ANSI/GBI 01-2024

Green Globes® Assessment Protocol for

Design, New Construction, and Major Renovations

This Standard is under continuous maintenance by the Green Building Initiative (GBI) and has a published schedule for regular publication of revisions, including procedures for timely, documented, consensus action on requests for change to any part of the Standard. The change submittal form, instructions, and deadlines may be obtained in electronic form from the GBI website. The latest edition of the ANSI/GBI 01-2024 Green Globes Standard is also free to download from the GBI website.

Disclaimer

This Standard provides a method of assessing commercial buildings in relation to commonly valued environmental and efficiency outcomes. This Standard is an assessment tool and does not purport to instruct users on the appropriate design, construction, operations and maintenance, standards, applicable laws, codes or regulations for their building. The use of this Standard does not expressly or implicitly establish the appropriate level of care of a licensed design or other professionals nor the appropriate duties and responsibilities of owners, design, construction, operations or maintenance personnel.

The Green Building Initiative (GBI) does not guarantee or warrant the actual performance of any building as a result of (1) the use of this Standard, or (2) a particular level of assessment indicated through the use of this Standard, whether through individual use or in conjunction with a provider of a third-party assessment. This Standard has been developed and structured to provide a general assessment tool for various attributes of buildings, as outlined in this Standard. This Standard is not a design, construction, operations or maintenance tool or a quality or performance assurance system. Building systems, technology, construction processes, design methodologies and best practices are constantly evolving and no building performance assessment system or tool, including this Standard, can account for these changes or the site-specific variances and limitations associated with individual buildings. The use of this Standard does not serve as a substitute for the work and advice of knowledgeable, licensed design, and other professionals; skilled construction personnel; building operators; and dedicated building owners.

GBI makes no representations about the results obtained from using this Standard. GBI, to the fullest extent permitted by law, disclaims all warranties of any kind, whether express or implied, including, but not limited to, the implied warranties of merchantability, fitness for a particular purpose and non-infringement.

Information on the ANSI approved procedures used to develop this Standard can be found at https://thegbi.org/green-building-standards/ or by emailing info@thegbi.org.

Special Notes

The Foreword and Appendix are informative only and do not contain mandatory requirements necessary for conformance to this Standard. As such, they may contain material that has not been subjected to public review or a consensus process. Sections V Definitions, Abbreviations, and Acronyms and VI References and Guidelines are informative only and are updated by the Secretariat upon the Consensus Body approval of all criteria.

Reference documents cited within the Standard are mandatory and are only to be applied within the context for which they are cited. Full acknowledgement and credit are given to the source organization for all references listed within this standard. Copies of the references and guidelines cited within this standard can be obtained from the full list of sources found in Section VI. Incorporation of a reference is limited to the edition of the publication that is cited within this standard. Future amendments or revisions of the reference are not included.

This Standard is maintained under continuous maintenance procedures. GBI publishes notices of calls for public comment in ANSI Standards Action as required. GBI has a list of stakeholders that will receive email announcements when any maintenance activity occurs to the recommended practice. GBI's website contains a place for new stakeholders to register.

Comments or proposals for revisions to any part of the Standard may be submitted to GBI at any time. The following person(s) may be contacted by those interested in submitting changes:

Emily Marx, Associate Director, Standards & Program Support, Green Building Initiative, 7805 S.W. 40th St., #80010, Portland, OR 97219 *(we prefer all correspondence be sent electronically),* E-mail: *comment@thegbi.org;* Phone: 971-256-7167.

FOREWORD

Note that the information contained in this Foreword is not part of this Standard. It does not contain requirements necessary for conformance to the Standard. The Foreword is not subject to public review.

The Green Building Initiative (GBI) is an international nonprofit organization dedicated to improving the built environment's impact on climate and society. GBI is the global provider of Green Globes, a comprehensive assessment and certification system that evaluates the sustainability, health and wellness, and resilience of all types of commercial real estate. Green Globes is rigorous, not rigid, offering an accessible certification program that encourages all buildings to evaluate and improve.

GBI is committed to the development and delivery of science- based tools that are transparent and user-friendly. As an American National Standards Institute (ANSI) Standards Developing Organization (SDO), GBI uses an open, balanced, and consensus-based process to create Green Globes standards. ANSI is a U.S.-based organization that has served as administrator and coordinator of the U.S. private sector voluntary standardization system for more than 100 years.

The Green Globes process is transparent and educational. GBI offers personalized support from a dedicated GBI Project Manager and third-party Green Globes Assessor (GGA) to every project team. The online questionnaire and onsite assessment promote early and often feedback for project teams to deliver on their sustainability goals by providing through a cost- and time-effective process.

In 2005 GBI became the first building rating organization to become an ANSI Standards Developer. GBI used the ANSI process, recognized for being open, balanced, and consensus-based, to create *ANSI/GBI 01-2010: Green Building Assessment Protocol for Commercial Buildings* out of the Green Globes environmental design and assessment rating system for New Construction and Major Renovations.

The following document represents revisions to and supersedes *ANSI/GBI 01-2021: Green Globes Assessment Protocol for Commercial Buildings* following three public comment periods and almost 40 public stakeholder meetings. The revised Standard correlates with the the rating system currently designated Green Globes for New Construction (NC) 2024. The GBI maintains *ANSI/GBI 01-2024: Green Globes Assessment Protocol for Design, New Construction, and Major Renovations* through a continuous maintenance schedule allowing for more frequent updates typically completing revisions over a two-year period.

Stakeholder Involvement

All meetings of the Subcommittees and Consensus Body are public. GBI accepts Consensus Body and Subcommittee applications year-round and maintains a queue of applicants to fill potential Consensus Body vacancies in three interest categories: General Interest, Producer, and User. The seven Subcommittees are: Project Management, Site, Energy, Water Efficiency, Materials, Indoor Environment and Point Allocation. Subcommittee members are not required to also be members of the Consensus Body and individuals may serve on more than one Subcommittee. GBI's Secretariat maintains an email list of interested Stakeholders used for updates on developments or opportunities to participate or comment. More information is available at https://thegbi.org/green-building-standards/.

GBI Encourages Participation in Public Comment Periods

The public comment process is a critical element to developing an ANSI Standard. GBI encourages discussion and debate. ANSI consensus processes afford due process to every commenter. Commenters will receive communication from the Secretariat upon receipt of their comment and again following Consensus Body action on their comment. Public comment notices are published in ANSI Standards Action.

Comprehensive Not Rigid

One of the many strengths of the Green Globes' collaborative process is that it allows for sustainability improvements that best fit each specific project, rather than a rigid checklist of requirements that don't consider unique sites, building function, or innovation opportunities.

"Not applicables" play a prominent role in Green Globes' flexibility, allowing projects to indicate criteria that are not applicable to a building or project. For instance, if a local code supersedes a criterion in the Standard and/or if optional features (e.g., cooling towers, etc.) are not included in the project scope, then those criteria could be marked Not Applicable removing those points from the denominator in determining percentages of points achieved.

The 1000 possible points are strategically allocated to direct projects toward criteria considered most critical in the reduction of a building's environmental impacts, as well as criteria that maximize a building's opportunity to have a positive impact on a community and its occupants. The new point distribution weights the Assessment Areas as follows:

- Project Management (100 points)
- Site (150 points)
- Energy (255 points)
- Water Efficiency (190 points)
- Materials (150 points)
- Indoor Environment (155 points)

The revised Standard, as is consistent with GBI-01-2021, does not contain mandatory criteria. Instead, additional weighting occurs within each Assessment Area to encourage pursuit of criteria considered to be most important.

Through point weightings, the Standard encourages users to strive to earn the highest number of applicable points for the building type, size, and budget, while using the flexibility built into the system to keep on track with the owners' goals and objectives, the planned functionality for the building, and the potential for deconstruction or repurposing of the building. Project teams achieving One Green Globes (the minimum certification level) on their first project—may strive for higher levels of achievement and recognition in future projects through their lessons learned. The Standard is designed to encourage and recognize incremental achievements that take buildings beyond minimum compliance requirements while incentivizing teams to innovate and strive for One, Two, Three, or Four Green Globes thereby going beyond code to achieve real-world results.

Technical Advances

Reviewers of this revised Standard will find many notable improvements that advance the art, form and definition of what constitutes a green building. Discussion and debate through the public comment process have been extensive and important to this process. Additional information concerning criteria can be found in the Technical Manual under Informational References, Recommended Documents, Assessment Guidance and ToolTips.

Topics covered in GBI-01-2024 include:

Project Management

- Site and Building Resilience
- Green Design Goals
- Two paths for Building Commissioning or Systems Manual & Training

Site
- Transportation
- Stormwater Management
- Exterior Lighting Pollution and Safety

Energy
- Six paths provided for Assessing Energy Performance
- Onsite and Offsite Renewable Energy
- Sub-metering

Water Efficiency
- Two paths for Assessing Water Consumption
- Alternate Sources of Water
- Metering

Materials
- Whole Building Life Cycle Assessment
- Construction Waste
- Sustainable Materials Attributes

Indoor Environment
- Air Ventilation and Quality
- Volatile Organic Compounds
- Lighting Design and Systems

Minimum Requirements

GBI sets minimum requirements for its assessment and certification system based on commonly valued environmental and efficiency outcomes, analysis of federal, state/provincial, and local policies, public input processes, and benchmarking against other global rating systems. The technical criteria and point weightings of the New Construction and Existing Buildings certification programs are determined through GBI's ANSI standard development consensus process. To incentivize innovation and best practices, GBI has updated Green Globes minimum requirements for certification while maintaining its signature accessibility.

Green Globes Certification Minimum Requirements

- Achieve points in each environmental assessment area
    - Green Globes building certification is a holistic certification and this formalized requirement underscores the importance of addressing the broad scope of building performance impacts. Specifically, a project will not earn certification if it does not achieve points in every assessment area.
- Achieve 35% of the total applicable points
    - Projects must continue to demonstrate compliance with at least 35% of the applicable points out of the maximum 1000 points to be eligible for the base level of certification: One Green Globes.
- Meet jurisdictional requirements
    - Code adoption varies at state/province, city, county, and federal levels. Therefore, Green Globes requires that the most stringent code adopted at the jurisdictional level must be met to achieve certification. Green Globes defaults to the requirements set by an executive branch government agency or a private sector entity if they are more stringent than Green Globes

minimum requirements. As a result, Green Globes certification reflects compliance with a property's specific jurisdictional or governing entity's minimum requirements.

- Achieve points in the Energy Performance subsection
    - Multiple pathways exist in every version of Green Globes for New Construction, such as the ENERGY STAR Target Finder pathway, ASHRAE 90.1 pathway, ASHRAE Building Energy Quotient pathway. These pathways provide options for all property types to pursue and achieve credit for energy performance. With this requirement, points must be achieved in the Energy Performance subsection of the Energy environmental assessment area to be eligible for certification.
- Demonstrate compliance with ASHRAE 90.1 -2016
    - For users selecting the ASHRAE 90.1 pathway, projects located in jurisdictions with less stringent code requirements must provide energy models that demonstrate energy savings at least in compliance with ANSI/ASHRAE/IES Standard 90.1-2016. Projects conducting modeling using an earlier ASHRAE 90.1 baseline must demonstrate a percentage savings equivalent with that of ASHRAE 90.1-2016. GBI's Green Globes Energy Baseline Calculator is available to assist with this translation when modeling using an earlier version of ASHRAE 90.1.
    - Other Energy Performance pathways - For projects using a pathway other than ASHRAE 90.1, compliance interpretations can be used to demonstrate alternate minimum requirements, such as an ENERGY STAR Target Finder score of 80, which aligns with other market programs driving energy and emissions reductions.

Ongoing Performance Monitoring and Aggregate Reporting of Performance Achievements
Green Globes New Construction (including major renovation) projects must provide one or more of the following, or equivalent measure:

- Projected Site Energy Use Intensity (EUI)
- ENERGY STAR Target Finder score
- Emissions reduction target
- Projected % performance above ASHRAE 90.1-2016

GBI requests that building owners agree to confidentially share ongoing performance data through the Green Globes platform, ENERGY STAR Portfolio Manager, ASHRAE Building Energy Quotient platform, or another platform for use in aggregated and anonymized performance and savings reporting. GBI also requests that owners agree to a simplified third-party review in support of recertification within three to five years following certification. GBI's Green Globes Journey to Net Zero program, which reviews energy and emissions savings, satisfies this simplified approach and requires reassessment at least every three years. Compliance with ongoing performance monitoring will maintain a building's status within GBI's certified buildings directory.

Exceptions
GBI reserves the right to issue exceptions to its minimum requirements on a case-by-case basis, as needed, following thorough review by a GGA and confirmation by GBI. Project teams or owners will be asked to provide detailed input to the assigned GGA if a minimum requirement cannot be achieved. An Exceptions Policy is intended to ensure there are no unintended consequences or disincentives to pursuing third-party review of sustainability objectives.
If you are interested in submitting input to GBI on minimum requirements for compliance with this Standard or any Green Globes rating system or protocol, please contact Emily Marx, Associate Director, GBI Standards & Program Support, at emarx@thegbi.org. All notification of public input processes related to GBI programs will

be sent to GBI's stakeholders' community, which you can join by completing a stakeholder application at www.thegbi.org/public-input.

How to Submit Public Comments

Calls for public comment will be published in ANSI Standards Action. Anyone wishing to submit a comment will be asked to complete a public comment form located at https://thegbi.org/green-building-standards/. To submit a proposal for a substantive change to the Standard commenters must be specific about the change they are requesting and provide a reason. Commenters are expected to copy and paste a section of the Standard into the comment form and use ~~strikethrough~~ and underline to identify suggested deletions and additions to the text.

Learn more about the public comment process or review GBI's ANSI-approved procedures at https://thegbi.org/green-building-standards/. For more information on upcoming calls for public comment or to request a public comment form, please contact the Secretariat at comment@thegbi.org.

Who Should Use This Standard

Property owners/operators, architects, green building consultants, design teams, developers, contractors, lenders, institutions, various levels of government, tenants, and occupants, as well as facility managers and maintenance personnel can apply this Standard to a broad range of commercial building types — such as office, data centers, multifamily, health care, schools, universities, labs, industrial, and retail. The Standard does not apply to single-family homes, two-family homes and townhouses that are three stories or less in height.

ANSI/GBI 01-2024: Green Globes Assessment Protocol for Design, New Construction, and Major Renovations includes prescribed levels of achievement that government agencies or other entities wishing to establish specific criteria may consider when adopting this Standard. GBI also develops customized tools for governments to comply with government-specific requirements or other codes and standards. An example is GBI's unique Guiding Principles Compliance program, which is customized for use by federal agencies for compliance with Executive Orders and "High Performance and Sustainable Building" mandates.

To learn more about current Green Globes tools, visit www.thegbi.org. To learn about participation in GBI's Standard development and ANSI consensus processes, visit https://thegbi.org/green-building-standards/ or contact GBI's Secretariat at comment@thegbi.org.

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I. PURPOSE

This Standard provides a method for assessing commercial buildings relative to the tenets of integrated design and contemporary best practices for high-performance green buildings. This assessment method addresses the design and construction of buildings with respect to reducing life cycle resource consumption, waste, and global/regional/local environmental impacts; contributing to human and ecological system health; and providing performance feedback to owners and communities on indicators such as energy and water performance.

II. SCOPE

This Standard applies to a broad range of commercial building types, including offices, multifamily, health care, schools, universities, labs, industrial, retail, etc., as well as to major renovations as defined in Section V Definitions, Abbreviations, and Acronyms of the Standard. The Standard does not apply to single-family homes, two-family homes, and townhouses that are three stories or less in height.

The Standard includes a points-based assessment rating system that allows users to identify solutions that earn points for actions likely to achieve levels of performance commonly valued as having desirable environmental and related efficiency outcomes. The assessment criteria and rating system within the Standard apply to new commercial buildings and major renovations, including criteria related to planning for subsequent operations and maintenance.

The six Assessment Areas within the Standard include Project Management, Site, Energy, Water Efficiency, Materials, and Indoor Environment.

This Standard shall not be used to circumvent any code, health, safety, security, or environmental requirements. It is the sole responsibility of the user of this Standard to establish appropriate safety and health practices, to comply with required building codes, and to assess the applicability of criteria based on other possible regulatory limitations prior to use.

III. NOT APPLICABLES

Each environmental assessment area contains certain criteria that a design and delivery team may deem to be "Not Applicable" to the building. Selecting "Not Applicable" may be appropriate in the following circumstances as denoted in Table III:

TABLE III

Reasons for Use of Not applicable Criteria	
1	If a criterion does not apply to the building type (e.g., if there are no oil fired burners on site, questions related to oil fired burners would be designated Not Applicable).
2	If a code or regulation overrides, conflicts with, or otherwise prevents compliance with a criterion.
3	If a criterion conflicts with best practices based on regional climatic differences.

Questions without a Not Applicable option should be answered as appropriate for the building.

IV. ASSESSMENT OF COMPLIANCE

Assessment of compliance can be established through a third-party review of appropriate written plans, working drawings, specifications, site plans, energy modeling, life cycle assessment results, commissioning reports, construction documents and/or other data or documents that demonstrate conformance.

V. DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

V.I Definitions

Note: *Italicized words found throughout this Standard indicate that a definition for the term can be found in the Definitions Section. Definitions not found in this section may be found in referenced standards contained in this Standard, and the user shall adhere to the meanings as defined in those standards. Other terms not defined in this Section or in referenced standards contained in this Standard shall have their ordinarily accepted meanings within the context in which they are used. Ordinarily accepted meanings are based upon American Standard English language usage as documented in a comprehensive dictionary. Where definitions in this Standard differ from those in a reference standard or any other source, definitions found in this Standard shall be used.*

AARP Livability Index (Neighborhood category): a measure of community livability on a scale of 0-100. The American Association of Retired Persons (AARP) is a nonprofit, nonpartisan organization that empowers people to choose how they live as they age. The livability index for a site can be publicly accessed at https://livabilityindex.aarp.org/.

alternate water source(s): *non-potable water* resources or water supplies not developed for *potable* use.

assemblies: building systems categorized as exterior walls, internal partitions, windows, interim floors, roofs, beams, and columns.

biobased content: that portion of a material or product derived from plants and other renewable agricultural, marine, and/or forestry resources. *Biobased content* does not include animal feed, food, or biofuels.

boilerless/connectionless food steamers: an appliance designed to cook food within an enclosure via steam-laden air that does not have a dedicated connection to a water supply.

brownfield: real property, the expansion, redevelopment, or *reuse* of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant (Some legal exclusions and additions may apply).

building commissioning: a process for enhancing the delivery of a project. The process assesses and documents that the facility,-systems, and/or *assemblies* are planned, designed, installed, tested, and can be operated and maintained to meet the Owner's Project Requirements.

building envelope: the element of a building that separates the conditioned interior space from the exterior, such as walls, roofs, floors, slabs, foundations, doors, and *fenestration.*

building product: building elements and *assemblies.*

building resilience: the ability of a building and project site to withstand and recover rapidly from adverse events and to adapt to changing environmental conditions.

carbon offset: a certificate representing the reduction of one metric ton (2,205 lbs.) of carbon dioxide equivalent emissions.

cartridge filtration: a removable type of filtration unit containing media. Cartridge filters are removed and cleaned or replaced as a unit in entirety.

charrette: a collaborative session in which a project team creates a solution to a design or project problem. The structure may vary, depending on the complexity of the problem or desired outcome and the individuals working in the group. *Charrette*s can take place over multiple sessions in which the group divides into sub-groups. Each sub-group then presents its work to the full group as material for future dialogue. *Charrette*s can serve as a way of quickly generating solutions while integrating the aptitudes and interests of a diverse group of people.

clear views: direct, unobstructed visual sightlines from a seated or standing position inside the building to a point at least 20 ft. (6.1 m) outside the building allowing occupants exposure to sunlight and a visual connection to nature and the outdoors. Adjustable shading devices for glare control shall not be considered an obstruction.

climate zone: see Normative Appendix B of ANSI/ASHRAE/IESNA Standard 90.1-2013, or Section 301 of the 2015 International Energy Conservation Code (IECC).

clothes washer, residential: a *clothes washer* designed for use in applications in which the occupants of one or more households will be using the *clothes washer*, including multifamily housing common areas or self service laundry

clothes washer, tunnel: an industrial laundry machine designed specifically to accommodate heavy wash loads; also called a continuous batch washer. In operation, laundry progresses through the washer in one direction, while water and washing chemicals move through in the opposite direction on a continuous basis.

combination oven: an appliance designed to cook food within an enclosure via hot air convection and steam-laden air.

conceptual design phase: a document that records the concepts, calculations, decisions, and product selections used to meet the owner's project requirements and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.

construction documents: all of the written and graphic documents (including BIM, CAD, and other electronic files) prepared or assembled by the architect/engineer for communicating the design and administering the project. The term "*Construction documents*" also includes the Project Manual that contains the bidding forms

and instructions, contract forms and conditions, and specifications, as well as documentation of all modifications made after the construction agreements are signed.

construction documents phase: the last stage of the design process. The *design and delivery team* is focused on finalizing the drawings and specifications for all components and systems of the building producing the Contract Documents. A complete set of Contract Documents provides a comprehensive, fully coordinated set of *construction documents* and specifications that the contractor uses to obtain necessary permits and construct the project.

conventional filtration: sorbtive media filtration (e.g., with perlite or diatomaceous earth) in which regular backflushing is done with each filter cleaning and the media is replaced after each flush. In *conventional filtration,* the media is mixed in a slurry process inside the filter and deposited on fabric coated tubes in the pressure vessel.

counterflow systems: an evaporative cooling system in which the flow of air is upward across the wetted cooling media.

cradle-to-gate product life cycle: a partial product life cycle from resource extraction (cradle) to the factory gate before the product is transported to the consumer. This includes the product stages or raw material supply, transport, and manufacturing. The construction process, use, and end-of-life stages of the product are omitted in this case.

cradle-to-grave product life cycle: the full product life cycle from resource extraction (cradle) through the disposal stage (grave). This includes the product, construction process, use, and end-of-life stages.

crossflow system: an evaporative cooling system in which the flow of air is horizontal across the wetted cooling media.

Dark Sky Façade Lighting: electrical lighting intended to illuminate the exterior of a building that does not deliver any direct light beyond the edge of the building rooftop.

Dark Sky Luminaire: a Dark Sky compliant *luminaire* directs all illumination down, with no light that projects at an angle greater than 90 degrees above nadir and does not facilitate *light trespass* beyond the property border.

daylighting: the integration of natural light for an enhanced connection to nature and to minimize the need for artificial lighting during the day using strategies such as effective *orientation* and placement of windows, use of light wells, light shafts or tubes, skylights, clerestory windows, light shelves, reflective surfaces, and shading, and the use of interior glazing to allow light into adjacent spaces.

deconstruction: the systematic dismantling and removal of a structure or its parts to salvage and harvest the components, for the purpose of reusing and recycling the *reclaimed materials* for their maximum value; the disassembly of a building with the explicit intent of recovering building materials for safe and economical *reuse*. Reclaimed material is material that would have otherwise been disposed of as waste or used for energy

recovery (e.g., incinerated for power generation), but has instead been collected and recovered as a material input, in lieu of virgin primary material, for recycling or a manufacturing process.

design development phase: refines the scope of work previously approved in the *schematic design phase*. In this phase, the project is developed to a level of detail necessary to work out a clear, coordinated description of all aspects of the project. Major elements including equipment, fire protection, mechanical, electrical, structural, telecommunications and plumbing systems are designed and coordinated through enlarged scale drawings, detailed elevations, and plans, and design mockups as required.

drift eliminator: structure to control water lost from cooling towers as liquid droplets are entrained in the exhaust air. A *drift eliminator* does not prevent water lost by evaporation.

drip irrigation: any non-spray, low volume irrigation system using emission devices with a flow rate measured in gallons per hour (gal/hr.) or liters per hour (L/hr.). Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

drought tolerant plant: a plant that can withstand long periods with little or no water and/or that have relatively low water requirements.

dry vacuum system: a system that does not use water to form a seal for a vacuum pump or use flowing water to create a vacuum.

existing building: a building or portion thereof that was previously occupied or approved for occupancy by the authority having jurisdiction.

fenestration: all areas (including frames) in the *building envelope* that transmit light including windows, translucent panels, clerestory windows, skylights, and glass block walls. For doors where the glazed vision area is less than 50% of the door area, the *fenestration area* is the glazed vision area. For all other doors, the *fenestration area* is the door area (including frames).

fenestration area: total area of the *fenestration* measured using the rough opening and including glass, sash, and frame.

