95899-7413

Standard reference number	Title	Referenced in code section number
CA/DHS/EHLB/ R-174—2010	Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers Version 1.1 February 2010	806.2, Table 806.2(2), 806.3, Table 806.2(2), 806.5, 806.6, 809.2.4

DOC

U.S. Department of Commerce
National Institute of Standards and Technology
1401 Constitution Avenue NW
Washington, DC 20230

Standard reference number	Title	Referenced in code section number
PS1—09	Structural Plywood	202
PS2—10	Performance Standard for Wood-Based Structural-Use Panels	202

ECP

Enterprise Community Partners, Inc
10 G Street, NE, Suite 450
Washington, DC 20002

Standard reference number	Title	Referenced in code section number
2015	Enterprise Green Communities On-Line Certification	302.2.4

EPA

Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Standard reference number	Title	Referenced in code section number
40 CFR, Part 60 Subpart AAA	EPA Standards of Performance for New Residential Wood Heaters	804.1.5
40 CFR 300	Small Business Liability Relief and Brownfield Revitalization Act-Public Law 107-118	202
ENERGY STAR	Energy Star	202, 702.6.1, 702.6.2, 702.6.4
ENERGY STAR	Energy Star Target Tool Finder Tool	302.2.1, 302.3.1
US EPA Method 24	Determination of Volatile Matter Content, Water Content, Density, Volume Solids and Weight Solids of Surface Coatings	806.2
Water Sense October 2007	High-efficiency Lavatory Faucet Specification	Table 702.1
Water Sense August 2009	WaterSense Specification for Flushing Urinals	Table 702.1
Water Sense March 2010	WaterSense Specification for Showerheads	Table 702.1
Water Sense May 2011	WaterSense Specification for Tank-Type Toilets	Table 702.1

FSC

Forest Stewardship Council
212 Third Avenue, North, Suite 504
Minneapolis, MN 55401

Standard reference number	Title	Referenced in code section number
STD-40-004 V2-1EN—2011	Standard for Chain of Custody Certification	505.2.4

ICC

International Code Council, Inc.
500 New Jersey Avenue, NW
6th Floor
Washington, DC 20001

Standard reference number	Title	Referenced in code section number
IBC—12	International Building Code®	201.3, 202, 303.1, 407.4, 410.2.1.2. 703.7.1, 803.1.2.1, 804.1.7
IECC—12	International Energy Conservation Code®	201.3, 202
IFC—12	International Fire Code®	201.3
IFGC—12	International Fuel Gas Code®	201.3, 804.1.2
IMC—12	International Mechanical Code®	201.3, 703.7, 803.1.2.1, 804.1.2
IPC—12	International Plumbing Code®	201.3, 704.1.3, 704.2, 705.2
IRC—12	International Residential Code®	201.3
ICC-700—2008	National Green Building Standard	302.1, Table 302.1

IESNA

Illuminating Engineering Society of North America
120 Wall Street, 17th Floor
New York, NY 10005-4001

Standard reference number	Title	Referenced in code section number
TM-15—07	Luminaire Classification System for Outdoor Luminaires	Table 405.3(2), Table 409.2, Table 409.3(1), Table 409.3(2)

ISO

International Organization for Standardization
ISO Central Secretariat
1 ch, de la Voie-Creuse, Case Postale 56
CH-1211 Geneva 20, Switzerland

Standard reference number	Title	Referenced in code section number
7708—1995	Air quality – Particle Size Fraction Definitions for Health-related Sampling	804.3
14025—2006	Environmental Labels and Declarations—Type III Environmental Declarations – Principles and Procedures	505.4.1
14044—2006	Environmental Management – Lifecycle Assessment—Requirements and Guidelines	303.1
ISO/IEC 17025—2005 2004—11	General Requirements for the Competence of Testing and Calibration Laboratories	806.2, Table 806.2(2), 806.3, 806.4, 806.5, 806.6, 809.2.4
21930—2007	Sustainability in Building Construction—Environmental Declaration of Building Products	505.4.1

NSC

Natural Stone Council
P.O. Box 539
Hollis, NH 03049

Standard reference number	Title	Referenced in code section number
NSC 373—2013	Sustainability Assessment for Natural Dimension Stone	505.4.2

NSF

NSF International
789 Dixboro Road
Ann Arbor, MI 48105

Standard reference number	Title	Referenced in code section number
NSF/ANSI 44—09	Residential Cation Exchange Water	704.1.2, 704.1.4
NSF/ANSI 58—09	Reverse Osmosis Drinking Water Treatment Systems	704.2
NSF/ANSI 140—13	Sustainability Assessment for Carpet	505.4.2
NSF/ANSI 332—12	Sustainability Assessment for Resilient Floor Coverings	505.4.2

NSF-continued

NSF/ANSI 336—11	Sustainability Assessment for Commercial Furnishings Fabric	505.4.2
NSF/ANSI 342—12	Sustainability Assessment for Wall Coverings	505.4.2
NSF/ANSI 347—12	Sustainability Assessment for Single-Ply Roofing Membranes	505.4.2
NSF 350—11	Onsite Residential and Commercial Water Reuse Treatment Systems	704.3

SCAQMD

South Coast Air Quality Management District
21865 Capley Drive
Diamond Bar, CA 91765

Standard reference number	Title	Referenced in code section number
SCAQMD Rule 1168	Adhesives and Sealant Applications	806.2

SFI

Sustainable Forest Initiative, Inc.
900 17th Street, NW, Suite 700
Washington, DC 20006

Standard reference number	Title	Referenced in code section number
SFI—2010-2014	Sustainable Forest Initiative 2010-2014	505.2.4

TCIA

Tree Care Industry Association
136 Harvey Road, Suite 101
Londonderry, NH 03053

Standard reference number	Title	Referenced in code section number
ANSI A300 Part 5—2005	Tree Shrub and Other Woody Plt Mgmt-Management of Trees and Shrubs during Site Planning, Site Development, and Construction	405.2.1.1

TCNA

Tile Council of North America
100 Clemson Research Boulevard
Anderson, SC 29625

Standard reference number	Title	Referenced in code section number
A138/A138.1—2012	Standard Specification for Sustainable Ceramic Tiles, Glass Tiles, and Tile	505.4.2

TMS

The Masonry Society
3970 Broadway, Unit 201-D
Boulder, CO 80304-1135

Standard reference number	Title	Referenced in code section number
0302—2011	Standard Method for Determining the Sound Transmission Class Rating for Masonry Walls	809.3, 809.5.1

