

**DEPARTMENT OF COMMUNITY PLANNING AND DEVELOPMENT AND
~~DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT~~OFFICE OF CLIMATE
ACTION, SUSTAINABILITY, AND RESILIENCY RULES GOVERNING GREEN
BUILDING REQUIREMENTS**

Adopted

ARTICLE I. GENERAL PROVISIONS

Section 1.01 Authority.

These rules and regulations are adopted by the City and County of Denver’s Executive Director of the Department of Community Planning and Development pursuant to Article II of Chapter 12 (“Community Planning and Development” or “CPD”) of the Denver Revised Municipal Code of the City and County of Denver (“DRMC”) and ~~by the City and County of Denver Board of Public Health and Environment promulgated by the Manager Executive Director of the Office of Climate Action, Sustainability, and Resiliency~~Department of Public Health and Environment in accordance with the authority in Denver Charter Section 2.12.3 pursuant to Articles VII and XIX of Chapter 2 (“Administration”) of the DRMC. These rules and regulations are adopted for the purpose of administering and enforcing the provisions of Green Buildings, codified at Article XIII, Chapter 10 (Buildings and Building Regulations) of the DRMC (the “Green Buildings Ordinance”), and transferring implementation authority from the Department of Public Health & Environment to the Office of Climate Action, Sustainability, and Resiliency in accordance with the Green Buildings Ordinance as amended by Ordinance No. 2019-1177. These rules and regulations replace the City and County of Denver Community Planning and Development Department Rules Governing Green Roofs adopted on April 30, 2018 and the City and County of Denver Community Planning and Development Department and Board of Public Health and Environment Rules Governing Green Buildings Requirements -Roofs adopted on April 30, 2018June 30, 2019. ~~except for~~ or any project that is complying with the requirements of Article XIII, Chapter 10 of the DRMC as the article existed prior to the adoption of the Green Buildings Ordinance, the City and County of Denver Community Planning and Development Department Rules Governing Green Roofs adopted on April 30, 2018 will continue to apply.

Section 1.02 Severability.

Should any section, clause, or provision of these regulations be declared by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of the regulations as a whole, or any part thereof, other than the part declared to be invalid.

Section 1.03 Definitions.

Terms or phrases specific to or introduced in this document are defined below and/or referenced to equivalent terms in the Green Buildings Ordinance. Terms or phrases not defined in this document but defined in the Denver Building and Fire Code, shall be given the defined meaning in the Denver Building and Fire Code.

Addition - Means an extension or increase in gross floor area or height of a building or structure. A connecting element of limited width as required by the International Building Code for a pedestrian walkway does not create an addition to a building.

Annual benchmarking report – The report provided each year to the ~~Department of Public Health and Environment~~Office of Climate Action, Sustainability, and Resiliency (“CASR”) to meet the requirements of Chapter 4, Article V “ENERGY EFFICIENCY IN COMMERCIAL AND MULTIFAMILY BUILDINGS”.

Available roof space - Means the total roof area of a building excluding the following:

- (1) Private terraces no greater in area than the gross floor area of the abutting unit at the roof level;
- (2) Outdoor amenity spaces of buildings, including, but not limited to, areas for recreational or social use;
- (3) Areas of rooftop mechanical, electrical, davit systems, or other equipment, including cell towers or other equipment leasing space on the roof, and all required clearances around these areas;
- (4) Areas covered by skylights;
- (5) Areas consisting of glass-covered atriums;
- (6) Areas covered with glazing (windows); and
- (7) Areas for renewable energy devices.

Green space on a roof that is not accessible to an owner or tenant of a building shall be included in the calculation of available roof space unless the green space is within 30 feet of an accessible outdoor amenity space and is no greater in size than the accessible outdoor amenity space area.

Building - Means any structure used or intended for supporting or sheltering any use or occupancy. The boundary of any single building is defined by its surrounding exterior walls. Party walls as constructed in accordance with the International Building Code shall create separate buildings.

Building height means the vertical distance from grade plane to the average height of the highest roof surface. Roof surfaces of rooftop structures, as governed by IBC Chapter 15, shall not be considered when determining the highest roof surface of a building.

Building Official - Means the person authorized and directed to act on behalf of the Building Permitting and Inspections Services in the interpretation and enforcement of the Building Code of the City and County of Denver, and appointed by the Executive Director of Community Planning and Development.

Campus - Means a tract of contiguous property with one or more owners and that contains or will contain more than one building, that is planned, developed and operated as an integrated facility for a number of individual uses with special attention to coordinated circulation, parking, utility needs, aesthetics and compatibility. For purposes of this definition, the presence of public rights-of-way shall not destroy contiguity of land area. A campus may contain only existing buildings, existing buildings and proposed new buildings, or only proposed new buildings.

Character defining roof – A *visible roof* where the roof’s relationship to the overall shape of the building, as well as the roof’s distinctive materials, craftsmanship, and/or decorative details are

important to the overall visual character of the building; if the materials, color or shape of the roof were to change, it would impact the visual character of the building.

Cool Roof – A roof or portion of a roof containing roof covering material meeting any of the solar reflectance values in Table 1 in order to mitigate or assist in reducing urban heat island effect.

Denver Building and Fire Code - Has the same meaning as in Section 10-16, DRMC.

ENERGY STAR Portfolio Manager - The online tool created by the U.S. Environmental Protection Agency used to measure and track a building's energy use, water consumption, and greenhouse gas emissions.

Energy Use Intensity (EUI) – The energy used (kbtus) per square foot per year.

Executive director of CPD - Means the executive director of community planning and development, or his/her designee.

Executive director of ~~DDPHE-CASR~~ - Means the executive director of the office of climate action, sustainability, and resiliency~~department of public health and environment~~, or his/her designee.

Green space - Means any area that is proposed to contain trees, groundcover, shrubs, urban agriculture, natural grass/turf, or vegetated roofs.

Greenhouse -Means a structure or a thermally isolated area of a building that maintains a specialized sunlit environment exclusively used for, and essential to, the cultivation, protection or maintenance of plants, that sells its commodities for a profit, or on behalf of a non-profit, and is constructed or planned to be constructed as either an F-1 occupancy or a U occupancy.

Gross floor area – The floor area within the inside perimeter of the exterior walls of the building under consideration, exclusive of vent shafts and courts, without deduction for corridors, stairways, ramps, closets, the thickness of interior walls, columns, or other features. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the useable area under the horizontal projection of the roof or floor above. The gross floor area shall not include shafts with no openings, interior courts, or areas used exclusively for the storage or parking of vehicles.

Individual roof section (or roof section) - Means a portion of roof bounded on all sides by one or more of the following features: a wall or parapet; the roof edge; an expansion joint; or a roof divider.

International Building Code (IBC) - Means the 2015 International Building Code, as amended by the 2016 Denver amendments and all subsequent amendments and reenactments.

International Fire Code (IFC) - Means the 2015 International Fire Code, as amended by the 2016 Denver amendments and all subsequent amendments and reenactments.

International Energy Conservation Code (IECC) - Means the 2015 International Energy Conservation Code, as amended by the 2016 Denver amendments and all subsequent amendments and reenactments.

International Plumbing Code (IPC) - Means the 2015 International Plumbing Code, as amended by the 2016 Denver amendments and all subsequent amendments and reenactments.

Low-sloped roofs – A roof having a slope less than 2 units vertical in 12 units horizontal.

Net zero energy building - Means an energy-efficient building where, on a source energy basis, the actual annual delivered energy is less than or equal to the on-site renewable exported energy.

Owner - Means any person, agent, operator, entity, firm, or corporation having any legal or equitable interest in the building or property; or any person authorized to act on the owner's behalf.

Registered Roof Consultant – Means a current Registered Roof Consultant (RRC), as provided by RCI, Inc..

Renewable energy device - Means a device that obtains energy derived from solar radiation, wind, landfill gas, biomass, the internal heat of the earth, or another source with the approval of the departments of community planning and development and public health and environment.

Residential building - Means a building where more than sixty percent (60%) of the gross floor area of the building is used, designed or intended to be used for a household living use type as defined in the Denver Zoning Code, including accessory residential uses; however, a residential building shall not include a nursing home or hospice use, a residence for older adults use, or a lodging accommodation use, all as defined in the Denver Zoning Code.

Roof – The overhead structural component of a building which functions primarily to shelter the interior of the building from the effects of weather and the infiltration of water.

Roof covering materials – The exposed covering or coating of a roofing system or roof structure protecting the building.

Roof recover – The process of installing an additional layer of roof covering over a prepared existing roof covering without removing the existing roof covering.

Roof replacement -- The process of removing the existing roof covering, repairing any damaged substrate, and installing a new roof; or the reconstruction or renewal of any part of an existing roof for the purposes of its maintenance.

Solar Reflectance – The reflective properties of roofing materials and coatings as tested and rated by the Cool Roof Rating Council or as otherwise approved by the Building Official for any of the following values: Initial solar reflectance, 3-year-aged solar reflectance, initial solar reflectance index (SRI) and 3-year-aged solar reflectance index (SRI).

Steep-sloped roofs – A roof having a slope equal to or greater than 2 units vertical in 12 units horizontal.

Total roof area - Means the square footage of all roofs and roof sections located on a building. Roofs covering a story or stories below grade, as determined in accordance with the International Building Code as adopted in the Denver Building and Fire Code, shall not be included in the calculation of total roof area of a building.

Urban Agriculture - The process of cultivating and processing herbs, fruits, flowers and or vegetables.

Vegetated roof - Means an assembly of interacting components designed to waterproof and normally insulate a building's top surface that includes, by design, vegetation and related landscape elements. A vegetative roof shall meet requirements as set forth in rules and regulations. Another term for vegetated roof is a green roof.

Visible roof – A *roof section* that is at least partially visible from a person of average height in a public vantage point such as a city park, public street, campus grounds, or a private street with a public access easement.

Section 1.04 Green Buildings Ordinance compliance options.

The Green Buildings Ordinance contains various compliance options and the requirements associated with those options. A copy of the Green Buildings Ordinance is attached as Appendix A to these rules and regulations.

ARTICLE II: GENERAL ADMINISTRATION

Section 2.01 Applicability of the Green Buildings Ordinance.

The Building Official shall have the sole responsibility for determining whether a project must comply with the Green Buildings Ordinance or if the project is subject to an applicable exemption as outlined in the ordinance. The Building Official shall also be responsible for verifying the owner's selected compliance path, and that it meets all applicable code requirements in consultation with other agencies.

All measurements shall be in conformance with the methods used in the Denver Building and Fire Code except where otherwise noted. Stories and height of residential buildings shall be measured per the Denver Building and Fire Code.

Section 2.02 Permit issuance.

The Building Official shall not issue any building or roofing permits for a project subject to the provisions of the Green Buildings Ordinance, except for permits such as those for shoring,

preparatory demolition, phased construction, or foundation permits, prior to a project documenting compliance with the Green Buildings Ordinance.

Section 2.03 Permitting requirements.

- (a) The Building Official is delegated the authority to establish submittal requirements to document compliance with the Green Buildings Ordinance. These requirements will be available on CPD’s webpage and at CPD’s offices, which are in addition to any requirements contained within these regulations. Regardless of compliance option, each building permit submittal that includes a roof replacement or a new roof must provide the building’s total roof area on the roof plan.
- (b) Buildings or additions 25,000 or greater in gross floor area, including those who must only comply with the provision of a cool roof, must submit required documents for review when constructing either a new roof or a roof replacement, or seeking to document compliance as a Campus as outlined in Article V. Owners seeking a character defining roof determination shall submit the required documentation as outlined in Section 3.04. Renewable energy devices being used to fulfill a Green Buildings Ordinance requirement shall also be submitted for review, regardless of the size of the system.
- (c) The owner of a building subject to the Green Buildings Ordinance shall submit to CPD a Green Building Declaration Form for either a new or existing building. This form will be available on CPD’s website.
- (d) Depending on the compliance method chosen, required permits are subject to change, but are summarized below. Any new construction, additions, or roof replacement that includes compliance with the Green Buildings Ordinance, shall follow the procedures for permit issuance in the administrative section of the Denver Building and Fire Code. Owners are required to comply with all other applicable City regulations and permit requirements.
- (e) Any new construction, addition, or roof replacement that includes a vegetated roof must receive a separate permit for the vegetated roof (a commercial construction permit for a green roof), in addition to a roof permit for the underlying roof/waterproof membrane of the building. The permit for the vegetated roof must be issued to a Denver licensed green roof installer.
- (f) For vegetated roofs, the following additional permits are required:
 - (i) A plumbing permit for irrigation on the vegetated roof which may include a backflow preventer so long as the permit is issued to a licensed plumber. If an irrigation contractor obtains the permit, then a separate plumbing permit shall be required for the backflow preventer and associated equipment.
 - (ii) Fire prevention for extension of any standpipes on existing buildings.
- (g) A separate electrical permit is required for any renewable energy device. A zoning permit will also be required for all solar panels that do not meet the definition in the Denver Zoning Code for “solar panels, flush-mounted”.
- (h) A site development plan (SDP) and resulting zoning permit, if applicable, is required for at-grade green space.