F-factor: the perimeter heat loss factor for slab-on-grade floor, expressed in Btu/hr-ft-^{o}F (W/m-K).

food waste disposal appliance: a device used to shred food and other organic waste.

formulated product: any combination or blend of two or more constituent chemicals if the combination does not occur in nature and is not, in whole or in part, the result of a chemical reaction.

global warming potential (GWP): an index, describing the radiative characteristics of well-mixed greenhouse gases, that represents the combined effect of the differing times these gases remain in the atmosphere and their relative effectiveness in absorbing outgoing infrared radiation. This index approximates the time-

integrated warming effect of a unit mass of a given greenhouse gas in today's atmosphere, relative to that of carbon dioxide.

graywater: Untreated wastewater that has not come into contact with toilet waste, kitchen sink waste, dishwasher waste or similarly contaminated sources. *Graywater* includes wastewater from bathtubs, showers, and bathroom wash basins, *clothes washers* and laundry tubs.

greenfield: undeveloped lands such as fields, forests, farmland or rangeland.

indoor environmental quality: refers to the quality of the air and environment inside buildings, based on pollutant concentrations and conditions that can affect the health, comfort, and performance of occupants-including temperature, relative humidity, light, sound and other factors.

integrated design process (IDP): a holistic approach to project design and planning where project team members from multiple disciplines work together throughout the project design and delivery process; this emphasizes goal setting, clear and ongoing communication, attention to detail, and active collaboration among team members with the objective of achieving holistic solutions.

integrated pest management: the use of different techniques to control pests, used singly or in combination, such as selection of pest-resistant plant varieties, regular monitoring for pests, use of pest-resistant materials or use of natural predators of the pest, to control pests, with an emphasis on methods that are least injurious to the environment and most specific to the particular pest.

Integrated Water Factor (IWF): the quotient of the total weighted per-cycle water consumption for all wash cycles in gallons divided by the cubic foot capacity of the *clothes washer.*

landscape irrigation sprinkler(s): hydraulically operated mechanical device consisting of a *sprinkler body* and one or more orifices that discharges pressurized water into the air through a nozzle(s) as a spray or stream of water.

lavatory: a washbowl or basin plumbing fixture supplied with water from a *lavatory faucet* located within the confinements of a bathroom or toilet room and used for the sole purpose of personal hygiene.

lavatory faucet(s): a fitting that controls the flow of water into a *lavatory*.

light pollution: any adverse effect of artificial light including sky glow, glare, light trespass, light clutter, decreased visibility at night, and energy waste.

Light Trespass (ref. ies.org): the encroachment of light, typically across property boundaries, causing annoyance, loss of privacy, or other nuisance.

luminaire: a complete lighting unit, consisting of an artificial light source(s) together with the components required to mount the unit and distribute the light, position the light source, and connect the light source to a power supply (often referred to as a "fixture").

major renovation: has occurred when 50% of the gross area (measured to the exterior footprint) of the building has been renovated.

makeup water: water added for losses, especially losses caused by evaporation.

mature plant: a full-grown plant or the size of the plant after a specified period once the plant becomes established.

modular construction: the remote assembly of major portions of a building constructed of multiple material types involving several trades working together to build a modular unit such as a bathroom pod, patient room pod, or a wall/floor/roof assembly including HVAC, electrical, and plumbing components.

mulch: a layer of permeable material applied to the surface of a landscape area to help conserve soil moisture, improve soil health, discourage weed growth and enhance visual appeal.

non-potable water: water that is not *potable water* (see *potable water*).

non-structural element(s): elements attached to or housed in a building or building system, that are not part of the main load-resisting *structural system* of the building. These include:

1. architectural elements such as a parapet wall, partition wall, non-load carrying windows, suspended ceilings, *furnishings*, cladding systems, and veneer;
2. mechanical system components;
3. electrical system elements; and
4. miscellaneous components, such as sign boards and file cabinets.

off-site renewable energy: green power Energy Attribute Certificates (EAC), Renewable Energy Certificates (RECs) or other similar instruments purchased from a third-party source such as an electrical utility. There is no physical *renewable energy* system either on site or specifically connected to the building.

once-through water-cooled equipment: equipment that uses water within a heat exchange process for cooling only once before discharge to a drainage system.

onsite renewable energy: energy derived from sun, wind, water, the Earth's core, and various forms of biomassused in a sustainable manner, that is captured, stored and used on the building site, using such technologies as wind turbines, photovoltaic solar panels, transpired solar collectors, solar thermal heaters, and small-scale hydroelectric power plants.

orientation: the relation of a building and its associated *fenestration* and interior surfaces to compass direction and, therefore, to the location of the sun, usually given in terms of angular degrees away from the south, (e.g., a wall facing due Southeast has an *orientation* of 45 degrees east of south).

overhang: a horizontal projection for a window or wall.

ozone depletion potential (ODP): a number that refers to the amount of ozone depletion caused by a substance. The *ODP* is the ratio of the impact on ozone of a chemical compared to the impact of a similar mass of CFC-11. Thus, the *ODP* of CFC-11 is defined to be 1.0. Other CFCs and HCFCs have *ODP*s that range from 0.01 to 1.0. The halons have *ODP*s ranging up to 10. Carbon tetrachloride has an *ODP* of 1.2, and methyl chloroform's *ODP* is 0.11. HFCs have zero *ODP* because they do not contain chlorine. Manufacturers publish tables of all ozone depleting substances showing their *ODP*s, *GWP*s, and *CAS numbers*.

permeable surface(s): infiltrate, treat, and/or store *rainwater* where it falls. They can be made of *pervious concrete, porous asphalt,* or permeable interlocking pavers.

pervious concrete: allows some or all water to penetrate the concrete assembly.

porous asphalt pavement(s): allows some or all water to penetrate the asphalt assembly.

post-consumer recycled content: the portion of *recycled material,* in a product, generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose. *Post-consumer recycled content* includes returns of materials from the distribution chain.

potable water: water that meets the requirement of the authority having jurisdiction and is satisfactory for drinking, culinary, and domestic purposes.

pre-consumer recycled content: the portion of *recycled material* in a product diverted from the waste stream during a manufacturing process. Materials that have been reutilized (i.e., reworked, reground, or scrap generated in a process and capable of being reclaimed within the same process that generated it) are excluded.

pre-design: the activities that happen during or prior to the conceptual/*schematic design phase* of the project.

prefabrication: off-site, custom fabrication of major building elements in specialized facilities, in which various materials are joined to form a component part of a final installation. Examples include trusses, joists, structural steel fabrications, architectural casework, curtain wall, and precast concrete. This does not include manufactured, multi-material components such as windows, doors, and gypsum sheathing unless they are incorporated into a prefabricated building element.

pre-rinse spray valve(s): a handheld device, used with commercial dishwashing and warewashing equipment and applications, that sprays water on dishes, flatware, and other food service items to remove food residue before cleaning and sanitizing the items.

previously developed site: land that is or was occupied by a permanent structure (excluding agricultural or forestry buildings), and associated fixed surface infrastructure.

qualified professional: an individual licensed or accredited by a jurisdictional body, third-party or other recognized organization on the subject matter being addressed.

R-value: indicates the resistance to heat flow (thermal resistance) of a material. The *R-value* of thermal insulation depends on the type of material, its thickness, and its density. **The higher the *R-value*, the greater the insulating effectiveness.** In calculating the *R-value* of a multi-layered installation, the *R-value*s of the individual layers are added.

rain shutoff device: a device connected to an irrigation controller that overrides scheduled irrigation when significant precipitation is detected.

rainwater: untreated water from natural precipitation that has not been contaminated by use. Can be used through *rainwater harvesting.*

reclaimed [recycled] water: highly treated wastewater that can be used for irrigation or other *non-potable* uses to extend water supplies.

regenerative sorbtive media: filtration media capable of filtering down to 5 microns, that is usually composed of diatomaceous earth or perlite but that is unique in that it is not back-washed and replace after each use, but rather agitated off of filter tubes and then recoated on the filter. In addition to only needing occasional replacement, filtration processes using this type of media are much more water efficient.

regularly occupied space: a room or enclosed space designed for human occupancy in which individuals for an hour or more at one time perform activities for which the space has been specifically designed.

renewable energy: energy that is continuously replenished on the Earth, such as wind, solar thermal, solar electric, geothermal, and hydropower.

renovation: changing in-kind, strengthening, refinishing, or replacing of structural elements or upgrading of existing materials, equipment and/or fixtures.

reuse: to use an object, material or resource again, either for its original purpose or a similar purpose, without significantly altering the physical form of the object or material.

risk: the probability that a *product formulation*, *article* or constituent chemical will cause an unacceptable hazardous or toxic human health or safety, or ecological effect under the intended exposure and use conditions.

risk assessment, product: a scientific product composition screening-level analysis that determines if a *product formulation*, *article*, or constituent chemical will produce a *risk*, based upon constituent hazards, dose and exposure assessments, and *risk* characterization.

salvaged material: discarded or unused construction materials or products removed from a structure or a site that have value and can be directly substituted for new materials or products with minimal reprocessing.

sand-based filtration: filtration that does not use a sorbtive media (such as diatomaceous earth or perlite) and does not filter down to 5 microns.

service life: the expected lifetime of a product.

shared use [multi-user] path: a form of infrastructure that supports multiple non-motorized transportation opportunities, such as walking, bicycling and inline skating. A multi-use path is physically separated from motor vehicular traffic with an open space or barrier.

smoking: the inhalation of smoke of burning tobacco, use of electronic-cigarettes, cannabis, or other substances encased in items such as (but not limited to) cigarettes, pipes, and cigars for recreational or medical use.

soil moisture sensor: a device connected to an irrigation system used to measure the moisture level in the soil.

specialized activities: activities that generate pollutants, that may include but are not limited to, printing rooms, and areas that contain industrial and quasi-industrial equipment.

splash out trough: the channel located around the edge of a pool that is designed to catch water that otherwise would spill or be tracked out of the pool onto the decking. The *splash out trough* drains back to the pool system.

sprinkler body: the exterior case or shell of a sprinkler incorporating a means of connection to the piping system, designed to convey water to a nozzle or orifice.
State of Place Index: a walkability and quality of place score from 0-100. It is based on 290 features of the built environment – like sidewalks, benches, street trees, and land uses – data that is collected block by block. It indicates how walkable – convenient, safe, pleasurable, and livable – a block, group of blocks, or neighborhood is. The index value for a site is determined by a proprietary algorithm maintained by State of Place, Inc. who can be contacted at https://www.stateofplace.co/.

steam sterilizer: a device that uses moist heat in the form of saturated steam under pressure for a predetermined period of time to sterilize materials.

stormwater: natural precipitation that has contacted a surface at, below (channels storm drain pipes), or above (elevated roadways) grade.

structural system: the load-resisting system of a structure that transfers loads to the soil or supporting structure through interconnected structural components or members.

sub-meter: a metering subdivision of the energy, water, gas, or sound that records the use of the metered subject by specific building systems and equipment.

substantial completion: the stage in the progress of a construction project when the project or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or use the project for its intended use.

Superfund site: a site that is on the U.S. Environmental Protection Agency's (EPA) National Priority List (NPL) based on a scoring process that rates its current or potential health impact.

task lighting: light that is directed to a specific surface or area to provide illumination for visual tasks.

U-factor (thermal transmittance): the heat transmission in unit time through unit area for all the elements of construction and the boundary air films, induced by unit temperature difference between the environmental conditions on each side. Btu/hr-ft^2-^{o}F (W/m^2-K).

variable occupancy: a variance of 30% from design occupancy for a minimum of 30% of normally occupied hours.

vegetated roof: a roof system that may include a water proofing and root repellant system, a drainage system, filter cloth, a lightweight growing medium, and plants. *Vegetated roof* systems can be modular, with drainage layers, filter cloth, growing media and plants already prepared in movable, interlocking grids or each component can be installed separately.
Walk Score®: measures the walkability on a scale of 0-100 of any address using a patented system. For each address, Walk Score® analyzes hundreds of walking routes to nearby amenities. Points are awarded based on the distance to amenities in each category. Walk Score® is maintained by Walk Score® Management, LLC part of Redfin Corporation. The score can be publicly accessed for a site at https://www.walkscore.com/.

waste heat: waste heat from industrial processes and power stations rated at more than 10MWe and with a power efficiency of greater than 35%.

water features: a designated, often artificial, area in which visible water is moving or open for some purpose. While often this is for aesthetic purposes, these areas may have multiple uses. Generally, the term applies to places not used exclusively for irrigation.

water tempering device: a device that cools a discharge of hot water or steam to the sanitary sewer by dilution (mixing) with cooler water.

wetland: natural or constructed areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. *Wetlands* generally include swamps, marshes, bogs and similar areas.

V.II Abbreviations and Acronyms
ASA: Acoustical Society of America

ASABE: American Society of Agricultural and Biological Engineers

ASTM: ASTM International

ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers

ATFS: American Tree Farm System

BUG: Backlight, Uplight and Glare Ratings

CAS: Chemical Abstracts Service

CBECS: Commercial Building Energy Consumption Survey. Developed by the U.S. Department of Energy's Energy Information Administration (EIA)

CDPH: California Department of Public Health

CO2e: *Carbon Dioxide Equivalent* Emissions Rate

CSA: Canadian Standard Association

EMS: Environmental Management System

EPA: Environmental Protection Agency

FGI: Facility Guidelines Institute

HVAC&R: heating, ventilating, air-conditioning, and refrigerating

IAPMO: International Association of Plumbing and Mechanical Officials

ICC: International Code Council®

IDP: Integrated Design Process

IECC: International Energy Conservation Code

IES: Illuminating Engineering Society of North America

ISO: International Organization for Standardization

IWF: Integrated Water Factor

LCA: life cycle assessment

LWA: landscape water allowance

MERV: Minimum Efficiency Reporting Value

NC: Noise Criterion

PEFC: Programme for Endorsement of Forest Certification

RELs: Reference Exposure Levels

SCAQMD: South Coast Air Quality Management District

VOC: Volatile Organic Compounds

ENVIRONMENTAL ASSESSMENT AREAS

1. PROJECT MANAGEMENT (100 points)

1.1 TEAM & OWNER PLANNING (45 POINTS)

1.1.1 PERFORMANCE & GREEN DESIGN GOALS	

1.1.1.1 Performance and green design goals (qualitative AND/OR quantitative) are established in collaboration with the owner in writing and are regularly assessed from *pre-design* through to completion of construction and occupancy for the following listed items:
 	
• Site design;
• Environmentally responsible construction activities;
• Biophilia and occupant enrichment;
• Water conservation, efficiency, *alternate water sources*, and *reuse*;
• *Building envelope* and moisture control;
• Energy efficiency;
• Materials including:
  ○ Efficiency;
  ○ Environmentally preferable products; and
  ○ Storage of hazardous materials;
• Indoor environment including:
  ○ Acoustic comfort;
  ○ Thermal comfort;
  ○ Lighting;
  ○ Air quality; and
• *Building resilience*.
 	
Assessment criteria:
Pre-design written goals
Design stage review and assessment of goals prior to:
• *Conceptual design phase*
• *Design development phase*
• *Construction documents*
Construction stage review and assessment of goals at:
• Pre-construction
• 25% completion of budget or schedule
• 50% completion of budget or schedule
• *Substantial completion*
	Maximum = 20 points
	
	• One point is earned for each written performance and green design goal for listed items at *pre-design* to a maximum of nine points.
	• One point is earned for evidence of each design stage review and assessment of goals prior to:
	  ○ *Conceptual design*
	  ○ *Design development*
	  ○ *Construction documents.*
	• One point is earned for evidence of each construction stage review and assessment completed at:
	  ○ Pre-construction
	  ○ 25% completion
	  ○ 50% completion
	  ○ *Substantial completion*
	• Four points are earned for a written plan and contract for post-occupancy review and assessment.

Occupancy assessment of goals: • Owner obtains a contract for Facility Performance Evaluation or Post-Occupancy Study to evaluate how the building meets the original and emerging goals and requirements within 18 months of being occupied.	

1.1.2 *INTEGRATED DESIGN PROCESS*

1.1.2.1 Employ an *Integrated Design Process (IDP)* with evidence of comprehensive *pre-design*, design phase, and construction phase planning and coordination.

Job functions involved in the *IDP* include but are not limited to the following:

- Architect;
- *Building Envelope* Specialist;
- Civil Engineer;
- Commissioning Agent;
- Community Representative;
- Electrical Engineer;
- Energy Engineer;
- Facilities Manager;
- General Contractor/Construction Manager:
  - Specialty Contractors;
- Industrial Hygienist or Occupational Health and Safety Professional;
- Infection Control Preventionist;
- Interior Designer;
- Irrigation Designer;
- Landscape Architect or Designer;
- Lighting Designer/Illuminating Engineer;
- Mechanical Engineer – Plumbing, HVAC, AND/OR Refrigeration;
- Owner's Representative;
- Structural Engineer;
- Sustainability Consultant; AND/OR
- User Group Representative.

Maximum = 14 points

The following points are earned when a minimum of the listed job functions or groups were represented at the following milestones or during the following project phases:

Milestone or Project Phase	Points for 6 to 9 Job Functions	Points for 10 or more Job Functions
Pre-Design Event (meeting, *charrette*, or workshop)	3	5
Conceptual or Design Phase	1	3
Construction Documents Phase	1	3

	Final Budget or Guaranteed Maximum Price (GMP) Review with the expectation of an in-depth review of the consequences of the decisions made on the project sustainability goals	1	3

1.1.3 SITE AND *BUILDING RESILIENCE*	
1.1.3.1 Building *Risk Assessment*: An assessment identifying *risks* to the building including continued building occupancy resulting from extreme natural events, global climate change, and human activity for the expected *service life* of the building has been conducted and provided to building owners and designers. The assessment identifies hazards and evaluates the probability and severity of occurrence of those events. These hazards include, but are not limited to, weather, flooding, seismic and volcanic events, drought, wildfire, soil stability, and terrorism.	3 points
1.1.3.2 Building Operational Continuity or Recovery Assessment: An assessment of the necessity of continuous or rapid recovery of various building functions during and after an extreme event has been conducted.	3 points
1.1.3.3 Project Specific Design Parameters: Document that the findings of both the *risk* and building function assessments have been integrated into the building design parameters and are reflected in the final design and construction of the building.	3 points
1.1.3.4 Publication of Emergency Preparedness Manual: A building operation manual has been prepared outlining actions to be taken in the event of an extreme event, materials to be stockpiled in the building if continuing occupancy is anticipated, and timeline for regular review.	2 points

1.2 ENVIRONMENTAL MANAGEMENT DURING CONSTRUCTION (8 POINTS)

1.2.1 ENVIRONMENTAL MANAGEMENT DURING CONSTRUCTION	

1.2.1.1 The general contractor (GC) or construction manager (CM) documents the following elements as part of their Environmental Management System (EMS):
 	
• **1.2.1.1.1**: GC/CM Environmental Policy:
  ○ Includes policies and practices that support the health of humans and site-environment during construction;
• **1.2.1.1.2**: Designated GC/CM Environmental Management Plan and Compliance Manager:
  ○ Lists their qualifications, role, responsibilities, and reporting compliance structure (e.g., checklists, inspections, and records of compliance).
  ○ Indicates how this information is passed along to project personnel and sub-contractors;
  ○ Describe continuous reporting mechanism;
• **1.2.1.1.3**: Project Ecological and Health *Risk Assessment*:
  ○ An assessment is conducted prior to the start of construction to identify major *risks* that could impact the general welfare and health of humans (i.e., residents, workers, visitors, and construction trades people) and the ecological environment surrounding the immediate area of construction for the specific project and local agency requirements;
• **1.2.1.1.4**: A construction management policy prohibits *smoking* within 25 ft. (7.62 m) of the building perimeter and construction zone during the construction phase.
  ○ *Smoking* is defined as the inhalation of smoke from burning tobacco, use of electronic-cigarettes, or other substance encased in items such as, but not limited to, cigarettes, pipes, and cigars for recreational or medical use.
	Maximum = 8 points
	
	• Two points are earned for documenting the items listed in 1.2.1.1.1.
	• Two points are earned for documenting the items listed in 1.2.1.1.2.
	• Two points are earned for documenting the items listed in 1.2.1.1.3.
	• Two points are earned for documenting the items listed in 1.2.1.1.4.

1.3 LIFE CYCLE COST ANALYSIS OR BUILDING *SERVICE LIFE* PLANNING (12 POINTS)

1.3.1 LCCA or Building *Service Life* Planning:
Path A or B
Two paths are available for assessing Life Cycle Cost Analysis or Building *Service Life* Planning.

- **1.3.1A Path A: Life Cycle Cost Analysis:** 12 points

OR

- **1.3.1B Path B**: **Building *Service Life* Plan:** 12 points

Points cannot be combined between paths. Select one of the paths below.

1.3.1A PATH A: LIFE CYCLE COST ANALYSIS	
1.3.1A.1 A cost of ownership financial analysis is performed on the project's collective bundle of green features (i.e., energy/water conservation measures, energy/water efficiency features, maintenance best practices, waste reduction) that are expected to impact: • Project first costs; • Operation costs (i.e., utility costs/savings, maintenance and repair costs, costs of replacement,); or • Other financial features of ownership. The analysis is a life cycle cost analysis (LCCA) that compares the lifetime benefits of ownership to the subsequent costs. The analysis accounts for and clearly states all calculation assumptions related to: • The time value of money; • Fuel escalation rates; • Other relevant operational factors that affect the cost of ownership. The LCCA study period is not less than the expected life of the building or system. Use projected annual energy costs for the proposed design for this LCCA.	12 points

OR

1.3.1B PATH B: BUILDING *SERVICE LIFE* PLAN	
1.3.1B.1 A Building *Service Life* Plan is implemented that includes the expected *service life* estimates, including inspection and replacement during the life of the building. The Building *Service Life* Plan covers the following systems: • **1.3.1B.1a**: *Structural systems*; • **1.3.1B.1b**: *Building envelope* including facades, doors, and windows; • **1.3.1B.1c**: Building roof system;	Maximum =12 points • Two points are earned for each of the listed elements included in the Building *Service Life* Plan up to a maximum of 12 points.

• **1.3.1B.1d**: Mechanical, electrical, plumbing, fire protection, and energy generation systems; • **1.3.1B.1e**: Site hardscape; AND/OR • **1.3.1B.1f**: *Furnishing* and interior *fit-out*. Provide documentation of the project design *service life*, the listed systems service lives, the basis for the determination, and the following details for each assembly or component used in the building: • Building assembly and material description; • Design *service life* in years; • Predicted *service life* in years; • Adaptability and repurposing at end of *service life*; and • Maintenance frequency and maintenance access.	

1.4 MOISTURE CONTROL ANALYSIS (6 POINTS)

1.4.1 MOISTURE CONTROL DESIGN ANALYSIS	
1.4.1.1 A moisture control design analysis is performed on walls and ceilings adjacent to spaces of added moisture AND/OR on above-grade portions of the *building envelope* in accordance with ASHRAE 160-2016 or a steady-state water vapor transmission analysis for the purpose of predicting, mitigating, or reducing moisture damage to the *building envelope*, materials, components, systems, and *furnishings*.	Maximum = 6 points • Three points are earned when a moisture control design analysis is performed on walls and ceilings adjacent to spaces of added moisture. ○ Not applicable where there are no spaces of added moisture. • Three points are earned when a moisture control design analysis is performed on above-grade portions of the *building envelope*.

1.5 COMMISSIONING OR SYSTEMS MANUAL & TRAINING (29 POINTS)

1.5.1 Commissioning or Systems Manual & Training
Path A or B
Two paths are available for assessing Commissioning or Systems Manual & Training.

- **1.5.1A Path A: *Building Commissioning* and Training:** 29 points

OR

- **1.5.1B Path B**: **Systems Manual and Training:** 20 points

Points cannot be combined between paths. Select one of the paths below.

1.5.1A PATH A: *BUILDING COMMISSIONING* AND TRAINING	

1.5.1A.1 Commissioning and building operator training is conducted in accordance with ANSI/ASHRAE/IES Standard 202–2018, *Commissioning Process for Buildings and Systems*, ASHRAE Guideline 0-2019, *The Commissioning Process*, or CSA Z320-11, *Building commissioning* for the following building systems as applicable. Alternatively, ASTM E2813-18 *Standard Practice for Building Enclosure Commissioning* and ASTM *E2947-16a Standard Guide for Building Enclosure Commissioning* meet this requirement for the *building envelope*.
 	
• **1.5.1A.1a**: HVAC&R systems and controls;
• **1.5.1 A.1b**: *Building envelope*;
• **1.5.1 A.1c**: Lighting systems and controls;
• **1.5.1 A.1d**: Plumbing;
• **1.5.1 A.1e**: Irrigation systems;
• **1.5.1 A.1f**: Electrical system including all renewable electrical generation;
• **1.5.1 A.1g**: Elevating and conveying systems;
• **1.5.1 A.1h**: Communication AND/OR Sound Masking systems; AND/OR
• **1.5.1 A.1i**: Other significant functional AND/OR energy systems (describe) that account for 10% or more of the total building energy use (describe).
	Maximum = 29 points or as adjusted by N/A Items
	
	• Six points are earned if commissioning and training is conducted for HVAC&R systems and controls.
	• Six points are earned if commissioning and training is conducted for the *building envelope*.
	• Six points are earned if commissioning and training is conducted for Lighting systems and controls.
	• Two points are earned if commissioning and training is conducted for plumbing systems.
	• Two points are earned if commissioning and training is conducted for irrigation systems.
	  ○ Not applicable if there are no irrigation systems.
	• Two points are earned if commissioning and training is conducted for Electrical systems.
	• One point is earned if commissioning and training is conducted for Elevating/conveying systems.
	  ○ Not applicable if there are no elevating/conveying systems.
	• Two points are earned if commissioning and training is conducted for Communications AND/OR sound masking systems.
	  ○ Not applicable if there are no communications AND/OR sound masking systems.
	• Two points are earned if commissioning and training is

	conducted for other significant functional AND/OR energy systems. ○ Not applicable if there are no other significant systems.