UL

Underwriters Laboratories Inc.
333 Pfingsten Road
Northbrook, IL 60062

Standard reference number	Title	Referenced in code section number
UL 100—2012	Sustainability for Gypsum Boards and Panels	505.4.2
UL 102—2012	Sustainability for Door Leafs	505.4.2
UL 391—2010	Standard for Solid-Fuel and Combination-Fuel Central and Supplementary Furnaces	804.1.3
UL 1482—2011	Room Heaters, Solid Fuel Type	804.1.6
UL 1993—2009	Standard for Safety of Self-Ballasted Lamps and Lamp Adapters	506.3
UL 2523—2009	Solid Fuel-Fired Hydronic Heating Appliances, Water Heaters and Boilers	804.1.6

USDA

United States Department of Agriculture
Office of Energy Policy and New Uses
Room 361, Reporters Bldg.
300 Seventh Street, SW
Washington, DC 20024

Standard reference number	Title	Referenced in code section number
7 CFR Part 2902 Rev. 1/1/06	Guidelines for Designating Bio-based Products for Federal Procurement	505.2.4

USGBC

US Green Building Council
2101 L Street, NW, Suite 500
Washington, DC 20037

Standard reference number	Title	Referenced in code section number
LEED BD+C v4	Building Design and Construction	302.4
LEED ID+C v4	Interior Design and Construction	302.4
LEED O+M v4	Building Operations and Maintenance	302.9
LEED Homes v4	Homes	302.4

APPENDIX A
PROJECT ELECTIVES

The provisions contained in this appendix are adopted in the District of Columbia.

SECTION A101
GENERAL

A101.1 Scope. Appendix A shall only apply to projects within the scope of the *Green Construction Code* as set forth in Section 101.4.9.3 of the *Building Code* that are either new construction, Level 2 *alterations,* Level 3 *alterations,* or *core-and-shell* projects (where less than 60 percent of the interior occupiable area is completed with permanent lighting, wall partitions, HVAC equipment, and plumbing systems).

A101.2 Intent. This appendix shall provide a basis by which a jurisdiction can implement measures to increase natural resource conservation, material resource conservation, energy conservation, water conservation and environmental comfort and mitigate impacts of building site development.

SECTION A102
APPLICABILITY AND CONFORMANCE

A102.1 General. Project electives shall be applicable to building, structures and building sites constructed under the provisions of this code.

A102.2 Required number of and selection of project electives. New construction projects shall attain a total of 18 project electives; Level 3 *alterations* and core-and-shell projects shall attain 13 project electives; first time tenant fit-outs 10,000 square feet (929 m^2) and larger shall attain 10 project electives; and Level 2 *alterations* 50,000 square feet (4645 m^2) and larger, where 10,000 square feet (929 m^2) of the space is being reconfigured, shall attain 10 project electives. For first-time tenant fit-outs and Level 2 *alterations*, up to three of the project electives can come from base building features.

Selected project electives shall be applied as mandatory requirements, and shall be communicated to the *code official* in the manner and form specified by the code official. Electives shall be disallowed if an elective is deemed by the code official not to meet the substantial intent of the elective.

SECTION A103
DEFINITIONS

A103.1 Definitions. The following words and terms shall, for the purposes of this appendix, have the meanings shown herein. Refer to Chapter 2 of this code for general definitions.

DESIGN LIFE. The intended service life or the period of time that a building or its component parts are expected to meet or exceed the performance requirements.

GEOTHERMAL ENERGY. Renewable energy generated from the interior of the Earth and used to produce energy for heating buildings or serving building commercial or industrial processes.

INFILL SITE. Infill sites are one of the following:

1. A vacant lot, or collection of adjoining lots, located in an established, developed area that is already served by existing infrastructure;
2. A previously developed lot or a collection of previously developed adjoining lots, that is being redeveloped or is designated for redevelopment.

PROJECT ELECTIVE. The minimum total number of project electives that must be selected and complied with as indicated in Section A102.2 and Tables A104, A105, A106, A107 and A108.

SERVICE LIFE. The period of time after installation during which a building or its component parts meets or exceeds the performance requirements.

VOCs, TOTAL (TVOCs). Sum of the concentrations of all identified and unidentified *volatile organic compounds* between and including n-hexane through n-hexadecane (i.e., C_6 - C_{16}) as measured by gas chromatography/mass spectrometry total ion-current chromatogram method and are quantified by converting the total area of the chromatogram in that analytical window to toluene equivalents.

SECTION A104
SITE PROJECT ELECTIVES

A104.1 [Reserved]

A104.2 Wildlife corridor project elective. Site development that restores a wildlife corridor, connecting wildlife corridors on adjacent lots, shall be recognized as a project elective.

A104.3 Bird collision deterrence. Projects that comply with LEED Pilot Credit 55: Bird Collision Deterrence (October 16, 2015), shall be recognized as a project elective. Compliance includes satisfaction of all the requirements in LEED Pilot Credit 55, including, but not limited to, adoption of post-construction and façade monitoring plans. Project teams seeking the bird collision deterrence elective(s) shall submit their post-construction and façade monitoring plans prior to the final inspection.

Projects with 40 percent or less glazing, excluding party or common walls, and with no single façade having more than 75 percent glazing, shall receive one (1) project elective.

TABLE A104
SITE PROJECT ELECTIVES

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A104.2	Wildlife corridor	☐ Yes ☐ No
A104.3	Bird Collision Deterrence—40% or less glazing or with no single façade having more than 75% glazing	☐ Yes ☐ No
A104.3	Bird Collision Deterrence—40% or more glazing or at least 75% glazing on any one surface	2 electives
A104.4	Brownfield site	☐ Yes ☐ No
A104.5	Site restoration	☐ Yes ☐ No
A104.6	Mixed use development	☐ Yes ☐ No
A104.7	Changing and shower facilities	☐ Yes ☐ No
A104.8	Long-term bicycle parking and storage	☐ Yes ☐ No
A104.9	Heat island	☐ Yes ☐ No
A104.9.1	Site hardscape project elective 1	1 elective
A104.9.2	Site hardscape project elective 2	1 elective
A104.9.4	Roof covering project elective—25 %	☐ Yes ☐ No
A104.9.4	Roof covering project elective—50%	☐ Yes ☐ No
A104.9.4	Roof covering project elective—75%	☐ Yes ☐ No
A104.10	Native plant landscaping—75% native plants	☐ Yes ☐ No
A104.10	Native plant landscaping—100% native plants	☐ Yes ☐ No
A104.11.1	*Electric vehicle* charging infrastructure project elective—infrastructure to support one vehicle charging space per each ten parking spaces, but not less than four spaces	☐ Yes ☐ No
A104.11.2	*Electric vehicle* charging infrastructure project elective—all necessary *electric vehicle supply equipment* for one vehicle charging space per each 20 parking spaces, but not less than two spaces	☐ Yes ☐ No
A104.11.3	*Electric vehicle* charging infrastructure project elective—all necessary *electric vehicle supply equipment* for one vehicle charging space per each ten parking spaces, but not less than four spaces	☐ Yes ☐ No

Projects complying with the LEED Pilot Credit 55 with either 40 percent or more total glazing, or more than 75 percent glazing on any one façade, shall receive two (2) project electives.