- (i) As required by the Denver Building and Fire Code and associated policies, and the zoning code of the City and County of Denver, additional permits or approvals shall be obtained for related work, including, but not limited to:
 - (i) General Construction;
 - (ii) Roofing;
 - (iii) Fire Protection systems;
 - (iv) Mechanical systems;
 - (v) Plumbing systems;
 - (vi) Electrical systems;
 - (vii) Irrigation systems;
 - (viii) Zoning permits; and
 - (ix) Landmark approval as needed.

Section 2.04 Inspection requirements.

The following inspection requirements are in addition to any other required inspections of issued permits, including but not limited to, final roof inspection and final building inspection for vegetated roof.

- (a) Pre-construction meeting required: Upon issuance of a roofing permit and vegetated roof permit (under a commercial construction permit for a green roof), the roofing contractor and green roof installer must schedule a pre-construction meeting with the appropriate construction inspector prior to beginning construction on the building's roof.
- (b) Leakage testing report for a vegetated roof: Prior to installation of the vegetated roof, an inspection for the roofing permit must be requested in order to verify that the membrane and other aspects of the roofing system have been installed per the approved plans. Additionally, the owner must provide a signed and stamped leakage testing report by a Colorado licensed architect or engineer, or a registered roof consultant, showing a successful leakage test.
- (c) Vegetated roof irrigation inspection: An inspection will be required of the backflow preventer, verification of the control system, water test of the irrigation system, and connection to the irrigation main.
- (d) Any green space not on the roof shall be inspected by CPD's Zoning/Neighborhood Inspections to ensure compliance with the site development plan and/or zoning permit that documents compliance with the green space requirements.

ARTICLE III: COOL ROOFS

Section 3.01 In General

The Green Buildings Ordinance requires new buildings or additions containing 25,000 square feet or more of gross floor area, and existing buildings containing 25,000 square feet or more of gross floor area upon a roof replacement or roof recover for more than 5% of either the total roof area or individual roof section(s) to provide a cool roof. See Appendix A for reference.

Section 3.02 Coverage Requirements.

- (a) New Buildings or applicable additions. Must provide a cool roof, except as specifically exempted in Section 3.04 below.
- (b) Existing Buildings. Only that portion of total roof area or roof section being replaced or recovered must provide a cool roof, except as specifically exempted in Section 3.04 below.

Section 3.03 Roof Covering Material Requirements

- (a) **Applicability.** Roof covering materials shall contain a minimum solar reflectance in accordance with Table 1 for a new roof, roof replacement, or roof recover of new or existing buildings containing 25,000 square feet or greater of gross floor area. Roof covering materials shall meet at least one of the values identified in Table 1; materials do not have to meet all four values.

Owners may apply for administrative approval when proposing specific roof materials not itemized or included in the above table by following the process in Section 106 of the Denver Building and Fire Code

- (b) **Requirements**

Table 1.

	Initial Minimum Reflectance	3-Year Minimum Reflectance	Initial SRI Minimum	3-Year SRI Minimum
Low Sloped Roofs Slope less than 2:12				
Low Slope roofs (except materials specified below).	0.70	0.55	78	64
Low Slope metal roofs	0.50	not available	not available	not available
Low Slope concrete pavers or a concrete surface or stone roofs	0.20	not available	not available	not available
Character defining roof	See Section 3.04(a)	See Section 3.04(a)	See Section 3.04(a)	See Section 3.04(a)
Steep Sloped Roofs Slope 2:12 or steeper				

Steep Slope roofs (except materials specified below)	0.25	0.15	39	32
Clay or Concrete roof tile installed on elevated battens	None Required	not available	not available	not available
Character defining roof	See Section 3.04(a)	See Section 3.04(a)	See Section 3.04(a)	See Section 3.04(a)

- (i) Where a roof recover or roof replacement project introduces a cool roof where none previously existed, the roof shall be demonstrated, or modified, to meet one of the following designs:
- (1) Steep sloped roofs shall be designed and installed to meet IBC 1203.2 Ventilation Requirements.
 - (2) Low sloped roofs shall be designed and installed to include at least a Class III vapor retarder at the roof deck in addition to an air barrier at the roof deck, a single layer may be used to provide both preventative measures. The roof shall also be installed with insulation on top of the roof deck that exceeds the R-value of any interior insulation by a minimum of R-18 thermal insulating value, and all other requirements of the International Energy Conservation Code, as amended.
 - (3) The roofing system shall be designed by a professional roofing consultant, architect, or engineer who must submit an analysis of the existing roofing system. The analysis shall calculate and identify the dew-point, and include a section-detail of the roofing system documenting the vapor retarder, air barrier and other roof components used to minimize condensation within the roof system.

Section 3.04 Exceptions

- (a) Character defining roof: Where approved by the Building Official, the solar reflectance of roof covering materials for use on a character-defining roof may be reduced as is technically and financially feasible to allow the use of materials and colors in keeping with the visual character of the building.
- (i) A submission requesting a character defining roof determination shall include the following, though the Building Official may ask for additional information:
- (1) Roof plan (new buildings only or existing buildings if a roof plan exists)
 - (2) Photographs of the building and roof from public vantage points (existing buildings only)
 - (3) Elevations (new buildings only – as photographs would not exist)
 - (4) Demonstration of at least one of the following criteria:

- a. The roof is or will be highly visible and contributes to the architectural identity of the building or its context.
 - b. There are certain roof features important to the profile of the building against the sky or its background, such as cupolas, multiple chimneys, dormers, cresting, or weather vanes.
 - c. The roofing material, color or patterns (such as patterned slate tile) are distinctive.
 - d. The roof is identified as being an integral part of the building's character and an identified feature for any historically designated building in its designation materials. Such historical designation may be local, state or national.
- (5) The application shall also include general information about the proposed roofing materials, color and finish, the materials' solar reflectance, and the importance of the roof in context of the building or its location.
 - (6) Any other information the Building Official requests in order to make a determination.
- (ii) The Building Official will use the following process to determine whether a roof is a character defining roof:
- (1) CPD staff shall review all submitted materials to determine if the above criteria are applicable and if the definition of character defining roof is met.
 - (2) The review team shall, at minimum, consist of at least three staff: a member of the Landmark Preservation team, an architectural/structural plan reviewer, and a member of the urban design team. Other staff may be consulted as deemed necessary. The team shall prepare a recommendation to the Building Official who shall have the final determination if the roof may or may not be characterized as a character defining roof.
 - (3) Upon a determination that the roof is a character defining roof, then a roofing permit may be issued using the information provided by the customer.
 - (4) Upon a determination that the roof is not a character defining roof, then the owner shall be notified and must make a resubmittal to provide roofing materials that comply with the cool roof provisions identified above before a roofing permit may be issued.
 - (5) The determination of the Building Official shall be appealable to the Board of Appeals per the Denver Building and Fire Code.
- (b) In the case of a roof recover of a non-cool roof, where the roof system analysis (item 3.03(b)(i)(3) above) determines that the existing roof would need to be replaced to control condensation, the roof section analyzed is exempt from meeting cool roof requirements.

- (c) The following roofs and portions of roofs are exempt from the requirements of Table 1:
 - (i) Portions of the roof that include or are covered by the following:
 - (1) Photovoltaic systems or components.
 - (2) Solar air or water-heating systems or components.
 - (3) Vegetated roofs.
 - (4) Above-roof decks or walkways. The roof below the deck or walkway need not be a cool roof, but the deck and walkways themselves must be made of materials meeting the cool roof standard.
 - (5) HVAC systems and components, and other opaque objects mounted above the roof.
 - (ii) Roof covering materials that are swimming pools, sport surfaces (such as tennis courts) and glazing.
 - (iii) Portions of the roof shaded during the peak sun angle on the summer solstice by neighboring buildings or other portions of the same building.
 - (iv) Portions of roofs that are ballasted with a minimum stone ballast of 15 pounds per square foot or, in the case of an existing ballasted roof, the weight of ballast for which the roof was originally designed.
 - (v) The solar reflectance of roof covering materials for use on a visible roof, as defined in Section 1.03 may be reduced for no more than 10% of the total roof area unless a roof is determined to be a character defining roof.
 - (vi) A roof section, as defined in Section 1.03, where not less than 75 percent of the roof covering materials comply with this Section.

ARTICLE IV: COMPLIANCE OPTIONS

Section 4.01 In general

The Green Buildings Ordinance requires new buildings and additions containing 25,000 square feet or more of gross floor area, and existing buildings containing 25,000 square feet or more of gross floor area upon a new roof or roof replacement for more than five percent (5%) of either the total roof area or individual roof section(s) to provide one of the compliance methods listed in this Article IV. See Appendix A for reference. The following sections in Article IV provide additional requirements for compliance options. Owners may apply for administrative approval when proposing an alternate material, design or method of construction by following the process in Section 106 of the Denver Building and Fire Code

Section 4.02 Green Space Requirements

- (a) Coverage Requirements When Green Space Solely Provided
 - (i) New Buildings.

- (1) Owners who choose to provide solely either a vegetated roof or at-grade green space must provide one of the following amounts of green space:
 - a. 10% of the gross floor area of the building;
 - b. 60% of the total roof area of the building; or
 - c. an amount equal to the available roof space of the building.
- (ii) Existing Buildings.
 - (2) Owners who choose to provide solely either a vegetated roof or at-grade green space may choose to replace either the total roof area or an individual roof section. If the owner chooses to replace the total roof area then he/she must provide one of the following amounts of green space:
 - a. 2% of the gross floor area of the building;
 - b. 18% of the total roof area on the building; or
 - c. an amount equal to the available roof space of the building.
 If the owner chooses to replace an individual roof section, then he/she must provide one of the following amounts of green space:
 - a. 2% of the gross floor area of the building multiplied by the area of individual roof section being replaced;
 - b. 18% of the individual roof section being replaced divided by total roof area; or
 - c. an amount equal to the available roof space of the building.
- (b) General Administration Requirements
 - (i) Owners may provide required green space either with a vegetated roof, and/or at-grade green space.
 - (ii) Buildings are allowed to provide more than the required green space and to allow that to count towards a future building's compliance only if that green space is located on the same zone lot or parcel, unless seeking compliance through the campus approach. Owners cannot use existing green space at their site at the time of permit for a new roof or roof replacement, unless specifically allowed in these rules and regulations.
 - (iii) At-grade green space must be designed by a licensed landscape architect, or certified arborist as appropriate, who shall take responsibility that the at-grade green space is designed per the requirements of these rules and regulations.
 - (iv) Vegetated roofs must be designed by a licensed landscape architect or an accredited green roof professional, unless the vegetated roof system is an approved manufactured system.
 - (v) For at-grade green space, plans shall be submitted for review through the site development plan (SDP) process. Submissions shall include, at a minimum, a cover sheet including the building area calculation, site plan, and a landscape plan. Other

sheets may be required to document compliance. If new lighting is being installed, then the SDP must also include a photometric plan. This SDP shall follow the typical SDP process as outlined in the zoning code. The SDP must contain the following note when green space is chosen as a compliance method for this ordinance.

At-grade green space is shown on this site development plan for compliance with Article XIII of Chapter 10, DRMC, it must be maintained, and cannot be used for purposes other than that shown on this site development plan. Should a future amendment change the amount or location of this at-grade green space, then additional at-grade green space must be provided to document compliance with Article XIII of Chapter 10, DRMC, or another compliance option must be selected.