OR

1.5.1B PATH B: SYSTEMS MANUAL & TRAINING	
1.5.1B.1 Produce a systems manual in accordance with ASHRAE Guideline 0-2019, *The Commissioning Process*, Informative Annex O – Systems Manual, Sections 4 to 10, inclusive or CSA Z320-11, *Building commissioning*.	10 points
1.5.1B.2 Conduct systems training in accordance with ASHRAE Guideline 0-2019, *The Commissioning Process*, Informative Annex P – Training Manual and Training Needs or CSA Z320-11, *Building commissioning*.	10 points

2. SITE (150 points)

2.1 DEVELOPMENT AREA (35 POINTS)

2.1.1 URBAN INFILL AND URBAN SPRAWL	
2.1.1.1 The building is being constructed on a *previously developed site* that has been served by existing utility and transportation infrastructure for at least a full year prior to construction.	10 points

2.1.2 *GREENFIELDS*, *BROWNFIELDS*, AND FLOODPLAINS	
2.1.2.1 The building is being constructed on a *brownfield* or *remediated Superfund site*.	10 points
2.1.2.2 The project is not located on or adjacent to sensitive natural sites (e.g. land that is forest or woodland area, savanna, prairie, *wetland*, undeveloped riparian zones, or wildlife corridor) or on land that was a sensitive natural site for at least three years prior to time of purchase or from the start of project. • The project is not located on a site that was used for farmland, public recreation, or a public park for at least three years prior to the time of purchase or from the start of the project. **AND** • The project is not within or adjacent to a wildland-urban interface area where established by the legislative body with jurisdiction.	6 points or N/A • Not applicable where the legislative body with jurisdiction has not declared a wildland-urban interface area.
2.1.2.3 Floodplains: • **2.1.2.3.1:** No construction or site disturbance takes place in the 100-year floodplain. OR • **2.1.2.3.2:** Buildings that have completed a Waterfront Edge Design Guidelines (WEDG) Certification. OR	Maximum = 9 points • Nine points are earned for 2.1.2.3.1. ○ Not applicable where no areas in the local jurisdiction fall within the 100-year floodplain. • Nine points are earned for 2.1.2.3.2. • Six points are earned for 2.1.2.3.3.

• **2.1.2.3.3:** Elevate Buildings and additions in the floodplain to a minimum of 3 ft. (.9 m) above the 100-year floodplain or are built to allow water to flow through or under the lowest floor. AND The facility also earns points for 2.2.1.1 or 2.2.1.6 or is within 0.25 mi (0.4 km) walking distance of developed residential land of at least 8 dwelling units per acre. AND Buildings and structures assigned a *risk* category of III or IV in Table 1604.5 of the 2012 International Building Code will not be located within a 500-year floodplain. (Not required if the entire jurisdiction is located within the 100-year floodplain. If the entire jurisdiction is located within the 500-year floodplain, then the facility is built outside the 100-year floodplain. Not applicable where no areas in the local jurisdiction fall within the 500-year floodplain.)	

2.2 TRANSPORTATION (31 POINTS)

2.2.1.1 PROXIMITY OF LOCAL TRANSIT

Path A or B
Two paths are available for assessing the proximity of local transit.

- **2.2.1.1A Path A: Local Transit Offerings:** 7 points

OR

- **2.2.1.1B Path B**: **Transit Score®:** 7 points

Points cannot be combined between paths. Select one of the paths below.

2.2.1.1A PATH A: LOCAL TRANSIT OFFERINGS	
2.2.1.1A.1 A building entrance is within 0.25 mi (0.4 km) walking distance of a local transit stop or 0.5 mi (0.8 km) walking distance of a rapid transit stop. Note: Local transit includes public transit that uses the same right-of-way as automobiles AND for which the distance between stops averages less than 0.33 mi (0.5 km). Rapid transit refers to all other types of public transit. AND	7 points

The stop is served by a transit route that offers service: • with single direction intervals (headways) no longer than 15 minutes during peak hours and 30-minute single direction intervals (headways) during off-peak hours for a minimum of 14 hours each weekday; AND • with single direction intervals (headways) no longer than 1 hour and operating at a minimum of 14 hours at least one day each weekend.	

OR

2.2.1.1B PATH B: TRANSIT SCORE®	
2.2.1.1B.1 The Transit Score® is at least 70.	7 points

Complete regardless of the path chosen above.

2.2.1.2 Parking areas have Electric Vehicle charging infrastructure that are either AC Level 2 (240V in one-phase or 208V in three-phase projects) or Direct Current Fast Charging (DCFC). For example, EV ready includes conduits in place to support installation of charging stations.	Maximum = 6 points or N/A • Four points are earned for buildings when ≥10% of onsite parking spaces are equipped with the specified EV charging stations. • Two points are earned for buildings when ≥5% to <10% of onsite parking spaces are equipped with the specified EV charging stations. AND • Two points are earned for buildings when ≥30% of onsite parking spaces are EV ready. • Not applicable where the project will have no parking associated with the building.
2.2.1.3 1% or more of onsite parking spaces are equipped with electric charging stations designated for vanpools and carpools.	1 point or N/A • Not applicable where the project will have no parking associated with the building or when employee van/carpool is not offered.

2.2.1.4 A building entrance is located within 0.25 mi (0.4 km) of a public bicycle path, *shared use [multi-user] path*, or road with an existing dedicated bicycle lane. AND The path, lane, or associated bicycle network connects within 5 mi (8.05 km) to a transit stop as described in 2.2.1.1 or to the developed residential land of at least 8 dwelling units per acre. AND There is reasonable, unobstructed access between the bicycle lane or *shared use [multi-user] path* and the bicycle parking facilities or the building entrance. OR The building's Bike Score® is 50 or greater.	2 points

2.2.1.5 Facilities for Bicycle Commuting and Long-Term Bicycle Parking:
 	
• **2.2.1.5.1:** Sheltered bicycle parking is:
  ○ provided for at least 10% of building occupants, where the building occupant load is established in accordance with the International Building Code AND shower and changing facilities are provided within the building project;
OR
  ○ provided for at least 50% of units in a multifamily residential building.
 	
• **2.2.1.5.2:** At least 50% of the sheltered bicycle parking is located inside the building or within storage lockers or another area that provides security of a locked room or cage secured by a keyed, cipher, or electronic lock and the ability to lock the bicycle to a rack within that space.
• **2.2.1.5.3:** The building is located within 0.25 mi (0.4 km) walking distance of a bike share facility.
 	
OR
 	
• **2.2.1.5.4:** A bicycle parking rack is located within 50 ft. (15.24 m) of an entrance, and is either readily visible from a main entrance, or signage indicating the location is posted at main entrances.
	Maximum = 5 points
	
	• Two points are earned where sheltered bicycle parking facilities are provided (and showers and changing facilities as applicable).
	• Two points where the sheltered bicycle parking is secure. (Only applicable where the above two points are achieved.)
	• One point is earned where the building is located near a bike share facility and/or where there is a parking rack near the main entrance.
	
	OR
	
	Five points are earned for a Gold or better ActiveScore Certification Rating.

OR • 2.2.1.5.5: A Gold or better ActiveScore certification rating.	

2.2.1.6 WALKABILITY
Path A, B, or C
Three paths are available for assessing a site's walkability.

- **2.2.1.6A Path A: *Walk Score*®:** Up to 10 points

OR

- **2.2.1.6B Path B: *State of Place Index*:** Up to 10 points

OR

- **2.2.1.6C Path C: *AARP Livability Index*:** Up to 10 points

Points cannot be combined between paths. Select one of the paths below. If building is unoccupied, select a Path and select N/A.

2.2.1.6A PATH A: *WALK SCORE*®	
2.2.1.6A.1 The *Walk Score*® is at least 50.	Maximum = 10 points • Ten points are earned for a ≥90 to ≤100 *Walk Score*®. • Eight points are earned for a ≥80 to ≤89 *Walk Score*®. • Six points are earned for a ≥70 to ≤79 *Walk Score*®. • Four points are earned for a ≥60 to ≤69 *Walk Score*®. • Two points are earned for a ≥50 to ≤59 *Walk Score*®. • No points are earned for a *Walk Score*® <50. • Not applicable if the building is unoccupied.

OR

2.2.1.6B PATH B: *STATE OF PLACE INDEX*	
2.2.1.6B.1 The *State of Place Index* score is at least 40.	Maximum = 10 points • Ten points are earned for a ≥90 to ≤100 *State of Place Index* score.

	• Eight points are earned for a ≥80 to ≤89 *State of Place Index* score. • Six points are earned for a ≥70 to ≤79 *State of Place Index* score. • Four points are earned for a ≥60 to ≤69 *State of Place Index* score. • Two points are earned for a ≥40 to ≤59 *State of Place Index* score. • No points are earned for a *State of Place Index* score <40. • Not applicable if the building is unoccupied.

OR

2.2.1.6C PATH C: *AARP LIVABILITY INDEX*	
2.2.1.6C.1 The Neighborhood category of the *AARP Livability* score is at least 50. Of the seven categories that make up the index the Neighborhood category index is used for the scoring in the criterion.	Maximum = 10 points • Ten points are earned for a ≥90 to ≤100 *Livability* score. • Eight points are earned for a ≥80 to ≤89 *Livability* score. • Six points are earned for a ≥70 to ≤79 *Livability* score. • Four points are earned for a ≥60 to ≤69 *Livability* score. • Two points earned for a ≥50 to ≤59 *Livability* score. • No points are earned for a *Livability* score <50. • Not applicable if the building is unoccupied.

2.3 CONSTRUCTION IMPACTS (34 POINTS)

2.3.1 Site Erosion:
Two paths are provided for assessing erosion and sedimentation:

- **2.3.1A Path A: Erosion and Sedimentation Control Plan:** 5 points
  OR
- **2.3.1B Path B: Erosion and Sedimentation Control Specifications:** 5 points

Select the path applicable or most applicable to the project. Points cannot be combined between paths.

2.3.1A PATH A: EROSION AND SEDIMENTATION CONTROL PLAN	
2.3.1A.1 An Erosion and Sedimentation Control Plan, signed and stamped by a professional engineer or designer approved by the authority having jurisdiction, is included in the *construction documents*.	5 points or N/A • Not applicable where projects are interior-only.

OR

2.3.1B PATH B: EROSION AND SEDIMENTATION CONTROL SPECIFICATIONS	
2.3.1B.1 The specifications require the implementation of the following best practices as appropriate to the site for erosion and sediment control during construction: • Construction Site Planning and Management Measures: construction sequencing, construction site operator BMP inspection and maintenance, preserving natural vegetation; • Erosion Control: articulated concrete block, chemical stabilization, compost blankets, dust control, flocculants, geotextiles, gradient terraces, *mulching*, riprap, seeding, sodding, soil retention, soil roughening, temporary slope drain, temporary stream crossings, wind fences and sand fences; • Runoff Control: check dams, grass-lined channels, permanent slope diversions, temporary diversion dikes; • Sediment Control: brush barriers, compost filter berms, compost filter socks, construction entrances, fiber rolls, filter berms, sediment basins and rock dams, sediment filters and sediment chambers, sediment traps, silt fences, storm drain inlet protection, straw or hay bales, vegetated buffers; and • Good Housekeeping/Materials Management: concrete washout, general construction site waste management, spill prevention, and control plan, vehicle maintenance and washing areas at construction sites.	5 points or N/A • Not applicable where the lot is larger than one acre. • Not applicable where projects are interior-only.

(Answer regardless of the Path chosen above):

2.3.2 SITE DISTURBANCE	
2.3.2.1 Construction activities do not go beyond 40 ft. (12.2 m) of the building footprint(s) and remain within 5 ft. (1.5 m) of parking lots, roadways, sidewalks and utility right-of-ways except where the intent of the construction activities was one or more of the following: Exceptions apply where the construction activities are intended to specifically improve the natural integrity of the site, e.g.,	5 points or N/A • Not applicable where projects are interior-only.

removing invasive plant species, replacing existing hardscapes with vegetation, restoring prairie or *wetlands*, or increasing onsite water retention by building rain gardens, swales, retention ponds, or berms.	

2.3.3 TREE AND SHRUB PRESERVATION	
2.3.3.1 Non-invasive existing trees and woody shrubs are retained and protected during construction. A certified arborist, a landscape architect, or a certified professional landscape designer provides plans and specifications that are used by the general contractor or construction manager to protect retained trees and shrubs from disturbance and soil compaction. Assessment Guidance: Base Calculations on the area of canopy coverage provided by trees and shrubs prior to clearing and construction activity. Calculations exclude plants that will be removed because they are unhealthy, invasive or otherwise inappropriate for site conditions (e.g., have water, soil, light, or other requirements that are inconsistent with the site). If an area is covered by overlapping layers of plants, it is not counted multiple times, (i.e., the maximum canopy coverage for any site is 100%).	Maximum = 6 points or N/A • Six points are earned when >90% of the canopy of existing trees and shrubs is retained and protected. • Five points are earned when ≥75% to ≤90% of the canopy of existing trees and shrubs is retained and protected. • Four points are earned when ≥50% to <75% of the canopy of existing trees and shrubs is retained and protected. • No points are earned when <50% of the canopy of existing trees and shrubs is retained and protected. • Not applicable where the site has no existing trees or shrubs or where existing plants do not qualify for calculation of canopy coverage, such as those that are invasive or in poor health.

2.3.4 MITIGATING HEAT ISLAND EFFECT	
2.3.4.1 Roof: The building has a *vegetated roof*, is shaded during summer months, AND/OR has a roof with a high Solar Reflectance Index (SRI) as prescribed based on the slope of the roof. The solar reflectance and thermal emittance values that are used to obtain SRI shall be measured in accordance with ANSI/CRRC S100 (2021) or rated in accordance with the Cool Roof Rating Council, Roof Product Rating Program Manual CRRC-1 (2024). Where used to comply, shading trees are to be existing, non-invasive plants that are retained on site or newly, non-invasive planted trees that will provide shade within 10 years.	Maximum = 6 points or N/A The following number of points may be earned when using one or more of the listed heat island mitigation strategies on the roof: • Six points are earned where >70% of the roof complies ○ Three points are earned where >70% of the roof has a high

• For a *roof* slope less than or equal to 2:12, a minimum initial SRI of 78 or greater or a three-year aged SRI of 60 or greater;
• For a *roof* slope greater than 2:12, a minimum initial SRI of 29 or greater or a three-year-aged SRI of 25 or greater.
	initial SRI, and three points are earned where >70% of the roof has a high three-year-aged SRI.
	• Four points are earned where ≥56% to ≤70% percent of the roof complies.
	  ○ Two points are earned where ≥56% to ≤70% of the roof has a high initial SRI and two points are earned where ≥56% to ≤70% of the roof has a high three-year-aged SRI.
	• Two Points are earned if ≥40% to <56% percent of the roof complies.
	  ○ One point is earned where ≥40% to <56% of the roof has a high initial SRI, and one point is earned where ≥40% to <56% of the roof has a high three-year-aged SRI.
	• No points are earned if <40% of the roof complies AND/OR has a high initial or three-year-aged SRI.
	• Not applicable for interior-only projects.

2.3.4.2 Hardscape: The building design addresses hardscape using one or more of the following strategies: • **2.3.4.2.1 Solar Reflectance Index:** Hardscape surfaces with an initial Solar Reflectance (SR) of at least 0.28 as measured in accordance with ANSI/CRRC S100 (2021). New concrete and concrete masonry without additional colored pigment are deemed to comply without additional testing. ○ Not applicable for interior-only projects. • **2.3.4.2.2 Shading:** Where the hardscape surfaces are not shaded by the primary building structures (either the building project or other *existing buildings*), hardscape surfaces outside the building footprint are intended to be shaded by trees or other vegetation within 10 years. Take the shading measurement at noon Standard Time on the Summer Solstice and document in the shading plan. • **2.3.4.2.3 *Permeable Surfaces*:** At least 50% of installed hardscape area (walkways, patios, driveways, etc.) uses	Maximum = 5 points or N/A • Five points are earned where ≥50% of hardscape surfaces comply with 2.3.4.2. • Three points are earned where ≥25% to <50% of hardscape surfaces comply with2.3.4.2. • No points are earned where <25% of hardscape surfaces comply with 2.3.4.2. • Not applicable where there are no hardscape surfaces.

permeable materials. Permeable materials include one or more of the following: ○ Clay or concrete paver with pervious joints/openings; ○ Bricks; ○ Gravel; ○ Vegetative paving systems; ○ *Mulch*; ○ *Pervious concrete*; ○ *Porous asphalt;* AND/OR ○ Open-grid pavement system (at least 50% unbound).	
2.3.4.3 Walls: At least 75% of opaque wall surfaces (by area) on the east, west, and south have a solar reflectance of 0.60 or greater and thermal emittance of 0.75 or greater, are covered by or are designed to be covered by non-invasive vegetation AND/OR a vegetative wall during the summer months. New concrete or concrete masonry without additional colored pigment is deemed to comply without additional testing. The solar reflectance and thermal emittance values should be obtained in accordance with the CRRC-2 Wall Program.	3 points or N/A • Not applicable for *climate zone* 6, 7, and 8.

2.3.5 BIRD STRIKES	
2.3.5.1 An assessment of potential bird strike conditions and mitigating measures is conducted. It shall include, but not be limited to the portions of buildings most likely to sustain bird strikes. This area begins at grade and extends upwards for 60 feet. This zone also applies to glass façades directly adjacent to large, landscaped roofs (two acres or larger) and extending upward 60 feet from the level of the subject roof. Mitigation measures to be assessed include: Glass and Façade Treatments: • Fritted and Frosted Glass • Angled Glass • Ultra-Violet Glass • Film and Art Treatment of Glass • External Screens • Architectural Features • Netting Other Considerations: • Wind generators • Lighting Treatments • Location-related hazards where:	Maximum = 4 points • Two points are earned for assessing and reporting on the design analysis for bird safety. • Two points are earned for implementing feasible mitigation measures identified in the report.

buildings are located inside of, or within sensitive areas for avian wildlife (e.g. a clear flight path of less than 300 feet from an Urban Wildlife Refuge, as designated by local government).	

2.4 *STORMWATER* MANAGEMENT (21 POINTS)

2.4.1 *STORMWATER* MANAGEMENT	
2.4.1.1 A *qualified professional* makes a *stormwater* management report that shows the following: • **2.4.1.1.1**: The project meets a minimum of 80% Total Suspended Solids (TSS) removal or complies with municipal AND/OR local watershed water quality control targets, whichever is more stringent; and • **2.4.1.1.2:** 50% annual average total phosphorus (TP) removal assuming typical pollutant concentrations in urban runoff. • **2.4.1.1.3:** Additional target pollutant removals are as follows: ○ Nitrate + nitrite reduction of 40% AND/OR ○ pH below 6.5 AND/OR ○ Alkalinity below 10 mg CaCO3/L. Note: Infiltration is not to be used as a treatment method if the site is located within 0.25 mi (0.4 km) of a lake or *wetland*. OR • **2.4.1.1.4**: The site retains at least the 95th percentile storm volume as per a site water balance assessment, to be included in the *stormwater* management report.	Maximum = 17 points or N/A • Three points are earned for compliance with 2.4.1.1.1. • One point is earned for compliance with 2.4.1.1.2. • One point is earned for compliance with each item in 2.4.1.1.3. for a maximum of three points. OR • Seventeen points are earned for compliance with 2.4.1.1.4. • Not applicable for interior-only projects.
2.4.1.2 Hardscapes and structures, excluding pervious walkways 48 in. (121.9 cm) or less in width, are located 100 ft. (30.5 m) or more from a natural body of water or natural waterway on or adjacent to the site. Document such distance on the site plan. Water bodies and waterways include: • Oceans; • Lakes; • Rivers; • Streams; • Estuaries; • Bays; • *Wetlands*;	4 points or N/A • Not applicable where the body of water is a retention pond or constructed *wetland*, or is a constructed feature that receives all *stormwater* runoff.

• Springs, or seeps; • Ravines; • Arroyos; AND/OR • Canyons. Note: Waterways may be intermittently dry provided they define channeled flow of water when wet.	

2.5 LANDSCAPING (16 POINTS)

2.5.1 LANDSCAPING	

2.5.1.1 A landscape design is planned and installed as follows:
 	
• **2.5.1.1.1:** The plan is developed by a landscape architect, certified professional landscape designer, certified horticulturalist, or other *qualified professional*; AND
  ○ The plan shows the natural light conditions of the site; AND
  ○ The plan shows structural limitations (e.g., shading, utilities, *overhangs*, lights) that would impact the location and growth of plants.
• **2.5.1.1.2:** The plan identifies existing soil types, and the installed landscape incorporates appropriate soil preparation and drainage to support root development for vegetation planned for the site.
 	
Where an irrigation system is installed, refer to Water Efficiency, Section 4.9, Irrigation.
	Maximum = 5 points or N/A
	
	• Three points are earned where the landscape plan is developed and shows natural light conditions and structural limitations.
	• Two points are earned where the plan identifies existing soil types, and the installed landscape incorporates soil preparation and drainage as stated.
	• Not applicable where there is no room for landscaping.

2.5.1.2 The vegetation palette includes the following: • The vegetated area uses non-invasive, *drought tolerant plants.* Required documentation: Website or literature that indicates that the given plant(s) are drought-tolerant or require little to no supplemental water for the specific region. Only applicable when the determination of plant invasiveness is guided by a list or lists that: • cover the appropriate geographical region; AND • are not limited to noxious weeds.	Maximum = 2 points or N/A • Two points are earned if >75% of the plants are *drought tolerant* and non-invasive. • One point is earned if between ≥50% to ≤75% of the plants are *drought tolerant* and non-invasive. • No points are earned if <50% of the plants are *drought tolerant* and non-invasive. • Not applicable where there is no room for landscaping.

2.5.1.3 The vegetated area is covered with plants (new, retained, or salvaged plantings) that are native.	Maximum = 3 points or N/A • Three points are earned if >75% of plants are native. • Two points are earned if between >50 to ≤75% of plants are native. • One point is earned if between >32 to ≤50% of the plants are native. • No points are earned if ≤32% of the plants are native. • Not applicable where there is no room for landscaping.
2.5.1.4 The landscape design shows that plants with similar water requirements are grouped together on the site.	1 point or N/A • One point is earned if plants are grouped according to water requirements. • Not applicable where all of the landscaping is a preserved natural area or where there is no room for landscaping.
2.5.1.5 The building project supports onsite agriculture accessible to building users or employees in any of the following ways: • **2.5.1.5.1:** Rooftop garden(s), edible landscape(s), food forest, or community garden is installed onsite; • **2.5.1.5.2**: 25% of vegetated area is dedicated to pollinator-friendly plantings or an apiary; • **2.5.1.5.3:** Chicken coop, aquaponics farm, AND/OR greenhouse is installed onsite.	Maximum = 5 points or N/A • Two points are earned where there is an onsite rooftop garden, edible landscape, food forest, or community garden. • Two points are earned where there is an apiary or pollinator garden onsite. • One point is earned where there is an onsite chicken coop, aquaponics farm, AND/OR greenhouse. • Not applicable for interior-only projects.

2.6 *LIGHT POLLUTION* (5 POINTS)

2.6.1 Exterior *Light Pollution*

Two paths are provided for assessing exterior *light pollution*:

- **2.6.1A Path A: Lighting Design Performance Method:** 5 points

OR

- **2.6.1B Path B: Prescriptive Method Lighting Requirements:** 5 points

Points cannot be combined between paths. Select one of the paths below.

2.6.1A PATH A: LIGHTING DESIGN PERFORMANCE METHOD	
2.6.1A.1 An engineer or lighting professional creates a lighting design that meets all the performance requirements of the *IDA - IES Model Lighting Ordinance (MLO), Table D (Initial Lumens),* AND *Table E (Additional Lumen Allowances)* AND *Table F (Maximum Vertical Illuminance on the Property Line), 2011.*	5 points or N/A • Not applicable where there is no site lighting.

OR

2.6.1B PATH B: PRESCRIPTIVE METHOD LIGHTING REQUIREMENTS	
2.6.1B.1 Exterior lighting does not exceed prescribed values for the amount of light per unit of area per IDA – IES Model Lighting Ordinance (MLO), Table A *(Parking Space Method)* or Table B *(Hardscape Area Method)* AND *Table F (Maximum Vertical Illuminance on the Property Line)*, 2011.	1 point or N/A • Not applicable where there is no exterior lighting.
2.6.1B.2 Exterior lighting trespass does not exceed prescribed Backlight, Uplight and Glare (BUG) ratings as per *IDA – IES Model Lighting Ordinance (MLO), Table C (C-1, C-2,* and *C-3), 2011* for the following: • Backlight; • Uplight; and • Glare.	3 points or N/A • Not applicable where there is no exterior lighting.
2.6.1B.3 Parking lot lighting does not emit light above 90 degrees from the vertical axis.	1 point or N/A • Not applicable where there is no parking lot lighting.