The following modifications to LEED Pilot Credit apply:

1. LEED Pilot Credit 55 provides for a general outline of applicable building materials and their threat factors (see the Bird Collision Deterrence: Summary of Material Threat Factors table in the pilot credit). Teams can also comply using manufacturer's products listed in the resources section of the American Bird Conservancy's website (www.abcbirds.org).
2. Subject to the exceptions in LEED Pilot Credit 55, all non-emergency interior and exterior lighting must be turned off, at minimum, from midnight until 6 a.m.

A104.4 Brownfield site project elective. The development of a building site that is a *brownfield* site with a new building with associated site improvements shall be recognized as a project elective. The development shall be in accordance with the following:

1. Phase I and II Environmental Assessment and, as necessary, the documentation of the site remediation plan and completion of the plan, as *approved* by the jurisdictional agency in charge of environmental regulations.
2. Where contamination levels are above risk-based standards for intended reuse and remediation is required, building and site development shall provide effective remediation *approved* by the local, state or federal government agency which classified the site as a *brownfield*, by one of the following:
   2.1. The effective remediation is completed in the manner described in the remediation plan *approved* by the agency which classified the site as a *brownfield*.
   2.2. A remediation commensurate with the initial *approved* plan which the agency approves upon completion by issuing a letter stating that no further remediation action is required.
3. The *brownfield* site project elective fully accomplishes the applicable state and local *brownfields* program cleanup goals, with all supporting documentation as required by the state, tribal or other responsible authority.

A104.5 Site restoration project elective. Previously developed sites that restore 25 percent or more of the nonbuilding footprint building site area with native or adaptive vegetation shall be recognized as a project elective.

A104.6 Mixed-use development project elective. Development of a mixed-use building shall be recognized as a project elective. The building shall be in accordance with all of the following:

1. It shall have not less than two stories.
2. Eight or more dwelling units of Group R-1 or R-2 occupancy shall be located above the first story.
3. The first story shall contain one or more of the following occupancies: A-1, A-2, A-3, B, M, Group E daycare, or Group R-2 live/work units.

A104.7 Changing and shower facilities project elective. Projects that provide changing and shower facilities shall receive a project elective.

A104.8 Long-term bicycle parking and storage project elective. Projects that provide not less than 90 percent of long term bicycle parking within a building or provide the parking with a permanent cover including, but not limited to, roof overhangs, awnings, or bicycle storage lockers, shall be recognized as a single project elective.

A104.9 Heat island. Project electives related to heat island impact shall comply with Sections A104.9.1, A104.9.2 or A104.9.4. Compliance with multiple electives shall be recognized.

A104.9.1 Site hardscape project elective 1. In climate zones 1 through 6, as established in the *Energy Conservation Code*, the development of a new building and associated site improvements where a minimum of 75 percent of the site hardscape is in accordance with one or any combination of options in Sections 408.2.1 through 408.2.4, shall be recognized as a project elective.

A104.9.2 Site hardscape project elective 2. In climate zones 1 through 6, as established in the *Energy Conservation Code,* the development of a new building and associated site improvements where a minimum of 100 percent of the site hardscape is in accordance with one or any combination of options in Sections 408.2.1 through 408.2.4, shall be recognized as a project elective.

A104.9.3 [Reserved]

A104.9.4 Roof covering project elective. Projects that install vegetative roofs shall be recognized as a project elective. Projects will receive one project elective for 25 percent coverage of total roof square footage, one additional elective credit for 50 percent coverage, or three total elective credits for 75 percent coverage.

A104.10 Native plant landscaping project elective. Projects that install native plant landscaping beyond the code minimum shall be recognized as a project elective. Projects shall receive one project elective for 75 percent native plant landscaping coverage, and an additional project elective for 100 percent coverage. Projects shall have not less than 3 percent of site covered in landscaping to achieve the electives. Intensive green roofs (not less than 6 inches of soil media depth) are allowed to count towards this credit. Extensive green roofs (less than 6 inches of soil media depth) are not allowed to count towards this elective.

A104.11 Electric vehicle charging project electives. All *electric vehicle* charging infrastructure and *electric vehicle supply equipment* provided to meet project electives shall comply with the following conditions:

1. At least 6.6 kW of power shall be supplied to the *electric vehicle* charging space(s).
2. Each junction box shall be sized for not less than 3.3 kW. The total power divided by the number of *electric vehicle* charging spaces shall be not less than 3.3 kW.
3. In all locations where a charging station is to be installed, a Level 2 charging station or alternative, as approved by the *code official*, shall be installed.
4. *Electric vehicle* charging infrastructure shall be designated on the construction documents.
5. At least one *electric vehicle* charging space shall be adjacent to an ADA accessible space.

A104.11.1 Installation of electrical charging infrastructure project elective. Projects that install electrical infrastructure suitable for the future installation of *electric vehicle supply equipment* for at least one *electric vehicle* charging space per each ten parking spaces or fraction thereof, but not less than four spaces shall be recognized as a project elective.

Exception: Installation of electrical infrastructure in order to comply with A104.11.2 and A104.11.3 cannot be counted towards the A104.11.1 elective.

A104.11.2 Installation of electric vehicle supply equipment project elective. Projects that install all necessary *electric vehicle supply equipment* for at least one *electric vehicle* charging space for each 20 parking spaces or fraction thereof, but not less than two spaces, shall be recognized as a project elective.

A104.11.3 Installation of additional electric vehicle supply equipment project elective. Projects that install all necessary *electric vehicle supply equipment* for at least one *electric vehicle* charging space for each ten parking spaces or fraction thereof, but not less than four spaces shall be recognized as a project elective.