- (vi) Vegetated roof plans should be submitted through the site development plan and the building permitting process.
- (vii) All green space installed for compliance with this ordinance must be maintained for the life of the building. If it dies, it must be replaced or another compliance option must be chosen.
- (c) All green space must be in an outdoor space; vegetation inside a building will not count as required green space coverage.
- (d) Vegetated roofs
 - (i) General Requirements –
 - (1) Permitting:
 - a. All vegetated roofs on commercial buildings (i.e. buildings constructed to meet the International Building Code) shall require a Green Roof Construction Permit issued to a licensed Green Roof contractor.
 - b. As required by the Denver Building and Fire Code and adopted policies, additional permits shall be obtained for related work, including, but not limited to:
 - i. General Construction
 - ii. Roofing
 - iii. Fire Protection systems
 - iv. Plumbing systems
 - v. Irrigation systems
 - (2) Code Compliance:

- a. The design and construction of vegetated roofs shall comply with Denver Building and Fire Code provisions and with these regulations. Where a vegetated roof is intended for occupancy, Denver Building and Fire Code requirements for occupied roof decks shall apply in addition to the requirements for vegetated roofs.
- b. Adopted Denver Building and Fire Code provisions governing vegetated roofs include, but are not limited to, the following current sections and standards, which are subject to change through code adoption cycles:
 - i. IBC Sections 1503, 1505.10, 1507.16, 1507.16.1, 1607.12.3, & 1607.12.3.1
 - ii. IFC Sections 304.1.2, 317 & 905.3.8
 - iii. IPC Sections 1106 & 1108
 - iv. ANSI/SPRI VF-1, ANSI/SPRI RP-14, ASCE 7, ASTM E108, ASTM E2397, ASTM E2396M-15 & ASTM E2788M-18

(3) Design Considerations:

- a. Vegetative roofing systems shall be either extensive, intensive, or semi-intensive systems, and shall include:
 - i. Vegetation,
 - ii. Growing medium,
 - iii. Filter fabric,
 - iv. Drainage layer,
 - v. Root barrier,
 - vi. Waterproofing membrane, and
 - vii. Other elements as required by the Denver Building and Fire Code or this standard (insulation, tie-downs, irrigation etc.).
- b. For new buildings, where vegetated roofs are covered by renewable energy devices, the overlapping coverage areas of the vegetated roof and the renewable energy devices shall be allowed to count twice when calculating green roof coverage.
- c. Existing vegetated roofs on existing buildings may be deemed compliant with the Green Buildings Ordinance if they meet the standards of this section.

(ii) Fire Protection

(1) Construction Materials:

- a. The fire-resistance of the structural frame and roof construction supporting the vegetative roof shall comply with the IBC. The roofing covering material shall be as required by the IBC and ANSI/SPRI VF-1 (tested to ASTM E108).
- b. Vegetated roofs on buildings of Type V, IV, III, or II-B construction without a tray system shall include permit submittal design information demonstrating the alternative means for providing building ventilation during firefighting efforts and post-fire salvage & overhaul operations. Some examples of recognized methods include mechanical smoke control systems and fixed smoke/heat vents as outlined in IFC 910. An owner seeking this approval must submit an administrative modification request to the Denver Fire Department's Fire Prevention Division.

(2) Vegetated Roof Layout:

- a. Area Dividers, Firebreaks & Border Zones shall be provided as required by the IFC and ANSI/SPRI VF-1.
- b. The roof shall include the following clearance zones:
 - i. 3ft-wide vegetation free border zones at non-combustible roof rooftop structures, roof joints and penetrations.
 - ii. 6ft-wide area covered with stone ballast or concrete pavers where vegetative roof systems abut combustible vertical surfaces and when terminating at a fire-resistance-rated wall.
 - iii. A 13ft-wide area that meets Class A fire classification requirements shall divide vegetated roofs into areas not exceeding 15,625sf or 125ft in length or width.
 - iv. In buildings less than 4-stories in height, there shall be a minimum 8 foot wide clear perimeter around the edges of the roof when exit stairways and fixed permanent ladders are not provided.
 - v. In buildings 4-stories and greater in height, all roofs containing vegetated areas shall be afforded access via exit stairways and fixed permanent ladders to upper roofs. Access points shall be separated by minimum of 10 feet from the vegetated areas.
- c. Required clearance zones shall not count towards required green roof coverage.

(3) Fire Protection Systems:

- a. Fire Protection Systems shall comply with the IFC as amended.

- b. Where the building requires a standpipe system, it shall extend to the roof. The standpipe hose outlet shall be located within 230 feet of all vegetated areas and located within the access point.
- c. In high rise buildings, activation of rooftop manual pull stations shall not activate building vertical pressurization systems.

(4) Maintenance:

- a. Maintenance shall be provided as required by the IFC. The requirement for maintenance shall be conveyed by the designer to the building owner, and it shall be the building owner's responsibility to maintain the vegetative roof system.
- b. A maintenance plan shall be submitted as part of the Vegetated Roof permit application and shall include:
 - i. A description of the maintenance and care necessary for the survival of the specified vegetation in the specified growing-media and how it will be provided.
 - ii. A plan for maintaining the design depth of the growing-medium.
 - iii. A plan for replanting the vegetated roof, in the event replanting becomes necessary.
 - iv. A plan for the removal of overgrown, dead and decaying vegetation at regular intervals, not less than two times per year.
 - v. A plan for the storage of combustible materials for the maintenance of the roof and compliance with the IFC for such storage.
 - vi. A plan for the winterization and maintenance of irrigation systems.
 - vii. Identification of IBC-compliant access to the vegetated roof and fall protection where the vegetated roof is within 10ft of a roof edge.

(5) Supplemental Irrigation:

- a. An irrigation system is required. Irrigation plans shall be submitted as part of the Vegetated Roof permit application. The system shall be designed as described in the maintenance plan as necessary for the survival of the specified vegetation in the vegetative roofing system.
- b. Plumbing connections shall meet Denver Building and Fire Code requirements including applicable IPC requirements.

(6) Vegetation:

- a. Vegetation shall be specified on plans and coordinated with the maintenance plan.

(iii) Waterproofing

(1) Code requirements:

- a. The roof covering materials shall be designed in accordance with the Denver Building and Fire Code, the IBC and ANSI/SPRI VF-1.

(2) Testing:

- a. When the roof cover is not impervious to root penetration, a root barrier shall be installed.
- b. Prior to the installation of the vegetative roof system, the roof's water-tightness shall be tested and a report documenting a successful test, signed by a registered roofing consultant or licensed architect or engineer, shall be provided to the building inspector for approval.
- c. Testing shall follow ASTM Standards and utilize one of the following methods:
 - i. Flood test
 - ii. Electrified field vector mapping
 - iii. Impedance test
 - iv. Infrared thermal imaging
 - v. Low voltage testing
 - vi. High voltage testing
 - vii. Moisture sensors

(iv) Roof Drainage

(1) Code requirements: The roof-drainage system shall be designed to meet the IBC and IPC requirements and the requirements of this standard.

(2) Design considerations:

- a. The reference point for overflow scuppers and drains shall be clearly indicated on drawings to be the roof membrane and not the vegetated roof surface or other layer above the waterproofing.
- b. The root barrier, vegetation, and border materials shall be designed to limit debris and to prevent the blockage of roof drains.
- c. The roof drainage layer of the vegetative system shall be designed to improve the ability of plants in the system to survive.

- i. Systems designed to detain water utilizing geocomposite drainage layers shall meet ASTM E2398-05.
- ii. Systems designed to detain water with a moisture retention mat and granular drainage layer shall meet ASTM E2396M-15.

(v) Structural Design

- (1) Submittal requirements: Structural design shall comply with the IBC and the submittal requirements shall be as required for commercial construction projects.
- (2) Gravity loads:
 - a. The roof structure and deck shall be engineered to support the load of fully-hydrated growing media, the vegetative roof system, and all other design loads.
 - b. Live loads and vegetative roof loads shall be computed as follows:
 - i. The weight of all landscaping materials shall be considered as dead load and shall be computed on the basis of saturation of the soil as determined in accordance with ASTM E2397.
 - ii. The uniform design live load in unoccupied landscaped areas on roofs shall be 20psf.
 - iii. The uniform design live load for occupied landscaped roofs shall be determined in accordance with IBC Table 1607.1.
- (3) Wind loads: The roofing system and the additional vegetative roof system shall be structurally designed to resist wind loads as follows:
 - a. Design meeting ANSI/SPRI RP-14 Wind Design Standard and utilizing ASCE 7 shall be considered to comply with the IBC.
 - b. Documented manufacturer testing of wind resistance for proprietary systems may be accepted by the reviewer in lieu of structural engineering, as appropriate.
 - c. For buildings over 150ft in height, the submittal shall include design by a wind design engineer or the results of a wind tunnel study.
- (4) Existing structures: Existing structures shall be demonstrated as capable of supporting added loads and, where unable to support a vegetated roof, shall be modified as required by the Denver Building and Fire Code.

(vi) Vegetative Roofing System –

- (1) Submittal Requirements: The vegetative system shall be fully specified, including the growing media and vegetation.

- (2) Growing media:
 - a. Growing media shall be specifically designed for use in vegetative roofing systems and may be composed of a combination of organic and inorganic materials complying with ASTM performance standards.
 - b. Growing media shall be minimum 4-inch depth. Except where demonstrated to meet Denver's vegetated roof performance criteria and approved by the Building Official.
- (3) Vegetation:
 - a. Vegetation shall be coordinated with the growing media, drainage mat, root barrier and maintenance plan.
 - b. Vegetation shall not include any noxious weeds as defined by the Colorado Department of Agriculture.
 - d. Vegetation shall be designed to cover 80% of the vegetated roof within 3 years or be used and maintained for the purpose of urban agriculture.
 - e. For roof slopes greater than 2:12, a licensed design professional experienced in vegetative roof design shall submit a vegetative system design that incorporates anti-shear measures for evaluation and approval by the Building Official.
- (4) Irrigation: Design of irrigation systems shall consider the waterproofing membrane, roof drainage systems, vegetation, growing media, drainage system and the maintenance plan.

(vii) Additional Standards –

- (1) The Building Official and the Green Building Technical Advisory Committee shall develop guides and performance criteria for industry use and for the evaluation of vegetated roof designs and specifications.

(e) At-grade green space.

- (i) Location of at-grade green space. At-grade green space may be located anywhere on the zone lot except for the roof of a building.
 - (1) New Buildings:
 - a. At-grade green space coverage provided must be above and beyond the required landscaping area as identified in the Zoning Code of the City and County of Denver or other applicable rules and regulations, unless otherwise allowed below.
 - b. For projects subject to a zoning requirement for publicly accessible open space, all or a portion of that open space requirement can be used to fulfill the green space requirement so long as it complies with the at-grade green space standards below.

- c. Areas designed to provide water quality treatment of storm water as required by Public Works may be used to fulfill the green space requirement as long as all water quality treatment is met through a vegetated water quality facility and in conformance with UDFCD's *Stormwater Criteria Manual* (Volume 3, Chapter 4, Factsheets T-3), and/or Public Works' *Ultra Urban Green Infrastructure Guidelines* criteria for vegetated bioretention facilities, or current versions of these documents
 - d. Areas in the right of way will not be considered unless they can meet one of the following standards, and so long as the vegetation does not reduce sidewalk width below the minimum required by Public Works.
 - i. A vegetated water quality facility and in conformance with UDFCD's *Stormwater Criteria Manual* (Volume 3, Chapter 4, Factsheets T-3), and/or Public Works' *Ultra Urban Green Infrastructure Guidelines* criteria for vegetated bioretention facilities, or current versions of these documents.
 - ii. A tree meeting the Level 2 or higher tree standard as detailed in Table 2 below.
 - iii. An existing tree in the right-of-way that is protected and preserved in accordance with existing tree(s) requirements below. Trees not properly protected and preserved to standards of the City Forester may result in loss of associated credit.
- (2) Existing Buildings. Generally, at-grade green space currently in existence on the zone lot, improvements to at-grade green space currently in existence, or vegetation in the right-of-way will not count towards required green space coverage with the following exceptions:
- a. Conversion of current green space to a new vegetated water quality facility that is in conformance with UDFCD's *Stormwater Criteria Manual* (Volume 3, Chapter 4, Factsheets T-3), and/or Public Works' *Ultra Urban Green Infrastructure Guidelines* criteria for vegetated bioretention facilities, or current versions of these documents.
 - b. Trees on the zone lot added to the existing green space or provided with improved planting space to meet a level in Table 2 shall count.
 - c. Trees in the right-of-way where meeting any of the following:
 - i. An improved tree planting space is provided to meet the Level 1 or higher tree standard as detailed in Table 2 below and in accordance with the existing tree(s) requirements

below. At direction of the City Forester, planting space must also preserve the existing tree or a new tree shall be planted.

- ii. A new tree planted to meet the Level 2 or higher standard for trees as detailed below. A building that does not have available at-grade land to meet the green space coverage requirements may count a new tree that meets the Level 1 or higher tree standard as detailed in Table 2 below.

(ii) Soil. All projects shall demonstrate that they have met the following soil remediation and irrigation standards:

- (1) Soil analysis from a local credited soil analysis laboratory with experience in local urban soils shall be required when plants are to be installed in green space. All soil remediation shall be based on the soil analysis.
 - a. Minimum soil analysis must determine soil texture and structure, pH balance, soil salinity, free lime, organic matter (OM) content, plant available nutrients, and compaction.
 - b. Depth of landscape soil analysis shall be 24in for trees and 18in for all other areas.
- (2) Grades shall be set to allow for proper drainage away from structures. Grades shall maintain smooth profiles and be free of surface debris, bumps, and depressions.
- (3) Shrub bed/planting areas shall be mulched to a depth of 2-4in. Perennials and groundcover areas shall be mulched with a 3in layer. No weed barrier shall be installed over top of tree root balls.
 - a. Mulch shall be an organic shredded wood mulch certified pathogen, weed and chemical free;
 - b. Surface coverage shall be a minimum 3ft radius from the trunk for trees where possible; and
 - c. Mulch shall be kept a minimum of 4-6in away from tree trunks and not touching the base of other woody landscape plants.