2.7 SAFETY (5 POINTS)

2.7.1 EXTERIOR LIGHTING SAFETY	
2.7.1.1 *Orientation* and Wayfinding, all exterior vertical and horizontal illuminances fall within the specified range per Table A-1 in Annex A of ANSI/IES RP-43-21, *Recommended Practice: Lighting Exterior Applications*, 2021.	2 points or N/A • Not applicable where there is no site lighting.
2.7.1.2 Glare Reduction, exterior *luminaire*s provide 55° cutoff above the horizontal plane. Exception for *luminaires* installed for the purpose of illuminating art, buildings, or trees.	1 point or N/A • Not applicable when *luminaires* are installed for the purpose of illuminating art, buildings, or trees or where there is no site lighting.

2.7.1.3 Color Rendering, exterior *luminaires* provide 80 or greater Color Rendering Index OR IES TM-30 Rf (Fidelity) of 80 and Rg (Gamut) of 85. Exception for *luminaires* installed for the purpose of illuminating art, buildings, or trees.	1 point or N/A • Not applicable when *luminaires* are installed for the purpose of illuminating art, buildings, or trees or where there is no site lighting.
2.7.1.4 For the safety and reassurance of pedestrians, uniformity is critical to ensure appropriate lighting of all contents within the same field of view. Exterior uniformity shall be 4:1 (Max:Avg) or greater for LZ0 or 20:5:1 (Max:Avg:Min) or greater for LZ1, LZ2, LZ3, and LZ4.	1 point or N/A • Not applicable where there is no site lighting.

2.8 WILDLAND-URBAN INTERFACE SITE DESIGN (3 POINTS)

2.8.1 WILDLAND-URBAN INTERFACE SITE DESIGN	
2.8.1.1 Where a Wildland Urban Interface Code has been adopted OR there is a determination by a fire protection engineer or certified fire marshal that the site wildland-urban interface hazard is moderate, high or extreme; AND The project achieves points for 2.2.1.1 or 2.2.1.6 or is within 0.25 mi (0.4 km) walking distance of developed residential land of at least 8 dwelling units per acre; AND The site is designed to comply with the most recent International Wildland-Urban Interface Code or the version adopted by the local governing authority; AND Excluding athletic fields and agriculture, greater than 50% of the vegetation on site achieves points for Section 2.5.1.2 for *drought tolerant plants,* and greater than 50% of the vegetation on site achieves points for Section 2.5.1.3 for native plants. AND A fire protection engineer or certified fire marshal has inspected the completed site within 90 days prior to project certification or	3 points or N/A • Not applicable where the building site is not located in a wildland-urban interface area.

re-certification and found it compliant with the most recent International Wildland-Urban Interface Code or the version adopted by the local governing authority.	

3. ENERGY (255 points)

3.1 ENERGY PERFORMANCE (180 POINTS)

3.1.1 Assessing Energy Performance

Six paths are provided for assessing energy performance. All paths provide a maximum of 180 points out of 180, except for Path F, which provides a maximum of 111 points out of 180. Select one of the paths below. Points cannot be combined between paths.

- **3.1.1A Path A**: **Performance - ANSI/ASHRAE/IES Standard 90.1, Appendix G:** Up to 180 points

OR

- **3.1.1B Path B: Performance – International Energy Conservation Code (IECC):** Up to 180 points

OR

- **3.1.1C Path C: Performance – ENERGY STAR® Benchmarking in Target Finder:** Up to 180 points

OR

- **3.1.1D Path D: Performance** – **ASHRAE Building EQ:** Up to 180 points

OR

- **3.1.1E Path E: Performance- Net Zero Carbon or Energy Certification:** 180 points

OR

- **3.1.1F Path F: Prescriptive:** Up to111 points

3.1.1A PATH A: ANSI/ASHRAE/IES STANDARD 90.1, APPENDIX G (180 POINTS)	
3.1.1A.1 The proposed building complies with all minimum energy performance requirements of the authority having jurisdiction. AND The proposed building demonstrates compliance with and/or improvement over the ANSI/ASHRAE/IES Standard 90.1-2016Appendix G baseline through the use of whole-building energy modeling in accordance with Appendix G. To use other versions of ANSI/ASHRAE/IES Standard 90.1, use the Green Globes Energy Baseline Calculator.	Maximum = 180 points • One hundred and eighty points are earned for a ≥32% improvement over the baseline. • One hundred and seventy-six points are earned for a ≥30% to <32% improvement over the baseline. • One hundred and sixty-eight points are earned for a ≥28% to <30% improvement over the baseline. • One hundred and sixty points are earned for a ≥26% to <28% improvement over the baseline. • One hundred and fifty-two points are earned for a ≥24% to <26% improvement over the baseline.

	• One hundred and forty-four points are earned for a ≥22% to <24% improvement over the baseline. • One hundred and thirty-six points are earned for a ≥20% to <22% improvement over the baseline. • One hundred and twenty-eight points are earned for a ≥18% to <20% improvement over the baseline. • One hundred and twenty points are earned for a ≥16% to <18% improvement over the baseline. • One hundred and twelve points are earned for a ≥14% to <16% improvement over the baseline. • One hundred and four points are earned for a ≥12% to <14% improvement over the baseline. • Ninety-six points are earned for a ≥10% to <12% improvement over the baseline. • Eighty-eight points are earned for a ≥8% to <10% improvement over the baseline. • Eighty points are earned for a ≥6% to <8% improvement over the baseline. • Seventy-two points are earned for a ≥4% to <6% improvement over the baseline. • Sixty-four points are earned for a ≥2% to <4% improvement over the baseline. • Fifty-six points are earned for compliance with 90.1-2016 Appendix G or up to 2% improvement over the baseline.

OR

3.1.1B PATH B: PERFORMANCE – INTERNATIONAL ENERGY CONSERVATION CODE (IECC) (180 POINTS)	
3.1.1B.1 The proposed building complies with all minimum energy performance requirements of the authority having jurisdiction. AND The building demonstrates compliance with or an improvement over an estimated ANSI/ASHRAE/IES Standard 90.1-2016, Appendix G (as per 3.1.1A Path A) through the use of a whole-building energy modeling and as translated from the IECC Baseline using the Green Globes Energy Baseline Calculator.	Maximum = 180 points • One hundred and eighty points are earned for a ≥32% improvement over the baseline. • One hundred and seventy-six points are earned for a ≥30% to <32% improvement over the baseline. • One hundred and sixty-eight points are earned for a ≥28% to <30% improvement over the baseline. • One hundred and sixty points are earned for a ≥26% to <28% improvement over the baseline. • One hundred and fifty-two points are earned for a ≥24% to <26% improvement over the baseline. • One hundred and forty-four points are earned for a ≥22% to <24% improvement over the baseline. • One hundred and thirty-six points are earned for a ≥20% to <22% improvement over the baseline. • One hundred and twenty-eight points are earned for a ≥18% to <20% improvement over the baseline. • One hundred and twenty points are earned for a ≥16% to <18% improvement over the baseline. • One hundred and twelve points are earned for a ≥14% to <16% improvement over the baseline. • One hundred and four points are earned for a ≥12% to <14% improvement over the baseline.

	• Ninety-six points are earned for a ≥10% to <12% improvement over the baseline. • Eighty-eight points are earned for a ≥8% to <10% improvement over the baseline. • Eighty points are earned for a ≥6% to <8% improvement over the baseline. • Seventy-two points are earned for a ≥4% to <6% improvement over the baseline. • Sixty-four points are earned for a ≥2% to <4% improvement over the baseline. • Fifty-six points are earned for compliance with ASHRAE 90.1 2016 or up to a ≥0% to <2% improvement over the baseline.

OR

3.1.1C PATH C: PERFORMANCE – ENERGY STAR® BENCHMARKING IN TARGET FINDER (180 points)	
3.1.1C.1 The ENERGY STAR® score of the proposed design is 80 or greater for a mixed use multi-family and multi-family building benchmarked in Target Finder determined by whole building energy modeling in accordance with the modeling guidelines prescribed in ANSI/ASHRAE/IES Standard 90.1-2016Appendix G.	Maximum = 180 points • One hundred eighty points are earned for an ENERGY STAR® score of 98 to 100 for a mixed use multi-family and multi-family building. • One hundred seventy-five points are earned for an ENERGY STAR® score of 96 to 97 for a mixed use multi-family and multi-family building. • One hundred sixty-eight points are earned for an ENERGY STAR® score of 94 to 95 for a mixed use multi-family and multi-family building. • One hundred sixty-one points are earned for an ENERGY STAR® score of 92 to 93 for a mixed use multi-family and multi-family building. • One hundred fifty-four points are earned for an ENERGY STAR® score

	of 90 to 91 for a mixed use multi-family and multi-family building. • One hundred forty-seven points are earned for an ENERGY STAR® score of 88 to 89 for a mixed use multi-family and multi-family building. • One hundred forty points are earned for an ENERGY STAR® score of 86 to 87 for a mixed use multi-family and multi-family building. • One hundred thirty-three points are earned for an ENERGY STAR® score of 84 to 85 for a mixed use multi-family and multi-family building. • One hundred twenty-six points are earned for an ENERGY STAR® score of 82 to 83 for a mixed use multi-family and multi-family building. • One hundred nineteen points are earned for an ENERGY STAR® score of 80 to 81 for a mixed use multi-family and multi-family building. • No points are earned for an ENERGY STAR® score <80 for a mixed use multi-family and multi-family building.

OR

3.1.1D PATH D: ASHRAE BUILDING EQ (180 points)	
3.1.1D.1 The ASHRAE Building EQ as designed rating is 85 or less.	Maximum = 180 points • One hundred eighty points are earned when the building's ASHRAE Building EQ as designed rating is ≤50. • One hundred seventy-five points are earned when the building's ASHRAE Building EQ as designed rating is 51 to 55. • One hundred seventy points are earned when the building's ASHRAE Building EQ as designed rating is 56 to 60. • One hundred fifty points are earned when the building's ASHRAE

	Building EQ as designed rating is 61 to 65. • One hundred thirty points are earned when the building's ASHRAE Building EQ as designed rating is 66 to 68. • One hundred ten points are earned when the building's ASHRAE Building EQ as designed rating is 69 to 71. • Ninety points are earned when the building's ASHRAE Building EQ as designed rating is 72 to 74. • Seventy points are earned when the building's ASHRAE Building EQ as designed rating is 75 to 77. • Fifty points are earned when the building's ASHRAE Building EQ as designed rating is 78 to 80. • Thirty points are earned when the building's ASHRAE Building EQ as designed rating is 81 to 83. • Ten points are earned when the building's ASHRAE Building EQ as designed rating is 84 to 85. • No points are earned when the building's ASHRAE Building EQ as designed rating is ≥86.

OR

3.1.1E PATH E: NET ZERO CARBON OR ENERGY CERTIFICATION (180 points)	
3.1.1E.1 The project has achieved GBI's Green Globes Journey to Net Zero certification/recognition, or equivalent from a nationally or regionally recognized certification program within the last three years.	Maximum = 180 points • One hundred eighty points is earned for a certification of 100% reduction. • One hundred forty points are earned for a recognition of ≥90% to <100% reduction. • One hundred five points are earned for a recognition of ≥70% to <90% reduction.

	• Eighty points are earned for a recognition of ≥50% to <70% reduction. • No points are earned for a recognition of <50% reduction.

OR

3.1.1F PATH F: PRESCRIPTIVE (111 POINTS)

Compliance with the prescriptive requirements of this section earns points based on the minimum prescriptive requirements of referenced codes and standards and building characteristics or best practices that are related to energy efficiency.

3.1.1F.1 *BUILDING ENVELOPE* AND FORM (20 POINTS)

3.1.1F.1.1 THERMAL RESISTANCE AND TRANSMITTANCE	

3.1.1F.1.1.1 All of the opaque and *fenestration* elements of the *building envelope* have a window-to-wall ratio less than or equal to 40% and comply with at least one of the following:
 	
• The *thermal transmittance* (*U-factor*), *thermal conductance* (*C-factor*), *F-factor*, and SHGC are less than those in the 2015 IECC, Section C402, or ANSI/ASHRAE/IES Standard 90.1-2013, Section 5, by 10%, except for these items where the factors must meet the 2015 IECC or ANSI/ASHRAE/IES Standard 90.1-2013:
  ○ Opaque elements in *Climate Zones* 1 through 3
  ○ SHGC for north and south-oriented *fenestration*
  ○ In cases where the *R-value* or SHGC are NR (no requirement).
• Demonstrate that the *U-factor*, *C-factor*, *F-factor*, and SHGC are less than those in the 2015 IECC, Section C402, or ANSI/ASHRAE/IES Standard 90.1-2013, Section 5, by 5%, except for these items where the factors must meet the 2015 IECC or ANSI/ASHRAE/IES Standard 90.1-2013:
  ○ Opaque elements in *Climate Zones* 1-3
  ○ SHGC for north and south-oriented *fenestration*
  ○ In cases where the *R-value* or SHGC are NR (no requirement).
• The thermal resistance (*R-value*/RSI-value) ***or*** the *thermal transmittance* (*U-factor*), *thermal conductance* (*C-factor*), and
	Maximum = 10 points
	
	• Ten points are earned where there is a 10% decrease in *U-factor*, *C-factor*, *F-factor* and SHGC from prescriptive requirements of the 2015 IECC, section C402, or ANSI/ASHRAE/IES Standard 90.1-2013, section 5.
	• Eight points are earned where there is a 5% decrease in *U-factor*, *C-factor*, *F-factor*, and SHGC from prescriptive requirements of the 2015 IECC, section C402, or ANSI/ASHRAE/IES Standard 90.1-2013, section 5.
	• Five points are earned where *R-value*/RSI-value or *U-factor*, *C-factor*, and *F-factor*; and *fenestration*, *U-factor,* and SHGC meet or exceed prescriptive requirements of the 2015 IECC, section C402, or ANSI/ASHRAE/IES Standard 90.1-2013, section 5.5.

F-factor; and for *fenestration*, the *U-factor* and SHGC meet or exceed the prescriptive requirements of the 2015 IECC, section C402, or ANSI/ASHRAE/IES Standard 90.1-2013, section 5.5. Note: A project must choose either the IECC or ANSI/ASHRAE/IES Standard 90.1 for all factors.	

3.1.1F.1.2 *ORIENTATION*	
3.1.1F.1.2.1 The building is oriented such that both the ratio of the west *fenestration* to the total *fenestration* and the ratio of the east *fenestration* to the total *fenestration* is between ¼ and 1/6.	Maximum = 10 points • Ten points are earned where the ratio is ≤1/6. • Six points are earned where the ratio ≤1/5 to >1/6. • Two points are earned where the ratio is ≤ ¼ to >1/5.

3.1.1F.2 LIGHTING (41 POINTS)

3.1. 1F.2.1 INTERIOR LIGHTING POWER	
3.1.1F.2.1.1 The total interior lighting power density (LPD) of the building is less than the referenced standard. Base calculations for LPD on either the whole-building method or space-by-space method. • ANSI/ASHRAE/IES Standard 90.1-2013 or 2015 IECC baseline The control factors from Table 9.6.3 in 90.1-2013 are used to achieve or exceed LPD targets. Account for high-end trim or Institutional tuning in all spaces where it is present by using a control factor of 0.15 for the purposes of scoring this item.	Maximum = 20 points • Five points are earned where LPD complies with ANSI/ASHRAE/IES Standard 90.1-2013 or 2015 IECC. • One additional point is earned for each 2% beyond the requirements of ANSI/ASHRAE/IES Standard 90.1-2013 or 2015 IECC up to an additional 15 points out of a maximum of 20 points for 3.1.1F.2.1.1.

3.1.1F.2.2 INTERIOR AUTOMATIC LIGHT SHUTOFF CONTROLS	
3.1.1F.2.2.1 All spaces have automatic controls that turn off non-twenty-four-hour lighting based on occupancy or time schedule. One or more of the following provides automatic control: • Occupancy or vacancy sensors; • Building control system based on timer or schedule, for example:	2 points or N/A • Not applicable where lighting control could endanger occupant safety in a space, patient care space, AND/OR dwelling units and

○ Time switch; ○ Automatic relays controlled by BAS; ○ Embedded controls; or • Other control signal. Lighting control zones consist of up to 25,000 ft^2 (2,322.6 m^2) on a single floor.	guest rooms, or where local code prohibits such systems.

3.1.1F.2.3 LIGHTING LEVEL CONTROL	
8.1.1F.2.3.1 In all *regularly occupied spaces* 90% or more of light fixtures have lighting controls that can reduce the lighting load by at least 50% from full lighting power using any of the following technologies: • Dimming: Continuous dimming of the lamps or *luminaires* from 100% to at least 10% of full light output; • Multi-level Lighting: Lighting with at least 5 control steps including ON and OFF; or • Bi-level lighting: Dual switching of alternate rows or *luminaires*; Switching of individual lamps independently of adjacent lamps within a *luminaire*.	Maximum = 3 points • Three points are earned where ≥90% of light fixtures have continuously dimmable light reduction controls. • Two points are earned where ≥90% of the of light fixtures have light reduction controls based multi-level lighting; • One point is earned where there is bi-level control.
3.1.1F.2.3.2 Occupants in private offices less than 250 ft^2 (23.23 m^2) and in open office work station areas can adjust their direct overhead lighting levels via continuous dimming or multi-level lighting. Providing bi-level overhead lighting in conjunction with separate *task lighting* is permitted for compliance.	Maximum = 3 points • Three points are earned where ≥90% of light fixtures have continuously dimmable personal lighting control. • Two points are earned where ≥90% of the light fixtures have multi-level light lighting. • One point is earned where there is bi-level control of overhead lighting and separate task lights.

3.1.1F.2.4 *DAYLIGHTING*	
3.1.1F.2.4.1 For buildings two stories or less above grade, a minimum of 50% of the total combined floor area is in a *daylight area*. For buildings three or more stories above grade, a minimum of 25% of the total combined floor area is in a *daylight area*. Control Lighting in the primary and secondary *daylight areas* with *daylight responsive dimming plus OFF.*	3 points or N/A • Three points are earned for compliance, excluding spaces that are not *regularly occupied*, such as,

	but not limited to, mechanical spaces and storage areas. • Not applicable where spaces would be functionally compromised by *daylighting*.
3.1.1F.2.4.2 A minimum of 2% of the roof area consists of skylights that comply with the requirements of Sections 5 and 9 of ASHRAE Standard 90.1-2013. Base this percentage upon the horizontal projected area of the skylight and roof, without *overhangs* Earning this credit is contingent on compliance with the daylight control credit **3.1.1F.2.5.1**.	Maximum = 3 points or N/A • Three points are earned where ≥5% of the roof consists of skylights. • Two points are earned where >3% to <5% of the roof consists of skylights. • One point is earned where ≥2% to ≤3% of the roof consists of skylights. • No points are earned where <2% of the roof consists of skylights. • Not applicable where the building is located in *Climate Zones* 7 or 8.

3.1.1F.2.5 CONTROL FOR DAYLIT ZONES	
3.1.1F.2.5.1 Control lighting in *primary and secondary daylight zones* [use 90.1-2013 definitions for daylight zones] with automatic daylight responsive lighting controls that lower the power consumption of the lighting system when daylight is available.	Maximum = 3 points • Three points are earned where there is automatic continuous daylight dimming to OFF control of all the general lighting in both primary and secondary zones. • Two points are earned where there is automatic *daylighting* switching to OFF control of the general lighting in primary zone and secondary daylight zones. • Two points are earned where there is no *daylighting* if it would be detrimental to the intended use of more than 90% of the building area.

3.1.1F.2.6 EXTERIOR *LUMINAIRES* AND CONTROLS	
3.1.1F.2.6.1 Exterior LPDs comply with or improve upon ANSI/ASHRAE/IES Standard 90.1-2013 Section 9.4.2 for exterior lighting power density. Additional control requirements to earn LPD credit include: • Deactivating lighting when sufficient daylight is available; and • Shutting off façade and landscape lighting between midnight and business opening, or other similar hours approved by the AHJ.	Maximum = 2 points or N/A • Two points are earned where LPDs are 20% below ANSI/ASHRAE/IES Standard 90.1-2013. • One point is earned where ANSI/ASHRAE/IES Standard 90.1-2013 is met. • Not applicable where there are no exterior luminaries.
3.1.1F.2.6.2 Garage and Parking Lot Lighting Control: Pole lighting in parking lots and garage *luminaires* are controlled such that at least 50% of the lighting power is automatically reduced during periods of no activity detected in the lighting zone.	Maximum = 2 points or N/A • Two points are earned where all garage and parking lot general lights are controlled to more than one lighting level. • One point is earned where 50% of the garage and parking lot general lighting is controlled to more than one lighting level. • Not applicable where there are no garage or parking lot general lighting fixtures.

3.1.1F.3 HVAC SYSTEMS AND CONTROLS (37 POINTS)

3.1.1F.3.1 BUILDING AUTOMATION SYSTEM (BAS)	

3.1.1F.3.1.1 A central Building Automation System (BAS) encompasses all systems that affect building energy performance, lighting, and thermal comfort including all of the functionality listed below:
 	
• A series of direct digital controllers (DDC) interconnected by a local area network and accessible by a web browser;
• Open communication protocols (e.g., BACnet) to allow interoperability between building systems and control vendors;
• Energy management and monitoring software that provides:
  ○ Start/stop control for HVAC equipment;
  ○ control of economizer cycles and heat recovery equipment; and
	1 point or N/A
	
	• Not applicable where buildings are under 20,000 ft^2 (1,858.06 m^2).

○ control of minimum outdoor ventilation air; • Log of trending, scheduling, set-point adjustments, event information, alarm information, confirmation of operators, and execution of global commands; and • Monitoring of fire safety systems, security systems, and elevator control systems to prompt emergency operating modes of HVAC and lighting systems.	
3.1.1F.3.1.2 The BAS has the capability to accept and collate data generated by any and all *metering* equipment as required by Section 3.3 *Metering*, Monitoring, and Measurement of the Energy assessment area of this Standard.	1 point or N/A • Not applicable where buildings are under 20,000 ft^2 (1,858.06 m^2).

3.1.1F.3.2 COOLING EQUIPMENT

3.1.1F.3.2.1 The cooling equipment base efficiency meets ANSI/ASHRAE/IES Standard 90.1-2013 efficiency requirements with respect to COP, EER, IEER, and SEER or the building does not use mechanical cooling.

90.1-2013 Table	Equipment
Table 6.8.1-1	Unitary A/C and condensing units
Table 6.8.1-2	Unitary and applied heat pumps
Table 6.8.1-3	Water-chilling packages
Table 6.8.1-4	PTAC, PTHP, single-package vertical A/C and heat pumps, room air-conditioners, and room A/C heat pumps
Table 6.8.1-9	Variable refrigerant flow A/C (multisplit) systems
Table 6.8.1-10	Variable refrigerant flow air-to-air and applied heat pumps
Table 6.8.1-11	Computer room A/C and condensing units

A weighted average improvement over efficiency is provided by the design engineer based on the capacity for projects with multiple applicable types of equipment. Air-conditioning units constituting less than 1% of the total capacity may be omitted from the calculation.

Cooling systems that use hydronic heat rejection also include measures to minimize fan power in order to earn efficiency credits under this section. Any of the following measures are used in cooling towers to reduce fan energy consumption:

- Two-speed fans;
- Variable speed fans; AND/OR

Maximum = 5 points or N/A

- Five points are earned where performance is 10% higher than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013.
- Three points are earned where performance is 5% higher than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013.
- One point is earned where performance is equivalent to the requirements of ANSI/ASHRAE/IES Standard 90.1-2013.
- Not Applicable where the building does not use mechanical cooling.

• Measures that allow operation at reduced fan power during part-load operation. Heat rejection equipment complies with minimum efficiency levels in ANSI/ASHRAE/IES Standard 90.1-2013, Table 6.8.1-7.	

3.1.1F.3.3 HEATING EQUIPMENT

3.1.1F.3.3.1 The heating equipment base efficiency meets ANSI/ASHRAE/IES Standard 90.1-2013 efficiency requirements with respect to AFUE, E_c, E_t, HSPF, or COP_H as appropriate to the specific equipment, or the building does not have a heating system. The design engineer provides a weighted average improvement over efficiency based on the capacity for projects with multiple applicable types of equipment. Heating units constituting less than 1% of the total capacity may be omitted from the calculation. Steam systems return condensate to the boiler feedwater system or recover heat from the condensate before sending it to the drain in order to claim equipment efficiency points.	Maximum = 5 points or N/A • Five points are earned where performance is 10% higher than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013. • Three points are earned where performance is 5% higher than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013. • One point is earned where performance is equivalent to the requirements of ANSI/ASHRAE/IES Standard 90.1-2013. • No points are earned where there is electric resistance heat. • Not Applicable where the building does not use heating systems.