SECTION A105
MATERIAL RESOURCE CONSERVATION AND EFFICIENCY

A105.1 Waste management project elective. Projects seeking a waste management project elective shall comply with Section 503.1, except that the nonhazardous construction waste materials required to be diverted from landfills shall be at least 75 percent.

A105.2 Construction waste landfill maximum project elective. Projects seeking a construction waste landfill maximum project elective in accordance with Table A105 and Section A102.2 shall comply with Section 503.1 except that not more than 4 pounds (1.814 kg) of construction waste, excluding hardscape, per square foot (0.0929 m^2) of building area shall be disposed of in a landfill. Building construction waste and hardscape waste shall be measured separately.

A105.3 Material selection project electives. Each of the following shall be considered a separate material selection project elective. The project electives are cumulative and compliance with each item shall be recognized individually.

1. This project elective shall require compliance with Section 505.2, except that buildings and structures shall contain any two of the following:
   a. *Recycled Content and Salvaged Material* Content. The sum of the recycled content and the *salvaged material* content shall constitute a minimum of 40 percent, based on cost, of the total materials in the *building project*.
   b. Regional Materials. A minimum of 50 percent of building materials or products used, based on cost, shall be regionally extracted/harvested/recovered or manufactured within a radius of 500 mi (800 km) of the project *site*. If only a fraction of a product or material is extracted/harvested/recovered or manufactured locally, then only that percentage (by weight) shall contribute to the regional value.
   c. *Biobased Products*. A minimum of 10 percent of building materials used, based on cost, shall be *biobased products*.
2. Compliance with the project elective shall require compliance with Section 505.4, where not less than 50 percent of the total building materials used in the project, based on cost, shall comply with Sections 505.4.1 or 505.4.2. Where a material complies with both Sections 505.4.1 and 505.4.2, the material cost shall be multiplied by two.

A105.4 Building service life plan project electives. Projects seeking a building service life plan project elective shall comply with this section. The building service life plan (BSLP) in accordance with Section A105.4.1 shall be included in the construction documents.

A105.4.1 Plan and components. The building service life plan (BSLP) shall indicate the intended length in years of the design service life for the building as determined by the building owner or *registered design professional*, and shall include a maintenance, repair, and replacement schedule for each of the following components. The maintenance, repair and replacement schedule shall be based on manufacturer's reference service life data or other *approved* sources for the building components. The manufacturer's reference service life data or data from other *approved* sources shall be included in the documentation.

1. Structural elements and concealed materials and assemblies.
2. Materials and assemblies where replacement is cost prohibitive or impractical.
3. Major materials and assemblies that are replaceable.
4. Roof coverings.
5. Mechanical, electrical and plumbing equipment and systems.
6. Site hardscape.

A105.5 Design for deconstruction and building reuse project elective. Projects seeking a design for deconstruction and building reuse project elective shall be designed for deconstruction of not less than 90 percent of the total components, assemblies, or modules to allow essentially the entire building to be reused. Design for deconstruction shall be documented on the building's plans and construction documents.

A105.6 Existing building reuse project elective. The development of a building site on which an existing building is already located and in which not less than 75 percent of the existing core and shell of the structure will be reused shall be recognized as a project elective.

A105.7 Historic building reuse project elective. The development of a building site on which an existing building is already located and in which not less than 75 percent of the existing core and shell of a locally or nationally designated historic structure will be reused shall be recognized as a project elective.

A105.8 Deconstruction project electives. Projects seeking a *deconstruction* project elective shall comply with Section 503.1 and this section. Buildings, structures or portions thereof that are to be demolished shall be systematically disassembled by means of *deconstruction*. Deconstruction must be performed by a contractor with Building Materials Re-use

TABLE A105
MATERIAL RESOURCE CONSERVATION AND EFFICIENCY PROJECT ELECTIVES

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED	
A105.1	Waste management	☐ Yes	☐ No
A105.2	Construction waste landfill maximum	☐ Yes	☐ No
A105.3(1)	Recycled (40%), Regional (50%), and Biobased (10%) materials	☐ Yes	☐ No
A105.3(2)	Material declaration and certification (50%)	☐ Yes	☐ No
A105.4	Service life plan	☐ Yes	☐ No
A105.5	Design for deconstruction and building reuse	☐ Yes	☐ No
A105.6	Existing building reuse	☐ Yes	☐ No
A105.7	Historic building reuse	☐ Yes	☐ No
A105.8	Deconstruction	☐ Yes	☐ No

Association (BMRA) deconstruction certification or other *approved* certification. A *deconstruction* plan and schedule shall be prepared and submitted by the *deconstruction* contractor for approval at permit application and prior to demolition. The plan shall list materials to be deconstructed. The plans and schedule shall use BMRA; Institute for Local Self Reliance's (ILSR) publications for deconstruction planning and tracking; Delta Institute's guidelines; or similar guidelines as approved. Prior to project completion, documentation must be provided to the code official. Documentation shall include receipts for donation, sale, recycling, and disposal of all materials, a complete post-deconstruction form completed and signed by the approved deconstruction contractor, and pictures of materials intended for re-use.

SECTION A106
ENERGY CONSERVATION, EFFICIENCY AND EARTH ATMOSPHERIC QUALITY

A106.1 zEPI reduction project electives. Project electives using zEPI reductions for buildings designed on a performance basis shall be determined by predictive modeling. Predictive modeling shall use a source energy kBtu/sf-y unit measure based on compliance with Sections A106.1.1 and A106.1.2. Where a building has mixed uses, all uses shall be included in the performance based compliance.

A106.1.1 zEPI. Performance-based designs shall be determined in accordance with Equation A106-1 for energy use reduction:

$$zEPI = 75 \times (EUIp/EUI) \quad \textbf{(Equation A106-1)}$$

where:

EUIp = the proposed energy use index in source kBtu/sf-y for the proposed design of the building and its site calculated in accordance with Section A106.1.2.

EUI = the base annual energy use index in source kBtu/sf-y for a baseline building and its site calculated in accordance with Appendix G of the *Energy Conservation Code*.

A106.1.2 Base annual energy use index. The proposed energy use index (EUIp) of the building and building site shall be calculated in accordance with Appendix G of the *Energy Conservation Code*, and *approved* modeling guidelines. The annual energy use shall include all energy used for building functions and its anticipated occupancy.

A106.1.2.1 Electric power. In calculating the annual energy use index, consistent units shall be used for electric energy by converting the electric power use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table A106.1.2.1 based on the geographical location of the building.