(iii) Irrigation.

- (1) All landscape plant material and grass shall be irrigated with an appropriate automatic system as needed. If applicable, then the irrigation system must meet the following:
 - a. Automatic system that has rain sensors and evapotranspiration clocks; and
 - b. Shrubs and trees shall be installed on a separate zone from turf.
- (2) When a graywater system is used for irrigation, salt tolerant plants shall be used.

(iv) At-grade green space options. An owner may choose any of the options below in order to satisfy green space requirements. The option must be documented within the Site Development Plan. Owners must maintain the green space.

(1) Trees.

- a. Projects installing trees must demonstrate on the site development plan how they will be planted with the appropriate supporting infrastructure or provide a tree protection plan detailing how existing trees will be successfully retained. Projects proposing to use trees for at-grade-green space must use green building qualified trees from the Office of the City Forester approved street tree list found at www.denvergov.org/forestry. Ornamental/columnar trees require approval from the Office of the City Forester.
- b. All trees shall have a soil area with a minimum depth of 3 feet, with a maximum 80% proctor density compacted soil that promotes healthy root growth, meeting one of the following soil volumes or horizontal areas as detailed in Table 2 (depths beyond 3 feet shall not count towards volume minimums). Trees shall receive square footage coverage credit towards compliance in accordance with Table 2.

Table 2: Tree standards.

	Soil Volume per tree (Cubic Feet)	Horizontal Area of Soil per tree meeting above soil standard (Square Feet)	Coverage Credit per Shade tree (Square Feet)	Coverage Credit per Ornamental / Columnar tree (Square Feet)
Level 1 (typical right of way street tree)	>225	>75	150	150
Level 2	>500	>167	300	300
Level 3	>750	>250	450	-
Level 4	1000+	334+	600	-

- c. Additional requirements for existing trees are as follows:
 - i. Existing canopy cover of established trees may be used instead of Table 2 when existing trees are used for new building compliance.
 - ii. An existing tree may only count towards at-grade green space if approved by the City Forester as a qualified tree (factors include: desirable species, in fair or better condition of health with sound structure for the species,

free of communicable insect and disease, in a location capable of supporting the mature size of the tree, etc.) Projects seeking to use existing trees must submit supporting documentation with the site development plan to allow the City Forester to determine if the tree can qualify.

- iii. In order for existing trees to be approved and counted towards at-grade green space, a tree protection plan shall be submitted including the following: tree location, species, trunk diameter at 4.5 feet above ground, surveyed drip line of existing tree canopy edge, and a maintenance plan to protect tree health during construction which must include continued irrigation of the tree.
 - iv. Projects proposing to use existing trees for at-grade green space must follow the City Forester tree retention and protection specifications found at www.denvergov.org/forestry.
- (2) Groundcover, Shrubs, and Xeric Grasses. In order to comply with required at-grade green space using groundcover, shrubs, or urban agriculture, the proposed vegetation must be included in one of the following resources:
- a. “Plant Select” lists. <http://plantselect.org/plansts/find-a-plant>;
 - b. <https://conps.org/gardening-with-native-plants/>; or
 - c. For xeric grasses see Table B-3 of UDFCD’s Urban Storm Drainage Criteria Manual (Volume 3, Chapter 4, Fact Sheet T-3) or current versions of these documents .
- (3) Turfgrass. Turfgrass may be installed in the following amounts.
- a. 25% of the green space requirement may be met with turfgrass.
 - b. An additional 25% of the green space requirement may be met with a turfgrass, if the grass areas also provide pollution removal and volume reduction from adjacent impervious areas per UDFCD’s Urban Storm Drainage Criteria Manual (Volume 3, Chapter 4, Fact Sheet T-1 –Grass Buffer), or current versions of these documents
- (4) Areas for Urban Agriculture. The area must contain protected plant beds with soils appropriate for plants meeting the definition of urban agriculture. Where not made available to the public as a community garden, Urban Agriculture green space shall be planted at least annually with plants meeting the definition of Urban Agriculture.

- (5) At-grade green space vegetation allowed in subsections 4.02(e)(iv)(1)-(3) above shall be designed to use an average of 10 gallons maximum per square foot of potable water irrigation per year.

Section 4.03 Renewable Energy Requirements.

(a) On-site solar panels.

- (i) New buildings must provide solar panels covering an area on the building or zone lot that is at least 70% of the total roof area of the building, or an area equal to an amount required to provide 100% of estimated annual average electricity used at the building.
- (ii) Owners of existing buildings may choose to replace either the total roof area or an individual roof section. If the owner chooses to replace the total roof area then he/she must provide on-site solar panels covering an area in one of the following amounts: 5% of the gross floor area of the building; 42% of the total roof area on the building; or an area equal to the amount required to provide 100% of estimated annual average electricity used at the building. If the owner chooses to replace an individual roof section, then he/she must provide on-site solar panels covering an area in one of the following amounts: 5% of the gross floor area of the building multiplied by the area of individual roof section being replaced; 42% of the individual roof section being replaced; or an amount equal to the available roof space of the building.
- (iii) Projects providing solar panels to comply with the Green Buildings Ordinance shall submit the information typically required by CPD for the review of such systems. Solar panels are required to have a minimum efficiency rating of 16%, and must provide manufacturer's specifications outlining this efficiency rating with the permit submittal. When selecting this option, the proposed installed system capacity (kW) should be noted on the initial application.
- (iv) When a project proposes to provide solar panels under this option, a roof plan must be provided that clearly outlines the total area of the roof, and identifies the areas for panels and associated clearances.
- (v) For existing buildings proposing to provide solar panels that generate at least 100% of the building's electricity usage, the customer must provide the most recent complete year's annual average electricity usage so that CPD may determine that the requirement is met. Solar panels providing electricity to existing buildings that are in place prior to the passage of the Green Buildings Ordinance may count towards this requirement so long as adequate coverage is provided and the panel efficiency rating of 16% is demonstrated.
- (vi) New buildings shall provide an energy model indicating the estimated annual average electricity usage.
- (vii) New buildings seeking to provide a renewable energy device other than solar panels shall submit documentation required to demonstrate that the renewable energy device provides a similar generation capacity as solar panels, and meets

the requirements above depending upon the compliance path chosen – either 70% of the available roof area, or an area required to provide 100% of estimated annual average electricity used at the building.

- (viii) The solar coverage area includes code required access around the panels and manufacturer recommended clearances.

(b) Off-site

- (i) For new construction projects choosing the 100% off-site renewable energy purchase option, an energy model indicating anticipated electricity consumption and a Green Buildings Declaration Form signed by the building owner committing to purchase renewable electricity capacity sufficient to supply 100% of electricity consumption is required. Anticipated electricity consumption must be shown using the same methodology as is used to demonstrate code performance compliance. Anticipated Site Energy Use Intensity (kBtu/sf/yr) for the building must also be reported from that model.

- (1) For buildings where the owner is the only utility account holder, the building owner must present the minimum five (5) year contract to CPD for the appropriate amount of renewable electricity capacity prior to issuance of the CO.
- (2) For buildings where tenants hold some or all utility accounts, the building owner must present minimum five (5) year contracts to ~~DDPHE-CASR~~ totaling the appropriate amount of renewable electricity capacity within 18 months of receiving the CO.
- (3) Electricity consumption may vary from the model year to year, therefore for the life of the building, the building owner must maintain contract(s) for sufficient renewable capacity to supply at least 90% of electricity consumption of the building. Contracts may be requested at any time by the City, but, at a minimum the building owner shall submit contracts at the following times:
 - a. For buildings where the owner is the only utility account holder, a new contract must be submitted to ~~DDPHE-CASR~~ upon expiration of the original contract or anytime the building is sold. If the building is sold, the new owner must demonstrate the original contract has been transferred or that they have purchased an equivalent amount of off-site renewable electricity capacity elsewhere.
 - b. For buildings where tenants hold some or all utility accounts, the building owner must present contracts to ~~DDPHE-CASR~~ totaling the appropriate amount of renewable electricity capacity every 5 years.
- (4) All off-site renewable electricity contracts must be for a subscription, lease, or purchase of a share in a voluntary renewable energy program offered by Xcel Energy or a community solar project for which a

dedicated renewable energy resource located in Public Service Company of Colorado territory is built for that customer program, and which has dedicated customer capacity or energy to fulfill that customer's subscription.

- (ii) For existing buildings, refer to section 4.08
- (c) Net zero buildings. At permit/plan review, the owner must submit an anticipated energy model and annual EUI that indicates the amount of energy anticipated to be used annually will be offset by the onsite renewable energy source provided in the design documents. At the end of 12 months of normal level of occupancy for that building type, the owner must provide a confirmation to ~~DDPHE-CASR~~ that the systems and building are performing as anticipated, and the building has met the requirements of a Net-zero energy building. The documentation shall include analysis of the solar panels or other renewable energy source and a continuous 12 month period of utility bills starting after the TCO was obtained and 60% of normal occupancy levels were achieved. A variance of 5% will be considered as a successful application. If the variance is greater than 5%, a reevaluation of the system and proposed corrective measures will need to be presented to both CPD and ~~DDPHE-CASR~~.

Section 4.04 Energy Cost Savings

- (a) The requirements below apply to new buildings. Existing buildings that choose to comply with an energy cost saving model should refer to Section 4.08 below.
- (b) The owner must submit at permit/plan review submission, an energy model indicating the baseline code compliance. Additionally, the report must identify those above code items being included in the design and demonstrate the additional above code performance in the report as a separate section to clearly delineate the additional scope of work indicating those above code systems and or performance features. At the completion of the project, a preliminary commissioning report must be submitted to CPD indicating that these items have been installed in accordance with the manufacturers' recommendations and are performing as designed and intended, prior to obtaining the TCO or CO.
- (c) Substantive requirements. The owner shall demonstrate a minimum of 12% annual energy cost savings above the current Denver Building and Fire Code. Annual energy cost savings shall be demonstrated using a performance compliance path allowed in the IECC.

For example, under the IECC 2015, projects can use either of the following methods:

- (i) 2015 IECC - Section C407, Total Building Performance method: Demonstration of a minimum 27% energy cost savings relative to the C407 standard reference design building. Projects must meet all mandatory requirements of the 2015 IECC.
- (ii) ASHRAE 90.1-2013 - Chapter 11, Energy Cost Budget method: Demonstration of a minimum 12% annual energy cost savings relative to the energy cost budget. Projects must meet all the mandatory requirements of ASHRAE 90.1-2013. Projects using either of these methods must use the same methodology as is used to demonstrate code performance compliance and report estimated Site Energy Use Intensity (kBtu/sf/yr) and annual estimated energy use by fuel type for

the building from that model.

- (iii) Projects using either of these methods should meet all other energy code compliance submittal requirements to document compliance with the selected method as required by the City & County of Denver: Other requirements can be found at the following URL:
https://www.denvergov.org/content/dam/denvergov/Portals/696/documents/Denver_Building_Code/2016_Code_Policies/IECC_C101.5.1_C103.2_C408.2.4.pdf.
- (iv) Additional energy savings or exceptional calculations for loads or efficiency measures that are not already addressed by the methods above may only be claimed with prior approval by the Building Official.

Section 4.05 Building Certification

- (a) **New Buildings:** The owner shall achieve for the entire building LEED Building Design and Construction: New Construction Gold Level, Enterprise Green Communities, National Green Building Standard ICC/ASHRAE 700 Gold, or equivalent alternative approved green building certification. For buildings or additions pursuing compliance via certification, the LEED design package or equivalent must be submitted at the time of permitting the building. At permit/plan review, the owner must submit the LEED scorecard and all ancillary documentation associated with meeting the criteria for certification. To be issued a certificate of occupancy, the building must be pre-certified or submit the LEED design review (or equivalent) with a plan for how any requested changes will be made. Proof of certification must be submitted to ~~DDPHE-CASR~~ 18 months after the certificate of occupancy is given.
- (b) **Existing Buildings:** The owner shall submit to CPD with the roof permit application one of the following for the entire building:
 - (i) A LEED Building Design and Construction: New Construction Silver or higher certification and/or a current LEED Operations and Maintenance Silver level or higher certification.
 - (ii) Enterprise Green Communities certification
 - (iii) National Green Building Standard ICC/ASHRAE 700 Silver level or higher certification
 - (iv) Equivalent approved alternative green building certification.
- (c) **Alternative certification.** The Building Official may allow an alternative method of certification so long as the alternative certification program's criteria encompasses the entire building and provides for similar energy efficiency as those programs called out above.
 - (i) LEED Building Design and Construction: Core & Shell Gold Level is an allowed alternative certification for new buildings if the building receives at least 2 points using Option 1 in Optimize Energy Performance credit in the Energy and Atmosphere category. The energy model used for LEED must be submitted to CPD

for code compliance so that the points can be verified and so that initial tenant improvement projects may be held to this model.