90.1-2013 Table	Equipment
Table 6.8.1-2	Unitary and applied heat pumps (heating mode)
Table 6.8.1-4	PTHP, single-package vertical heat pumps, and room A/C heat pumps (heating mode)
Table 6.8.1-5	Warm-air furnaces and unit heaters
Table 6.8.1-6	Gas and oil-fired boilers
Table 6.8.1-10	Variable refrigerant flow air-to-air and applied heat pumps

3.1.1F.3.4 DOMESTIC HOT WATER HEATERS

3.1.1F.3.4.1 All domestic hot water heaters meet the efficiency requirements of ANSI/ASHRAE/IES STANDARD 90.1-2013, Table 7.8, or domestic hot water heaters are not provided.	1 point • One point is earned where performance is 10% better than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013.

	• No points are earned where there is electric resistance heat unless the source of electricity was documented as 100% onsite renewable electricity [1 point].

3.1.1F.3.5 ENERGY RECOVERY	
3.1.1F.3.5.1 The HVAC design complies with Section 6.5.6 of the ANSI/ASHRAE/IES Standard 90.1-2013.	6 points or N/A • Not applicable where projects meet the exemptions of Section 6.5.6.

3.1.1F.3.6 SIMULTANEOUS HEATING AND COOLING	
3.1.1F.3.6.1 The HVAC design minimizes or eliminates simultaneous heating and cooling through one of the following strategies: • HVAC design incorporates a configuration/strategy that eliminates reheat and re-cool by using thermal and ventilation compartmentalization, with heating, cooling, and ventilation provided independently for each zone, e.g., fan coil systems, distributed heat pumps, single-zone systems. OR • HVAC design complies with Section 6.5.2 of the ANSI/ASHRAE/IES Standard 90.1-2013.	Maximum = 6 points or N/A • Six points are earned where HVAC design uses ventilation compartmentalization. • Four points are earned where HVAC design complies with Section 6.5.2. • Not applicable for projects that meet the exemptions of Section 6.5.2.

3.1.1F.3.7 ECONOMIZERS	
8.1.1F.3.7.1 The project complies with Section 6.5.1 of the ANSI/ASHRAE/IES Standard 90.1-*2013*.	3 points or N/A • Not applicable where projects meet the exemptions of Section 6.5.1.

3.1.1F.3.8 AIR-HANDLING EQUIPMENT AND VENTILATION CONTROL	
3.1.1F.3.8.1 The project uses equal or less fan power than the requirements of ANSI/ASHRAE/IES Standard 90.1-2013 Table 6.5.3.1-1 including all exceptions and modifiers.	Maximum = 6 points or N/A • Three points are earned where the project complies with ANSI/ASHRAE/IES 90.1-2013 Table 6.5.3.1-1.

	• One additional point is earned for each 10% less than the allowance according to Table 6.5.3.1-1, up to a maximum of 6 points. • Not applicable where there are no fan systems.
3.1.1F.3.8.2 Occupancy AND/OR CO_2 sensors are installed to control ventilation rates in *regularly occupied spaces* that may experience frequent variation in the number of occupants. CO2 sensors maintain calibration within 2% for one year after initial installation.	3 points or N/A • Not applicable where spaces meeting this criterion represent <40% of the total design ventilation volume of the building.

3.1.1F.4 ENERGY SIMULATION AIDED DESIGN & INTEGRATIVE PROCESS (13 POINTS)

3.1.1F.4.1 ENERGY SIMULATION AIDED DESIGN	
3.1.1F.4.1.1 Before finalizing the building footprint, perform an energy simulation on a simplified geometric representation of the building to determine strategies to save lighting and HVAC energy. This simulation includes massing, *orientation*, window-to-wall ratio, and *building envelope* strategies.	8 points

3.1.1F.4.2 INTEGRATIVE PROCESS	
8.1.1F.4.2.1 Before issuing *construction documents*, a simulation is used to inform design decisions regarding incremental equipment efficiency of building systems for the envelope, lighting, and HVAC.	5 points

Complete 3.2, 3.3, and 3.4 regardless of Path chosen above.

3.2 NON-MODELED ENERGY EFFICIENCY IMPACTS (15 POINTS)

3.2.1 VERTICAL, HORIZONTAL, AND INCLINED TRANSPORT SYSTEMS – EFFICIENCY MEASURES	
	•
3.2.1.1 Enhance the energy efficiency of elevator systems through the use of: • Regenerative braking AND/OR machine-roomless (MRL) elevators; • TWIN elevators (stacked cabins on one operating elevator in one shaft);	Maximum = 2 points • One point is earned for each of the prescribed strategies for a maximum of 2 points.

• Elevators with a destination dispatch system (grouping people traveling to the same floor); AND/OR • Elevators with a zero-power sleep mode.	• Two points are earned where there are no escalators or elevators.
3.2.1.2 One or more of the following energy efficient equipment systems related to the movement of people is in use: • Reclaim of Machine Room *Waste Heat*; • Linear Induction Motor (LIM); • AC Synchronous Guide Rail hoisting motors with integral braking and controls; AND/OR • innovative energy efficient people-transport equipment or system (Requires statement of system description and benefits document for submittal).	1 point or N/A • One point is earned where any of the listed items are used. • One point is earned where innovative energy efficient people-transport equipment or system is used. • Not applicable where the building does not contain any systems capable of using this equipment.

3.2.2 LOAD SHEDDING	
3.2.2.1 Install lighting systems that are capable of load shedding. Loading shedding may be initiated automatically or manually.	Maximum = 4 points • Four points are earned where lighting system can reduce power by ≥20% from peak levels. • Three points are earned where lighting system can reduce power by ≥10% to <20% from peak levels. • Two points are earned where lighting system can reduce power by ≥5% to <10% from peak levels.
3.2.2.2 HVAC equipment controls that are capable of load shedding are installed. Loading shedding may be initiated automatically or manually. Load shedding program initiates setback of space temperatures, heating and cooling system hydronic temperatures, air system static pressure setpoints, or cycling of heating and cooling equipment.	3 points

3.2.3 PLUG LOAD AND PROCESS ENERGY MANAGEMENT	
8.2.3.1 The project documents include an inventory of appliances and equipment organized by location. The inventory includes: • nameplate power use; • typical power use; and • an expected schedule of use.	Maximum = 2 points • Two points are earned where there is a complete inventory of expected plug load equipment appliances, and hard-wired process equipment.

	• One point is earned where there is a complete inventory of hard-wired process equipment only. • One point is earned where there is a complete inventory of plug load equipment and appliances only.
3.2.3.2 Establish a policy that requires all new equipment purchases be based on energy efficient criteria, such as ENERGY STAR or other equivalent energy efficiency standards.	1 point or N/A • Not applicable if no equipment is subject to ENERGY STAR label criteria.
3.2.3.3 The project is furnished with receptacles that automatically control the availability of power based on occupancy sensors AND/OR timed schedules in accordance with ANSI/ASHRAE/IES Standard 90.1- 2013, Section 8.4.2.	Maximum =2 points • Two points are earned where energy-saving power strips are installed on ≥75% to ≤100% of private offices, open offices and computer classrooms, including receptacles installed in modular partitions. • One point is earned where energy-saving power strips are installed on ≥50% to <75% of private offices, open offices and computer classrooms, including receptacles installed in modular partitions.

3.3 *METERING*, MONITORING, AND MEASUREMENT (20 POINTS)

3.3.1 *METERING*	
3.3.1.1 Install *Metering* or ensure a mandatory design requirement exists for *metering* (at the building level) for the following: • Electricity; • Heating fuels; • Steam; and • Other (e.g., chilled or hot water for campus/district systems).	Maximum = 10 points • Two points are earned for each 20% increment of the building's site energy that is *metered* through any combination of building-level energy *meters* up to a maximum of 10 points.
3.3.1.2 Install *sub-metering* or energy monitoring equipment in the building, or require a mandatory tenant improvement that	Maximum = 6 points or N/A

calls for *sub-metering* or energy monitoring equipment to be installed for the following systems: • Lighting and lighting controls by floor or by zones with floor areas no greater than 20,000 ft^2 (1860 m^2); • Plug loads by floor or by zones no greater than 20,000ft^2 (1860 m^2); • Major electric HVAC equipment (e.g., chillers, cooling towers, AHU fans, pumps) 5 HP or greater; • Chilled water generation; • *Onsite renewable energy* power generation; • Heating water or steam generation; AND/OR • Specialty or process electrical equipment.	• One point each for *sub-metering* five or more of the listed systems in a mixed use multi-family and multi-family building at the building level to a maximum of 6 points. • Two points each are earned when heating, cooling, and electricity are *sub-metered* at the individual unit level in a mixed use multi-family and multi-family building to a maximum of 6 points. • One point is earned for each listed system where *sub-metering* is installed to a maximum of 6 points. • Not applicable for buildings <20,000 ft^2 (1860 m^2).

3.3.2 MONITORING AND REPORTING	
3.3.2.1 A Resource Management Plan addresses all energy consuming areas of a building or project and includes the following monitoring protocols (i.e., hourly, daily, monthly, seasonal, by floor, etc.): • Electricity; • Heating fuels; • Steam; and • Other (e.g. campus/district systems) Note: This may reflect new technology that uses other energy sources as long as they are measurable.	1 point
3.3.2.2 Create an action plan for evaluating the results of documentation defined by the Resource Management Plan and gathered by *metering* equipment (based upon Section 4.5 D, of the International Performance Measurement & Verification Protocol (IPMVP): Concepts and Practices for Determining Energy savings in New Construction, Volume III, Part I, January 2006). The action plan has a process for implementing changes identified as a result of the analysis of the monitoring of energy use. The action plan addresses a minimum of two of the following systems: • Lighting and lighting controls by floor or by zones; • Plug loads by floor or by zones;	2 points

• Major electric HVAC equipment (e.g., chillers, cooling towers, AHU fans, pumps) 5 HP or greater; • Chilled water generation; • *Onsite renewable energy* power generation; • Heating water or steam generation; AND/OR • Specialty or process electrical equipment.	

3.3.3 FAULT DETECTION AND DIAGNOSTIC SYSTEM	
3.3.3.1 Install a fault detection and diagnostic system (FDD) on HVAC and lighting systems, if applicable, with the ability to detect the following: • Economizer operation; • Simultaneous heating and cooling; • Photocell malfunction; and • Additional HVAC and lighting setpoints.	1 point or N/A • Not applicable for buildings less than 20,000 ft^2.

3.4 RENEWABLE SOURCES OF ENERGY (40 POINTS)

3.4.1 *ONSITE RENEWABLE ENERGY*	
3.4.1.1 Conduct a study to determine the technical feasibility and life cycle cost effectiveness of *onsite renewable energy*. The study considers an *onsite renewable energy* system that provides at least 2% of the total building annual energy usage either from a system connected to the building or generated on campus.	5 points
3.4.1.2 Use the recommendations of a Feasibility Study, or other owner's project requirements to implement *onsite renewable energy* system(s).	Maximum = 25 points or N/A • One point is earned for each percent of project energy produced by *onsite renewable energy* systems to a maximum of 25 points. • Not applicable where Feasibility Study was completed, and implementation was found to be not life cycle cost effective.

3.4.2 *OFF-SITE RENEWABLE ENERGY* CREDITS	
3.4.2.1 The building owner commits to signing a contract to purchase *Renewable Energy Certificates* (*RECs*), either certified *Green Power (US Dept. of Energy)* listed *renewable energy* credit	Maximum = 10 points

products or other certified *RECs* or *carbon offsets*, with a minimum three-year commitment. *Renewable energy* supplied as part of a utility provider portfolio may be considered towards earning this credit for systems using 10% or greater of power from appropriate sources. Buildings using the prescriptive path and that don't otherwise have an energy model may base the percentage of *renewable energy* on median EUI from CBECS for the building type.	Points are earned where *renewable energy* supplies a percentage of the building's energy*:* • Ten points are earned for 100%. • Nine points are earned for ≥90% to <100%. • Eight points are earned for ≥80% to <90%. • Seven points are earned for ≥70% to <80%. • Six points are earned for ≥60% to <70%. • Five points are earned for ≥50% to <60%. • Four points are earned for ≥40% to <50%. • Three points are earned for ≥30% to <40%. • Two points are earned for ≥20% to <30%. • One point is earned for ≥10% to <20%. • No points are earned for <10%.

4. WATER EFFICIENCY (190 points)

4.1 Water Consumption (61 POINTS)

4.1.1 Water Consumption

Two paths are provided for assessing water consumption.

- **4.1.1A Path A: Water Consumption:** Up to 61 points

OR

- **4.1.1B Path B: Prescriptive:** Up to 61 points

Points cannot be combined between paths. Select one of the paths below.

4.1.1A.1 PATH A: WATER CONSUMPTION	
4.1.1A.1.1 Using the Green Globes Water Reduction Calculator, the expected indoor water use is at least 10% less than the given baseline.	Maximum = 61 points • Sixty-one points are earned for a project ≥60% lower than the baseline. • Fifty-five points are earned for a building with consumption ≥55% to <60% lower than the baseline. • Fifty points are earned for a building with consumption ≥50% to <55% lower than the baseline. • Forty-five points are earned for a building with consumption ≥45% to <50% lower than the baseline. • Forty points are earned for a project ≥40% to <45% lower than the baseline. • Thirty-five points are earned for a building with consumption ≥35% to <40% lower than the baseline. • Thirty points are earned for a building with consumption ≥30% to <35% lower than the baseline. • Twenty-five points are earned for a building with consumption ≥25% to <30% lower than the baseline. • Twenty points are earned for a building with consumption ≥20% to <25% lower than the baseline.

	• Fifteen points are earned for a building with consumption ≥15% to <20% lower than the baseline. • Ten points are earned for a building with consumption ≥10% to <15% lower than the baseline. • No points are earned for a building with consumption <10% lower than the median.

OR

4.1.1B PATH B: PRESCRIPTIVE (61 POINTS)

4.1.1B.1PLUMBING FIXTURE AND FITTING STANDARDS	

4.1.1B.1.1 Plumbing fixtures and fittings comply with one of the following:
 	
• ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017, Section 6.3.2.1
• 2021 International Green Construction Code (IgCC), Table 601.3.2.1
• 2020 IAPMO WEStand Section 402
 	
OR
 	
Points are earned for a *major renovation* when plumbing fixtures and fittings installed in the project meet or exceed requirements for maximum water consumption as listed below and are certified as being compliant with the requirements of the U.S. EPA's WaterSense Program where WaterSense specifications exist.
 	
• Toilets (Maximum flush volume 1.28 gal. (4.8 L) per flush);
• Urinals (Maximum flush volume 0.5 gal. (1.9 L) per flush);
• Showerheads (Maximum flow rate 2.0 gal. (7.6 L) per minute);
• Residential *lavatory faucets* (Maximum flow rate 1.5 gal. (5.7 L) per minute);
• Residential kitchen faucets (Maximum flow rate 2.2 gal. (8.3 L) per minute);
• Non-residential *lavatory faucets* (Maximum flow rate 0.5 gal. (1.9 L) per minute); and
  • *Pre-rinse spray valves* (Maximum flow rate 1.28 gal. (4.8 L) per minute)
	Maximum = 52 points or N/A
	
	• For points to be earned fifty percent of fixtures must comply with one of the listed standards.
	  ○ Points earned = percentage of compliant fixtures x 52 (fractional points are rounded upward)
	OR
	• For points to be earned fifty percent of *major renovation* fixtures must comply.
	  ○ Points earned = percentage of compliant fixtures x 45 points (fractional points are rounded upward)
	• Not applicable where no fixtures or fittings exist.

4.1.1B.2 INDOOR APPLIANCES	
4.1.1B.2.1 *Residential clothes washers* are ENERGY STAR 8.0 labeled and possess a maximum *Integrated Water Factor (IWF)* of 4.3 or less.	1 point or N/A • Not applicable where there are no *clothes washers.*
4.1.2.2 Residential dishwashers are ENERGY STAR 6.0 labeled and possess a maximum water use of 3.5 gal per cycle (13.2 L per cycle) AND/OR commercial dishwashers comply with ENERGY STAR 2.0 requirements. Rackless flight-type dishwashers consume 160 gal/hr. (605.7 L/hr.) or less.	2 points or N/A • Not applicable where there are no dishwashers.
4.1.1B.2.3 Self service *clothes washers* have an *Integrated Water Factor* (*IWF*) of 4.3 or less and comply with ENERGY STAR 8.0 requirements	2 points or N/A • Not applicable where there are no *clothes washers*.
4.1.1B.2.4 Laundry equipment in industrial laundry facilities include the following features and systems: • *Clothes washers*, *tunnel clothes washers* can be programmed to use a specific amount of water depending on the soil level of the material to be washed; • Maximum water consumption of washers is 1.0 gal/lb. (8 L/kg); AND • Washers have a water recycling system.	2 points or N/A • Not applicable where there is no industrial laundry or where volumes do not exceed 350 lbs. (160 kg) per hour.
4.1.1B.2.5 In an on-premise/institutional laundry, non-residential *clothes washers* have a maximum *IWF* of 4.0.	2 points or N/A • Not applicable where there are no non-residential *clothes washers*.

4.2 COOLING TOWERS (22 POINTS)

4.2.1 COOLING TOWERS	
4.2.1.1 Cooling towers are designed to be in conformance with Section 6.3.2.3 HVAC Systems and Equipment of ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2020.	7 points or N/A • Not applicable where there are no wet-cooling towers.
4.2.1.2 Use advanced predictive or tracking tower control systems to mediate cooling tower makeup and discharge. Possible examples include integrated systems with occupancy sensors estimating demand, tracer based monitoring systems, etc.	2 point or N/A • Not applicable where there are no evaporative towers.

4.2.1.3 For the purposes of reducing evaporated water losses, at least 20% of annual cooling demands are made up by non-evaporative cooling.	Maximum = 7 points or N/A • Seven points are earned where ≥75% to <100% of annual evaporative cooling demands are replaced by non-evaporative cooling. • Four points are earned where ≥50% to <75% of annual evaporative cooling demands are replaced by non-evaporative cooling. • Two points are earned where ≥20% to <50% of annual evaporative cooling demands are replaced by non-evaporative cooling. • No points are earned where <20% of annual evaporative cooling demands are replaced by non-evaporative cooling. • Not applicable where evaporative cooling is not required.
4.2.1.4 Equip Cooling tower(s) with the following features: • **4.2.1.4.1:** an overflow alarm to detect overflow of water from the basin caused by *makeup water* valve failure. Overflow alarm shall send an audible signal or provide an alert to the tower operator via the building automation system (BAS); AND/OR • **4.2.1.4.2:** *drift eliminators* that achieve an efficiency of 0.001% or less for *counterflow systems*; OR 0.002% or less for *crossflow systems*.	Maximum = 2 points or N/A • One point is earned where an overflow alarm with an audible signal or alert is installed. • One point is earned where a *drift eliminator* is installed. • Not applicable where there are no wet-cooling towers.
4.2.1.5 Use safe and approved alternative non-potable sources to meet a cooling tower's annual *makeup water* demand.	Maximum = 4 points or N/A Points are earned where alternative non-potable sources supply a percentage of the cooling tower's annual *makeup water* demand: • Four points are earned for ≥25%. • Three points are earned for ≥20% to <25%.

	• Two points are earned for ≥15% to <20%. • One point is earned for ≥10% to <15%. • No points are earned for <10%. • Not applicable where there are no wet-cooling towers.

4.3 BOILERS AND HOT WATER SYSTEMS (12 POINTS)

4.3.1 BOILERS AND WATER HEATERS	

4.3.1.1 Boilers AND/OR water heaters have the following features:
• **4.3.1.1.1:** Boiler systems with over 50 BHP or 1.67MBtu/hr have condensate return systems;
• **4.3.1.1.2:** Non steam boilers have conductivity controllers; AND/OR
• **4.3.1.1.3:** Steam boilers have conductivity *meter*s.
	Maximum = 3 points or N/A
	
	• Two points are earned where boiler systems with over 50 BHP or 1.67MBtu/hr have condensate return systems.
	  ○ Not applicable where there will be no steam boilers or where steam boilers are less than 200 BHP or 6.69MBtu/hr.
	• One point is earned where boilers have conductivity controllers and meters.
	  ○ Not applicable where there are no boilers

4.3.2 DOMESTIC HOT WATER SYSTEMS	
4.3.2.1 Hot Water Volume: Conserve energy and water by reducing hot water volume to all to sinks and showers by designing efficient hot water delivery piping systems to one of the following: • A maximum of 48 oz. from a water heater OR a maximum of 20 oz. from a hot water recirculation system or temperature maintenance cable; OR • A maximum of 64 oz. from a water heater OR a maximum of 24 oz from a hot water recirculation system or temperature maintenance cable; OR • A maximum of 96 oz. from a water heater OR a maximum of 3 6oz from a hot water recirculation system or temperature maintenance cable.	Maximum = 3 points • Three points are earned where there is a maximum of 48 oz. from a water heater OR a maximum of 20 oz. from a hot water recirculation system or temperature maintenance cable. • Two points are earned where there is a maximum of 64 oz. from a water heater OR a maximum of 24 oz. from a hot water recirculation system or temperature maintenance cable.

Table E202.1
INTERNAL VOLUME OF VARIOUS WATER DISTRIBUTION TUBING

Ounces of water per foot of tube					
Size Nominal Inch	**Copper Type M**	**Copper Type L**	**Copper Type K**	**CPVC CTS SDR 11**	**CPVC SCH 40**
3/8	1.06	0.97	0.84	N/A	1.17
½	1.69	1.55	1.45	1.25	1.89
¾	3.43	3.22	2.90	2.67	3.38
1	5.81	5.49	5.17	4.43	5.53
1 ¼	8.70	8.36	8.09	6.61	9.66
1 ½	12.18	11.83	11.45	9.22	13.20
2	21.08	20.58	20.04	15.79	21.88

Ounces of water per foot of tube				
Size Nominal Inch	**CPVC SCH 80**	**PE-RT SDR 9**	**Composite ASTM F 1281**	**PEX CTS SDR 9**
3/8	-	0.64	0.63	0.64
½	1.46	1.18	1.31	1.18
¾	2.74	2.35	3.39	2.35
1	4.57	3.91	5.56	3.91
1 ¼	8.24	5.81	8.49	5.81
1 ½	11.38	8.09	13.88	8.09
2	19.11	13.86	21.48	13.86

2018 International Plumbing Code (IPC)

- One point is earned where there is a maximum of 96 oz. from a water heater OR a maximum of 36 oz. from a hot water recirculation system or temperature maintenance cable.

4.3.2.2 Reduce hot water waste to *lavatory* sinks, kitchen sinks, and showers by use of hot water recirculating systems that also use occupant sensors-controlled faucets or temperature-actuated flow-reduction devices at the hot water fixtures. These provisions shall reduce water purged down the drain during time to temperature intervals.

Maximum = 3 points

- Three points are earned where 100% of the hot water fixtures meet these provisions.

Note: Continuously operating recirculation systems and recirculation systems on timers are not eligible for this credit alone. The additional conservation components listed above must be paired with the hot water recirculation systems for eligibility.	• Two points are earned where ≥75% to <100% of the hot water fixtures meet these provisions. • One point is earned where ≥50% to <75% of the hot water fixtures meet these provisions. • No points are earned where <50% of the hot water fixtures meet these provisions.
4.3.2.3 Hot water recirculation systems are classified as a system of hot water supply and return piping with shutoff valves, balancing valves, circulating pumps and a method of controlling the circulating system. Hot water recirculation improvements have been shown to affect energy use and water quality.	Maximum = 3 Points • Three points are earned where the circulating pump(s) are continuously operational. Recommended for healthcare facilities, hotels and/or motels. • Two points are earned where the circulating pump(s) are programmed for intermittent operation with on-demand activation or time clocks combined with temperature sensing capabilities. • No points are earned if temperature maintenance cable is installed in lieu of hot water recirculation.

4.4 WATER INTENSIVE APPLICATIONS (14 POINTS)

4.4.1 COMMERCIAL FOOD SERVICE EQUIPMENT	
4.4.1.1 Food services avoid water intensive equipment as follows: • **4.4.1.1.1:** The project does not include *once-through water-cooled equipment*; AND • **4.4.1.1.2:** The project does not include water-fed *food waste disposal* appliance.	Maximum = 2 points or N/A • One point is earned where food services avoid water intensive equipment per each listed item up to a maximum of 2 points. • Not applicable where there are no commercial food service facilities.
4.4.1.2 The following appliances and fittings meet the prescribed limits for water usage:	Maximum = 4 points or N/A

• **4.4.1.2.1:** *Combination ovens* consume 1.5 gal per pan/hr. (39 L/hr.) or less in the steamer mode. N/A where there are no *combination ovens*;
• **4.4.1.2.2:** *Pre-rinse spray valves* consume 1.28 gal/min (4.8 L/min) or less;
  ○ N/A where there are no *pre-rinse spray valves*.
• **4.4.1.2.3:** *Boilerless/connectionless food steamers* comply with ENERGY STAR 1.2 requirements and consume 2 gal/hr./compartment (7.5 L/hr.) or less.
  ○ N/A where there are no food steamers; and
• **4.4.1.2.4:** Ice Makers comply with ENERGY STAR 3.0 requirements where such requirements exist.
  ○ N/A where there are no ice makers.
	• One point is earned where each listed appliance or fitting meets the specified water usage limits.
	• Not applicable where the listed appliance or fitting is not present.