TABLE A106.1.2.1
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA eGRID SUB-REGION

eGRID 2010 SUB-REGION ACRONYM	eGRID 2010 SUB-REGION NAME	CO2e RATE (kg/kWh)
RFCE	RFC East	3.28

A106.1.2.2 Non-renewable energy. In calculating the annual energy use index, for fuel other than electrical power, energy use shall be converted to consistent units by multiplying the non-renewable energy fossil fuel use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table A106.1.2.2.

TABLE A106.1.2.2
U.S. AVERAGE BUILDING FUELS ENERGY CONVERSION FACTORS BY FUEL TYPE

FUEL TYPE	ENERGY CONVERSION FACTOR
Natural Gas	1.09
Fuel Oil	1.19
LPG	1.15
Purchased District Heating—Hot Water	1.35
Purchased District Heating—Steam	1.45
District Cooling	0.33 × value in Table A106.1.2.1
Other	1.1

A106.2 Mechanical systems project elective. Buildings seeking mechanical systems project electives shall comply with Section A106.2.1. One elective shall be granted for each of the Sections A106.2.2 through A106.2.6.

A106.2.1 Prescriptive path. The building shall be designed prescriptively in accordance with the *Energy Conservation Code*.

A106.2.2 Heating equipment. For heating equipment, the part-load, full load, annual, or season efficiency of the equipment shall be not less than 10 percent greater than the part-load, full load, annual, or season efficiencies shown in the applicable tables of the *Energy Conservation Code*, or the equipment shall be ENERGY STAR labeled, as applicable. Grid-interactive electric thermal storage heating systems shall be deemed to meet the requisites of this section where they are directly regulated by the grid operator to store energy during off-peak hours to utilize available renewable energy or to provide balancing services for management of the grid.

A106.2.3 Cooling equipment. For cooling equipment, the part-load, full-load, annual, or season efficiency of the equipment shall be not less than 10 percent greater than the part-load, full load, annual, or season efficiencies shown in the applicable tables of the *Energy Conservation Code*, or the equipment shall be ENERGY STAR labeled. Cooling equipment compressors shall have at least two-stage operation if available for the size of the equipment.

A106.2.4 Supply and return duct insulation. Ducts shall be insulated to R-8 or greater where located in unconditioned spaces and R-11 or greater where located outside of the building structure. Where located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by R-8 insulation or greater. To qualify for this elective, there must be a minimum of 1 linear foot (304.8 mm) of applicable supply air ducting per 50 square feet (4.64 m^2) of building area for ducts 600 CFM or less, or 1 linear foot (304.8 mm) of applicable ductwork per 200 square feet (18.6 m^2) of building area for ducts supplying greater than 600 CFM.

TABLE A106
ENERGY CONSERVATION AND EFFICIENCY PROJECT ELECTIVES

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED
A106.1	zEPI reduction project electives	☐ Yes ☐ No
A106.1	Project zEPI score of 40	☐ 1 elective
A106.1	Project zEPI score of 35	☐ 2 electives
A106.1	Project zEPI score of 30	☐ 3 electives
A106.1	Project zEPI score of 25	☐ 4 electives
A106.1	Project zEPI score of 20	☐ 5 electives
A106.1	Project zEPI score of 15	☐ 6 electives
A106.1	Project zEPI score of 10	☐ 7 electives
A106.1	Project zEPI score of 5	☐ 8 electives
A106.1	Project zEPI score of 0	☐ 9 electives
A106.1	Project zEPI score of -5	☐ 10 electives
A106.2	Mechanical systems project elective	☐ Yes ☐ No
A106.2	Heating equipment	☐ 1 elective
A106.2	Cooling equipment	☐ 1 elective
A106.2	Duct insulation	☐ 1 elective
A106.2	Duct system testing	☐ 1 elective
A106.2	Ductless systems	☐ 1 elective
A106.3	Service water heating	☐ Yes ☐ No
A106.4	Lighting power density electives	☐ Yes ☐ No
A106.4	Lighting power density—10% reduction	☐ 1 elective
A106.4	Lighting power density—15% reduction	☐ 2 electives
A106.4	Lighting power density—20% reduction	☐ 3 electives
A106.4	Lighting power density—25% reduction	☐ 4 electives
A106.4	Lighting power density—30% reduction	☐ 5 electives
A106.5	Passive design	☐ Yes ☐ No
A106.6	Renewable energy systems	☐ Yes ☐ No
A106.6	Renewable energy systems—5%	☐ 1 elective
A106.6	Renewable energy systems—10%	☐ 2 electives
A106.6	Renewable energy systems—20%	☐ 3 electives
A106.7	Energy display	☐ Yes ☐ No
A106.8	Auto demand response for lighting	☐ Yes ☐ No
A106.9	Insulation and fenestration	☐ Yes ☐ No
A106.9	Insulation and fenestration—10% greater efficiency	☐ 1 elective
A106.9	Insulation and fenestration—20% greater efficiency	☐ 2 electives
A106.10	Permanent shading devices for fenestration—exterior	☐ Yes ☐ No
A106.10	Permanent shading devices for fenestration—interior	☐ Yes ☐ No
A106.11	Air leakage testing—0.25 cfm/ft^2 qualifies for two project electives	☐ Yes ☐ No
A106.11	Air leakage testing—0.15 cfm/ft^2 qualifies for two project electives	☐ Yes ☐ No
A106.12	Waste water heat recovery	☐ Yes ☐ No
A106.13	Circulating hot water systems	☐ Yes ☐ No
A106.15	High efficiency equipment project electives	☐ Yes ☐ No
A106.15	High efficiency equipment—100% CEE Tier 1	☐ 1 elective
A106.15	High efficiency equipment—100% CEE Tier 2	☐ 2 electives
A106.15	High efficiency equipment—100% CEE Tier 3	☐ 3 electives
A106.16	Green power purchases project electives	☐ Yes ☐ No
A106.16	Green power purchases —50%	☐ 1 elective
A106.16	Green power purchases—100% and Green-e Certified	☐ 2 electives

A106.2.5 Duct system testing. Low pressure duct systems shall be leak tested and shall have a rate of air leakage of 80 percent or less than that specified in R402.2.2.1 of the *Energy Conservation Code*. Other duct systems shall be leak-tested in accordance with the SMACNA *HVAC Air Duct Leakage Test Manual* and shall have a rate of air leakage (CL) less than or equal to 4 as determined in accordance with Equation 4-5 of the *Energy Conservation Code*.