Section 4.06 Combination requirements This option is only available for new buildings.

(a) **Green Space and Renewable Energy-**

(i) Coverage requirements. Owners must provide green space in one of the following amounts: 3% of the gross floor area of the building; 18% of the total roof area on the building; or 30% of available roof space. Owner must also provide on-site solar panels covering an area in one of the following amounts: 7% of the gross floor area of the building; 42% of the total roof area on the building; or 70% of available roof space. Other renewable energy devices may be used in place of on-site solar panels as long as the renewable energy devices achieve equivalent total energy production as the on-site solar panels. Other combinations may be approved by the Building Official so long as the area covered equals 10 percent of the gross floor area of the building, 60% of the total roof area on the building, or the available roof space on the building.

(ii) Owners must submit floor plans, site plans, solar panel location plans, and provide a complete analysis of all area calculations and anticipated kW of renewable capacity located on all plans for all options, including but not limited to, solar panels on the roof, solar panels on grade, vegetated roofs, at-grade green space, building floor area, roof area, available roof area, mechanical equipment, etc. The submission must clearly identify the desired path/option chosen and the percentages of each aspect of the submission (green & solar). Note that solar area includes code required access around the panels and manufacturer recommendations for clearance; however, the vegetated roof area does not include required area for access and other clearances as mentioned in these rules and regulations, the IFC, and the IBC. Green space shall be a minimum of 30% of the required coverage under the alternative coverages of green spaces and on-site solar panel option allowed in Ordinance Section 10-301a (2)f.4.

(b) **Green Space and Off-site Solar** – Owners must submit all of the items noted in the Green and renewable energy option above and the following to demonstrate the required off-site solar has been purchased and the energy efficiency requirements of this option have been met:

(i) Green space covering an area in the amount of one of the following: 3 percent of the gross floor area of the building; 18 percent of the total roof area on the building; or the available roof space on the building.

(ii) Off-site solar

(1) For buildings where the owner is the only utility account holder, the building owner must present the minimum five (5) year contract to CPD

for off-site renewable electricity capacity equal to the amount of solar that would have been provided on-site prior to issuance of the CO.

- (2) For buildings where tenants hold some or all utility accounts, the building owner must present minimum five (5) year contracts to ~~DDPHE-CASR~~ totaling the appropriate amount of renewable electricity capacity within 18 months of receiving the CO.
- (3) For the life of the building, the building owner must maintain contract(s) for required renewable capacity. Contracts may be requested at any time by the City, but at a minimum, the building owner shall submit contracts at the following times:
 - a. For buildings where the owner is the only utility account holder, a new contract must be submitted to ~~DDPHE-CASR~~ upon expiration of the original contract or anytime the building is sold. If the building is sold the new owner must demonstrate the original contract has been transferred or that they have purchased an equivalent amount of off-site renewable electricity capacity elsewhere.
 - b. For buildings where tenants hold some or all utility accounts, the building owner must present contracts to ~~DDPHE-CASR~~ totaling the appropriate amount of renewable electricity capacity every 5 years.
- (4) All off-site renewable electricity contracts must be for a subscription, lease, or purchase of a share in a voluntary renewable energy program offered by Xcel Energy or a community solar project for which a dedicated renewable energy resource located in Public Service Company of Colorado territory is built for that customer program, and which has dedicated customer capacity or energy to fulfill that customer's subscription;

- (iii) Energy Efficiency. Owners must demonstrate a minimum of 2.5% annual energy cost savings above the current Denver Building and Fire Code. Annual energy cost savings shall be demonstrated using a performance compliance path allowed in the IECC.

For example, under the IECC 2015, projects can use either of the following methods:

- (1) 2015 IECC - Section C407, Total Building Performance
method: Demonstration of a minimum 17.5% energy cost savings relative to the C407 standard reference design building. Projects must meet all mandatory requirements of the 2015 IECC.
- (2) ASHRAE 90.1-2013 - Chapter 11, Energy Cost Budget
method: Demonstration of a minimum 2.5% annual energy cost savings relative to the energy cost budget. Projects must meet all the mandatory requirements of ASHRAE 90.1-2013.

- (3) Projects using either of these methods must use the same methodology as is used to demonstrate code performance compliance and report estimated Site Energy Use Intensity (kBtu/sf/yr) and annual estimated energy use by fuel type for the building from that model.
- (4) Projects using either of these methods should meet all other energy code compliance submittal requirements to document compliance with the selected method as required by the City & County of Denver: Other requirements can be found at the following URL:
https://www.denvergov.org/content/dam/denvergov/Portals/696/documents/Denver_Building_Code/2016_Code_Policies/IECC_SectionsR101.5.1_R103.2_C101.5.1_C103.2_C408.2.4.pdf.
- (5) Additional energy savings or exceptional calculations for loads or efficiency measures that are not already addressed by the methods above may only be claimed with prior approval by the Building Official.

(c) **Green Space and Energy Efficiency.** Owners must provide green space in an amount equal to the amounts required in Section 4.06(b)(i) above. Owners must also demonstrate a minimum of 5% annual energy cost savings above the current City & County of Denver energy code. Annual energy cost savings shall be demonstrated using a performance compliance path allowed in the IECC.

For example, under the IECC 2015, projects can use either of the following methods:

- (i) 2015 IECC - Section C407, Total Building Performance method: Demonstration of a minimum 20% energy cost savings relative to the C407 standard reference design building. Projects must meet all mandatory requirements of the 2015 IECC.
- (ii) ASHRAE 90.1-2013 - Chapter 11, Energy Cost Budget method: Demonstration of a minimum 5% annual energy cost savings relative to the energy cost budget. Projects must meet all the mandatory requirements of ASHRAE 90.1-2013.
- (iii) Projects using either of these methods must use the same methodology as is used to demonstrate code performance compliance and report estimated Site Energy Use Intensity (kBtu/sf/yr) and annual estimated energy use by fuel type for the building from that model.
- (iv) Projects using either of these methods should meet all other energy code compliance submittal requirements to document compliance with the selected method as required by the City & County of Denver: Other requirements can be found at the following URL:

https://www.denvergov.org/content/dam/denvergov/Portals/696/documents/Denver_Building_Code/2016_Code_Policies/IECC_SectionsR101.5.1_R103.2_C101.5

.1_C103.2_C408.2.4.pdf.

- (v) Additional energy savings or exceptional calculations for loads or efficiency measures that are not already addressed by the methods above, may only be claimed with prior approval by the Building Official.

Section 4.07 Payment to the Green Building Fund

- (a) An owner whose building is subject to the requirements of the Green Buildings Ordinance may choose to comply by paying an amount to the Green Building Fund. Upon the owner's request to comply through payment to the Green Building Fund, the owner must calculate the amount of green space required, and CPD shall calculate the appropriate fee to be paid to the fund. The owner must pay the applicable fee at the same time as payment of building and/or roofing permits. CPD will not issue any building permit for a new building or addition, or a roof permit for an existing building until the owner has paid the applicable fee to the Green Building Fund. Payment of a fee to the green building fund is a one-time payment, and shall be valid for compliance for the life of the building.
- (b) In cases where an owner chooses to provide required green space, but is unable to provide the entirety of required green space coverage, the owner may pay the applicable amount for no more than twenty-five (25) percent of the green space required, but not provided, and must provide at least seventy-five (75) percent of the required green space coverage.
- (c) Revenue received through payments to the fund will offset the cost undertaken by the City in providing new or improved green space within the City. In selecting projects for funding, the City will strive to give priority or preference to the following:
 - (i) Low income areas that currently have less green space and trees;
 - (ii) Highest impact projects. Prioritize projects that will make substantial impacts in alignment with the uses and purposes outlined in the Green Building Ordinance; and
 - (iii) Green spaces located near the buildings that paid into the fund where feasible.

Section 4.08 Energy Program for Existing Buildings

- (a) The Energy Program shall be administered by ~~the Department of Public Health and Environment~~CASR.
- (b) An owner may enroll in the Energy Program at the time of roof replacement, or prior to roof replacement. If the owner enrolls prior to roof replacement, then no further action will be required at the time of roof replacement. Enrollment in the Energy Program will be valid for the longer of 20 years or through one roof replacement. When a building owner enrolls in the Energy Program they have up to 5 years from June 1st following their enrollment date to demonstrate they have achieved one of the following:
 - (i) ENERGY STAR score of 85 or higher. The score must be maintained annually after initial compliance and will be verified via the building's annual energy

benchmarking report.

- (ii) **Building Certification**
 - (1) A LEED Building Design and Construction: New Construction level or higher certification and/or a current LEED Operations and Maintenance: Existing Buildings Silver level or higher certification
 - (2) Enterprise Green Communities certification
 - (3) National Green Building Standard ICC/ASHRAE 700 Silver level or higher certification
 - (4) Equivalent approved alternative green building certification.

- (iii) Installation of on-site solar panels, or other on-site renewable energy technologies that achieve equal to or greater additional, new greenhouse gas emission reductions. Solar panels must be a minimum of 16% efficiency and must cover at minimum one of the following areas. The solar coverage area includes code required access around the panels and manufacturer recommendations for clearance.
 - (1) 5% times gross floor area
 - (2) 42% of the roof
 - (3) An amount required to meet 100% of estimated average electricity used at the location.

- (iv) Purchase off-site renewable electricity capacity sufficient to supply 100% of electricity used in the building with a minimum of a 5-year contract, which will be renewed for the term of the Energy Program. Additionally, the owner must comply with the requirements of subsection (vii) below.

- (v) Purchase off-site renewable electricity capacity with a minimum of a 5-year contract, which will be renewed for the term of the Energy Program. The owner must comply with the requirements of subsections (vii) and (viii) below, and reduce annual EUI as follows:
 - (1) Buildings with a gross floor area of 25,000 – 49,999 square feet will invest in off-site solar equivalent to 10% of the energy used in the building with a minimum 5-year contract and reduce their annual EUI 5% below their baseline;
 - (2) Buildings with a gross floor area of 50,000 square feet or larger will invest in off-site solar equivalent to 15% of the energy used in the building with a minimum 5-year contract and reduce their annual EUI 7.5% below their baseline

- (vi) Reduction of annual weather normalized site Energy Use Intensity (EUI) as follows:
 - (1) Buildings with a gross floor area of 25,000 – 49,999 square feet will reduce their annual EUI by 10% below their baseline;

- (2) Buildings with a gross floor area of 50,000 square feet or larger will reduce their annual EUI 15% below their baseline.
 - (3) Buildings in either category of (vi)(1) or (2) above, must additionally comply with subsection (viii) below.
- (vii) For off-site renewable electricity options the building owner must present minimum five (5) year contract(s) indicating the appropriate total amount of renewable electricity capacity has been purchased. The amount of electricity consumed will be verified through the annual benchmarking report sent to the City via ENERGY STAR Portfolio Manager. For the term of the Energy Program the building owner must maintain contract(s) for the required renewable capacity.
- (1) For buildings who selected to purchase renewable electricity capacity sufficient to supply 100% of electricity used in the building, if electricity consumption in the building rises over time they must contract for additional renewable capacity to supply least 90% of electricity consumption of the building in the previous year.
 - (2) Contracts may be requested at any time by the City, but, at a minimum the building owner shall submit contracts at the following times:
 - a. For buildings where the owner is the only utility account holder a new contract must be submitted to ~~DDPHE-CASR~~ upon expiration of the original contract or anytime the building is sold. If the building is sold the new owner must demonstrate the original contract has been transferred or that they have purchased an equivalent amount of off-site renewable electricity capacity elsewhere.
 - b. For buildings where tenants hold some or all utility accounts the building owner must present contracts to ~~DDPHE-CASR~~ totaling the appropriate amount of renewable electricity capacity every 5 years.
 - (3) All off-site renewable electricity contracts must be for a subscription, lease, or purchase of a share in a voluntary renewable energy program offered by Xcel Energy or a community solar project for which a dedicated renewable energy resource located in Public Service Company of Colorado territory is built for that customer program, and which has dedicated customer capacity or energy to fulfill that customer's subscription;
- (viii) For annual EUI improvement compliance options the EUI baseline and required savings will be determined based on the building's annual energy benchmarking report. The required savings must be maintained annually after initial compliance and will be verified via the building's annual energy benchmarking report. For buildings with manufacturing use types the owner may apply to use energy consumption per items produced or similar appropriate metric in place of EUI.