4.4.2 LABORATORY AND MEDICAL EQUIPMENT	
4.4.2.1 When installed *steam sterilizers* are equipped with *mechanical vacuum systems* and *water tempering devices* that only allow water to flow when the discharge of condensate or hot water from the sterilizer exceeds 140°F (60°C).	1 point or N/A • Not applicable where there are no *steam sterilizers*.
4.4.2.2 Specify *Dry vacuum systems* for all laboratory/medical/dental purposes.	1 point or N/A • Not applicable where there are no laboratory/medical/dental systems.

4.4.3 *Water Features* and Pools

Two paths are provided for assessing a project's *water features* and/or pools.

• **4.4.3A Path A: No *water feature* and pool are installed:** 6 points
OR
• **4.4.3B Path B: A *water feature* and/or pool is installed**: up to 6 points

Points cannot be combined between paths. Select one of the paths below.

4.4.3A PATH A: NO WATER FEATURE AND POOL ARE INSTALLED	
4.4.3A.1 No water feature and pool are installed.	6 points

OR

4.4.4B PATH B: *WATER FEATURE* AND/OR POOL IS INSTALLED	
4.4.3B.1 *Water features* re-circulate water for *reuse* within the system and have a leak/water loss detection system.	1 point
4.4.3B.2 *Water features* use *alternate water sources* of *non-potable water* for *makeup water*.	1 point or N/A

	• Not applicable where prohibited by the authority having jurisdiction.
4.4.3B.3 Pools and spas or *water features* have an evaporation reduction/mitigation feature (e.g., Pool covers, storage of feature water in underground tanks, controls to curtail use during high loss periods, etc.).	1 point
4.4.3B.4 Equip Pools and spas with *splash out troughs* to recover water.	1 point
4.4.3B.5 Pools and spa backwash water is treated and recovered for appropriate reclamation, recycling, AND/OR irrigation.	1 point
4.4.3B.6 Use *regenerative sorbtive media* (not *conventional filtration* or standard *sand-based filtration*) or *cartridge filtration* for pools and spas.	1 point

4.5 WATER TREATMENT (4 POINTS)

4.5.1 WATER TREATMENT FOR END USES	
4.5.1.1 Equip filtration systems with pressure drop gauges that allow backwash to be based on pressure drop and not on timers.	1 point or N/A • Not applicable where there is no water treatment system.
4.5.1.2 Provide reverse osmosis that achieves one of the following: • Rejects less than 60% of feed-water volume for a system that produces more than 100 gal. (380 L) per day; OR • Rejects less than 70% of feed-water volume for a system that produces less than 100 gal. (380 L) per day.	Maximum = 2 points or N/A • Two points are earned where reverse osmosis rejects <60% of feed-water volume. • One point is earned where reverse osmosis rejects <70% of feed-water volume. • Not applicable where there is no water treatment system.
4.5.1.3 Water softeners are demand-initiated, equipped with recharge controls based on volume of water treated or hardness and not on clock timers.	1 point or N/A • Not applicable where there is no water treatment system.

4.6 *ALTERNATE WATER SOURCES* (25 POINTS)

4.6.1 *ALTERNATE WATER SOURCES* FOR INDOOR USES	
4.6.1.1 Use *non-potable water* for indoor purposes.	Maximum = 10 points or N/A

	Points are earned based on the percentage of indoor water demands met with *non-potable water*: • Ten points are earned for >75%. • Eight points are earned for >50 to ≤75%. • Six points are earned for >25% to ≤50%. • Three points are earned for ≥15% to ≤25%. • No points are earned for <15%. • Not applicable where the authority having jurisdiction prohibits the use of *alternate water sources* for indoor applications.
4.6.1.2 One of the following systems is at least 80% pre-plumbed (pipes and valves) with a suitable area designated for a collection tank during construction: • *Graywater*; • *Reclaimed water*; • *Recycled water*; AND/OR • *Rainwater* premise distribution. Pre-plumbed systems are marked or otherwise identified as such.	2 points

4.6.2 *ALTERNATE WATER SOURCES*	
4.6.2.1 Where applicable, use *alternate water source(s)* to replace *potable water* for one or more of the following purposes but not limited to: • **4.6.2.1.1:** Cooling Towers; • **4.6.2.1.2:** Irrigation; • **4.6.2.1.3:** *Water features*; • **4.6.2.1.4:** Wash Down/Surface Washing; • **4.6.2.1.5:** Dust Control.	Maximum = 12 points or N/A Points are earned where *alternate water source(s)* are used to supply a percentage of annual *makeup water* demand for the combined purposes described: • Twelve points are earned for ≥50%. • Nine points are earned for ≥40% to <50%. • Six points are earned for ≥30% to <40%. • Three points are earned for ≥20% to <30%. • One point is earned for ≥10% to <20%.

	• No points are earned for <10%. • Not applicable when end uses are not included or *reclaimed water* is not available.

4.6.3 *GRAYWATER* TREATMENT	
4.6.3.1 *Graywater* treatment systems are NSF/ANSI 350, NSF/ANSI 350-1 or IAPMO IGC 324 listed where present.	1 point or N/A • Not applicable where there are no *Graywater* treatment systems.

4.7 *METER*ING (17 POINTS)

4.7.1 *METER*ING	
4.7.1.1 Install *Sub-metering* for all water-intensive applications such as commercial kitchens, commercial laundries, laboratories, pools, spas, etc.	2 points or N/A • Not applicable where there are no water intensive applications.
4.7.1.2 Install *metering* or *sub-metering* for water that is used for pressurized irrigation.	4 points or N/A • Not applicable where there is no irrigation.
4.7.1.3 Link all water *meters* and *sub-meters* to a *Meter* Data Management System to store and report water consumption data.	2 points
4.7.1.4 Equip chilled or hot water loops or cooling tower *makeup water* supply pipes with *meters*.	2 points or N/A • Not applicable where there are no chilled or hot water loops.
4.7.1.5. Use tenant *Metering* or *Sub-metering* in multi-unit developments.	Maximum = 7 points or N/A • Seven points are earned when ≥90% of the units in the development are *sub-metered* and allow for tenants to view their consumption and be billed based upon it. • Six points are earned when ≥75% to <90% of the units in the development are *sub-metered* and allow for tenants to view their

	consumption and be billed based upon it. • Five points are earned when ≥50% to <75%of the units in the development are *sub-metered* and allow for tenants to view their consumption and be billed based upon it. • Two points are earned when ≥25% to <50%of the units in the development are *sub-metered* and allow for tenants to view their consumption and be billed based upon it. • Not applicable where there is no multi-unit development.

4.8 LEAK DETECTION (10 POINTS)

Leak detection devices shall comply with IAPMO Z1349 and not interfere with fire protection systems.

Water Leak Detection Device: A plumbing appurtenance that monitors a water supply and distribution system in order to detect and report unusual conditions that may cause water waste.

Adaptive Plumbing System Monitoring and Control Device: A type of water leak detection device that uses sensor inputs to continuously monitor the hydraulic conditions and intelligently adapts to remotely report expected normal vs abnormal plumbing system states.

4.8.1 LEAK DETECTION	
4.8.1.1 Install *water leak detection device* for all water-intensive applications such as commercial kitchens, commercial laundries, laboratories, pools, spas, etc.	1 point or N/A • One point is earned for adaptive plumbing system leak detection devices. • Not applicable where there are no water intensive applications.
4.8.1.2 Install *water leak detection device* for water that is used for pressurized irrigation.	2 points or N/A • Two points are earned for adaptive plumbing system leak detection devices. • Not applicable where there is no irrigation.

4.8.1.3 Link all *water leak detection devices* to internet or a central Data Management System to store, monitor and report data.	1 point
4.8.1.4 Equip chilled or hot water loops or cooling tower *makeup water* supply pipes with water leak detection devices.	1 point or N/A • One point is earned for adaptive plumbing system leak detection devices. • Not applicable where there are no chilled or hot water loops.
4.8.1.5 Use tenant water leak detection devices in multi-unit developments. Percentages are based on units with water supply.	Maximum = 5 points or N/A • Five points are earned when ≥90% of the units in the development include adaptive plumbing system water leak detection. • Four points are earned when ≥80% to <90%of the units in the development include adaptive plumbing system water leak detection. • Two points are earned when ≥40% to <80%of the units in the development include adaptive plumbing system water leak detection. • One point is earned when ≥20% to <40%of the units in the development include adaptive plumbing system water leak detection. • Not applicable where there is no multi-unit development.

4.9 IRRIGATION (25 POINTS)

4.9.1 Irrigation

Two paths are provided for assessing a project's irrigation.

- **4.9.1A Path A: No irrigation system is installed:** 25 points

OR

- **4.9.1B Path B: An irrigation system is installed:** up to 25 points

Points cannot be combined between paths. Select one of the paths below.

4.9.1A PATH A: NO IRRIGATION SYSTEM IS INSTALLED	
4.9.1A.1 No irrigation system, or a temporary system that is dismantled after two years, is installed.	25 points

OR

4.9.1B PATH B: IRRIGATION SYSTEM IS INSTALLED	
4.9.1B.1 Use the EPA *WaterSense* Water Budget Tool to determine landscape water allowance (LWA) and the landscape irrigation design and installation aligns with the allowance. Exclusion: The area of the landscape used to grow food for human consumption is not included in the calculations.	Maximum = 14 points • Six points are earned when there is a 30% reduction in water demand compared to the baseline as determined by the EPA WaterSense Water Budget Tool. • One point is earned for each additional 5% reduction in water demand above 30% to a maximum of an additional 8 points.
4.9.1B.2: An irrigation plan is developed by a certified/licensed irrigation designer for the approved landscape plan that shows calculations for landscape water requirements compared to the LWA.	4 points • Four points are earned where there is an irrigation plan.
4.9.1B.3 The irrigation system includes the following: • **4.9.1B.3.1:** *WaterSense* labeled weather-based irrigation controller, WaterSense labeled bypass *soil moisture sensors*, on-demand *soil moisture sensor*, AND/OR automatic *rain shutoff devices*; • **4.9.1B.3.2:** Pressure regulation for each zone to maintain proper operating pressures for *landscape irrigation sprinklers* or drip components; • **4.9.1B.3.3:** *Drip irrigation* on all planting beds where *mature plant* height is 10 in. (25.4 cm) or greater AND/OR in any planted area with a dimension less than 5 ft. (1.5 m) in any direction; • **4.9.1B.3.4:** Flow sensing incorporated in the control system to suspend irrigation in any zone where flows exceed expectation; • **4.9.1B.3.5:** *Landscape irrigation sprinklers* and drip emitters that comply with ASABE/ICC 802-2020 *Landscape Irrigation Sprinkler* and Emitter Standard; AND/OR • **4.9.1B.3.6:** Spray *sprinkler bodies* are WaterSense labeled.	Maximum = 5 points • One point is earned for each of the listed features included in the irrigation system up to a maximum of 5 points.
4.9.1B.4: Sprinkler system is evaluated for proper installation of all components specified on the irrigation plan and to assure that there is no runoff or overspray onto impervious surfaces.	2 points

	• Two points are earned where there is a sprinkler system inspection.

5. MATERIALS (150 points)

5.1 WHOLE BUILDING LIFE CYCLE ASSESSMENT (26 POINTS)

5.1.1 WHOLE BUILDING LIFE CYCLE ASSESSMENT	
5.1.1.1 The project team conducts a whole building life cycle assessment. The life cycle assessment shall conform to ASTM E2921-22 *Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes, Standards, and Rating Systems*. The life cycle assessment minimally reports the following life cycle impact indicators: • *Global warming potential (GWP);* • Acidification potential; • Eutrophication potential; • *Ozone depletion potential (ODP);* and • Smog potential. Operating energy consumption and MEP systems can be included in the life cycle assessment.	3 points
5.1.1.2 The project team evaluates two different building designs of similar size and function comparing *global warming potential* (*GWP*) to select the building with the lower *GWP* impact through either of the following methods: Method 1: Conduct a Whole Building Life Cycle Assessment (LCA) that conforms to ASTM E2921-22 *Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes, Standards, and Rating Systems.* Method 2: Conduct a *GWP* comparison assessment using an embodied carbon calculator. The life cycle assessment or *GWP* assessment report includes the following life cycle impact indicators: • *Global warming potential (GWP)*	Maximum = 7 points Points are earned where the following percentage reduction is demonstrated for *global warming potential*: • Seven points are earned for a total of ≥20% reduction. • Six points are earned for a total of ≥17% to <20% reduction. • Five points are earned for a total of ≥15% to <17% reduction. • Four points are earned for a total of ≥13% to <15% reduction. • Three points are earned for a total of ≥11% to <13% reduction. • Two points are earned for a total of ≥10% to <11% reduction. • One point is earned for a total of ≥9% to <10% reduction.

	• No points are earned <9% reduction.
5.1.1.3 The project team evaluates a minimum of two different building designs of similar size and function to select the building with the lower environmental impacts across three impact indicators, one of which must be *GWP*. The selected building design shall be consistent with the design chosen for 5.1.1.2, if applicable. Conduct a Whole Building Life Cycle Assessment (LCA) that conforms to ASTM E2921-22 *Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes, Standards, and Rating Systems*. The life cycle assessment minimally reports the following life cycle impact indicators: • *Global warming potential (GWP);* • Acidification potential; • Eutrophication potential; • *Ozone depletion potential (ODP);* and • Smog potential. The proposed final design of the building with the lower anticipated environmental impact has no other impact indicator exceeding the reference design by more than 5%.	Maximum = 16 points Points are earned where the following cumulative percentage reduction is demonstrated by adding at least two impact indicators: • Sixteen points are earned for a total ≥25% reduction. • Fifteen points are earned for a total ≥23% to <25% reduction. • Fourteen points are earned for a total ≥21% to <23% reduction. • Thirteen points are earned for a total ≥19% to <21% reduction. • Twelve points are earned for a total ≥17% to <19% reduction. • Eleven points are earned for a total ≥15% to <17% reduction. • Ten points are earned for a total ≥13% to <15% reduction. • Five points are earned for a total ≥1% to <13% reduction. • No points are earned for <1% reduction.

5.2 PRODUCT LIFE CYCLE (39 POINTS)

5.2.1 PRODUCT LIFE CYCLE	
5.2.1.1 Product Manufacturers provide one or more of the following for a minimum of fifteen products that evaluate the *cradle-to-gate product life cycle* environmental impacts: • Third-party verified Type III Environmental Product Declarations (EPD) according to ISO 21930: 2017 and/or ISO 14025: 2006, either product specific or industry wide. Environmental Product Declaration developed according to ISO 21930: 2007 shall be acceptable through December 31, 2024; • Third-party Multiple Attribute Product Certification; AND/OR • Third-party verified product life cycle assessment based upon ISO 14040: 2006 and ISO 14044: 2006.	Maximum = 29 points Points are earned where products include one of the listed third-party verifications/certifications: • Twenty-nine points are earned for ≥40 products. • Twenty-six points are earned for ≥38 to ≤39 products. • Twenty-three points are earned for ≥35 to ≤37 products. • Twenty points are earned for ≥33 to ≤34 products.

	• Seventeen points are earned for ≥30 to ≤32 products. • Fourteen points are earned for ≥28 to ≤29 products. • Eleven points are earned for ≥25 to ≤27 products. • Eight points are earned for ≥23 to ≤24 products. • Seven points are earned for ≥21 to ≤22 products. • Six points are earned for ≥18 to ≤20 products. • Five points are earned for ≥15 to ≤17 products. • No points are earned for fewer than 15 products.
5.2.1.2 A minimum of five products include one or more of the following verifications that evaluate the products' environmental impacts through end of life (*cradle-to-grave product life cycle*): • Third-party verified Type III Environmental Product Declarations (EPD) according to ISO 21930: 2017 and/or ISO 14025: 2006. Environmental Product Declaration developed according to ISO 21930: 2007 shall be acceptable through December 31, 2024; AND/OR • Third-party verified product life cycle assessment based upon ISO 14040: 2006 and ISO 14044: 2006. Product count compliance with 5.2.1.2 can also be used for 5.2.1.1 product count compliance.	Maximum = 10 points Points are earned where products are evaluated through end of life: • Ten points are earned for 10 or more products. • Nine points are earned for 9 products. • Eight points are earned for 8 products. • Seven points are earned for 7 products. • Six points are earned for 6 products. • Five points are earned for 5 products. • No points are earned for fewer than 5 products.

5.3 *PRODUCT RISK ASSESSMENT* (4 POINTS)

5.3.1 OCCUPANT EXPOSURE SCREENING REPORT (OESR)	
5.3.1.1 Select at least one *formulated product* that has a completed Occupant Exposure Screening Report (OESR) prepared in accordance with ASTM E3182-20 - *Standard Practice for Preparing an Occupant Exposure Screening Report (OESR) for Substances in Installed Building Products* or other third-party	Maximum = 4 points Points are earned where products undergo a screening-level *product risk assessment:*

verified transparency documentation that includes any chemical constituents that are carcinogenic, mutagenic, or reprotoxic (CMR) to reproduction or human development and related exposure *risk*. Points are earned for discrete products with different functional uses that have an OESR, SDS, HPD, or equivalent labeling/certification that includes transparency and ingredient listing for specified products.	• Four points are earned for 4 products. • Three points are earned for 3 products. • Two points are earned for 2 products. • One point is earned for 1 product.

5.4 SUSTAINABLE MATERIALS ATTRIBUTES (15 POINTS)

5.4.1 PRODUCT SUSTAINABLE MATERIALS ATTRIBUTES	

5.4.1.1 Points are earned based on the Sustainable Materials Index (SMI), the percentage of the total value of the products that have sustainable materials attributes. The sustainable materials attributes considered in calculating the SMI are third-party certified *pre-consumer recycled content, post-consumer recycled content, biobased content, sustainable forestry certification content* and materials or that meet the requirements of the Eco-Certified Composite sustainability standard. The SMI is the sum of the value of these attributes divided by the Total Project Materials Cost expressed as a percentage.
 	
Sustainable Materials Index (%) =
 	
100 x
($ value of pre-consumer recycled content
+
$ value of *post-consumer recycled content*
+
$ value of *biobased content*
+
$ value of third-party sustainable forestry certification content
+
$ value of Eco-Certified Composite)
÷
Total Project Materials Cost
 	
See the Green Globes Materials and VOC Emissions Tracker in the Technical Reference Manual.
	Maximum = 15 points
	
	Points are earned where the Sustainable Materials Index is greater than 10%:
	• Fifteen points are earned for ≥38%.
	• Fourteen points are earned for ≥36% to <38%.
	• Thirteen points are earned for ≥34% to <36%.
	• Twelve points are earned for ≥32% to <34%.
	• Eleven points are earned for ≥30% to <32%.
	• Ten points are earned for ≥28% to <30%.
	• Nine points are earned for ≥26% to <28%.
	• Eight points are earned for ≥24% to <26%.
	• Seven points are earned for ≥22% to <24%.
	• Six points are earned for ≥20% to <22%.
	• Five points are earned where for ≥18% to <20%.
	• Four points are earned where for ≥16% to <18%.
	• Three points are earned for ≥14% to <16%.

Only the portion of products that has the identified attribute should be included. For example, if a product has 40% *pre-consumer recycled content*, only 40% of the value of that product is included. Mass balanced attributable biobased may be calculated by weight using third-party certifications. Products that are claimed for credit under Third-Party Sustainable Forestry Certification are not included as *biobased content*. *Biobased physical content* percentage may be calculated by weight or in accordance with ASTM D6866-16 *Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis*. Mass balanced attributable biobased may be calculated by weight using third-party certifications. The following certification systems and standards are recognized: • Forest Stewardship Council (FSC): https://us.fsc.org/en-us (last accessed 2/28/24) • Sustainable Forestry Initiative, Inc. (SFI): https://www.forests.org/ (last accessed 2/28/24) • American Tree Farm System (ATFS): https://www.treefarmsystem.org/ (last access 2/28/24) • Canadian Standards Association Sustainable Forestry Management (CSA): https://www.pefccanada.org/ (last accessed 2/28/24) • Programme for the Endorsement of Forest Certification (PEFC): https://www.pefc.org/ (last accessed 2/28/24) • UL 2809 Environmental Claim Validation Procedure for Defined Recycled Content • UL 9798 Environmental Claim Validation Procedure for Biobased Content • Products categorized as Responsible or Certified Sources in accordance with ASTM D7612-21 *Standard Practice for Categorizing Wood and Wood-Based Products According to Their Fiber Sources*. • ISCC+ • Redcert	• Two points are earned for ≥12% to <14%. • One point is earned for ≥10% to <12%. • No points are earned for <10%.

5.5 *REUSE* OF EXISTING STRUCTURES AND MATERIALS (30 POINTS)

5.5.1 *STRUCTURAL SYSTEMS* AND *NON-STRUCTURAL/*INTERIOR *ELEMENTS*	
5.5.1.1 *Structural systems* (e.g., exterior walls, interior bearing walls, roof systems, floor systems) from an *existing building* on the site are retained and incorporated in the new design. Assessment Guidance: Percentage = 100 x (A ÷ B), where: A = Total square footage of *reuse*d existing *structural systems* B = Total square footage of *structural systems* in the project Wall Area is measured in the vertical plane and other *structural systems* are measured in the horizontal plane.	Maximum = 12 points Points are earned where a percentage of the existing *structural systems* is *reused*: • Twelve points are earned for ≥95% *reuse*. • Eleven points are earned for ≥90% to <95% *reuse*. • Ten points are earned for ≥85% to <90% *reuse*. • Nine points are earned for ≥80% to <85% *reuse.* • Eight points are earned for ≥75% to <80% *reuse.* • Seven points are earned for ≥70% to <75% *reuse.* • Six points are earned for ≥65% to <70% *reuse.* • Five points are earned for ≥60% to <65% *reuse.* • Four points are earned for ≥50% to <60% *reuse*. • Three points are earned for ≥40% to <50% *reuse.* • No points are earned for <40% *reuse.* • Not applicable where a building didn't previously exist.
5.5.1.2 *Non-structural* interior systems and *finishes* (e.g., ceiling, interior partitions, demountable walls, flooring, doors) from an *existing building* on the site are retained and incorporated in the new design. Assessment Guidance: Areas are calculated as the projected area of the element (e.g., if an interior partition is *reused*, the area is calculated as length x height of the wall).	Maximum = 10 points Points are earned where a percentage of existing *non-structural*/interior systems and finished is *reused*: • Ten points are earned for ≥95% *reuse.* • Nine points are earned for ≥85% to <95% *reuse.* • Eight points are earned for ≥75% to <85% *reuse.*

Percentage = 100 x (A ÷ B), where: A = Total area of *reused* existing interior systems and *finishes* B = Total area of interior systems and *finishes* in the new design	• Seven points are earned for ≥65% to <75% *reuse.* • Six points are earned for ≥55% to <65% *reuse.* • Five points are earned for ≥45% to <55% *reuse.* • Four points are earned for ≥35% to <45% *reuse.* • Three points are earned for ≥25% to <35% *reuse.* • Two points are earned for ≥15% to <25% *reuse.* • One point is earned for ≥10% to <15% *reuse.* • No points are earned for <10% *reuse.* • Not applicable where a building didn't previously exist.

5.5.2 MATERIAL *REUSE* FROM OFF-SITE	
5.5.2.1 The project incorporates *reused*, refurbished AND/OR off-site *salvaged materials* in place of new materials (except *furnishings*). Assessment Guidance: Percentages are calculated as the percentage of the total materials cost. Percentage = 100 x (A ÷ B), where: A = Total value of *reused* materials B = Total value of materials The value of the *reused*, refurbished, or *salvaged material* is the greater of the cost of the *reuse*d, refurbished or *salvaged material* or the cost of new comparable material which is being avoided.	Maximum = 4 points Points are earned where a percentage of materials is *reused*, refurbished, AND/OR salvaged from off-site: • Four points are earned for ≥20% of materials. • Three points are earned for ≥10% to <20% of materials. • Two points are earned for ≥5% to <10% of materials. • One point is earned for ≥2% to <5% of materials. • No points are earned for <2% of materials.
5.5.2.2 *Furnishings* (including systems furniture) are *reused*, salvaged AND/OR refurbished for *reuse* within the project. Assessment Guidance: Percentages are calculated as the percentage of the total *furnishings* cost.	Maximum = 4 points or N/A Points are earned where a percentage of existing *furnishings* is *reused*: • Four points are earned for ≥30% of existing *furnishings*.