A106.2.5.1 Documentation. Documentation shall be furnished by the designer demonstrating that representative sections totaling not less than 50 percent of the duct area have been tested and that all tested sections meet the requirements of Section A106.2.4.

Exception: Projects entailing more than seven (7) duct systems shall utilize a sampling protocol approved by the code official.

A106.2.6 Ductless systems. Where a minimum of 85 percent of the total floor area of a building is served by ductless systems for space conditioning, or duct systems less than 10 feet (3048 mm) in length, project teams shall receive one project elective.

A106.3 Service water heating project elective. Buildings seeking a service water heating project elective in accordance with Sections A102.2 and A106.3 shall comply with Sections A106.3.1 through A106.3.3.

A106.3.1 Prescriptive path. The building shall be designed prescriptively in accordance with Section 601.3.2.

A106.3.2 Occupancy. The building shall be designed to serve one of the following occupancies:

1. Group A-2, restaurants and banquet halls;
2. Group F, laundries;
3. Group R-1, boarding houses (transient), hotels (transient), motels (transient);
4. Group R-2 buildings;
5. Group A-3, health clubs and spas; and
6. Group I-2, hospitals, mental hospitals and nursing homes.

A106.3.3 Service water heating efficiency. The efficiency of the service water heating equipment shall be at least 10 percent greater than the efficiencies shown in the *Energy Conservation Code* and ASHRAE 90.1 or the service water heating equipment shall be ENERGY STAR qualified.

A106.4 Interior lighting power density reduction. Projects seeking the lighting power density reduction elective shall be designed prescriptively in accordance with the *Energy Conservation Code*. Projects seeking the lighting power density elective shall receive one project elective for 10 percent reduction, two project electives for 15 percent reduction, three project electives for 20 percent reduction, four project electives for 25 percent reduction, and five project electives for 30 percent reduction compared to the requirements of the *Energy Conservation Code*.

Commercial buildings seeking the lighting power density reduction elective shall have at least 50 percent of the total building area designed and installed for permanent light fixtures.

Exception: Groups R-2, R-3, and R-4 shall not achieve this project elective.

A106.5 Passive design project elective. Buildings seeking a passive design project elective in accordance with Sections A102.2 and A106. 5 shall comply with Sections A106.5.1 and A106.5.2.

A106.5.1 Performance path. The building shall be designed using the performance path in accordance with Section 601.3.1.

A106.5.2 Passive design provisions. The simulation of energy use performed pursuant to Section 602 shall document that not less than 40 percent of the annual energy use reduction realized by the proposed design has been achieved through passive heating, cooling, and ventilation design, as compared to the standard reference design. Passive heating and cooling shall use strategies including, but not limited to, building orientation, fenestration provisions, material selection, insulation choices, overhangs, shading means, microclimate vegetation and water use, passive cooling towers, natural heat storage, natural ventilation, and thermal mass.

A106.6 Renewable energy system project electives. Buildings seeking a renewable energy system project elective or electives shall be equipped with one or more renewable energy systems that have the capacity to provide the percent of annual energy used within the building as selected in Table A106.

A106.7 Energy display. Buildings seeking an energy display project elective shall install a permanent, readily accessible and visible display adjacent to the main building entrance or on a publicly available web site. The display shall be capable of providing all of the following:

1. The current energy demand for the whole building, updated for each fuel type.
2. The average and peak demands for the previous day and the same day the previous year.
3. The total energy usage for the previous 18 months.

A106.8 Auto demand response system for lighting. Buildings seeking an auto demand response system for lighting project elective shall install a system capable of reducing total connected power of lighting as determined in accordance with the *Energy Conservation Code* by not less than 15 percent.

A106.9 Insulation and fenestration project electives. For projects seeking the insulation and fenestration project elective, the *building thermal envelope* shall exceed the requirements of *Energy Conservation Code* by not less than 10 percent. A second project elective shall be given for projects that exceed the *building thermal envelope* by 20 percent or more. Specifically, for purposes of compliance with this code, each *U*-factor, *C*-factor, *F*-factor and SHGC in the specified tables shall be reduced by 10 percent to determine the prescriptive criteria.

A106.10 Permanent shading devices for fenestration. Projects seeking the permanent shading devices project electives shall comply with one of the following for *vertical fenestration* on the west, south, and east façades. One project elective shall be granted for exterior shading devices and one project elective shall be granted for interior shading devices.

1. *Vertical fenestration* shall be shaded by permanent projections that have an area-weighted average projection factor of not less than 0.50. The building is allowed to be rotated up to 45 degrees to the nearest cardinal orientation for purposes of calculations and showing compliance.
2. *Vertical fenestration* shall have direct solar radiation for fewer than 250 hours per year because of shading by permanent external buildings, existing permanent infrastructure, or topography.
3. *Vertical fenestration* shall have automatically controlled shading devices capable of modulating in multiple steps the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity that comply with all of the following:
   a. Exterior shading devices shall be capable of providing at least 90 percent coverage of the *fenestration* in the closed position.
   b. Interior shading devices shall be capable of providing at least 90 percent coverage of the *fenestration* in the closed position and have a minimum solar reflectance of 0.50 for the surface facing the *fenestration.*
   c. A manual override located in the same *enclosed space* as the *vertical fenestration* shall override operation of automatic controls no longer than 4 hours.
   d. Acceptance testing and commissioning shall be conducted to verify that automatic controls for shading devices respond to changes in illumination or radiation intensity.
4. *Vertical fenestration* shall have automatically controlled *dynamic glazing* capable of modulating in multiple steps the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity that comply with all of the following:
   a. *Dynamic glazing* shall have a lower labeled *SHGC* equal to or less than 0.12, lowest labeled *VT* no greater than 0.05, and highest labeled *VT* no less than 0.40.
   b. A manual override located in the same *enclosed space* as the *vertical fenestration* shall override operation of automatic controls no longer than 4 hours.
   c. Acceptance testing and commissioning shall be conducted to verify that automatic controls for *dynamic glazing* respond to changes in illumination or radiation intensity.

A106.11 Air leakage testing. Projects shall receive two project electives where the tested air leakage is 0.15 cfm/ft^2 under a pressure differential of 0.3-inch water column (1.57 lb/ft^2 or 1.25 L/s.m^2 under a pressure differential of 75 Pa). Testing shall occur after rough-in and after installation of penetrations of the building envelope, including penetrations for utilities, heating, ventilating and air-conditioning (HVAC) systems, plumbing, and electrical equipment and appliances. Testing shall be done in accordance with ASTM E779, CAN/CGSB-149.10- M86, CAN/CGSB-149.15-96 or equivalent.