- (1) The building's default baseline annual EUI will be the EUI reported in the building's energy benchmarking report the year prior to enrollment (as reported via the ENERGY STAR Portfolio Manager tool). Alternately, the building owner may select a different calendar year up to 5 years prior to enrollment into the energy program to use as a baseline.
- (2) An owner may petition for a change in their baseline if they can demonstrate a major shift in building use type. An engineer's report estimating what the new adjusted baseline should be based on the new building use type will be required.
- (3) If an owner has not yet achieved the required savings in the calendar year prior to the June 1st deadline 5 years after enrollment in the program, then they have the option to instead submit proof of completion of an energy efficiency project. They must submit report from an energy efficiency contractor showing they have made energy efficiency improvements to the building with an estimated energy savings equal to the required energy savings. In this case, the benchmarking report submitted 2 years later must demonstrate they have actually achieved the estimated savings.
- (4) For owners that submit an energy efficiency project, default baseline annual EUI will be the EUI reported for the calendar year prior to the completion of the project. Alternately, the building owner may select a different calendar year up to 5 years prior to completion of the project to use as a baseline. For example, any building submitted improvements in 2018 may select a baseline year as far back as 2013; any building submitting improvements in 2023 may select a baseline year as far back as 2018.

Section 4.09 Additions

For additions, CPD will calculate any coverage requirements using the gross floor area of the building addition or square footage of the roof of the building addition, as applicable. When a building undergoes a roof replacement or recover, and that building previously built an addition less than 25,000 square feet of gross floor area, then CPD will include the gross floor area of the addition in its calculation of the gross floor area of the entirety of the building. Construction that increases the overall height of a building, but does not add interior volume to the building, will be considered a roof replacement, and not an addition.

ARTICLE V: CAMPUSES

Section 5.01 Administration

- (a) Documentation. Compliance with the campuses requirement shall be demonstrated through a Site Development Plan, Infrastructure Master Plan (IMP), or similar site plan document and subsequent building plans. If a campus is required to do an IMP or similar document for other reasons, then compliance with the Green Buildings Ordinance shall be accomplished in that document and subsequent permit submittals. If an IMP is not required, then documentation of compliance with the Green Buildings Ordinance shall

occur on a site development plan with subsequent building permits, if required. Submissions should provide information detailing compliance on related sheets, including as applicable, but not limited to, the Cover Sheet, Site Plan, Roof Plan, and Landscape Plan.

- (b) Campus Extent. The owner(s) of buildings within a campus shall identify the extent of the proposed campus by including all new and existing buildings desired to be included in the campus (identified as such), all surrounding streets, and all surrounding ground level areas utilized to meet the campus requirement.

Section 5.02 Compliance Options

Owners of new buildings within a campus may comply with the green building requirements by providing green space, on-site renewable energy purchase, or a combination of green space and on-site renewable energy purchase at a campus-wide level. Owners of existing buildings within a campus may comply with the green building requirements by providing green space or on-site renewable energy devices at a campus-wide level instead of documenting compliance building by building. Owners of buildings within a campus must comply with any applicable cool roof requirements.

Section 5.03 Energy Master Plan

- (a) When Required. An Energy Master Plan is required for a campus when complying with:
 - (i) On-site renewable energy or a combination of green space and on-site renewable energy for a new building; and
 - (ii) On-site solar panels for an existing building.
- (b) Documentation. Campuses seeking to document compliance utilizing the Energy Master Plan shall provide the following in addition to the requirements of Article IV.
 - (i) Any new or existing building roof plans
 - (ii) A campus site plan showing the location of any new, existing or future building locations
- (c) Energy Master Plan. The submission shall include the following elements:
 - (i) A detailed calculation of what renewable energy generation would have been had the individual building on the campus complied at the individual level with the renewable energy requirements.
 - (ii) A summary of the renewable energy projects that will be undertaken in existing and new buildings on the campus. Calculations should be included showing how those projects will generate as much energy as if individual buildings on the campus had complied.
 - (iii) Commitment to a deadline by which each project will be complete by and who is responsible for completing it and reporting its completion to DDPHECASR.
 - (iv) Identify interim project steps that will be reported to track progress and deadlines by which each step will be complete and submitted to DDPHECASR.

- (v) Plan for how the projects will be funded and financed.
 - (vi) A protocol for continuing to monitor energy production to ensure the energy generation is realized.
- (d) ~~DDPHE-CASR~~ shall be responsible for reviewing and approving the energy master plan as well as enforcing compliance with the plan.

ARTICLE VI: REPORTING





Every twelve (12) months, CPD and ~~DDPHE-CASR~~ shall prepare a written report of the activities related to, and an assessment of outcomes of, this article, and report their findings and any recommendations to the city council.

- The report shall include information about the number of buildings that have selected each compliance option and the total number of cool roofs, square footage of vegetated roofs and at-grade green spaces, solar capacity installed on-site and purchased off-site, and efficiency improvements made.
- The report will also characterize the effects those installations have had on improving the urban heat island, adding green space to the City, improving water and storm water management, and reducing greenhouse gas emissions.

APPENDIX A

Green Building Ordinance - Compliance Options for New Buildings





 Cool Roof Required* Plus ONE of the Following Options:

 <p>Green Roof / Green Space</p> <p>Anywhere on building or zone lot</p> <p>Green area equivalent to the lesser of:</p> <ul style="list-style-type: none"> • 10% of gross floor area of the building • 60% of the total roof area • Available roof space <p>Pay for Offsite Green</p> <p>Payment to Green Building Fund of:</p> <ul style="list-style-type: none"> • \$50.00 per square foot of green space coverage required but not provided 	 <p>Green Plus Solar or Energy Efficiency</p> <p>Anywhere on building or zone lot, or off-site for solar</p> <p>Green area equivalent to the lesser of:</p> <ul style="list-style-type: none"> • 3% gross floor area • 18% of total roof area • Available roof space <p>COMBINED WITH ONE OF THE FOLLOWING:</p> <ol style="list-style-type: none"> 1) Onsite solar equiv. to the lesser of: <ul style="list-style-type: none"> • 7% of the floor area • 42% of total roof area 2) Offsite solar equivalent to the onsite solar plus a minimum 2.5% energy cost savings from energy efficiency above code 3) 5% energy cost savings from energy efficiency above code 	 <p>Solar or Energy Efficiency</p> <p>Anywhere on building or zone lot, or off-site</p> <p>Onsite solar or other renewable equiv. to your choice of:</p> <ul style="list-style-type: none"> • 70% of the total roof area • 100% of annual average electricity used at the building • Proof that the building is Net Zero <p>OR</p> <p>Offsite solar equiv. to your choice of:</p> <ul style="list-style-type: none"> • 100% of building electricity use • Amount equivalent to required onsite solar plus minimum 6% energy cost savings from energy <p>OR</p> <p>Minimum 12% energy cost savings from energy efficiency above code</p>	 <p>Certification</p> <p>One of the following:</p> <ul style="list-style-type: none"> • LEED Certification, minimum gold • Enterprise Green Communities certification • National Green Building Standard ICC/ASHRAE 700 • Equivalent certification approved by the building official
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* If the proposed roof is a character-defining roof, CPD may allow alternative roof materials

Green Building Ordinance - Compliance Options for Existing Buildings

 At Roof Replacement: Cool Roof Required* plus ONE of the Following Options:

 <p>Green Roof / Green Space</p> <p>Anywhere on building or zone lot</p> <p>Green area equivalent to the least of:</p> <ul style="list-style-type: none"> • 2% of floor area of the building • 18% of the total roof area • Available roof space <p>Pay for Offsite Green</p> <p>Payment to Green Building Fund of:</p> <ul style="list-style-type: none"> • \$50.00 per square foot of green space coverage required but not provided 	 <p>Solar</p> <p>Anywhere on building or zone lot</p> <p>Onsite solar or other renewable equivalent to the least of:</p> <ul style="list-style-type: none"> • 5% of the floor area • 42% of the total roof area • An area equal to an amount required to provide 100% of building electricity use 	 <p>Certification</p> <p>One of the following:</p> <ul style="list-style-type: none"> • LEED Certification, minimum silver • Enterprise Green Communities certification • National Green Building Standard ICC/ASHRAE 700 • Equivalent certification approved by the building official 	 <p>Energy Program</p> <p>Enroll in a flexible energy program that includes various energy efficiency and renewable options designed to achieve similar greenhouse gas emission reductions as the on-site solar option.</p> <ul style="list-style-type: none"> • Comply with one of many pathways in the Energy Program within 5 years. • Can enroll early to “bank” efficiency projects for next roof replacement
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* If the roof is a character-defining roof, CPD may allow alternative roof materials

ARTICLE XIII. - GREEN BUILDINGS

DIVISION 1. - GREEN BUILDING REQUIREMENTS

Sec. 10-300. - Definitions.

The following words and phrases, as used in this article XIII, have the following meanings:

- (a) *Addition* for purposes of this article XIII means an extension or increase in gross floor area or height of a building or structure. A connecting element of limited width as required by the International Building Code for a pedestrian walkway does not create an addition to a building.
- (b) *Available roof space* means the total roof area of a building excluding the following:
 - (1) Private terraces no greater in area than the gross floor area of the abutting unit at the roof level;
 - (2) Outdoor amenity spaces of buildings, including, but not limited to, areas for recreational or social use;
 - (3) Areas of rooftop mechanical, electrical or other equipment, including cell towers or other equipment leasing space on the roof, and all required clearances around these areas;
 - (4) Areas covered by skylights;
 - (5) Areas consisting of glass-covered atriums;

- (6) Areas covered with glazing (windows); and
 - (7) Areas for renewable energy devices.
- (c) *Building* for the purposes of this article XIII means any structure used or intended for supporting or sheltering any use or occupancy. The boundary of any single building is defined by its surrounding exterior walls. Party walls as constructed in accordance with the International Building Code shall create separate buildings.
 - (d) *Building official* means the person authorized and directed to act on behalf of the building permitting and inspections services in the interpretation and enforcement of the Building Code of the City and County of Denver, and appointed by the executive director of community planning and development.
 - (e) *Campus* means a tract of contiguous property with one (1) or more owners; that contains or will contain more than one (1) building; and that is planned, developed and operated as an integrated facility for a number of individual uses with special attention to coordinated circulation, parking, utility needs, aesthetics and compatibility. For purposes of this definition, the presence of public rights-of-way shall not destroy contiguity of land area. A campus may contain only existing buildings, existing buildings and proposed new buildings, or only proposed new buildings.
 - (f) *Character defining roof* means a visible roof where the roofs relationship to the overall shape of the building, as well as the roofs distinctive materials, craftsmanship, or decorative details are important to the overall visual character of the building; a change of materials, color, or shape to a character defining roof would significantly impact the visual character of the building.
 - (g) *Cool roof* means a roof, or portion of a roof, containing roof covering materials meeting certain solar reflectance values that mitigate or assist in reducing urban heat island effect.
 - (h) *Denver Building and Fire Code* has the same meaning as in Section 10-16, D.R.M.C.
 - (i) *Executive director of CPD* means the executive director of the department of community planning and development ("CPD"), or his/her designee.
 - (j) *Executive director of ~~DDPHE~~ OCASR* means the executive director of the ~~department of public health and environment ("DDPHE")~~, or ~~his/her designee~~ office of climate action, sustainability, and resiliency, or his or her designee ("OCASR").
 - (k) *Green space* means any area that is proposed to contain trees, groundcover, shrubs, urban agriculture, natural grass/turf, or vegetated roofs.
 - (l) *Greenhouse* means a structure or a thermally isolated area of a building that maintains a specialized sunlit environment exclusively used for, and essential to, the cultivation, protection or maintenance of plants, that sells its commodities for a profit, or on behalf of a non-profit, and is constructed or planned to be constructed as either an F-1 or U occupancy.
 - (m) *Gross floor area* means the gross floor area within the inside perimeter of the exterior walls of the building under consideration, exclusive of vent shafts and courts, without deduction for corridors, stairways, ramps, closets, the thickness of interior walls, columns or other features. The gross floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the usable area under the horizontal projection of the roof or floor above. The gross floor area of a building shall not include shafts with no openings, interior courts, or areas used exclusively for the storage or parking of vehicles.
 - (n) *Individual roof section* means a portion of roof bounded on all sides by one (1) or more of the following features: a wall or parapet; the roof edge; an expansion joint; or a roof divider.
 - (o) *Net zero energy building* means an energy-efficient building where, on a source energy basis, the actual annual delivered energy is less than or equal to the on-site renewable exported energy.
 - (p) *Owner* means any person, agent, operator, entity, firm, or corporation having any legal or equitable interest in the building or property; or any person authorized to act on the owner's behalf.
 - (q) *Renewable energy device* means a device that obtains energy derived from solar radiation, wind, landfill gas, biomass, the internal heat of the earth, or another source with the approval of CPD.