Percentage = 100 x (A ÷ B), where: A = Total value of *reused furnishings* B = Total value of *furnishings*	• Three points are earned for ≥20% to <30% of existing *furnishings*. • Two points are earned for ≥15% to <20% of existing *furnishings*. • One point is earned for ≥10% to <15% of existing *furnishings*. • No points are earned for <10% of existing *furnishings*. • Not applicable where there are no existing *furnishings* or if it is not feasible to *reuse* existing *furnishings*.

5.6 WASTE (26 POINTS)

5.6.1 CONSTRUCTION WASTE	
5.6.1.1 A preconstruction waste management plan is created prior to any construction or demolition activities. This plan describes the project team's strategy for reducing construction waste and diverting materials from landfilling via *reuse* or recycling. The preconstruction waste management plan will include: • The strategies planned for construction waste reduction, salvaging, recycling, returning to supplier/manufacturer, or other methods for diverting waste from landfill; • The facility, hauler, or service provider that will handle each material being diverted; • Whether construction and demolition materials will be separated onsite or commingled; • The name and contact information for the person(s) responsible for developing and implementing the waste management plan; • Reporting and record keeping provisions; • Target construction waste rate per 10.6.1.3 below; and • Target waste diversion rate.	2 points
5.6.1.2 A final waste management summary report is completed after construction documenting the results of the implementation of the preconstruction waste management plan, including: • The weight or volume of the total quantity of construction and demolition waste;	1 point

• The calculated construction waste per unit area for the project (see 10.6.1.3 below); • The weight or volume of hazardous waste generated, if any; • The weight or volume of the major categories of materials that were *reused* or recycled; • The *reuse*/recycling rate for each major category of waste material; • The overall *reuse*/recycling rate for the project; • A description of whether materials are managed through source separation or comingling; • Copies of receipts and invoices used to track the progress of the waste management effort; • A statement that describes if a waste recycling facility was used whether it was certified by a government or non-government organization; • The organization and contact information of the author of the waste management summary report and the name and contact information of the person(s) at the off-site recycling facility (or facilities) responsible for data collection and reporting.	
5.6.1.3 Minimize construction waste, per unit area of new building floor area, generated in new portions of buildings. Construction waste includes that which is hauled from the site, whether diverted, landfilled, incinerated, or otherwise disposed of. Soil and land-clearing debris are not included in the calculations.	Maximum = 10 points • Ten points are earned where waste is <1.2 lbs./ft^2 (5.9 kg/m^2) of the new building floor area. • Six points are earned where waste is 1.2 lbs./ft^2 (5.9 kg/m^2) to 2.0 lbs./ft^2 (9.8 kg/m^2) of the new building floor area. • Three points are earned where waste is 2.0 lbs./ft^2 (9.8 kg/m^2) to 2.5 lbs./ft^2 (12.2 kg/m^2) of the new building floor area. • No points are earned where waste is >2.5 lbs./ft^2 (12.2 kg/m^2) of the new building floor area.
5.6.1.4 Construction waste, including building demolition waste and packaging, is diverted from the landfill through recycling, *reuse,* repurposing, or composting. The amount of construction waste that is used for waste-to-energy combustion is multiplied by 0.5 when counted as waste	Maximum = 7 points Points are earned where a percentage of the total amount of construction waste is diverted from landfill: • Seven points are earned for ≥75%.

diverted from landfill. Waste-to-energy facilities have a combustion efficiency rate of 60% or more. Soil and land-clearing debris and materials used as alternative daily cover at landfills are not included in these calculations. Calculations may be performed based on weight or volume, but the same basis is used throughout this credit. Where calculations are performed to convert waste from weight to volume or volume to weight, the source of these conversions is stated.	• Five points are earned for ≥50% to <75%. • Three points are earned for ≥25% to <50% • No points are earned for <25%.

5.6.2 POST OCCUPANCY SOLID WASTE RECYCLING	

5.6.2.1 The building design addresses recycling for solid waste using one or more of the following:
• **5.6.2.1.1:** Capacity: Provide recycling collection capacity as follows:
  ○ Multifamily: Minimum of 0.0625 CY per resident; or
  ○ Office and Retail: Minimum of 0.035 CY per full time employee; or
  ○ Schools: Minimum of 0.010 CY per student;
• **5.6.2.1.2:** Interior Storage Requirements: Building design addresses interior storage of recyclables in accordance with one or more of the following space layouts, as required to meet minimum capacity for scheduled collection and any security or safety needs:
  ○ In-cabinet or under-counter/work station collection bins;
  ○ A minimum of one collection bin centrally located on each floor;
  ○ A separate and secure collection area for a single material stream; AND/OR
  ○ Recycling chutes that empty into dedicated recycling collection bin;
• **5.6.2.1.3:** Exterior Storage Requirements: Building design addresses exterior recycling storage by providing adequate, accessible enclosures for recycling collection containers in size and number that meet minimum capacity requirements and the following:
  ○ Permanent, durable enclosures are sized to accommodate collection bins required for minimum recycling capacity;
  ○ Enclosures are screened on three sides; and
  ○ Enclosures are designed to accommodate minimum clearances for collection equipment.
	Maximum = 2 points
	
	• Two points are earned where two or more of the listed items are used to address recycling for solid waste.
	• One point is earned where one of the listed items is used to address recycling for solid waste.

5.6.3 SUPPLY CHAIN WASTE MINIMIZATION	
5.6.3.1 Products used in the construction of the building are selected from manufacturers who have minimized or diverted waste during the production/manufacturing of the products. This criterion applies gate-to-gate – to all material inputs and outputs to a facility (or facilities) that produce/manufacture finished products. The diversion rate is calculated for the entire facility (or facilities) in which the products were produced/assembled/manufactured, and not just for an individual product line. Assessment Guidance: The diversion rate is expressed as a percentage and calculated as follows: $$Diversion\ Rate = \left(1 - \left[\frac{Mass\ Landfilled + Mass\ Incinerated\ without\ Energy\ Recovery)}{Mass\ Discarded\ Material}\right]\right) x100$$ Waste materials generated from the recycling of an external waste stream as an incoming material should not be considered a "discarded material" and should not appear in either the denominator or numerator. The Diversion Rate is multiplied by 1.5 for products that have been produced or manufactured in a facility that meets the following standards and certification programs: • Business or facilities that have achieved Zero Waste certification from the US Zero Waste Business Council; or • Demonstrate compliance with UL2799 Environmental Claim Validation for Zero Waste to Landfill The following methods are accepted as valid diversion from landfill: • Recycling; • Returning to supplier; • *Reuse* in same process; • *Reuse* in different process;	Maximum = 4 points • Four points are earned where ≥50%, by cost, of *building products* used come from facilities that divert over 80% of their waste. • Three points are earned where ≥40% to <50%, by cost, of *building products* used come from facilities that divert over 80% of their waste. • Two points are earned where ≥30% to <40%, by cost, of *building product*s used come from facilities that divert over 80% of their waste. • One point is earned where ≥20% to <30%, by cost, of *building products* used come from facilities that divert over 80% of their waste. • Zero points are earned where <20%, by cost, *of building products* used come from facilities that divert over 80% of their waste.

• Processing and selling to third-party;
• Commercial composting; AND/OR
• Waste-to-energy: the manufacturer removes, to the maximum practical extent, recyclable materials from the waste stream using common or front-end recycling methods before material is sent to the waste-to-energy operation. Final by-products of waste-to-energy processes are disposed of properly and, if sent to landfill, are included in the total mass discarded value. Facilities are compliant with applicable government emissions regulations and facility permits. The waste-to-energy process used is one of the following:
• Bio-diesel or other biofuels;
• Anaerobic digestion with energy recovery; or
• Combustion with energy recovery where:
  ○ Combustion makes up less than 10% of the total waste by mass diverted; and
  ○ Combustion does not generate bottom ash or fly ash defined as hazardous by US CFR 261.24 (TCLP) 2011 or equivalent test for the jurisdiction of the incineration plant.	

5.7 RESOURCE CONSERVATION (10 POINTS)

5.7.1 OFF-SITE FABRICATION FOR CONSTRUCTION OPTIMIZATION	
5.7.1.1 The project incorporates building elements that are produced by one or both of the following methods, alone or in combination: • *Modular Construction* • *Prefabrication.*	Maximum = 4 points Points are earned where a percentage of the building construction by cost, not including site work, is *Modular Construction* AND/OR *Prefabrication:* • Four points maximum are earned for a minimum of ≥20%. • Three points are earned for a minimum of ≥15% to <20%. • Two points are earned for a minimum of ≥10% to <15%. • One point is earned for a minimum of ≥5% to <10%. • No points are earned for <5%.

5.7.2 DESIGN FOR *DECONSTRUCTION* (DFD)	
5.7.2.1 The project teams document the application of design for *deconstruction* (DFD) principles in the design of the building and provides the Owner with a *Deconstruction* Plan that addresses both partial *deconstruction* (for *renovations*) and total *deconstruction* (for end of life removal) of the building to maximize the *reuse* and recycling of building components and materials.	6 points

6. INDOOR ENVIRONMENT (155 points)

6.1 AIR VENTILATION AND QUALITY (37 POINTS)

6.1.1 VENTILATION AIR QUANTITY	
6.1.1.1 The quantity of ventilation for the building is compliant with one of the following: • *ANSI/ASHRAE Standard 62.1-2019; Ventilation for Acceptable Indoor Air Quality;* • The *ICC International Mechanical Code (ICC IMC 2018);* • *IAPMO UMC (2018): Uniform Mechanical Code;* • *ANSI/ASHRAE/ASHE Standard 170-2017, Ventilation of Health Care Facilities*; OR • Local codes or standards (if more stringent).	11 points

6.1.2. AIR CHANGE EFFECTIVENESS	
6.1.2.1 The following strategies are implemented for ventilation systems when used: 1. For mechanical ventilation systems, the zone air distribution effectiveness E_z value is greater than or equal to 0.9 in all *regularly occupied spaces*, excluding circulation and transitional spaces. 2. Natural ventilation systems are designed in accordance with Section 6.4 of ANSI/ASHRAE Standard 62.1- 2019, or are designed using professionally accepted sophisticated analytical methods such as computational fluid dynamics. The E_z value is determined using Table 6.1.2.1.	11 points

Table 6.1.2.1: Air Distribution Effectiveness

Air Distribution Configuration	Ez
Ceiling supply of cool air	1.0
Ceiling supply of warm air and floor return	1.0
Ceiling supply of warm air 15F or more above space temperature and ceiling return	0.8
Ceiling supply of warm air less than 15F above space temperature and ceiling return provided that the 150 fpm supply air jet reaches to within 4.5 ft. (1.37 m) of the floor level. *Note: For lower velocity supply air, E_z = 0.8*	1.0
Floor supply of cool air and ceiling return provided that	1.0

the 150 fpm supply jet reaches 4.5 ft. (1.37 m) or more above the floor. *Note: Most underfloor air distribution systems comply with this provision.*		
Floor supply of cool air and ceiling return, provided low-velocity displacement ventilation achieves unidirectional flow and thermal stratification.	1.2	
Floor supply of warm air and floor return.	1.0	
Floor supply of warm air and ceiling return.	0.7	
Makeup supply drawn in on the opposite side of the room from the exhaust AND/OR return.	0.8	
Makeup supply drawn in near to the exhaust AND/OR return location.	0.5	

1. "Cool air" is air cooler than space temperature.
2. "Warm air" is air warmer than the space temperature.
3. "Ceiling" includes any point above the breathing zone.
4. "Floor" includes any point below the breathing zone.
5. As an alternative to using the above values, E_z may be regarded as equal to air change effectiveness determined in accordance with *ANSI/ASHRAE 129-1997 (RA 02), Measuring Air Change Effectiveness* for all air distribution configurations except unidirectional flow.

6.1.3 AIR HANDLING EQUIPMENT	
6.1.3.1 Air handling equipment is equipped with filtration as follows: • Air handling equipment that provides ventilation air (e.g., central mixed air equipment, make-up air equipment, ventilation equipment for "compartmental" systems such as fan coils or unitary heat pumps): minimum MERV 13; and • Terminal equipment that circulates room or zone air (e.g., fan coils, unitary heat pumps): minimum MERV 8.	6 points or N/A • Not applicable where non-ducted circulating unitary equipment serves only a single zone (e.g., unit heaters, force-flows).
6.1.3.2 Interior liners that could harbor microbial growth AND/OR erode in the air stream are not used in any outdoor air, return air, and supply air ductwork, or any fan, coil, terminal, or other devices exposed to the airstream.	3 points or N/A • Not applicable where a building does not have ductwork with radiant systems and operable windows.

6.1.4 CO_2 SENSING AND VENTILATION CONTROL EQUIPMENT	
6.1.4.1 Densely occupied rooms (25 or more people per 1,000 ft^2 (92.9 m^2)) with *variable occupancy* (e.g., meeting rooms, assembly areas) have CO_2 sensing and ventilation control equipment.	6 points or N/A • Not applicable where there are no

	densely occupied spaces with *variable occupancy*.

6.2 SOURCE CONTROL AND MEASUREMENT OF INDOOR POLLUTANTS (40 POINTS)

6.2.1 VOLATILE ORGANIC COMPOUNDS

6.2.1.1 Adhesives and sealants that are applied on site within, or part of, the *building envelope's* continuous plane of air tightness comply with VOC content limits for 90% of products by volume AND/OR VOC emissions criteria for 70% of products by volume.

Maximum = 4 points

- Two points are earned where 70% of products by volume comply with VOC emissions criteria.
- Two additional points are earned where 90% of products by volume comply with VOC content limits.

Table 6.2.1.1: Adhesives and Sealants VOC Content Criteria

Product Area	Product Sub-area	VOC Content Limit[1] 1 point
Adhesives – Architectural Applications	Indoor Carpet	50 g/L
	Carpet Pad	50 g/L
	Outdoor Carpet	150 g/L
	Wood Flooring	100 g/L
	Rubber Flooring	60 g/L
	Subfloor	50 g/L
	Ceramic Tile	65 g/L
	VCT / Asphalt Tile	50 g/L
	Dry Wall and Panel	50 g/L
	Cove Base	50 g/L
	Multipurpose Construction	70 g/L
	Structural Glazing	100 g/L
	Single Ply Roof Membrane	250 g/L
Adhesives – Substrates	Metal to Metal	30 g/L
	Plastic Foams	50 g/L
	Porous Material (except wood)	50 g/L
	Wood	30 g/L
	Fiberglass	80 g/L
Adhesives – Specialty	PVC Welding	510 g/L
	CPVC Welding	490 g/L
	ABS Welding	325 g/L
	Plastic Cement Welding	250 g/L
	Adhesive Primer for Plastic	550 g/L
	Contact Adhesive	80 g/L
	Special Purpose Contact Adhesive	250 g/L

Sealants	Architectural	250 g/L
	Non-membrane Roof	300 g/L
	Single Ply Roof Membrane	450 g/L
Sealant Primers	Architectural	
	Non porous	250 g/L
	Porous	775 g/L

1. The VOC content must conform to the VOC limits in the *South Coast Air Quality Management District (SCAQMD) Rule 1168 (October 6, 2017* http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1168.pdf*).* VOC limits are expressed as grams of VOC per liter of adhesive or sealant less water and less exempt compounds, with no exception for chloroform, ethylene dichloride, methylene chloride, perchloroethylene, and trichloroethylene according to SCAQMD Rule 1168. For low-solid adhesives or sealants the VOC limit is expressed in grams per liter of material. SCAQMD Rule 1168.

VOC Emissions Criteria
VOC emissions results are determined by either the California Department of Public Health's *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers*, Version 1.2, January 2017; or UL 2821GREENGUARD *Certification Program Method for Measuring and Evaluating Chemical Emissions from Building Materials, Finishes and Furnishings, Edition 2, 2022*.

Provide documentation indicating the product does not have VOC emissions exceeding compliance with the requirements as stated in the Standard Private Office Scenario in CDPH Standard Method V1.2 or a certification by a certifying body accredited to ISO/IEC 17065:2012 and with relevant certification program in the scope of its accreditation.

6.2.1.2 Paints and coatings applied on site within, or are a part of, the building's continuous plane of air tightness comply with VOC content limits detailed in CARB 2007 SCM for 90% of products by volume AND/OR VOC emissions criteria) for 70% of products by volume.

VOC Emissions Criteria
VOC emissions results are determined by the California Department of Public Health's Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from

Maximum = 4points

- Two Points are earned where 70% of products by volume comply with VOC emissions criteria.
- Two additional points are earned where 90% of products by volume comply with VOC content limits.

<table>
<tr>
<td>Indoor Sources Using Environmental Chambers, Version 1.2, January 2017; or UL 2821 GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions from Building Materials, Finishes and Furnishings, Edition 2, 2022.

Provide documentation indicating the product does not have VOC emissions exceeding compliance with the requirements as stated in the Standard Private Office Scenario in CDPH Standard Method V1.2 or a certification by a certifying body accredited to ISO/IEC 17065:2012 and with relevant certification program in the scope of its accreditation.</td>
<td></td>
</tr>
<tr>
<td>6.2.1.3 Interior products will comply with prescribed limits of product emissions.

Table 6.2.1.3: Interior Product VOC Emissions
<table>
<tr><th>Product Area</th></tr>
<tr><td>6.2.1.3.1: Floors / Floor Coverings (including carpeting, resilient, other non-carpet flooring, and padding/cushion)[1]</td></tr>
<tr><td>6.2.1.3.2: Acoustical and Thermal Insulation</td></tr>
<tr><td>6.2.1.3.3: Ceiling Systems (including acoustical ceiling and gypsum board)</td></tr>
<tr><td>6.2.1.3.4: Wall Systems (including wall coverings, gypsum board, and window shading devices)[1]</td></tr>
<tr><td>[1]Concrete, concrete masonry, clay brick, ceramic tile, stone, glass and glass block masonry used in floors and wall systems without additional coating/sealers are deemed to comply without testing.</td></tr>
<tr><td>VOC emissions are determined by a third-party laboratory that is accredited to ISO/IEC 17025 with the specified test method listed in the scope of its accreditation. VOC emissions results are determined by California Department of Public Health (CDPH) “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers,” V 1.2, 2017, Standard Private Office Scenario. Alternatively, VOC emission results are determined by UL 2818 “GREENGUARD Certification Program For Chemical Emissions For Building Materials, Finishes And Furnishings,” Edition 2, 2022, Table 6.5.1 Office Model and Section 7.2 Allowable Limits for GREENGUARD Certification Gold.</td></tr>
</table>
</td>
<td>Maximum = 8 points or as adjusted by N/A items

Points are earned when 90% by area of products in the following categories comply with VOC emissions criteria, up to a maximum of 8 points:

• Three points are earned where floors/floor coverings comply with VOC emissions criteria.
  ○ Not applicable if there are no floor coatings/floor coverings.
• Three Points are earned where ceiling systems comply with VOC emissions criteria.
  ○ Not applicable if there are no ceiling systems.
• One point is earned where acoustical and thermal insulation comply with VOC emissions criteria.
  ○ Not applicable if there is no acoustical and thermal insulation.
• One point is earned where wall systems comply with VOC emissions criteria.
  ○ Not applicable if there are no wall systems.</td>
</tr>
</table>

6.2.1.4 Furniture, casework, cabinets, work stations, and seating all comply with prescribed limits of VOC emissions AND/OR are certified. Note: certified means compliance with any of the certifications listed per Table 6.2.1.4: Furniture and *Furnishings* VOC Emissions. **Table 6.2.1.4: Furniture and *Furnishings* VOC Emissions** Product Area Furniture and *Furnishings* (including case work, cabinetry, work stations, and seating) **VOC Emissions Criteria** VOC emissions are determined by a third-party laboratory that is accredited to ISO/IEC 17025:2017 with the specified test method listed in the scope of its accreditation. VOC emissions results are determined by ANSI/BIFMA M7.1-2011(R2016) *Standard Test Method for Determining VOC Emissions From Office Furniture Systems, Components and Seating*. Alternatively, VOC emission results may be determined by UL 2818 "GREENGUARD Certification Program For Chemical Emissions For Building Materials, Finishes And Furnishings," Edition 2, 2022 Table 6.5.1 Office Model and Section 7.2. Allowable Limits for GREENGUARD Gold Certification. To determine acceptability of the emission results, VOC product emission concentrations are estimated per testing procedures from ANSI/BIFMA e3-2019, 7.6.1, 7.6.2, and 7.6.3.	Maximum = 6 points • Two points are earned when 100% by cost of installed furniture products comply with ANSI/BIFMA e3 Section 7.6.1. • Two points are earned when 90% by cost of installed furniture products comply with ANSI/BIFMA e3 Section 7.6.2. • Two points are earned when 70% by cost of installed furniture products comply with ANSI/BIFMA e3 Section 7.6.3.

6.2.2 Pre-Occupancy Indoor Air Quality Testing
Two paths are available for assessing 6.2.2.

- **6.2.2A Path A: Indoor Air Quality (IAQ) Pre-Occupancy Testing:** 4 points

OR

- **6.2.2B Path B: Total Volatile Organic Compounds (TVOC):** 2 points

Points cannot be combined between paths. Select one of the paths below.

6.2.2A PATH A: INDOOR AIR QUALITY (IAQ) PRE-OCCUPANCY TESTING	
6.2.2A.1 To determine that the indoor air quality is acceptable upon *Substantial Completion* but prior to occupancy, the buildings indoor environments are tested using ASTM D 5197-16 Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampling Methodology)	4 points

AND one of the following U.S. EPA methods TO-1, TO-11, TO-15, or TO-17 (from the Compendium of Methods for the Determination of Toxic Organic Pollutants in Ambient Air) . The air sampling shall take place after construction ends and prior to occupancy.

The test protocols are in accordance with the following:

- The VOC and Particulate Matter sampling and averaging times and measurement methods achieve the detection limits at or below the maximum concentrations of the contaminant levels listed in Table 6.2.2A.1 below;
- HVAC systems are operated at the minimum design outdoor air ventilation rate during testing;
- Air sampling and monitoring are at a height of 3-6 ft. (91-183 cm) from the floor and at least 3 ft. (0.9 m) away from walls and ventilation supply;
- The test protocols are documented to show that appropriate sampling methods and times were used; and
- The number of sampling locations are as follows for each portion of the building served by a separate ventilation system:
    - At Least one per contiguous floor; and
    - At Least one per 10,000 ft^2 (929 m^2) of floor area.

The sampling points include areas presumed to have the greatest source strength with the least ventilation.

Table 6.2.2A.1: Maximum level of contaminants:

Contaminant	**Maximum Concentration**
	µg/m3 (Unless Otherwise Noted)
Acetaldehyde	140[1]
Acrylonitrile	5[1]
Benzene	60[1]
1,3-Butadiene	20[1]
t-Butyl methyl ether (Methyl-t-butyl ether)	80000[1]
Carbon disulfide	800[1]
Caprolactam	100[1]
Carbon tetrachloride	40[1]
Chlorobenzene	1000[1]
Chloroform	300[1]
1,4-Dichlorobenzene	800[1]

Dichloromethane (Methylene chloride)	400[1]
1,4-Dioxane	3000[1]
Ethylbenzene	2000[1]
Ethylene glycol	400[1]
Formaldehyde	33[2]
2-Ethylhexanoic acid	25[2]
n-Hexane	7000[1]
1-Methyl-2-pyrrolidinone	160[2]
Naphthalene	9[1]
Nonanal	13[2]
Octanal	7.2[2]
Phenol	200[1]
4-Phenylcyclohexene (4-PCH)	2.5[2]
2-Propanol (Isopropanol)	7000[1]
Styrene	900[1]
Tetrachloroethene (Tetrachloroethylene, Perchloroethylene)	35[1]
Toluene	300[1]
1,1,1-Trichloroethane (Methyl chloroform)	1000[1]
Trichloroethene (Trichloroethylene)	600[1]
Xylene isomers	700[1]
Particulate ($PM_{2.5}$)	35 (24-hr)
Particulates (PM_{10})	150 (24-hr)
[1]Chronic RELS developed by the California Office of Environmental Health Hazard Assessment [2]ANSI/ASHRAE/USGBC/IES Standard 189.1-2014 Table 10.3.1.4	

For any area that fails to meet the requirements, the individual chemical(s) in the highest concentrations that are leading to failure are to be reviewed and the problem remedied.

OR

6.2.2B PATH B: TOTAL VOLATILE ORGANIC COMPOUNDS (TVOC)	
6.2.2B.1 Upon *Substantial Completion,* but prior to occupancy, conduct a TVOC indoor air sampling and laboratory analysis of collected samples as follows: Sampling for TVOCs is conducted over a minimum four-hour	2 points • Two points are earned where the test is conducted. There are no pass/fail criteria for conducting this

period. All measurements are completed prior to occupancy, but during normal occupied hours, with the building ventilation starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the testing. Samples are taken using one of the following collection media: • Thermal desorption tubes. • Canisters. Laboratory analysis is conducted in accordance with the following: • VOC Range (Carbon): C6 – C16. • Reference Compound: Toluene. All interior *finishes* are in place at the time of testing. Non-fixed *furnishings*, such as work stations and partitions are encouraged, but not required to be installed at the time of testing; Samples are collected for each portion of the building served by a separate air handling system. In each area served by a single air handler, samples are collected for each 25,000 ft. ^{2} (2,323 m^2) of floor space, or each contiguous floor space, whichever is larger. Samples include areas presumed to have the least ventilation, and the strongest presumed source strength. Samples are collected at 3-6 ft. (91-183 cm) above the finished floor.	test.