Where the tested rate exceeds 0.15 cfm/ft^2 but is less than 0.20 cfm/ft^2, a visual inspection of the air barrier shall be conducted and any leaks noted shall be sealed to the extent practicable. An additional report identifying the corrective actions taken to seal leaks shall be submitted to the code official and the building owner, and shall be deemed to satisfy the requirements of this section.

A106.12 Waste water heat recovery. Projects that install a waste water heat recovery system shall qualify for a project elective provided that the system preheats the incoming water used for hot water functions by not less than 10°F (5.6°C).

A106.13 Circulating hot water systems. Projects seeking a circulating hot water systems project elective shall not have continuous, timer, or water temperature-initiated (aquastat) operation of circulating pumps. Gravity or thermosyphon circulation loops are prohibited. Pumps on circulating hot water systems shall be activated on demand by either a hard-wired or wireless activation control located within the room of final usage and of one of the following types:

1. A normally open, momentary contact switch.
2. Occupancy sensors.
3. A flow switch.
4. A door switch.

A106.14 [Reserved]

A106.15 High efficiency appliance elective. Projects seeking one (1) high efficiency appliance elective shall install 100 percent Consortium for Energy Efficiency (CEE) approved appliances, commercial clothes washers, commercial kitchen equipment, and new consumer electronics (including computers, monitors, copiers, printers, and A/V equipment) used in the final project. Additionally, ENERGY STAR dryers shall be installed as applicable to the final occupancy. Fifty percent of the appliances must be new for the project to receive any electives in this section.

Projects shall earn two electives by meeting all the requirements for the first elective, and in addition installing 100 percent CEE tier 2 products for those product types available in the CEE standard.

Projects shall earn three electives by meeting all the requirements for the first two electives, and in addition installing 100 percent CEE tier 3 products for those product types available in the CEE standard.

A106.16 Green power purchases. Projects that sign up for at least 50 percent green power for a minimum of 5 years of modeled design energy consumption or at least 8 kWh/sf/year shall receive one project elective.

An additional project elective will be received for projects that sign up for 100 percent and Green-e certified green power for 5 years of modeled design energy consumption or at least 16 kWh/sf/year.

SECTION A107
WATER RESOURCE CONSERVATION AND EFFICIENCY

A107.1 Indoor water use. This section contains project electives related to indoor water use.

A107.2 Onsite waste water treatment project elective. Where projects are intended to qualify for an onsite waste water treatment project elective in accordance with Section A107.2, all waste water from the building shall be treated to meet the quality requirements appropriate for its intended use and as required by law.

A107.3 Alternate onsite nonpotable water for outdoor hose connections project elective. Where projects are intended to qualify for an alternate onsite nonpotable water for outdoor hose connections and irrigation project elective in accordance with Section A107.3, sillcocks, hose bibs, wall hydrants, yard hydrants, and other outdoor outlets or any connection used for irrigation shall be supplied by nonpotable water providing 50 gallons (189 L) of storage per 250 square feet (23.2 m^2) of landscaping. Any irrigation system for the project *site* shall be controlled by a qualifying smart controller that uses evapotranspiration (ET) and weather data to adjust irrigation schedules or an on-site rain or moisture sensor that automatically shuts the system off after a predetermined amount of rainfall or sensed moisture in the soil. Qualifying smart controllers shall be tested in accordance with IA *SWAT* Climatological-Based Controllers 8th Draft Testing Protocol. Smart controllers that use *ET* shall use the following inputs for calculating appropriate irrigation amounts:

a. Irrigation adequacy—80 percent minimum *ET*c.

b. Irrigation excess—not to exceed 10 percent.

Exception: A temporary potable water irrigation system used exclusively for the establishment of new landscape shall be exempt from this requirement. Temporary potable water irrigation systems shall be removed or permanently disabled at such time as the landscape establishment period has expired.

Projects shall have a minimum of 3 percent of site covered in landscaping to achieve the elective. Intensive green roofs or roof portions are allowed to count towards this credit. Extensive green roofs are not allowed to count towards this elective.

A107.4 Alternate onsite nonpotable water for plumbing fixture flushing water project elective. Where projects are intended to qualify for an *alternate onsite nonpotable water* for plumbing fixture flushing project elective in accordance with Section A107.4, nonpotable water shall be used for flushing water closets and urinals.

A107.5 [Reserved]

A107.6 [Reserved]

A107.7 Alternate onsite nonpotable water for industrial process makeup water project elective. Where projects are intended to qualify for an *alternate onsite nonpotable water* for industrial process makeup water project elective in accordance with Section A107.7, industrial processes requiring makeup water shall utilize nonpotable water except where the process requires potable water for proper functioning.

A107.7.1 Signage. Rooms containing process equipment supplied with nonpotable water shall be provided with signage in accordance with Section 706.2.

A107.8 Alternate onsite nonpotable water for cooling tower makeup water project elective. Where projects are intended to qualify for an *alternate onsite nonpotable water* for cooling tower makeup water project elective in accordance with Section A107.7, nonpotable water shall be utilized for cooling tower makeup water in accordance with the requirements of Section 703.7.

A107.9 Graywater collection project elective. Where projects are intended to qualify for a graywater collection project elective in accordance with Section A107.8, waste water

TABLE A107
WATER RESOURCE CONSERVATION AND EFFICIENCY PROJECT ELECTIVES

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED	
A107.2	Onsite waste water treatment	☐ Yes	☐ No
A107.3	Alternate onsite nonpotable water for outdoor hose connections and irrigation	☐ Yes	☐ No
A107.4	Alternate onsite nonpotable water for plumbing fixture flushing	☐ Yes	☐ No
A107.7	Alternate onsite nonpotable water for industrial process makeup water	☐ Yes	☐ No
A107.8	Alternate onsite nonpotable water for cooling tower makeup water	☐ Yes	☐ No
A107.9	Graywater collection	☐ Yes	☐ No
A107.10	Condensate drainage recovery	☐ Yes	☐ No
A107.11	Wet-hood exhaust scrubber system	☐ Yes	☐ No

from lavatories, showers, bathtubs, clothes washers, and laundry trays shall be collected for reuse onsite.

A107.10 Condensate drainage recovery. Projects that are pursuing a condensate drainage recovery project selective shall collect 100 percent of condensate for reuse in applications such as water features, fountains, graywater collection systems and rainwater collection systems.