- (r) *Residential building* means a building where more than sixty (60) percent of the gross floor area of the building is used, designed or intended to be used for a household living use type as defined in the Denver Zoning Code, including accessory residential uses; however, a residential building shall not include a nursing home or hospice use, a residence for older adults use, or a lodging accommodation use, all as defined in the Denver Zoning Code.
- (s) *Roof* means the overhead structural component of a building or a part of a building supported by walls or columns and which functions primarily to shelter the interior of the building from the effects of weather and the infiltration of water.
- (t) *Roof recover* means the process of installing an additional layer of roof covering over a prepared existing roof covering without removing the existing roof covering.
- (u) *Roof replacement* means the process of removing the existing roof covering, repairing any damaged substrate, and installing a new roof; or the reconstruction or renewal of any part of an existing roof for the purposes of its maintenance.
- (v) *Total roof area* means the square footage of all roofs and roof sections located on a building. A roof covering a story or stories below grade, as determined in accordance with the International Building Code as adopted in the Denver Building and Fire Code, shall not be included in the calculation of total roof area of a building.
- (w) *Vegetated roof* means an assembly of interacting components designed to waterproof and normally insulate a building's top surface that includes, by design, vegetation and related landscape elements.
- (x) *Visible roof* means an individual roof section that is at least partially visible from a person of average height in a public vantage point such as a park, public street, campus grounds, or private street with public easement.

Sec. 10-301. - Green building requirements for new buildings.

- (a) *In general.* Except as provided in subsection 10-301(c) below, an owner constructing a building containing twenty-five thousand (25,000) square feet or greater of gross floor area who has not submitted a formal site development plan application with payment of all applicable fees by 4:30 pm on November 2, 2018 must provide the following green building requirements:
 - (1) A cool roof; and
 - (2) One (1) of the following options:
 - a. Green space covering an area in one (1) of the following amounts, whichever is least:
 - 1. Ten (10) percent of the gross floor area of the building;
 - 2. Sixty (60) percent of the total roof area on the building; or
 - 3. The available roof space on the building.
 - b. On-site solar panels covering an area anywhere on the building or zone lot equal to seventy (70) percent of the total roof area or an area equal to an amount required to provide one hundred (100) percent of estimated annual average electricity used at the building. Other renewable energy devices may be used in place of on-site solar panels so long as the owner provides evidence of similar generation capacity. Any net zero energy building complies with this subsection 10-301(a)(2)b.
 - c. Off-site renewable energy purchase with the following requirements:
 - 1. The off-site renewable energy purchase must be met through a minimum five (5) year contract for a subscription, lease, or purchase of a share in a voluntary renewable energy program offered by Xcel Energy or a community solar project for which a dedicated renewable energy resource located in Public Service Company of Colorado territory is built for that customer program, and which has dedicated customer capacity or energy to fulfill that customer's subscription;
 - 2. The term of purchase must be renewed a minimum of every five (5) years for the life of the building; and

3. The off-site renewable energy purchase must cover the equivalent energy production of either (i) the estimated one hundred (100) percent of electricity the building will use, or (ii) the amount that would have been provided with required on-site solar panels and demonstration of decreased energy consumption measured as estimated cost savings of a minimum six (6) percent above requirements in the applicable Denver Building and Fire Code.
- d. Demonstration of decreased energy consumption measured as estimated cost savings of at least twelve (12) percent above requirements in the applicable Denver Building and Fire Code.
- e. Building certification of LEED Gold, Enterprise Green Communities, the National Green Building Standard ICC/ASHRAE 700, or an equivalent certification approved by the building official.
- f. A combination of green space, and renewable energy device(s) with the following required coverages:
 1. Green space covering an area in one (1) of the following amounts, whichever is least:
 - (i) Three (3) percent of the gross floor area of the building;
 - (ii) Eighteen (18) percent of the total roof area on the building; or
 - (iii) Thirty (30) percent of the available roof space on the building; and either section 10-301(a)(2)f.2 or 3 below.
 2. On-site solar panels located anywhere on the subject zone lot covering an area in one of the following amounts, whichever is least:
 - (i) Seven (7) percent of the gross floor area of the building,
 - (ii) Forty-two (42) percent of the total roof area on the building; or
 - (iii) Seventy (70) percent of the available roof space on the building.
 3. Renewable energy devices, other than solar panels, so long as the renewable energy devices achieve equivalent total energy production to the required amount of on-site solar panels in subsection 10-302(2)f.2 above; or
 4. Alternative coverages of green space and on-site solar panels may be approved by the building official so long as the combination covers an area in one (1) of the following amounts, whichever is least:
 - (i) Ten (10) percent of the gross floor area of the building;
 - (ii) Sixty (60) percent of total roof area on the building; or
 - (iii) The available roof space on the building.
- g. A combination of green space and off-site renewable energy purchase, with the following requirements:
 1. Green space covering an area in one (1) of the following amounts, whichever is least:
 - (i) Three (3) percent of the gross floor area of the building;
 - (ii) Eighteen (18) percent, of total roof area on the building; or
 - (iii) Available roof space on the building.
 2. The off-site renewable energy purchase must be met through a minimum five (5) year contract for a subscription, lease, or purchase of a share in a voluntary renewable energy program offered by Xcel Energy or a community solar project for which a dedicated renewable energy resource located in Public Service Company of Colorado territory is built for that customer program, and which has dedicated customer capacity or energy to fulfill that customer's subscription. The term of purchase must be renewed a minimum of every five (5) years after initial purchase.
 3. The off-site renewable energy purchase must cover the amount that required on-site solar panels would have provided and demonstration of decreased energy consumption measured as

estimated cost savings of a minimum two and a half (2.5) percent above requirements in the Denver Building and Fire Code.

- h. A combination of green space and decreased energy consumption with the following requirements:
 - 1. Green space covering an area in one (1) of the following amounts, whichever is least:
 - (i) Three (3) percent of the gross floor area of the building;
 - (ii) Eighteen (18) percent of total roof area on the building; or
 - (iii) The available roof space on the building.
 - 2. Demonstration of decreased energy consumption measured as estimated cost savings of a minimum five (5) percent above requirements in the applicable Denver Building and Fire Code during plan review.

(b) *Payment into the green building fund.*

- (1) Instead of providing required green space, an owner may pay an amount to the green building fund, defined in division 3 below, of fifty dollars (\$50.00) per square foot of all green space coverage required in subsections 10-301(a)(2)a, f, g, or h, but not provided.
- (2) In cases where an owner chooses to provide green space as required in subsections 10-301(a)(2)a, f, g, or h, but is unable to provide the entirety required green space coverage, the owner may pay fifty dollar (\$50.00) per square foot for no more than twenty-five (25) percent of the green space required, but not provided, and must provide at least seventy-five (75) percent of the required green space coverage.

(c) *Exceptions.*

- (1) Subsection 10-301(a) shall not apply to the following:
 - a. One- and two-family dwellings constructed under the provisions of the International Residential Code;
 - b. Dwelling units constructed in a group of three (3) or more attached units in which each unit extends from foundation to roof and is not more than three (3) stories above grade plane; or
 - c. Temporary structures, air supported structures, and greenhouses.
- (2) Subsection 10-301(a)(1) shall not apply to the following:
 - a. Portions of a proposed roof that include the following:
 - 1. Photovoltaic systems or components;
 - 2. Solar-, air-, or water-heating systems or components;
 - 3. Vegetated roofs;
 - 4. Above-roof decks or walkways; or
 - 5. HVAC systems and components, and other opaque objects mounted above the roof.
 - b. Portions of a proposed roof shaded during the peak sun angle on the summer solstice by neighboring buildings or other portions of the same building;
 - c. Portions of a proposed roof that are ballasted with a minimum stone ballast of fifteen (15) pounds per square foot;
 - d. Twenty-five (25) percent of an individual roof section, when the remaining seventy-five (75) percent of the proposed individual roof section contains a cool roof;
 - e. An individual roof section containing less than twenty five (25) percent of roofing materials; or
 - f. Visible roofs for no more than ten (10) percent of the total roof area.
- (3) Subsection 10-301(a)(2) shall not apply to residential buildings five (5) stories or fewer, less than sixty-two and one-half (62.5) feet in height, and with twenty-five thousand (25,000) square feet or more of gross floor area.

- (d) *Character defining roof.* When a proposed roof is determined to be a character defining roof, the building official may allow roof materials that do not meet the requirements for a cool roof.
- (e) *Continuing compliance.* An owner of a building subject to the requirements of section 10-301(a) must provide a cool roof and one (1) of the options of 10-301(a)(2) for the duration of the building's existence.

Sec. 10-302. - Green building requirements for existing buildings.

- (a) *In general.* Except as provided in subsection 10-302(d) below, any owner of a building that has received a certificate of occupancy prior to November 2, 2018 and whose building contains twenty-five thousand (25,000) square feet or greater of gross floor area, must provide the following green building requirements upon a roof replacement for more than five (5) percent of either the total roof area or individual roof section(s), as applicable, in any calendar year:
 - (1) A cool roof; and
 - (2) One (1) of the following options:
 - a. Green space covering an area in one (1) of the following amounts, whichever is least:
 - 1. For total roof area replacement: two (2) percent of the gross floor area of the building; for individual roof section replacement: two (2) percent of the gross floor area of the building, multiplied by the area of individual roof section(s) being replaced, divided by the total roof area of the building;
 - 2. For total roof area replacement: eighteen (18) percent of the total roof area on the building; for individual roof section replacement: eighteen (18) percent of the individual roof section(s) being replaced; or
 - 3. Available roof space on the total roof area of the building, or the individual roof section(s) being replaced, as applicable.
 - b. On-site solar panels located anywhere on the building or zone lot and covering an area in the least of the following:
 - 1. For total roof area replacement: five (5) percent of the gross floor area of the building; for individual roof section replacement: five (5) percent of the gross floor area of the building, multiplied by the area of roof section(s) being replaced, divided by the total roof area of the building;
 - 2. For total roof area replacement: forty-two (42) percent of the total roof area on the building; for individual roof section replacement: forty-two (42) percent of the individual roof section(s) being replaced; or
 - 3. An area equal to an amount required to provide one hundred (100) percent of estimated annual average electricity used at the building.
 - c. Building certification of LEED Silver, Enterprise Green Communities, the National Green Building Standard ICC/ASHRAE 700, or an equivalent certification approved by the building official.
 - d. Enrollment in the energy program described in section 10-304 below.
- (b) *Payment into the green building fund.*
 - (1) Instead of providing required green space, an owner may pay an amount to the green building fund, defined in division 3 below, of fifty dollars (\$50.00) per square foot of all green space coverage required in subsection 10-302(a)(2)a, but not provided.
 - (2) In cases where an owner chooses to provide green space as required in subsection 10-302(a)(2)a, but is unable to provide the entirety of green space coverage required, the owner may pay fifty dollars (\$50.00) per square foot for no more than twenty-five (25) percent of the green space required, but not provided, and must provide at least seventy-five (75) percent of the required green space coverage.

- (c) *Individual roof section replacements.* Any excess coverage requirements provided on an individual roof section replacement may be applied to later roof replacements of individual roof sections of the building.
- (d) *Exceptions.*
- (1) Subsection 10-302(a) shall not apply to the following:
 - a. One- and two-family dwellings constructed under the provisions of the International Residential Code;
 - b. Dwelling units constructed in a group of three (3) or more attached units in which each unit extends from foundation to roof and is not more than three (3) stories above grade plane;
 - c. Temporary structures, air supported structures, and greenhouses; or
 - d. Buildings that have complied with section 10-301(a).
 - (2) Subsection 10-302(a)(1) shall not apply to the following:
 - a. Portions of a roof that include or are covered by the following:
 1. Photovoltaic systems or components;
 2. Solar-, air-, or water-heating systems or components;
 3. Vegetated roofs;
 4. Above-roof decks or walkways; or
 5. HVAC systems and components, and other opaque objects mounted above the roof.
 - b. Portions of a roof shaded during the peak sun angle on the summer solstice by neighboring buildings or other portions of the same building;
 - c. Portions of a roof that are ballasted with a minimum stone ballast of fifteen pounds per square foot, or, in the case of an existing ballasted roof, the weight of ballast for which the roof was originally designed;
 - d. Twenty-five (25) percent of an individual roof section, when the remaining seventy-five (75) percent of the individual roof section contains a cool roof;
 - e. An individual roof section containing less than twenty-five (25) percent of roofing materials; or
 - f. Visible roofs for no more than ten (10) percent of the total roof area.
 - (3) Subsection 10-302(a)(2) shall not apply to the following:
 - a. Residential buildings five (5) stories or fewer, or less than sixty-two and one-half (62.5) feet in height and with twenty-five thousand (25,000) square feet or more of gross floor area;
 - b. A building that must replace its roof due to an emergency, including, but not limited to, fire or wind damage to be determined by the building official;
 - c. A building that must replace its roof due to hail damage in the first year after the effective date of this ordinance when the building owner can demonstrate a gap in insurance coverage. Such gap exists where the building owner has insurance coverage that includes the cost of meeting any new code requirements, but had a cost limit on that coverage that is insufficient to meet the additional costs of this ordinance, and the insurance policy is not yet due for renewal; or
 - d. A building that contained a vegetative roof prior to January 1, 2018, so long as the vegetative roof is replaced upon any roof replacement.
- (e) *Compliance with new building requirements.* Any owner who submits a building permit for a roof replacement or construction including roof replacement, and has complied with subsection 10-301(a), does not have to comply with the requirements of section 10-302(a), but shall maintain compliance with the selected option from section 10-301(a)(2) or demonstrate compliance with another option from section 10-301(a)(2) upon completion of any roof replacement which must be submitted and approved by the building official.