6.2.3 CARBON MONOXIDE MONITORING	
6.2.3.1 Carbon monoxide monitoring devices and alarms are installed in enclosed areas where there are sources of combustion (i.e., stoves, ovens, grills, clothes dryers, furnaces, boilers, water heaters, heaters and fireplaces).	1 point or N/A • Not applicable where there are no areas with combustion sources.

6.2.4 LEGIONELLOSIS MITIGATION IN THE BUILDING WATER SYSTEMS	
6.2.4.1 The building water systems conform with ASHRAE 188-2018, *Legionellosis: Risk Management for Building Water Systems*.	6 points or N/A • Not applicable if both 5.1 and 5.2 in ASHRAE 188-2018 are satisfied.

6.2.5 PEST AND CONTAMINATION CONTROL	
6.2.5.1 The following *integrated pest management* strategies are	1 point

used: • Outdoor air inlets have insect screens of 18x14 mesh for plenum systems feeding multiple air handlers; • Structural and mechanical openings are fitted with permanent protection (e.g. screens, sealants, etc.); • Advertising signs and other *assemblies* affixed to the building façade are designed and constructed in a way that reduces bird habitation, and penetrations in the façade are sealed to prevent entry; and • Mullions and ledges are less than 1 in. (2.5 cm) deep to discourage bird roosting.	
6.2.5.2 The building has a sealed storage area for food/kitchen solid waste and recycling.	1 point

6.2.6 OTHER INDOOR POLLUTANTS (TOBACCO, RADON)	
6.2.6.1 An occupancy policy prohibits *smoking* within the building. Signage is posted at every building entrance prohibiting *smoking* and the use of electronic cigarettes within 25 ft. (7.6 m) of any building entrance, operable window, or outdoor air intake when within the prerogative of the building owner and/or the authority having jurisdiction.	1 point
6.2.6.2 A site-specified assessment of radon potential is conducted, and radon prevention and mitigation measures are implemented if indicated by the assessment.	2 points
6.2.6.3 Hazardous materials are safely stored, secured, and HCS labeled per ANSI/ASHRAE Standard 62.1-2019 *Ventilation for Acceptable Indoor Air Quality 1 Standard* based on the space type. Spaces housing *specialized activities* that generate hazardous pollutants are: • provided with separate ventilation AND/OR exhaust systems capable of maintaining the space at a negative pressure of at least 5.0 Pascals (0.02 in. water gauge) on average relative to adjacent spaces (with doors closed) to prevent the spread of air-borne contaminants to other spaces; • physically isolated by doors and deck-to-deck partitions or hard lid ceilings.	2 points or N/A • One point is earned when hazardous materials are safely stored, secured, and labeled. • One point is earned when spaces are properly ventilated and isolated. • Not applicable where there are no spaces housing *specialized activities*.

6.3 LIGHTING DESIGN AND SYSTEMS (37 POINTS)

6.3.1 *DAYLIGHTING* AND VIEWS	
6.3.1.1 Regularly occupied floor area achieves a minimum *daylight factor (DF)* of at least 2 (excluding all direct sunlight penetration where window shades/treatments are not available or not used). Assessment Guidance: Estimate the DF for a daylit space that has vertical windows using the following formula: **DF = 0.1 x PG**, where: DF = daylight factor PG = percentage of glass to floor area (area of the windows/floor area)	Maximum = 5 points • Five points are earned where ≥75% of the floor area achieves a DF of 3 or more. • Four points are earned where ≥50 to <75% of the floor area achieves a DF of 3 or more. • Three points are earned where ≥25 to <50% of the floor area achieves a DF or 3 or more. • Two points are earned where ≥75% of the floor area achieves a DF of 2 to <3. • One point is earned where ≥50 to <75% of the floor area achieves a DF of 2 to <3.
6.3.1.2 Regularly occupied spaces are designed to have *clear views* to the exterior or atria within 25 ft. (7.6 m) from a window.	Maximum = 3 points • Three points are earned where ≥90% of occupied space has *clear views.* • Two points are earned where ≥60% to <90% of occupied space has *clear views*. • One point is earned where ≥40% to <60% of occupied space has *clear views*. • No points are earned where <40% of occupied space has *clear views*.
6.3.1.3 Southern, western, and eastern exposures have the following shading devices: • **6.3.1.3.1:** Active automated shading devices (e.g., automated window shades or electrochromic glazing) that automatically adjust based on sky conditions for all listed exposures; OR • **6.3.1.3.2:** Passive shading devices (e.g., manual window shades or permanent projections such as *overhangs*).	Maximum = 2 points • Two points are earned where there are active automated shading devices for the specified exposures. • One point is earned where there are passive shading devices for the specified exposures. • No points are earned if there are no shading devices.

6.3.1.4 Daylit areas (with a *Daylight Factor* of at least 2) use photo-sensors to maintain consistent lighting levels throughout the day using both *daylighting* and electric lighting.	Maximum = 2 points • Two points are earned where >75% of daylit areas use photo-sensors. • One point is earned where ≥50% to ≤75% of daylit areas use photo-sensors. • No points are earned if <50% of daylit areas use photo sensors.

6.3.2 LIGHTING DESIGN QUANTITY

6.3.2.1 *Regularly occupied spaces* meet the Recommended Illuminance for the Locations/Tasks in Table 6.3.2.1-A and Table 6.3.2.1-B.

"Recommended vertical and horizontal illuminance targets" are found in the *IES Lighting Handbook, 10th Edition, Table 22.2 and Applications Sections 21-37* OR *Table 6.3.2.1-A: IES Illuminance Categories* and *Table 6.3.2.1-B: IES Task/Location Categories.* Lighting levels may be increased or decreased by 10% (max.) based on Occupant Age, Visual Performance Requirements, or other weighting factors as detailed in the *IES Lighting Handbook, 10th Edition Table 4.1,* the following weighting factors:

Table 16.3.2.1–A: IES Illuminance Categories

Illuminance Category	Description	Recommended Illuminance (lux/footcandles)
A	Public Spaces	30 / 3
B	Simple *orientation* for short visits	50 / 5
C	Working spaces where simple visual tasks are performed	100 / 10
D	Performance of visual tasks of high contrast and large size	300 / 30
E	Performance of visual tasks of high contrast and small size or visual tasks of low contrast and large size	500 / 50

Maximum = 6 points

- Six points are earned where ≥90% of occupied floor area meets the IES Illuminance recommendations.
- Four points are earned where ≥70% to <90% of occupied floor area meets the IES Illuminance recommendations.
- Two points are earned where ≥50% to <70% of occupied floor area meets the IES Illuminance recommendations.
- No points are earned where <50% of occupied floor area meets the IES Illuminance recommendations.

F	Performance of visual tasks of low contrast and small size	1,000 / 100
G	Performance of visual tasks near threshold	3,000-10,000 / 300-1,000

Table 6.3.2.1–B: IES Location/Task Categories

Interior Location/Task	Horizontal Category	Vertical Category
Auditoriums – Assembly	C	-
CAD drafting stations	C	A
Conference Rooms – Meeting	D	B
Conference Rooms – Video Conference	E	D
Hospital patient rooms – general	B	A
Hospital nursing stations – general	D	B
Hospital lobby	B	A
Hospital anesthetizing locations	E	C
Hospital general critical care	B	A
Hotel guest rooms – general	C	-
Hotel lobby general lighting	C	-
Library reading stacks	D	-
Museum exhibit cases	D	B
Open Office – Intensive VDT	D	B
Open Office – Intermittent VDT	E	B
Office lobby	C	A
Office copy room	C	A
Stairways and corridors	B	-
Toilets and washrooms	B	A

6.3.2.2 Luminance ratios do not exceed the following as per IESNA for tasks: • 3:1 between the task and adjacent surroundings; • 10:1 between the task and remote (non-adjacent) surfaces; and • 20:1 between the brightest and darkest surface in the field of view; or 8:1 between rows of *luminaires* where there is indirect lighting and where ceiling luminance exceeds 124.1 fL (425 cd/m^2).	3 points or N/A • Not applicable where spaces are designed such that source/task eye geometry do not require IESNA Standard VDT compliant *luminaires*.
6.3.2.3 Install *luminaires* with a luminance less than 6,500 candela per square meter (cd/m)^2 between 45 and 90 degrees from nadir as documented on manufacturer specification sheets OR install *luminaires* that have 50% or more of their light directed	3 points

down with a Unified Glare Rating (UGR) of <19 using lighting calculation software to measure the UGR of the general lighting in the space or the tabular method for calculating the UGR of a single *luminaire*.	

6.3.3 LIGHTING DESIGN QUALITY	
6.3.3.1 *Regularly occupied spaces* use electric light sources with a minimum Color Rendering Index (CRI) of 80.	1 point
6.3.3.2 *Regularly occupied spaces* use electric light sources with a Correlated Color Temperature (CCT) between 2700°K and 4500°K.	1 point or N/A • Not applicable to specialty retail, medical, or exterior environments.
6.3.3.3 *Regularly occupied spaces* use no more than 50% direct only general lighting. Direct only general lighting limits Direct Glare to no more than 50° above horizontal; Direct Glare includes direct view of the light source and luminances over 2,335 fL (8,000 cd/m²).	3 points
6.3.3.4 Individual control of primary workspace lighting is provided for at least 90% of occupants. "Control" may either be dimming from 100% to at least 10% or stepped dimming with at least three (3) steps: 100%, 50% and 0%.	Maximum = 3 points • Three points are earned for continuous dimming of at least 10% to 100%. • Two points are earned for stepped dimming or switching with at least three steps (100%, 50%, 0%).

6.3.4 LIGHTING SUSTAINABILITY	
6.3.4.1 A minimum of 75% of electric light sources have a Lumen Maintenance factor of 35,000 hours to L70 or greater (the output of the lights has lost no more than 30% of their initial output at 35,000 hours). 35,000 hours is based on at least 1 hour of operation per start.	2 points
6.3.4.2 All *luminaires* are RoHS compliant with EU Directive 2011/65/EU of the European Parliament. RoHS specifies maximum levels for the following ten restricted materials: • Lead (Pb): < 1000 ppm; • Mercury (Hg): < 1000 ppm; • Cadmium (Cd): < 100 ppm; • Hexavalent Chromium: (Cr VI) < 1000 ppm; • Polybrominated Biphenyls (PBB): < 1000 ppm; • Polybrominated Diphenyl Ethers (PBDE): < 1000 ppm; • Bis(2-Ethylhexyl) phthalate (DEHP): < 1000 ppm; • Benzyl butyl phthalate (BBP): < 1000 ppm;	Maximum = 2 points • Two points are earned for compliance with all *luminaires*. • One point is earned for at least 50% compliance of all *luminaires*. • No points are earned for <50% compliance of all *luminaires*.

• Dibutyl phthalate (DBP): < 1000 ppm; and • Diisobutyl phthalate (DIBP): < 1000 ppm. Certification is provided by the *luminaire* manufacturer.	
6.3.4.3 A maintenance and operations plan is documented and supplied to the building owners, management, and maintenance. The maintenance plan includes the following: • Reflected ceiling plan; • Lighting fixture schedule (*luminaire* catalog numbers, manufacturer, lamp, wattage, beam spread, color temperature, and color rendering index); • Initial measured footcandle levels in each space; • Cleaning instructions and cleaning schedule; and • Lighting sequence of operations for each space (e.g. what the lights are supposed to do when someone enters the room, what are the light levels they can choose, what controls are in each space).	1 point

6.4 THERMAL COMFORT (18 POINTS)

6.4.1 THERMAL CONTROL ZONES	
6.4.1.1 One or more of the listed thermal zoning strategies is used for continuously occupied areas: • **6.4.1.1.1: Office Occupancies/Areas:** Includes offices and conference rooms, among others. For open areas, thermal control zones are designed to be ≤1000 ft^2 (92.9 m^2) for open areas. For single rooms, thermal control zones are designed to be ≤1200 ft^2 (111.5 m^2). Circulation and support areas are excluded. • **6.4.1.1.2: Educational Occupancies/Areas:** Includes classrooms, teaching labs, etc. Classrooms AND/OR teaching labs thermal control zones are designed to be <1500 ft^2 (139.4 m^2). • **6.4.1.1.3: Healthcare Occupancies/Areas:** Includes patient wards, diagnostic and treatment areas. Thermal control zones are designed to be ≤1000 ft. ^{2} (92.9m^2). • **6.4.1.1.4: Open-Area Mercantile and Assembly Occupancies/Areas:** Includes retail, food service, convention halls, etc. For spaces exceeding 464.5 m^2 (5000 ft^2) thermal control zones are designed to be ≤2500 ft^2 (232.3 m^2). For spaces ≤5000 ft^2 (464.5 m^2) thermal control zones are designed to be ≤1500 ft^2 (139.4 m^2).	Maximum = 12 points or N/A • **Office Occupancies/Areas** ○ Twelve points are earned where thermal control zones are designed to be ≤500 ft^2 (46.5 m^2) for open areas or ≤750 ft^2 (69.7 m^2) for a single room. ○ Ten points are earned where thermal control zones are designed to be ≤1000 ft^2 (92.9 m^2) for open areas or ≤1200 ft^2 (111.5 m^2) for single rooms. ○ Not applicable where there are no office occupancies/areas. • **Educational Occupancies/Areas:** ○ Twelve points are earned where classrooms AND/OR teaching labs thermal control zones are designed to be <1500 ft^2 (139.4 m^2).

For multiple occupancy types and/or spaces with varying thermal zone size within a building type, score each occupancy area and prorate score by floor area (rounding upward to nearest integer to the maximum available total points).	○ Not applicable where there are no educational occupancies/areas. • **Healthcare Occupancies/Areas:** ○ Twelve points are earned where thermal control zones are designed to be ≤500 ft^2 (46.5 m^2). ○ Ten points are earned where thermal control zones are designed to be ≤1000 ft^2 (92.9 m^2). ○ Not applicable where there are no healthcare occupancies/areas. • **Open-Area Mercantile and Assembly Occupancies/Areas:** ○ Twelve points are earned where thermal control zones are designed to be ≤2500 ft^2 (232.3 m^2) for spaces exceeding 5000 ft^2 (464.5 m^2) and ≤1500 ft^2 (139.4 m^2) for spaces ≤5000 ft^2 (464.5 m^2). ○ Not applicable where there are no open-area mercantile and assembly occupancies/areas. • Not applicable for other occupancies/areas.

6.4.2 THERMAL COMFORT DESIGN	
6.4.2.1 The HVAC systems and building are designed to provide a thermal environment in conformance with *ANSI/ASHRAE Standard 55-2017, Thermal Environmental Conditions for Human Occupancy.* Exceedance hours for *regularly occupied spaces* do not exceed 300 hours per year.	6 points or N/A • Not applicable where the occupancy is outside the purview of 55-2017.

6.5 ACOUSTICAL PRIVACY AND COMFORT (23 POINTS)

6.5.1 NOISE LIMITS AND MASKING SOUND LEVEL	
6.5.1.1 Design complies with noise limit criteria, quantified by either Noise Criterion (NC) or A-weighted Overall Sound Level (dBA)/C-weighted Overall Sound Level (dBC), as follows:	Maximum = 6 points • One point is earned for establishing

• **Healthcare spaces noise limit criteria in accordance with one of the following as applicable:**
  ○ *2022 FGI Guidelines for Design and Construction of Hospitals*
  ○ *2022 FGI Guidelines for Design and Construction of Outpatient Facilities*
  ○ *2022 FGI Guidelines for Design and Construction of Residential Health, Care, and Support Facilities*
• **Educational spaces noise limit criteria in accordance with the following:**
  ○ ANSI S12.60 Series: *Acoustical Performance Criteria, Design Requirements, And Guidelines For Schools*
• **All other spaces noise limit criteria in accordance with the following:**
  ○ *Table 1 Design Guidelines for HVAC-Related Background Sound in Rooms* in *Chapter 49. Noise and Vibration Control* of the 2019 *ASHRAE Applications* Handbook
  ○ Informative *Annex C – Recommended noise level specifications for various occupied activity areas* of *ANSI/ASA S12.2-2019: Criteria For Evaluating Room Noise*.
	noise limit criteria for all listed spaces.
	
	AND
	
	• Three points are earned for assessing compliance with a Noise Assessment of noise limit criteria for ≥75% to ≤100% of listed spaces.
	• Two points are earned for assessing compliance with a Noise Assessment of noise limit criteria for ≥50% to <75% of listed spaces.
	• One point is earned for assessing compliance with a Noise Assessment of noise limit criteria for ≥10% to <50% of listed spaces.
	• No points are earned for assessing compliance with a Noise Assessment of noise limit criteria for <10% of listed spaces.

6.5.1.1.1 Evaluation of building-related systems', services' and utilities' noise levels comply with noise limit criteria in 6.5.1.1, measured after construction but prior to occupancy, using a Type I or Type II sound level meter.	• One point is earned for 6.5.1.1.1. • One point is earned 6.5.1.1.2.

6.5.1.1.2 Assessment of transient noise shall be evaluated, after construction but prior to occupancy, using appropriate metrics as defined in one of the following:
• *Chapter 49. Noise and Vibration Control of the 2019 ASHRAE Applications* Handbook
  ○ *Table 1 Guidelines for HVAC-Related Background Sound in Rooms* (with footnote c)
  ○ *Table 5 Plumbing Noise Levels*
• *2018 International Green Construction Code (IgCC)*
  ○ *Table 8.3.3.2 Maximum Interior Background Sound Pressure Levels from Building Systems and Exterior Sound Sources*
• *ANSI/ASA S12.2-2019: Criteria For Evaluating Room Noise*
  ○ *Section 5.3.3 Screening for Surging or Large Random Fluctuations*
• *ANSI/ASA S12.60-2010/Part 1 American National Standard Acoustical Performance Criteria, Design Requirements, and*	

Guidelines for Schools, Part 1: Permanent Schools ○ *Section 5.2.2* (citing *ANSI/ASA S1.13 Measuring Sound Pressure Levels in Air*)	
6.5.1.2 Design incorporates a sound masking system to provide the specified minimum A-weighted Overall Sound Level (dBA) for all occupiable spaces where a sound masking system is to achieve the acoustical goals of the identified space. **6.5.1.2.1** The installed sound masking system is measured in accordance with ASTM E1573-18 *Standard Test Method for Measurement and Reporting of Masking Sound Levels Using A-Weighted and One-Third-Octave-Band Sound Pressure Levels* to determine compliance with specified performance requirements, as follows: • The measured overall level is within +/-0.5dBA of that specified. • The measured spectrum conforms to the National Research Council's SPMSoft Optimum Masking frequency range and 1/3 octave band levels, or the project acoustician's specified 1/3 octave band levels, within +/-2.0dB.	4 points • Two points are earned for ≥70%of floor area of the identified space using sound masking. • One point is earned for ≥50% to <70% of floor area of the identified space using sound masking. • No points are earned if <50% of floor area of the identified space use sound masking. • Two points are earned for 6.5.1.2.1. •

6.5.2 ACOUSTIC INSULATION AND VIBRATION ISOLATION	
6.5.2.1 Design complies with minimum composite Sound Transmission Class ratings of rooms, as follows*:* • **Healthcare spaces, one of the following as applicable:** ○ 2022 *FGI Guidelines for Design and Construction of Hospitals* ○ 2022 *FGI Guidelines for Design and Construction of Outpatient Facilities* ○ 2022 *FGI Guidelines for Design and Construction of Residential Health, Care, and Support Facilities* • **Educational spaces:** ○ ANSI S12.60 Series: *Acoustical Performance Criteria, Design Requirements, And Guidelines For Schools* • **Other spaces:** ○ *Table 801.3.3.3 Minimum Sound & Impact Sound Ratings* of the 2018 *International Green Construction Code* (IgCC). **OR** Design complies with minimum composite Sound Transmission Class ratings calculated to meet the noise limit criteria or 5 points less than the masking sound levels for spaces. For spaces	Maximum = 4 points • Four points are earned for ≥80% to ≤100% of listed room types. • Three points are earned for ≥50% to <80% of listed room types. • Two points are earned for ≥25% to <50% of listed room types. • No points are earned for <25% of listed room types.

requiring speech privacy, the minimum composite Sound Transmission Class ratings is set to the required "Level Difference" (as in ASTM E2638) or "Level Reduction" (as in ASTM E1130) to provide the required level of speech privacy in accordance with one of the following: • Speech Privacy Class values of 70 or greater, as in *TABLE X2.1 Interpreting SPC: Descriptions of the Likelihood of Speech Being Audible or Intelligible for Various Ranges of SPC, Based on Speech Levels in Meeting Rooms and Offices* in *ASTM E2638-10 Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room* • Articulation Index values of 0.30 or less, as in *Appendix X.1 RELATIONSHIP OF ARTICULATION INDEX TO SPEECH PRIVACY* in *ASTM E1130-16 Standard Test Method for Objective Measurement of Speech Privacy in Open Plan Spaces Using Articulation Index*	
6.5.2.2 Design of floor-ceiling *assemblies* complies with *Table 801.3.3.3 Minimum Sound & Impact Sound Ratings* in the 2018 *International Green Construction Code* (IgCC) for Impact Insulation Class (IIC).	1 point
6.5.2.3 Design identifies and addresses vibration isolation in accordance with *Table 47 Selection Guide for Vibration* Isolation in *Chapter 49. Noise and Vibration Control* of the 2019 *ASHRAE Applications* Handbook and complies with recommendations in the selection guide.	1 point

6.5.2.4 Field-testing of adjacent spaces comply with criteria limits in 6.5.2.1, measured after construction but prior to occupancy, in accordance with the following as applicable:
• For adjacencies of mechanical, electrical and plumbing (MEP) and heating, ventilation and air-conditioning (HVAC) rooms:
  ○ *ASTM E336-20 Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings*
• For spaces where speech privacy is required:
  ○ *ASTM E2638-10 Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room*
  ○ *ASTM E1130-16 Standard Test Method for Objective Measurement of Speech Privacy in Open Plan Spaces Using Articulation Index*
	Maximum = 4 points
	• Four points are earned if ≥15% of each different types of space comply with speech privacy criteria.
	• Three points are earned if ≥10% to <15% of each different types of space comply with speech privacy criteria.
	• Two points are earned if ≥5% to <10% of each different types of space comply with speech privacy criteria.
	• One point is earned if ≥5% of MEP and HVAC rooms' adjacencies performance ratings comply with designed composite Sound Transmission Class rating. If not

	applicable, the point is earned. • No points are earned if <5% of each different types of space do not comply with speech privacy criteria or if <5% of MEP and HVAC adjacencies' performance ratings do not comply with design composite STC ratings.

6.5.3 REVERBERATION TIME OR CEILING NOISE REDUCTION COEFFICIENT (NRC)[1]	
6.5.3.1 Design of spaces complies with the maximum reverberation time (T60) criteria from *Sections 801.3.3 Acoustical Control* and *801.3.3.4 Interior Sound Reverberation* in the 2018 *International Green Construction Code* (IgCC). For specialized spaces not included in the above references the design team shall submit evidence of compliance. Spaces may include but are not limited to the following: community centers, theatres, music halls, studios, sensory rooms, supportive accessibility spaces.	Maximum = 3 points or N/A • Three points are earned for ≥50% of listed spaces. • Two points are earned for ≥25% to <50% of listed spaces. • No points are earned for <25%. • Not applicable for mixed use multi-family and multi-family building

The Foreword and Appendix are informative only and do not contain mandatory requirements necessary for conformance to this Standard. As such, they may contain material that has not been subjected to public review or a consensus process. Sections V Definitions, Abbreviations, and Acronyms and VI References and Guidelines are informative only and are updated by the Secretariat upon the Consensus Body approval of all criteria.

Reference documents cited within the Standard are mandatory and are only to be applied within the context for which they are cited. Full acknowledgement and credit are given to the source organization for all references listed within this standard. Copies of the references and guidelines cited within this standard can be obtained from the full list of sources found in section VI. Incorporation of a reference is limited to the edition of the publication that is cited within this standard. Future amendments or revisions of the reference are not included.

VI. REFERENCES AND GUIDELINES

ActiveScore
ActiveScore Certification

American Society of Acoustics (ASA)
ANSI/ASA S12.60-2010/Part 1 American National Standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools

ANSI/ASA S12.2-2019: Criteria For Evaluating Room Noise

ANSI S12.60 Series: Acoustical Performance Criteria, Design Requirements, And Guidelines For Schools

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
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ENERGY STAR® 6.0 Program Requirements for Residential Dishwashers

ENERGY STAR® 8.0 Program Requirements Product Specification for Clothes Washer

WaterSense® Water Budget Tool

US Zero Waste Business Council
Zero Waste Certification

Waterfront Alliance
Waterfront Edge Design Guidelines (WEDG) Certification