A107.11 Wet-hood exhaust scrubber systems. Where wet-hood exhaust scrubber systems are used, projects that are pursuing this elective shall incorporate a water recirculation system. The makeup water supplies for such systems shall be metered in accordance with Section 705.1.

A107.11.1 Washdown systems. Hoods incorporating washdown or rinsing systems for perchloric acid and similar chemicals shall utilize self-closing valves. Such systems shall be designed to drain automatically after each washdown process has been completed.

A107.11.2 Water sources. Where suitable alternate onsite nonpotable water is available, makeup water supplies to the recirculation system of wet-hood exhaust scrubbers shall utilize alternate onsite nonpotable water or municipal reclaimed water of a water quality appropriate for the application.

SECTION A108
INDOOR ENVIRONMENTAL QUALITY AND COMFORT

A108.1 VOC emissions project electives. Sections A108.2 through A108.5 shall be considered to be separate project electives. The electives shall be cumulative and compliance with each project elective shall be recognized individually.

A108.2 Flooring material project elective. Where projects are intended to qualify for a "flooring material" project elective, all flooring installed within the interior of the building shall comply with Section 806.4 or shall be one or more of the following flooring materials that are deemed to comply with VOC emission limits:

1. Ceramic and concrete tile
2. Clay pavers
3. Concrete
4. Concrete pavers
5. Metal
6. Organic-free, mineral-based

A108.3 Ceiling and wall materials project elective. Where projects are intended to qualify for a ceiling and wall materials project elective, all ceiling and wall systems shall comply with Chapter 8 or shall be one or more of the following ceiling or wall systems that are deemed to comply with VOC emission limits:

Ceiling Systems:

1. Ceramic tile.
2. Clay masonry.
3. Concrete.
4. Concrete masonry.
5. Metal.
6. Organic-free, mineral-based.

Wall Systems:

1. Ceramic tile.
2. Clay masonry.
3. Concrete.
4. Concrete masonry.
5. Metal.
6. Organic-free, mineral-based.

A108.4 [Reserved]

A108.5 Architectural paints and coatings project elective. Where projects are intended to qualify for an architectural paints and coatings project elective, 100 percent of the non-specialty paints and coatings shall have VOC limits that are more than 50 percent lower than the thresholds in Table 806.4(1) and 100 percent of the specialty coatings shall meet the requirements in Table 806.4(1).

A108.6 Views to building exterior project elective. Where projects are intended to qualify for a "views to building exterior" project elective in accordance with Section A108.6, not less than 75 percent of the net floor area shall have a direct line of sight to the exterior through clear vision glazing. A total of not less than 45 square feet (4.18 m^2) of clear vision

TABLE A108
INDOOR ENVIRONMENTAL QUALITY AND COMFORT PROJECT ELECTIVES

SECTION	DESCRIPTION	MINIMUM NUMBER OF ELECTIVES REQUIRED AND ELECTIVES SELECTED	
A108.2	VOC emissions—flooring	☐ Yes	☐ No
A108.3	VOC emissions—ceiling and wall systems	☐ Yes	☐ No
A108.5	Architectural paints and coatings	☐ Yes	☐ No
A108.6	Views to building exterior—75%	☐ Yes	☐ No
A108.6	Views to building exterior—90%	☐ Yes	☐ No
A108.7	Post-construction, pre-occupancy baseline IAQ testing project electives (2)	☐ Yes	☐ No
A108.8	Adhesives and sealants	☐ Yes	☐ No
A108.9	Post-construction, pre-occupancy flush out	☐ Yes	☐ No

glazing in the exterior wall or roof shall be visible. The direct line of sight shall originate at a height of 42 inches (1067 mm) above the finished floor of the space, shall terminate at the clear vision glazing in the exterior wall or roof, and shall be less than 40 feet (12 192 mm) in length. Projects that have a direct line of sight to the exterior for 90 percent of the net floor area shall qualify for an additional project elective.

Exception: Where the direct line of sight is less than 25 feet (7620 mm) in length, a total of not less than 18 square feet (1.67 m^2) of clear vision glazing in the exterior wall or roof shall be visible.

A108.7 Post-construction, pre-occupancy baseline IAQ testing project electives. Where projects are intended to qualify for these two project electives, after all interior finishes are installed the building shall be tested for indoor air quality and the testing results shall indicate that the levels of VOCs are less than 50 percent of all of the levels detailed in Table 806.1 of the *Green Construction Code* using testing protocols in accordance with ASTM D6196, ASTM D5466, ASTM D5197, ASTM D6345, and ISO 7708. Test samples shall be taken in not less than one location in each 25,000 square feet (1860 m^2) of floor area or in each contiguous floor area.

A108.8 Adhesives and sealants project elective. Where projects are intended to qualify for an adhesives and sealants project elective, 100 percent of the adhesives and sealants shall have VOC limits that are more than 50 percent lower than the thresholds in Table 806.3(1).

A108.9 Post-construction, pre-occupancy flush out. After construction ends, and prior to occupancy and with all interior finishes installed, install new filtration media and perform a building flush-out by supplying a total air volume of 14,000 cubic feet of outdoor air per square foot (4,500 cubic meters of outdoor air per square meter) of floor area while maintaining an internal temperature of at least 60°F (15°C) and relative humidity no higher than 60 percent.

SECTION A109
REFERENCED STANDARDS

AHRI	Certified Direct GEO Exchange Certification 870-2011	Table A106.2.2.3
ASHRAE 90.1-2010	Energy Standard for Buildings Except Low-Rise Residential Buildings	A106.2.2.1 A106.2.2.2 A106.2.5 A106.3.3
CDPH	Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers, Version 1.1 - 2010	A108.5
EPA	Energy Star	A106.2.2.1 A106.2.2.2 A106.2.5 A106.3.3
ICC IECC—12	International Energy Conservation Code	A104.9.1 A104.9.2 A104.9.4 A106.2.2.1 A106.2.2.2 A106.2.4 A106.2.5 A106.3.3 A106.4.2 A106.4.3
ISO 13256-1: 1998	Water-source Heat Pumps—Testing and Rating for Performance – Part 1: Water-to-air and Brine-to-air Heat Pumps	Table A106.2.2.3
13256-1: 1998	Water-source Heat Pumps—Testing and Rating for Performance – Part 2: Water-to-air and Brine-to-air Heat Pumps	Table A106.2.2.3
SMACNA	HVAC Air Duct Leakage Test Manual -1985	A106.2.4

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