- (f) *Character defining roof.* When a proposed or existing roof is determined to be a character defining roof, the building official may allow roof materials that do not meet the requirements for a cool roof.
- (g) *Roof recover.* Any owner proposing a roof recover of more than five (5) percent of either the total roof area or individual roof section in any calendar year, and whose building contains 25,000 square feet or greater of gross floor area must comply with section 10-302(a)(1) for that portion of roof being recovered, but need not comply with the requirements of section 10-302(a)(2). When an analysis of any individual roof section prior to a roof recover determines that application of a cool roof will result in condensation, then an owner may choose not to provide a cool roof.
- (h) *Continuing compliance.* An owner of a building subject to the requirements of section 10-302(a) must provide a cool roof and one (1) of the options of section 10-302(a)(2) for the duration of the building's existence.

Sec. 10-303. - Additions.

- (a) *Large additions.* Any owner proposing an addition of fifty thousand (50,000) square feet of gross floor area or greater to a building shall comply with section 10-301 for that addition.
- (b) *Small additions.* Any owner proposing an addition of twenty-five (25,000) or more and less than fifty thousand (50,000) square feet of gross floor area to a building shall provide a cool roof, as applicable, and comply with any of the following:
 - (1) Any of the requirements of section 10-302(a)(2)a-c for that addition;
 - (2) The requirements of section 10-302(b) for that addition; or
 - (3) Estimated energy cost savings of at least four (4) percent above requirements in the Denver Building and Fire Code for that addition.

Sec. 10-304. - Energy program.

- (a) *Purpose.* The purpose of this section is to establish an energy program that provides an owner various options designed to reduce cumulative emissions city-wide in an amount equivalent to section 10-302(a)(2)(b).
- (b) *Applicability.* An owner subject to the requirements of section 10-302(a), may enroll in the energy program at or before the time of roof replacement.
- (c) *Options.* The requirements of the energy program shall provide for compliance options, including, but not limited to, the following: building certification; on-site solar panels; off-site renewable energy purchase; energy efficiency improvements; reductions in energy use intensity; and differentiation of requirements for buildings over and under fifty thousand (50,000) square feet of gross floor area.

Sec. 10-305. - Campus compliance with green building requirements.

- (a) *Compliance.* Owners of buildings within a campus may comply with the green building requirements of sections 10-301(a)(2)a, b, or f, and 10-302(a)(2)a or b, through application of the requirements at a campus-wide level instead of complying with each individual building in the campus or each zone lot. Owners of buildings within a campus must comply with any applicable cool roof requirements for each individual building within a campus.
- (b) *Documentation.* CPD shall require owners who choose to comply at the campus level to submit a plan documenting compliance with section 10-301(a) or section 10-302(a). Such plan may include, but is not limited to, a general development plan (or successor type of plan), infrastructure master plan, site development plan, or development agreement. A site development plan will be required for any new buildings or green space.
- (c) *Energy master plan.* Owners choosing to comply with section, 10-301(a)(2)b or f or section 10-302(a)(2)b must submit an energy master plan to CPD.

Sec. 10-306. - Authority to adopt rules and regulations.

The executive director of CPD and the ~~board of public health and environment~~ executive director of the office of climate action, sustainability, and resiliency shall have the authority to adopt cooperatively rules and regulations for the implementation and administration of this article XIII.

Sec. 10-307. - Enforcement.

- (a) It ~~shall be~~ unlawful to violate any provision of this article XIII, or any rules and regulations adopted pursuant to this article XIII.
- (b) The executive directors of CPD and the ~~DDPHE~~OCASR, or their designees, have the authority to enforce the provisions of article XIII.
- (c) This article applies to all agents, successors and assigns of an owner. A building permit ~~shall~~may not be issued, and a site development plan ~~shall~~may not be approved unless the owner meets the requirements of this article and rules and regulations adopted under this article. The building official may deny, suspend or revoke any building or occupancy permit for a site when ~~he/she~~the building official finds a violation of article XIII or adopted rules and regulations.
- (d) CPD and the ~~DDPHE are authorized to~~OCASR may issue notices or orders for violations of this article. Any person who violates any provision of this article XIII, including any rules and regulations adopted under this article, ~~shall be~~ subject to a civil penalty in an amount up to fifty dollars (\$50.00) times sixty (60) percent of the total roof area, to be deposited into the green building fund, defined below.
- (e) ~~In the event~~If an owner subject to the civil penalty above fails to pay the required amount within one hundred eighty (180) days, the civil penalty shall be considered a debt to the city until paid in full. ~~This debt shall be~~The debt is a perpetual lien on the property, and ~~shall be~~ superior and prior to all other liens, regardless of their dates of recordation, except for liens for general taxes and prior special assessments, until the civil penalty owed, delinquent interest, and recording fees have been paid in full. In addition to the remedies set forth in this section, an action or other process provided by law may be maintained by the city to recover or collect any amounts, including interest, owing under this section. Interest ~~shall be~~ calculated in the same manner and same amount as delinquent property taxes. The executive director of ~~the department of public health and environment~~ shallOCASR must record the lien with the clerk and recorder.
- (f) In addition to any other available remedy, the executive director of ~~community planning and development or the executive director of the department of public health and environment~~CPD or the executive director of OCASR may take legal action to require an owner to construct a cool roof upon discovery of any unpermitted roof recover or replacement.

Sec. 10-308. - Appeals.

- (a) Any person aggrieved by a denial, suspension, or revocation of a building permit or occupancy permit, or a determination of the applicability of this article, may appeal to the board of appeals; however, the board of appeals is not authorized to grant variances to the requirements of this article.
- (b) Any person aggrieved by a final administrative action or decision by the executive director of CPD or ~~DDPHE~~ OCASR concerning issuance of a civil penalty as allowed in section 10-307(d), may appeal in accordance with ~~the process described in~~ Article I, Section 24, D.R.M.C., except that no request for a variance ~~shall~~may be granted by ~~the board of public health and environment~~OCASR. The decision of ~~the board of public health and environment~~OCASR may be appealed to district court in accordance with the Colorado Rules of Civil Procedure Rule 106(a)(4).

Secs. 10-309—10-315. - Reserved.

DIVISION 2. - GREEN BUILDING TECHNICAL ADVISORY COMMITTEE

Sec. 10-316. - Creation and composition; terms; and officers.

- (a) *Creation and composition.* There is hereby created a green building technical advisory committee. The committee ~~shall consist~~consists of thirteen (13) members, all appointed by the mayor, except for the members in subsection (1) below, as follows:
 - (1) A representative from the department of community planning and development's building permitting and inspections services agency, a representative from the department of community planning and development

department's landmark preservation staff, a representative from ~~the department of public health and environment~~the office of climate action, sustainability, and resiliency, and a representative from the department of public works, each of whom shall be appointed by their respective executive directors;

- (2) Representative(s) of the design sector;
 - (3) Representative(s) of material and component manufacturers and suppliers sector;
 - (4) Representative(s) of the construction sector;
 - (5) Representative(s) of the research sector including, but not limited to, persons involved in green roof research and testing, water quality/capture research and testing or building energy efficiency in a professional academic institution, school of engineering or architecture;
 - (6) Representative(s) of the green roof industry sector;
 - (7) Representative(s) of the renewable energy industry sector;
 - (8) Representative(s) of the energy efficiency industry sector; and
 - (9) Water quality/capture requirements expert(s).
- (b) *Terms.*
- (1) Committee members shall serve for a period of three (3) years, with terms to be staggered by initially appointing three of the mayoral appointed members for three-year terms, another three of the mayoral appointed members for two years, and the remaining mayoral appointees for one year. Initial terms shall be set by the mayor.
 - (2) Committee members may be re-appointed for successive terms.
 - (3) The committee members from subsection (a)(1) above shall not be subject to the term requirements of this subsection (b).
- (c) *Officers.* The mayor shall appoint a chairperson among the committee members to preside over the committee for a three (3) year term.

Sec. 10-317. - Meetings.

The committee ~~shall~~must meet at the call of the executive directors of CPD or ~~DDPHE~~CASR, or their designees, and ~~the meeting shall~~ consider the matters set out in an agenda prepared by the executive directors, or their designees.

Sec. 10-318. - Powers and duties.

The general purpose of the committee is to render advice and recommendations to the executive directors of CPD and ~~DDPHE~~CASR regarding green building standards. The specific powers and duties of the committee ~~shall be:~~

- (a) Reviewing technical issues relating to the implementation of vegetative roof construction standard contained in the rules and regulations;
- (b) Considering possible amendments to any vegetative roof construction standards;
- (c) Reviewing the consistency of the vegetative roof standards with objectives in the Denver Building and Fire Code;
- (d) Periodically reviewing rules and regulations;
- (e) Reviewing annual reports of the energy program; and
- (f) Reviewing projects that request to use an equivalent certification program as allowed in section 10-301(a)(2)e or 10-302(a)(2)c, and making a recommendation to the building official.

Sec. 10-319. - Staffing and administrative support.

Staffing and administrative support for the committee shall be provided by CPD.

DIVISION 3. - FEES

Sec. 10-320. - Green building fund.

- (a) *Dedicated revenues.* The green building fund is created for the exclusive purpose of receiving and accounting for all revenues derived from the payments of amounts for required, but not provided, green space in this article XIII.
- (b) *Permitted uses of revenue in the green building fund.* Revenue received in the green building fund shall be used exclusively for the following purposes:
 - (1) For the acquisition of green space within the city;
 - (2) For improvements to existing green space;
 - (3) For water quality improvements and green infrastructure;
 - (4) For urban forest protection and expansion;
 - (5) For green roof creation; and
 - (6) For solar adoption and energy efficiency projects in areas of low-income and affordable housing populations.
- (c) *Cap on administrative costs.* Monies in the green building fund may be expended to pay the costs incurred by the city associated directly with the administration of this fund; provided, however, in no event shall the amount expended from the green building fund for such administrative expenses in any year exceed five (5) percent of the amount of revenue received in that year.
- (d) *Fund earnings.* Any interest on any balance in the green building fund shall accrue to this fund.
- (e) *Administration of fund.* The green building fund ~~shall be~~ administered by the executive director of the ~~department of public health and environment~~office of climate action, sustainability, and resiliency, or its successor city agency or department. The executive director may promulgate rules and regulations consistent with this article XIII governing the procedures and requirements for expenditures from the funds.
- (f) *Review of fund.* The ~~department of public health and environment~~office of climate action, sustainability, and resiliency shall conduct a policy review of the fund created in this article XIII, hold a public hearing to gather input for the review, and report the findings and any recommendations to the city council. The first public hearing shall be held no later than March of 2020, and subsequent public hearings and reviews of the fund shall occur every two (2) years after this date.
- (g) *Annual inflation adjustment.*
 - (1) On July 1, 2020, and on each July 1 thereafter, the fees set forth in sections 10-301(b) and 10-302(b) shall be adjusted in an amount equal to the percentage change from the previous year in the Mortenson Construction Cost Index for the Denver metro area. The adjustments will be reflected in a fee schedule issued by the executive director of CPD and made publicly available in advance of the fees becoming effective. The annual inflation adjustment shall apply to any building permit on or after January of the year in which the adjustment is made, regardless of when the application for the building permit was made.
 - (2) In the event that the Mortenson Construction Cost Index is substantially changed, renamed, or abandoned, then in its place shall be substituted an index that resembles the Mortenson Construction Cost Index, to be determined by the executive director of CPD.

DIVISION 4. - EVALUATION

Sec. 10-321. - Evaluation of article.

| Every twelve (12) months, CPD and ~~DDPHE~~ CASR ~~shall~~ must prepare a written report of the activities related to, and an assessment of outcomes of, this article, and report their findings and any recommendations to the city council.